

**THE  
MONETARY  
ECONOMY**

**(THE THEORY OF MADRID)**

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# Preface

(First Edition)

It's funny, but the economics book most quoted of all time begins his preface with the same words that we have chosen to explain the reasons that lead us to the publication of this work:

*"I make this book especially to my fellow economists, though I hope it is understandable to those who are not. Its main object is to address the difficult questions of theory, and only secondarily of its practical applications; for if orthodox economics is in disgrace, the reason must be sought not in the superstructure, which has been prepared with great care as regards its logical consistency, but in the lack of clarity and generally from their premises."*

JOHN MAYNARD KEYNES, 1935

Of having done so (and by removing the reference to "my fellow economists", which in our case would have been clearly pretentious because only one of the authors has studied economics), we would have been charged very fairly plagiarism; and for this we have not done so.

We say that it is funny because the event is already almost a century, and nothing seems to have changed in the economy over a period of time so long, in which the advances in other scientific disciplines would leave with the mouth open to the most daring visionaries of those times. We have gone and come back from the Moon, and in a few years we will do the same with Mars. Genetics has advanced so much that the problems that we face are more ethical scientists: cloning, purchase and sale of organs, the immortality just around the corner and at exorbitant prices. We know what happened to the universe makes 15,000 million years and also what killed him, in more recent times, our distant relatives, the dinosaurs. Get that machines think it is a goal that many visionaries already see it's very feasible to try to address it. New materials, chemists and physicists put within our reach, allow you to dream, with towers as high as that of Babel, and in which we will touch the sky with the tip of your fingers. We live in a world that is so extraordinarily generous and promising with the human being that we are amazed that just 10 years ago in 2008, everything was about to go to hell, because of an economic crisis that very few economists knew how to predict and that no one seems to know even today, 10 years later, why it happened.

It astonishes us that, being immersed in such an abundance of scientific knowledge, nobody knows tell us what it is that pushes us so blindly to destroy the world in which we live, and that with so much generosity has given us the livelihood for more than 1 million years ago.

There are a few economists, "colleagues" of other economists, who have alleged without rest and without getting absolutely nothing, degraded situation in which the economy from the

scientific point of view, and that also Keynes as to denounce it in the prologue of “The General Theory”. Put names now of the small number of these people have no sense here, and we're not going to do it, but if we're going to point out that there has always been within the universities around the world, “a handful of irreducible gauls” (as Asterix), who have alleged without a break the repression of the economic thought that the Empire of the Liberal Theory has been imposed by force in all the universities of the world and, most important, that have managed to keep alive the flame of the science that illuminates the economy.

We denounce in this preface, to the Liberal Theory as the responsible of the major shortcomings of scientific suffering from the economy since hundreds of years ago.

We denounce in this preface, to the large amounts of money with Multinationals and Investment Funds fill our Public Universities all over the world, for purchase wills, to remove and put on chairs, to decide, to investigate or not to investigate, to propagate as a science, which is only ideology with the sole purpose of maintaining an economic system that favors the few, at the same time that pushes us to the rest to exhausting the planet's resources.

We denounce in this preface, to the Private Universities. As the University of Princeton, who uses his immense annual revenues of more than 25,000 million dollars to the spread of Liberal Theory.

We denounce in this prologue, the Swedish bank that grants the Nobel Prizes without anyone knowing what people are responsible for the choice, nor is it at all clear to what dark and shameful ideological reasons are serving when granted the coveted award.

We denounce in this preface, to the means of communication that spread and cover the interested views devoid of any scientific backing of the liberal economists.

Clara Rojas García  
Julia Rojas García  
Pedro Rojas Sola

05 October, in the year of 2019

# Preface

(Second Edition)

The beginnings are always difficult, or so they say, but the reception he has had the first edition of the Theory of Madrid has been really disastrous. The authors selected more than 100 economists, almost all of them Spanish and academics, and will send you the edition in pdf the theory asking for an assessment of its content, but no one responded to our request. They said in the letter that the work will be deducted the basic equations that conforms to a monetary economy, and discussed the consequences are more direct and obvious for the real economy, but, for some reason unknown to us, the mention of the basic equations, not only did not arouse any curiosity on the part of the economists, but rather was a sharp rejection and a strong misunderstanding.

I really still don't know what happened exactly. Maybe the problem is in the language of mathematics, which is very different from that economists are accustomed to handle, despite the fact that the level of mathematics that uses the theory is really simple, and is available to any student high school.

Maybe the problem this on another site, and be more psychological than of lack of mathematical knowledge. Apparently, economists do not believe that the economy is an experimental science, similar to medicine, chemistry, or physics. It is usually shown very suspicious to any statement of this kind on the discipline. Even more so, when you state, as is done in the theory, that the use of the money imposes a few ligatures and few limitations very demanding about what can and cannot be done within the economy. Although no one will be hidden, and the economists also, that the economic crises exist and, therefore, not everything is possible within a monetary economy, it seems that expose openly a mathematical expression to explain, it raises a huge distrust among economists without that authors can understand why:

$$\frac{1}{k_F} \frac{d}{dt} PIA = [Ah^C - Ah^S] \quad \text{Equation for Growth}$$

The expression, which we call the theory, the Equation of Growth, indicating that it is the creation of bank money by the credit which guide the production cycle rated within the monetary economy. Of the expression, the veracity of which is very easy to check, we deduce the condition to receive a credit crisis, which apparently is something impossible to believe an economist educated in the Theory of Utility, used to dealing with equations without any sustenance empirical.

One of the economists of the most prestigious when we send you the first edition of the Theory of Madrid in October of 2019, was an economist, marxist English, whose name we will not mention, who offered to give an appraisal of the theory despite the fact that we caution you that had not been translated into English. We will send the document in Spanish and translated with the Google English to save the translation. However, it was quite frustrating to see that,

like the rest of the economists, not sent us any valuation of the work, nor returned us to respond. Why this unnecessary lack of education? Even today, after more than a year, what is unknown to us, but never more we know of the british economist, and never more we try to communicate with him.

The sadness that we, however, was very great, because we were not able to understand anything that was happening around us. We could not understand why no one responded, though it was only to tell us that our work seemed pointless.

Such was our disappointment, we went to visit them in person to one of over 100 economists to which we had given them the job is submitted, requesting an assessment. In particular, we went to visit a prestigious professor of economics at the University of Seville in search of answers, and had no hesitation in tackling the issue in your office with the hope that, finally, we were going to know because the Theory of Madrid, there was much silence. Greeted us very politely, and we listened with great patience, but, apart from to tell us that he had only had time to glance at the work, it was very logical, nor showed much interest or curiosity about what will we have during the lecture on the theory that we developed.

The silence became more silent, and destroying all our hopes, the only thing that we would clear it was from our visit to Seville, was, that, even with a personal conversation we were going to know why no one seemed to have no interest in expressing an opinion of what is said in the theory. Since then, our professor was very skeptical with everything that we told him about the theory, so that when we retired, leaving behind the Theory of Madrid on the desk, as he had to leave Peachy the head of your friend Dravot on the table in horror and disbelief Kipling, we feel like Peachy empty luggage.

Our search was there, in that office, and resisted to find an economist who would like to give us the answer. From then on, we focus on extending the theory with the hope that, by rewriting the Theory of Madrid and explaining its consequences in a way more direct and a little more depth, to be better received by the scientific community.

The second edition of the Theory of Madrid began to be re-written at the beginning of the pandemic, already in 2020. Between confinement and confinement, the extension of the theory was already ready for the christmas of that year, coinciding with the arrival of the long-awaited vaccine that was going to leave behind hundreds of people every day killed the terrible pandemic in Spain. It was a great effort for us, but we thought it was very important to finish it. The virus had already put in check throughout the global economy and all the nations of the world were using the ability to create money that has the Central Bank to rescue the real economy, with no idea of the consequences of such a proceeding, and also without taking no idea of the existence of other alternatives.

In this situation of pandemic, when the economy is sinking without that economists know what to do to prevent it, is when we see with clarity the stupidity institution that has fallen investigating in our public universities to the economy. In less than a year, the scientists working in the field of infectious diseases have been prepared more than a half-dozen vaccine to stop the virus and turn it into a bad memory. However, economists who work for us in our public universities are unable to provide a coordinated and coherent to the economic problem unique to all countries in the world are facing. While the rest of the disciplines moves and poses solutions to the problems they face, the economy, and economists seem determined to bring humanity to the disaster. The problem for economists, it is not that they do not give answers, is that they behave as if they were not guilty. It's funny, but if you ask an economist about what

happened in 2008, will answer that that was almost a disaster, but you will never be given to understand that they are responsible. To an economist, the crisis of 2008 is something external to the economy and oblivious to the way in which we address the structure economics. It is, so to speak, as a pandemic is unpredictable, oblivious to the economists and on the that there is no response from the science.

In this sense, what the Theory of Madrid is very important from the social point of view, because it allows to understand the origin of the crisis and that the cause, allowing you to tackle the economic effects of the pandemic in the best possible way. Scientific knowledge does not prevent the disaster, but since then, contributes to prevent its consequences more painful.

Although we have to warn you, with some insistence, which is much more important to the economy, to reinstate the scientific methodology within the discipline that have an economic theory of science serves to something, as is the Theory of Madrid. If the economy wants to leave behind the liberal ideology and become free from the control that you have to tax the private universities of the USA, it is necessary first of all to re-introduce the peer review within the discipline and create a set of journals in economics, where the selection of articles for publication is carried out in a fair and transparent manner.

But it is not the only thing that must be done.

It is also necessary to provide a transparent selection process to the annual grant of the Nobel Prize in Economics, because at the present time the award is being used for ideological and propaganda. To explain, these and other measures that should be taken to return the economy to its status as a scientific discipline, we have added to the first edition of the book a brief first chapter on economics as a science, in which we denounce the degrading situation in which you have fallen, the economy and the way of remedy.

There are many economists, increasingly, that they are aware of the degrading situation in which the economy, but the lack of a reasonable explanation of what causes this, and the lack of an alternative theory to the doctrinal liberal to deal with it, prevents them from seeing what is happening. They are unable to act and remedy the problem, not realizing that the economy is being a victim of the method used by those who run the private universities in the U.S. in order to indoctrinate the future economist studying in public universities from all over the world.

We hope that this treaty will open your eyes and allow them to understand where it has always been the problem and you will have to remedy, because only restoring the peer review within the economy, may have the economy the future, and with it, the society in which we live. We have the absurd idea that "Science" is, in and of itself, invincible, and very capable of defending themselves from any violence, but nothing is further from the reality that is an idea idyllic that we have on the incorruptibility of the scientific method. The "Science", as almost any other thing that is valuable, it is fragile and must be protected against those who would manipulate it, break it and turn it into an instrument of oppression, precisely, because it is very valuable.

We address this treaty to all the students who are studying economics in the many public universities in the world, but not only them. Although it is undoubtedly true that, after reading, the students will have a vision of the economy totally different from the one that they try to instill their teachers during the race, we would be very little sincere and something liars if we said that that is the only motivation that has led us to write it down and publish it. This treaty is also directed to the rest of the scientific community to remember that the science, the same as democracy, needs a lot more protection than it seems.

Clara Rojas García  
Julia Rojas García  
Pedro Rojas Single

04 of march of the year of 2021

*PART 0*  
*THE ECONOMY*

Clara Rojas García, Julia Rojas García, Pedro Rojas Sola  
04 of march of the year of 2021

### **1. WHAT IS SCIENCE?**

What is science? When something is considered scientific and what is not? How do we know whether a statement either is being backed up by science or when it's not?

To answer these questions in a way categorical is always very difficult and almost impossible. The science of philosophy that deals with these and similar problems, tells us that what we call "science" is only the consensus more or less of the majority of the scientific community about those statements that are considered scientific. That is to say, scientific knowledge is not an absolute knowledge of reality outside completely to the scientific community on which it is created and where it exists. Therefore, in the science of philosophy that studies the foundations on which it sits the scientific knowledge, used the word "paradigm" to refer to the set of claims that are considered certain by the scientific community at a given point in the historical evolution of a discipline.

Since then, we are not saying that scientific knowledge is subjective, but if we are saying that there is always a paste subjective and not demonstrable within any scientific assertion is not trivial that a reality. There is, therefore, a "truth" that can be stated as an objective within a scientific discipline, but if there is a methodological consensus about what is "the truth" contained in a set of propositions enunciated as scientific.

When we understand that science is the methodological consensus that create the people that make up the scientific community, then it is possible to understand why the foundation of the science and the strength of the Scientific Method rests on the "peer review", which is nothing other than the prescription or set of unwritten rules that must be followed to create the scientific consensus on what is a scientific statement, and what is not.

When we understand that peer review does it imply that any claim is made within a scientific discipline is completely open to critique from the moment in which it is done, then we understand that any person (whether or not a scientist) can issue an opinion on it whenever you want. In science no statement is considered true, and is in the tug-of-war involving the entire

scientific community about the accuracy or veracity of any statement, which creates the dominant paradigm within the discipline, and what it does to advance the science.

It is now possible to understand why the economy is far from being a scientific discipline, because, among other things, there is no peer review within the discipline. It is very important to understand that the economy fails so loud because any statement that is displayed as a scientist within the discipline can be discussed or put in doubt. What we call the methodological consensus, which is nothing other than the set of rules or procedures that is carried out the peer review, does not exist within the economy.

For example, a scientific assertion has to be always well defined, and you have to make reference to something that can be measured, or at least be able to isolate in the context. It is logical, in addition of also being one of the essential characteristics of any scientific assertion, because, if the elements with which it builds a claim are not well defined or cannot be isolated, hardly another person will be able to verify or refute any claim that is made about it. However, the economy is full of variables that are not well defined, and when they are, they do not refer to anything that can be measured.

Let us consider a concrete example within the economy, so that it understands the importance of peer review: “The **unemployment rate is not accelerating inflation**, also known as NAIRU, for its acronym in English (non-accelerating inflation rate of unemployment)”.

Although, since then, the rate of inflation and unemployment are well-defined and can be measured, however, the NAIRU, unemployment rate of the non-accelerating inflation, is a term that is not well defined. Not only because the term given to understand that there is a causal relationship between unemployment and inflation, in the sense that unemployment is the cause of inflation, but because it is impossible to know how you can calculate it in the case there is. I wouldn't have to prove first that the unemployment is the only cause of inflation?

The existence of the concept as the NAIRU demonstrates very clearly that in the economy there is no peer review. If the science of economics had a peer review, had never published an article on the NAIRU in a journal of economy, because the reviewers of the journal have considered the term as a term is not scientific. At most, it would have published at least one article of presentation talking about the definition of the NAIRU and showing his shortcomings, with the idea of asking for input from others to improve it, but it is certain that I never would have become the center of attention of the economy for decades, as has in fact occurred.

However, for decades, we have published thousands of articles on the NAIRU in the most prestigious magazines of the economy, obviously never reaching no conclusion, because it is impossible to happen with something that is not defined. Why? Because the economy is run by a small group of economists, who makes it and rolled back to his own whim, without allowing anyone to criticize publicly what they say, that is the essential characteristic of the scientific method. This is what we call in science peer review.

## 2. PEER REVIEW

At present, it is known by the name of “peer review” the sophisticated and arbitrary selection process that follows any article before publication in one of the few solid scientific journals that

exist, but here we are using the term to refer to the set of rules that are followed to ensure that any claim is made within one scientific discipline can be criticized by any other scientific or any other person it sees fit.

The science is unlike any of the many other systems that are used to accumulate and make accessible the knowledge, that any claim that is within her is always subject to criticism and revision, will be considered or not considered certain. And here is where lies the difficulty that a discipline can be called scientific, because it can occur that the permanent critical to what is declared as true in the discipline does not exist and that, in addition, as is the particular case of the economy, has degenerated to convert the discipline in a theology in the service of the minority favoured by the economic system.

The peer review, which in origin is conceived to ensure that all the scientific paradigm is always open to any criticism or any new information that could put him in doubt to force you to change, it is used in the economy to the contrary, to avoid that the ideas that are presented as scientific criticism and force yourself to review. The perversion of this change of use that is given to the peer review, you get that no one can put in doubt the entire theology that is taught in the private universities of the USA under the name of science of the economy.

There is nothing difficult to understand how it is possible that, in a world and in an era in which science is presented as a paradigm of the reason, independence, and knowledge, can be used in the peer-review as a court of censorship to prevent prosper any idea who dares to criticize the dogma of economic teaching of the private universities of the United States. Only when we analyze what is the method that is used to select the articles that are published in journals of economics world's most prestigious (and that are invariably those magazines that publish the private universities in the united States), then it is very easy to understand how it can be used peer review to present as a genius and that is just one of the stupid things larger than can be said within the economy on a topic, to the point of actually giving out the Nobel Prize in economics for make statements that are understood by all economists as obviously false.

Let's remember what is the process that follows an article before it is published in a scientific journal, not only in the field of economics, but is any scientific field, but only in the field of economics has been made use of as perverse method. Despite the fact that it is a very long process that can last for more than a year, he is still always a few steps very well-defined:

- 1) The article is assessed first by the editor of the magazine, or the people that the address of each journal can be designated for this purpose, with the intention of determining, in a quick read if the article is suitable for publication. When the item is rejected at this first assessment, it tends to return to the author, accompanied by a terse comment, saying that it, or its subject matter does not conform to the who is still the magazine, or that you have already published articles that are very similar to this, or that the article does not have enough relevance, or is rejected without giving any explanation.
- 2) When the editor finds interesting the article is then sent to a group of 2 to 5 reviewers that they're supposed to be independent and experts on the particular topic of the article, and whose names tend to stay in anonymity. They are the ones that have elapsed between 15 days and 3 months, to issue an opinion on the article, which has the result to decide if the item is to be published, or will not be published.
- 3) From here, what happens with the valuation of the article for the magazine is again confusing in the best of cases. Some times the item is returned to the author for modification and re-evaluated in a few specific areas, and at other times rejected

definitively, but almost never says the author, who were people who appreciated his work and what was the outcome of such assessment. That is to say, neither the author nor the scientific community knows what the article has been rejected, nor knows who has been rejected.

The dark process of evaluation before posting, has its origin in the recent past, when the scientific community was very small and all the scientists knew each other. At that time, it was considered a good one that both who was a chartered accountant as one whose ideas they were exposed to the criticism to remain anonymous to avoid suspicions between people who knew each other. But no one can deny, that the dark process of evaluation that we have just described makes hair stand on end to anyone who knows a little story, because it is very similar to the procedure that follows any Court of Censorship to prevent the publication of those ideas that are considered dangerous to the rulers.

In fact, at that time, the peer review was carried out with the personal communication between specialists and the organization of congresses. While the scientific journals are used only to communicate the findings to the rest of the scientific community less specialized, so that the procedure of publication was not of any danger to the scientific method or science. Neither the idealism implicit among scientists, who have always seen themselves as benefactors of mankind, helped a lot to see the potential danger that was in the foul system of selection of articles that were imposed on the researchers who led the scientific journals before publishing any article, and the time passed without anyone put in doubt the process, or to see its dangers.

But the time never happens in for nothing. Science went from “god's machine” which opens with the industrial revolution, the “every man for himself” that brings with it the economic liberalism most outrageous, and the scientific knowledge, before human knowledge shared, now becomes the source of the inequality of development between countries. It is quite possible that in other scientific disciplines, it is not evident with as much clarity as can be seen in the case of the economy, but the system that is used for the publication of articles has been used without any modesty to censor any idea contrary to the economic theory official created by economists working for the universities of the USA.

No one will deny that any author who wishes to publish an article, must submit to a value judgment on the part of those who direct the magazine that can be used as a Court of Censorship to select the items according to the ideology, nationality, race or the sex of who publishes, leaving the small fry who run the magazine, the selection criteria. In such a situation, the journal becomes a powerful ideological weapon in the hands of those who lead, not very different from the ideological weapon in the that have become all the press newspaper in modern information societies.

We can see that we have newspapers left and right, and we can understand that journalists are required to profess the ideology of the editorial line of the newspaper in which they work, at the same time that you are forbidden to write in a newspaper of an ideology rivals, but it would cost us understand that something like this happened in the scientific journals. Scientists would like to think that the scientific articles are different, and are published according to the scientific importance that they have, forgetting completely that the “scientific truth” is only the consensus reached by using the peer review. Scientists behave as if you do not want to accept what that means, and they prefer to ignore the fact that it is very easy to pass for science what is only ideology with only control the selection method that is used in science to carry out the peer review in scientific journals.

At present, the economy is not a scientific discipline. At present, the scientific paradigm is a set of doctrinal statements that economists working for the private universities of the US, posing as science. To understand how this can happen it is important to understand how the Scientific Method and, in particular, the peer review.

The science is unlike any of the other systems that have been used to access the knowledge, which requires that any statement made within the science is always subject to criticism and review, consider or not consider a certain must. Being here where lies the greatness that involves the Scientific Method, and also in the residence of his great weakness, because it can occur that the permanent criticism to which you must submit any claim which declare certain, not only exists, but rather that it is used to make statements that do not have any livelihood empirical, as in the case of the economy.

In science, it is known with the name of “peer review” to the dark and arbitrary selection process that continues today an article before publication in one of the few solid scientific journals that exist, but here we are using the term to refer to the set of rules that ensure that any claim is made within one scientific discipline can be criticized and doubted by any other scientist when it suits you.

The peer review is conceived in source to ensure that all the scientific paradigm is always open to criticism, so that the appearance of any new information or fact that could put him in doubt make it change. The idea is to make public the new facts, or the ancient critical exposing them in the form of articles in scientific journals, so be disseminated and may be criticized. But in economics, the peer review is used to censor, to prevent any article contrary to the paradigm official post and put in doubt the fundamentalist ideology propagated by the economists who work for the private universities of the USA.

There is nothing difficult to understand how it is possible to do this in a world and in an era in which science is presented as a paradigm of the reason, independence and knowledge; it is nothing difficult to understand how it is possible to use peer review as a court of censorship to prevent prosper any criticize the dogma of economic taught in the public and private universities from all over the world. To do this, analyze what is the process that is used to select the articles that are published in the journals in economics most prestigious in the world, and which are invariably those magazines that publish the private universities in the United States.

Despite the fact that it is a very long process that can last for more than a year, he is still always a few steps very well-defined:

- 1) The article is assessed first by the editor of the magazine, or the people that the address of each magazine has appointed for this purpose, with the intention of determining, in a quick read if the article is appropriate, or not, for publication. When the item is rejected at this first assessment, it tends to return to the author, accompanied by a terse comment, saying that it, or its subject matter does not conform to the who is still the magazine, or that you have already published articles that are very similar to this, or that the article does not have enough relevance. Although it is very possible that will not give any explanation.

- 2) When the editor finds interesting the article is then sent to a group of between 2 to 5 reviewers that they're supposed to be independent and experts on the particular topic of the article, and whose names tend to stay in anonymity. They are the ones that have elapsed between 15 days and 3 months, to issue an opinion on the article, which aims to decide if the item is to be published, or will not be published.
- 3) From there, what happens to the valuation of the article becomes confusing in the best of cases. Sometimes the article is returned to the author for it to be modified in a few specific areas, and at other times rejected definitively, but almost never says the author, who were people who appreciated his work and what was the reason for the rejection. That is to say, the scientific community do not know which articles have been featured in a magazine to be published, or the reason why they have been rejected.

The dark evaluation process that suffers an article before being published in a magazine, has its origin in the recent past, when the scientific community was very small and all the scientists knew each other. At that time, it was considered a good idea, both who was a chartered accountant as one whose ideas they were exposed to the criticism to remain anonymous to avoid raising suspicions between people who knew each other. But no one can deny, that the dark process of evaluation that we have just described makes hair stand on end to anyone who knows a little story, because it is very similar to the procedure that follows any Court of Censorship to prevent the publication of those ideas that are considered dangerous to the rulers.

In fact, at that time, the scientific journals are used only to communicate the findings to the rest of the scientific community less specialized, because the peer review was carried out with the personal communication between specialists and the organization of congresses very specialized. With a population scientific so reduced, a selection procedure so dark there was no danger to the scientific method or science. Also the idealism implicit among scientists, who have always seen themselves as benefactors of humanity, was also very helpful to hide the potential danger that was in the foul system of selection of articles that were imposed on the researchers who led the scientific journals, and the time passed without anyone put in doubt the process, or to see its dangers.

But the time never happens in for nothing.

With the increase of the population investigating, the direct communication becomes impossible and the convening of conferences specialized becomes a mechanism to recognize the scientific merit of the researchers, leaving to be the way in which it is carried out the peer review, which now happens to depend almost exclusively on the publication in the scientific journals. Now no one knows who is who in science and the publication of articles in scientific journals become the only means for carrying out the peer review, without which there can be created the scientific consensus product of the scientific methodology and, therefore, there can be no science.

Perhaps in other scientific disciplines, it is not evident with as much clarity as can be seen in the case of the economy, but the process chosen to select the articles that are published, you can use it without any modesty to censor any idea contrary to the economic theory official. In fact, from the end of the Second World War, the private universities of the USA have been used to

convert the selection process in a Court of Censure with which to present the liberal ideology as a theory supported by the Scientific Method.

It escapes no one that you can select the items to be published according to the ideology, nationality, race or the sex of who publishes, being at the mercy of those responsible for the scientific journal, the criterion of selection. In such a situation, the journal becomes a Court of Censorship that puts a powerful ideological weapon in the hands of those who lead, not very different from the ideological weapon in the that have become all the means of communication in the modern information societies.

Everyone understands that there is periodic of left and right, and that journalists are required to profess the line ideology that marks the editorial of the newspaper in which they work, but it would cost us much to understand that something like that happened in the scientific publications. Scientists would like to think that the scientific articles are published according to the scientific importance they have, forgetting completely that the “scientific truth” is only the consensus that is reached when using the scientific methodology that embodies the peer review. Scientists behave as if the “scientific truth” out absolute and not a simple consensus, preferring to ignore the fact that it is very easy to pass for science what is only ideology with only control the selection method that is used to carry out the peer review in scientific journals.

In fact, it is what has been happening over the last 50 years within the economy, without which the rest of the scientific community to say anything about it. There should be no mystery to anyone, you know how it has replaced the selection process that you have to submit any article before its publication in a journal of economy, in a process that in nothing is the difference that follows a Court of Censorship. The same thing that should not surprise anyone, how easy it is to use the same process to make them pass an economic doctrine devoid of any scientific basis for a scientific theory to be consolidated.

### **3. THE PRIVATE UNIVERSITIES OF THE USA**

It all started to go wrong in the world after the Second World War. It then became very apparent the existence of two superpowers, the USA and the USSR, locked in an ideological struggle without quarter, on what was the best political and economic system to organize, whether communism or liberalism. Since then, no one will escape the ideological fight between the two hegemonic blocs, barely concealed the fight material for the constructive possession of the resources that both superpowers needed to continue to exist.

In the middle of a situation that is so violent, where two conceptions conflicting are struggling to maintain economic hegemony, it is inevitable that there is a temptation to bribe the science to support the ideas that uphold one of the two sides. The science, but on the whole the economy, then becomes unwittingly in the field of battle where it matters very little of the scientific knowledge and any consideration is subject to achieve victory. However, while that in the USSR there was no need to bribe anyone, because there everything published was subjected to prior censorship, this was not so in the US, and in the so-called “free world”, where

economists spread communist ideas without any hindrance, driven by an environment of poverty, deprivation and inequality, which acted as a breeding ground and a sounding board.

In the west, unlike the USSR, there was a very strong incentive to control the ideas and theories that were propagated as science within the discipline of the economy in order to strengthen her liberal ideology, forcing the science of economics to take a stand for the causes liberal. And what was used to achieve this, as it could not be of another way, it was misrepresenting the existing method for the selection of articles that were published in the journals of economics and convert it in a Court of Censorship to prevent any publication contrary to the liberal ideology. The whole view of the world, but no one would perceive of what was happening, not even the scientists themselves, the economy was subjected to a strict censorship on the part of the private universities in the united states over what is published in the journals and in textbooks dependent on them. The scientists of other disciplines, too idealistic to think that such a thing was possible, never came to understand that the greatest attack ever against science, not only was taking place in front of their noses, but that was bring it to completion in collaboration with and consent.

The witch hunt that suffered the Mecca of Cinema, Hollywood, during the decade of the 50s of the TWENTIETH century is known for all, but it is not so known as the silent expulsion of teachers with leftist ideas, that began in that decade, in all the private universities in the US. The time of persecution, that he knew how to visualize Hollywood with all the pomp that deserves always to any media lynching, also occurred in the other activities within the United States, but in a much more quiet, especially in the case of university education, where it was natural that there were economists who defend as an alternative approach to the study of the economy, the marxist ideas. Then began a rapid process of selection and replacement of university teachers according to their political beliefs, their race, their nationalism and, above all, according to their faith in liberalism, especially of the teachers who devoted themselves to the teaching of the science of economics.

The ideological cleaning was constant and was highly favored by the fact that the vast majority of universities of the USA are private universities, whose owners had no obligation to justify why they hired some teachers and not others. Little by little, and after the passage of only a decade, all of the faculty hired by private universities in the united states professed, without reserve, the liberal ideology.

The next step was to build an economic theory that might arise as a scientific advancement to support the economic doctrine liberal, both in textbooks and in scholarly journals devoted to the economy. Here, the economist Paul Samuelson of the Massachusetts Institute of Technology (the famous MIT) was essential, because it was considered as an economist keynesian for a good part of the scientific community, when in reality it was a person with convictions deeply liberal, closer to the ideas of Friedrich Hayek than of Keynes. The award to Paul Samuelson, the Nobel Prize in Economics in 1970, was the turning point that marks the victory of ideology over science to convert the Theory of the Production Function created by Samuelson in a scientific theory, when a few years before the scientific community had proven, beyond any reasonable doubt, that the production function could not exist as conceived by the current theory.

To achieve this, it was only necessary to control everything that was published in the journals of the economy's most important that, at that time, just after the end of the war, were the journals that published the private universities of the USA, the only country that had completed unscathed by the war. The obscurantist system review the articles prior to their publication was perfect for that purpose, and from the seventies allowed people who were in the private

universities of the united states to decide what articles are published and which items were not published in their journals. The power gained from that moment, the cloisters of the private universities in the united states was immense, and the small minority of people who were, was unable to prevent the publication of any article contrary to the liberal doctrine, at the same time they were published as great ideas, which were only swill ideological of the worst sort, addressed to justify the liberal doctrine, as it was the Theory of the Production Function by the Samuelson received the Nobel Prize.

From then on, the factory, an economist hired by the MIT and for the rest of the other private universities in the U.S., such as Chicago, contribute with their work to provide an apparent scientific consensus, the creation of ideological of a small group of people, to make them appear in the journals and in textbooks, such as scientific discoveries, when the truth is that they are only statements ideological without any support empirical. Constructed theories to justify the free movement of capital in favor of the dollar, in order to justify the lack of protection for local industries of all countries of the world in favor of the industry of the united states, to justify the dismantling of the trade unions in all over the world, and, finally, we constructed the theory of externalities to justify the discharge of CO2 to the atmosphere instead of prohibiting, among many other things. From then on, all the recommendations that are derived from the economic theories were to be addressed to protect for reasons of "utility" and "efficiency" are the interests of the richest people on the planet.

Economists who work for the private universities in the US have a very bad memory, and now renounce the theoretical recommendations that was forced to take to the developing countries during the past 50 years, and the dire consequences that it had for them. The free movement of capital left defenceless in the local currency against speculative attacks on the dollar backed by investment banks north americans, opening the door wide to the crisis of change that hit almost all of the economies of the planet. Even the all-powerful british Pounds was unable to prevent the devaluation forced to attack in sync investment banks in the united states to the beginning of the decade of the 90s of the TWENTIETH century.

They have also forgotten all the recommendations made for the withdrawal of the protection that the tariffs provided by the local industry. In the 80's, completed a myriad of treaties of "free trade" that forced the developing countries to the withdrawal of the tariffs that allowed them to carry out the policy of "import substitution". All of the local industry of the developing countries was destroyed and, since then, their economies are specialized in the production of the raw materials that the more developed countries, the USA and the european countries, they needed in their advanced industry.

It is quite understandable that today want to forget the role played by the economic theories for the whole of the second half of the TWENTIETH century came out without the rest of the private universities in the united states, for were they the cause of all the imbalances between the countries, the poverty in which he lives half of the inhabitants today, the deteriorated environment and the threat to the entire planet posed by climate change.

What is the science? So that human beings can be protected against fundamentalism and ideological that degrades human beings. But what happens when a minority uses the science with the idea to justify scientifically their economic privileges? That was what happened with the nazis and with the course scientific backing to the theory of evolution of Darwin gave to the existence of a superior race, and it is also what has been happening over the last 50 years with the economic theory created by economists working for the private universities of the USA, which has been used to support the degrading liberal idea, which asserts that human beings are

more productive and more efficient than others, and therefore, deserving of their wealth; and the same thing that people less productive and less efficient, are deserving of their poverty. If prior to the racism used the physiological differences to justify that some human beings are better than others, now the liberal economy uses the difference of income to justify, such as auto-deserved, the misery and the poverty they suffer a good part of the human beings that inhabit the planet.

Why have we allowed this? How is it possible that we have left that the people who run the private universities of the USA, all of them belonging to 0.001% richest of the planet, are those who decide that they are taught in the textbooks of economics of the universities around the world as scientific truth?

How have we been able to be so idiotic?

#### **4. PUBLIC UNIVERSITIES**

Talk about economy corrupt it may seem unfair, and even insulting to many economists working in the public universities from all over the world, but we have already reported the diligent work they have done private universities in the U.S. to select according to their ideology to the professionals that are dedicated to the research in the field of the economy. Although you can't blame a private company that you hire the people who create appropriate, and therefore, cannot be called corrupt economists who work for the private universities in exchange for an excellent salary with which to enrich themselves, what is certain is that if they can be accused of corrupt when deceive, lie and distort to make pass through a scientific theory, which is only a doctrine with which to justify as a well-deserved income inequality existing. That can only be classified as corruption, because they do it intentionally, knowing what they do and knowing that you are cheated to people who are not economists. It is very difficult to defend people like Paul Samuelson, or as Gregory Mankiw, because they are people whose behaviour can only be classified as corrupt, define as define the term "corrupt".

However, next to these economists whose corrupt behaviour is very clear and open for all those who want to see it, there are other, much more grey and much less visible, but just as corrupt, without whose complicity and silence, the ideological work of the other would not be possible and could not be carried to term. We are referring to economists working in the public universities from all over the world. They are, in our judgment, the true economists corrupt discipline, because all the prestige that have been achieved within the economy, it has been due to bend to the will of ideological those that are named, the exalt and the privilege other economists within the discipline. To understand what we're referring to, it is necessary to remember how to select teachers who are dedicated to the research and teaching within a public university.

Unlike what happens in a private university, where nobody puts in question the right to hire the research staff and faculty members as they see fit to the owners, in a public university in the opposite happens, as a result of the transparency that requires the management of public goods. In a public university, there is a complex selection process that seeks to be impartial when it determines the suitability of the teaching and research staff that you hire. And here is where problems begin, because the evaluation research of a candidate to work in a public university,

comes from an external assessment on the quality and quantity of scientific articles, books and other publications made by the researcher throughout his professional life.

No one will deny, and we have already discussed this point, that publishing an article in a scientific journal does not depend on the research capacity of the person submitting the article, nor of the scientific quality of the article, but the valuation of the article who run the magazine, which tend to be almost always a private institution, dependent from a private university in the united states.

We forget the obvious, because we want to forget, but who has to determine the “quality” of the scientific article is the scientific community, and for that, for what is published, which can only be done once it has been published article, and not before. We forget the obvious, that assess an article is not the competence of the people that filter the articles prior to their publication, but that its function is to reject those articles that are considered to be scientific or to repeat what has already been said other articles without adding anything substantial. We do not forget that the scientific methodology requires that any article is published for the scientific community to evaluate, and not to be presented to the scientific community as “something” whose scientific quality has previously been valued by those who run the magazine, because that can never be its function.

A clear example of what we are saying we can view the article in the publication, by more than a hundred of physical a few years ago, an article in which he stated that the neutrinos, particles very difficult to detect, traveling at a higher speed of light, placing in doubt the veracity of the claims of the most basic and settled in the present about the nature of the universe. It is very evident that those who ran the journal where the article was published, there was no one to assess the scientific aspect of the article and that, despite the immense probability that what was stated was false, the magazine had the obligation to publish it to outside the scientific community who would be valued. However, we know that this is not what happens in the economy. In the economy, the opposite happens, and it prevents the publication of any article that does not profess the ideology of the owners of the magazine.

The problem of peer review that is carried out with the publication of articles in scientific journals, and that misrepresents what is considered the “scientific truth”, derives from the confusion concerned about what role they have to play that direct scientific journals. Because when we accept that they are the owners of the magazines, the ones that decide without any transparency which articles are published and which are not, we will be accepting that it's a small and unknown group of people who value those who are good researchers and those who do not, according to criteria that have nothing to do with the impact of scientific articles published. Or in another way, we will be accepting that they are the ones who manage scientific journals who assess the scientific quality of the researchers, forgetting that those who possess the vast majority of the scientific journals are the private universities of the USA, which are private entities which employ researchers on the basis of purely ideological.

The granting of this unheard of privilege, has direct consequences on the recruitment process followed in a public university, because, as we have already mentioned, the research staff and faculty members is selected by attending in large part to the amount and quality of the articles that are published in the journals of science. It is then understood very well the enormous influence of the private universities of the USA who would end up occupying the chairs of the public universities from all over the world, because they are private universities that decide the scientific prestige of each researcher as we publish more or hands articles in their journals. Not only that, also the private universities of the USA hired for a short period of time to economists

foreigners, according to their ideology, increasing their curricula enough to overcome other researchers when they compete for a place in the public universities.

This silent and corrupt the process of selecting curriculum has been carried out since more than 50 years ago, with a special zeal in the field of economics, and right now all the teaching and research staff of any public university processes the liberal ideology, sometimes without, that they themselves are given count. It is very logical, any person who wishes to move up the hierarchy faculty of a public university knows that you have to think, investigate and come to some conclusions and not to others, if you want your articles to be published in some prestigious journals that depends on the private universities of the USA, or if you want to take classes as a teacher assistant in a university like that of Massachusetts.

It is very easy to see that a large part of the economists who occupy the chairs in public universities in Spain have the same curricular profile. First, almost all of them have a doctorate or a phd in any private university in the united states. Second, almost all of them have been hired for a short time in any private university in the united states. Third, have been published with some regularity in some magazine-dependent economy of any private university in the USA, generally, of the university that participated in studies of post-doctoral study or where they worked as assistant professor for some time. This is not a coincidence.

It is also easy to see that the majority of economists with the best scores on the scientific side, working for a private university in the united states. It can hardly be overlooked that the 70% of people who have received the Nobel Prize in Economics have american nationality and, very probably, working for a private university.

You have to be very blind, or be an economist corrupt, not to see what is happening in the economics departments of all public universities in the world. The own economists are well aware that if they want to progress within the discipline, the last thing you should do is to be critical of the ideas propagated by the private universities of the USA. This is the reason, and no other, which we have named these economists "corrupt", and the reason for what we call the chapter zero of this treaty as "Economy Corrupt." Not being our intention is not to offend economists working in the public universities from all over the world, but to point out to them that they have to get up and shake off the yoke of tyranny imposed on them by decades, the private universities of the USA, without themselves being aware of it.

Are we exaggerating? What almost all economists working in the public universities are corrupt? Better let's look at an example, and judge. Not long ago, in 2013, the economists of the public university of Massachusetts Amherst, Thomas Herndon, Michael Ash and Robert Pollin, published an article denouncing the little scientific rigor of the conclusions I had come in another article, the economists of the private university of Harvard, also in the state of Massachusetts, Carmen Reinhart and Kenneth Rogoff. The criticism was published in the journal of dependent economy of the university of Cambridge, but the Cambridge English.

It would seem then that the example contradicts our complaint, and the sample as exaggerated. Nothing could be further from the reality. When we investigate in a little more detail the sequence of acts, we find that the critical Herndon, Ash and Pollin was published in The New York Times, a year before it can be published in the journal of economics Cambridge. It is very similar to what happened with the economist Thomas Piketty, who began to publish in the most prestigious journals in economics, and was not considered to be a great economist until the Times became The Capital of the Twenty-first century in a best sellers.

It is, on the contrary, the example and Thomas Piketty reveal the state of complete corruption has reached the economy.

## 5. THE NOBEL PRIZE IN ECONOMICS

But, not all the manipulation or all of the censorship that was imposed from the cloisters of the private universities in the US would be sufficient to prevent, by itself, that the scientific truth to find its way, even in a discipline as degraded as it is the economy. Something more is needed to close the circle and drown out any semblance of critical thinking within the economy, and that is got from the beginning using the awarding of the Nobel Prize as a weapon of propaganda.

As the institutionalization of scientific journals, the Prize Nobel is relatively old, and began to grant in 1901 the Nobel Foundation. The same thing happens with the method of selection of the articles, also the system of choice of the honorees is a very obscurantist and it is unknown what it is. The reason, as before, is to be found in the small amount of people that make up the scientific community and the suspicions that might wake up the names of those who granted the award and, therefore, that we know their policy preferences, and your nationality. For this reason, and since the birth of the institution, the selection process is completely secret and ignore those who are in charge of the election process and what criteria they are following to select the candidates. Once more, the naivety and blind faith in the ethics, which scientists attribute to themselves, allows the creation of a system of choice easily manipulated by those who have the opportunity to use it, also it is unknown who they are. A true nonsense.

In the case of the award of the Nobel Prize, the situation is even worse, because it was in 1969, at the beginning of the liberal offensive, when the Central Bank of Sweden instituted the award. It was not a coincidence, that just a year later, in 1970, was granted the Nobel Prize for Economics, Paul Samuelson's Theory of the Production Function, marking what would be a general trend of the use that is going to give the award to support the economic theories that would be emerging from the private universities in the U.S. in order to propagate the liberal doctrine. Another way of thinking, it would be stupid.

It is not difficult to understand that it has been due to the award of the Nobel Prize in Economics as they have been able to present theories as absurd as genius, positioning itself as scientific discoveries of the liberal policies then were going to take Regan in the US and Thatcher in the United Kingdom, among others.

If we ask someone by the person to whom it is granted him the Nobel Prize in Physics for to build the laser, very few would know his name, but they all coincide in that the invention of the laser was a great scientific discovery. However, if we ask someone for some discovery in the economy, until the own economists would find it difficult to point to any. Not know, economists are unaware of until that is the money, although that does not prevent the banks to make it to their whim. By what criteria it is awarded the Nobel Prize in Economics? What have been the discoveries made by Paul Samuelson just 50 years? To Samuelson, he was awarded the nobel prize *"for the scientific work through which he has developed the economic theory, static and dynamic, and has actively contributed to raising the level of analysis in economic science"*, that is to say, for nothing to be realized or has had any continuity after 50 years. Why, then, was granted the Nobel Prize in 1970?

A true fact that you can put us on the track of the reason for that is granted to someone the Nobel Prize in Economics, we can find it when we count the number of award winners has american nationality. What it is not surprising that around 70% of the recipients of the Nobel Prize in Economics belong to the cloister of any private university in the USA? That is to say, 7 out of every ten people who get the Nobel Prize have american nationality. That, in itself, already tells us everything we need to know about who is behind the selection of the award winners and the type of criteria may be used to grant permissions, but, if that were not enough, we just have to take a look at what are the scientific findings that have served as an excuse for the award of the prize, to realize that is has been using shamelessly to propagate as a scientific theory, the economic doctrine that justifies the liberal policies that have been conducted around the world during the past 50 years.

The situation has come to the science of economics is terrifying, and we can see easily that the economists who work for the private universities of the USA are the ones who are deciding that presents itself to the world as “scientific discovery” within the economy. First, because they are the ones who decide which jobs are published and that jobs are not published in scientific journals most prestigious. Second, because they are the ones who decide who thrives within the economy. And third, because they are the ones who decide who gets the Nobel Prize. Let us consider a few examples.

To William Nordhaus is an american economist, close associate of Paul Samuelson, researcher, teacher and involved for many years in the direction of the Private University of Yale, in New Haven, Connecticut (United States), who was awarded the Nobel Prize in 2018 for his research and findings on climate change. What are these findings? Certainly in nothing, but the people who run the cloisters of the private universities of the USA wanted to grant him a last homage to one of its economists more pointed and more diligent in the propagation of the liberal doctrine. The Nobel Prize in Economics was awarded to William Nordhaus simply because they could do so; for they are they who decide who gets the Nobel Prize and who is not. There is no other reason.

It would be a serious error that the reader comes to the conclusion that we are accusing the private universities to be conservative and to spread conservative ideas. No, think that would be a serious mistake. Here we are not censoring the people to defend conservative ideas. Here we are denouncing the private universities in the U.S. of having created the world, and deliberately, a structure of propaganda at all levels of education of the economy with the sole purpose of preventing the scientific advancement of the economy, and to propagate the liberal ideology as if it were a scientific theory. A structure of propaganda odious and corrupt, the basis of which logista are the private universities of the USA, which produces thousands of economists indoctrinated into fundamentalism, liberal distributed by public colleges and universities from all over the world and teach and propagate the liberal doctrine.

The horrific and scary box is complete with the complicity active by large companies and large investment funds, which organize symposia and competitions in where to meet honors and praises the professors and university teachers to display them successful to the rest of the scientific community, which has no awareness of what is going on and how they are using public colleges and universities from all over the world to propagate an economic doctrine that in a very little difference of the ideology propagated by the nazis.

## 6. WHAT TO DO?

What to do to down the whole structure propagandist created by the private universities in the U.S. for the spread of the liberal doctrine? What to do to avoid that is to pretend to be scientific findings which is only fundamentalism doctrinal? What to do for the economy to become a scientific discipline?

The solution to eliminate the corruption that has taken hold of the research and the teaching of economics is to be found in the peer review, because that's where sits the scientific method and science. For this reason, it is necessary to rebuild the institutions designed to allow criticism of any idea of economic spreading as a scientist within the discipline, it is deemed true or not is considered true to the idea and without any limitation. The science is based, first of all, in the existence of a provisional a methodological consensus within the community on what is considered the truth, so that without restoring the institutions that are tasked with ensuring the process, what we have called on the name of the peer review, will not be able to reach any scientific truth.

We have to understand that the source of the power of the private universities of the USA on the economy, but also on the rest of the scientific disciplines, it is appropriate to manipulate the scientific methodology that underlies the process of selection of the articles before publication, to make it into a Court of Censorship, which prevent the publication of any article contrary to the liberal ideas in the economics journals. Therefore, in order to restore the scientific method within the economy, it is necessary to deprive the private universities of the USA of the control they have over what is posted within the discipline:

- 1) The Nobel Prize has to concede the scientific community as a whole. You can't leave a group of people, that nobody knows who you are, what interests they protect, or what criteria they use, are granted the Nobel Prize in Economics, this is an outrage. The method used to award the Nobel Prize has to be transparent, and similar to that used by the persons related with the world of cinema to grant the Oscars or the Goya Awards. Must be those economists from around the world selected by an open vote and to double back, the person deserving of the Nobel Prize. In economics, every economist must have a vote, the same thing happens at the Oscars.
- 2) Preventing the continued use of the review articles as a Court of Censorship that would deprive them of the private universities in the united states of much of their power to propagate the liberal doctrine. To do this, you must force the magazines "scientific" to indicate the specific name of each person who has rated an article, along with the exposure of such an assessment, for both to be known by the person who presents the work and for the rest of the scientific community. Although it is true that an economy magazine is a private entity that is managed privately, it is also equally true that the role is a social role and therefore must abide by a set of rules without which it may not be declared a magazine "scientific", intended for the publication of scientific articles. Often thought that a journal is scientific because in it there are published scientific articles, when is reality is just the opposite way, the articles are scientific because they are published in a scientific journal. The reason for this confusion has its origin in that it is considered the scientific truth as an objective reality, when the reality is that it is the

result of a consensus, the methodological within a community. Scientific journals are part of that methodology, and why they are important.

The same thing that we require a doctor a degree and certain standards of transparency in the treatments applied to the sick, and also scientific journals should be subject to a set of binding rules when they conduct their work informative. Secret Courts and judges anonymous are the best way to impose by force a particular vision of the world that favors the few, just as they do in the present, those who run the private universities of the USA.

- 3) The prestige researcher, a scientist, in the field of the economy or is not in any other field of science, it cannot be subject to a scientific journal to publish or not to publish your work, or which is cited more often or less often in such journals. This is equivalent to giving that run such journals the power to select teachers and researchers who will work in public universities from all over the world, which is absurd.

To avoid this, implemented a procedure of self-assessment, so that they are the own scientific community working in the same field of knowledge, that is to value themselves. We understand perfectly that this is an aspect that must be carefully considered, but we firmly believe that the current system of scientific evaluation based on the number of citations has no sense and lets a small group of people are corrupt. We think it should be changed by another more open and more democratic.

To understand that science cannot flourish in the dark of a Court of Censorship that works in the shadow is very important. Remember that 7 of every 10 of the economists who have received the Nobel Prize are of american nationality, it is very important to understand where is the problem, because it can hardly be explained without recourse to the widespread corruption that have been implemented within the economy, direct the private universities of the USA.

## **7. THE THEORY OF MADRID**

The Theory of Madrid is a scientific theory because, unlike the current economic theories, all the variables that appear in the theory are associated with the physical quantities that can be measured. There is no problem then confirm the validity of the claims that are made, and, therefore, to check the validity of the Theory of Madrid.

But no theory will ever to get to the discipline of the ruin intellectual in which it is located, and sooner or later everything will be as it was before, if not previously returned the scientific methodology, and removes the yoke to which the subject of the private universities in the US. The Theory of Madrid has not arisen from any university, whether public or private, because that never would have been possible in the current state in the economy, and while that doesn't change, no theory by very scientific this is, you will be able to change anything.

*PART I*

*THE EQUATIONS BASIC*

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## **1.INTRODUCTION**

If we want a discipline does not feed from the scientific point of view, so that it is completely stuck in the barbarism and the fundamentalist ideological, the first thing you have to do is to define the variables on which it is based, the discipline of the more vague as possible. When a quantity or variable is ill-defined will not be able to affirm or deny anything about its evolution, and any discussion about it will be impossible; no one will know what you're talking about. So, we will prevent them discredit any claim that is within the discipline for the absurd, and can be made to pass for a genius any nonsense that occurs to us. Therefore, it is no surprise a lot to check that the variables that are used in textbooks to describe the economic reality, are all of them so ill-defined that nothing can be said about them, and, much less, can be measured in practice.

On the contrary, for a theory to be “scientific,” it has to meet at least two essential characteristics: *“first, that the variables that use the theory to describe the reality can be measured, and second, that any prediction that is made in the theory on the future value of those variables, allows to confirm or reject the validity of the theory”*. When a theory has at least these two characteristics, the variables can be measured and any prediction that is done on them can be verified, then it is said that the theory is “falsable”, that is to say, you can check if any prediction that makes the theory is false or not false.

In this sense, the economic theory taught in today's economists working for the private universities of the USA is not a scientific theory, and most of the variables that are used to explain the social organization from the economic point of view are not well defined, are inaccurate and, in practice, are impossible to measure. Although we understand that the criterion of “falsabilidad”, is just one of the many criteria that can be used to define the science,

the intention of using it now is to report on the lack of any scientific criterion within the economy. For example, and are by no means the only variables without sense, the “utility” or “cost of opportunity” are variables that are mentioned frequently in the works published in economics journals most prestigious in the world, despite the fact that nobody knows how to define them and, therefore, no one can measure it.

Another example, but much more serious, what we have with the definition of “supply” and “demand”. Both are distance with the two basic variables most important in the economy and, however, its definition is so vague that it is impossible to measure them. Economists call the “offer” to the amount of goods you produce entrepreneurs, without that it is never clear whether they are referring to the goods to be sold, the goods are manufactured or, even, to the amount of goods that may occur but that for some reason does not arrive to be manufactured. But the most serious of the idea of “deal” is that it is an aggregate of heterogeneous goods, and will hardly be compared. What is higher or lower, an offer of two cars and a tractor or two tractors and a car? The same thing happens with the “demand” that, according to what the case may be referring to the amount of goods that are consumed, the amount of goods they wish to consume, or even to the amount of goods that can become consumed, without that it is never clear which of the three situations you are referring to, in addition that can be purchased, and the various demands each other, to be aggregated heterogeneous.

Then why private universities in the US based all the articles published in the area of the economy in two variables that can be used to make measurements or comparisons? Obviously, because its job is to avoid that the economy is a scientific discipline.

Here, to develop the Economic Theory of Madrid, we're going to start by making the economy theoretically would that have done for more than a century, which is no other thing than to define univoca and consistent manner, the basic variables in which you have to settle any economic theory to be considered scientific, so that they can always be measured and verified, any prediction that are made within the theory. Only in this way can we talk about peer review and the scientific method. We will start by defining the variable “income” and “expense”, with the same meaning as it has for a person who is not an economist and that, interestingly, allows you to measure without any problem making use of the money.

It is easy to verify that the amount of goods or services that are sold, as well as the amount of goods or services that are bought, they are variables that can be measured very easily, though, are the magnitudes that cannot be compared to each other for being a grouping heterogeneous of different goods. However, the cash flows that created the purchase and sale of goods, which is calculated by multiplying the price of each commodity by the amount of it that is purchased or sold in a period of time, they are variables that can be measured and compared without any difficulty, since its value is given in money power.

Here we are going to use the “stream of income” and “expenditure flow” as the basic variables of the economy in the Theory of Madrid. Of course, we're not going back to the mention of the word “offer” or the word “demand” in the rest of the work, because in the Theory of Madrid will not be defined by those terms.

## 2. THE MATRIX OF SPENDING $G$ AND $PIA$

Let's imagine that some extraterrestrials visit an island inhabited by three people, John, Celia, and Lucia, and in which there is established a cash economy. The aliens did not find it strange to verify that the three inhabitants of the island are cooperating in the production of consumer goods, and neither is it strange to verify that spread between them is produced. But if I called everybody's attention to the "money" that seems to guide the relations of production and distribution within the island. So much so, that they decide to investigate what may be the role that it plays in society the mysterious "money" that always used the inhabitants when they give each other the goods.

To do this, during a specific time period, recorded the amount of "money", which they exchange each other the inhabitants of the island, with the idea of verifying the suspicion, that the "money" is always the same and is retained when it is exchanged for the goods that are produced on the island. With the data they collect construct a square matrix in which to record the flow of money giving (and receiving) every one of the inhabitants of the island during the time period considered (a month, for example):

Expenses (Euros/Month)	Juan	Celia	Lucia
John	0	400	600
Celia	600	0	200
Lucia	300	500	0

What appears in each row of the square matrix that we will call the Matrix of Expenditure  $G$  is it that every inhabitant of the island spent over a month in purchasing goods to the other inhabitants of the island. For example, John has spent during the month 400 € shopping Celia and 600 euros in purchases Lucia. The same thing we can say of Celia and Lucia spent on purchases to John, 600E, and 300E respectively. Since then, the array is not specified the type of goods that have been given to change the money because the aliens are only interested in keeping track of the money to prove that in the economy of the island is preserved, and on the table are listed all of them.

**THE MATRIX OF EXPENDITURE:** The "Matrix of Expenditure" shows the money that each participant has a monetary economy spent on the purchase of services to any other participant, for a period of time which is usually a year:

$$\text{Matrix of Expenditure} \rightarrow \mathbf{G} = \begin{pmatrix} c_{11} & h \cdots & c_{1n} \\ \vdots & \ddots & \vdots \\ c_{n1} & -h \cdots & c_{nn} \end{pmatrix}$$

The coefficients of the matrix of expenditure  $c_{ij}$  are the basic variables of the theory that we will develop, and the sum of each row or each of the columns are the expenditure flow, or the flow of monthly income of each one of them:

$$\begin{aligned} (\text{Flow expenditure})_i &\rightarrow x_i \stackrel{\text{def}}{=} \sum_j c_{ij} \\ (\text{Flow entry})_i &\rightarrow y_i \stackrel{\text{def}}{=} \sum_j c_{ji} \end{aligned}$$

We can see that when we make a row either, and we add up all the values that appear in it, we get the total flow of expenditure  $x_i$  of each of the participants, that is to say, the total money you spend on purchasing a participant “i” of the island during the time period considered. But we can also see that when we add the values that are listed in any of the columns, we obtain the total flow of income  $y_i$  each one of the inhabitants of the island, that is to say, the total money entering sales in a month, each one of the inhabitants:

$$\rightarrow \begin{cases} \mathbf{X} \stackrel{\text{def}}{=} \mathbf{G} \mathbf{X} \mathbf{I} \leftrightarrow \begin{bmatrix} x_1 \\ \vdots \\ x_n \end{bmatrix} \stackrel{\text{def}}{=} \begin{pmatrix} c_{11} & h \cdots & c_{1n} \\ \vdots & \ddots & \vdots \\ c_{n1} & -h \cdots & c_{nn} \end{pmatrix} \times \begin{bmatrix} 1 \\ \vdots \\ 1 \end{bmatrix} \leftrightarrow x_i \stackrel{\text{def}}{=} \sum_j c_{ij} \\ \mathbf{Y} \stackrel{\text{def}}{=} \mathbf{G}^t \times \mathbf{I} \leftrightarrow \begin{bmatrix} y_1 \\ \vdots \\ y_n \end{bmatrix} \stackrel{\text{def}}{=} \begin{pmatrix} c_{11} & h \cdots & c_{1n} \\ \vdots & \ddots & \vdots \\ c_{n1} & -h \cdots & c_{nn} \end{pmatrix} \times \begin{bmatrix} 1 \\ \vdots \\ 1 \end{bmatrix} \leftrightarrow y_i \stackrel{\text{def}}{=} \sum_j c_{ji} \end{cases}$$

The “matrix of expenditure”, it is everything that you need to know for now to describe the economic activity of the island. With it we have defined the vector of spending  $x_i$  and the vector of income,  $y_i$  as the sum of the rows and the columns, respectively.

The definition of the vector of income,  $y_i$  and the vector of spending  $x_i$  using the coefficients of the matrix of expenditure  $\mathbf{G}$  are two of the basic equations of the theory, and with them entered two of the economic variables basic with that we are going to describe the monetary economy.

It is now very easy to prove the suspicion of the aliens that the money is kept in the purchase or sale. To do this just to prove that the sum of all costs is equal to the sum of all income, something that always happens. The equality between aggregate expenditure and aggregate income of the economy, is a property that is going to always comply in any economy and we're going to name the Law Say, because it was the economist Say who first formulated in 1870, although in a context of ambiguous where it is not clear that it has the same meaning that we're giving us here:

**LAW OF SALLY:** “The sum or aggregate of all expenses that are performed within a monetary economy is equal to the sum or aggregate of all income.

$$\sum_j x_j = \sum_j y_j \text{ (Say's law)}$$

The law Say it is a property of macroeconomic and its validity, as it is formulated here, is out of question as it is a consequence of the matrix of spending  $\mathbf{G}$  and its transpose  $\mathbf{G}^t$  contain the

same coefficients. Say's law is another of the equations that appear in the set of basic equations of the monetary economy and tells us that in a monetary economy the aggregate income is always equal to aggregate expenditure.

**Product inside Wide, or *PIA*.** Another variable of interest that you will use frequently is the *PIA* Product or Spacious interiors. It is defined as the nominal value of the sum or aggregate of all cash flows from exchange, conducted within the economy, during the period considered:

$$PIA \stackrel{\text{def}}{=} \sum_i x_i = \sum_{ij} c_{ij} = I \times G \times I = X$$

$$PIA \stackrel{\text{def}}{=} \sum_i y_i = \sum_{ij} c_{ji} = I \times G^t \times I = y$$

The *PIA* is, therefore, a monetary flow and its nominal value can be obtained by two different paths, one by using the sum of the sales revenue of the agents, and the other by the sum of all of your expenses for purchases. Both sums give the same result because they contain the same terms, the coefficients  $c_{ji}$  of the matrix spending. It is this equality which we have called the Law Say.

### 3. THE MATHEMATICS OF THE ECONOMY.

The previous section suggests very clearly that the vectors, matrices, and scalars, seem to be the natural language with which to describe the phenomena money because they adapt very well to the description of the economy is divided into different sections for your study, what is usually called microeconomics. Therefore, in the theory of Madrid we will use the language of a matrix as a mathematical language to the basis in which to express any relationship within the monetary economy.

In particular, any relationship or ligation microeconomic that satisfies a sector generic "i" what we are going to represent using a relationship vector, so that each of the components of the expression vector indicates a property or ligation that you must fulfill each of the sectors independently. For example, the definition of the flow of income or expenditure flow from one sector either it is an expression vector and each component of the vector refers to the flow of income or expenditure of each of the sectors in which it has been divided into the economy:

$$\begin{cases} x_i \stackrel{\text{def}}{=} \sum_j c_{ij} \\ y_i \stackrel{\text{def}}{=} \sum_j c_{ji} \end{cases}$$

Another expression vector that may be more clear with the idea, is the expression that is usually used to define the save, and it will look more detail:

$$y_i = x_i + ah_i \begin{cases} \text{if } ah_r > 0 \rightarrow \text{savings} \\ \text{if } ah_{(i)} < 0 \rightarrow \text{credit} \end{cases}$$

The expression tells us that each participant in the economy, she divides her income between spending and saving. It's an equation that you need to fulfill each and every one of the sectors and the index runs through all of them. That is why we say that the expression is a ligature of microeconomic, because it describes a property or ligation that must be met independently of each participant of the economy.

It's an interesting formulation of vector is that you can define an operation, "the aggregation vector", which add up all the components of the vectors that appear in the expression, so that, if the expression microeconomic met, will also be fulfilled, the expression added. For example, we have represented the flow of spending  $X$  with a vector where each of its components  $x_i$  represents the flow of spending that makes each of the sectors or agents in that it has divided the economy, so that when we add up all of its components  $x_i$  is obtained by a number, the flow of aggregate spending throughout the economy,  $X$ , that it is not a vector, but that is a scalar that we've given it a special name, the *PIA* or *Product Inside Wide* for its acronym in Spanish:

$$X = \begin{bmatrix} x_1 \\ \vdots \\ x_n \end{bmatrix} \equiv x_i \xrightarrow{\text{agregacion}} X = x_1 + x_2 + \dots + x_n = \sum_i x_i = PIA$$

When instead of referring to a single vector as in the previous case of the vector of expenditure, reference is made to an equal vector, the aggregation process is carried out by adding the components of each of the vectors that appear in the expression, and will result in an identity scale that is valid on the condition that you assume the validity of the identity vector of the proceeds. For example, the previous expression used to define the saving has an associated equation added, which will be valid to the extent that what is the equation for the saving of that which proceeds by aggregation:

$$y_i = x_i + ah_i \xrightarrow{\text{agregacion}} Y = X + Ah \begin{cases} Y = \sum y_i \\ X = \sum x_i \\ Ah = \sum ah_i \end{cases}$$

**AGGREGATION:** Given a property microeconomic expressed through an identity vector, when we add each of the components of each of the vectors that appear in the expression obtained an identity scale that, in the particular case of the economy, has always been associated with the idea of aggregation as the sum of the parts of a whole.

We define the equation added, or equation to scale, of an expression vector to the equation that is obtained when we add up all the components of the equality:

$$a_i = b_i + c_i \xrightarrow{\text{equation added}} \sum_j a_j = \sum_j b_j + \sum_j c_j \leftrightarrow A = B + C$$

*In general, we will use capital letters to refer to a macroeconomic variable and lowercase letters with a subscript to refer to a variable in microeconomic.*

The importance of the process of aggregation comes from the different economic significance, which has an equal scale. Equality vector is true component-to-component and refers to a property of microeconomic that they have to abide by each of the agents or sectors in which it has been divided the economy. On the contrary, the equality scale meets the aggregate sum of all the components, so that an equal scale refers to a property that meets all the economy as a whole.

*EQUATION MICROECONOMIC. An expression vector is a restriction microeconomic that has to be fulfilled component-to-component, that is to say, that meets each of the agents that are used to describe the economy, since each component of a vector is associated with the behavior of each of the agents:*

$$a_i = b_i + c_i$$

*EQUATION MACROECONOMIC. On the contrary, when we take an expression vector and then do the sum or aggregation of all the components, we obtain a scalar expression that refers to a restriction of macroeconomic who meets all of the economy as a whole:*

$$a_i = b_i + c_i \xrightarrow{\text{equation added}} \sum_j t_{0j} = \sum_j b_j + \sum_j c_j \leftrightarrow A = B + C$$

Some aggregate expressions will have a lot of importance in the theory we are developing because they are laws macroeconómicas that you must comply with all the economy.

#### 4. THE MONETARY EQUATION

The money is there and is real, it is known from a long time ago. There is a fixed amount of money  $M$  circulating through the economy, which is linked to the total production, it is also a very old idea and seated in the economic science. But to demonstrate what is the relationship between the quantity of money  $M$ , which we will call “money supply”, and the other variables of the economy, as are the flows of income and expenditure, is not so simple, nor so evident and is the reason for which we are going to enter the relationship in the form of a postulate.

The type of the variable completely real, as what is the amount of money  $M$  that is used within the economy, but that is at the same time a variable ghost because it does not have a slur clear that the relationships with the other variables of the economy, appear a lot in the natural sciences and on their practical importance within the discipline running partner that can meet any equation that the link with the rest of the variables used in the theory.

In theory, the equations of origin experimental serving of ligation between variables that do not have to be related, they are called **Constitutive Equations of the Theory**, and, though the later development of the theory can deducirlas of principles more profound without the need to

impose it from the outside as laws empirical equations are the equations of tremendous importance because their source experimental allows the expressions in which they appear can be validated empirically. That is to say, are expressions or the relationships that make a simple theory in a scientific theory, because it allows the formulation of laws that can be tested experimentally and, therefore, that allow you to validate the theory.

In summary, a theory becomes science when you get this type of relations that allows the expressions which are deduced from them, and in which the variables underlying the theory can be tested by experiments and by the empirical data. Without these equations, there is no experience, nor is there any science.

In the science of economics exists one of these equations, the so-called “**constituent**”, which has been for a few centuries, turns, and being the subject of on discussion within the discipline. If we want to do justice to the Story, we have to affirm that the expression reappears periodically from the ashes like a phoenix to become the expression of fashion of the time, only to fall into oblivion and disappear after a short time. We are referring to the equation that is called **The Monetary Equation** and is expressed in the language of a matrix that we're using, such as:

$$k_F \cdot M = \sum_j p_j \cdot q_j = PIA \text{ (Ec. Monetary)}$$

Where  $k_F$  is the constant of Fisher, and the summation is done over all the cash flows of exchange carried out over a period of time. that is to say, the expression relates to what we have called the *PIA* with the amount of money in the economy through a constant, the constant of the Fisher. But there are several interpretations of the expression, each subject to different conception that each school of thought has it on the money, here we will consider valid the interpretation of the expression at the beginning of the TWENTIETH century, the american economist Irving Fisher, and this is the reason that the constant takes its name: “*the constant of Fisher*”.

The monetary equation is an equation with a long history in the economic science and, without doubt, the most famous within the discipline with distance. One of the first times that appears is in the hand of David Hume, even though it was not far from the first to refer to it. Hume uses it with success in the mid-NINETEENTH century to attack the protectionism of its time, stating that any surplus money of a country as a result of the increased exports would end up driving up prices and limiting exports. The dubious conclusions reached by Hume to fall into disgrace to the equation disappears from the economy after a short time. More than a century later, he returns to bring it back to life Irving Fischer, who in the decade of 1910, used in a way very similar to Hume, before falling back again into oblivion as a result of the Great Depression and the fierce criticism of Keynes's it.

The last time that was fashionable was in the 1970s, following the rise of “monetarism” sponsored by economists working for the private universities of the USA, in particular, by the University of Chicago. He was an economist of the university, Milton Friedman, the father of liberalism, who with the publication in 1957 of a famous and short article, fashionable once more to the equation. In the article showed, with empirical data drawn from historical series, the “velocity of money” (the  $k_F$  of the expression) was in practice a constant that does not

depend on any other variable that changes little in time, that is to say, the same idea that defended both Hume as Fisher. The probma of the interpretation that makes Friedman of the equation is that it completely forgets what it actually says the monetary equation and use it to justify the liberal doctrine, by spreading the idea that inflation is a consequence of the creation of money by the government, without that it is not clear how it should be interpreted the claim because it does not develop a theory of monetary creation. Yours is the famous phrase: “inflation is always and everywhere a monetary phenomenon”, which have nothing or little is unlike that other famous phrase that says: “the rain is always and everywhere a weather phenomenon”, except that neither of the two statements tell us something we don't know. It seems to be a bit much to give someone the Nobel Prize for a phrase so trivial.

***THE MONETARY EQUATION:** The monetary equation is that in the natural sciences is known by the name of constitutive equation. An equation whose origin is almost always empirical, and whose relevance lies in the fact that league variable that does not appear to have any relationship, in this case, the amount of money and the flow of exchanges.*

*Clearly it is not an accounting equation, or it can be deduced easily from first principles, but is an expression that binds variables that have a statistically significant very clear, as is the amount of money  $M$ , or as the sum of the flows of purchase of the economy, or PIA, so that its theoretical justification last must be sought in the statistics, and the proof of its validity will be the empirical data taken from the reality of who the show:*

$$k_F \cdot M = PIA \text{ (Ec. Monetary)}$$

*The expression league a stock monetary  $M$ , the amount of money throughout the economy, with the aggregate flow of the economy, the PIA, through the constant  $k_F$  or constant of Fischer, even though there is no economic reason that both variables have to be related. This was the meaning that he gave Fischer the constant at the beginning of the TWENTIETH century, and the reason why we think that the constant must carry his name. The dimensions of the constant  $k_F$  is of  $(\text{time})^{-1}$ .*

*Although its importance for the theory that we are developing is that it will allow us to relate the creation of money with the growth of the economy, the monetary equation is, first of all, the expression that gives value to the money. There is an expression that serves to set the specific price of the goods, but it is an expression that tells us what is the purchasing power of the money, because it establishes a relationship one-to-one between the amount of money and the quantity of goods that can be purchased:*

$$\begin{aligned} \text{Amount of money} &\leftrightarrow \text{Amount of goods} \\ M &\leftrightarrow PIA \cdot \text{year} \end{aligned}$$

*The monetary equation is one of the basic equations of the monetary economy. Refers to a property of macroeconomic and is the only one of all of them that has a source experimental or empirical. Enter in the economy, the important concept of the money supply  $M$  is associated with the PIA, the aggregate flow of exchanges, in the original interpretation of Fisher. The monetary equation is the pillar that sustains the whole of the monetary economy. If she falls, she falls all the theory that we will develop here.*

THE CONSTANT OF FISCHER. Although the money supply  $M$  is unique and in the monetary equation appears related to the PIA, it can be expected, although it is not entirely correct, that there is a constant relationship between the money supply  $M$  and the PIA, then there must also exist a constant relationship between the money supply  $M$  and GDP. This forces us to define two equations monetary with two constants of Fischer different, depending on the flow that relate to the money supply:

$$\begin{cases} k_F^* \cdot M = GDP \\ k_F \cdot M = PIA \end{cases}$$

In order not to overburden the notation with two constants of Fisher's different, we're going to name the two constants with the same name, the constant of Fisher  $k_F$ , about understanding the context which of the two flows, we are referring to in each moment, whether it is with the PIA, as is usual in the economy, whether it is with the GDP.

## 5. THE EQUATION OF FISHER: THE MONEY SUPPLY

The monetary equation introduced into the economy the amount of money as a new variable, different from the flows of expenditure and income, it is necessary to define with precision before you can use it in the description of the economy. In a monetary economy, we assume stationary, without growth or decline of economic activity, we can intuit that there will be an amount of money given  $M$  associated to this stationary situation, so that an increase or a decrease of  $M$  will take the economy to the steady state in which is located, by increasing or decreasing the nominal flow rate of exchange. But the importance of a supply of money fixed  $M$  associated with the PIA that appears in the equation currency is not in that it serves to introduce the constant of Fischer, that is the least of it, but its usefulness is that it allows to characterize the monetary economy as it meets or not the monetary equation.

THE ECONOMY MONETARY: it is said that an economy is a monetary economy when there is a well called money that can be purchased any good, service, or merchandise put up for sale and the amount of  $M$  meets the monetary equation:

$$k_F \cdot M = PIA \text{ (Ec. Monetary)}$$

Being  $M$  is the money supply.

The money supply is measured as a nominal amount or stock in current currency, being perhaps the most important concept in macroeconomics because it allows us to “touch” the money, which until now only what we have seen to pass from one side to another as a monetary flow of income or expense. For now it will suffice to understand that it is necessary that there is a supply of money that an economic system based on the exchange of goods and services for money to work.

Let's imagine that the shops are full of products, but that no one person has enough money to afford to buy something. Nothing then can be bought and nothing then can be sold, the sale will be impossible. If the baker need to buy flour and don't have money you will have to wait to sell the breads that you have to get the money to buy flour to keep producing loaves of bread. You can sense that when the amount of money in the economy is poor, the purchase and sale will be scarce and will be subject to that done previously other purchase and sale, leading to a slowdown in the flow of trade and to a decrease of the *PIA*. The opposite will happen if the amount of money used by economic agents, which is very large. The exchanges will increase and it will be very fluid, perhaps in excess, so that the stores can get to be emptied of products and the suppliers of the services may not be able to meet the high demand of goods due to the increase in the amount of money existing. In such a situation, intuition leads us to suspect that it can result in a general increase of prices, perhaps along with an increase of the production.

One might think that the money supply is a concept macroeconomic-related monetary flows throughout the economy, that can hardly be generalized by defining a mass monetary microeconomic to any sector or agent that divide the economy, which is only true on average. In addition, it seems that its origin will have to provide a statement of reasons in the statistics and in large numbers so that we could get the mistaken idea that it is a concept that can only be associated with the economy as a whole.

Quite the contrary, from now on, we will consider that any economic agent, or the sector in which we divide the economy, is formed by the grouping of a sufficient number of individual agents that behave in the same way, so that we can use the statistics and associate all of them, as a whole, a mass monetary microeconomic that develop economic activity.

*MASS MONETARY MICROECONOMICA. With this idea, it is not difficult to understand that the money supply that describes the amount of money in the economy is a vector whose components  $m_i$  represent the nominal stock that uses each of the agents that has divided the economy to llevar out the exchanges, understood as a grouping of a large number of people or companies of the same type:*

$$\mathbf{M} = \begin{bmatrix} m_1 \\ \vdots \\ m_n \end{bmatrix} \xrightarrow{\text{aggregation}} M = \sum_i m_i \rightarrow \left| \begin{array}{l} \text{the money supply} \\ \text{of the entire economy} \end{array} \right.$$

*Nor is it difficult to understand than the aggregate sum of the vector  $m_i$  is the mass monetary aggregate  $M$  of the economy that appears in the monetary equation.*

Our purpose for now, introduce the vector  $\mathbf{M}$  is to find the expression of microeconomic that is appropriate to the monetary equation, and we will call the Equation of Fisher. We know that the

monetary equation is a scalar expression, and describes a ligature macroeconomic who has to fulfill all the economy as a whole, so that there must be a property of microeconomic, described by a vector equation and whose aggregation proceed the monetary equation.

We also know that the monetary equation establishes a relation between a stock, the monetary aggregate  $M$ , and the aggregate flow of expenditure or income of the economy, the  $PIA$ , and so the expression vector that we must relate microeconómicamente the same magnitudes, that is, it must relate the vector money supply  $m_i$  of each agent with the cash flow that creates each agent in its economic activity. The only question would be to know which of the two possible flows, the flow of spending  $x_i$  or the flow of income  $and_i$  will be linking the supply of money:

$$\text{what?} \rightarrow k_F \begin{bmatrix} m_1 \\ \vdots \\ a m_n \end{bmatrix} = \begin{bmatrix} x_1 \\ \vdots \\ x_n \end{bmatrix} \equiv k_F \cdot m_i = x_i \xrightarrow{\text{aggregation}} k_F \cdot M = PIA$$

$$\text{what?} \rightarrow k_F \begin{bmatrix} m_1 \\ \vdots \\ a m_n \end{bmatrix} = \begin{bmatrix} and_1 \\ \vdots \\ and_n \end{bmatrix} \equiv k_F \cdot m_i = y_i \xrightarrow{\text{aggregation}} k_F \cdot M = PIA$$

Both flows, the spending and the income, they have the same value, the  $PIA$ , so that both streams are going to play by aggregating the monetary equation. But both vectors have different components, so pick one or choose another will give rise to two theories are completely different. That is to say, only one of the two possible expressions is correct, and only one of the two possible flows is generated by aggregating the monetary equation.

A priori, we have no reason to choose the flow of expenditure and discard the flow of income, and vice versa, but since then only one of them can be valid. What of them is the correct flow? What of the two vectors, the expenditure flow, or the flow of income, is the one that appears in the monetary equation of microeconomic, or Equation of Fischer?

The question of which of the two vectors, the expenditure or income, is the one that appears in the expression of Fisher is resolved when we realize that the flow of income  $and_i$  is the money it receives in exchange for the venta of a well, for what it represents to the agent that you do not need to have money to make the exchange: *“the flow of income represents the seller”*. On the contrary, the expenditure flow  $x_i$  represents the money that they spend the buyer and requires the possession of the prior of money so that you can carry out the exchange of buying and selling: *“the flow of expenditure represents the buyer”*. Therefore, it is very clear that it has to be the flow-of-pocket, which is backed of the money supply, since it represents the money that is necessary to have previously to perform the exchange of buying and selling.

When we exchange one good for money is an agent, the seller, that does not need to have money to make the exchange, and there is another agent, the buyer, you need to have the money to make the exchange. It is, therefore, the flow of purchase, the buyer, who is to associate the supply of money because he is the one who is using the stock of money to carry out the purchase:

$k_F \cdot m_i = x_i$	<i>(ec. Fischer)</i>
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The equation microeconomic that relates the money supply with the flow of spending, we call the Equation of Fisher and is another of the basic equations of a monetary economy. It is obtained by aggregating the monetary equation:

$$k_F \cdot m_i = x_i \xrightarrow{\text{aggregation}} k_F \cdot M = PIA$$

With this last expression, we gathered a set of three equations basic microeconomic and their corresponding equations are added.

## 6. BASIC EQUATIONS OF THE MONETARY ECONOMY

We have already commented that we were going to use the “income” and “expenditure” as the basic variables of a monetary economy. We named **vector of income** to the amount of money annually that you receive an agent either by the sale of goods and services, and we have named **vector of expenditure** to the amount of money annually spent an agent either in the purchase of goods or services, and we used the matrix of expenditure to define the two vectors. But, apart from these two definitions, the rest of the equations we have introduced using two postulates implicitly.

In particular, it understands very well that in order to define income and expense, we assume implicitly that in an exchange, or purchase and sale, the amount that enters the seller is always equal to the amount spent by the buyer. It may seem very obvious to the validity of the previous statement, but it is important to understand that it has been necessary to use it to get the Law Say.

*POSTULATE OF CONSERVATION: The amount of money is a scale that is preserved in the trade of buying and selling.*

Or another way, the activity of buying or spending does not change the amount of money within the economy, that is to say, that the aggregate sum of all the money that is used in the economy is constant and conserved. The assumption of conservation of the amount of money is a postulate of the self-evident and all the economists agree with him, even though he has never formulated explicitly to provide for validity of the Law Say, and as we have done here, but we must not forget that it is their existence that will allow us to affirm that, when the money out of the economy increases, or decreases, it is because someone is making money out of nothing or what is destroying it.

The other postulate that we are using, this time phrased explicitly as a basic equation, is the postulate monetarist with which we have defined money supply of an economy.

*POSTULATE MONETARIST: In a monetary economy there is a constant ratio  $k_F$  between the amount of money  $M$  that is used in trade and the flow of exchanges, or  $PIA$ , which is carried out within the economy:*

$$k_F \cdot M = PIA$$

Or in another way, we have characterized the monetary economy as the economy in that it complies with the interpretation that makes the American economist Irving Fisher, at the beginning of the TWENTIETH century of the monetary equation. It is also this assumption that has allowed us to obtain the important equation of microeconomic Fisher, and which will allow us later to obtain the important equation aggregate of conservation.

The two postulates are very simple, easy-to-understand and even easier to interpret. The variables that appear in them are measured in money, and, therefore, the conclusions that you reach with them are verifiable. Based on these two assumptions, we have found six of the eight basic equations that meet a monetary economy based on the free exchange of goods for money:

***Ec. Básic of the Economía Monetary***

$$Ec. \text{microeconomic} \left\{ \begin{array}{l} y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \quad (Ec. \text{de conservation}) \\ y_i = \sum_j c_{ji} \quad (Def. \text{of income}) \\ x_i = \sum_j c_{ij} \quad (Def. \text{spending}) \\ k_F \cdot m_i = x_i \quad (Ec. \text{Fisher}) \end{array} \right.$$

$$Ec. \text{macroeconomic} \left\{ \begin{array}{l} k_F \cdot M = PIA \quad (Ec. \text{monetary}) \\ y = \sum_i y_i \\ X = \sum_j x_j \end{array} \right\} \rightarrow PIA = \sum_i x_i = \sum_i y_i \quad (Law \text{ of Sally})$$

$$Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0 \quad (Ec. \text{aggregate of conservation})$$

The set of basic equations, is divided into two sub-groups, the equations that describe the economy from the microeconomic point of view, and the equations that describe the economy from the macroeconomic point of view.

The equations microeconomic expressing the bands that you have to meet every one of the sectors in which it has been divided the economy for their study. Use the vectors as a means of representation because it allows each component "i" of the vector refers to each of the "N" sectors or economic agents in which it has divided the economy.

On the contrary, the equations macroeconomic relations are the scalar obtained by addition or aggregation of the components of each vector equations, and thus are not independent equations of the vector equations from which they come. The equations macroeconomic do not add new bands to the already existing, but they make reference to a ligature, which must meet all of the economy as a whole, so that each of them holds a meaning macroeconomic very different from the meaning microeconomic that has the expression vector of the proceeds.

Therefore, we can say that the set of vector equations describe the economy from the microeconomic point of view, while the set of equations added describes the economy from the macroeconomic point of view, or added.

By way of example, let's look at the last expression, which we have called the equation aggregate of conservation, and that is perhaps the law macroeconomic most important of the whole economy, since it is comparable to the conservation equation of the energy that appears in the physical sciences. Given its importance, we have given a specific name, the Equation of Growth, and we will deduct a little later:

*THE EQUATION OF GROWTH. In a monetary economy, the decrease in nominal PIA is proportional to the net flow of savings 'ah (the flow of destruction of money), being the constant of proportionality the constant Fischer,  $k_F$ :*

$$\frac{dPIA}{dt} = -k_F \cdot Ah$$

Although we have not yet defined the vector of saving,  $oh_i$ , it can be shown that the equation comes from the aggregation of the Vector Equation of Conservation, the first of the equations microeconomic, and tells us that the aggregate flow of exchanges or PIA depends on the growth of the amount of money out of the economy, the aggregate savings or Ah, which as we will see later, dependent on bank credit (dissaving).

## THE CONSERVATION EQUATION

Clara Rojas García, Julia Rojas García, Pedro Rojas Single  
04 of march of the year of 2021

### 1. EQUATION OF CONSERVATION OF MONETARY FLOW.

What characterizes a monetary economy, and that the difference of any other type of organization that can be used to produce and distribute it together with the goods that you need to live, is that each of the agents generic participate in the economy they have to comply with an accounting equation, the Equation of Conservation, which requires that the money is kept.

Recall that in the first chapter he has made use of only two postulates to derive the set of basic equations that conforms to a monetary economy. In fact, we made use of the postulate monetarist to deduce two of them, while the other three are a consequence of the definition of the flow of spending and income through the matrix of expenditure and of the postulate of conservation:

$$\left\{ \begin{array}{l} y_i = \sum_j c_{ji} \\ x_i = \sum_j c_{ij} \end{array} \right. \quad \begin{array}{l} (\text{Def. of income}) \\ (\text{Def. of expenditure}) \end{array}$$

$$k_F \cdot m_i = x_i \quad (\text{Ec. Fischer})$$

$$k_F \cdot M = PIA \quad (\text{Ec. Monetary})$$

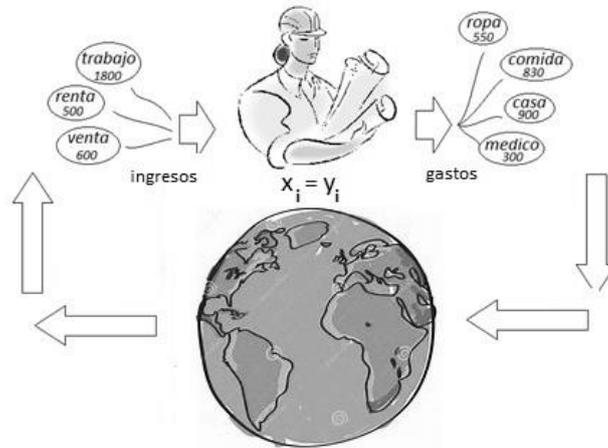
$$\left. \begin{array}{l} Y = \sum_i y_i \\ X = \sum_j x_j \end{array} \right\} \rightarrow PIA = \sum_i x_i = \sum_i y_i \quad (\text{Act Sally})$$

It is, therefore, to explain where they come from and what is the significance of the conservation equation and its equation added:

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \quad (\text{Ec. de conservation})$$

$$Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0 \quad \left( \begin{array}{l} \text{Ec. aggregate of} \\ \text{conservation} \end{array} \right)$$

For what will be necessary to use the Postulate of Conservation in a long and complicated process of deduction. Let's start by explaining why Ito call “**the equation of conservation**” with the help of figure 1 with which we represent the relationship of an agent generic either with the rest of the world.



In the attached figure shows the behavior of monetary of a single economic agent generic faced the rest of the economy, which we have represented symbolically by a globe. It is shown that the agent has only two ways of connection with the rest of the economy, that is the money that comes into your sales and the other is the cash that you spend on your purchases.

Let us observe that when we demand to each of the agents involved in the economy than the rated flow of your expenses is equal to the rated flow of your income, we will be forcing the money is kept within the economy, since the rest of the world is made up of many other agents that also is imposing the same condition:

LAW OF CONSERVATION OF MONETARY FLOW (economy without savings or money creation): *The Flow of Spending by shopping each one of the agents that participate in the economy is equal to the Flow of Income from sales:*

$$x_i = and_i \left| \begin{array}{l} Ec. de Conservation \\ of Monetary Flow \end{array} \right.$$

Impose to each agent that matches your income with your spending, it is one of the many possible statements that we may make of the Conservation Equation for forces to which the money is kept in the economy, but it is unique. In fact, the statement made is very restrictive and we will see that it describes a very particular case of a monetary economy in which it is not allowed or the transfer currency between the various agents, nor the creation or destruction of money, but it serves us as an example to show the significance of the conservation equation and the reason why it is so important to their formulation within the economy, since their function is to force the activity of each agent to keep the money.

*The Equation of Conservation of Monetary Flow expresses the ligature that has to meet cada agent within the economy to ensure that the cash flow is conserved, that is to say, the equation of conservation will serve to describe what is the travel destination or what the provenance dthe money in the event that you are creating or you will be destroyed within the economy.*

In the particular example above, the equality in the expenditure flow and the flow of income that we impose on each agent implies that no agent saves and, therefore, in the economy there is no saving. It also implies that there is also no creation or destruction of money, so that the conservation equation in the general case will be very different to the previous equation, since in the real economy there is the savings and also there is the creation and destruction of money, and the expression above is not what it covers.

Another observation about the equation of conservation that it is important to do now is that, since it is an expression vector, can be obtained from it by the aggregation of an identity scale that reflects the condition of conservation macroeconomic complies with the economy as a whole. With the formulation in particular that you've given to the conservation equation, the equation for aggregate coincides with the Law of Say:

$$x_i = y_i \xrightarrow{\text{aggregate}} PIA = \sum_i x_i = \sum_i y_i$$

The appearance of the Law Say it has not happened by chance, as this was the original meaning which gave him Say:

*“Every producer asks for money in exchange for their products, only for the purpose of using again that money immediately to purchase another product, as we do not get the money, and you don't typically looking for the money to hide it; therefore, when a producer you would like to exchange your product for money can be considered that he is already asking for the goods it proposes to buy with that money.”*

Say

Be seen very clearly in the paragraph, they Say it is stated, right, the equation of conservation of microeconomic just ask, and that requires any seller to afford to purchase all the input from sales. In this way, Say you get to demonstrate that in a monetary economy cannot be over-production, at the aggregate level, that was what I really wanted to show and Say.

The intent of , Say, was to refute the argument that they used mostly economists of his time to explain the economic crisis: *“an economy that produces more of what you want or you can consume”*. That is exactly the same argument used by Keynes 100 years later to explain the economic crisis, and it is still using now, 200 years later, to explain recessions: *“sub consumption”*. We see, that the idea of what is causing the economic crisis has actually changed very little in the last two hundred years.

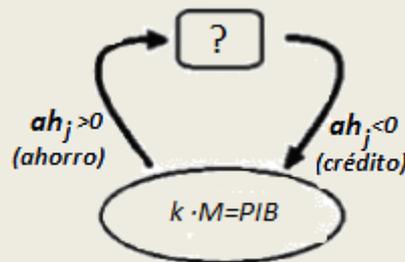
We have called the “Law of Say,” not to the equation of microeconomic conservation that requires each agent to spend that enters, so it would have been more correct, but the conclusion that is reached when imposing this obligation, which was what I wanted to prove Say to refute the argument of the production, or the sub consumption, as a source of the economic crisis (it is necessary to remember that what we have called the “Law of Say” is always true, whatever statement, particularly the conservation equation).

The rest of the chapter will be dedicated to find which is the equation of conservation as general as possible that meets any agent generic within a monetary economy.

## 2. THE SAVINGS IN MONETARY ECONOMICS.

In a real economy, economic agents do not spend everything they earn on their sales and tend to save a portion of what you earn. Not only that, the agents can also borrow money, which allows them to maintain a flow of expenditure in excess of the value of your income stream. To build an economic theory realistic we must take into account that both possibilities of savings and credit, can be assumed by the agents when they perform the economic activity and should be reflected in the formulation of concrete that is made of the Conservation Equation. It is clear that the equality between the spending and the income, such as we have formulated in the previous section, the Equation of Conservation, does not allow the saving and will have to be changed to reflect the possibility of saving and spending to credit.

*A very important aspect to take into account when you save or spend on credit is that we're not going to be considered as an exchange of purchase-sale. The reason for doing so is that when it saves or when it is spent on credit, we understand that you are not purchasing any service in exchange for money, that is what is meant by a purchase and sale, so that they must not appear in the matrix of expenditure  $G$ .*



*The figure below shows what we mean by savings. The act of saving or spending money borrowed is a monetary transfer between economic agents without a compensation in the present, which is based on a promise of return future of borrowed money that is backed by a legal system. There is, therefore, a purchase-sale or exchange, nor is there any reason why you have to appear in the matrix of expenditure, and that is what we use to describe the exchanges of money.*

*In the figure it is observed that saving money is extracted from the real economy and ends up out of the economy. The opposite happens with the money that deficit, which in the figure comes from outside and ends up giving himself within the real economy.*

This forces you to separate the cash flows generated by the savings and credit flows generated by the trade of buying and selling in the real economy, so that is going to define a vector specific to represent the savings and credit, vector-saving  $Ah$ .

The traditional definition of savings and credit, as the two sides inseparable from a single currency, can be found without difficulty in the claims they make, economists, and not in the least famous. The definition of John Keynes that appears in the General Theory, has more than 80 years and is still considered valid. It is the standard definition used in the economy:

*“I know, everyone is in agreement that the saving is the excess of income over expenditure of consumption”*

*John Keynes, 1936*

However, when we look at the statement that defines Keynes savings from the perspective of the theory that we are developing, we see that the expression is, at the same time that the definition of the vector-saving  $ah_i$  of the economy, a possible formulation of the **Equation of Conservation of Monetary Flow** for an economy in which allows for the saving and credit. Therefore, we define savings:

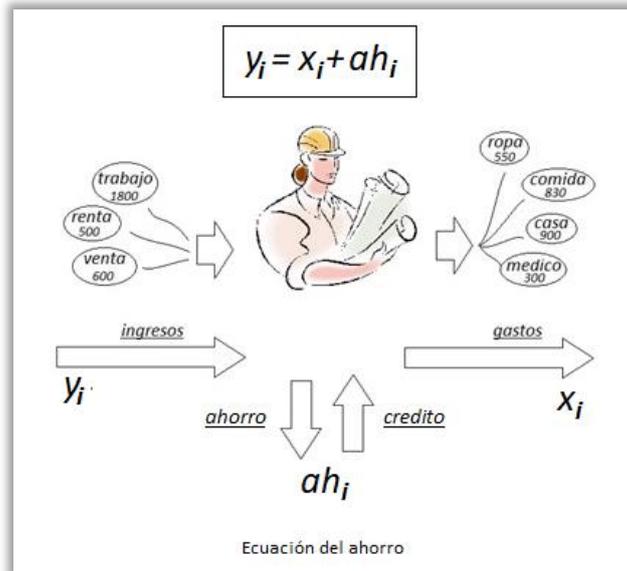
*SAVING: We define the Flow of Savings  $ah_i$  the surplus flow of income over the expenditure flow of each of the agents that develop economic activity:*

$$y_i = x_i + ah_i \begin{cases} \text{if } ah_r > 0 \rightarrow \text{savings} \\ \text{if } ah_{(i)} < 0 \rightarrow \text{loan} \end{cases}$$

$$Ah = \begin{bmatrix} ah_1 \\ \vdots \\ ah_n \end{bmatrix} \xrightarrow{\text{agregacion}} Ah = \sum_j ah_j$$

*From this point of view, the saving is a removal of monetary and loan a cash injection.*

The reason for the positive sign in the expression is that their coefficients are positive as they represent money that comes out of the economic system and not spent (what is meant by saving), and negative when it represents money coming into the economic system (what is meant by a loan). The definition of savings, understood as the statement of the conservation equation, contains and generalizes the expression given in the previous section, as a particular case where the vector of savings is identically null. In the attached figure shows this idea.



Now, Ito definition allows us to understand the savings and credit within the economy as a monetary flow outside the productive activity is real that allows you to violate, and do not comply, the equation of conservation of microeconomic that we held to the agents in an economy without saving:

$$ah_j \neq 0 \xrightarrow{y_i = x_i + ah_i} y_i \neq x_i$$

Thanks to the savings the agents do not have to spend all that entered, and thanks to the loan are likely to spend more than they earn, breaking the previous formulation of the Conservation Law, which stated that the flow of income of each agent had to be equal to its expenditure flow.

**The Equation of Conservation.** To demonstrate that, indeed, the expression that defines the vector of savings  $ah_i$  is the **Equation of Conservation of Monetary Flow** of an economy in which allows for the saving and loan, we have only to show that when it meets the expression the money actually is retained. To verify this, we obtain the equation for the aggregate of the new conservation equation:

$$y_i = x_i + ah_i \xrightarrow{\text{aggregation}} \sum_j y_j = \sum_j x_j + \sum_j ah_j \xrightarrow{\text{Say's Law}}$$

$$\rightarrow Ah = \sum_j ah_j = 0 \quad (\text{Eq. Aggregate of Conservation})$$

The expression tells us that in an economy that satisfies the equation with which we have defined the savings, the aggregate savings is always zero. Maybe we can see more clearly what it is telling us the expression if we separate the agents that they are spending on credit of those other agents that they are saving:

$$\sum_j ah_j = 0 \rightarrow \left\{ \begin{array}{l} ah_{(i)} > 0 \leftrightarrow \text{savings} = \sum_{ah_{(i)} > 0} ah_i \\ ah_i < 0 \leftrightarrow \text{loan} = \sum_{ah_{(i)} < 0} ah_i \end{array} \right\} \rightarrow Ah = \text{savings} + \text{loan} = 0$$

The equality between the aggregate flow of savings and loan necessarily imply that all the money saved is spent and, therefore, that in the economy there is no creation or destruction of money. That is to say, the expression that defines the savings in the monetary savings is, in fact, the statement of a Law of Conservation of Monetary Flow that does not allow the creation or the destruction of the money.

This can also be seen, when we identify the components of positive vector-saving with a “savings”, and the components are negative with an “investment”, which is what he is usually identified credit in the economy:

$$\sum_i ah_i = 0 \rightarrow \left\{ \begin{array}{l} ah_{(i)} > 0 \rightarrow \text{save} \rightarrow A = \sum_{ah_{(i)} > 0} ah_i \\ ah_i < 0 \rightarrow \text{investment} \rightarrow I = \sum_{ah_{(i)} < 0} ah_i \end{array} \right\} \rightarrow A + I = 0$$

Using the same words that you used John Keynes in the General Theory, it has been almost 100 years:

*“In my view, the preponderance of the idea that saving and investment, considered in its strict sense, they may differ from each other, only can be explained by the optical illusion due to the relationship between an individual depositor and a bank is considered as a unilateral, rather than bilateral, as it is in reality. It is assumed that a depositor and the bank have way contrive to perform an operation by which the savings can disappear from the banking system in such a way that they lose to the investment; or on the contrary that the banking system can ensure that an investment that is not appropriate savings whatsoever.”*

*John Keynes, 1936.*

Although it is a quote very strange coming from Keynes, knowing what he thought about the act of, Say, the obligation of every euro saved is borrowed and spent, or vice versa, the requirement that any amount of money borrowed is to be saved previously, it is a consequence of how we have defined the savings, but it is very difficult to understand why there has to be necessarily. It is not easy to justify why any money they save has to borrow and spend, or vice versa, it is very difficult to understand why all of the money given in loan requires someone to perform simultaneously the corresponding saving.

The problem is not only to find the mysterious mechanism by which it is connected both flows, the flow of savings and credit flow. It is also the problem of determining what is the line cause that creates the equality between savings and loan: *Who saves compels someone to spend to credit or who spends credit that requires someone to save?*

All economists of all times have passed unnoticed and in silence in front of the problem, and have postulated the equality between savings and credit appealing to the balance which is achieved by manipulating the interest rate on the money, without understanding even where the problem was, except perhaps Keynes. Only Keynes seems that he understood very clearly that the definition as usual savings obliged to comply with the equality between savings and investment, but this does not seem to him to doubt the definition of savings. However, we demonstrate that which fulfils the equation that defines the savings, both flows must always be equal to:

$$\sum_j ah_j = 0$$

The obligation of ultra tomb league savings and investment, it is a problem that has been simmering since always within the economy, and it turns out to be a direct consequence of the equation that has been used to define the savings, so that it is easy to reach the conclusion that the definition may not be, nor much less, the equation of conservation general we were looking for, because, and as we have shown, it describes an economy in which neither is created nor destroyed, money, what does not correspond with a real economy in which money can be created and destroyed.

The incorporation of the definition of the savings on to the set of equations that we have already allows us to describe a monetary economy with savings and credit, but without creation of money:

<u><i>Economy Monetary without creation of money</i></u>	
<i>Ec. microeconomic</i>	$\left\{ \begin{array}{ll} y_i = x_i + ah_i & \text{(Eq. de conservation)} \\ y_i = \sum_j c_{ji} & \text{(Def. vector of income)} \\ x_i = \sum_j c_{ij} & \text{(Def. vector spending)} \\ k_F \cdot m_i = x_i & \text{(Eq. Fisher)} \end{array} \right.$
<i>Ec. macroeconomic</i>	$\left\{ \begin{array}{ll} k_F \cdot M = PIA & \text{(Ec. monetary)} \\ PIA = \sum_i x_i = \sum_i y_i & \text{(Law of Sally)} \\ Ah = 0 & \text{(Eq. aggregate of conservation)} \end{array} \right.$

These equations are the first representation that we make a monetary economy. The second and the third expression is used to define the spending and the income, so always met. The fourth expression is the version vector of the monetary equation and you have a source experimental. The first expression is the only expression that implies a hypothesis or postulate

economic, the Postulate of Conservation and, therefore, does not have to be a certain, though, and is the expression that defines the savings, and are considered some since the mists of time.

**The problem of the savings.** You can say that we have reached the frontiers of knowledge. The set of above expressions are used today to describe a monetary economy, despite the fact that we know that in the real economy it is possible to create and destroy money and, therefore, we also know that the equation that defines the saving has to be necessarily false.

*THE PROBLEM WITH SAVING: Consider the following two statements:*

*-Yes the millions of euros that carries an armored van was burned in a car accident, according to the equations raised, the rest of the agents are forced to take it from some site, the same amount of money that has been burned in the accident to lend it and spend it.*

*-When a counterfeiter get to spend their fake bills, according to the equations raised, the rest of the economic agents are forced to save in the same amount in which the forger spend counterfeit money.*

*It is very evident that the two previous statements must be false in general, however, the Conservation Equation with which we have defined the savings requires that both assertions are met because it does not allow that the money can be created and destroyed.*

*Therefore, the savings may not be “the surplus of income over the expenditure on consumption”, as Keynes thought, pero what, then, is the expression of the savings that allow the creation and destruction of money within an economy?*

The problem is obvious. The ligature that we have imposed on the economy with the equation that defines the saving is not realistic:

$$y_i = x_i + ah_i \quad (\text{Ec. Conservation})$$

The equation may not reflect what happens when a forger (or a bank either) creates money out of nothing and spend it in the economy. The same thing nor may you reflect what happens when a saver buries the money in the garden of his house. Both possibilities can occur in a real economy, and the equation of conservation, such as we have defined it, is not what permits.

To solve the problem and understand what is the **Equation of Conservation** that allows for you to have net savings or expense to net credit, that is to say, that you can have both the creation and destruction of money, we must ask ourselves the right questions. Where does the money that someone extracted the economy when saving? Where does the money that the faker manages to sneak in the market?

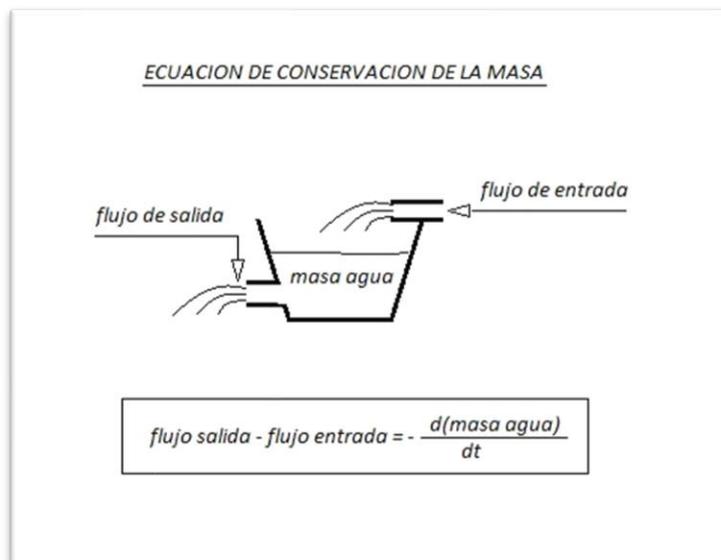
### 3. THE EQUATION OF CONSERVATION MICROECONOMICA.

To understand why it is so important to the monetary microeconomic  $m_i$  that we introduced when we formulate the Equation of Fisher, we make a comparison between the money flowing through the economy, which we represent with the money supply, and the mass of fluid that flows through a piping system.

Let's think specifically in a container where water collects, with a pipe that is filled with a pipe or drain that are empty. The attached diagram describes the physical situation, along with the equation of conservation that conforms to the quantity of water contained in the container:

$$\frac{d(\text{mass outgoing})}{dt} - \frac{d(\text{mass incoming})}{dt} = - \frac{g(\text{mass of container})}{dt}$$

The equation, which only expresses the conservation of the mass of the water in the container, textually says that, "the difference between the flow of water outlet and the inlet flow of water can only come from a change in the mass of water contained in the container, increasing or decreasing according to the difference of flows, positive or negative". Therefore, we can express the amount of water that contains our container as:



$$\text{flow outgoing} - \text{incoming flow} = - \frac{g(\text{mass of container})}{dt}$$

Knowing the value of the input streams and output we can know without any difficulty, how to change the amount of water in the container.

Now, let's make a conceptual leap and accept that the amount of money within the economy is preserved as it keeps the amount of water within a container. That is, we will consider the economic system in its entirety as a system formed by many lines for where the money flows and many vessels where it builds up, and we're going to identify any agent generic as one of those containers that contain money into your interior, then, it will also be possible to identify the conservation equation that satisfies the mass of water from a container with the

conservation equation that satisfies the money supply that uses any agent for their activity within the economy.

With this identification, the supply of money  $m_i$  for each agent used to maintain and carry out the economic activity is equivalent to the water that is contained in each container. Therefore, when you change the amount of money that has an agent generic, or porque spend more money than you enter, or because they enter more money than it spends, there will be an outflow of money or an incoming flow of money that comes from changes in the money supply and that nothing is different from the rest of the money that is being used in the economy.

The changes in the value of the amount of money  $m_i$  de each of the agents, you create a flow, either incoming (money creation) either outgoing (destruction of money), that they are completely real and can be used to buy when you increase the expenditure in respect of the income, or to save, when decreasing the expenditure in respect of the income:

$$\frac{dm_i}{dt} = (\text{cash flow incoming} - \text{flow monetrio outgoing})_i$$

The money flow from the input, or output, as a result of changes in the money supply that is used by each agent is real and must be added the equation of conservation of the monetary flow that we already have to complete it, but this should never be confused with the variation of the mass monetary savings, or credit, that are still described by the vector-saving  $ah_i$  because he has nothing to do with him. Therefore, to obtain the equation that will allow us to describe the evolution of a monetary economy in which you can create and destroy money, we must add to the equation of conservation, which helped us to define the savings, a new term that accounts for the contribution in the monetary flow that lead to changes in the money supply of each of the agents:

*LAW OF CONSERVATION OF MONETARY FLOW: In a monetary economy, the flow of sales revenue and  $y_i$  of which any economic agent must be equal to the sum of the expenditure flow  $x_i$  for purchases, plus the flow of savings  $Ah$ , the more the variation of its money supply:*

$$y_i = x_i + ah_i + \frac{dm_i}{dt} \quad (\text{Ec. Conservation})$$

*The expression is the Equation of Conservation of a monetary economy in which it can be destroyed or created money.*

It is the expression of general conservation that we were looking for. The positive sign in the expression indicates that an increase in the money supply can only be the result of a positive difference between the flows of income, expenditure and savings:

$$\frac{dm_i}{dt} = (\text{cash flow incoming})_i = y_i - x_i - ah_i$$

The expression is, clearly, the **Equation of Conservation of Monetary Flow** (or **Accounting Equation**) that must comply necessarily any agent or sector within a monetary economy generic that provides for the possibility of changes in the amount of money it manages, and it involves, as we know, a ligation microeconomic.

*THE TIME DEPENDENCE. The notable novelty that brings us to the “Conservation Equation” that we have to ask, is introduced into the economy so natural and not forced, the time as an economic variable.*

*In addition, the variation of the amount of money in the time that appears in the Equation of Conservation, so that the amount of money becomes an independent variable along with the flow of expenditure and income necessary to carry out the exchanges:*

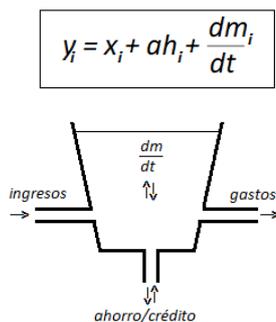
$$y_i = x_i + ah_i + \frac{dm_i}{dt} \quad (\text{Ec. Conservation})$$

*The expression is an equation dynamic that turns the economy into a predictive science, as it describes the time evolution of the economic variables.*

Perhaps the simplest way to visualize what is stated in the equation is re-use of the simile of the water going in and out of a container.

In the attached figure appears again represented by an agent as if it were a vessel in which enters and leaves a stream of water. The amount of water in the container depends on the money supply of the economic agent and the water that comes out and enters into another container, what we identify with your spending and your income. The flow of savings and loan what we identify with the extraction or injection of water into or from any part, giving to understand that it is an exchange of money in the not half - ninga purchase or sale. That is to say, savings or credit allows you to change the amount of money that uses an agent within the economy without being limited to your income or your spending.

While the flows of expenditure and income are coming and going from one container to another without changing the quantity of money out of the economy, the flow of savings and credit have a destination and a source known within the economy, and are external to this.



The latter, the extraction and injection of money into the economy very well appreciated when we calculated what is the equation for aggregate associated with the new equation for conservation, as it is the one that will allow us to prove without difficulty that the new term is going to allow that money, although it remains, the best you can't be created and destroyed without any problem. That is to say, the vector equation that includes the term of

the variation of the supply of money is really the equation of conservation of the money that we were looking for. We know that para obtain its equation added only have to add each of the components of the equation of conservation, and when in addition we have in mind the Law Say it is obtained without difficulty:

$$0 = Ah + \frac{dM}{dt} \quad (\text{Ec. de Aggregate of Conservation})$$

The expression added associated with the nominal value of the flow of money to the savings or the loan you are taking or entering the monetary,  $Ah$ , with the changes in the money supply  $M$ ,

as it is very logical. We can see that if the aggregate savings is zero,  $Ah = 0$ , the equation tells us that the money supply  $M$  remains unchanged, that is to say, that when the aggregate savings is zero there is no creation or destruction of money and all the money that you save an agent has to be spent for some other agent as a credit, or vice versa. On the contrary, when the aggregate savings is not null expression tells us that the money that is being created or destroyed it changes the supply of money  $M$ , and its importance, to the margin of the value it has in itself, is pointing to the money supply needed to carry out the economic activity as the target or the source of the money is created or destroyed from the outside of the economy:

*CREATION AND DESTRUCTION OF MONEY. The money supply  $M$  is necessary for the operation of the economic system is the source of the money that comes out of the economic system (destruction), and it is the destination of the money enters the economic system (the creation), using the flow of savings  $Ah$ :*

$$0 = Ah + \frac{dM}{dt}$$

The equation we can compare it with the equation of conservation of energy in physics, we speak of the conservation of the money supply within the economy:

*“When the economy is isolated, that is to say, that neither enters nor leaves the money, the money supply remains unchanged”*

The equation of conservation, along with its equation is added, becomes economics into a science, predictive, that in nothing differs from the other natural sciences, since it expresses the time dependence that they have the basic variables that described the economy. In addition, it allows you to solve most of the problems that have prevented the scientific advancement of the discipline in the last two centuries, among them, those related to the creation and destruction of money.

With the new expression of conservation, the set of equations that describe any monetary economy generic is:

*Ec. Basic Economy Monetary*

$$Ec. \text{ microeconomic } \left\{ \begin{array}{ll} y_i = x_i + ah_i + \frac{dm_i}{dt} & (Eq. \text{ de conservation}) \\ \left\{ \begin{array}{l} y_i = \sum_j c_{ji} \\ x_i = \sum_j c_{ij} \end{array} \right. & \begin{array}{l} (Def. \text{ of income}) \\ (Def. \text{ spending}) \end{array} \\ k_F \cdot m_i = x_i & (Eq. \text{ Fisher}) \end{array} \right.$$

$$Ec. macroeconomic \left\{ \begin{array}{ll} k_F \cdot M = PIA & (Ec. monetary) \\ PIA = \sum_i x_i = \sum_i y_i & (Law of Sally) \\ Ah + \frac{dM}{dt} = 0 & (Ec. aggregate of \\ & conservation) \end{array} \right.$$

Now, yes, it would seem that we have reached the purpose of finding the set of equations basic that describe any monetary economy generic. What is certain is that it is so, but it would be a shame to end here our search and not rounding it off with a beautiful finishing touch.

If we derive with respect to time, the equation of Fischer and we use the expression to replace the vector  $m_i$  by the vector-purchase  $x_i$  in the equation microeconomic conservation, we obtain:

$$y_i = x_i + ah_i + \frac{dm_i}{dt} \xrightarrow{k_F \frac{dm_i}{dt} = \frac{dx_i}{dt}} y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt}$$

The new equation is not different from the former, although it has been removed from the monetary and now in the expression only appear the vector entry, the vector of expenditure and the vector-saving. Neither the equation aggregate is going to have a different meaning than they already had, but now in the new formulation does not appear the money supply as a variable explicit, but the aggregate expenditure or  $PIA$ :

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \xrightarrow{agregacion} Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0$$

Now the expression added relates to the flow of monetary creation  $Ah$  with the changes in the aggregate expenditure of the economy-wide or  $PIA$ . Therefore, el ultimate set of basic equations that must meet an economic system either based on the free exchange of goods for money is:

### ***Ec. Basic of the Monetary Economy***

$$Eq. microeconomic \left\{ \begin{array}{ll} y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} & (Eq. de conservation) \\ y_i = \sum_j c_{ji} \\ x_i = \sum_j c_{ij} \\ k_F \cdot m_i = x_i & (Eq. Fisher) \end{array} \right.$$

$$Eq. \text{ macroeconomic} \begin{cases} k_F \cdot M = PIA & (\text{Eq. monetary}) \\ PIA = \sum_i x_i = \sum_i y_i & (\text{Law of Sally}) \\ Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0 & (\text{Ec. aggregate of conservation}) \end{cases}$$

The whole set of equations that describe the monetary economy, only the equations microeconomic form an independent set. The equations scalar are obtained by aggregation of the corresponding vector equations so that equations are the equations redundant. The reason why we bring them explicitly is because each one of them holds a meaning macroeconomic very different from the meaning microeconomic that have expressions vector from which they come. In fact, we can say, that the set of vector equations describe the economy from the microeconomic point of view, while the set of equations added describes the economy from the macroeconomic point of view.

The last expression, which we have called the equation of conservation scale, has, as we will see a huge importance within the economy, so much so that we've given it a specific name:

*THE EQUATION OF GROWTH. In a monetary economy, the nominal growth of the PIA is proportional to the flow of money creation Ah, being the constant of proportionality the constant of Fischer,  $k_F$ :*

$$\frac{dPIA}{dt} = -k_F \cdot Ah$$

*The equation tells us that the growth of the PIA has nothing to do with the amount of money that you save to invest, since it is only the spending of new money created which allows the growth, whether or not spent on investment.*

$$\sum_i ah_i = Ah \neq 0 \rightarrow \left\{ \begin{array}{l} ah_i > 0 \rightarrow \text{save} \rightarrow A = \sum_{ah_i > 0} ah_i \\ ah_i < 0 \rightarrow \text{investment} \rightarrow I = \sum_{ah_i < 0} ah_i \end{array} \right\} \rightarrow$$

$$A + I \neq 0 \rightarrow \frac{dPIA}{dt} \neq 0$$

This is perhaps the law macroeconomic most important part of the economy and is equivalent to the conservation equation of the energy of the physical sciences.

# THE MEANING OF THE EQUATIONS BASIC

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## 1. THE EQUATION OF MONEY.

We don't want to be heavy repeating once and again the same thing, but the importance of the postulated monetarist required, since it has been this postulate, together with the postulate of conservation, which allows to obtain the set of basic equations that conforms to a monetary economy.

Although it is not easy to agree on what science is, yes we can say that we are all more or less agree that it is based on the belief that there are a set of laws or relationships that bind, and become dependent on each other, the vast amount of unrelated phenomena that we observe around us. Taking this into account, and assuming it is certain such a vague way of defining what is a law of physics from the point of view of science, we have no choice but to affirm, that the monetary equation is a physical law that relates league or economic phenomena that are presented to us as independent without being it.

What reason can there be to require a specific amount of money to keep a flow of concrete exchanges money? In principle, no, but it is the fact that there is such a relationship between two variables that are presented to us as independent, which allows us to investigate and relate to other economic phenomena that we were also presented to the view as independent, but that the relationship of monetary league without remedy once we consider to be true. Specifically:

$$k_F \cdot M = \sum q_i \cdot q_i \rightarrow \frac{dPIA}{dt} = -k_F \cdot Ah$$

The growth of expenditure, which we have called the PIA of the economy, does not have to be related to the flow of savings, understood as a cash injection from nothing, from the creation of money. However, it is this interdependence between variables without apparent relationship, that the mathematical structure of a scientific theory forces us to formulate a posteriori, which is the magic that surrounds to science and the reason why we believe that there really are in the nature of a reduced set of mathematical relationships that we can explain what's going on around us. In this sense, the scientist is a believer that nothing is different from other religious beliefs, and like those, based their faith in the dialog dumb that it establishes with nature.

At no point in this lengthy treatise we're going to try to justify recourse to first principles, that the monetary equation is true, not because we do not have a theory more fundamental and profound that suggests the relationship, but because, with such proceeding, tarnish the immense beauty that is presented to us when we discovered a law of thumb that relates variables for which there is no reason why you have to be related.

Understand, that it is the monetary equation which characterizes a monetary economy, it is then evident. Understand, that it is the ligature that shows the monetary equation causing the last of the credit crisis, and that there will be finely that appeal to find a cure, will be shown as clear. The magic is magic because we understand that is not possible, despite the fact that it is displayed to our eyes as clear. the monetary equation is magical, because it is one of those that force you to create science.

## 2. THE EQUATION OF CONSERVATION OF MONETARY FLOW.

Let's look at the three formulations of the Equation of Conservation, of many possible, which have been appearing up to find the equation more generally that allows you to describe a monetary economy in which it creates and destroys money:

$$y_i = x_i + ah_i \quad (1)$$

$$y_i = x_i + ah_i + \frac{dm_i}{dt} \quad (2)$$

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \quad (3)$$

The first equation is not more than the accounting equation that we have been valid for all the life. It is the expression that is used in economics to define saving as an outside activity and external of the process of production and distribution. Using the words of Keynes:

*"I know, everyone is in agreement that the saving is the excess of income over expenditure of consumption"*

It is an equation that is static in the sense that it does not appear any derivative temporary variables, although there is nothing in the expression that prevents the vector of income, expenditure and savings, may change with time. However, we know that the expression may not be valid in a generic manner for any economy because its equation is added, which is obtained by adding all of its components, tells us that the aggregate savings of the entire economy is zero:

$$\sum_i y_i = \sum_i x_i + \sum_i ah_i \xrightarrow{PIA = \sum_i y_i = \sum_i x_i} \sum_i ah_i = 0 \rightarrow Ah = 0$$

In an economy where it meets the usual expression that is used to define the savings there can be no creation or destruction of money, and it can be used to create a real model of the economy because the expression may not be valid in a monetary economy real.

The second equation is telling us exactly the same as the first and is, therefore, also an accounting equation:

$$y_i = x_i + ah_i + \frac{dm_i}{dt} \quad (2)$$

The difference between one and another is the emergence of a new term, the term of variation of the money supply, which converts the expression into an equation dynamic where the amount of money does not have to be retained. Now the aggregate savings  $Ah$  throughout the economy does not have to be null and void, and in the economy can be created and destroyed money:

$$\sum_i y_i = \sum_i x_i + \sum_i ah_i + \frac{dm_i}{dt} \xrightarrow{PIA = \sum_i y_i = \sum_i x_i} \sum_i ah_i + \sum_i \frac{dm_i}{dt} = 0 \rightarrow Ah + \frac{dM}{dt} = 0$$

We see that the amount of money in the economy  $M$  depends on the flow of aggregate savings, and if this is not null, it will not be null and the variation of the amount of money. What is really amazing of the expression is that which is the origin and the destination of the money is created or destroyed in the economy:

*“Is the money supply  $m_i$  used in each one of the agents to perform the exchange of buying and selling, where it comes from and where it ends the money that destroys and creates in the economy”:*

$$y_i - x_i - ah_i = \frac{dm_i}{dt} \rightarrow \begin{cases} y_i - x_i - ah_i > 0 \rightarrow \frac{dm_i}{dt} > 0 \\ y_i - x_i - ah_i < 0 \rightarrow \frac{dm_i}{dt} < 0 \end{cases}$$

The problem of the equation is that it does not tell us how to calculate the money supply, nor what relationship he has with the other variables of the economy. In particular, it does not tell us what was the relationship of the money supply of each agent with their income with their spending or savings.

The third expression is another story:

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \quad (3)$$

It is not only that it is an equation dynamic that seems to be the derived temporary spending  $x_i$  as a variable, is also the fact that now, as it does not appear the money supply as a variable explicitly, the expression retrieves status original accounting equation that defines the savings

$ah_i$  and re-express the relation microeconomic that exists between the three basic variables of the economy: income, spending and savings. Observe also that, when the economy does not change in time, the expression becomes the used by Keynes to define the saving, in the first equation. Therefore, the third expression is an equation that is more general than that used in the traditional way in the economy and to define the savings, and contains as a particular case.

The expression also speaks to us of the profound asymmetry that exists between the role of the buyer and the role of seller within the monetary savings, as the flow of spending  $x_i$  appears in the Conservation Equation together with its derivative temporary, not something that happens with the flow of income  $and_i$ . This asymmetry is not trivial and has an enormous importance, since it indicates very clearly the line causal economic growth:

$$\frac{1}{k_F} \frac{dx_i}{dt} + x_i = (y_i - ah_i) \rightarrow x_i \xrightarrow{\frac{dx_i}{dt} \rightarrow 0} (y_i - ah_i)$$

The Conservation Equation is a differential expression with respect to the expense, where the difference between the income and savings is what you're doing term independent and, therefore, is the term that tends the expense: *"the expenses is the difference between the income and the saving"*. If we forget the ambiguous term coined by Keynes in the General Theory to appoint the engine of growth: "Effective Demand", and we replaced him with the much more accurate: "The disposable Income", as the difference between income and saving:

$$(Disposable\ income)_i = y_i - ah_i$$

So, what that tells us the Equation of Conservation of Monetary Flow is that the expense of a sector of any economy, will grow or decrease depending on the available income greater than or is less than the money that they spend the sector. That is to say, the nominal power consumption of any sector continues to disposable income and "will grow when you grow the income available and will decrease when lowering the income available". Or another way, a sector, either the economy will enter a recession when the disposable income of the sector to decrease.

Finally, and not least important, the expression tells us that the creation of money is the sole cause of the growth of the economy:

*THE BEGINNING OF THE GROWTH. In a monetary economy, the nominal growth of any sector is proportional to the difference between the disposable income and the expenditure of the sector, being the constant of proportionality equal to the constant of Fisher:*

$$(Income\ Available)_i = y_i - ah_i$$

$$k_F \cdot (y_i - x_i - ah_i) = \frac{dx_i}{dt} \rightarrow \begin{cases} \xrightarrow{y_i - x_i - ah_i > 0} & dx_i \uparrow \text{ (crecimiento)} \\ \xrightarrow{y_i - x_i - ah_i < 0} & dx_i \downarrow \text{ (decrease)} \end{cases}$$

This is the reason why the Equation of Conservation should carry the name of the "Equation of Keynes" because the equation expresses what he wanted to convey when he wrote the General Theory:

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \quad \text{¿ Equation Keynes?}$$

Leave it to the scientific community to decide that, because Keynes is not exactly an economist who need to be rescued from oblivion.

### 3. ANALYSIS OF AN ECONOMY DIVIDED INTO N SECTORS

Let's start by studying the equation of conservation of a monetary economy divided into N sectors in the general case, in which you can be creating or destroying money:

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt}$$

We will assume at all times that the revenues, expenses, and savings functions are independent of each other, and which are only linked by the equation of conservation. This working hypothesis is very debatable, especially in regard to the saving, but don't have much choice but to suponerla certain if we are to arrive at conclusions very general without having to raise any prior example of economy of concrete.

The conservation equation shows, with the previous assumption, a system of differential equations of the first order for the vector of spending  $\mathbf{X}$  has an equation for homogeneous associated, a characteristic equation, and a functional term, is not homogeneous:

$$\mathbf{Y} = \mathbf{X} + \mathbf{Ah} + \frac{1}{k_F} \frac{d\mathbf{X}}{dt} \rightarrow \begin{cases} \frac{d\mathbf{X}}{dt} + k_F \mathbf{X} = 0 & \text{(ec. homogeneous)} \\ k_F (\mathbf{Y} - \mathbf{Ah}) & \text{(term not seamless)} \\ (k_F + \lambda)^n = 0 & \text{(ec. carasteristica)} \end{cases}$$

The general solution of the system of differential equations is, for each component:

$$x_i(t) = C_i e^{-k_F t} + k_F e^{-k_F t} \int [y_i(t) - ah_i(t)] e^{k_F t} dt \quad \text{(solution sector "i")}$$

Equation on you can make the following observations:

- 1) The general solution is a functional term, transient  $C_i e^{-k_F t}$  that for long times is aborted, since  $k_F$  is positive by definition:

$$C_i e^{-k_F t} \xrightarrow{t \rightarrow \infty} 0$$

This demonstrates that the events of "the past" does not influence the present beyond a characteristic time which is of the order of the "constant Fischer"  $k_F$ .

The economic significance of the "constant Fischer"  $k_F$  is, therefore, the average time that it takes for the flow of spending in responding to sudden changes of disposable

income (the equivalent of money creation in the sector), which can be used to calculate experimentally the value of the constant of Fischer.

- 2) Of the previous statement can be deduced that, for the time very large, the transient can be neglected and the general solution is:

$$x_i(t)_{t \rightarrow \infty} = k_F e^{-k_F t} \int [y_i(t) - ah_i(t)] e^{k_F t} dt$$

Let's look at the term  $[y_i(t) - ah_i(t)]$  is precisely the value of  $x_i(t)$  when there is no change in spending, which we have called the disposable income of the sector, so that the expression shows the line causal of the monetary savings:

*“the expense, it depends on and follows in the disposable income of the sector”*

That is to say, it is necessary to increase the disposable income over expenditure to achieve that growth in spending in the sector:

$$y_i - x_i - ah_i > 0 \quad \leftrightarrow \quad \frac{dx_i}{dt} > 0$$

Money can come from a transfer from another sector through the flow of credit.

- 3) The equation of conservation of monetary flow can be expressed for each of the sectors such as:

$$(y_i - ah_i - x_i) = \frac{1}{k_F} \frac{dx_i}{dt}$$

The term  $(y_i - ah_i - x_i)$ , represents the cash flow net that leaves or enters in the sector, and when they are referring to the economy of a country is named as an external balance of payments. In the conservation equation, this term makes the flow of money creation within the sector, so that, as we already know, the economy of the sector can only grow when the term is positive. Although, later we will present the theory of economic growth, it is observed that the origin of the increase in nominal spending (consumption) within a sector, either  $\frac{dx_i}{dt}$  (or within a country), has two possible origins:

$$(y_i - ah_i - x_i) > 0 \rightarrow \begin{cases} \xrightarrow{ah_i=0} y_i - x_i > 0 \rightarrow \text{increase the income} \\ \xrightarrow{y_i-x_i=0} ah_i < 0 \rightarrow \begin{cases} \text{credit external} \\ + \\ \text{creation of money} \end{cases} \end{cases}$$

The first term indicates the amount of money entering the sector due to the difference between the sales revenue and expenses for purchases. The second term indicates the savings, that is to say, the income due to the creation of internal money in the cash transfers in the form of credit from other sectors (which acts as a money-making). When the sum of the two terms is positive contributes to the nominal growth of the economy.

- 4) **DEFINITION.** We say that an economy is to Say when the expenses by purchasing any sector are equal to its sales revenue:

$$y_i(t) = x_i(t) \quad (\text{Economy Say})$$

In an economy of Say, each sector meets the same expression that it meets the aggregate savings in a closed economy:

$$y_i(t) = x_i(t) \xleftrightarrow{\text{Economy of Say}} \frac{1}{k_F} \frac{dx_i(t)}{dt} = -ah_i(t)$$

Saying it another way, in an economy of Say each sector behaves as an economy isolated (but that you can get money from other sectors).

With this small introduction to the mathematical structure underlying the Conservation Equation we terminate this third chapter, but not before making a brief foray into the terrible consequences that the “disposable Income” has in the real economy in which we live.

#### 4. SPAIN EMPTY

Although it will be later, when we develop a more in-depth theory of the trade, we want to now show how the Equation of Conservation of Monetary Flow can be explained very easily one of the phenomena most obvious and least marked of the globalization of trade:

*“Massive migration from the countryside to the city that shows all companies based in a monetary economy, in every age and in every place.”*

All countries, whether rich or poor, they tend to focus a good part of the population in large urban centres. In addition, it can be shown empirically that the lower economic development in a country, the greater tends to be the percentage of the population is concentrated in the large cities. We're not going to give specific names of countries that continue to this dynamic of human concentration in large cities, but you could see very easily that it is not uncommon to find urban cores which is concentrated in one-third or more of the entire population of the country.

Paris is a huge city with approximately 12 million inhabitants within a country with a population of close to 70 million people. Tokyo is the most populated city in the world, located on an island, Japan, which contains approximately 120 million inhabitants. However, it is not uncommon to find many capitals, countries with less than half of the income per capita in France or Japan, with a population that reaches and passes the 18 or 20 million people in countries that do not have more than 60 million inhabitants. For example, the city of Buenos Aires is around 16 million people in a country with an area 4 times the size of France and with a population of about 45 million people.

Why this phenomenon happens?

Although it is, of course, a phenomenon that has always happened, it is not difficult to demonstrate that it has gotten much worse over the last 50 years of globalization of trade and the free movement of capital, without this nothing unclear whether the two phenomena are, or are not, connected.

“Spain " empty”, it is the term with which reference is made in Spain, this phenomenon is happening everywhere, that seems to be unstoppable and that it lacks a convincing explanation on the part of economists working for the private universities of the USA, because they simply prefer to ignore it. Everything that don't go out into the prestigious economics journals that published the most prestigious private universities in the USA, does not exist, although it is a phenomenon that is very easy to explain from the point of view money.

Let's look at what it says in the conservation equation when we divide the economy into two unique sectors, which in our case we can identify with an urban nucleus against the position of the periphery. When we assume that there is no creation or destruction of money, we have:

$$\left. \begin{aligned} y_1 &= x_1 + ah_1 + \frac{1}{k_F} \frac{dx_1}{dt} \\ y_2 &= x_2 + ah_2 + \frac{1}{k_F} \frac{dx_2}{dt} \end{aligned} \right\} \xrightarrow{ah_1+ah_2=0} \frac{dx_1}{dt} + \frac{dx_2}{dt} = 0 \rightarrow$$

$$\rightarrow \begin{cases} (x_1 \uparrow) \leftrightarrow (x_2 \downarrow) \\ (x_1 \downarrow) \leftrightarrow (x_2 \uparrow) \end{cases}$$

The equations tell us that, when there is no money creation, the nominal growth of one sector at the expense of the nominal growth in another sector, which is a very noticeable result. Especially, when you understand that it is the disposable income of each sector who is guiding the process of growth or negative growth in the sector. That was the conclusion at which we arrive when we analyze the conservation equation, and we demonstrate that the line causal league spending to income, confirms that the decrease in disposable income below the expenditure lowers the spending, which has dire consequences for the sector that suffers, because as we will see later, the decrease in the expenditure on consumption will decrease its production in favor of the growth of the productive fabric of the other sector. Specifically, for a sector, either is true:

$$(y_i - x_i - ah_{-i}) = \frac{1}{k_F} \frac{dx_i}{dt} \xrightarrow{(y_i - ah_{-i}) < x_i} \frac{1}{k_F} \frac{dx_i}{dt} < 0 \rightarrow x_i \downarrow$$

Where  $(y_i - ah_i)$  is the disposable income of the sector, and  $x_i$  your spending.

The conclusion of the expression is valid for any industry generic and demonstrates that, within the same country, the regions that are “exported” more than “matter” will increase the productive fabric, while the regions that “matter” more of that matter will decrease its production (where we identify the increase in expenditure with the increase of the production, as it is the right thing). It is the same thing happens between the exporting and importing countries, that the first will increase your production at the expense of the production of the latter, which exported less of that matter.

Let us observe that it is possible to keep spending steady in each of the sectors, despite the fact that the income is greater or less than that. To view it, perhaps it is best to compare the cash flows from the sale of those other streams that come from the transfer by the vector-saving, so that both are balanced:

$$(y_i - x_i - ah_i) = \frac{1}{k_F} \frac{dx_i}{dt} = 0 \rightarrow \begin{cases} (y_1 - x_1) > 0 \leftrightarrow ah_1 > 0 \\ (y_2 - x_2) < 0 \leftrightarrow ah_2 < 0 \end{cases} \xrightarrow{\frac{dx_i}{dt}=0} ah_1 + ah_2 = 0$$

A sector that sell more of what you're buying, you must save and lend the excess money to the sector that buys more than it sells, to keep the economy balanced, while the sector that buys more than it sells must spend borrowing (negative savings) in order to maintain your balanced economy. Obviously, it saves one should be what you spend to credit the other, so that the economy who buys more than it sells will be able to maintain balance while "take credit", otherwise, you will have to decrease spending and with this production (your *PIA*) will decrease until you get it to balance expenditure with the income. That is to say, the economies or sectors, importing more than they export more early or late will reduce your production and will be making more poor and unproductive when you stop to get money through the loan.

The large migration flows from the periphery to the large urban centers, which have always happened, but they are getting worse since the liberalization of trade and the free movement of capital are a direct consequence of the Equation of Conservation of Monetary Flow, and little or nothing to do with how much or how little you work for the people. The regions become poorer to the extent that they see the need to buy more of what they sell, which is very logical. Spain empty, the huge capital that are being created around the world at the expense of the population of the periphery are part of the same process that we are witnessing from the sidelines, without doing anything to remedy it.

*Whathow you can fight an equation? You can't fight an equation. When we face against the math we need to be like the reed that bends to the passage of the wind, but without never to break. Let us try to understand the mechanism against which we are fighting:*

*1) a nucleus with A larger population produces a greater variety of goods and more efficient than that produced in the periphery, usually to the widely dispersed population.*

*2) The vast majority of the times, the goods manufactured in the urban core have a higher added value than those that occur in the periphery, for many and varied reasons.*

*3) A greater variety of goods implies that, under normal conditions, the people who live in the suburbs and buy more goods core goods purchased from the nucleus at the periphery. This uneven flow of goods out of balance the flow of monetary exchange between the two regions, which makes the disposable income of the region that you purchase in the other, to fall below the expense. That is to say, that the entry in the periphery is less than the expense, and vice versa, the nucleus has more income than your expenses.*

*There is nothing strange or mysterious in the analysis, what we have is a periphery that is empty of money:*

$$(y_i - x_i - ah_i) = \frac{1}{k_F} \frac{dx_i}{dt} \xrightarrow{(y_i - ah_i) < x_i} \frac{1}{k_F} \frac{dx_i}{dt} < 0 \rightarrow x_i \downarrow$$

*The people of the periphery depend on many products that are not manufactured, and that they need to buy the urban core, causing an imbalance in the monetary flow between the periphery and the center. The periphery, literally, is empty of money, and with him, are empty of companies and people. If you want to say the same thing, but in a more technical way, we will say that the disposable income of the periphery decreases, and with it, all of the productive fabric of the periphery.*

*Taxation, understood as a flow of transfers, you can slow down the process and reach out to stop him, but any attempt to stop the process with the fiscal transfers from the center to the periphery, will have to keep forever because it does not address the source of the problem. The solution is in another site and show you when you study international trade.*

The implications of the use of money in the life of the people, and that we showed in the brief analysis of “the Spain Empty” are very general and can be applied to any other division consistent in the two sectors that we may make a monetary economy. Since then, for the analysis to be valid it is necessary that the agents that form each of the sectors in which it has been divided the economy are sufficiently homogeneous so that its behavior can be assimilated to that of a single agent, but beyond this restriction statistic that is nothing complicated to meet, there is no other limitation that prevents us from generalizing the result.

The preceding analysis on the causes of Spain's Empty is also worth to predict what is going to happen in a country as large as the European Economic Community, formed by about 500 million people, or what is happening to a country as large as the united states, all with independence that use the same currency.

When we divided Europe into two sectors, the industrialized countries of the center and north, and the countries agricultural and tourist sites in the south, we have a situation with two sectors are very heterogeneous, which reflects very well the imbalances of sale of which we have spoken. It is foreseeable that the “disposable Income” of the countries of the north will keep on top of your costs thanks to greater specialisation in products with a high added value, which are not produced by the countries of the south, but they consume greedily. On the contrary, the income of the countries of the periphery, highly specialized in tourism and in products derived from agriculture and fishing, and which tend to pay lower wages in comparison with the wages paid in the industrialized north.

In this economic context, and taking into account that the difference in the language will prevent the mass movements of the population in search of work, it will be inevitable that the imbalance in the flow of income from one sector to sector there in the extraction of a net of money that force you to lower production in the countries of the south. The decrease of the production will be observed in an increase of unemployment, which is kept in bounds very high and that the economists who work for the private universities of the USA associated invariably with a structural unemployment for the recommended lower wages. Despite the fact that what is happening is that there is an imbalance in the balance of trade that is fed back, and whose origin

is to be sought in the lower income that is obtained by producing goods of lower value-added, that is to say, in low wages.

To see that these imbalances are not that easy to solve, let's take as an example the economy of east Germany and the west. Both areas continue to have a significant inequality in wages even after almost 30 years since the fall of the wall, and this, despite the numerous aid and investments that Germany industrialized west has done in east Germany. If the Germans themselves have not been able to balance the production of the two Germanys after 30 years of efforts in a row, still less can be expected that the Greeks, Spanish and / or Portuguese succeed. Pretty much have all of them, follow the wheel and not to stay further back still.

***ECONOMY OF THE TWO COUNTRIES.** The set of independent variables that describe a monetary economy is formed by the coefficients of the matrix of expenditure  $c_{ij}$ , the savings flows  $ah_i$  and the time. The flow of spending  $x_i$  and the flow of income  $and_i$  is obtained from the sum of the coefficients of the matrix of expenditure by aggregation and are therefore variables redundant.*

*Specifically, an economy that is divided into  $N$  sectors, has  $N^2+N$  separate streams linked by  $N$  equations:  $N^2$  flows that form the matrix of expenditure and the  $N$  flows that form the vector of savings. Therefore, if we want to delve a little deeper into the implications of the conservation equation, we must express the conservation equation in function of these flows general of the matrix of expenditure.*

*For example, let's do it for the particular case of an economy divided in two sectors, or in two countries, the conservation equation expressed in terms of the coefficients of the matrix of expenditure is:*

$$\begin{aligned} y_1 = x_1 + ah_1 + \frac{1}{k_F} \frac{dx_1}{dt} & \quad c_{11} + c_{21} = c_{11} + c_{12} + ah_1 + \frac{1}{k_F} \frac{d(c_{11} + c_{12})}{dt} \\ y_2 = x_2 + ah_2 + \frac{1}{k_F} \frac{dx_2}{dt} & \quad c_{12} + c_{22} = c_{21} + c_{22} + ah_2 + \frac{1}{k_F} \frac{d(c_{21} + c_{22})}{dt} \end{aligned}$$

*Where the vector of income and expenditure are obtained by aggregation of the rows and of the columns of the matrix of spending  $G$ :*

$$\begin{cases} x_1 = c_{11} + c_{12} \\ x_2 = c_{21} + c_{22} \end{cases} \quad \begin{cases} y_1 = c_{11} + c_{21} \\ y_2 = c_{12} + c_{22} \end{cases}$$

*When each sector represents in the economy of a country, the coefficients of the matrix of expenditure have a very specific meaning and simple:*

- $c_{11} \rightarrow$  expense of the country 1 in the own country
- $c_{12} \rightarrow$  expense of the country 1 country 2
- $c_{21} \rightarrow$  expense of the country 2 country 1
- $c_{22} \rightarrow$  expense of the country 2 and its own country

*The two differential equations dependent on the coefficients of the matrix of expenditure  $c_{ij}$  are very complicated to solve in the general case, but it is possible to simplify them very much doing a hypothesis quite simple and that will probably be true in most cases:*

*“the expense of a country within a country is proportional to the total expenditure of the country”*

*With this simple hypothesis, the four coefficients of the array passed to depend on only two parameters. Calling “a” and “b” to the percentage of the expenditure itself, which spent a country in the other country, we have:*

$$c_{11} = (1 - a) \cdot x_1 \rightarrow \text{expense of the country 1 in the own country}$$

$$c_{12} = a \cdot x_2 \rightarrow \text{expense of the country 1 country 2}$$

$$c_{21} = b \cdot x_1 \rightarrow \text{expense of the country 2 country 1}$$

$$c_{22} = (1 - b) \cdot x_2 \rightarrow \text{expense of the country 2 in the own country}$$

*With a little algebraic manipulation, the two differential equations are converted into the following system of coupled differential equations, now dependent on the coefficients “a” and “b”, and the savings:*

$$\left. \begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \right\} \text{Economy of two countries}$$

*Once more, you can extract a set of general conclusions, provided we accept that both flows of spending  $x_1$  and  $x_2$  are independent of each other:*

*a) Suppose, for simplicity, that the respective flows of savings are zero, that is to say, we will assume that there are no monetary transfers between the Capital markets of both countries (we shall see a little later which is the capital market). With this assumption, the system of equations says:*

*- Each of the flows of expenditure has two contributions. A first contribution of a transient that tends to zero for times very great, and a second contribution stationary, which is the aim of each of the flows of expenditure for long times.*

*- For long times, when it falls, the transient, the two flows of spending tend to a steady relationship, dependent only on the coefficients of spending “a” and “b”. In particular, it can be shown that the relation is:*

$$a \cdot x_1 = b \cdot x_2 \leftrightarrow \frac{x_1}{x_2} = \frac{b}{a}$$

*Therefore, for the time very large, the balance of trade has to be balanced and spending between the two countries is equal, being the ratio between the total expenses of both countries (GDP) and inversely proportional to the ratio between their respective coefficients of expenditure.*

*This result is very remarkable, and it may seem shocking to that what we describe in terms of the balance of payments. When we identify the flow of spending  $x_1$  and  $x_2$  with the GDP of each of the countries, which asserts the expression is, the more unbalanced it is the balance of payments of a country with respect to the other country, and more to spend a country on the other, the less will end up as their GDP (production) GDP (production) from the other country. That is to*

say, the relationship between the GDP of both countries will end up being inversely proportional to the ratio between the respective coefficients of expenditure.

(b) When we assume that the flows of savings are not null (but we assume that there is no money creation), or what is equivalent, when we assume that both savings flows are equal and of opposite sign, the result is altered slightly, but do not change the substance of the matter. For times very great, the relationship that tends the expenditure of each of the countries, is altered:

$$ah_1 = -ah_2 \rightarrow a \cdot x_1 = b \cdot x_2 - ah_1$$

Now, thanks to a flow of negative savings (from and equal to the positive saving another country) it is possible to maintain an expense (here we identify the country's GDP, which is not entirely correct) above which corresponds to him by the income from his trade, that is to say, that the country may maintain a deficit spending, thanks to the loan from the other country:

$$a < b \xrightarrow{a \cdot x_1 = b \cdot x_2} x_1 > x_2 \quad (\text{balance of trade}=0)$$

$$a < b \xrightarrow{a \cdot x_1 = b \cdot x_2 - ah_1} x_1 \overset{?}{\leftrightarrow} x_2 \quad (\text{balance of trade} \neq 0)$$

Now, the balance of trade does not vanish for very large because the trade deficit is kept with the loan from the country's surplus, and the GDP of a country can be maintained above that corresponds to him by his trade. We see that, thanks to the flow of loan, it is possible to maintain an external deficit without having to reduce domestic spending (GDP), but, as is logical, it will ensure that the flow of external credit, which offsets the trade deficit will keep indefinitely in time.

(c) The situation changed again when you take into account the possibility of creating money and savings flows are uncoupled and can be both negative. In such a case, the system of equations becomes difficult to solve in a generic way, so that will have to wait a little, to define the Capital Market and have a theory of economic growth, to try to address the specific solution in some situations specific, but we can not expect that the result obtained in the previous sections change significantly.

Given that we still do not have any theory on growth or on the money creation, it is impossible to interpret with more depth the implications of the savings in GDP final of the countries, but it does not seem an exaggeration to say that the flows of money, not be able to change the economic reality that underlies the exchange of goods for which likely the conclusion to which we arrive when we assumed that there was no savings will be valid in a universal way:

*“The more unbalanced is the trade balance of a country with respect to the other country, and the more you spend one country in the other country, the less will end up as their GDP (production) GDP (production) other country”*

*It is the same conclusion that we arrived when we try to explain the economic growth for the benefit of the large cities at the expense of the periphery.*

## 5. THE MULTIPLIED SPENDING KEYNESIAN.

One of the more strange that exist within the economy is the “multiplier of expenditure”, in particular, the “multiplier of public expenditure” or “multiplier keynesian”. As happens to most of the variables that are used within the economy, the “multiplier” is something very vague, that it never appears defined, but any economist will tell you that he knows perfectly what he is, despite the fact that it is impossible to measure in practice, precisely because it is not defined.

For example, the “Samuelson” is defined as the ratio between increasing GDP and the increase in government spending that causes it (a definition which, as is logical, it can be generalized to any increase of expenditure that can make any agent within the economy, for example “the multiplier of investment”). The problem with the definition is that it does not say clearly what you mean with the increase in public spending; if it is an increase in taxes to increase uniformly the public service, or refers to an expense timely and deficit of the government to turn the economy. Such a definition we can see it also in another text book published by a private university, this event written by Mankiw, where you do not get to define explicitly the concept, but where it is also associated with the increase that suffers the *GDP* to an increase in public spending, without specifying either referred with an increase in public spending. Be that as it may, the lack of definition that characterizes any variable used to describe the economy, seems to be motivated in this particular case to which the multiplier of spending is most often associated, with an evolutionary process of the economy, with a ratio to dry in two variables, so that the concept is in need of some implicit model in which to sustain themselves.

If we strictly adhere to the definition of multiplier as the ratio that exists between the growth of GDP and the growth in public spending, we must think first of all in two basic aspects that round the quotient. The first, that public spending is a flow and, therefore, the changes in the flow of public spending are the variation of the flow, and not can be described as a flow. The second, that in order to increase the public expenditure should be, or an increase in revenue or a deficit spending, so the best way to analyze the multiplier of expense from the point of view of the basic equations that we have developed is dividing the economy into two sectors, the private sector and the public sector:

$$\left. \begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \right\} \text{Economy divided into two sector}$$

Where now the meaning of the parameters is:

$$\begin{aligned} a \cdot x_1 &\rightarrow \text{which is levied on the private sector} \\ b \cdot x_2 &\rightarrow \text{the public spending that ends up in the private sector} \\ ah_1 = 0 &\rightarrow \text{the net savings of the private sector} \\ ah_2 &\rightarrow \text{the flow of credit to the public sector} \end{aligned}$$

To simplify, we assume that the net savings of the private sector is zero and that the public deficit constant applicable, in aggregate terms, of the monetary creation. Although it is possible to solve the system of equations without difficulty, to find the expression for the multiplier of spending that we're looking for, we have only to divide the variation that is evident in the GDP of the economy by the variation that suffers the public expenditure due to spending on credit:

$$\frac{dPIB}{dx_2} = \frac{d(x_1+x_2)}{dx_2} = \frac{-ah_2}{(a \cdot x_1 - b \cdot x_2 - ah_2)} = \text{multiplier of expenditure}$$

The result is very interesting and something other than that which could be expected. Given that  $ah_2$  is always negative because it is a loan, and since the term  $(a \cdot x_1 - b \cdot x_2)$ , the difference between what they collect taxes and spending by the public sector into the private sector, can be negative or positive according to the public sector surplus with the private sector, or not (almost always the term is negative), we have the multiplier will be greater than "1" or less than "1" depending on whether positive or negative, the surplus of the public sector:

$$(a \cdot x_1 - b \cdot x_2) > 0 \rightarrow \frac{dPIB}{dx_2} < 1$$

$$(a \cdot x_1 - b \cdot x_2) < 0 \rightarrow \frac{dPIB}{dx_2} > 1$$

The expression is very general in nature, and tells us something we already know, that the concept of the multiplier does not have much meaning when it is associated with the public deficit in this way, because it is very dependent on the deficit public that concrete has in the time of the injection of cash, and not only of the cash injection that is what would give meaning to the relationship.

A much more coherent set the multiplier Keynes, in the context created by the Theory of Madrid, we have expressed in the equation aggregate of conservation, that is to say, in the Equation of Growth:

$$\frac{dPIA}{dt} = -k_F \cdot Ah$$

When the constant of Fisher's refer to the *GDP*, we have:

$$\frac{dPIB}{dt} = -k_F \cdot Oh \rightarrow \frac{1}{Ah} \frac{dPIB}{dt} = -k_F$$

The expression tells us, that whatever the source of the cash injection  $Ah$ , the *GDP* will grow at a rate proportional to the injection of cash, being the constant of proportionality constant of Fisher, this being the main conclusion that can be derived from the basic equations derived in the first chapter. Here, we are going to consider all the time that the value of the constant of Fisher is "2", but there are many reasons to think that your value is more close to "1.5", though this is a matter of indifference to what concerns us here.

PART II  
THE CONSUMER  
MARKET

## ***ECONOMY OF PRODUCTION SIMPLE TO CONSTANT RETURNS***

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### **1. INTRODUCTION**

In the first, we find the equations that describe a monetary economy, based on only two assumptions. The first, that in the monetary equation the constant of Fisher is effectively a constant, and, second, that the amount of money that is used to carry out the exchanges are retained. Despite all of this, and although the basic equations are very powerful and allow us to reach conclusions very broad, deep and amazing on the monetary economy, what is certain is that, just as they are, the equations speak only of monetary flows and nothing to tell us of the productive reality that creates them.

The purpose of this second topic will be coming up with an Economic Model that is Basic, in that the monetary flows that appear in the set of basic equations is connected with the two variables that we tend to describe the economic reality that surrounds us, the variable price and the variable quantity of goods.

Obviously, the difficulty of creating a “model” of the economy in which the cash flows depend on the price and quantity of goods will be closely related to the possibility of finding a balance between the realism of the model, and the predictive ability of the model. Nothing we're going to serve a model so exceedingly simple that only allow us to make nontrivial predictions, the same thing that we do is no a model of the economy so realistic, yet so complex, that we can not get any prediction with him. The model has to be realistic, but above all, it has to be approached from the mathematics, so that we displayed predictions that we can test, just so it will make sense to the model.

Here we are going to be inspired by the mechanism of self-sustaining that uses the life to be played and we're going to build a model of economy sufficiently complex to contain all the variables that are displayed and that are used in the description of the economy, and sufficiently

simple to draw conclusions, realistic, without excessive difficulty in math. Let's start by understanding what makes the life to be played and why it is so efficient by staying alive.

Consider for a moment a herd of gazelles. We observe that all the individuals who make up the flock are very similar to each other, so much so, that it becomes difficult to distinguish them from each other, especially when we pay attention only to the adult members, who are the majority. All the gazelles adult seem to be equal; they have the same size, eat the same and behave in the same way, so that they are virtually indistinguishable from each other. But most important of all, and what most interests us, it is to note that when it grows or decreases the food available to the flock, to feed, gazelles do not increase or decrease your size becoming larger or smaller, but the flock is made larger or smaller by increasing or decreasing the number of gazelles.

Now let's look at what happens in a fishing port. We see in him many ships, almost all of the same size and almost all of them dedicated to the same type of fishing. In that sense it is very similar to what we observed in a herd of gazelles; all of them are very similar and are used to catch the same type of fish. But, the funny thing is that it also, like the gazelle, when the fishing becomes more abundant, we will see increasing the number of ships that are in port, but we will not see the boats get bigger. It is the opposite happens when the fishing becomes more scarce. Then, the boats will not be smaller, but simply reduced its number to correspond to the amount of catches to which they have access. The fishing boats, as is the case with the majority of the companies that we see around us, they seem to behave like it behaves a herd of gazelles, increasing or decreasing its number according to increase or decrease the possibilities of business, but keeping the number of companies suitable, appropriate to the size of the market.

We can go further and ask ourselves why this is happening, why our companies appear to behave in a way so similar to how it runs it the life for thousands of millions of years and they show us around, like life, a sort of diversity that reminds a lot of the diversity that unfold and animal species. The answer is very obvious:

*“For businesses, the same happens to the life, it is more efficient to reproduce constant returns”.*

To view, let us think for a moment on the gazelle. If the gazelles increase in size each time, which increases the amount of food available, they would have to face tremendous challenges biological of difficult solution. The heart, the lungs, the bones, and the rest of the body would have to increase its size, but not in a way proportional but depending on their functionality. If the agency is already very efficient with a particular size, to find the way that all these organs continue to be as efficient as when they change size does not seem at all easy to get. This is what happens with a fishing boat. Having to change the size of a fishing boat every time you change the amount of fish available is severely a process very inefficient.

You can understand very well that when there is more food the gazelle does not attempt to be bigger, but the flock takes to feed a greater number of offspring and become more numerous, which is a more efficient way to grow that increase the size of the individuals. That's going to

happen when for some reason decreases the food. If the gazelle had a decrease in size every time food gets scarce; the challenge to biological it would have to face in order to change your metabolism, and adapt to the change of environment would be a very inefficient in biological terms.

This can be seen much better if we think of two species that compete for food in the same ecosystem, one of them by changing the size of each individual to changes in the food and, the other, by changing the number of individuals, but without change of size. It is easy to reach the conclusion that the most efficient strategy would be without a doubt the second option, and not because we say so ourselves, but because it is the option that you've chosen the life and that he used on Earth the last 2,000 million of years, without change of strategy in all that time.

Therefore, when you listen to the economists who work for the private universities of the united states to argue against the possibility that the economy will operate at constant returns, we can only laugh. When they claim that *"it would be a lot of a coincidence that a company either chosen at random to work yields constants and can work in so many other ways"*, are not only saying nonsense, but they are deceiving the people of deliberate, in that the economy can operate at constant returns, although the individual companies do not (although they do). We have seen that an economy produces at constant returns when, to an increase in production, the economy responds by increasing the number of companies and not by increasing the size of each individual company. The company, in such a case, it matters very little if it works or does not work yields cash, because it is the specific set of companies, and not the individual company, which produces a constant returns.

When we look around we see without difficulty that to increase production, the economy increases the amount of companies that are engaged to produce but does not increase its size, so the assumption that it is possible to represent the economy with a production model simple to constant returns, not only is it a hypothesis for a full valid within the reality that surrounds us, but above all it is a hypothesis very sensible given the mathematical simplicity of the model.

Obviously, an individual firm does not have to operate at constant returns, and in fact does not happen almost never. It is the same thing that happens with a gazelle individual, that it is absurd to affirm that works to constant returns, as does a herd of gazelles. In the same way, also it would be completely absurd to think that a fishing boat operates a constant returns and is going to increase the size of your engine every time you hire a sailor more. That is the absurd logic that we want to bring the text books written by economists working for the private universities of the USA, when they want to make us believe that, for the economy functions yields constants it is necessary that the individual companies also work to increasing returns. We are not going to fall into that trap.

The reason why economists working for the private universities of the USA despise the production model simple to constant returns, the gave Piero Sraffa 50 years ago, when he stated in the preface of *"Production of Commodities by means of other Goods"*:

*This point of view, which is that of the old classical economists from Adam Smith to Ricardo, has been submerged and forgotten since the advent of the method "marginal". The reason is obvious. The approach marginal demands that the attention is focused on the variation, because without variation, either in the scale of the industry, well in "the proportions of the factors of production", there can be marginal product or marginal cost. In a system where the production will continue without variation in those aspects, day after day, the marginal product of a factor (or, alternatively, the marginal cost of a product) would not only be **difficult** to find, but that would not have where to find it.*

*Piero Sraffa*

*(Production of Commodities by means of Commodities)*

In the model of production that yields constant, there is no marginal performance that can be associated with a set of factors of production. In the model appears to work and this is remunerated with the salary, but, although it may seem incredible, there is nothing in the model that can be identified with a physical capital that need to be renumbered. In fact, you may not be defined in a coherent way, the capital within the model. And therein lies the problem, because the economists working for the private universities of the USA want the distribution of the production is the function of the productivity of each one of the factors that participate in the production, so it is not possible to do on the production model simple to constant returns.

When the economy moves for ideological reasons, as has happened in the discipline from the seventies of the TWENTIETH century, it is inevitable that science, and the peer review that is based on, go into the background and certain ideas that are absurd, as is the Theory of the Production Function, is explained in the text books as a scientific truth with justification of thumb, when the truth is that it completely lacks such support.

More than 1500 million years of life multi-celled on the planet attest that it is more efficient to produce a constant returns in any other way. The logical thing to do then is to wait for the economy, just like life, you try to produce a constant returns, that is indeed what we observe around us:

*"thousands of local Mcdonald's identical, in cities identical, they produce hamburgers identical accompanied by pickles cut identically"*

You must be really blind to not see it and we're not going to insist more on the obvious. Just want to note that the economists who work for the private universities in the U.S. have earned the salary with a vengeance.

## **2. ECONOMICS OF PRODUCTION SIMPLE TO CONSTANT RETURNS.**

Although in the first chapter, we have found the basic equations that describe a monetary economy and have been used to draw a set of conclusions very general, what is certain is that the monetary flows that appear in them do not have any reference to the productive reality that creates them. The purpose of this chapter will be to find the matrix of expenditure associated to an economy of production simple to constant returns in function of the real variables, so that we can express the equations of conservation in function of price and quantity of companies that are involved in the production.

To associate the cash flows of exchange that are listed in the matrix of Expenditure  $G$  with variables physical originate is necessary, first of all, to raise some hypotheses constructive about the production and distribution of goods and services within the economy. This is what is known in economics as a "model". In particular, the model that we will use throughout this work is very simple, compact, and full, and it receives the name of the **Production Model Simple to Constant Returns**. It's going to be thanks to this model, with which we obtain in the next topic the Principle of Asymmetry Buyer and Seller that govern the production and distribution within the Consumer Market. But, we must make it very clear from the beginning that, despite the apparent simplicity of the set of expressions that we're going to come, these will be valid with a very general.

### **Production model Simple to Constant Returns**

The model assumes that there are  $N+2$  agents involved in the productive process:

- The  $N$  companies basic that produces  $N$  goods or services are differentiated.
- The group of workers.
- The set of entrepreneurs.

Each one of the  $N+2$  agents are going to meet an accounting equation. The  $N$  companies will depend on two new real variables, "the number of companies basic"  $\lambda$  "and " the price"  $p$ , and will be a function of them as we will express the matrix of expenditure and the equations of conservation that describe the economy. Accounting equations of workers and entrepreneurs will depend on your time of new variables, wages, and benefits.

#### **a) The N companies basic.**

The first hypothesis, and, most importantly, that we're going to describe realistically the economy is to define the "business basic". We assume that each one of the sectors "i" that has divided the economy is formed by  $\lambda_i$  companies specific basic that is engaged in the manufacture of a single well.

*THE COMPANY'S BASIC. The production of each good generic "i", is performed within each sector of the economy by a number  $\lambda_i$  of firms are identical and independent, so-called "business basic" in the industry.*

*It is said that we are in an economy of production “simple” when each company basic produces a single good. The coefficient technical  $Q_{ii}^o$  describes the flow of goods of type “i” which produces every one of the companies basic, while the set of technical coefficients  $Q_{ij}$  describes the flow of goods needed for production, each one of them buying other companies basic. It is said that we are in a production model to constant returns when the coefficients are all constants.*

*The accounting equation that satisfies each company basic is:*

$$Q_{ii}^o p_i = \sum_{j=1}^n Q_{ij} p_j + B_i^w + B_i^{cap}$$

*Where the coefficients  $B_i^w$  and  $B_i^{cap}$  are the expenses made in the wages and income.*

The reason for that is introduced in the model the “business basic” is to attribute any increase or decrease in the production of the increase or decrease in the number of companies that exist in the sector. In this way, the economy can produce at constant returns, although the companies themselves basic does not occur to constant returns. In this sense, we assume that each company basic produces a flow constant of goods, to consume a constant amount of goods that are given by the technical coefficients, so that to the accounting equation that satisfies each one of the companies core is of the type:

$$(income)_i = (cost)_i \rightarrow \begin{cases} (income)_i = Q_{ii}^o p_i \\ (spend)_i = \sum_{j=1}^n Q_{ij} p_j + B_i^w + B_i^{cap} \end{cases}$$

Where,  $Q_{ii}^o$  is the amount of goods produced by each one of the companies basic,  $Q_{ij}$  is the amount of products “j” that each company basic purchase to each of the other companies basic, and  $B_i^w$  and  $B_i^{cap}$  are respectively part of the benefits that each company dedicates to pay the salaries and the income perceived by the entrepreneurs. The  $p_i$  are the prices which are sold every one of the goods.

Of course, in the Production Model Simple to Constant Returns, each sector of the economy is formed by a certain number of business basic is given by the variable  $\lambda_i$ , and which we call, “the number of companies in the basic i-sector”. Therefore, the accounting equation that satisfies each of the sectors in terms of the new variables is:

$$\lambda_i Q_{ii}^o p_i = \lambda_i \cdot \left( \sum_{j=1}^n Q_{ij} p_j + B_i^w + B_i^{cap} \right)$$

We see in the equation that not only do companies spend on buying goods to other companies, but also to pay wages and to pay benefits to the enterprise. Is the term  $B_i^w + B_i^{cap}$  that appears at the end of the expression. That is to say, that an economy of simple production yields constant formed by  $N$  productive sectors, have at least two sectors, workers, and entrepreneurs, which will be described well by an equation accounting independently. It is logical. As we have

mentioned before, basic companies are not the only agents that are in an economy of production simple.

**b) The set of workers.**

In an economy there are not only the companies, there is also the workers that carry out the production in exchange for a share of the surplus money of the company. That is the reason why your income appear in the accounting equation for each company as an expense, but we know nothing of what they do with them and what they spend, which is what we need to know to be incorporated into the matrix of expenditure with its own accounting equation:

*DEFINITION. The aggregate flow of spending that makes the set of workers is equal to the sum of the quantity  $q_i^k$  of each of the goods they buy, for its price  $p_i$ :*

$$x^w = \sum_{i=1}^n q_i^w p_i$$

*DEFINITION. The aggregate flow of income that the whole of the workers get for their work, is equal to the sum of the benefits  $B_i^k$  each company basic sector dedicated to paying workers by the number of enterprises basic  $\lambda_i$  for each sector:*

$$y^w = \sum_{i=1}^n \lambda_i B_i^w$$

*EQUATION ACCOUNTING OF THE WORKERS. The accounting equation that satisfies the set of workers is:*

$$y^w = \sum_{i=1}^n q_i^w p_i$$

In the production model simple to constant returns, the workers are a sector with its own accounting equation. The model tells us not only where they came from, their income, the term  $\sum_{i=1}^n \lambda_i B_i^k$ , but it also tells us that they spend it, which is what is represented by the row of the matrix of expenditure  $G$  ) dedicated to them.

**c) The set of entrepreneurs.**

It is not finally included in the model to the entrepreneurs, who like workers in the add on a single independent agent who buys and sells in the same way that any other agent. The entrepreneur receives its income by the owner of the company and, like workers, will also be a buyer of the goods they need to live, so that you will also have to comply with an accounting equation:

*DEFINITION. The aggregate flow of spending that make entrepreneurs is equal to the sum of the quantity  $q_i^{cap}$  that buy each property by its price  $p_i$ :*

$$x^{cap} = \sum_{i=1}^n q_i^{cap} p_r$$

**DEFINITION.** The flow of income that gets the set of entrepreneurs, it is equal to the sum of the number of enterprises basic  $\lambda_i$  of each sector on the part of the surplus  $B_i^k$  each company basic dedicates to pay for entrepreneurs:

$$y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap}$$

**EQUATION ACCOUNTING FOR ENTREPRENEURS.** The accounting equation that satisfies the set of entrepreneurs is:

$$y^{cap} = \sum_{i=1}^n q_i^{cap} p_r$$

Now we know where they came from, their income, and what specific items they buy with them entrepreneurs. That is to say, we know the accounting equation of entrepreneurs and we can incorporate it as a row to the matrix of expenditure  $\mathbf{G}$ .

### 3. THE MATRIX OF EXPENDITURE

Knowing the equations accounting for each sector, and identifying each one of the terms that appear in them with each of the coefficients of the matrix of spending, we can finally describe an economy of production simple to constant returns on the basis of prices, the number of companies and the technical coefficients of each company's basic. In particular, the matrix of income and the array of expense take the following values:

$$\mathbf{G} = \begin{bmatrix} \lambda_1 Q_{11} q_1 & \cdots & \lambda_1 Q_{1n} p_n & \lambda_1 B_1^w & \lambda_1 B_1^{cap} \\ \vdots & \ddots & \vdots & \vdots & \vdots \\ \lambda_n Q_{n1} q_1 & \cdots & \lambda_n Q_{nn} p_n & \lambda_n B_n^w & \lambda_n B_n^{cap} \\ q_1^k q_1 & \cdots & q_n^k p_n & 0 & 0 \\ q_1^{cap} q_1 & -h \cdots & q_n^{ch} - p_n & 0 & 0 \end{bmatrix}$$

It is observed that the matrix is divided into four different areas that have a meaning specific economic:

$$\mathbf{G} = \begin{bmatrix} \left| \begin{array}{ccc} \lambda_1 Q_{11} q_1 & \cdots & \lambda_1 Q_{1n} p_n \\ \vdots & \cdots & \vdots \\ \lambda_n Q_{n1} q_1 & \cdots & \lambda_n Q_{nn} p_n \end{array} \right| & \left| \begin{array}{cc} \lambda_1 B_1^w & \lambda_1 B_1^{cap} \\ \vdots & \vdots \\ \lambda_n B_n^w & \lambda_n B_n^{cap} \end{array} \right| \\ \left| \begin{array}{ccc} q_1^w q_1 & \cdots & q_n^w q_n \\ q_1^{cap} q_1 & \cdots & q_n^{cap} p_n \end{array} \right| & \left| \begin{array}{cc} 0 & 0 \\ 0 & 0 \end{array} \right| \end{bmatrix}$$

The first quadrant of  $N$  rows and  $N$  columns, to the left above, contain all the flows of spending generated by the purchases between basic companies present in the economy. The second quadrant of two columns, above and to the right, contains the flows of expenditure that companies use in paying the wages and income (which are at the same time, the incomes of the workers and employers). Finally, the third quadrant of the two-row, down and to the left, contains costs that make the workers and entrepreneurs in the purchase of the goods they produce basic companies. The matrix  $\mathbf{G}$  is general, and describes a Monetary Economy Simple with Constant Returns.

In addition, and in a manner alien to the matrix of expenditure, the model also gives us the vector of income of an economy of production, simple in function of the technical coefficients of the companies basic, price, and the number of businesses:

$$y_i = \lambda_i q_{ii}^o p_i$$

Let us note, that the model does not say two different ways to obtain the vector of income, a this last expression, and another summing up all coefficients of each of the rows of the matrix of expenditure  $\mathbf{G}$ , which has a lot more importance than it appears, as we will see.

It is interesting, to simplify the notation, define the matrices auxiliary  $\mathbf{Q}$  and  $\mathbf{Q}^o$  calls matrices of the technical coefficients of basic companies. A little later allow us to express certain results in a very compact and elegant:

$$\mathbf{Q} = \begin{bmatrix} Q_{11} & -h \dots & Q_{1n} \\ \vdots & \ddots & \vdots \\ Q_{n1} & -h \dots & Q_{nn} \end{bmatrix} \quad \mathbf{Q}^o = \begin{bmatrix} Q_{11}^o & -h \dots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \dots & Q_{nn}^o \end{bmatrix}$$

The rows of the matrix  $\mathbf{Q}$  represent the quantity of products that you purchase every one of the companies basic. While the matrix  $\mathbf{Q}^o$  represents the amount produced by each one of the companies basic, and therefore have null all the coefficients that are not on the main diagonal.

Finally, thanks to which the matrix of expenditure  $\mathbf{G}$ , we can express the basic equations of the economy in terms of the new real variables. Let us remember that the basic equations expressed in function of the flow of income and spending are:

**Ec. Basic of the Monetary Economy**

$$Ec. \text{ microeconomic } \begin{cases} y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} & (Eq. \text{ de conservation}) \\ y_i = \sum_j c_{ji} \\ x_i = \sum_j c_{ij} \\ k_F \cdot m_i = x_i & (Eq. \text{ Fisher}) \end{cases}$$

$$Ec. macroeconomic \begin{cases} k_F \cdot M = PIA & (Eq. monetary) \\ PIA = \sum_i x_i = \sum_i y_i & (Law of Sally) \\ Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0 & (Eq. aggregate of conservation) \end{cases}$$

In particular, the set of vector equations in function of the new variables is:

## Production Simple to Constant Returns

### System of equations accounting

conservation Equation

$$\begin{aligned} \lambda_i q_{ii}^o p_i &= x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt} \\ y^w &= x^w + ah^w + \frac{1}{k_F} \frac{dx^w}{dt} \\ y^{cap} &= x^{cap} + ah^{cap} + \frac{1}{k_F} \frac{dx^{cap}}{dt} \end{aligned}$$

vector of expenses

$$\mathbf{X} = \begin{bmatrix} x_1 \\ \vdots \\ x_n \\ x^w \\ x^{cap} \end{bmatrix} = \mathbf{G} \times \mathbf{I} = \begin{cases} x_i = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^w + \lambda_i B_i^{cap} \\ x^w = \sum_{i=1}^n q_i^w p_i \\ x^{cap} = \sum_{i=1}^n q_i^{cap} p_i \end{cases}$$

$$\begin{array}{c}
 \overbrace{\hspace{15em}}^{\text{vector of income}} \\
 \mathbf{Y} = \begin{bmatrix} y_1 \\ \vdots \\ y_n \\ y^k \\ y^{cap} \end{bmatrix} = \mathbf{G}^t \times \mathbf{I} = \left\{ \begin{array}{l} y_i = \sum_{j=1}^n \lambda_j Q_{ji} q_i + q_i^w p_i + q_i^{cap} p_i \\ y^w = \sum_{i=1}^n \lambda_i B_i^w \\ y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap} \end{array} \right. \\
 \\
 \underbrace{\hspace{10em}}_{\text{a vector of income}} \\
 y_i = \lambda_i q_{ii}^o p_i \\
 \\
 \underbrace{\hspace{10em}}_{\text{Equation of Fisher}} \\
 x_i = k_F \cdot m_i
 \end{array}$$

Let us observe that we have provided physical support to the set of cash flows from source indefinite that appears in the set of basic equations that we obtained in the first chapter. Now, the expressions on where it appears are expressed by the set of variables that is often used to describe the real economy: the number of companies  $\lambda_i$ , the prices  $p_i$  and the set of technical coefficients  $q_{ij}$  with which we describe basic companies and that we assume constant of the economy. The novelty comes from the two different ways in which it expresses the vector revenues.

**The Principle of Conservation of Production.**

There is a detail that it is necessary to mention because it is almost always go unnoticed. In all the analysis that we have done is implicitly assuming that all of the goods he produces any company basic are purchased and consumed. To see what is actually being used as some this hypothesis, we just need to remember that the income of a company basic can also be expressed as a function of the amount of goods produced and sold:

$$y_i = \lambda_i q_{ii}^o p_i$$

Where  $q_{ii}^{or}$  is the amount of a commodity "i" which produces every one of the companies basic. It is not difficult to see that when you are accepted as valid, the previous expression, then we are also accepting that the goods that are produced are consumed:

$$y_i = \sum_{j=1}^n \lambda_j Q_{ji} q_i + q_i^w p_i + q_i^{cap} p_r \xrightarrow{y_i = \lambda_i q_{ii}^o p_i} \lambda_i Q_{ii}^o = \sum_{j=1}^n \lambda_j Q_{ji} + q_i^w + q_i^{cap}$$

Any merchandise that has been produced, the term  $\lambda_i Q_{ii}^o$  to the left of the expression, or consumed by the business, or consume the workers, or consume entrepreneurs.

It is important to understand that this conservation law is not contained in the equation of conservation of monetary flow, so that should be imposed from the outside when you create the production model and when it is valid, the previous expression.

#### 4. THE INVESTMENT IN THE MODEL OF PRODUCTION TO CONSTANT RETURNS.

Another parameter interesting and whose value is not possible to know the production model simple to constant returns without making a new hypothesis, is the investment spending that is taking place within the economy. The knowledge of the matrix components of expenditure  $c_{ij}$  a function of the variables price, number of enterprises and technical coefficients allows us to know explicitly the flow of trade within the economy, the *PIA*, and it also allows you to know what is the flow of final goods *in GDP* that is produced, which are the variables that tends to be of interest in the economy, but the model does not appear when it is worth the investment, that is to say, what is the rated flow, which is dedicated to create new capital .

Normally, it is often claimed that the *GDP* of the economy is given by the consumption that make the employers and the workers as they spend their income, excluding the consumption that is made to replace the capital that already exists, and will not include either the consumer in the creation of new capital. Normally you are given the name of investment money that is dedicated to meeting these last two concepts, the maintenance of the capital already existing and expense in the creation of new capital. If however, it is not easy to introduce in the model constant returns these two expenses.

The usual thing is to accept that companies are dedicating a portion of the proceeds to replenish the deterioration of the means of production, while we do not know how much of it explicitly. In this way, the benefits are divided between workers and entrepreneurs are the actual surplus of the economy, and can be dedicated, indistinctly, to meet the personal needs of consumption or new investment. For this reason, it is normally considered that the *GDP* contains personal consumption and investment, but does not contain the expense of replacement of the means of production, already existing, as is logical, it is considered that it does not form part of the surplus.

To see what we want to say more clearly, let's look at the breakdown of the *PIA* as to what is the topic of the expenditure of the different agents:

$$PIA = \mathbf{I} \times \mathbf{G} \times \mathbf{I} = \sum_{i=1}^n x_i + x^w + x^{cap} \rightarrow \begin{cases} x_i \rightarrow \text{expense among companies} \\ x^w \rightarrow \text{expense of workers} \\ x^{cap} \rightarrow \text{expense of entrepreneurs} \end{cases}$$

Expressing each of the terms in function of the coefficients of the Matrix of Expenditure, we obtain without many problems:

$$PIA = \left[ \sum_{j,i=1}^n \lambda_j Q_{ji} q_i \right] + \left[ \sum_{i=1}^n \lambda_i B_i^w + \sum_{i=1}^n \lambda_i B_i^{cap} \right] + \left[ \sum_{i=1}^n q_i^w p_i + \sum_{i=1}^n q_i^{cap} p_r \right]$$

Therefore, the total value of the *PIA* contribute three monetary flows that have an economic significance differential:

$$PIA = \Phi^{companies} + \Phi^{benefits} + \Phi^{consumption}$$

The first cash flow is identified with the added value of the costs among the companies present in the economy. What we call business flow:

$$\Phi^{companies} = \sum_{j,i=1}^n \lambda_j Q_{ji} q_i = \lambda \times Q \times P$$

The second cash flow is identified with the sum of the costs that companies make when they pay to the workers and entrepreneurs. Is the income that workers receive for their work, and employers for the possession of the companies, and its value does not have to coincide with the expenditure made by workers and employers because, in general, both can be saving or spending on credit. We call this flow of benefits because they are the monetary surplus obtained by the firms of your activity, even if it appears as an expense in their equations accounting:

$$\Phi^{benefits} = \sum_{i=1}^n \lambda_i B_i^w + \sum_{i=1}^n \lambda_i B_i^{cap} \equiv GDP$$

The third monetary flow is identified with what we normally call the spending on consumption", and here we identify with the *GDP* or with the flow of aggregate spending throughout the economy, that is to say, spending money on final goods consumed by the workers and employers:

$$\Phi^{consumption} = x^w + x^{cap} = \sum_{i=1}^n q_i^w p_i + \sum_{i=1}^n q_i^{cap} p_i$$

The difficulty of the production model simple to constant returns is to identify clearly the *GDP* real and separate the investment to consumption. Typically, the investment is named as the part of consumption that employers and workers devote themselves to expand the business:

$$GDP = \Phi^{investment} + \Phi^{consumption}$$

But this way of seeing things and ignores the fact that it is not the people but the companies themselves that are normally performed by the investment spending, they use a part of the surplus they don't get to hand out as capital income. Although most of the times companies borrow the money they need to invest, what is certain is that almost always deviate a part of the surplus to devote to investment costs. That is to say, a part of what it would take for companies to pay the salaries or income, the dedicated, on the contrary, at the expense of investment: the investment of a part of surplus is insufficient to carry out the investment and

$$\Phi^{companies} = \Phi^{production} + \Phi^{replacement} + \Phi^{investment}$$

From this perspective, all the expense of the replacement, but also a part of the investment, what companies are doing and does not appear in the *GDP* as we have defined. However, when measured, in practice, the *GDP* is usually included both investment spending as the cost of replacement, plus all of the spending on consumption, so it is not easy to differentiate between all of them.

It is possible to take forward the “model” assuming that the companies deliver as much excess as possible in benefits and only perform the expenses in replacement, which means assume that the investment by the workers and employers by saving previous, that will be what to do here.

## **THE PRINCIPLE OF ASIMETRIA BUYER SELLER**

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### **1. INTRODUCTION**

In this topic we are going to enter fully into the thorny study of the formation of prices within the monetary savings, but restricted our attention only to the goods reproducible that are bought and sold within what we call the Consumer Market.

Any economist, or any economic theory that was worth his salt, he is obliged to give an explanation that is minimally convincing of why things are worth what they are worth and sell them at the price at which they are sold, being without doubt this topic, the most interest has been awakened from a very old among economists and that more time has been dedicated to discipline. If there is something that characterizes the economists working for the private universities of the USA, is that they do not have a theory on the formation of prices that can be called as well. The reason must be sought in the Theory of the Production Function that requires to link the price with the marginal productivity of the factors, but only to the price of the work and the price of capital and leaves without giving any explanation to the price of the goods. For them, it draws on the intersection of two curves, the supply curve and the demand curve, without which no one will know for certain as determined each of them, and without anyone ever having been calculated for a certain commodity.

The observation that is often used to initiate the discussion on the price at which they are selling things, is the great difference that there is between the price at which they sold water and the price at which they sell the diamonds. The water is considered very valuable, so much so, that we cannot live without it, and yet its price is very low. While diamonds, which is something that no one really needs for nothing, have a selling price very high. Why is this happening? Why would something with no real value is as high of a price and something so imperative to live has a price so low?

Let us observe, first, that the example is tricky, very tricky, and have been chosen with the intention of confusing, since neither water nor diamonds are property reproducible which can be made in any amount you want. Both the diamonds and the water, are property, not reproducible, which can amount to very little, as in the case of diamonds, or very abundant, as is usually the case of water. For this reason, we do not have any reason to think that its price is

set in the same way as setting the property reproducible, that is the price that you want to explain when you are constructing a theory of value.

We have very clear what is the “price” because we live in a monetary economy where the most desirable things can be bought and have a price, which is the amount of money it costs us to buy it. However, we do not have very clear where does the idea of “value, absolute, intrinsic, and different from the price that we attribute to a commodity.

Let's look a bit more slowly, what history tells us about the value and the price.

Let us observe that Aristotle, for more than 2,000 years ago, made the distinction between “value” and “price” of the things, pointing out that, all too often, the prices do not correspond with the value that they should have things. We see that, from the most remote antiquity, and any attempt of explanation about the price of the goods reproducible part of the point of view that there are two qualities differentiated within each thing, the value and the price, with the gap that there is between the two that needs an explanatory theory. Despite the fact that no one, not even the great Aristotle, we clarify never what is the “value” that we attribute to things, and that we assume a quality that is distinct from the price.

There is a written record of how, in the time of Diocletian, the year 301, an imperial edict was fixing the selling prices of more than 1500 products under the penalty of death for those who do not comply with the court order, and we know that at the time the application of the death penalty is taken very seriously. If prices are decided by the free and healthy competition among buyers and sellers within the market, as the economists tell us that working for the private universities of the world, it is very difficult to explain the complaints that in all times have expressed the consumers about the abusive selling prices of many commodities.

It is not easy to justify that, to the discontent of the people, authorities of all ages have finished always give you the reason to the consumers and have agreed to regulate the prices. For example, today, the price of the rentals in the center of the most important cities in the world is regulated, in a way, that in nothing is the difference of the edict issued by Diocletian. If there is some truth to the popular notion that the “value” of the goods is very different from the “price” that they take in the markets is very difficult to understand the persistence of the idea at the time.

Also throughout the middle ages existed between the thinkers scholastic a widespread consensus relating to the subject matter of the price, coming to the conclusion that one thing was the price at which they are bought and sold goods and the other thing different was the intrinsic value of the goods. They were the ones who Introduced into the study of the economy, the idea of “fair price”, which has survived until our days and that is the basis of many social movements nothing believers in the benefits of the free market being touted by economists working for the private universities of the USA.

Attempts to provide an explanation for the difference between the “price” of the market and its “value, or price of the natural, inherent, is what led to the thinkers of the industrial revolution, as Adams Smith or David Ricardo, to search for the source of the “value” in the human labour required for their production, justifying the differences to spot between the market price and

the cost of its production (the intrinsic value of things), in the scarcity spot of the quantity of the goods. But this identification between the work and the value, although logic does not correspond with what is seen in the markets, where the price at which you sold the things they seem to have a clear relationship with the amount of social work that is needed to produce them.

The economist Karl Marx leads up to the end of this logic that involves the identification between the value of a commodity and the social work containing the goods and gives the turn to the reasoning of Smith and Ricardo as he gives back to a sock. For Marx the selling price of a commodity reproducible always tends to its value, understood as “social work” content in it, and what sets out as a law, the Law of Value:

“the goods are exchanged according to the social work contained in them”

For Karl Marx, “price” and “value” are equal in the monetary savings (except for the job, because according to Karl Marx is the only thing that is not paying for its value).

Here, in the Theory of Madrid, we're not going to get into that stupid argument between the value and the price of things. We will accept, on the contrary, that there is only the “price” at which buy and sell goods within a monetary economy, so that our problem is going to reduce to explain clearly and unequivocally the mechanism that determines the market price of the things.

*THE THEORY OF PRICES. The only valuation of a commodity that makes sense within a monetary economy is the price to buy on the market, so that the problem of creating a Theory of Prices is equivalent to creating a theory that determines how or who sets the price of each commodity.*

*In this sense, we say that we have a Theory about the Formation of the Prices when we find a set of variables that depend on the prices and their functional dependence on concrete. That is to say, if we are able to determine the functional dependence that have the price of any goods with a specific set of variables of the economy, then we can say that we have a theory of prices that will be falsable in the extent to which these variables are well-defined, can be measured and you can check the dependency.*

Recall that the set of variables of which depends on the economy of the model is:

- $p_i \rightarrow$  prices
- $\lambda_i \rightarrow$  the number of companies basic
- $q_i^k \rightarrow$  consumption of the workers
- $q_i^{cap} \rightarrow$  consumption of entrepreneurs
- $B_i^k \rightarrow$  benefits of labour (wages)
- $B_i^{cap} \rightarrow$  benefits of capital (income)
- $Q_{ii} \rightarrow$  quantity sold
- $Q_{ii}^o \rightarrow$  quantity produced

What we are going to prove now, and let it out as the Principle of Asymmetry Buyer, Seller, is what is the particular dependency that has the price, and the number of companies with the rest of the variables that appear in the model of production simple to constant returns that we

are using to describe the economy. With that, we will have a Theory of Prices that we can call it as such, as we can predict the price of things by knowing the rest of the variables on which it depends.

## 2. THE ASIMETRIA BUYER SELLER

In this work, we will continue to the end the idea that develops Piero Sraffa in the work published in 1959, "Production of commodities by means of other goods", but avoiding many of the hypotheses unnecessary that makes Sraffa to develop his theory. This will allow us to determine which depend on prices and production within a monetary economy without making any assumptions in addition to those that we've already done on the Production Model Simple to Constant Returns, with the only exception and on a provisional basis, that any agent spends all his income. This will allow us to greatly simplify the analysis without losing generality, since, as we will see later, the conclusions that we reach are kept unchanged in cases more general.

Let's start by remembering the functional arrays of income  $Y$  spending and  $G$  for an economy of simple production yields constant in function of the number of firms, the price and the technical coefficients:

$$Y = \begin{bmatrix} \lambda_1 Q_{11}^o p_1 \\ \vdots \\ \text{and}_i = \lambda_n Q_{nn}^o p_n \\ y^k \\ y^{cap} \end{bmatrix}$$

$$G = \left[ \begin{array}{ccc|cc} \lambda_1 Q_{11} q_1 & \cdots & \lambda_1 Q_{1n} p_n & \lambda_1 B_1^k & \lambda_1 B_1^{cap} \\ \vdots & \cdots & \vdots & \vdots & \vdots \\ \lambda_n Q_{n1} q_1 & \cdots & \lambda_n Q_{nn} p_n & \lambda_n B_n^k & \lambda_n B_n^{cap} \\ \hline q_1^k q_1 & \cdots & q_n^k q_n & 0 & 0 \\ q_1^{cap} q_1 & \cdots & q_n^{cap} p_n & 0 & 0 \end{array} \right]$$

On the one hand, the vector of income  $Y$  and the vector of spending  $X$  can be expressed as a function of the variables price and the number of businesses using its dependence on the matrix  $G$ :

$$\begin{array}{c}
\mathbf{X} = \mathbf{G} \times \mathbf{I} \equiv x_i = \sum_j c_{ij} \\
\text{expenses} \\
\downarrow \\
x_i = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^k + \lambda_i B_i^{cap} \\
x^k = \sum_{i=1}^n q_i^k p_i \\
x^{cap} = \sum_{i=1}^n q_i^{cap} p_r
\end{array}
\quad \Bigg| \quad
\begin{array}{c}
\mathbf{Y} = \mathbf{G}^t \times \mathbf{I} \equiv and_i = \sum_j c_{ji} \\
\text{income} \\
\downarrow \\
y_i = \sum_{j=1}^n \lambda_j Q_{ji} q_i + q_i^k p_i + q_i^{cap} p_r \\
y^k = \sum_{i=1}^n \lambda_i B_i^k \\
y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap}
\end{array}$$

But, on the other hand, the conservation equation gives us a second expression of the income **And**, also in function of the new variables:

$$\begin{aligned}
\lambda_i Q_{ii}^{or} p_i &= x_i + ah_{(i)} + \frac{1}{k_F} \frac{dx_i}{dt} \\
and^k &= x^k + ah^k + \frac{1}{k_F} \frac{dx^k}{dt} \\
and^{cap} &= x^{cap} + ah^{cap} + \frac{1}{k_F} \frac{dx^{cap}}{dt}
\end{aligned}$$

So we have two expressions different functional for the vector of income in terms of the new variables: “the definition of income in function of the matrix **G** and the expression of the conservation”.

**HYPOTHESIS OF DEPARTURE.** In all that follows, we will assume an economy in which it is true that any agent spends all of the money that goes:

$$and_i = x_i$$

With this condition, we obtain two ways of expressing the vector of income, in the mathematical aspect, represent two sets of equations differ expressing the same thing:

$$\begin{aligned}
y_i = x_i &\rightarrow \lambda_i Q_{ii}^o p_i = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^k + \lambda_i B_i^{cap} \quad (\text{ec. conservation}) \\
y_i = y_i &\rightarrow \lambda_i Q_{ii}^o p_i = \sum_{j=1}^n \lambda_j Q_{ji} q_i + q_i^k p_i + q_i^{cap} p_r \quad (\text{def. income})
\end{aligned}$$

The first of them comes from the conservation equation when we impose that the vector input of each agent is equal to the expense. The second comes from the very definition of income through the matrix of expenditure **G**. Both are two systems of equations different linking the price, the number of firms and the technical coefficients of the economy:

<p style="text-align: center;"><i>equation of conservation</i></p> <p style="text-align: center;">↓</p> $\lambda_i Q_{ii}^o p_i = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^{cap} + \lambda_i B_i^k$ $y^{cap} = \sum_{i=1}^n q_i^{cap} p_i$ $y^k = \sum_{i=1}^n q_i^k p_i$		<p style="text-align: center;"><i>definition of income</i></p> <p style="text-align: center;">↓</p> $\lambda_i Q_{ii}^o p_i = \sum_{j=1}^n \lambda_j Q_{ji} q_i + q_i^{cap} p_i + q_i^k p_i$ $y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap}$ $y^k = \sum_{i=1}^n \lambda_i B_i^k$
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The result is really quite remarkable, because each of the sets of N+2 equations is expressing two different things. Now, if we eliminate the variable  $\lambda_i$  of the first N equations that make up the group of equations on the left, we have a set of N equations, where only the prices. If we do the same with the first N equations of the right and removes the variable  $p_i$ , we have a set of N equations dependent solely on the number of companies  $\lambda_i$ . More explicitly. What we get are two systems of N equations dependent, each one of them, only one of the two sets of variables:

<p style="text-align: center;"><i>System – dependent price</i></p> <p style="text-align: center;">↓</p> $Q_{ii}^o p_i = \sum_{j=1}^n Q_{ij} p_j + B_i^{cap} + B_i^k$		<p style="text-align: center;"><i>System – dependent quantities</i></p> <p style="text-align: center;">↓</p> $\lambda_i Q_{ii}^o = \sum_{j=1}^n \lambda_j Q_{ji} + q_i^{cap} + q_i^k$
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The first of them depends only on the set of prices  $p_i$  and what we will call, the circuit of money. The second of them, depends only on the set of the number of companies  $\lambda_i$ , and what we will call, the circuit of the goods.

**THE TWO CIRCUITS.** "When an economy generic production simple to constant returns described in function of the real variables  $p_j$  and  $\lambda_j$ , it is true that the income of each of the agents is equal to its expenditure, then the set of  $2(N+2)$  equations accounting-dependent of the  $2N$  real variables  $p_j$  and  $\lambda_j$  with that described the economy, split in two systems of N equations dependent, each one of them, or set of prices or of the whole of the amount of business."

That is to say, of the original set made up of  $2(N + 2)$  equations accounting-dependent set prices and set the number of companies in the basic, have been extracted two systems of N equations, one dependent solely on the price set " $p_i$ ", and other dependent only of the whole number of companies " $\lambda_i$ ".

This result, which is not a mirage mathematician, shows that in a monetary economy there is a profound difference between the role of the sellers and the role played by the buyers, because, even when conservation equation is symmetric to the income and expenditure ( $and_i = x_i$ ), the role of vendors and role of the buyers within the economy are described by a different set of equations, independent of one another. To uncouple the two systems of equations independent purchasing decisions and the decisions of sale, are also decoupled the consequences that result from the purchase and sale:

*“The consequences of buying and selling are different in the monetary savings”*

We call them the “Circuit of the Money to” the system of dependent equations of the prices, and we call them the “Circuit of Goods” to the system of equations dependent variable amount of companies.

### 3. THE CIRCUIT OF THE MONEY AND THE CIRCUIT OF THE GOODS.

Let us consider a little more in detail the two systems of equations are decoupled, but dependent on each one of the variables price and the number of businesses when will we impose on the economy that all income is spent, and try to understand what they mean with regard to the theory of the formation of prices.

#### The Circuit of Money

Let's look closely at the first set of N equations that are dependent on the prices, which we've called the “Circuit of the Money”. If, for more clarity, we group them into a single vector of benefits, **B**, the part of income spent by companies to pay the salaries of its workers and the company income, that is to say, we in the expression:

$$\mathbf{B} = \mathbf{B}^k + \mathbf{B}^{cap}$$

Now, aided by the square matrices of the technical coefficients, the system of N equations can be cleared so that the price vector **P** is expressed in terms of the vector of benefits **B** in matrix form very simple and elegant:

$$Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j = B_i^{cap} + B_i^k \xrightarrow{B_i = B_i^{cap} + B_i^k} \boxed{\mathbf{P} = (\mathbf{Q}^o - \mathbf{Q})^{-1} \cdot \mathbf{B}}$$

The result shows very clearly the relationship one-to-one that exists between the benefits obtained by companies basic and the prices at which it sold the goods, so that it is possible to affirm that there is a dependence causal between the two: *“the prices are fixed when companies set their benefits”*. Which leads us to conclude:

- 1) Are the sellers (those who wish to sell goods or services in exchange for money), that determine the price at which they sold when they decide the benefits they get from the sale of the goods.

*Therefore, they are the owners of the businesses, the entrepreneurs, when they decide what benefits obtained by companies, the vector **B**, which set the prices at which they sell the goods that are produced, the vector **P**.*

- 2) In the expression, the prices depend on the sum of wages and income, so that this particular cast is made between the workers and employers of the benefits  $B_i$ , has no influence on the price of the sold goods, as already demonstrated by Piero Sraffa in 1959 in his work *“the Production of Goods for other Goods.”*

There is, therefore, no reason macroeconomic or microeconomic that justified a priori what particular part of the benefits it has to go to pay the salaries and what part it has to go to pay for the benefits of entrepreneurs. Beyond affirm that tend to be entrepreneurs who decide the sharing of the benefits, because they are the ones that tend to fix the profits of the companies, there is no justification to decide a priori by a cast or another, and there must be found in another site, perhaps on the Theory of Capital, which we will study later, but it is not, nor can it be within the Consumer Market.

- 3) The benefits derived by each company will decide in each company, but the sale prices of the products, which are the consequence of the decision is determined in the global economy. Any change in the benefits of a particular company is going to affect, not only the price that produces the company itself, but also to the prices of all goods produced in the economy.

Even though the decisions about the benefits are taken in a timely manner, and responding to reasons sector specific, what is certain is that the consequence they have on prices is global. The company is producing and distributing the surplus of the joint, and the struggle for who gets what, it is cross-sectoral.

- 4) The salaries of the workers can be considered an expense of the business or can be regarded as the part that corresponds to the workers in the distribution of the profit of enterprises between workers and employers. The mathematical structure is not changed by this, but if you change the line causal about who set the price of wages.

In the first case, when wages are an expense that is tax on employers, so employers are price-takers with respect to the wage, since they are the workers that decide the price at which to sell their work (as we will see, in such a situation, employers have the privilege to say how many people they hire).

However, in the second case, when the distribution of income between wages and income is decided jointly, then we can say that also the number of people who contract it is also a joint decision.

It is difficult to decide which of the two situations is occurring in the present economic reality that surrounds us, because the relationship between employees and employers is very different depending on what sector of the economy and what the particular country concerned. Depending on what country study, the salary is considered in one way or another, and the collective bargaining is carried out with more intensity in some countries than in others.

There is nothing difficult to confirm that workers ' rights are very different in Germany or in Denmark, in Spain or in Portugal, although in both countries work the same monetary economy.

- 5) The prices are independent of the absolute or relative amount that is produced from a service either, since the system of equations that determines not depend on the number of companies  $\lambda$  of each sector. This is no surprise, but the direct consequence of the hypothesis of production to constant returns we have tax, accounting equations that describe the business.
- 6) It is also shocking that the companies seem to have no limitation when it comes to increasing the benefits, although it will increase the prices of the goods they sell, according to the expressions that have just exposed, it would be expected as a minimum, a tendency to inflation difficult to control. Put another way, the Circuit of Money seems to predict the runaway inflation of all the prices which collides with the most obvious price stability that manifest all the economies of today. It will be necessary to justify what other mechanism is stopping inflation, and a little later we will explain the apparent paradox.

*THE LABOUR MARKET. As we are exposing the theory, the monetary surplus produced by each company is split between workers and entrepreneurs, reflecting the sense of belonging of both in the same project social common. In this sense, we will consider that the wages are fixed during the collective bargaining between workers and employers and, therefore, that the work is not fixed in the Consumer market as a commodity any more, which is considered the economists working for the private universities of the USA.*

*But it's good not to forget that the mathematical structure on which is built the Theory of Madrid, it does not prevent the work is purchased and sold as a commodity and that the workers, whose only possession is their job, they become simply vendors with "freedom of choice" at what price to sell their work.*

*Here, we will always consider that there is not a "job market" where the workers are being offered to the highest bidder, but we must not forget that the increase of "false self-employed" every time we are moving away from a participative economy and bringing us closer to a slave economy.*

One need only think of the structural change that induce new technologies, such as online purchase, or telework, to imagine that in a near future the worker raised to the category of entrepreneur, creator of "work": the false self.

The work thus becomes a commodity that, like they did in the time of Engels, is bought and sold at a price related to its cost of manufacturing, such as happens with any other commodity. Although it is very evident that at any time and within any economy, there have always been plenty of professionals who work in an autonomous way as a real manufacturers of specialized services, these have behaved is always more as entrepreneurs than as employees, and therefore can't be used in its existence as an excuse to justify that the companies they outsource the work

to “buy” out of the productive system of the business as a commodity that they need to carry out the production.

### The Circuit of the Goods

Let us now look at the second system of  $N$  equations dependent on the number of companies basic  $\lambda$  that exist in the economy. If, for more clarity, we have grouped the amount of goods that they buy both workers and entrepreneurs,  $And_i = q_i^{cap} + q_i^k$ , in a single vector  $E$ , so-called vector of surplus, the system of  $N$  equations can be clear to the number of companies  $\lambda$ , being a function only of the vector of surplus **And** in the form of a matrix very elegant:

$$\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} = q_i^{cap} + q_i^k \xrightarrow{E_i = q_i^{cap} + q_i^k} \boxed{\lambda = (Q^o - Q^t)^{-1} \cdot E}$$

The result shows so clear, the correlation between the preferences of the expenditure shown by consumers through the vector of excess and the amount of companies that exist in the economy. So, it can be argued that there is a dependence causal between the two variables: “the number of companies that exist within the economy depends on the spending decisions that take consumers.” We can then conclude:

- 1) The amount of goods of a particular type that buy workers and employers,  $q_i^{cap}$  and  $q_i^k$ , which represent their consumption preferences, are those that determine the amount of companies basic  $\lambda_i$  that are devoted to the production.

*Therefore, son consumers, workers and entrepreneurs, when they set their preference of consumers to spend their incomes, those who decide what is produced and how much is produced of each one of the goods or services, and, therefore, of the number of enterprises basic that exist in the economy.*

The statement may seem trivial, or even superficial, but it is the manifestation of an underlying principle that is very deep and of great beauty, because the number of companies in a sector, either, and, therefore, of all the sectors of the economy, not dependent on the willingness to invest for entrepreneurs, nor depend on the prices at which they sell the goods they produce, but that only depends on the decision of consuming that make workers and employers.

The remarkable result is a consequence of that the prices of the services do not appear explicitly in the system of equations linking the decisions of consumption with the number of companies in the basic, so that the prices can not influence in a direct way in the number of companies basic that is dedicated to the production of a good or service.

Since then, the prices will influence indirectly on the quantity of companies that are dedicated to produce each good to make consumers change their consumption preferences to a change in prices. But, and this is what actually tells us the expression, are the changes in the consumer preferences, regardless of what the reasons or the reasons why consumers decide to change them, which changes the number of companies dedicated to producing a particular good.

- 2) Any change in the amount of consumption of a good, not only changes the number of companies  $\lambda_i$  that are devoted to produce that good, but it also changes the amount of the other companies present in the economy. That is to say, any change in the quantity consumed of a good decision is a sector that is taken on an individual basis, but it affects globally the number of all the companies in the basic present in the economy.
- 3) The possible changes in the preferences of the consumers for a product or others does not influence the prices of the products, as is generally believed.
- 4) A change in the distribution of the benefits (the monetary surplus) between the employee and employer, does not change the nominal value of the expenditure, but you can change the preferences of consumption and, therefore, can change the quantity of what is produced for each service.

We tend to believe, by an example taken from the world of cars, publicity about the different vehicles that are sold is the manifestation of the struggle between the vehicle manufacturers to expand or maintain market share within the sector, which, although it is not necessarily false, it is not entirely correct. As shown in the Circuit of Goods, advertising encourages us to buy cars or any other products, can also be seen as the manifestation of a struggle between companies of different branches that compete for a share of the disposable income of buyers dedicated to the consumption.

For example, it is very possible that a person who decides to go on holiday, you are giving up when you do this to renew your old vehicle when you have to choose between spending the money you have on a vacation or on a vehicle. In this sense, we can affirm that the advertisements that we invite you to buy a vehicle they are intended, first of all, to convince people to devote their money to the renovation of your old vehicle and not to other alternatives such as travel. Although no one doubts, nor do we here, too, that when the advertiser achieves its purpose, it will be very likely your vehicle that finally buy the consumer, and not the other.

If car manufacturers were to realize that the competition they have with the other sectors of the economy, and not so much with the other manufacturers of vehicles, it is almost certain that they would make announcements sets trying to convince people to spend their money to renew your old car for a more modern instead of devoting it to spend it on something else.

*THE CIRCUIT OF THE GOODS. Perhaps, the most remarkable result of the existence of the “circuit of goods” is to show that the specific amount that occurs in a well anyone not decide independently of the other decisions of consumption.*

*In a monetary economy there is market independent of other markets because all the vendors are competing for the disposable income of the consumers. It is the struggle between the sectors, and not the struggle within the sector itself, which finally decides the amount of businesses in each sector.*

*Let's not forget that the sectors do not have to be only companies. The sectors can also be whole countries that specialize in the production of a type of certain goods: agricultural raw materials, manufactured products, etc therefore, your final production or GDP will depend on the consumer decisions that are made in other countries.*

#### **4. THE PRINCIPLE OF ASIMETRIA AND ITS CONSEQUENCES**

The purpose of this chapter was to give a convincing explanation of how to form the prices in a monetary economy. The appearance of two systems of equations are decoupled with respect to the variables price, and the number of companies, shows us the different consequences that the decision of what to buy for the decision of what benefit you get from that you are selling. Now we're going to presenting in the form of “principles” which in reality are the conclusions that are derived from the appearance of the circuit of money and the circulation of goods, with the sole intention of summarizing a set of assertions of the consequences of the existence separate from that of buyers and sellers. This will help us to understand many of the problems that seem insoluble in the economy, and that, however, are trivial when seen from the point of view of the two circuits kludgy:

The set of assertions, we will point it out as principles, despite the fact that they are all a direct consequence of the use of money in our form of organizing, and we are going to give an overview of the deep secrets in that it moves the Consumer Market:

- 1) The Principle of Asymmetry.
- 2) The Principle of Closure.
- 3) The Beginning Of Inflation.
- 4) The Principle of the Deal.
- 5) The Principle of Unequal Exchange.

- 1) **The Principle of Asymmetry.**

*PRINCIPLE OF ASIMETRIA BUYER AND SELLER. In a monetary economy, the quantity produced of each good or service is decided by the buyers when they pass the income available according to your preferences, consumption, while the price at which it sells each one of the goods or services that occurs is decided by sellers when fixing the profits earned from the sale of the produce.*

Or, to put it another way, the decision of what to buy and the decision of what benefits are obtained when selling, which is taken by different people on every purchase-sale, has different consequences or asymmetric in the monetary savings. The buyer decides how much of each good is produced in the economy when deciding what to purchase, as the seller decides the price of each one of the goods that are produced when you decide which benefits you enter your sale.

The doubt that is presented, if they are the prices that determine the benefits or the benefits are the ones who determine the prices, is easily solved when we understand that the entrepreneur the only thing it cares about is that the profits obtained from the sale to be "enough" to keep the business open, no matter what is the price at which it sells its goods. There is no price "goal" that you have to have a well anyone, but if there is a benefit, "goal" that you have that have any business activity in order to develop. In this sense, the "Principle of Asymmetry" is only asking the obvious and that everyone knows from the night of the times: the prices of the goods or services have to give benefits.

The same thing happens with the purchase of the goods and services. It is very evident that the seller of a commodity does not decide the amount you are going to sell it and, therefore, does not decide how much to produce it. This is so obvious that anyone who's got two fingers in front of you would say the opposite: *it is the buyer, when she divides her income among different goods to purchase, who decides how much to produce of each good.*

*THE MARKET OF PERFECT COMPETITION. Although the validity of the Principle of Asymmetry, has always been evident to economists of all times, however, that has not stopped economists who work for the private universities in the U.S. to assert just the opposite, spreading the idea that both the sellers and buyers are price takers. To do this, they've created a whole theory based on a conceptual model, the Market of Perfect Competition, which allows them to get to the final conclusion that they wish to get there:*

*"both buyers and sellers are price taker"*

*That is to say, they have created a theory about the formation of the prices which states that no one puts the prices in a monetary economy, what is a conclusion really very difficult to believe.*

*That a theory such is considered to be true and is taught in the universities of the world as such, can only be explained by the absolute dominance that have economists who work for the private universities in the united states over what is published or not published in economics journals and in textbooks.*

*It is very evident that the economy is not a scientific discipline in the present because there is no "peer review".*

Of course, a theory that claims that no one sets the price of the goods and services it is necessarily false, because not only did not explain anything, but that is stating that nothing explains it all.

*The Principle of Asymmetry is the cornerstone on which it sits, all the monetary economy.*

*The effects and their influence is felt in all areas, modeling and shaping so profound and determining the social structure in which we live, that is, to the prostre, where to look for the origin of capital and the growing inequality that surrounds the entire capitalist system. You can say that it is, with distance, the most important statement that can be made within a monetary economy.*

## 2) **The Principle of Closure**

*THE PRINCIPLE OF CLOSURE. Although in a monetary economy the set of variables "price" and the variables "number of businesses" are set independently of one another, both sets of variables are linked to each other by the value of the PIA, which according to the Monetary Equation is constant and independent of the particular value that you take each of the variables:*

$$PIA = k_F \cdot M \leftrightarrow PIA = \sum_i q_i \cdot q_i$$

What does the Principle of Closure is that, despite what is stated in the Principle of Asymmetry, there is a tie between the price of the goods produced and the number of companies that produce them, so that the prices and quantity of goods that are produced are not independent. The two statements, the Principle of Asymmetry, and the Principle of Closure, are not contradictory, and the two principles complement each other not exclude each other. While the origin of the Principle of Asymmetry is in the equation of conservation of monetary flow, which is a ligature of microeconomic, the origin of the Principle of Closure is in the monetary equation, which is a ligature macroeconomic:

$$PIA = \sum_{j,i=1}^n \lambda_j (2Q_{ji}^o - Q_{ji}) p_{(i)} = k_F \cdot M \neq f(\lambda_i, p_i)$$

As we have mentioned, one of the apparent contradictions faced by the Principle of Asymmetry is to explain why entrepreneurs do not go up indefinitely their benefits. If it were true that the price only depends on the benefits that the sellers decide to get, you can't understand why not rise indefinitely the benefits. Also, it is not at all clear why consumers do not buy goods without limit. Yes it was true that the amount of goods that are manufactured solely depends on what the buyers decide to buy, we do not see for what reason don't buy no limit. The reason that the benefits do not rise without limit, or the reason that consumers do not consume without limit, there is nothing mysterious, and is explained without problems when we understand that the cash flow of trade is limited by the supply of money available in an economy, and as such affirms the monetary equation.

The *PIA* has a specific value that does not depend on either the price or the number of businesses in the economy, since their value is linked solely to the amount of money that has the money supply and its growth or decay depends only on, according to the equation aggregate of conservation, the amount of money that is created or destroyed annually in the economy, that is to say, the flow of savings *Ah*:

$$Ah + \frac{1}{k_F} \frac{dPIA}{dt} = 0$$

If there is neither creation nor destruction of money within the economy, the *PIA* will remain unchanged and the prices may not go up without lower the number of firms, or vice versa, the number of companies you may not upload without a drop in prices. We see that employers have a good reason not to raise your profits indefinitely, because in such a case, will have to decrease the amount of businesses in the economy and threatened his own existence:

$$PIA = \sum_{j,i=1}^n \lambda_j (2Q_{ji}^o - Q_{ji}) p_i = const.$$

The consequences of the Principle of the Closure of the Economy are much more deep than it seems this brief exposure. Their existence reminds us of the reason why prices do not end in an exhale inflationary debocada, despite the fact that it affirms the Principle of Asymmetry. The beauty that holds the appearance of the two circuits, and the different consequences that you have to buy and sell, is an essential feature of the monetary savings, which has no comparison with economies based on barter or some other organizing principle. Money affects our lives in a way that would be unimaginable but we sirviéramos of the mathematics to see it and test it, and the Principle of Asymmetry, along with the rest of the principles that we're going to make only it is one of the many ways in which we can expose them.

### 3) **The Beginning Of Inflation.**

*THE BEGINNING OF INFLATION. In a monetary economy we can say very generally that the price at which you sell and buy a good any one you can only go up and never can be lowered.*

DEMONSTRATION. To demonstrate the Principle of Inflation is not complicated and it is very suspicious that no one before has attempted to formulate. To do this, it is only necessary to resort to the Principle of Asymmetry and use it to analyze the most immediate effect that it has on the equation of accounting that must meet a company's basic for anyone within the economy:

$$q_{ii}^o p_i = \sum_{j=1}^n q_{ij} p_j + B_i^{cap} + B_i^k$$

We know, by the Principle of Asymmetry, the employer is not who sets the price of what you purchase, so you can't reduce their production costs, the term  $\sum_{j=1}^n q_{ij} p_j$  from the right side of the equation. The employer nor you can download the part of the surplus money with which to



Whatever the cause that originates the fall of disposable income, and the last three years of price deflation initial production of the entire economy goes down fast, but at constant prices.

The phase deflationary is misleading because it hides the companies, in their attempt to survive, are producing at a loss. But if, during the short space of time it takes the process a deflationary not remedied the fall of disposable income that is at the origin of the crisis, deflationary, nothing can prevent the destruction of the business fabric of the economy to a level of prices, this time yes, unyielding to any attempt to make them decrease.

The deflation of prices are extremely destructive to the economy, precisely because it can't happen. Should be avoided at any price because they assume the physical destruction of the whole productive system of the society.

*THE THREE PRINCIPLES. What that tells us the Principle of Closure is that the expense of the buyer is limited to and is split between all the production, while the seller of a product, and fight with the rest of the sellers of other products for a share of that spending. It is the struggle between the entrepreneurs of different industries due to the limited disposable income that keeps prices under control, preventing and prevents them from increasing their profits by making the inflation to skyrocket, and it's the limited disposable income buyers that prevents spending to skyrocket.*

*The Principle of Asymmetry is consistent with the Principle of Closure, even though it claims that the decisions about what to produce and what price to produce are made by buyers and sellers independently of each other.*

*The Principle Inflationary complete the table by stating that prices can only go up and never down. It is a direct consequence of the Principle of Asymmetry, since the prices are set by setting the benefits and these, although they can climb up to will, not can be downloaded at will without endangering the viability of the business.*

*There really is something of divinity within the math when you are able to show us just how clear the immense beauty that embodies the natural phenomena when we express them.*

#### 4) **The Principle of the Distribution.**

*THE PRINCIPLE OF THE DISTRIBUTION: In a monetary economy, the nominal value of the monetary surplus that produces a firm is independent of how it is distributed between the wages of workers and the profits of the bosses.*

*The distribution of the surplus among those who participate in the productive process is a decision solely for the social that is not dependent on the variables microeconomic that describes the Consumer Market. If the distribution between wages and rents have any specific ratio, the origin of such a relationship will have*

*to look for it in the Capital Market, but it certainly is not, nor can it be found in the Consumer Market.*

The Principle of Distribution was enunciated by Sraffa in the “Production of Commodities by Means of other Goods” in 1959, where he showed that the distribution of the surplus money of the companies between the wages and the benefits of entrepreneurs does not affect the prices or production.

The only question that can arise is related to the function that ranks job within the mathematical structure of the theory, since the wage that is paid to a person can be considered as the expenditure that the company makes in the purchase of a commodity called “work” that is needed to carry out the production. When the worker is considered as a businessman that produces and sells his work, then, though in appearance only, there are companies and there are only entrepreneurs, what is certain is that there are two social classes differentiated, those who produce the goods called “work” and those that are produced by the rest of the goods or services, despite the fact that from the point of view of the mathematical structure of the work is not different from any other commodity that is produced.

In an economy as well, in which the work is a simple commodity, ceases to exist, the society as a group of people who are organized with the intention to produce and distribute among all of what is produced. Companies cease to be the site where all, entrepreneurs and workers, work together to get what they need to live and becomes a slave society. In a situation as described, what we have are two differentiated types of “businesses” that the mathematical structure does not distinguish between yes, but we, from the outside, if we are able to differentiate: the producers of the work and the producers of other products or services. It is the situation that so masterfully describes Karl Marx in “Capital”, and that, sooner or later, will cause a revolution as a result of the struggle of the working class to seize the means of production.

However, if you split the monetary surplus-producing companies following a social agreement between the owners of the companies and workers, it is possible to overcome the separation of society into two social classes, despite the fact that the mathematical structure underlying that induces the use of money: a social structure of slavery in which the work is paid as a consumer good more.

Fortunately, or unfortunately, the equations here are equally applicable to a society in which their members are slaves, as for example the company that built the Roman Empire, or to a society in which all people share equally the property of the companies. This is the reason why we live together under the same capitalist system, nations that seem to have passed the social struggle between the workers and the employer, along with other nations that appear to be authentic regimes slave in a very little differ from the ancient Republic of Rome.

*The responsibility of what you do with a knife we cannot attribute it never the knife, because it is who wield the sole responsible for the benefits or damages that may cause to its use. The monetary savings they have some distinct benefits over other forms of organizing the production and the distribution of the social surplus, but can hardly be the money the person responsible for the use that society make money.*

*It is true that the use of the money imposes a few ligatures and has some profound consequences in the way we organize, for example, the Principle of Asymmetry or the Principle of the Distribution are some of them, but the responsibility of converting the cash economy in a slave society is only human.*

The last consequence of the presence of the two circuits we are going to call a Principle of Unequal Exchange, and because of their importance, we will analyze separately from the rest of the principles.

## **5. THE PRINCIPLE OF UNEQUAL EXCHANGE.**

When studying the difference in wages with which to pay for different jobs within the existing economies can be seen two facts very clear:

- a) The first of them happen within a country and finds that the wage gap is provided between different sectors, in particular between the primary sector and the rest of the sectors with the highest wages in the latter.
- b) The second interesting fact is when you compare salaries in different countries, and allows us to see the different wage that is paid for the same work in the non-industrialized countries and in the industrialized countries, being higher wages in these last few years.

Both facts are very well known for a long time within the economy and we will see then how the Principle of Asymmetry can be explained without difficulty the origin of the capacity of the industrialized countries to impose the purchase price of the produce of the non-industrialized countries, which is the same capacity of the secondary sector to set the price to purchase the production of the primary sector within the same country. Let us observe that the Principle of Asymmetry seems to indicate the opposite, and states that the seller is the one who sets the price, which in this case is the primary producer. To do this, we will analyze with a little bit of depth at the example that is often put this case: the production of cocoa and chocolate.

The cocoa is a primary product which often lead to countries with little industrial and chocolate is a product that generally produce the industrialized countries. It is not easy to understand the reason why the salaries of the people working in the field and produce the cocoa are many more low the salaries of the people working in the factories that produce the chocolate, but that is what happens. The example serves well to illustrate the problem, because it draws without the possibility of deception, the real existence of the “unequal exchange”.

Cacao is the raw material that is manufactured for the chocolate and for a long time their production is concentrated in countries of low level of industrialization, such as the Ivory Coast, the largest date producer of cocoa. Unlike what happens in the countries where it is grown cocoa, the countries that are devoted to produce and commercialize the chocolate appear to be

highly industrialized countries, such as Switzerland, the leading manufacturer of chocolate and one of the countries with the highest income per capita in the world.

For this reason, it is striking that the wages paid to the laborers who are engaged in the cultivation and collection of the cocoa and the wages paid to the workers who processed and packed, chocolate can get to be about 10 times higher one than the other. This difference is impossible to justify rationally, alleging the different productivity in the work they do each other, as they are jobs with a similar level of expertise. In addition, the greater or lesser use of machinery is the result of a more or less industrialization of the activity and does not affect the working capacity of the people. A chocolate factory can be a lot more industrialized than a plantation of cocoa, but a person works the same in both activities, and the final product, the chocolate, you need to manas activities. We see that it is necessary to some other explanation which is not limited simply to say that a work is more productive than another, or to denounce the exploitation that clearly show the facts.

Let us look now, from the point of view of the Principle of Asymmetry, the business relationship that exists between the chocolate manufacturers in Switzerland and the cocoa farmers in the Ivory Coast. Let's look at that first, the swiss, are the buyers of cocoa and they are the ones who decide on the amount of cocoa they buy, while the second, the costa ricans, are the sellers of cocoa, and they are the ones who decide the price of cocoa they produce. It would seem, therefore, that are the swiss, who have to lose in the exchange between the two since they are price-takers and the costa ricans do not. Nothing could be further from the reality.

The swiss only need to purchase just the right amount of cocoa to remaining surplus unsold in the chocolate market. In such a case, some producers of cocoa will sell what they have already produced, which lowers necessarily the price. The swiss risk very little when they leave cocoa without buying because they are basically intermediaries and, although no one denies that they have to assume fixed costs when they transform the cocoa and chocolate, what is certain is that they lose little or nothing by not marketing as much chocolate as they could. In addition, manufacturers of chocolate, can compensate for the decrease in the production of chocolate by driving up prices, precisely because there are less chocolate for sale.

It is a situation completely different from that faced by cocoa farmers, they have no choice but to sell what they have already produced, and that, thanks to the purchase restricted cocoa of the swiss, is almost always in surplus. The swiss (industrialized countries) can do that cocoa prices are always kept low by making the production of cocoa is always in surplus, because they are, according to the Principle of Asymmetry, that decide the amount of cocoa they buy and that is finally going to turn into chocolate. Although the result is just the opposite of what it seems to reach the Principle of Asymmetry, is the use of the capacity of the producers francs to decide on the amount of cocoa they buy which allows them to force down the price of cocoa purchasing.

The result is applicable to the relationship that exists between the various links in any chain of production, so that they are worked dedicated to produce the goods less developed that will have the lowest wages for jobs that produce goods more elaborate. In economics, it is distinguished from a general way between the primary sector and the secondary sector to distinguish the products are not made of more sophisticated products, and is very eloquent see

that the difference in wages between these sectors is very real, although to appreciate much better the difference when you compare the salaries of different countries.

Take a look, are not in contradiction of the Principle of Asymmetry because the swiss are not deciding at any time which is the price at which it sells the cocoa. In fact, the price of cocoa secure it to the floor the same producers: *the price of cocoa it ends up being the minimum price that allows us to pay farmers a salary of survival, because it is that moment when the production of cocoa decreased without lowering of the price, and the mechanism of downward pressure stops working.* Of course, the ultimate reason of the “unequal exchange” of work that is created between switzerland and costa ricans is no other than the lack of control of the costa ricans on the amount of chocolate that is produced and the Principle of Asymmetry indicates that secure the buyers, that is to say, the manufacturers swiss chocolate. A situation that is exacerbated by the absence of a working alternative to the cultivation of cocoa. As A result of the lack of industrialization, the cocoa producing countries may not lower the production of cocoa and devote workers in the sector to other sectors more productive (in nominal terms), preventing drop in prices.

This is what happens with the wood that produces Canada or the countries norwegians. If the wages paid in the industry of wood, come down, workers migraran to other sectors, allowing the production of wood down, but allow you to lower your price. The blackmail on the production, which forces down the wages paid in the production of raw materials to overcome for very little wages of survival, it does not work in industrialized countries because workers migrated to areas with minimum wages well above those of survival, able to absorb the excess timely work. Canada may be forced someday to reduce to zero the production of wood for the low prices of foreign competition, but it will not lower the wages of the sector in the process.

However, that does not happen in the developing countries, which are often characterized by having a strong unemployment, and in which there are no jobs alternative to the commodity sector. In these countries the only defense against the threat of a decrease in sales is the lowering of wages, which only stops when it reaches the level of survival.

*THE UNEQUAL EXCHANGE. One of the dire consequences of the absolute dominance of economists working for the private universities of the USA on the economic thought was the lack of dissemination that suffered many of the advances made by the economists of ibero-american from the fifties of the TWENTIETH century within the economy.*

*One of these advances, which was formalized in the call to Power Structuralism in Latin america, was the explanation which they gave the argentine Raúl Prebisch and the German Hans Singer, the increasing deterioration of the terms of trade suffered by the countries of the third world with respect to the industrialized countries of the time. Singer first, and Prebisch after, had observed that the raw materials they produced the least developed countries is exchanged each time for less processed products of the industrialized countries, attributing the process to the position of power enjoyed by the developed countries on developing countries, which allowed them to reduce the relative prices of the raw materials that are bought in respect of the processed products that they sold, but without getting to formulate a theory to explain the phenomenon.*

*A little time after, in the decade of the sixties, the economist, the Greek Emmanuel, Arghiri, uses the term "unequal exchange" to refer to the unequal exchange between countries, but unlike Prebisch and Singer, now the exchange referred to the trade between countries, the central and peripheral in a way very similar to the explanation that we have given here to justify the origin of the "Spain " empty" in the second chapter. Nor Arghiri came to formulate a theory of the facts, beyond denouncing the apparent exploitation that involves the unequal exchange between the countries of the centre and the periphery, but it came very close.*

*Here we will keep the term "unequal exchange" but referring, not to the different exchange of production between countries and regions, as tends to be the usual, but referring to the different work exchange between the countries, resulting in more accurate when you want to explain the causes of the phenomenon and to formulate a theory about the same. What interests us, is not just how many kilos of coffee exchanging a developing country by a car in an industrialized country, but how many working hours are being exchanged between the two countries when they exchange coffee for cars (equal cash flow).*

*The problem of the "unequal exchange" is a direct consequence of the existence of the division of the value chain that originates from the division of labour in the monetary savings, beyond the inequalities of political origin that may exist within the society. It manifests within the same country, no matter if it is or not, an industrialized country, affecting the wages of the primary sectors, especially in agriculture, but it is in the trade between the countries where the unequal exchange becomes pure and simple exploitation.*

*If within the same country, because it is difficult to control the process, is the main cause of the deflation of wages that pushes the population of the periphery towards the center, the problem between countries is chronic and impossible to solve because of the different legislation and different industrial development of each country. The specialization of trade of the country as a whole in the primary production condemns the country to a productivity below the average, to the contrary of what happens to a country that specializes in manufactured products, which usually have a high productivity or purchasing power.*

*It is possible to define the exchange between two trading countries, as the ratio between the average time of work used by each country to produce the same cash flow of the exchange, and also it is possible to define the same parameter relating two sectors of any economy of a country, but here we will not do so.*

*What is important is to understand that the industrialized countries should oblige the less industrialized countries to increase the wages paid for the goods they purchase until it is equal to the country's buyer. This would have two advantages, the first is that there would have to be protected against its own products by putting tariffs on products manufactured cheaper thanks to the low wages, and the second is that it will prevent the deslocalice production in search of low wages.*

## 6. THE DIFFERENT EVOLUTIONARY PROCESSES OF AN ECONOMY.

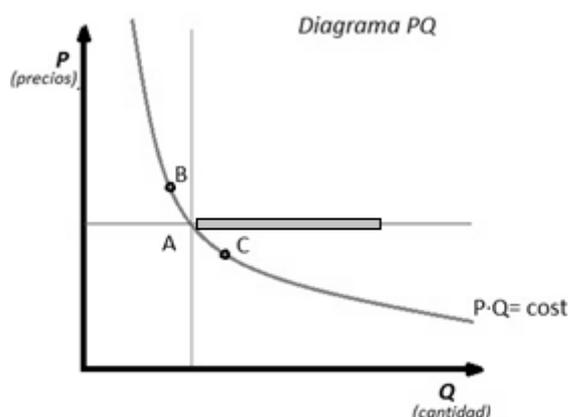
The reason that we have called “principles”, which are the direct consequences of the equation of conservation of monetary flow in the production model simple to constant returns, is not other than to facilitate the analysis of the problems that occur in the economy, helping us from a set of premises a very solid and easy to understand expressed in a function of the variables price and number of firms. It is the same thing which is typically done in the natural sciences when it expresses the Principle of Conservation of Matter, Conservation of Energy or other similar principles with the aim of analyzing very complex problems and come to conclusions with certainty almost without sweat.

In this sense, it is possible to graphically display the different evolutionary processes that may follow an economy either following as a guide to the principles we have enunciated. To do this, we express in a cartesian diagram, the *GDP* nominal of the economy, representing the x-axis the average prices  $\bar{p}$  of the goods that are produced, and on the ordinate axis, the average amount of goods  $\bar{q}$  that are exchanged during a period of time. In the following figure is shown explicitly in the diagram.

When we pointed out in a diagram P-Q” as described, a point generic “To” as the initial state in which is located the economy, from him, there are four evolutionary processes that is displayed especially well thanks to the four quadrants in which is divided the surface when you draw the lines ( $\bar{p} = const.$  ) and ( $\bar{q} = const.$ ) passing through said initial state generic:

- 1) The “stagflation”, which is the term that is used to name an economy plagued by inflation at the same time decreases its production. Occupies the left upper quadrant.
- 2) The “growth” that is the name we give to the evolution of an economy when at the same time which prices increase so does the production. It occupies the right upper quadrant.
- 3) The “deflation”, which is like calling an economy when production decreases, accompanied by a decrease in more or less persists the average price  $\bar{p}$  of a product. It occupies the lower left quadrant.
- 4) The pause of Engels, which is known to the developments of an economy when it grows the actual production, but accompanied with a very slight inflation of prices. This is the line that separates the two quadrants on the right in which it has been divided the map, and that we have highlighted with a black line stroke thick in the diagram. Its evolution is usually idealize with the line  $\bar{p} = constant$ , although in practice there is always a slight inflation of prices.
- 5) The only region that is without name it is the right lower quadrant, and this is because, according to the Principle of Asymmetry, an evolution that lowers prices and increases the production is a process that can't happen in reality. In fact, while deflation has taken on a multitude of occasions for short periods of time, it is on record that the real growth of the economy, at the same time to lower prices, it has never been.

In the accompanying figure has been drawn also the curve isoingreso ( $\bar{p} \cdot \bar{q} = const$ ) that passes through the point "A" and which represents the evolution that follows the economy when the *PIA* nominal does not change.



Let's explain with a bit of detail of what happens in the different evolutionary processes:

a) **Stagflation**

In an economy where the prices of goods rise faster than the speed of growth of the money of the money supply, it is inevitable that the actual production decrease due to the increase of prices and the economy enters into a process that is known with the name of stagflation. Although the root cause that initiates the rise in prices can be multiple, however, the cause of the decline in output is always the same: *the money supply is not growing as quickly as do the prices*. Stagflation is a direct consequence of the Principle of Closure:

$$PIA = \bar{p} \cdot \bar{q} = k_F \cdot M \rightarrow \frac{dM}{M} = \frac{d\bar{q}}{\bar{q}} + \frac{d\bar{p}}{\bar{p}} \rightarrow \frac{d\bar{q}}{\bar{q}} = \frac{dM}{M} - \frac{d\bar{p}}{\bar{p}} \xrightarrow{\frac{dM}{M} < \frac{d\bar{p}}{\bar{p}}} \frac{d\bar{q}}{\bar{q}} < 0$$

We see that, if prices grow faster than the money supply, the economy goes into a stagflation, that is to say, the actual production of low carbon economy, in the midst of an apparent abundance currency that makes up the price. You can express the relationship of a more elegant way using the growth rates of the different variables:

$$\left. \begin{array}{l} \tau_M = \frac{1}{M} \frac{dM}{dt} \\ \tau_{\bar{p}} = \frac{1}{\bar{p}} \frac{d\bar{p}}{dt} \\ \tau_{\bar{q}} = \frac{1}{\bar{q}} \frac{d\bar{q}}{dt} \end{array} \right\} \rightarrow \tau_{\bar{q}} = \tau_M - \tau_{\bar{p}} \xrightarrow{\tau_M < \tau_{\bar{p}}} \tau_{\bar{q}} < 0$$

Causes that can start a process of stagflation are varied, but once it has started, are the entrepreneurs and the workers who maintain and increase when trying to maintain the purchasing power of their income by driving up prices. If the deflation is bad, the estanflaciones are just as bad, because the mechanism monetary produces is the same: *"the monetary existing*

is not capable to satisfy the cash flow of exchanges that requires the actual production of the economy.”

THE ESTANFLACION. To understand the internal mechanisms that set in motion a rise in prices generalized without the sufficient increase of the money supply to support it, is not complicated if we consider the two following statements whose validity we will demonstrate below:

-The increase of the money supply, depends on the increase of the credit granted by the banks.

-When there is a strong inflation, the banks are reluctant to extend credit because, even at a real interest rate is negative, the nominal interest rate is very high and it makes it very difficult to pay back any credit.

The two previous statements indicate that, despite the fact that economists tend to attribute inflation to an increase in the money supply, what is certain is that the presence of a strong inflation restricts the granting of credit by banks and, therefore, limits the increase of the money supply of the economy. In an environment of high inflation and what usually happens is that, despite appearances, is not creating the necessary money for the nominal GDP of the economy to increase the demands of the price increase, what does that begin to unravel the companies (Principle of Closure):

little credit  $\rightarrow$  M grows bit  $\rightarrow$  PIA rated it grows bit  $\rightarrow$

$$\rightarrow PIA = \sum_{j,i=1}^n \lambda_j (2Q_{ji}^o - Q_{ji}) p_i \text{ slowly begins } \rightarrow$$

$\rightarrow$  prices skyrocket  $\rightarrow$  number of companies low

When prices rise a lot and the money supply increases a bit, the production decreases. We need to understand that the terms “short” and “long” are relative.

Let's look at that which affirms the Principle of Asymmetry is that the entrepreneurs prices will rise as a rise in costs threatens their benefits and, therefore, their own survival. This was what happened when they raised the price of oil in the decade of the 70 years of the TWENTIETH century and, in response, entrepreneurs went up the prices of their products. The increase in spending in the price of fuel had to be satisfied with a decrease of the benefits in the non-producing countries, as a larger part of the surplus should be transferred as an expense to the oil-producing countries. But, both the employers as well as workers of the non-producing countries tried to maintain the purchasing power of their incomes, which moved to the prices of the products and resulted in a deep stagflation, especially, in the developing countries, which at that time were heavily indebted in dollars and could not resort to borrowing in order to relieve the invoice of the oil (which would have gained time to restructure the process redistributive).

The rise of the oil was so quick, and the inflation induced so high, that the slowdown in bank credit and prevented the increase of the money supply needed to keep the rise in prices and, therefore, the nominal increase of the PIA that would have been allowed to keep the tissue

business. Of all ways, the growth of credit could not have been kept a long time and, sooner or later, you will see the dreaded stagflation when granting credit to a stop.

To aggravate the international situation, the federal Reserve increased the interest rate of loans in dollars, without impórtales at all, that the dollar was the reserve currency of the rest of the world, plundering to all developing economies are loaded with debt in dollars and the missteps. For the economies of the rest of the world it was impossible to meet the time the two fronts that had been created: *"The need of dollars to cushion the impact of the rise in the price of oil and the payment of the bonded debt in dollars"*. Although the US managed to escape very well for the inevitable crisis, deflationary, which led to the increase of the interest rate of the dollar, however, was a real disaster for the rest of the economies which, when entering into a stagflation without the possibility of return, condemned to underdevelopment to the half of the population of the planet. It understands very well, that there are no good output when you go into an inflationary spiral, and that is the reason why inflation should be prevented from getting out of control, at any price.

#### b) **The Pause Engels**

The "Pause Engels", is a special case of evolution, which describes an economy in which real output grows slowly because of the weak growth of the money supply, and therefore prices. The pause of Engels is idealized with a straight " $p = const$ " despite the fact that the prices grow, because, even though they grow, they grow very slowly.

It was the evolution that followed the economy during the greater part of the NINETEENTH century and where it takes its name, since that was the era in which he lived, Friedrich Engels, theorist, communist, and socialist German, a friend and collaborator of Karl Marx and founder of the marxist tendency of the economy. the death of this. It is the economic evolution that is described in The Capital and the reason that Engels and Marx wrote the Communist Manifesto.

Let's start by understanding why it is nothing common (theoretically impossible) that the growth of production accompanied by the descent more or less generalizes prices. A seller it is very easy to increase the price of what it sells, since this is supposed to increase their own profits, but it is very difficult to lower the price of what he sells, because that's not him who decides the price of the goods you purchase. It is what declares the Beginning of Inflation.

For this reason, the only way it can be a process of descent generalizes the price is when there is a good or service that all sectors need to buy to produce, which has a significant weight in the expenditure of any company and that, of course, for some reason lower price. If there is such a good and low price, the economy will be able to lower the prices in a general way, but if you do not meet these three conditions, the economy will not be able to engage in a process of economic growth without inflation or with a slight fall in prices, or deflation. For example, a product like this would be oil, a drop widespread and persistent in the price of oil could do to lower the prices (that has never happened), but also what would be the salary, as it is a service that has a very important role in the pricing and that are used by all the companies.

If wages fall, the price of the rest of the goods can be lowered without reducing benefits and the actual production could grow without an increase in the *GDP* nominal (or the flow of nominal exchange or *PIA*). But why would decrease wages? What can compel workers to reduce their wages?:

*In a situation of high unemployment it is not unlikely that wages estaguen, or lower, while the economy as a whole reaches a strong output growth, sustained by an environment of technological innovation and increased productivity.*

This is the situation which was giving, at least, during the second and third quarter of the NINETEENTH century, when the industrial revolution occurred in the productivity gains not seen since the dawn of mankind. It was this miserable and sad period in which they wrote the Communist Manifesto and gave birth to *The Capital*, and is the reason why it is known by the name of *The Pause Engels* (so it was named the economist Robert Allen, according to Pikety). But, what was the cause of the chronic unemployment which was at the time, when the technology and industrial development, he favored a continued increase of the productivity of labor and, therefore, a strong need of work?

Let's look at the situation from the viewpoint of the Principle of Asymmetry, and the Principle of Closure:

- 1) You can't increase the money supply because it can increase the stock of gold, and without a banking system that assumes the creation of money, credit backed by a Central Bank, it cannot be used on bank notes as money. None of the two situations was given to the mid-NINETEENTH century, when the growth of the stock of gold was subject to its extraction, physical, and there was no central bank to guarantee the deposits of the banks.
- 2) As A result of the use of the gold standard, the monetary growth is limited by the growth of the amount of gold, thus preventing you from increasing the *PIA* is rated at a pace that prints the strong growth of the economy.
- 3) The number of workers is increasing in the vicinity of the large cities and industrial because of the strong migration from the countryside to the city (Spain empty, it takes emptying several centuries).
- 4) The strong technological innovation increases significantly the physical productivity per worker. New inventions create new products and open new markets, but, above all, leaves out a significant amount of people when you leave the ancient techniques that are most in need of work (for example, looms driven by steam engines reduce significantly the amount of people dedicated to the production of tissues) and are replaced by other transactions with more machinery and less work.

Everything was ready at that time to create due to pure lack of knowledge of the dynamic, capitalist, one of the greatest deceptions carried out by the mankind:

*"An economy of hunger and misery widespread thanks to the stagnation of wages, at a time when the technology incredibly increases the productivity and, therefore, allows for a broad-based growth and sustainable wages, wealth and general well-being."*

To understand that was what caused the unemployment during the whole revolution industry we need to understand the serious limitation to the nominal growth imposed by the Principle of Closure to a monetary economy. When we formulated the Principle of Closure with the different rates of growth involved, we have:

$$\tau_{\bar{q}} = \tau_M - \tau_{\bar{p}}$$

We see, that if the rate of real growth of the economy,  $\tau_{\bar{q}}$  is large, the rate of growth of the money supply  $\tau_M$  must be large enough to allow at least a slight inflation, as prices can't go down. But, if the rate of growth of the money supply is not endogenous, but that depends on physical removal of the gold, then the growth of the production will be limited to a drop widespread of prices, though these may not go down in a monetary economy.

In a monetary economy the prices can't go down unless you lower the price a good or service that they use all of the companies and that is a major expense for all of them. And there is only one service that has these characteristics: "the job". During the fifty years of 1830 and 1880, the age in which he lived Engels, unemployment was a chronic and an army of workers booking malvivía in the middle of some periods more lush than she ever lived humanity. The economic growth of the era was limited throughout the period because of the monetary restriction imposed by the use of the gold standard. It was not until the 1880s, when the emission mass of banknotes, without the backing of gold allowed to grow the economy without limitation, unemployment fell significantly. Were those final years of the NINETEENTH century, after the Pause of Engels, the era that gave birth to the revolution trade unionists and the birth of democracy.

One of the great merits of "Capital in The TWENTY-first Century" by the economist Thomas Piketty, is the report with a fluid prose of the disastrous economic situation that was going throughout the industrial revolution. Is your book of where we have taken out many of the ideas that we are expressing here:

*The most important case, which I discussed briefly in the introduction, it is without a doubt the increase of the share of capital in income during the early phases of the Industrial Revolution, 1800-1860. In Great Britain, so that we have the most complete data, the historical studies are available, in particular the Robert Allen (who gave the name of "break of Engels" to the long stagnation of wages), suggest that the share of capital has increased by something like 10 percent of national income, from 35 to 40 per cent at the end of the EIGHTEENTH and beginning of the NINETEENTH century up to around 45-50 per cent in the mid-NINETEENTH century, when Marx wrote the Communist Manifesto and was put to work in the capital. The sources also suggest that this increase was offset by a decrease more or less comparable in the part of the capital of the period 1870-1900, followed by a slight increase between 1900 and 1910, and in the end the participation of the capital was probably not very different at the turn of the*

*TWENTIETH century than it was during the French Revolution and the napoleonic era (see Figure 6,1). Therefore, we can speak of a movement to "medium-term" rather than a lasting trend in the long term. However, this transfer of 10 per cent of national income to the capital during the first half of the NINETEENTH century was by no means insignificant: to put it in concrete terms, the lion's share of the economic growth in this period was to earnings, while the wage-objectively – they were miserably stuck. According to Allen, the main explanation for this was the exodus of labor from the countryside and in the cities, coupled with the technological changes that increased the productivity of capital (reflected by a structural change in the production function), the vagaries of technology, in the short term.*

*Thomas Piketty (Capital in The TWENTY-first Century)*

*The most astonishing fact of the period was the misery of the industrial proletariat. Despite the growth of the economy, or perhaps, in part, because of this reason, and because, also, of the great exodus from rural areas, due to both the growth of the population and the increase of agricultural productivity, the workers were being held in urban slums. The working hours were very long, and wages were very low. A new misery urban arose, more visible, more powerful, and in some ways even more extreme than the misery rural of the Old Regime. Germinal, Oliver Twist, and Les Misérables did not come from the imagination of its authors, and neither did the laws that limited child labor in the factories children over the age of eight (in France, in 1841) or ten in the mines (in Great Britain in 1842). Tableau de l'état physique of Dr. Villermé et moral des ouvriers Employés dans les manufactures, published in France in 1840 (that leads to the shy adoption of a new child labor law in 1841), describes the same reality sordid of the condition of the Working Class in England, Friedrich Engels, published in 1845.*

*Thomas Piketty (Capital in The Twenty-first Century)*

## **7. DYNAMICS OF THE ASIMETRIA SELLER BUYER**

The formulation of the Principle of Asymmetry has been obtained by assuming that each agent spends as much as he enters, which is a constraint demanding enough within an economy. Although the imposition does not preclude or the nominal growth of the economy or monetary

transfers through savings, the truth is that if it requires that both flows are cancelled and are identical to any of the sectors in which it has been divided into the economy:

$$y_i = x_i \xleftrightarrow{y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt}} ah_i = -\frac{1}{k_F} \frac{dx_i}{dt} \quad (\text{Economy Say})$$

The question arises to what extent, the conclusions that we have reached, and which we have summarized in the form of “principles”, can be generalized to any monetary economics, meets or does not meet the demanding conditions that we have imposed to be able to show them.

You must be clear in that sense, the line causal and which relates variables with other not can depend on the restrictions that we impose in the analysis. If in a particular case, we demonstrate that the prices depend on the decision by the sellers on the benefits of the sale, then that will be provided for any economy, regardless of whether they are or are not complying with the restrictions imposed on the economy to reach the conclusion.

It can't happen, because it has no logic, the fact that firms do not produce at yields constant, change or other circumstances that are related with the flow of savings, profits are no longer the cause of the prices or the quantity of companies ceases to be a consequence of the consumption preferences of the people.

That wouldn't make any sense.

Despite this, we will try to analyse to what extent can relax the restrictions that we have imposed to the economy to obtain the Principle of Asymmetry, so that the latter will continue to be valid and variables continue to pop up in the circuit of the money and the circuit of the goods decoupled. The equation of conservation of monetary flow, without simplifications, is:

$$y_i = x_i + ah_i + \frac{1}{k_F} \frac{dx_i}{dt}$$

The expression tells us that, in general, the sales revenue in any sector are different from the expenses made in purchasing, and the set of (N+2) equations dependent on the price and the number of firms is different from the one that we got when we had the equality between income and expenditure. Specifically, the set of equations is:

Equation Vector of Conservation of Monetary Flow

$$\left( y_i - ah_i - \frac{1}{k_f} \frac{dx_i}{dt} = x_i \right)$$

$\underbrace{X = G \times I}_{\text{expenses}}$ $x_i = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^{cap} + \lambda_i B_i^k$ $x^{cap} = \sum_{i=1}^n q_i^{cap} p_i$ $x^k = \sum_{i=1}^n q_i^k p_i$	$\underbrace{Y = G^t \times I}_{\text{income}}$ $\lambda_i Q_{ii}^o p_i = \sum_{j=1}^n \lambda_j Q_{ji} q_j + q_i^{cap} p_i + q_i^k p_i$ $y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap}$ $y^k = \sum_{i=1}^n \lambda_i B_i^k$
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Let us observe that the set of equations that define the income through the array of spending, does not change and it is possible to decouple the circuit of the goods in the general case, but the expression on the entry that shows the equation of conservation not now allows you to decouple the circuit of money in the general case:

$$x_i \neq y_i \rightarrow x_i \neq \lambda_i Q_{ii}^o p_i$$

Without the constraint, the equations show explicitly the difference of treatment that you receive the flow of expenditure and the revenue flow in the general case, while the set of N equations of the right (the circuit goods) is exactly the same:

$$\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} = q_i^{cap} + q_i^k \xrightarrow{E_i = q_i^{cap} + q_i^k} \boxed{\lambda = (Q^o - Q^t)^{-1} \cdot E}$$

But now, in the general case, the circuit of money changes a lot, so much so, that it is not possible to delete the variable number of enterprises of the equations. What interests us now is to try to decouple the dependence on the variable number of companies, and to recover the line causal allowed us to formulate the Principle of Asymmetry (although not really necessary to do this to generalize their validity). To achieve this, we need to make depend on the term of the savings and the derivative of a temporary spending the amount of companies.

$$\lambda_i Q_{ii}^o p_i - ah_i - \frac{1}{k_f} \frac{dx_i}{dt} = \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i^{cap} + \lambda_i B_i^k$$

The components of the vector-saving problems do not arise. A hypothesis is very reasonable to accept that the aggregate savings  $ah_i$  of any sector is the sum of the savings typical of each of them. In such a case, the needs of credit or savings of a sector, either is proportional to the number of basic companies in the sector and the need of credit or savings to each company's basic. That is to say:

$$ah_i = \lambda_i ah_i^{type}$$

That has the functional form that we seek, therefore, that the term does not give any problem.

The problem comes from the term differential  $\frac{1}{k_f} \frac{dx_i}{dt}$  that is necessary to do so also depend on the number of companies in the sector, which will only be true in the first approximation, where we assume that the number of companies basic changes slowly (though this is suppose to cheat, in that it assumes what it wants to show, that the production does not change):

$$\frac{dx_i}{dt} = \frac{d}{dt} \left( \sum_{j=1}^n \lambda_i Q_{ij} p_j + \lambda_i B_i \right) = \lambda_i \left( \sum_{j=1}^n Q_{ij} \frac{d}{dt} p_j + \frac{d}{dt} B_i \right) + \frac{d\lambda_i}{dt} \left( \sum_{j=1}^n Q_{ij} p_j + B_i \right)$$

Therefore, when we assume that the number of companies basic changes very slowly, the second term is very small and can get rid of it:

$$\xrightarrow{\frac{d\lambda_i}{dt}=0} \frac{dx_i}{dt} = \lambda_i \left( \sum_{j=1}^n Q_{ij} \frac{d}{dt} p_j + \frac{d}{dt} B_i \right)$$

In such a case, we can decouple the two systems of equations with respect to the variable price and quantity of the companies and recover the line causal that we have named as the Principle of Asymmetry. The equation dependent variable prices is now:

$$Q_{ii}^o p_i = \sum_{j=1}^n Q_{ij} p_j + B_i + ah_i^{type} + \frac{1}{k_f} \left( \sum_{j=1}^n Q_{ij} \frac{d}{dt} p_j + \frac{d}{dt} B_i \right)$$

Where it is very clear that the dependence is much more complicated than the one that we obtained before, even though prices are depending on only the benefits, because they are the only two variables that appear in the expressions.

You can also see which retrieves the line causal when we assume that the expenditure in each sector does not change with time, although you can change the income and savings. In such a case, the variation of the vector of expenditure is zero, and the expression that relates the prices with the benefits is:

$$\boxed{\frac{dx_i}{dt} = 0} \rightarrow Q_{ii}^o p_i = \sum_{j=1}^n Q_{ij} p_j + B_i + ah_i^{type} \rightarrow \mathbf{P} = (\mathbf{Q}_0 - \mathbf{Q})^{-1} \times (\mathbf{B} + \mathbf{Ah})$$

That is a result more general than that you can get when taking into account the change in the savings, and contains as a particular case the equality between income and expenditure. We are told that the prices depend on the value of the **benefits available** to each company's basic sector:

$$\text{Benefit Available} = b_i + ah_i$$

$b_i + ah_i \uparrow \rightarrow$  decrease of the prices of the sector  $i$

$b_i + ah_i \downarrow \rightarrow$  growth of the prices of the sector  $i$

It was observed that the expression allows the price of which produces a sector down to the coast of the indebtedness of the sector ( $ah_i < 0$ ), that is, it allows the dumping of credit. It is

logical, if the expenditure does not change, and lower income, then the only possibility is that the sector is borrowing, there is no other.

***Never have so few done so much damage to so many. We live for centuries, in a monetary economy where money matters, and much.***

*If we open the "Samuelson" or the "Mankiw", books of macroeconomics that serve as a guide for university-level teaching of the discipline, we will see with astonishment that the money does not seem to exist in today's society, despite the fact that it is virtually impossible to live without a credit card in any one country in the world. For economists who work for the private universities of the USA, it does not seem that we live in a monetary economy, but in a barter economy.*

*The Pause of Engels is perhaps the most obvious manifestation of the misuse that can be given to the money within the monetary savings. We as a society immersed in a productivity revolution unprecedented in the history of mankind that should result in an increase of wages, and the widespread increase in the welfare of the entire population, is doomed to widespread unemployment and the decline in the purchasing power of wages, reaching the misery of human dimensions unthinkable. All this, as a result of limiting the increase in the money supply, either by the imposition of the gold standard, or whether because of restrictive policies.*

*The stagnation of wages is, with the distance, the manifestation of more harmful and miserable from the austerity imposed in the NINETEENTH century by the gold standard, and that, today, economists working for the private universities of the united states, argued in books such as the ideal choice for the material progress of humanity.*

## **THE REASON PATTERN OF SRAFFA**

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04 of march of the year of 2021

### **1. INTRODUCTION**

In the previous chapter, we developed a comprehensive theory on the formation of prices within the monetary savings, demonstrating that the decisions they make those who sell and those who buy influence in a very different way in the fixing of prices and the quantity of goods that are produced. But, although we have analyzed many of the consequences of the different nature of buyers and sellers because of the money, we have not found any way of comparing the monetary savings that occur in a similar manner with prices and number of different companies.

In this sense, we are now going to continue the work of Piero Sraffa in the book published in 1956, "the Production of goods for other goods," but from a more general perspective and not just focusing on the premise that he was forced to use Sraffa.

We will begin by finding concrete expression that has the monetary surplus in an economy of production simple to constant returns, in which we will impose, as we've been doing, that any agent spend all the income you get. Then, we will use the expression to find what is the price vector and the vector number of companies that make minimum that monetary surplus. Our intention, as Sraffa, is to find a point is unique or special in that it can operate the economy (although not to work there in reality), that will allow us to compare economies equivalent when they work differently.

### **2. THE MONETARY SURPLUS**

Let's start by finding the expression of the excess of the monetary function of the price and of the number of enterprises basic when the economy was to fulfill two basic assumptions:

- 1) Production economics Simple to Constant Returns.

- 2) Economy where it is true that the income of any agent is spent entirely on the purchase of goods and services

$$y_i = x_i$$

It is understood by monetary surplus of an economy, the monetary flow that is devoted to consumption is not necessary to maintain the production. The definition is a little vague because it is not easy to distinguish what part of the consumption is necessary and what is not. For example, the money intended for the food we consider here some of the surplus, even though it is clear that if the people do not eat the economy cannot function. Here, we will identify the excess with the flow of income of the people, which includes the income from labor and income from benefits. To obtain it, let us first remember that the functional form of the matrices of income **And** spending and **G** to an economy of production simple to constant returns, depends on the number of firms, the price and the technical coefficients:

$$Y = \begin{bmatrix} \lambda_1 Q_{11}^{or} p_1 \\ \vdots \\ \lambda_n Q_{nn}^{or} p_n \\ y^k \\ y^{cap} \end{bmatrix}$$

$$G = \left[ \begin{array}{cc|cc} \left| \begin{array}{ccc} \lambda_1 Q_{11} q_1 & \cdots & \lambda_1 Q_{1n} p_n \\ \vdots & & \vdots \\ \lambda_n Q_{n1} q_1 & \cdots & \lambda_n Q_{nn} p_n \end{array} \right| & \left| \begin{array}{cc} \lambda_1 B_1^k & \lambda_1 B_1^{cap} \\ \vdots & \vdots \\ \lambda_n B_n^k & \lambda_n B_n^{cap} \end{array} \right| \\ \left| \begin{array}{ccc} q_1^k q_1 & \cdots & q_n^k q_n \\ q_1^{cap} q_1 & \cdots & q_n^{cap} p_n \end{array} \right| & \left| \begin{array}{cc} 0 & 0 \\ 0 & 0 \end{array} \right| \end{array} \right]$$

The matrix of expenditure **G** is split into four areas that have an economic meaning very concrete. El first quadrant, above and to the left, contains all the flows of spending generated by the exchanges between basic companies present in the economy. The second quadrant, above and to the right, containing the profit flows that companies pay workers ' incomes (wages) and the benefits of entrepreneurs (income). Finally, the third quadrant, below and to the left, contains the preferences expense of workers and entrepreneurs in the purchase of assets of companies in basic.

Now, we are going to impose to each agent that your income is equal to expenditure, that is to say, companies, workers, and employers, to meet each one of them  $x_i = and_i$ . This allows us to find the expression that relates the benefits or monetary surplus  $B(\lambda_i, p_i)$  with the  $PIA(\lambda_i, p_i)$ , but in terms of the new variables, that is to say, for the price, the number of companies and technical coefficients,

$$\left. \begin{array}{l}
x^k = \sum_{i=1}^n q_i^k p_i \\
y^k = \sum_{i=1}^n \lambda_i B_i^k
\end{array} \right\} \xrightarrow{x^k=y^k} \sum_{i=1}^n q_i^k p_i = \sum_{i=1}^n \lambda_i B_i^k$$

$$\left. \begin{array}{l}
x^{cap} = \sum_{i=1}^n q_i^{cap} p_r \\
y^{cap} = \sum_{i=1}^n \lambda_i B_i^{cap}
\end{array} \right\} \xrightarrow{x^{cap}=y^{cap}} \sum_{i=1}^n q_i^{cap} p_r = \sum_{i=1}^n \lambda_i B_i^{cap}$$

$$\rightarrow \left\{ \begin{array}{l}
\text{profit} = \overbrace{\sum_{i=1}^n q_i^k p_i + \sum_{i=1}^n q_i^{cap} p_r}^{\text{expenses, workers and employers'}} = \underbrace{\sum_{i=1}^n \lambda_i B_i^k + \sum_{i=1}^n \lambda_i B_i^{cap}}_{\text{income workers and entrepreneurs}}
\end{array} \right.$$

Using the second expression, we have for the surplus:

$$B(\lambda_i, p_i) = \sum_{i=1}^n \lambda_i Q_{ii}^o p_i - \sum_{i,j} \lambda_i Q_{ij} p_j$$

Where  $B(\lambda_i, p_i)$  is the monetary surplus of the whole economy, which is split between workers and employers. In addition, it can be shown that they are valid the following expressions:

- 1) Always satisfy that  $x_i = y_i$ , the flow monetary aggregate, or *PIA*, can be expressed as:

$$PIA(\lambda_i, p_i) = \sum_{j,i} \lambda_i Q_{ij} p_j + 2 \cdot B(\lambda_i, p_i)$$

Expression that is obtained simply by adding each one of the terms of the array of spending  $G$  and equating the income and expenditure of the workers and entrepreneurs.

- 2) Using this last expression, and removing from it the benefits, we get:

$$PIA = 2 \sum_i \lambda_i Q_{ii}^o p_i - \sum_{j,i} \lambda_i Q_{ij} p_j$$

- 3) Using the last two expressions and eliminating including the terms that appears in the coefficients of the matrix  $Q$ , we obtain the expression that binds the *PIA* with the benefits or monetary surplus:

$$PIA(\lambda_i, p_i) = B(\lambda_i, p_i) + \sum_i \lambda_i Q_{ii}^o p_i$$

This last expression is remarkable, because it tells us that, in an economy of production simple to constant returns, and provided that all income is spent, the *PIA* of the economy is equal to the sum of all income earned by the business basic more benefits or monetary surplus:

**MONETARY SURPLUS.** *In an economy of production simple to constant returns, and provided that all income is spent, the PIA of the economy is equal to the sum of the income and benefits obtained by companies basic:*

$$PIA(\lambda_i, p_i) = B(\lambda_i, p_i) + \sum_i^n \lambda_i Q_{ii}^o p_i$$

Where  $B(\lambda_i, p_i)$  is the monetary surplus (or profit):

$$B(\lambda_i, p_i) = \sum_{i=1}^n \lambda_i Q_{ii}^o p_i - \sum_{i,j} \lambda_i Q_{ij} p_j$$

Expression of the latter, which allows to calculate the *PIA* knowing the *GDP* without much difficulty.

### 3. THE MINIMUM MONETARY SURPLUS

Now, using the expressions that we have found for *PIA* and for the monetary surplus, we can ask ourselves what are the components of a vector of prices  $\mathbf{P}$  and the components of the vector quantity of companies  $\boldsymbol{\lambda}$  that make it maximum or minimum the monetary surplus of companies  $B(\lambda_i, p_i)$ , maintaining a constant *PIA*. That is to say, we want to know what values of the price and of the number of enterprises making the maximum or minimum monetary surplus, or the sum of the flows of income of workers and entrepreneurs, assuming always that the *PIA* of the economy remains unchanged. The problem, as posed, is equivalent to pose a maximization problem that can be solved very easily using the method of Lagrange Multipliers.

As a reminder of the Method of Lagrange Multipliers to maximize or minimize a function subject to restrictions, we are going to explain so as that what we are applying to the economic problem, particularly, that here we are concerned. We want to maximize, or minimize, the surplus monetary economy of production simple to constant returns that meet the expense of each agent is equal to your income and subject to the restriction that the *PIA* is constant.

**LAGRANGE MULTIPLIERS.** *Given the function benefits of business  $B(\lambda_i, p_i)$ , which depends on 2N variables  $\lambda_i$  and  $p_i$ , which we want to maximize (or minimize) subject to the constraint expressed by the equation  $g(\lambda_i, p_i) = 0$  which is also a function of the 2N variables  $\lambda_i$  and  $p_i$ , then the values of  $\lambda_i$  and  $p_i$ , which makes the maximum (or minimum) of the objective function  $B(\lambda_i, p_i)$  is also a solution of the system of 2N+1 equations given by:*

$$\begin{cases} \frac{\partial B(\lambda_i, q_i)}{\partial \lambda_i} + \eta_s \frac{\partial g(\lambda_i, q_i)}{\partial \lambda_i} = 0 \text{ (} N \text{ equations)} \\ \frac{\partial B(\lambda_i, p_i)}{\partial p_i} + \eta_s \frac{\partial g(\lambda_i, p_i)}{\partial p_i} = 0 \text{ (} N \text{ equations)} \\ g(\lambda_i, p_i) = 0 \text{ (restrincion)} \end{cases}$$

Where the parameter  $\eta_s$  receives the generic name of Lagrangian multiplier of the problem of maximizing (or reduction) raised.

In the economic problem particular that concerns us here, the objective function we want to maximize (or minimize) is the one that expresses the monetary surplus of the economy on the basis of prices, and in the number of enterprises basic, and that is equal to the business profits that are shared between workers and employers:

$$B(\lambda_i, p_i) = \sum_{i=1}^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j \leftarrow \begin{cases} \text{maximize} \\ \text{or minimize} \end{cases}$$

Subject to the constraint that the *PIA* does not change and is a constant of the economy, which is expressed by saying that the restriction  $g(\lambda_i, p_i) = 0$  is given in our case by the expression:

$$g(\lambda_i, p_i) = PIA - 2 \sum_i^n \lambda_i Q_{ii}^o p_{(i)} + \sum_{j,i}^n \lambda_i Q_{ij} p_j = 0 \text{ (restrincion)}$$

Both expressions, the function to maximize or minimize, and the restriction to meet the conditions necessary to apply the Method of Lagrange Multipliers, and find the system of equations that must comply with the variables  $\lambda_i$  and  $p_i$  that maximize or minimize the expression of the business benefits  $B(\lambda_i, p_i)$  when the *PIA* is constant:

$$\begin{cases} \frac{\partial B(\lambda_i, q_i)}{\partial \lambda_i} + \eta_s \frac{\partial g(\lambda_i, q_i)}{\partial \lambda_i} = 0 \rightarrow Q_{ii}^o p_{(i)} - \sum_{j=1}^n Q_{ij} p_j - \eta_s \left( 2Q_{ii}^o p_{(i)} - \sum_j^n Q_{ij} p_j \right) = 0 \\ \frac{\partial B(\lambda_i, p_i)}{\partial p_i} + \eta_s \frac{\partial g(\lambda_i, p_i)}{\partial p_i} = 0 \rightarrow \lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} - \eta_s \left( 2\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} \right) = 0 \\ g(\lambda_i, p_i) = 0 \rightarrow PIA - 2 \sum_i^n \lambda_i Q_{ii}^o p_{(i)} + \sum_{j,i}^n \lambda_i Q_{ij} p_j = 0 \end{cases}$$

Where the constant  $n_s$  is the Lagrangian multiplier associated to the constraint that the *PIA* remains constant. It is not difficult to demonstrate that, from the economic point of view, the multiplier  $n_s$  is the quotient between the  $B_{min}$ , the minimum value of the surplus money that can be obtained from an economy of production simple to constant returns to occur with some technical coefficients are determined and the *PIA* of the economy. To do this, we take the first set of *N* equations and multiply it by the variable number of companies, and we add:

$$\rightarrow \lambda_i \times \left\{ Q_{ii}^o p_{(i)} - \sum_{j=1}^n Q_{ij} p_j - \eta_s \left( 2Q_{ii}^o p_{(i)} - \sum_j^n Q_{ij} p_j \right) = 0 \right\} \sum_{\{\dots\}}$$

$$\rightarrow \left( \sum_{i=1}^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j \right) - \eta_s \left( 2 \sum_{i=1}^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j \right)$$

Now  $\eta_s$  is the quotient between the two summations having a meaning that is very accurate, when we identify the monetary surplus with the *GDP* nominal:

$$\left. \begin{aligned} GDP &= \sum_{i=1}^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j \\ PIA &= 2 \sum_{i=1}^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j \end{aligned} \right\} \rightarrow \eta_s = \frac{GDP}{PIA}$$

To demonstrate, moreover, that the end point is associated with the Lagrangian multiplier is a minimum and not a maximum, as you might expect, is not very complicated, therefore, the multiplier tells us what is the minimum monetary surplus in an economy that produces with a few techniques of production determined the technical coefficients of the matrices  $Q$  and  $Q^o$ ) and when the *PIA* nominal does not change:

$$\eta_s = \frac{GDP_{min}}{PIA} \quad (\eta_s \equiv \text{Efficiency of Sraffa})$$

The parameter  $\eta_s$  what we call Efficiency of Sraffa because, as we will see in a moment, is closely related to the “Reason” Pattern used by the Italian economist Pietro Sraffa in his work “Production of Commodities by Means of Commodities.” For an economy either characterized by the matrices techniques  $Q^o$  and  $Q$ , the surplus money with them, is always greater than the minimum that expresses the Efficiency of Sraffa:

$$\eta = \frac{GDP}{PIA} > \eta_s \leftrightarrow GDP \geq GDP_{min}$$

The result is a bit counter-intuitive. The expression tells us that, when the *PIA* remains constant and unchanged, the *GDP* nominal of the economy can get as close as you want to the value of the *PIA*, but, however and contrary to expectations, a monetary economy has a monetary surplus minimum or  $GDP_{min}$  that can not be lessened, whatever the price that is sold or which are the number of companies that produce.

*IS THERE A MAXIMUM OR A MINIMUM? Although it may seem strange, the monetary surplus (of a monetary economy (here we are identifying with the GDP, although strictly the identification is not correct) have a minimum of you can't get off, and not a maximum, as expected initially if we go by appearances.*

*This result has an enormous importance, that the brevity of this treaty prevents us from analyzing in detail, as it is not going to be any impediment to structural to the nominal profits of a sector, either to rise at the expense of the benefits nominal of another sector, without affecting the surplus nominal total of the economy.*

*Note that this result implies that, given an economy formed by two countries, the distribution of the surplus between the two countries can be whatever, and is not subject any limitation on structural, while the surplus of the productive GDP in relation to the PIA, in itself, should be kept always above a minimum.*

#### 4. THE REASON PATTERN OF SRAFFA

If we take the system of  $2N+1$  equations of Lagrange found in the previous section, and we skipped a few intermediate steps that don't add anything new, but it will slow down a lot of the explanation, we can regroup the terms of each expression and get the same system of equations expressed in a slightly different way:

$$\begin{aligned} \frac{(1 - \eta_S)}{(1 - 2\eta_S)} \cdot \sum_{j=1}^n \lambda_j q_{ji} &= \lambda_i Q_{ii}^o \text{ (variable } \lambda_{(i)}) \\ \frac{(1 - \eta_S)}{(1 - 2\eta_S)} \cdot \sum_{j=1}^n q_{ij} q_j &= Q_{ii}^o p_i \text{ (variable } p_i) \\ PIA &= 2 \sum_i^n \lambda_i Q_{ii}^o p_i - \sum_{j,i} \lambda_i Q_{ij} p_j \text{ (restricción)} \end{aligned}$$

The new way of expressing the same system of equations allows to easily identify the two sets of  $N$  equations with the two systems of equations that are deduced Sraffa in his work "the Production of Goods for other Goods.

Let's look at the first set of  $N$  equations, which depend on the variable number of companies, is the same system of equations that Piero Sraffa used to obtain the "Reason" Pattern  $R$  and named "System Pattern":

$$(1 + R) \cdot \sum_{j=1}^n \lambda_j q_{ji} = \lambda_i Q_{ii}^o \quad (\text{System Pattern})$$

If we identify the two expressions, we have obtained here and that obtained by Sraffa in his search for the goods pattern we have:

$$\frac{(1 - \eta_S)}{(1 - 2\eta_S)} = 1 + R$$

Moreover, it is possible to identify also the second set of  $N$  equations of Lagrange, which depend on the variable price, with the  $N$  equations that uses Sraffa to get the benefit rate of maximum  $r_{max}$  of each company basic, the same for all of them, when they are paid a wage null to the workers:

$$(1 + r_{max}) \cdot \sum_{i=1}^n q_{ki} q_i = Q_{kk}^o p_k \quad (\text{wage null})$$

If we identify the two expressions, we have obtained here and that obtained by Sraffa in his search of the rate of profit maximum, we have that:

$$\frac{(1 - \eta_S)}{(1 - 2\eta_S)} = 1 + r_{max}$$

Piero Sraffa shows in their work, as it could not be otherwise, that the reason the pattern  $R$  and the maximum rate of profit  $r_{max}$  are the same. What is nothing self-evident, since for such a

coincidence to happen, Piero Sraffa force demonstration accepting the validity of two hypotheses to very controversial:

1. Defines “*benefit rate*” of a company's basic either as “*the ratio between the monetary benefit and spending money, but not including wages*”, which goes away a little of the definition as usual the rate of profit, which usually include wages as an expense for the company.
2. Assume that, regardless of the rate of profit, its value is the same for all companies basic.

The first hypothesis, the definition of the rate of profit, even if it is a definition completely arbitrary is not, in itself, is more objectionable than other definitions of the rate of profit more usual in that it does include the salary costs in the calculation of the rate of profit. The definition can be considered a matter of taste, and its acceptance does not change the background of the conclusions reached by Sraffa.

Very different is the case with the second hypothesis, which is completely unacceptable. There is no justification for empirical or theoretical, to assume that the rate of profit, either that defines Sraffa or other more usual, and do equal in all industries. The assumption, which was postulated for the first time, the economist scottish David Ricardo about 150 years ago, has been considered somewhat since then, and today, all economists continue to accept as valid, without which you know very well the reason of such strange consensus in a discipline in which all economists disagree on almost everything.

The starting hypothesis of Sraffa, which is also that of all economists, assumed as obvious that the entrepreneur obtains its benefits of the risk when advancing the money necessary to carry out the production. Without the advancement of money or investment, the production cannot be carried out, and without the assumption that the money will be invested in the companies that higher rate of benefits to occur, the rate of benefit is not equal in all industries. The reasoning is very easy to follow:

*“...the money moves freely and will go to the companies that benefits occur, so that when the money attracted by a greater benefit to increase the number of firms will increase production, lowering inevitably the price of what it sells and, therefore, lowering its greatest benefit will match that of the rest of the companies...”*

*David Ricardo*

The reasoning did, for the first time, David Ricardo, and is considered a postulate an indisputable part of the economy since then, in such a way that no one has since never in doubt. It is observed very clearly that the reason why it defined the rate of profit as the ratio between the money that is put forward and the money surplus, is no other than to justify the source of the benefit to the employer, and not so much to justify that “*the rate of profit tends to be equal in all the industries*”. That's why, no wonder a lot of that Piero Sraffa use in their work the rate of profit and its matching in all industries but not even question it. Although in his defense we should mention that Karl Marx, not only does the discussion, but he uses it to demonstrate that this benefit comes from the exploitation of wage labor, or capital gain.

Be that as it may, the reason pattern  $R$  that gets Piero Sraffa is a gift that we cannot deny or ignore, because it allows us to give economic meaning to the Lagrangian multiplier  $\eta_S$  in the analysis that we are doing. If we call  $r_j$  to the ratio between the monetary surplus of an industry

generic and spending money, and we call  $R_j$  to the ratio between the amount in surplus of a commodity generic and the quantity of that commodity that is spent on all the industries, we demonstrate that when the economy produces at the minimum surplus money as possible, they all have the same value  $R$ , the reason pattern of Sraffa:

$$R = r_j = \frac{(\text{monetary surplus})_j}{(\text{spending money})_j} = \frac{(\text{a surplus product})_i}{(\text{expense product})_i} = R_i \forall i, j$$

Affirmation that, as usual, we express it as a principle:

THE EFFICIENCY MONETARY SRAFFA. A monetary economy subject to the constraint that the  $PIA$  is constant, it is said that it is producing with el minimum surplus money possible when, for any well, the ratio between the surplus that is produced and the consumption of energy used in its production, measured in both monetary terms and in terms of amount of product, it has the same value, the reason pattern of Sraffa  $R$ :

$$R = r_j = \frac{(\text{monetary surplus})_j}{(\text{spending money})_j} = \frac{(\text{a surplus product})_i}{(\text{expense product})_i} = R_i \forall i, j$$

In such case, the excess monetary minimum  $B_{min}$  is given by the expression:

$$\eta_s = \frac{B_{min}}{PIA} = \frac{R}{1 + 2R} \quad (\eta_s \equiv \text{Efficiency of Sraffa})$$

Where  $\eta_s$  is the Efficiency of Sraffa.

From the macroeconomic point of view, the “Reason” Pattern  $R_s$  is the minimum ratio between the  $GDP$  (the income dand the workers along with the income of entrepreneurs) and spending monetary set of all basic companies (excluding work) when the  $PIA$  of the economy has a certain value:

$$\frac{(1 - \eta_s)}{(1 - 2\eta_s)} = 1 + R \rightarrow R = \frac{\eta_s}{(1 - 2\eta_s)} = \frac{\frac{GDP}{PIA}}{1 - 2\frac{GDP}{PIA}} = \frac{GDP}{PIA - 2PIB} \rightarrow$$

$$R = \frac{\text{cash flow surplus}}{\text{cash flow inter business}}$$

The really remarkable thing of all-the analysis of Sraffa is that the reason for pattern  $R$  is a ratio between quantities of goods of nature very uneven, so that it is very difficult to understand what was the relationship of the physical world of the amounts that produce basic companies with the financial world and its cash flows. Now we already know that. The error of Piero Sraffa was the same that made Karl Marx and the same comment all economists today: “to believe that there really is the profit rate, and that this matches the time in all industries”.

## 5. THE PRINCIPLE OF CLOSURE

In the previous topic already noted the great importance for the economy of the Principle of Closure as a complement to the Principle of Asymmetry. Although it has been now, to use it explicitly as a constraint to obtain the value of the variables that minimize the monetary surplus, when we begin to glimpse the profound consequences that it has on the economy:

$$k_F \cdot M = PIA = const. \rightarrow PIA - 2 \sum_i^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{j,i} \lambda_i Q_{ij} p_j = 0$$

Although in appearance the  $PIA$  is a function of the variables  $\lambda_i, q_i, Q$  and  $Q^{or}$ , what is certain is that the monetary equation tells us that it is a constant independent of all variables to the extent that what is the money supply. Hence its importance:

$$PIA \neq F(\lambda_i, p_i, Q_i)$$

So, the expression becomes, in practice, in a ligation macroeconomic you have to meet the different variables that appear in the expression. Hence, the importance of the Principle of Closure and the reason to use it as a condition to obtain the Lagrangian multiplier associated with the monetary surplus of the economy.

We can appreciate again the influence of latent Principle of Closure if we manipulate a little more of the set of equations of Lagrange and we define a new parameter:

$$\omega = \frac{(1 - 2 \cdot \eta_S)}{(1 - \eta_S)} \quad 0 < \omega < 1$$

Now, find the minimum monetary surplus of an economy becomes the problem of calculating the maximum eigenvalue  $\omega$  of the matrix  $\mathbf{Q} \times \mathbf{Q}^{o-1}$  dependent of the technical coefficients. specifically:

THE EQUATIONS OF LAGRANGE:

$$\{0 < \omega < 1\}$$

$$\begin{cases} \sum_{i=1}^n \lambda_i Q_{ik} - \omega - \lambda_k Q_{kk}^o = 0 \leftrightarrow \lambda \times [\mathbf{Q} \times \mathbf{Q}^{o-1} - \omega \mathbf{I}] = 0 \\ \sum_{i=1}^n Q_{ki} q_i - \omega Q_{kk}^o p_k = 0 \leftrightarrow [\mathbf{Q}^{o-1} \times \mathbf{Q} - \omega \mathbf{I}] \times \mathbf{P} = 0 \end{cases}$$

$$PIA = 2 \sum_i^n \lambda_i Q_{ii}^o p_{(i)} - \sum_{j,i} \lambda_i Q_{ij} p_j \leftrightarrow PIA = \lambda \times (\mathbf{a} \mathbf{2} - \mathbf{Q}^o - \mathbf{Q}) \times \mathbf{Q}$$

Where the reason pattern of Sraffa vale  $R_s = \frac{1-\omega}{\omega}$  and the efficiency of Sraffa 's worth,  $\eta_s = \frac{1-\omega}{2-\omega}$

Now, the calculation of the minimum monetary benefit that can be obtained from an economy of production simple to constant returns, and where all income is spent, it is equivalent to solutional the problem of eigenvalues of thes matrices  $\mathbf{Q} \times \mathbf{Q}^{o-1}$  and  $\mathbf{Q}^{o-1} \times \mathbf{Q}$  is described by the technical coefficients of basic companies:

The eigenvalues  $\omega$  are comprised between 0 and 1 when the matrix  $Q$  and  $Q^{or}$  describes an economy of production simple to constant returns with excess physical.

For each eigenvalue, the eigenvector for the right of  $Q^{o-1} \times Q$  correspond with a possible price vector and the eigenvector by the left  $Q \times Q^{o-1}$  corresponds to a possible vector of the number of enterprises basic.

Only the eigenvalue maximum  $\omega_m$  has an associated vector of prices and a vector quantity with all components positive.

Both eigenvectors, the price and the quantity of companies basic, associated with  $\omega_m$  are necessary to maximize the monetary surplus, or profit. The system of equations determined by the two vectors in direction, but not in module.

The Equation of Closure can only determine the modulus of one of the two vectors, but then the other is not yet determined. That is to say, the variables price and the number of businesses that determines the economy have a degree of freedom when produced with the minimum surplus productive.

What we would like to point out now of all of this, not just knowing the specific value of the eigenvalue maximum  $\omega$  is known, the efficiency of Sraffa or the reason pattern:

$$\eta_s = \frac{1 - \omega}{2 - \omega}$$

But, in addition, the fourth and the fifth statement informs us that the eigenvectors are determined in direction, but not in module, so that the equation of closure that binds both modules to each other, leaves a degree of freedom:

$$\left\{ \begin{array}{l} \lambda \times [Q \times Q^{o-1} - \omega I] = 0 \rightarrow \lambda(\omega) = \lambda \cdot \hat{\lambda}(\omega) \\ [Q^{o-1} \times Q - \omega I] \times P = 0 \rightarrow P(\omega) = p \cdot \hat{p}(\omega) \end{array} \right\} \rightarrow PIA = \lambda \cdot p \cdot [\hat{\lambda} \times (a2 - Q^{or} - Q) \times \hat{q}]$$

Where each of the eigenvectors  $\lambda$  and  $P$  is decomposed as a product of your module  $\lambda$  for his direction unitary  $\hat{\lambda}$ . When we understand that the term  $[\hat{\lambda} \times (a2 - Q^{or} - Q) \times \hat{q}]$  is the  $PIA$  is calculated with the vector of prices and the number of businesses unit, we have:

$$\boxed{\lambda \cdot p = \frac{PIA}{\widehat{PIA}} = const.} \quad \widehat{PIA} = [\hat{\lambda} \times (a2 - Q^{or} - Q) \times \hat{q}]$$

The same thing happens with the minimum monetary surplus  $B$ , which is also fixed when you know the  $PIA$ :

$$B(\lambda_i, p_i) = \lambda \cdot p \cdot [\hat{\lambda} \times (Q^{or} - Q) \times \hat{p}] \rightarrow \lambda \cdot p = \frac{B(\lambda_i, p_i)}{\widehat{B(\lambda_i, p_i)}}$$

That is to say, that even in an economy where the  $PIA$  does not change, because we assume that there is growth in the money supply  $M$ , and also occurs with the minimum monetary benefit as possible, the economy is not completely determined, and it is still possible to evolution because the price change and the production.

THE BEGINNING OF INFLATION. Yes now we recall that the Principle of Inflation tells us that prices can never go down, then we can go back to check the influence of the Principle of Closure on the

*whole of the monetary economy, since, despite the fact that we are assuming that the economy has not nominal growth, that there are no changes in productivity, and that is occurring with the maximum financial benefit, the economy can still evolve and move towards a decrease of the production as a price increase.*

*The result of the reasoning is remarkable, because the Principle of Inflation, not only tells us that the prices may not go down, but it states that in the event that there is no nominal growth of PIA, the economy will slow down your production. Forcing the economy to be minimally inflationary if you want to avoid a recession.*

Of course, it will be highly unlikely that a real economy to produce with the minimum surplus money as possible because the consumption preferences of the agents will not match ever with the proportion that has the goods pattern of Sraffa. Nor do you see any clear reason why the prices of the sold goods is such that the different companies produce with the minimum monetary surplus as possible. Therefore, there is no reason to expect that a real economy has to walk near even the minimum monetary surplus as possible.

## 6. PRACTICAL EXAMPLE OF ECONOMICS

Let us consider a numerical example that, despite being very contrived, allows us to visualize a little bit of everything so far.

**Equations accounting basic.** It is an economy that produces wheat, iron, and oil. Suppose that the set of equations accounting that meet the different companies in the basic are:

$$\begin{aligned} \text{wheat} &\rightarrow 20\text{kg} \cdot p_{\text{wheat}} = 12\text{kg} \cdot p_{\text{wheat}} + 1\text{kg} \cdot p_{\text{iron}} + 1\text{kg} \cdot p_{\text{oil}} + B_{\text{wheat}} \\ \text{iron} &\rightarrow 50\text{kg} \cdot p_{\text{iron}} = 10\text{kg} \cdot p_{\text{wheat}} + 5\text{kg} \cdot p_{\text{iron}} + 5\text{kg} \cdot p_{\text{oil}} + B_{\text{iron}} \\ \text{oil} &\rightarrow 42\text{kg} \cdot p_{\text{oil}} = 10\text{kg} \cdot p_{\text{wheat}} + 5\text{kg} \cdot p_{\text{iron}} + 13\text{kg} \cdot p_{\text{oil}} + B_{\text{oil}} \end{aligned}$$

Of course, the prices at which they sell the wheat, iron ore and oil have to be such that the monetary surplus or benefit  $B_i$  that generates each company's basic, and that is split between workers and employers, are all positive.

Each accounting equation tells us the quantity of goods that are involved in the production. For example, to produce 20 kilograms of wheat, each company basic that is dedicated to the production of wheat wastes, 12 kilos of wheat, 1 kg of iron and 1 kilo of oil, and the same happens for the other companies in the basic. It is precisely this accounting information, which allows us to construct the two arrays of technical coefficients  $Q$  and  $Q^o$  that describe the economy from the point of view of the production:

$$Q = \begin{bmatrix} 12 & 1 & 1 \\ 10 & 5 & 5 \\ 10 & 3 & 13 \end{bmatrix} \quad Q^o = \begin{bmatrix} 20 & 0 & 0 \\ 0 & 50 & 0 \\ 0 & 0 & 42 \end{bmatrix}$$

Let us observe that we do not know completely how many companies basic of each type there are in the economy, the vector  $\lambda$ . We also do not know the specific prices of the goods, the price vector  $p$ . We don't even know how many workers there are. Despite all this, the information contained in the matrices of the technical coefficients of the techniques that companies use

basic, it is enough to know what is the minimum monetary benefit with which it can lead to the economy.

To do this, we just have to find the eigenvalues of any of the two arrays:

$$\mathbf{Q} \times \mathbf{Q}^{o-1} = \begin{bmatrix} \frac{3}{5} & \frac{1}{50} & \frac{1}{42} \\ \frac{1}{2} & \frac{1}{10} & \frac{5}{42} \\ \frac{1}{2} & \frac{3}{50} & \frac{13}{42} \end{bmatrix} \quad \mathbf{Q}^{o-1} \times \mathbf{Q} = \begin{bmatrix} \frac{3}{5} & \frac{1}{20} & \frac{1}{20} \\ \frac{1}{5} & \frac{1}{10} & \frac{2}{10} \\ \frac{5}{21} & \frac{1}{14} & \frac{13}{42} \end{bmatrix}$$

They are namely:

$$\omega_1 = 0,063 \quad \omega_2 = 0,283 \quad \omega_3 = 0,663$$

Only the largest of them,  $\omega_3 = 0,663$ , has an associated eigenvector of prices and of the number of companies with all components positive. Explicitly, even though the vectors are normalized, they are:

$$\omega_m = 0,663 \xrightarrow{\text{eigenvectors}} \begin{cases} \mathbf{P}_m \equiv (1,294 \quad 0,637 \quad 1) \\ \boldsymbol{\lambda}_m \equiv (12,164 \quad 0,538 \quad 1) \end{cases}$$

Knowing the eigenvalue maximum, it is possible to know the monetary surplus minimum of the economy:

$$\eta_s = \frac{1 - \omega}{2 - \omega} = 0,25 \rightarrow GDP = 0,25 \cdot PIA$$

The two eigenvectors, the price and the business, representing the set of prices and the number of businesses that have a minimum monetary surplus, but we are determined only in direction, but not in module.

To determine the particular module of one of them, we can go to the ligation imposed by the Equation of Closure, since we assume known the value of the  $PIA$  with the one that makes the economy:

$$PIA = \lambda \cdot p \cdot [\hat{\lambda} \times (\mathbf{a} \mathbf{2} - \mathbf{Q}^o - \mathbf{Q}) \times \hat{p}] \xrightarrow{PIA = [\hat{\lambda} \times (\mathbf{a} \mathbf{2} - \mathbf{Q}^o - \mathbf{Q}) \times \hat{p}]} \lambda \cdot p = \frac{PIA}{\widehat{PIA}}$$

Which confirms that the variables that describe the economic system have a degree of freedom that is not possible to reduce without recourse to any hypothesis that is external to the model. The same thing happens with the monetary surplus minimum that we're looking for, which we know is related to the  $PIA$  by the Efficiency of Sraffa, although the variables on which they depend also have a degree of freedom:

$$B(\lambda_i, p_i) = \lambda \cdot p \cdot [\hat{\lambda} \times (\mathbf{Q}^o - \mathbf{Q}) \times \hat{p}] \rightarrow \lambda \cdot p = \frac{PIA}{\widehat{PIA}} = \frac{B}{\widehat{B}}$$

To restrict the last degree of freedom is necessary to resort to a hypothesis additional external to the model that is usually always related to the physical constraints of the economy, what is called the "possibilities" or the "GDP potential", and that is usually the maximum number of workers  $T^{or}$  that there is in the economy. If we call  $T_i$  to the vector gives us the number of workers in each company's basic and we call  $w$  to your salary, we have that:

$$\sum_{i=1}^n \lambda_i T_i = T^o \xrightarrow{\lambda = \lambda \cdot \hat{\lambda}} \lambda \cdot \sum_{i=1}^n \hat{\lambda}_i T_i = T^o \rightarrow \lambda = \frac{T^o}{\sum_{i=1}^n \hat{\lambda}_i T_i}$$

What that allows us to fix the module of the vector number of companies and, with it, the module of the vector of prices when the economy is all over the world working. In short: the number of workers fixed the concrete number of companies basic that is engaged in the production of each good when consumer preferences are known (the direction of the vector  $\lambda$ ), together with the knowledge of the *PIA* fixed the prices at which it is sold.

But all this tells us nothing new, except that which is apparent and as we know: “*the production is independent of how repartand what occurred between workers and employers*”.

**Empirical data.** When we look at the concrete reality that surrounds us, in addition to the equations of accounting firms basic that you get the technical coefficients of the matrices  $Q$  and  $Q^o$ , you tend to collect a whole set of empirical data with which to confirm the consistency of the macroeconomic and microeconomic that describes the production model simple we are using. For example, let us consider that we have figured out the value of the following variables:

$$\begin{aligned} \text{macroeconomic variables} &\rightarrow \begin{cases} PIA = 2998 \\ GDP = 890 \\ T^o = 335 \end{cases} \\ \text{variables microeconomic} &\rightarrow \begin{cases} \mathbf{p} \equiv (3 \quad 2 \quad 4) \\ \boldsymbol{\lambda} \equiv (55 \quad 3 \quad 6) \\ \mathbf{T} \equiv (5 \quad 8 \quad 6) \end{cases} \end{aligned}$$

From the above data, we can confirm that the number of active workers is indeed 335:

$$T^o = \sum_{i=1}^n \lambda_i T_i = 275 + 24 + 36 = 335$$

We can confirm that the value of the *PIA* is 2998 and the value of the *GDP* is 890:

$$PIA = \lambda \times (2Q^o - Q) \times \mathbf{p} = 2998$$

$$GDP = \lambda \times (Q^{or} - Q) \times \mathbf{p} = 890$$

But what is more important, is that we can confirm that, indeed, the *GDP* nominal that is producing the real economy is greater than the minimum *GDP* nominal to that caused by the economy when the vector of prices and the vector number of companies are the reason pattern of Sraffa:

$$\eta = \frac{GDP}{PIA} = 0,296 > \eta_s = \frac{1 - \omega}{2 - \omega} = 0,25$$

A result which, though it may seem like an insignificant and of no importance, has been absent in the theory of distribution that develops Piero Sraffa in the “*Production of Commodities by means of Commodities*.”

## 7. THE MINIMUM BUSINESS BENEFIT OF AN ECONOMY.

This is not at all easy to explain what is the difference between the theory of the distribution that we are developed very briefly in these lines and the theory of distribution developed by Piero Sraffa in the “Production of Commodities by means of Commodities” for more than half a century. It is very clear that Sraffa shows in their work that the prices of goods are fixed within the monetary savings for structural reasons, and it is very clear that the Principle of Asymmetry part of the same mathematical structure that used Sraffa and follows the same path, although using a mathematical structure more general and less “ad hoc” than that used by him. For example, the problem of calculating the eigenvalues of the matrices of technical coefficients is common in both structures, however, we think that the condition that uses Sraffa when you apply the “ad hoc” rate of profit  $r$  is common to all industries does thinking about the physical nature of capital, that here we have not needed.

Also, the formulation of the Equation of Closure, which league the economic variables with the  $PIA$ , appears as a differentiator that has nothing to do with the use Sraffa 's surplus (the GDP of the economy) when used only as an element normalizer with respect to which to measure the rest of the variables. But, despite all these clear differences between this work and the one that performs Sraffa, what is certain is that here we are following from the beginning their path and we want to finish this chapter, following you once again for your path.

In the analysis done so far on the monetary surplus, we have not distinguished between the benefits that will remain the employers and the benefits are workers in the form of wages. Now separate the surplus money that they receive from each other, as did Piero Sraffa, and to examine the possible influence that a particular cast is in the minimum benefit of the economy that we have found in the previous section

To do this, we just have to treat the work as a commodity, and let all the monetary surplus that occurs the economy is intended solely to pay the income of the entrepreneurs. To do this, we maintain the matrix of spending  $G$  and income, **And** without changes, but indicating explicitly the number of workers in each company basic  $T_i$  and his wage  $w$ , in addition to the basic basket  $q_i^k$  consumed by a worker generic, and the total number of workers  $T^0$ :

$$\mathbf{And} = \begin{bmatrix} \lambda_1 Q_{11}^o p_1 \\ \vdots \\ \lambda_n Q_{nn}^o p_n \\ T^o w \\ y^{cap} \end{bmatrix} \mathbf{G} = \begin{bmatrix} \left| \begin{array}{ccc} \lambda_1 Q_{11} q_1 & \cdots & \lambda_1 Q_{1n} p_n \\ \vdots & \cdots & \vdots \\ \lambda_n Q_{n1} q_1 & \cdots & \lambda_n Q_{nn} p_n \end{array} \right| & \left| \begin{array}{cc} \lambda_1 T_1 w & \lambda_1 B_1^{cap} \\ \vdots & \vdots \\ \lambda_n T_n w & \lambda_n B_n^{cap} \end{array} \right| \\ \left| \begin{array}{ccc} T^o q_1^k q_1 & \cdots & T^o q_n^p q_n \end{array} \right| & \left| \begin{array}{cc} 0 & 0 \\ 0 & 0 \end{array} \right| \\ \left| \begin{array}{ccc} q_1^{cap} p_1 & \cdots & q_n^{cap} p_n \end{array} \right| & \left| \begin{array}{cc} 0 & 0 \\ 0 & 0 \end{array} \right| \end{bmatrix}$$

The matrix of expenditure and income continues to be a square matrix of  $N+2$  as before, and the changes that appear in it are only conceptual, now that the work is a commodity and its cost structure of manufacturing is the basic basket. Therefore, the problem of finding the monetary surplus of the economy reduces to finding the set of prices and wages that make maximum (or minimum) in excess of the entrepreneurs, but now subject to two constraints. In particular, we must minimize or maximize the expression:

$$B(\lambda_i, p_i) = \sum_{i=1}^n \lambda_i Q_{ii}^o p_i - \sum_{i,j=1}^n \lambda_i Q_{ij} p_j - \sum_{i=1}^n \lambda_i T_i w + \left[ T^o w - \sum_{i=1}^n T^o q_i^k p_i \right]$$

Where the term in brackets is identically zero, since it represents the spending that makes each worker, that is to say, the basic basket.

Subject to two restrictions. The restriction that the *PIA* does not change and is a constant of the economy, which continues to express the constraint  $g(\lambda_i, p_i) = 0$  given by the expression of the *PIA*, where it does not appear explicitly wages or number of employees:

$$g(\lambda_i, p_i) = PIA - 2 \sum_i^n \lambda_i Q_{ii}^o p_i + \sum_{j,i}^n \lambda_i Q_{ij} q_j = 0 \quad (\text{restricción})$$

And a new restriction that league prices of the goods with the salary through the basket, that is to say, it tells us that spent the wage of each worker:

$$f(\lambda_i, p_i) = w - \sum_{i=1}^n q_i^k p_i = 0 \quad (\text{restricción})$$

All expressions, the function whose end is sought subject to the two constraints, they fulfil the necessary conditions that allow to apply the Method of Lagrange Multipliers. We can find the system of equations that must comply with the variables  $\lambda_i$ ,  $p_i$ ,  $T^0$  and  $w$  to maximize or minimize the expression of the business benefits  $B(\lambda_i, p_i)$  when the *PIA* is constant and all the salary is spent in the basket:

$$\frac{\partial B(\lambda_i, q_i)}{\partial \lambda_i} + \eta_S \frac{\partial g(\lambda_i, q_i)}{\partial \lambda_i} + \eta_M \frac{\partial f(\lambda_i, q_i)}{\partial \lambda_i} = 0 \rightarrow (1)$$

$$\frac{\partial B(\lambda_i, p_i)}{\partial p_i} + \eta_S \frac{\partial g(\lambda_i, q_i)}{\partial p_i} + \eta_M \frac{\partial f(\lambda_i, q_i)}{\partial p_i} = 0 \rightarrow (2)$$

$$g(\lambda_i, p_i) = PIA - 2 \sum_i^n \lambda_i Q_{ii}^o p_i + \sum_{j,i}^n \lambda_i Q_{ij} p_j = 0$$

$$f(\lambda_i, p_i) = w - \sum_{i=1}^n q_i^k p_i = 0$$

Doing some operations, we get:

$$(1) \rightarrow \begin{cases} \forall i \rightarrow Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j - T_i w - \eta_S \left( 2Q_{ii}^o p_i - \sum_j^n Q_{ij} p_j \right) = 0 \\ w \rightarrow 0 \end{cases}$$

$$(2) \rightarrow \begin{cases} \forall i \rightarrow \lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} - \eta_S \left( 2\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} \right) - \eta_M (q_i^k) = 0 \\ w \rightarrow - \sum_{i=1}^n \lambda_i T_i + \eta_T = 0 \end{cases}$$

Where  $\eta_S$  and  $\eta_T$  are, respectively, multiplied associated to the constraint that the *PIA* remains constant and that is the multiplier associated with the basic needs of the workers. Let's look at that from the last equation it follows that the multiplier associated to the basket is equal to the number of workers:

$$\eta_T = \sum_{i=1}^n \lambda_i T_i = T^0$$

The two new systems of equations have changed little compared to the original. In reality, the changes are reflected only as it is the new surplus when you remove the part of the workers:

$$Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j - T_i w - \eta_s \left( 2Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j \right) = 0$$

$$\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} - T^o q_i^k - \eta_s \left( 2\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} \right) = 0$$

Let us observe that the term  $(T_i w)$  is what you spend each company basic wages, and the term  $(T^o q_i^k)$  is what you consume of each good basic set of workers, so that the Lagrangian multiplier can be interpreted in two ways, the monetary and physical:

$$\eta_s = \frac{Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j - T_i w}{2Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j} \quad \forall i$$

$$\eta_s = \frac{\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} - T^o q_i^k}{2\lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji}} \quad \forall i$$

The remarkable result is that it is the same result you get Sraffa. When the economy operates at a point at which the surplus business is minimal, then the value of the surplus depends linearly on the value of the wages, by varying these last from zero, when all the surplus goes to the entrepreneurs and the Lagrangian multiplier is maximum, up to  $w_{max}$  when the Lagrangian multiplier  $\eta_s$  is null:

$$0 < w < w_{max} \quad T_i w_{max} = Q_{ii}^o p_i - \sum_{j=1}^n Q_{ij} p_j \leftrightarrow \eta_s = 0$$

What happens when the surplus physique of any goods are the remaining workers:

$$T^o q_i^k = \lambda_i Q_{ii}^o - \sum_{j=1}^n \lambda_j Q_{ji} \quad \forall i$$

With this last attempt to show, from the perspective offered by the matrix of expenditure, the physical structure that is behind the distribution of the surplus by the formation of prices, we finish this chapter. But not before remembering, as he did Piero Sraffa in the "Production of goods for other goods," the present study, as well as the previous chapter where it articulates the Principle of Asymmetry Buyer and Seller, prove beyond any reasonable doubt the absurdity of the theory of the Production Function. Therefore, these two chapters, but especially this last chapter especially devoted to the work of Sraffa, wants to be a tribute to the many people who have been ostracized by economists working for the private universities of the USA.

# PART III

## THE CAPITAL MARKET

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**1. THE TRUTH AND THE LIE**

It can be stated in a very general sense that the reason to be of any economic system is to organize the production of goods and services for further distribution among all the people involved in the production process. In this sense, a monetary economy is no different from any other system that you use in order to meet the many and varied vital needs of the company, except for the essential role of the money in the making of decisions that affect the processes of production and distribution of goods. Some of the many restrictions imposed by the existence of money to the economy we have seen when we study the Consumer Market and enunciated the Principle of Asymmetry, but it will be the study of the capital goods that are bought and sold in the Capital Market when you really show the special nature that the use of the money printed to our modern society.

One of the biggest hits of economists working for the private universities of the USA, and the proof is irrefutable that have managed to get beyond the astronomical salaries of those who enjoy, has been to convince the world that there are no assets that produce income. The magnitude of success that have been achieved can only be seen when we quantify the immense size of the market that have managed to hide: *“a Capital Market in which they are bought and sold property, whose value in the year of 2019 exceeded 200 million euros, only in assets that are listed on the stock exchange”*. There is, therefore, no doubt that the economists who work for the private universities in the U.S. have earned the most splendid salaries that charge, and that is why, far from making us feel anger or contempt for the immense deception to which we have undergone, what we feel for those teachers is awe and wonder at such a feat. Much more still, when we see how they have achieved.

In the economics textbooks used by the teachers of the private universities in the US, the goods are divided into two broad categories, differentiated solely to those who consume them. On the one hand, there are those goods that are consumed by people for the purpose of satisfying the many needs of human immediate and they are named as **“consumer goods”**. On the other hand, there are those other goods which are consumed in the production process with the aim of

creating consumer goods, and those who are given the generic name of capital or “**capital goods**”.

No one will deny that there is something very rare and very illogical in this classification of the goods according to whether they are consumed or not consumed directly by people, as in a monetary economy such a difference has no relevance. First, because, although a few goods, the consume people and other goods to consume the company is in the process of production, both goods are consumed and are, therefore, consumer goods. Second, because both goods are bought and sold on the Consumer Market and, therefore, its price is fixed at the same market and with the same rules. It is very clear that, from the point of view of the relations that it establishes the use of the money in a monetary economy there is no difference between the products that a person takes and the products that they consume a company: they are both bought and sold with money, both are bought and sold in the same market, and both are purchased to be consumed.

In that sense, to distinguish between the two types of goods, which are consumed by people, and those that consume the companies, it's very stupid from the point of view of money, unless, of course, is that it is a classification intentional that it is to propagate a lie. Because, since then, the lies are created and spread with the intention that we may not be able to distinguish between them and the truth.

But even accepting that everything is a lie, it is difficult to believe that you were able to keep hidden the truth for so long, because in order to hide the truth, it is not sufficient to propagate the lie, it is also necessary to prevent the propagation of the truth. Seen in this way, the undoubted success in hiding the financial nature of the capital that they have obtained the economists working for the private universities of the USA, can only be a consequence of the ability to prevent the truth is explained in the text books, to be published in the journals of economics and comes to be known by economists, and not both, for the lies that you have in your university textbooks.

*PAUL SAMUELSON. Paul Samuelson is surely the economist contemporary most famous and most prestigious of the united states. Recently deceased, has worked all his life to the private university of Cambridge located in the state of Massachusetts, the famed Institute of Technology Massachusetts's most well-known for its acronym in English, MIT, being there, where in 1970 he received the Nobel Prize. It was just before these dates, as in the decade of the 60's, when it took place the so-called Controversy of the Two Cambridge in the Samuelson gave the reason to Joan Robinson, when he recognized that the defense of the physical nature of the capital was unsustainable.*

*However, that doesn't seem to mind much, and in the book university of wider dissemination of the past 50 years, written in her own handwriting, the capital appears as a factor of production physical, in fact, the Nobel Prize in Economics was awarded to defend that the nature of the capital is physical, despite the fact that he himself recognized that such a thing was impossible.*

Not only that, the entire book of macroeconomics that writes Samuelson, and that as a result of the awarding of the Nobel Prize for Economics, is converted in the book academic most-read of the story, is a justification of the Theory of the Production Function, you need to have some

semblance of plausibility that is the nature of the capital is the physical why is that nonsense? Why Samuelson lends itself to be the main author of the greatest hoax ever perpetrated in the history of knowledge and accepts the Nobel peace Prize for a theory which he himself recognizes that it is fake?

The answer is direct and clear when we ask ourselves who are the people who run the private universities of the USA, or wonder by the people who awarded the Nobel Prize.

If the money is not distinguished as different goods consumed by the people of those other goods consumed by the companies when it engaged in the production, then the distinction between the one and the other is superfluous, and such rating is only part of the lie that serves to prevent the truth from spreading.

## 2. CAPITAL GOODS

Without any doubt, the peculiarity is most important that you have the monetary economy, and that the difference of all other possible systems designed to organize the production and distribution of goods, it is the existence of the goods they produce “income cash”:

***CAPITAL GOODS:** “In a monetary economy, we call **capital goods** to those assets that produce an income, or to acquire its price of, the possibility of producing an income”.*

*In the definition, “income” is identified with the cash flow that is received by virtue of having a good (in this case, a capital good) and, therefore, it is completely different from the flow of income that is received by developing a job, that is to say, of the wages.*

*In this work, the property, whether consumer goods or capital goods, the we assume always reproducible, that is to say, that there is no limitation to produce them in any amount, despite the fact that the assumption is patently false (there are a number of goods that are not reproducible, which can be both consumer goods and capital, but here obviaremos this issue, and we assume that all assets are infinitely reproducible).*

In general, we will avoid the use of the word “wealth” to refer to the market value that have the capital goods and the name simply as “capital”, although there are authors such as Thomas Pikety that used interchangeably both words, capital and wealth, to refer to the market value of assets that produce income.

The first thing we must understand is that the existence of assets that produce income is an inevitable consequence of the use of money in the economy. To verify this, just us, just remember that, in a monetary economy, any company plays an equation of conservation of monetary flow, or accounting equation, which forces her to get monetary benefits, in such a way that its sales revenue must exceed its costs by shopping. In particular, in the model of an

economy of production simple to constant returns, and when we assume the steady state, the accounting equation that is required to meet any company basic is:

$$\overbrace{q_{ii}^o P_i = \sum_{j=1}^n q_{ij} P_j + B_i^{cap} + B_i^k}^{ec.accounting} \rightarrow \text{income} \equiv B_i^{cap} = q_{ii}^o P_i - \sum_{j=1}^n q_{ij} P_j - B_i^k > 0$$

$$\text{rent} \equiv \text{profits} \geq 0$$

The identification with a lease of part of the surplus money that is spent to pay for the benefits business, is the reason why any company within a monetary economy is a capital good:

*THE BENEFIT AS AN INCOME. The existence of the business benefit, defined as the part of the monetary surplus that cannot be justified with an expenditure of physical needed to carry out the production, allows to identify without ambiguity to any company with a capital good that produces an income equal to the business benefit:*

$$\text{rent} \equiv \overbrace{B_i^{cap} = q_{ii}^o P_i - \sum_{j=1}^n q_{ij} P_j - B_i^k}^{eq. accounting} > 0$$

*The company is a capital good because it produces an income, and produces an income because it produces a profit, and produces a benefit because it is obligated to comply with an accounting equation, and is obliged to comply with an accounting equation because it exists inside of a monetary economy:*

*“The capital goods exist because there is the money, and can exist only within a monetary economy.”*

*It's called “income” in the income of the owners of a well by the mere fact of having the well. Assets that produce income are called capital goods, and the goods that do not produce income are called consumer goods.*

If we accept as true that the business benefit that appears in the accounting equation could not be justified as any spending physical time needed to carry out the production process, then we take as a given that any company is a well of capital produces income cash for those who have it and say, without risk of being wrong, that the existence of money is the necessary and sufficient condition for the existence of capital goods.

To understand that the income for possession actually exist, we have only to observe what happens with the oil (even though it is a non-reproducible). It is very easy to check that who has a well for oil, which in the present is always the sovereign State of a country, it obtains some income from the exploitation and sale of oil that cannot be associated to any expenditure of physical being in the extraction of oil. For example, when the oil is low in your quote of euro 100 per barrel to about 70 euros, in a short period of time, it is very clear that the operating expenses have not decreased over that amount. Therefore, the decrease in the price of oil is not possible

to associate to any physical fact related to the improvement of the process of exploitation and, consequently, the benefit that was obtained before the drop in the price of crude oil, it may not be the result of any expenditure. The same can be said when the price of oil rises sharply, that neither can be attributed to the increase of the benefits of a change in the situation productively.

It is very obvious to everyone, and it is not necessary to insist much on this, that the exploitation of an oil well produces a monetary income to their owners, whose origin alone it is possible to associate with the possession of the oil well.

Another typical example that will allow us to understand very well the difference between a consumer good and a capital good is the possession of a home. A home is a good that is produced, sold and bought, to be consumed like any other good or goods, although it may take much to burn. The house is composed by the aggregation of many goods, as is the case with many other consumer goods, from the pipes by running the water, the doors and entrances that allow you to enter the house, until the furniture that is essential to endow her to be habitable. In addition, its function is to give the “service of habitability” when it is used, so you can consider it without problems as a “consumer good” that meets the need to provide shelter and shelter to the people who use it. In addition, the normal of a house is its owner, who inhabits it, so that housing seems to have all the qualities that we attribute to a consumer good, even if it takes many decades to get a housing age, and we can say that we have consumed.

However, we also know that housing can be used to rent it out to other people and get a monetary income from it. Use your owner is not obliged to give but that, according to the definition we have given of the capital goods, converted to housing in a capital good, even when you are not using in order to obtain from it an income.

So what is a home? What is a consumer good or a capital good? We should be clear that the housing is always, even when inhabits its owner or remain empty without even rented, a capital good.

Why a home that is not being rented is a capital good if you're not getting any income from it? Because the house gets its price from the fact that it generates income when you rent. A home gets its price from the possibility that who has to get an income from it when he or she dedicated to the rental, and not the fact of whether you are getting, or not, an income from it. This is the reason, and no other, which we have demanded that the capital goods that can produce an income, because their market value comes from that possibility. In this sense, the price of a home does not depend upon whether or not you have rented.

***THE HOUSING IS A CAPITAL GOOD.** A shelter can be considered as a company that provides the service of habitability to the people living in it. What people are buying with the payment of rent is a consumer good, “livability”, but the housing is not the consumer that purchase with the rental, but “the company” that is causing the consumer to pay with the rent. You build the housing to produce a consumer good, “habitability”. The housing, vista as well, is a company that produces income and, therefore, it is a capital good.*

Despite the fact that the previous two examples, an oil well, and housing, are not strictly what is meant by a company, if you make it very clear that it is the fact that they are assets that can produce an income so that the difference in a car, a snack or the vision of a film.

### 3. MONEY AS A CAPITAL GOOD

Our next step, now that we already know that the goods they produce rents exist, is to figure out how to put price within the Capital Market solely on the amount of income they produce, and without falling into the easy temptation to assign a price depending on the potential fitness cost of manufacturing each one of the capital goods.

The only way is to give a price to the large and heterogeneous set of capital goods that exist in a monetary economy is compared with a single capital good whose price is known and that is used as a numeraire. It is the same thing that is done with the money when it is used to give the consumer goods price, so that you can compare them with each other. Even when the money has no intrinsic value because the money fiat, consumer goods are still picking “price” relative exchange for money in the Consumer Market.

As the essential feature of a capital good is to produce an income, the well of universal capital that we also have to possess the ability to produce an income. As it is used in the Capital Market to provide monetary price of the capital goods is necessary for the universal good that we also have a monetary price defined and stable. Luckily for all, we must not look far to find in the Capital Market for a good that meets these two essential requirements that we have mentioned: therefore, to be able to provide price to each well of capital solely to the income they produce, we have to find a good of universal capital that has monetary price, concrete, producing income and exchanged in a generic manner with the different capital goods that exist in the Capital Market.

*“Money is a capital good, the price of which is himself and that produces an income when on loan: the interest rate.”*

All the world knows that who is in need of money you can borrow it from a bank in exchange for paying an interest rate on the money borrowed. While the money is not returned, the bank will receive an annual income in exchange for the money borrowed, which is what that indicates the rate of interest. Also, banks often give back with a small income when we give up our money and what we give in temporarily as a deposit. Although, since then, all the world knows that the two rates of interest charged by the bank for the money that it pays and the charged by the bank for the money you provide are different.

Although the reason for which it pays rent, or interest, when it gives the money borrowed has been interpreted in many and varied ways throughout the history of the economy, what we would like to point out here is that, thanks to that there is the interest rate, the loan money can

be interpreted by the one who grants such as the purchase of a capital good, whose price is the amount of money which is transferred in the loan and whose rent is the interest or annual income that occur while you are keep the money on loan.

Precisely, we define the “annual interest rate” or the “interest”, the percentage of the borrowed money that is received annually as income when the money borrowed.

*MONEY AS A CAPITAL GOOD. The money is a capital good because it has the ability to produce an income when it occurs in the loan, and the price as a capital good is he:*

$$\text{rent money} = \text{interest rate} \cdot \text{amount of money borrowed}$$

$$r = i \cdot d \begin{cases} r \rightarrow \text{flow of income} \\ i \rightarrow \text{rate of interest} \\ d \rightarrow \text{amount of money} \end{cases}$$

*The identification of money in a loan with a fictitious purchase of a capital good, the debt, the price of which is the amount of money that we give loan and whose income is the flow of money associated with rate of interest that we receive in return, will allow us to use the loan as well as the capital of reference with which to equip price to all capital goods.*

Economists often consider the interest rate is a constant without dimensions, which is not true, as the monetary income that occurs is, of course, a monetary flow and not a stock money. You should be careful with this, because in all the calculations made here, the rate of interest will always have dimensions of time<sup>-1</sup>:

*The rate of interest relates a stock's money, the amount of money that is provided with a flow of money, the annual income that you receive, so that its dimensions are that of “time-to-the-minus-one”.*

Let us observe that it is entirely consistent to say that the money is a capital good. It is also consistent to consider that the interest rate on the money, “i”, the ratio between the income received and the amount of money that is paid is a constant of the economy that does not change over time.

The identification of money with a capital good is a process that occurs naturally in the monetary savings and what we are doing here is simply to note this fact, empirical, accept it as true, and analyze their consequences. The weird thing is that no one until now it seems to have pointed out explicitly this fact, except the economist the English Joan Robinson, who was always very clear that in order to define the capital goods it is necessary that there be a rate of interest prior, unrelated to the production process, which would allow to escape from the trap that combines the capital with a wealth of accounting physical. The funny thing is discovering that Robinson had always had a reason and, within the complex nature of the money that we used as a universal pattern of change in the Consumer Market is also to be a capital good. The reading of the work of Joan Robinson gives ample proof of this.

#### 4. THE FIRST LAW OF CAPITAL OR THE FIRST LAW OF ROBINSON

Although not usually think of the loan in this way, we have formally identified the act of lending money with the purchase, or the purchase of a capital good whose income is proportional to the rate of interest on the loan and whose price is the amount of money that is paid to:

$$r = i \cdot d \begin{cases} r \rightarrow \text{flow of income} \\ i \rightarrow \text{rate of interest} \\ d \rightarrow \text{money} \end{cases}$$

Seen in this way, it is understood, without difficulty, that you can use the money as a reference, or a pattern to assign a price to the other capital goods, and be able to compare between them according to the income they produce.

The way to proceed is to compare the income that it produces any good capital with the income that produces a loan. When both incomes are equal, we can suspect that the prices of both forms of capital, even though they are very different in nature, are equivalent and have the same value accounting. When we validate provisionally this assumption, and we accept that the price of a capital good either is equal to the amount of money that is necessary to give loan to receive the same income it produces, then the price of a capital good either would be given by the same expression that binds the money with the income that it produces when it gives loan:

$$price_{capital} = \frac{rent_{capital}}{i}$$

*“When the income that is obtained by paying an amount of money is the same as that obtained by the possession of a capital good may be suspected that both forms of capital, for a very different nature, both have the same price in the Capital Market, being indifferent in accounting terms possess a form of capital or possess the other form of capital.”*

But this natural way of proceeding, which allows us to provide a price on the capital goods solely on the income it produces, regardless of the nature and source of the income, it collides with a serious difficulty empirical. It can be seen in the Capital Market that the price at which we buy or sell various assets of capital is not equal to the amount of money that is necessary to give a loan to produce an income equal to that which they produce. On the contrary, what we see in the Capital Market is that the price at which they are sold and bought every one of the assets of capital is, in general, lower than its equivalent in money.

Or saying it another way, it is observed that it is necessary to define a new parameter associated with each capital good, the uncertainty  $\aleph_j$ , to generalize the expression that links the income of the money given on loan with its value. An empirical observation that leads us to formulate the First Law of Capital or the First Law of Robinson:

THE FIRST LAW OF ROBINSON. "In a monetary economy, the market price of a capital good anyone is proportional to the amount of money that is necessary to give the loan to get the same income that it produces, being the constant of proportionality called "Uncertainty" of the capital good."

$$\begin{aligned}
 & \text{renta}_{\text{capital}} = i \cdot \text{Uncertainty} \cdot \text{price}_{\text{capital}} \\
 & \qquad \qquad \qquad \downarrow \\
 & k_j = \frac{r_j}{i \cdot \aleph_j} \left( \begin{array}{l} \aleph_j \geq 0 \\ \aleph_{\text{money}} = 1 \end{array} \right) \rightarrow \begin{cases} r_j \rightarrow \text{rent}_{\text{capital}} \\ \aleph_j \rightarrow \text{Uncertainty} \\ i \rightarrow \text{rate of interest} \\ k_j \rightarrow \text{price}_{\text{capital}} \end{cases}
 \end{aligned}$$

The expression allows you to determine the price of a capital good to know the income that it produces and its uncertainty.

Joan Violet Robinson was an economist English of the second half of the TWENTIETH century, very critical of the concept of physical capital that spread throughout the world economists who work for the private universities of the USA. Their first contributions to the economy were in the study of "imperfect competition", a concept that she's developed in depth, and only after many decades of silence, began to appear in textbooks of private universities in the US without even mentioning it. Much more important was his contribution to the concept of "capital", identical to the one here, we have developed and which even today, after more than 50 years, economists working for the private universities in the united states continue to prevent spread. The name of the first of the three laws of capital as the First Law of Robinson, we only do a posthumous, late and fair recognition to one of the best economists of the TWENTIETH century, whose ideas have been fundamental for the development of the ideas of the authors.

The expression with which it has been endowed with a price on the capital assets is more general than the one that was used to define the loan of money as a capital good, and contains. The value of the uncertainty for the money, as it cannot be otherwise, it is "one":

$$k_j = \frac{r_j}{i \cdot \aleph_j} \xrightarrow{\aleph_{\text{money}}=1} k_{\text{money}} = \frac{r_{\text{money}}}{i}$$

The uncertainty  $\aleph_j$  is an unknown parameter, characteristic of each capital good, which is postulated in the theory, for empirical reasons, and that gives meaning to the name of "law," which we used to define it. It is understood very well that the expression to which it is postulated the uncertainty will only have meaning to the extent that it is:

- a) A constant parameter.
- b) It can be determined for each capital good concrete.
- c) That does not depend on the other variables in the usual of the economy.

In particular, for the "law" makes sense, the parameter uncertainty  $\aleph_j$  associated to any coming of capital has to be independent of the rate of interest:

$$r_j = i \cdot \aleph_j \cdot k_j \rightarrow \aleph_j \neq f(i)$$

It is important to note that the Law of the Capital is formally equivalent to the definition of  $\gamma_j$  the "rate of return on capital", or rate of profit, which is usually defined as the ratio between

the income that produces a capital good and the fitness cost of producing it (there are other definitions):

$$\text{rate of return on capital} \equiv \gamma_j = \frac{\text{profit}}{\text{cost of capital}} = r \cdot \aleph_j$$

Where, of course, it identifies the cost of capital to the price of the physical to create the capital good, which indicates the physical origin of the concept of capital.

Although both expressions are formally identical, and it appears that they are saying the same thing, it is certain that each one of them attributed to a different nature to the capital. The Law of Robinson shows the nature of financial capital, and declares that the market price of a capital good is a consequence of the income that it produces. On the contrary, the rate of return on capital shows the physical nature of the capital, and declares that the income is a consequence of the price of the physical fabrication of the capital good. Both statements are completely different because they both show a nature of the capital completely different.

*DAVID RICARDO AND KARL MARX. David Ricardo is perhaps, next to Karl Marx, the economist and the most influential of all times. Lived in England in the first half of the NINETEENTH century, just a few decades after the Independence of the united states and the French Revolution, when liberal ideas spread throughout Europe to the step that marked the armies of Napoleon.*

*It is very important to understand that the liberalism of the time needed, not only to delegitimize the hereditary origin of the power of the monarchy, but above all I needed to delegitimize the source of its economic power.*

*As you would also Karl Marx decades later by publishing "The Capital", David Ricardo published the Treatise of Political Economy and Taxation" with the intention to demonstrate that the income of the lives of the aristocracy of his time from the possession of the earth, and their source is almost always inherited. They are, therefore, income that you get without doing any work and without assuming any risk. On the contrary, the income earned by entrepreneurs is achieved thanks to the investment of money to create new wealth that did not previously exist, which assumes at least an economic risk that difference to entrepreneurs in a very clear way of the landowners.*

*Ricardo in his Theory of Rent, is denouncing the social structure of his time and the real reason why that arises liberalism. In his book, difference three sources of income: rent, profit and wages. The income is the income that is obtained from the possession of the land. The benefits are the revenues that are derived from the investment of money in productive assets or capital. And wages are income from work. But it hides very well, and leaves it outside the division into three classes, to lenders who derive their income from the interest from the loan of the money.*

*The great achievement of Ricardo was, therefore, ideological, when the Theory of the Income Differential is able to show very powerfully, that the landowners are earning their income by owning the land, which at that time was the main source of wealth. While the industrious entrepreneur, who at that time began to be associated with the nascent liberal bourgeoisie, obtains their income to invest their money in the creation of new means of production.*

*It is against this idyllic idea about the beneficial and productive investment of the capitalist bourgeoisie, against what you are trying to fight Karl Marx fifty years later, with little success or no success, depending on who you look at and depending on how you look at it, but ignoring both in its dialectic struggle that the capital goods and their benefits, in little or nothing to differentiate it from the income that it produces the possession of the land.*

What is the point of the First Law of Robinson?

Yes it makes sense. The very existence of the Capital Market within the monetary savings as the place where you buy and sell capital goods fully confirms the concept of capital as we have defined, since the basic function of the Market of Capital is to determine what particular value is the uncertainty  $\aleph_j$  associated with each of the different forms taken by capital goods.

## 5. THE SECOND LAW OF CAPITAL OR THE SECOND LAW OF ROBINSON

In the previous section we have postulated, in the form of law microeconomic, the existence of uncertainty  $\aleph_j$  to be able to explain the different valuation that makes the market of the income of the different capital goods. No one will deny that there should be a parameter analogous, but associated to all the economic, that allows us to know the aggregate value of all capital goods in an economy knowing the aggregate rent that occur.

***THE SECOND LAW OF ROBINSON:** "In a monetary economy, the price of the aggregate of the capital is that which makes the rate average of return on equity  $\gamma$  is equal to the product of the interest rate by the Factor of Uncertainty."*

$$k_{capital} = \frac{r_{capital}}{\bar{\aleph} \cdot i} \leftrightarrow \gamma = \bar{\aleph} \cdot i \quad (\text{Second Law of Robinson})$$

*It can be shown that the factor of uncertainty is equal to the weighted average with respect to the capital of the uncertainties:*

$$\bar{\aleph} = \frac{\sum \aleph_j \cdot k_j}{\sum k_j}$$

The Second Law of Robinson is the version macroeconomic of the First Law of Robinson. Introduces a new parameter, the Factor of Uncertainty  $\bar{\aleph}$ , when you consider all of the capital goods present in the economy, as if of a single capital good, is involved, and calculate the uncertainty associated with the total income produced in the same way that we have done for each of the capital goods. Obviously, the sum is performed only on the capital assets that produce income, but here we suppose always that all the capital that exists in the economy is producing income.

As with the first law, so that the expression makes sense and you will be able to give the name of “law,” the Factor of Uncertainty  $\bar{\aleph}$  that appears in the expression has to be independent of the other economic variables. In particular, it has to be independent of the rate of interest:

$$r_{capital} = \bar{\aleph} \cdot i \cdot k_{capital} \rightarrow \bar{\aleph} \neq f(i)$$

But this is something that is met automatically, since the value of the Factor of Uncertainty  $\bar{\aleph}$  is deduced from the first law, and is valid when it is this. In fact, the second law will be valid when is the first law, since  $\bar{\aleph}$  is equal to the weighted average of the uncertainties regarding the value of the capital goods:

$$r_j = i \cdot \aleph_j \cdot k_j \rightarrow \left\{ \begin{array}{l} k_{capital} = \sum k_j \\ r_{equity} = \sum r_j = \sum \aleph_j \cdot i \cdot k_j \end{array} \right\} \xrightarrow{\bar{\aleph} = \frac{r_{capital}}{i \cdot k_{capital}}} \bar{\aleph} = \frac{\sum \aleph_j \cdot k_j}{\sum k_j}$$

Where it is apparent that the rate of return of the entire economy is equal to:

$$\gamma = \frac{r_{capital}}{k_{capital}} = \bar{\aleph} \cdot i$$

Recall that the product  $\aleph_j \cdot i$  is the rate of return  $\gamma_j$  of a capital good generic “j” according to the First Law of Robinson (microeconomic), while the product  $(\bar{\aleph} \cdot i)$  is the rate of return  $\gamma$  of all the capital of the economy. It is proper, therefore, to formulate the relationship of macroeconomic above as a law, the Second Law of Robinson, but in reality, both the parameter  $\bar{\aleph}$  as the law itself, are a consequence of the first law and are deduced from it.

The interpretation we have given of the theory to the uncertainty of the capital goods  $\aleph_j$  as the lack of knowledge on the flow of income future, it is not difficult to show that, in general and in the real world in which we live, the value of the Factor of Uncertainty  $\bar{\aleph}$  must be always greater or equal to “1”, reflecting the belief that in the future they are not going to maintain the rents that create the different ways in which exist in the present, the capital. That is what is expected to happen in an economy in a state of evolution, where a part of the business disappears to make way for new companies in a process of creative destruction similar to that described by the economist Schumpeter.

But this same interpretation of the parameter  $\bar{\aleph}$  also leads us to suspect that there should be capital assets that are expected not only to keep las income in the future, but also the increase. Those goods will have an uncertainty  $\aleph_j$  less than “1” and are easily identifiable in the real economy in homes built in the centers of most major cities, and with other forms of capital real estate, as are the local offices, and also in urban centers. As it could not be of another way, the capital assets with a value in the uncertainty smaller than “1” will appear in the speculative bubbles, so the parameter can be used without difficulty to detect its presence.

## 6. THE THIRD LAW OF CAPITAL OR THE LAW OF PIKETTY

A question that arises naturally from the exposure that we're doing on the financial nature of the capital and its valuation in the market, is related to the evolution which is still in the time of the Uncertainty Factor that appears in the Second Law of Robinson:

*Towards what value tends Factor of Uncertainty  $\bar{\aleph}$  in an economy that does not change, or changes very slowly in time?*

It stands to reason that, if the Factor of Uncertainty is measured by the lack of knowledge in the future income-producing capital goods, then in an economy nearly stationary, or grow slowly, the future income will also be very stable and will change the value of slowly, so that the valuation that makes the Capital Market of the capital goods is expected to be almost equal to the money that can be loaned. In such a situation, the Factor of Uncertainty  $\bar{\aleph}$  of the economy should bear to a value close to and slightly above "1", pointing out that there are no substantial differences between the money that is given in loan (capital money) and the rest of the different forms of capital:

$$\gamma = \frac{\alpha}{\beta} = \bar{\aleph} \cdot i \quad \xrightarrow{\bar{\aleph} \rightarrow 1} \quad \begin{cases} \gamma = i \\ \beta = \frac{\alpha}{i} \end{cases} \quad (\text{Economy without uncertainty})$$

The reason of this evolution is to be found in the very concept of uncertainty. If an economy is so predictable that we know when a capital good will withhold income and when a new capital good will to them, it will be possible to diversify investments so that the income match with an income that produces a good capital whose uncertainty is equal to "1". This is the inevitable conclusion to the one that bears the financial nature of capital and the interpretation of the parameter uncertainty that is introduced by stating the First and Second Law of Robinson, and that we're going to finish now formulated the Third Law of Capital or the Law of Piketty:

**THE LAW OF PIKETTY:** *In a monetary economy, stationary, and no changes in production or distribution, the Uncertainty Factor in capital  $\bar{\aleph}$  is worth "one":*

$$\gamma = i \quad \text{or} \quad \bar{\aleph} = 1 \quad \text{or} \quad \beta = \frac{\alpha}{i} \quad \text{Law of Piketty}$$

*Or, another way: "In an economy without uncertainty, the return rate of the aggregate capital is equal to the interest rate on the money".*

As we have said, in an economy stationary or without changes in the forms of production, there will be no reason for the income of the capital goods are subject to uncertainties in the future, so that the factor of uncertainty  $\bar{\aleph}$  of the economy as well as the uncertainty  $\aleph_j$  of each of the capital goods should be in such a case, slightly higher than "1".

### **"Capital in the Twenty-first century" by Thomas Piketty**

It is interesting to note that also Piketty makes this same question about the future value of the aggregate capital of an economy in its publication, "The Capital of the Twenty-first Century", and, like us, he answers the question by making a law. In your case, formulating his "Second

Fundamental Law of Capitalism”, focusing more and more on the swampy trap concept that defines the capital as a “wealth accounting”:

*...The second salient fact refers to the comparison between Europe and the United States. As expected, the shocks of the period 1914-1945 affected Europe with much more strength, so that the ratio capital/income was lower there from the 1920s until the 1980s. If we exclude this long period of war and its consequences, however, we find that the relationship between capital/income has always tended to be highest in Europe.*

*This was the case in the NINETEENTH and TWENTIETH centuries (when the ratio of capital-to-revenue ratio was 6 to 7 in Europe, compared with the 4 to 5 in the United States) and again in the late TWENTIETH century and early Twenty-first: the private wealth in Europe once again surpassed the levels of the United States in the 1990s, and the relationship between capital/income is now close to 6, compared with a little over 4 in the United States.*

*These facts have yet to be explained. Why is the reason capital/income is at all-time highs in Europe, and why it should be structurally higher in Europe than in the United States? What magical forces implies that the capital of a company must be six or seven years of national income, instead of the three or four? Is there a level of balance of the relationship between capital/income, and if so how is it determined? what are the consequences for the rate of return on capital, and the relationship between this and the division of capital and labor in the national income? To answer these questions, I will start by introducing the legislation dynamic that allows us to relate the ratio of capital/income in an economy with their savings and their rate of growth.*

***The second fundamental law of capitalism:  $\beta = s/g$***

*In the long term, the relationship between capital and income/  $\beta$  is related in a simple and transparent way with the savings rate  $s$  and the growth rate  $g$  according to the following formula:*

$$\beta = s/g$$

*For example, if  $s = 12\%$   $g = 2\%$ , then  $\beta = s/g = 600\%$ .*

*In other words, if a country saves a 12 per cent of its national income each year, and the growth rate of national income is 2 percent per year, for long times, the relationship between capital/income will be equal to 600 percent: the country will have accumulated the capital equivalent of six years of national income.*

*Tomas Piketty, capital in The Twenty-first century (2012)*

Needless to say, that if in the Theory of Madrid, we tried to answer this and other questions about the valuation of capital goods, it has been only after the reading of the book of Piketty, so that the Third Law of Capital that we have made it never would not have been possible without the precedent that creates Thomas Piketty in his work, where he asks the right questions, but fails to present a Theory of Growth that is consistent with which to answer them, that is what

you need in order to justify the relationship between the savings and the valuation of the capital that has entered its second fundamental law.

Regardless of that, “the second fundamental law of capitalism” as the formula Piketty, is true or is not true, and regardless of who can be more or less supported by the empirical data that he presents in his book (something that is not at all clear that to happen, yes that is very evident that the theory that exposes Piketty, is a theory of the growth-based, once more, in the physical nature of the capital where the value of the capital increases due to the accumulation of physical capital that buys savings:

To see that the theory of capital, which exposes Piketty speaks of the physical nature of the capital, suppose that an economy that saves 12% of the GDP and investment in capital. If the value of the GDP is 1,000 euros, you will be saving \$ 120 a year, and the increase in physical capital will be 120 euros per year, that is to say, that the capital is growing at 12% of *GDP*. But if the *GDP* grows, the race between the accumulated capital and the growth of *GDP* will remain the partner only when its ratio  $\beta$  has the value of 6:

$$\frac{K + \Delta K}{GDP + \Delta GDP} = \frac{6120}{1020} = 6 = \beta$$

That is to say, in an economy that is growing at 2% per year, which saves 12% of the GDP and that has a value of  $\beta$  less than 6, the capital is growing faster than the *GDP*. Or also, in an economy that is growing at 2% per year, which saves 12% of the GDP and that has a value of  $\beta$  greater than 6, the capital grows more slowly than *GDP*. Therefore, the parameter  $\beta$  tends to:

$$\beta_{t \rightarrow \infty} = \frac{s}{g}$$

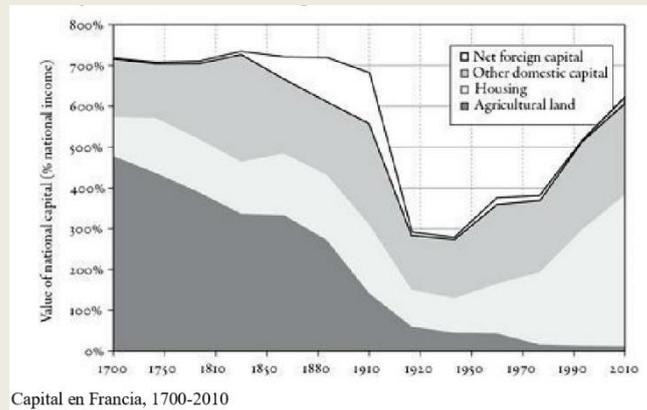
The idea of Piketty is very bright, but only if the nature of the capital is physical. In fact, it can be shown very easily that the law is fulfilled only if it is also true that *the growth rate of the capital of an economy is equal to its rate of savings*, which is not at all clear that to happen.

Obviously, you must be careful not to fall into a tautology to identify the increase in the capital that have individuals with the increase of your savings, as in such a case it is evident that the second law of Piketty is met. When Piketty speaks of saving refers to the money used in the purchase of real physical capital (that is, goods that are consumed in the physical training of the companies). So strict is money that is not spent on consumption goods but also saves so that it is not at all clear how it can be measured, in fact, Piketty never comes to show a graph of how changing the monetary savings that are done within the economy, so that can't demonstrate empirically the validity of the second law.

*THE CAPITAL PHYSICAL PIKETTY. Despite all the doubts that presents the physical nature of the capital, the motivation that continues throughout the book, and what we think is the central idea of Piketty along of “Capital in The Twenty-first Century”, is that the value of capital tends towards a constant value:*

$$\beta_{t \rightarrow \infty} = \frac{s}{g}$$

*This is very well seen in the graph with the Piketty shows the evolution of  $\beta$ , and that seen without difficulty that the parameter remained unchanged for more than 200 years, which clearly indicates the presence of a law.*



*Piketty thinks that you can easily justify the constant value of  $\beta$  equal to about 7 times the GDP associating a savings rate, also constant, 14% of GDP. What is consistent with the plateau of the graph and allows to explain it very well.*

*But then, as it is logical, it is very difficult to find an explanation for the huge “hole” that appears throughout the entire TWENTIETH century in the valuation of the capital, using the same second law. Despite this, Piketty if you make an observation extraordinary when it predicts that the value of aggregate capital with respect to GDP is heading toward the value that was throughout the EIGHTEENTH and NINETEENTH centuries. In fact, it is the slope almost constant of the valuation of the capital, when the economy out of the slump, the thing that makes you believe that it is a clear demonstration of the physical nature of the capital.*

The authors of this work we recognize that we would never have raised the question about what value tends to the aggregate capital, but we would have seen it before made in the book of Thomas Piketty. Therefore, there never have attempted to explain the evolution of the parameter  $\beta$ , if we had not seen before the “Pit of Piketty” on the graph that appears in his book. Therefore, although in brief we will see that it is very easy to explain from a financial point of view the changes that are observed in the graph of the valuation of the capital, we do not have the slightest doubt that the Third Law of Capital that we have made here, yes it ultimately true, it has to be named the “Law of Piketty”:

$$\beta = \frac{\alpha}{i} \quad \text{The Law of Piketty}$$

Clara Rojas García, Julia Rojas García, Pedro Rojas Sola  
05 of march in the year of 2021

### **1. THE PARAMETERS ON WHICH DEPENDS THE CAPITAL.**

The three laws of capital we speak of the financial nature of capital and how to value capital assets within the Capital Market, so that it is necessary, first of all, explain the meaning of the various parameters that appear in the three laws, their possible values and that they depend on these. Only then can one establish the validity or falsehood of the three laws.

In particular, it is necessary to explain in more detail which is the parameter uncertainty, which is the rate of interest and who the fixed, how the market or the monetary authorities? But it is also important to explain the other parameters that do not appear implicitly in the laws, but that we can reasonably expect that can influence the valuation of capital goods, such as, inflation or taxes.

Let's go to evaluate these issues.

### **2. THE MEANING OF THE PARAMETER UNCERTAINTY.**

Since the beginning, we understood that the parameter that measures the uncertainty  $\aleph_j$  must be intimately linked with the likelihood that they will hold in the future, the monetary income produced by each capital good concrete. It is logical. Yes the price of a capital good comes from its ability to produce an income, and the income is, by definition, a revenue stream that is maintained over time indefinitely, then, it is logical to think that the greater the doubt that exists about the amount of income in the future, the lower will be the price at which it sells in the present, the capital good and the higher the value of the uncertainty  $\aleph_j$  that aparece in the Law of Robinson.

But, though this simple idea of uncertainty is very attractive, we should not forget that the capital goods are valued in the Market of Capital by comparing it with the income that comes from the money that is given out on loan, so to be able to carry out the arbitration is necessary that any person wishing to apply for a loan at the rate of interest to be able to buy a capital good that you think that this underestimated. Without this prerequisite, which is implicit in the nature of financial capital, it would be impossible to assert the validity of the law of Robinson and talk of a Capital Market where the law is fulfilled:

$$r_j = \aleph_j \cdot i \cdot k_j$$

Let's see why.

If we accept as true, that any person who so requests can get a loan at the interest rate of the market for buying a capital good, then anyone who thinks you can afford to repay the interest and principal with the income that produces a capital good, ask for a loan and purchase such capital good. But this will happen when you think the uncertainty factor of the capital good that purchase with the loan is greater than "1", because, otherwise, you will have to put extra money to repay the loan. If we call  $k_j$  the price of the capital good:

$$\left. \begin{array}{l} (\text{income}) \rightarrow r_j = \aleph_j \cdot i \cdot k_j \\ (\text{interests}) \rightarrow r_{\text{money}} = i \cdot k_j \end{array} \right\} \xrightarrow{\aleph_j > 1} r_j > r_{\text{money}} \rightarrow r_j = r_{\text{money}} + \frac{\text{main}}{\text{n fees}}$$

The expression tells us that the buyer of a good capital whose uncertainty is greater than "one", you can use the income  $r_j$  that produces the well of capital to pay the interest on the loan and return it slowly to the main. In such a case, after a time, the "investor" will be returned to the loan and will remain the capital good.

Therefore, there must be a good reason for agents to not run away and go to borrow money on credit, to buy capital assets whose uncertainty is greater than "1", almost all of them are. And the reason is no other, than what really is telling the potential buyer an uncertainty  $\aleph_j$  greater than "1" is that the income that produces the well of capital will not be kept long enough to be able to repay the loan, that is the interpretation we have given the uncertainty from the beginning. In fact, we can do a few simple math operations (which we will not do), and obtain the relationship between the factor of uncertainty and the time during which it is expected to remain the rent:

$$T = \frac{1}{(\aleph_j - 1) \cdot i}$$

Where  $T$  is the number of years during which maintain the well-giving an income, and  $i$  is the interest rate on the money. The expression we face that when the uncertainty is "1" the well will keep indefinitely giving you income, but the greater the uncertainty is lower, the time will be the time that revenue.

But, the important thing is to understand that we can only be confident that the Capital Market is doing its function, when any person wishing to request a loan at the interest rate in the market to buy capital goods, because only in this way, the uncertainty will be expressing doubts that people have about the future of income.

This is what happens when someone believes that a capital good has an uncertainty  $\aleph_j$  real that is below the value that you assign to the market, which will attempt to buy it if you have access to credit. And, it will do the opposite when you think, rightly or wrongly, that the uncertainty associated with a capital good that it possesses is above the value that you assign to the market, which will try to sell it to make liquid savings and acquiring another capital good in its place.

*THE ARBITRATION OF THE CAPITAL MARKET. From the point of view of the Capital Market, and the agents who participate in the economy have unlimited access to loans at the interest rate of the money, we can be sure that the uncertainty  $\aleph_j$  of a good capital indicates the limit beyond which it will be advantageous to go into debt to buy, and below which it will be advantageous to sell it and give the money on loan.*

*The business of borrowing money to buy a capital good that you think is undervalued, it is known in economics with the word "leverage". It is a market mechanism that has a very bad reputation among the economists of the left (which tend to hate enough to the financial markets), because they think that the benefit that you get who you leverage comes not from the provision of any service, but the bet and the game, which is completely wrong.*

*Unlike what happens in the Consumer Market, the prices of the put sellers in the Capital Market pricing is put through the buying and selling, so it is necessary that you have the "liquidity" enough for the purchase and sale are carried out without problems. Without liquidity is not possible that the capital goods have its actual value, because it can't be done on the leverage that allows arbitration in the Capital Market.*

*Of course, here we are not advocating the speculation, that almost never be performed without a control criminal market, nor are we saying that the speculation is not harmful to the economy, but we must not forget that the speculation and arbitrage are completely different things. Precisely, it is the liquidity and the fact that anyone can ask for a loan at the interest rate of the market, which ensures that there is no speculation in the market.*

*The liquidity of the Capital Market, and therefore the leverage, it is vital for the capitalist economy.*

### **3. THE INTEREST RATE ON THE MONEY**

Since is a historical record of the presence of the money within the society, there seems to have existed alongside it, the inevitable interest rate that is claimed when he gives the money on loan. Nobody should be no surprise then, that one of the major controversies in which it has been involved in economic theory since the night of the times, it is the inevitable question about the origin of the interest rate on the money and on what determines its value, without which it has never come to any satisfactory answer that most economists accept it as valid.

In the theory we are developing we have identified unequivocally and “money” as the capital good that is used in reference to give price to the rest of the capital goods, thank you, precisely, to the income that it produces when it is given on loan. But this should not make us forget that he has not answered the question of why the money produces an income when it occurs in the loan, nor has it said anything about who or what sets its value.

Therefore, to assert that the interest rate on the money exists because there are assets that produce income, but it can be a statement very anti-intuitive and almost tautological, it is certain, that is a very old idea that has been defended by almost all economists.

*THE INTEREST RATE of the money, there is always positive, because with the money that it borrows can be purchased capital assets that produce income. That is to say, the rate of interest of money is positive because there are assets that produce income.*

Let's start with an example to understand why the existence of the rent obliged to ask for an interest for money that it offers.

A house, as we all know, it is a capital good that has a price and that the owner can rent in exchange for a rent. Imagine, making it a little more, the price of housing is 100,000 euros, and that can be rented easily in exchange of an annual income of 5,000 euros, after removing expenses.

No one will deny that, if a bank would give us the loan of 100,000 euros to buy the house, with the only obligation to give back a little to 100,000 euros in the main, but without having to pay any interest on the money that we have provided, we could buy the house and to return the principal of the loan without difficulty at a time more or less long, using only the income that you get to rent the home.

In the example, we see clearly that the existence of assets that produce income means money that can be loaned to pay an interest, for the simple and silly reason that with the money that can be loaned you can buy assets that produce an income with which it is possible to return the principal of the loan without any problem. The existence of the interest that you pay the money, spoil invariably what would otherwise be a windfall for people who have unlimited access to credit. See with crystal clarity that, indeed, the interest is there because there are assets that produce income.

Another way to explain the same thing, and that certainly allows us to understand more easily the idea of the background, is imagining a monetary economy in that there are no assets that produce income and showing why, in such a case, it should not be ordered any interest the money borrowed.

Let's imagine for a moment a monetary economy in which there are no assets that produce income, that is to say, there are no capital goods, but if there is the money. In an economy with these characteristics, the money can only be used to buy consumer goods, which leads us to ask ourselves, first of all, the reason why someone would like to save money. If we think a bit of it, we reach the conclusion that the only intention that you can have who saves money in an economy as well, is to reduce its current consumption to increase it later, that is to say, the one

who saves you are using money as a store of value for the purchase of consumption goods in the future.

We must also ask about what can be the intention that a person asks for a loan. In an economy without capital goods, the only reason that someone can ask for a loan is to increase its current consumption, at the expense of lower consumption in the future when you have to return the money of the loan.

This situation is very curious, because we are in an exchange of services between those who wish to advance the consumer and those who want to defer it. An exchange between those who save and those who spend on credit. In such a situation, it is very reasonable to suspect that the interest rate will be around zero, being negative when there are more people willing to defer consumption, that is to say, willing to save, and being positive when there are more people wanting to advance the consumer, that is to say, wanting to spend on credit. In an economy as described above, when the flow of the expenses that you want to defer to match the flow of the expense that you want to move, the interest rate must be zero.

We see very clearly, that in an economy that cannot be purchased capital goods, the rate of interest round environment to a value of zero, and will only be different from zero when the desire added save and desire aggregate spending to differ (as long as the legal system guarantees the repayment of loans, which usually happens).

In short, if in the monetary savings, real interest rate is positive, is because of who asks for money in the loan you can use it for the purchase of capital assets that are expected to get an income with which they can return the principal of the loan. This is what we call leverage.

*THE APANCAMIENTO. The mechanism of borrowing money to buy capital goods with the intention of returning it for the income that it produces are referred to as leverage. In general, the leverage is highly frowned upon by some economists because they tend not to understand that by means of this mechanism is as arbitrator in the Capital Market the price of the different capital goods.*

*How much is a capital good? How much is the income that it produces? Only you can know when there are people who are willing to borrow at the market interest rate to purchase them. With these leveraged buyouts, the agents set the price of capital goods to the set of the uncertainty attributed to the income they produce.*

*In particular, in an economy in which it is possible to access without restriction to any amount of money to the interest rate in the market, a capital good producing an income of  $r_j$  and that has a price  $k_j$  has to have an associated uncertainty  $\aleph_j$  worth:*

$$k_j = \frac{r_j}{\aleph_j \cdot i} \rightarrow \aleph_j = \frac{r_j}{k_j \cdot i} = \frac{r_j}{r_{money}}$$

*Obviously, it is the interest rate on the money that you set the value of the capital goods, but that is only possible to the extent that you can get credit unlimited. In the opposite case, when it may not be the leverage and there will be no arbitration.*

## Who sets the value of the interest rate?

We conclude that, in a monetary economy, not just the money has to be paid with an interest rate greater than zero, but, in addition, access to credit has to be unlimited so that leverage can set the value of the capital goods. But, who fixed the value of the rate of interest? Who decides what value does it have?

Of course, to fix the interest rate of the money to a particular value necessarily have the ability to pay any amount of money that is requested of such interest rate. If this condition is not met, it makes no sense to talk about someone fixed the interest rate on the money. In that sense, only the commercial and investment banks have the legal privilege of creating money out of nothing and lend it out, so that they are fixing the interest rate on the money when granting credit. However, it is very clear that in the crisis, deflationary the banking system is illiquid and the banks are unable to sustain the provision of credit without the help of the Central Bank, so that it is not very clear that the banking system is actually able to fix the interest rate on the money when it gives liquidity to the system.

*WHATWHAT INTEREST RATE? In the monetary savings today, is the Central Bank who creates money out of nothing and lends to commercial banks and investment at the request of these, the "overnight rate" with a mechanism that we will discuss later, when we look at the "Banking System". But here we are calling the "interest rate" at the price at which they lend money to banks when someone goes to buy a home, or when any company wants to make an investment, and that is much higher than the overnight rate, so that there seems to be two interest rates in the economy, which is used for loans to the consumption and investment, and another that used the Central Bank to provide liquidity to the banking system. This is not true.*

*In addition, to complicate everything even more, in general, economists associated with the interest rate on the money with the interest rate that the government pays their credit, treasury bonds, and whose value sets the commercial and investment banks when they lend money to the government.*

*If the situation was not already complex enough, the current large-scale purchase of assets by the Central Bank in the Capital Market to provide liquidity to the economic system, alters the rate of interest treasury bonds, so that it is difficult to determine what is the interest rate on the money, or who is setting, if the commercial and investment banks or the Central Bank.*

*However, here we are calling the "interest rate" at the price at which it lends money to carry out the leverage in the Capital Market, it is not possible to identify with any of the two rates above, because the money is paid to a different interest rate according to who is the debtor, depending on the creditworthiness of that is attributed to it.*

*It is logical. You're not going to charge the same interest to a government that asks for a loan of 10,000 million euros to an individual who asks for a loan to buy a car.*

*It would not make sense, therefore, one cannot speak of a rate of interest that is defined but a rate of interest that goes from the overnight rate until the onerous interest rate of credit cards.*

*We see, that in the economy there is some confusion about what is meant by interest rate because there are different lenders and different access to different lenders. The confusion, therefore, has its origin in the privilege granted by the Central Bank to actors who are determined, as are the private banks, to the detriment of other actors, such as companies or individuals, without which this very clear that this differential treatment really is this justified.*

*(go over to the front to address the issue, in relation to the liquidity of the Capital Market).*

#### 4. THE INFLATION RATE AND THE ASSESSMENT OF THE CAPITAL.

In theory, it has been identified as “the capital” with the assessment that makes the Capital Market of the different streams of income that will occur in the economy, so it is important to know how to change the valuation when there is inflation in the economy. In particular, it is important to check if the particular form have the three laws of capital remains valid when the economy is inflationary, or otherwise suffer any change.

The economist who first job thoroughly the topic on the impact of inflation on the value of the capital goods was in american Irving Fischer, who already know here by the constant that bears his name. Now, we will simply repeat very quickly some of the conclusions of his work, which has already more than 100 years old, without entering into the details of how to get to them, but within the context of the formulation of the three laws of capital.

Inflation is defined in the monetary savings as a generalised increase of the prices at which the goods were sold for consumption. In practice, as not all prices change in the same way or in the same proportion, what is done is to define the average inflation rate  $\pi$  as the percentage change in the price of a “basket of goods” chosen for that purpose, in a period of time  $\Delta t$ , which is typically one year:

$$\pi \equiv \text{rate of inflation rate} \rightarrow \pi = \frac{1}{p_{basket}(t)} \frac{p_{basket}(t + \Delta t) - p_{basket}(t)}{\Delta t}$$

Since the variables that described the economy are no stocks of money, but are monetary flows, it is better to define inflation in reference to the expense necessary to acquire a standard flow of goods. In this way, inflation is the percentage change annually, the standard flow of spending that allows for the purchase of the standard flow of goods. If we call  $\varphi(t)$  to the flow of spending that allows you to buy the standard flow of goods (basket of goods), and if we call  $\varphi(t + \Delta t)$  the gas flowto, that after a period  $\Delta t$ , allows you to purchase the same basket of goods, then:

$$\pi = \frac{1}{\varphi(t)} \frac{\varphi(t + \Delta t) - \varphi(t)}{\Delta t} \quad \varphi(t) \equiv \text{monetary flow}$$

With this definition, the inflation rate has dimensions of time<sup>-1</sup> (as in the first expression), which can complicate your life much, because in the current economy the inflation rate  $\pi$ , the rate of interest  $i$  and the real interest rate  $i^{or}$  considered parameters without dimensions that relate to stocks of money, but of course they are not. This is seen very well in “the equation of Fisher” that relates to the three parameters, where all of them are clearly dimensional:

$$(1 + i^o) = (1 + \pi)(1 + i) \quad \begin{cases} \pi \rightarrow \text{inflation rate} \\ i \rightarrow \text{interest rate} \\ i^o \rightarrow \text{real interest rate} \end{cases}$$

We will not enter now into this problem of the dimensions, but in figuring out how to change the law of Robinson when there is inflation. Let's clarify a little bit of this by comparing two economies, one with inflation and the other without inflation:

$$\begin{aligned} r_j &= \aleph_j \cdot i \cdot k_j \\ r_j^o &= \aleph_j \cdot i \cdot k_j^o \end{aligned}$$

The first expression is the law of Robinson in an economy in which there is inflation, while the second expression is the same law, but using the above index to zero to indicate that they are the variables in an economy without inflation. We assume that the interest rate is the same in both economies, and that the uncertainty  $\aleph_j$  that appears in the law does not depend on either the interest rate or the rate of inflation. What we will show is that this is only possible if both the revenue, as the price of capital, suffer on average the same inflation that suffer the consumer goods. Accept that it is true, and that the income suffers from the same inflation, consumer goods, and take a well-generic j:

$$r_j = (1 + \pi) \cdot r_j^o \xrightarrow{r_j^o = \aleph_j \cdot i \cdot k_j^o} r_j = (1 + \pi) \cdot \aleph_j \cdot i \cdot k_j^o \xrightarrow{r_j = \aleph_j \cdot i \cdot k_j} k_j = (1 + \pi) \cdot k_j^o$$

We see that when the capital suffers an inflation rate equal to the inflation that suffers the income the expression of the 1st law is consistent and only depends on the nominal interest rate, that is what we can expect to happen in an economy where the income comes from the benefits that are obtained from the sale of consumer goods, so that will go up in nominal terms when they raise these and fall in nominal terms when you drop these. Therefore, one can expect an inflation of the valuation of the capital, equal to the inflation suffered by the rest of the consumer goods, which is consistent with the wording of the law of Robinson and is also consistent with the other two laws. According to all of the above uncertainty  $\aleph_j$  of the capital goods should also be independent of the rate of inflation:

THE THREE LAWS OF CAPITAL	
$r_j = \aleph_j \cdot i \cdot k_j$	<i>1st Ley Robinson</i>
$r_{capital} = \bar{\aleph} \cdot i \cdot k_{capital}$	<i>2nd Law of Robinson</i>
$\bar{\aleph} = 1 \quad \gamma = i \quad \beta = \frac{\alpha}{i}$	<i>Law of Piketty</i>

*The formulation of the three laws of capital is independent of the rate of inflation, which is consistent with the assertion that the value of the capital goods changes nominally at the same rate at which changes consumer goods, which confirms the nature of financial capital.*

## 5. THE VERIFICATION EXPERIMENTAL LAW OF PIKETTY

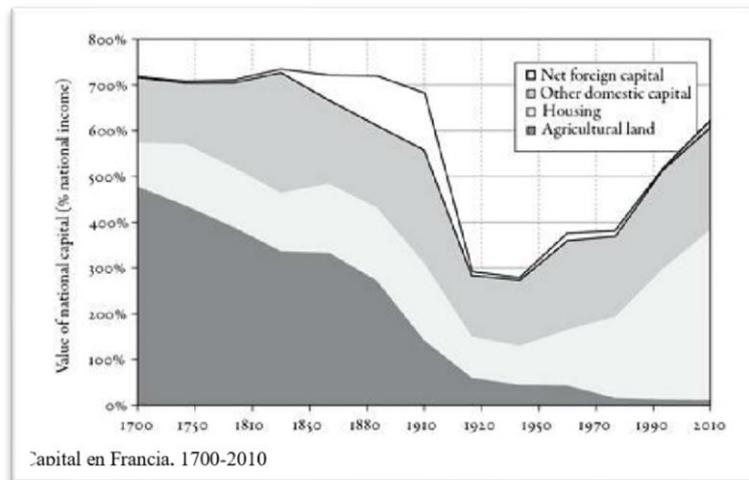
Although, both the first law and the second law of Robinson are so logical that it seems impossible not to be fulfilled, it is certain that the theory leaves undetermined the parameter uncertainty  $\bar{\kappa}_j$ , so it is always possible to choose the value of the parameter so that both laws are met. However, the latter is not possible to do so with the third law, which we have named the Law of Piketty, because in its statement, the parameter uncertainty should be “1” for the law to be fulfilled:

$$\bar{\kappa} = 1 \quad \gamma = i \quad \beta = \frac{\alpha}{i} \quad \text{Law of Piketty}$$

Each one of the variables that appear in the formulation of the law of Piketty can be determined experimentally, so that it is easier to check whether the law is, or is not, valid. That is to say, you can check the value slightly above the “1” that predicted by theory for the Factor of Uncertainty when the economy is stationary, what should happen most of the time in any economy.

The funny thing is there is no problem in check. The book written by Thomas Piketty, which we have already mentioned several times here, “Capital in The Twenty-first century”, is an excellent compendium in which is collected in a graphical manner all the information that you have on the valuation of the aggregate capital in the major economies of the world during the last 300 years, in particular, from the French revolution to our days. Not only that, the book also includes changes to the tax rate that is levied on the income of capital and the capital itself. what was the value of the aggregate capital.

The reason why Piketty collect these data, it is not only informative, it needs to try to justify the two fundamental laws of capitalism that formula in his book. In addition, you also need the data to show that the decrease of the tax rate is the most likely source of the growing inequality of income, which accuse almost all economies of the world, which makes it very complete and invaluable to the work of Piketty.



For example, the figure we have shown a number of times here, is taken from the book of Piketty. Show the market value of the aggregate capital as a percentage of *GDP* over the last 300 years ago in France, which is known as the parameter  $\beta$ . The graph, which refers to the French economy, is no different from other graphics in relation to other countries that appear in the book, but it's the one we are using here as an example to try to explain the changes in the valuation of the capital that have occurred in the economy during the last 300 years, because it is the most complete and surely, also the most accurate:

*The great merit of Thomas Piketty, if it is possible to highlight one among the many merits that treasure within "Capital in The Twenty-first Century", is the graph that serves as a thread to explain the unstoppable increase in inequality has been experienced during the last half-century in our economies. In she manages to synthesize in a simple look, the theoretical problem facing the economy as a science:*

*" explain the sharp drop and the slow recovery that is observed in the parameter  $\beta$ "*

*It is what we have called "the Pit of Piketty", and that in our opinion is a reason more than enough to grant him the Nobel Prize in Economics.*

We explain what is observed in the graph.

### a) The Economy of Piketty

In the graph it is observed that for two long centuries, the EIGHTEENTH and NINETEENTH centuries, the valuation of the capital remained constant and stable environment to seven times the annual value of the production in France, according to the financial nature of the capital described above, the Factor of Uncertainty  $\bar{\alpha}$  that appears in the Law of Piketty remained slightly above the "1" over the entire period, being the average rate of return on capital  $\gamma$  very close to the interest rate on the money.

***ECONOMY OF PIKETTY:** Call Economy of Piketty to an economy in which the rate of return on the aggregate capital is equal to the interest rate on the money:*

*It is the type of economy that tends, according to the Law of Piketty, any economy is stationary.*

At least two centuries, the EIGHTEENTH and the NINETEENTH, the interest rate of government bonds, which we can identify with the interest rate on the money, even though they are not exactly the same, remained without changes around 4% or 5%, while the share of the income in the *GDP*, the parameter  $\alpha$  of the economy, averaged environment of 30% of the *GDP*, according to the us account Piketty in his book. In addition, we can see from the graph that the value of the aggregate capital of the economy remained consistent at around about 6 times the *GDP*, so that it can be said that, for two long centuries, the world economy was an economy of Piketty with an Uncertainty Factor slightly above "1":

$$\left. \begin{array}{l} \alpha = \frac{r_{capital}}{GDP} = 30\% \\ \beta = \frac{k_{capital}}{GDP} = 6 \end{array} \right\} \xrightarrow{\text{Econ. Pikety } (\gamma=i)} \gamma = \frac{\alpha}{\beta} = \frac{30\%}{6} = 5\% = i$$

An economy without uncertainty in income-producing capital goods might seem like an event that is impossible in the economy today if it weren't for the empirical evidence that contributes to the work of Piketty, and are a test very strong on the validity of the three laws of capital, which we have mentioned, but, above all, a test very solid financial nature of the capital.

### **(b) The Pit of Piketty**

If the constancy of the parameter  $\beta$  during the EIGHTEENTH and NINETEENTH centuries and that shows us Piketty confirms without any doubt the third law of the capital, the same does not happen with the data that show the evolution of the parameter from the early TWENTIETH century, quite the contrary, they seem to contradict. If it is not at all clear what might cause the tremendous decline in the valuation of capital income at the beginning of the second decade of the TWENTIETH century, are much less clear yet the reasons for the valuation of the capital has not yet reached, after a century, the steady-state that predicted by the third law.

We think that the sharp drop in equity valuation and its extension for at least 20 years can be explained, almost certainly, by a cluster of several causes, the first and the most important of them, the banking panic that originated in the USA in the year of 1907, which spreads to all economies of the world, and being the second, the world war that broke out only a few years later. According to the chronicles of the early TWENTIETH century, a strong banking crisis struck in 1907 on the banking system in the USA and, although in appearance it was resolved thanks to the vigorous intervention of the banker J. P. Morgan and the subsequent creation of the Federal Reserve, all of this makes us suspect that left him touched in the global economy to the point of giving place only a few years later, the First World War in 1914.

Along with these two root causes are “obvious”, we can add a third cause that certainly compounded the problem, as was the collapse of capital income from the colonies that Europeans, and especially the French, had invested all over the world.

What is not so easy to explain is the reason for the low valuation of the revenue went on in France during the decade of the 1920s until it culminated in the great crisis end of 1929, just ten years later, gave way to the Second World War. The three decades of disastrous, the First World War, the “roaring twenties” and the “fascist thirties”, are the floor of the pit is seen in the graph, and that it is necessary to justify from the perspective of the financial theory of capital.

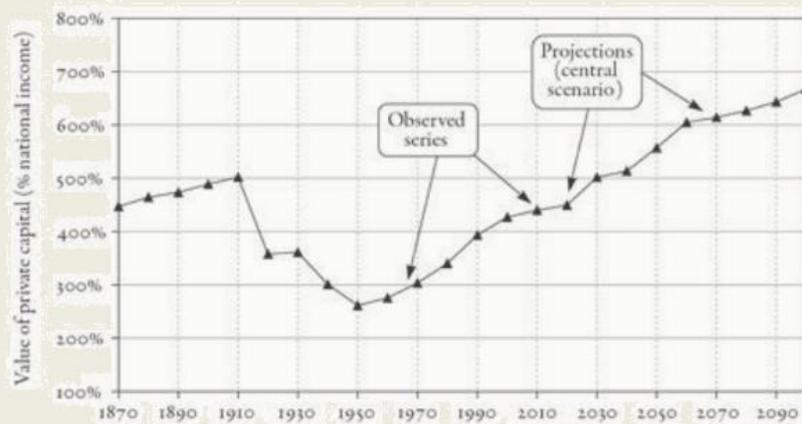
Since the first great war did not destroy appreciable physical capital of any of the warring nations, and as he says Piketty in his work, the war, by itself, cannot explain the fall in the valuation of capital goods, it must have an explanation financial of what is observed. Something very different was what happened years later during the Second World War, in which both Russia and the whole of central Europe, were devastated completely. Even France and the United Kingdom suffered noticeable damage.

In the graph it is observed that, only very slowly, and only after having spent almost a century, the value of capital, measured by the term of the *GDP*, the parameter  $\beta$ , seems to come close to the theoretical value that predicts the Third Law. Precisely, Piketty formula in his book “the Second Fundamental Law of the Capital” to explain the slope is almost constant, and the graph shows during these past 80 years:

$$\beta \approx \frac{s}{g} \rightarrow \begin{cases} s \equiv \text{savings rate} \\ g \equiv \text{growth rate} \end{cases}$$

And predicts that it will not be until the end of the twenty-first century when the savings continued from 10% of *GDP* and an average growth of 1.5% to accumulate enough physical capital for the economy to return to a situation similar to the one that took place during the EIGHTEENTH and NINETEENTH centuries.

$$\beta_{t \rightarrow \infty} = \frac{10\%}{1,5\%} = 7$$



Cociente entre el capital y los ingresos mundiales  
(El capital del siglo XXI - Piketty)

*“The more interesting question is that of the extrapolation of this curve in the future. Here I've used the projections of demographic and economic growth are presented in Chapter 2, according to which the world production will be gradually reduced from the current 3 percent a year to just 1.5 percent in the second half of the twenty-first century. I also guess that the savings rate will stabilize at around 10 per cent in the long term.*

*With these assumptions, the dynamic  $\beta=s/g$  implies that the overall ratio capital/income logically will continue to increase and could get close to a 700 percent before the end of the twenty-first century, i.e., approximately to the level observed in Europe since the EIGHTEENTH century up to the Belle Époque. In other words, in 2100, the entire planet might look like Europe at the turn of the TWENTIETH century, at least in terms of the intensity of capital. Obviously, this is only one possibility among others. As noted above, these growth forecasts are highly uncertain, as is the prediction of the rate of savings. These extrapolations are, however plausible and valuable as a way of illustrating the crucial role of the growth slowdown in the accumulation of capital.”*

*Tomas Piketty, capital in The twenty-first century (2012)*

We see, once more, that Thomas Piketty thinks all the time in the capital as a “wealth accounting” that is being accumulated, thanks to the savings, and not as the financial valuation of the income that produces the “reality” of physical production. In particular, the prediction of Piketty is based on assuming that the value of accumulated savings is equal to the growth of the capital, which seems to corroborate evolution of the last 80 years in the industrialized countries:

$$\left. \begin{array}{l} \text{saving} \equiv 15\% \text{ GDP} \cdot \\ \Delta \text{capital} \equiv 3\% \cdot \beta \cdot \text{GDP} \end{array} \right\} \rightarrow \text{savings} = \Delta \text{capital} \rightarrow \beta \sim 7$$

With the data that is supposed to Piketty, capital increases, on average, in the value of the GDP every 40 years, which gives a lot of credibility to the belief that saving is the source of the accumulation of physical capital, the savings accumulated in the 80 years since the end of the

Second World War coincides with the increase that is observed in the aggregate capital, which has gone from being about 4 times the GDP at the end of the war, to have at the present value of approximately 6 times the GDP.

However, we know that, from the point of view of the third law, the value of the capital has a roof that is reached when the economy goes into steady state, regardless of the value of growth and regardless of the amount saved (provided that it does not enter into the tautology of define savings as the increase of capital):

$$\begin{matrix} \text{economy} \\ \text{stationary} \end{matrix} \leftrightarrow \beta = \frac{\alpha}{i} \quad (\text{Law of Piketty})$$

Yes the slope that shows the value of the capital during the past 80 years seems to support the nature of the accumulation of physical capital that defends Piketty, the opposite happens with the prediction based on the financial nature of the capital that we are defending here.

When we assume, as we're doing here, the quotient involvement of rents in *GDP*, (the parameter  $\alpha$ ), around 30% of the *GDP*, and the interest rate on the money that around 4%, it does not seem at all easy to justify why, contrary to that predicted by the third law of capital, the economy is approaching so slowly to the particular value of about 6 or 7 times the value of *GDP*:

$$\left. \begin{matrix} \alpha = \frac{r_{\text{capital}}}{\text{GDP}} = 30\% \\ r = 4\% \end{matrix} \right\} \xrightarrow{\text{Econ.Piketty } (\gamma=i)} \beta = \frac{k_{\text{capital}}}{\text{GDP}} = \frac{\alpha}{i} = \frac{30\%}{4\%} \cong 7 \text{ the } \text{GDP}$$

In fact, our problem is to explain why the prediction has not been fulfilled already, and the value of the capital has not been achieved decades ago six or seven times the value of the *GDP*.

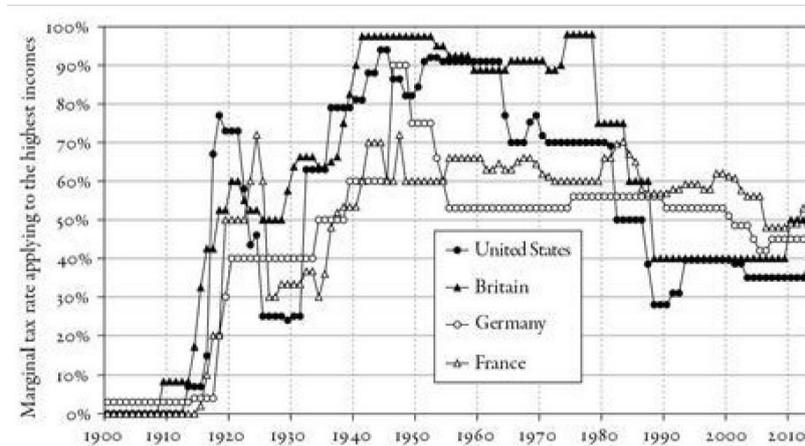
### c) The Marginal tax on capital income.

Unless we deem the economies of post-war as a very unstable, which clearly contradicts the name of the “thirty glorious years” with the known three decades after the Second World War, there seems to be no justification for it has not achieved the roof of Piketty predicts the third law. Since then, it is possible to assume a high value on the factor of uncertainty  $\bar{\kappa}$  which appears in the second act of the capital, and to justify, in this way, the low value of the parameter  $\beta$ , but that seems to be an attitude very little scientific:

$$\gamma = \bar{\kappa} \cdot i \xrightarrow{i=5\% \gamma \sim 8\%} \bar{\kappa} \cong 1,6$$

A value that is as far from “1” in the case of the French economy (and of any other economy of the time), disagrees with the stability and growth observed in the post-war and contradiction, simply, the third law. Even more, when it falls into the account that the majority of the companies and all the great fortunes that were born and grew up in those thirty years glorious enjoy an excellent economic health in the present. It is impossible to think that after 80 years, the steady state has not been reached yet.

The discrepancy found between the prediction of the theory, and the low valuation that during the whole of the second half of the TWENTIETH century makes the market from the revenue that is produced in the capital is easily explained when we take into account a factor that we have overlooked in all of the previous analysis: *“the tax on capital, which were introduced, precisely, from the second decade of the TWENTIETH century”*.



*Evolucion del impuesto marginal sobre el capital  
(El capital del siglo XXI)*

In the chart below, also taken from the book of Piketty, shows that it was precisely at the beginning of the second decade of the TWENTIETH century when the growing public spending began to be financed with a sharp rise in the marginal rate on income from capital income and its heritage. It is very well seen, the various taxes on the income from the capital came to its peak in the 60's and 70's of the last century in the major economies of the world, decreasing thereafter gradually in all of them to levels similar to those that existed in the so-called 20 happy years, keeping an inverse correlation with the evolution that follows the parameter  $\beta$ , which started from the post-war growth in almost constant.

The view of the data shown by the graph, and given the inverse correlation that seems to exist between the marginal rates on capital and the value of the capital, it is inevitable to ask why the role that taxes have on the valuation of capital income, and if not will they be the missing piece of this whole puzzle on the evolution of  $\beta$ , which explain the discordance observed between theory and practice.

Recall that the law of Robinson, expressed through the parameters  $\alpha$  and  $\beta$ , says that the value of the aggregate capital depends on the part of *GDP* that is devoted to the rent, the parameter  $\alpha$ :

$$k_{capital} = \frac{r_{capital}}{\delta \cdot i} \leftrightarrow \beta = \frac{\alpha}{\delta \cdot i} \quad \text{2nd Law of Robinson}$$

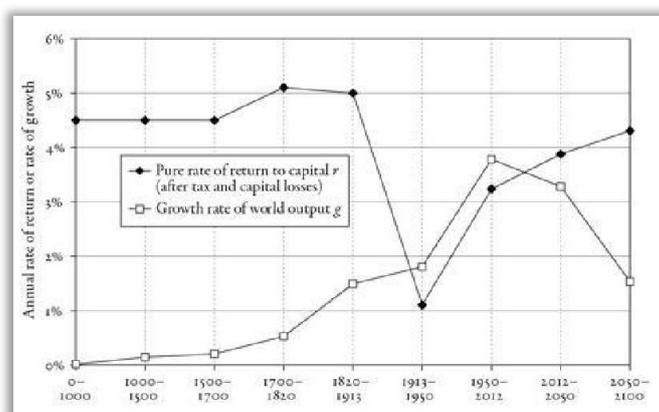
However, the parameter  $\alpha$  divides national income in two parts, the one who is going to pay wages and that's going to pay the rent of the capital, leaving out of the sharing of the money

allocated to public spending, which makes a lot of sense in the aggregate, as the service provided by the “government” is to firms and workers, but there is no sense in terms of micro-economic, since the public sector is captured by the tax an important part of the income produced by the business and the workers ' income, although you do not see reflected eventually in the *GDP*, which is distributed only in income work and income.

Therefore, you must calculate the parameter  $\alpha$  that measures the participation of capital income in *GDP*, after paying taxes and not before, since, from the point of view of purely economic, taxes are a necessary expenditure to carry out the economic activity of any enterprise, and, like wages, are not part of the income that is produced in the capital good and should not be counted as such.

This is understood much better when we remember that the assessment of the uncertainty  $\aleph_j$  and, therefore, the value of any good capital, is carried out by the arbitration by means of leverage. It is very clear that, when buying a capital good with money that it borrows, the income that will allow to return the debt is the income that is left after paying taxes. If you do not take into account the taxes as an expense, probably, the buyer will not be able to repay the loan.

The luck we have is that Piketty has also done in “The capital of the XXI century” an extraordinary work of data collection on this topic to the tax rate, and in spite of the precautions which he recommended that we use, what is certain is that it greatly facilitates the justification and defense of the thesis on the cause of the apparent lack of agreement between the third law and the reality that we observe, and that is none other than “*the effect of taxes on the valuation of the capital*”



When we look at the curve that shows Piketty on the evolution of the rate of return on equity after tax, we see that it is exactly the same as the curve that shows the valuation of the aggregate capital as a percentage of *GDP* during the last three hundred years. So, if in the expression of the three laws of capital use capital income after taxes  $\langle \alpha \rangle$ , that is right, instead of the income before taxes  $\alpha$ :

$$\beta = \frac{\langle \alpha \rangle}{\aleph \cdot i} \quad \langle \alpha \rangle \rightarrow \begin{matrix} \text{income after} \\ \text{tax} \end{matrix}$$

We find that the uncertainty has been almost equal to “1” during almost the entire TWENTIETH century, and the Law of Piketty has been serving almost always during the last 300 years, as

could not be otherwise. Except for the two world wars and the two long-crisis lending that preceded it, it can be said without fear of being wrong that the more developed economies have been growing stable almost all the time. That is to say, that the parameter uncertainty  $\bar{\kappa}$  has been slightly greater than “1” from the end of the Second World War to our days, as stated by the Law of Piketty and it was foreseeable that to happen.

We can verify this very easily by normalizing the rate of return of capital to the value it had during the EIGHTEENTH and NINETEENTH centuries, which was 5%, and normalizing the value of the capital to the value that it had at the same time, which was about 7 times the *GDP*:

$$\bar{\kappa} = \frac{\langle \alpha \rangle}{\beta \cdot i} \xrightarrow{\langle \alpha \rangle = 7 \cdot GDP \cdot \langle \gamma \rangle} \bar{\kappa} = \frac{\langle \gamma \rangle}{\frac{\beta}{7PIB}} \approx 1$$

When we do the ratio between the two variables are standardized, the rate of return and the value of the capital, it is easy to see that their ratio is kept very close to “1” during the last 300 years. Test hard rebuttable of the financial nature of the capital, and of course the Law of Piketty that we have mentioned.

THE THREE LAWS OF CAPITAL

$k_j = \frac{\langle r_j \rangle}{\bar{\kappa}_j \cdot i}$	<i>1st Ley Robinson</i>
$\beta = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i}$	<i>2nd Law of Robinson</i>
$\bar{\kappa} = 1 \quad \gamma = i \quad \beta = \frac{\langle \alpha \rangle}{i}$	<i>Law of Piketty</i>

*Where  $\langle r_j \rangle$  and  $\langle \alpha \rangle$  is, respectively, the income produced by each well of capital and the aggregate rent as a percentage of GDP measures both after-tax.*

## 6. THE SAVINGS AND CAPITAL

We have shown, beyond any reasonable doubt, that there are two types of goods, those who bought it for eating, that we refer to as consumer goods, and those who buy it because they produce income, which we call capital goods

The essential feature of a monetary economy, which is manifested in the obligation of any participant in the process of production and distribution to meet an equation accounting that you keep the amount of money, is what allows us to distribute the surplus productive within society and that creates the income that makes any manufactures or means of production in a capital good, completely different from the consumer goods:

$$rent \equiv \overbrace{B_i^{cap} = q_{ii}^o P_i - \sum_{j=1}^n q_{ij} P_j - B_i^k}^{eq. \text{ accounting}} > 0$$

the identification between the business benefit and the income, is the basis of the Theory of Financial Capital and has allowed us to differentiate, with no mistake possible, the two different types of property that exist within the monetary savings, consumer goods and capital goods, and to find the mechanism that uses the Capital Market to set the price of the latter.

A very important point of the Theory's Financial Capital is the disconnect between the capital and savings. Since the capital is an appraisal of an income, does not have to be related to the savings that makes the society and the physical investment that is being made through the savings. Although, it will be later when the development of the Financial Theory of the Growth, it is not difficult to imagine that it is the existence of capital who is allowing the saving and not the other, no more to remember what is stated in the equation of growth:

$$\frac{dPIA}{dt} = -k_F \cdot Ah$$

The equation tells us that the growth of the PIA has nothing to do with the amount of money that you save to invest, since it is only the spending of new money created, which allows the growth.

$$\sum_i ah_i = Ah \neq 0 \rightarrow \left\{ \begin{array}{l} ah_i > 0 \rightarrow \text{save} \rightarrow A = \sum_{ah_i > 0} ah_i \\ ah_i < 0 \rightarrow \text{investment} \rightarrow I = \sum_{ah_i < 0} ah_i \end{array} \right\} \rightarrow$$

$$A + I \neq 0 \rightarrow \frac{dPIA}{dt} \neq 0$$

We see, that the amount of money that it saves, has nothing to do with the amount of capital that is created within a monetary economy, since it is only the creation of money who increases the capital in aggregate terms. Quite the contrary, is the saving that can cause a serious problem when you can't find capital to be invested.

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Clara Rojas García, Julia Rojas García, Pedro Rojas Sola  
4 of march in the year of 2021

### 1. THE CAPITAL MARKET

Looking at the economic reality that surrounds us, we have postulated as the only logical possibility to explain to her that the price of capital goods has its origin in the income it produces to their respective owners, and not the price of the physical to create them (as stated in the text books the economists working for the private universities of the USA). That was the reason why we formulated two Laws of Robinson and introduced two new parameters that allowed to give price to the assets of capital: the interest rate of the money  $i$ , as a parameter of reference common to the whole economy and the uncertainty  $\aleph_j$  as a parameter specific to each of the capital goods.

No one will deny, that all this construction, logical-mathematical we are doing it with the sole intention to understand the economic reality in which we live, so that little or nothing we can add to what has already been said about the nature of the uncertainty of capital  $\aleph_j$  beyond to try to find traces of their existence. That is why it is very gratifying to see that there exists a vast specific market, the Capital Market, that now has a gigantic proportions, and in which are valued with more or less success factor of uncertainty  $\aleph_j$  associated to the various assets in the shares of companies listed on the stock exchanges, currently has a price of more than 200 million of million of euros.

Although the variety of capital goods is immense, covering goods as diverse as are the homes and patents, it is possible to classify them into four major groups based on the relationship they have with the money:

- a) The supply of money.
- b) The capital money.
- c) The debt securities.
- d) Capital goods

The money supply is what we mean by money, and is formed on the currently almost entirely by money, credit, made out of nothing by the banking system, deposits, banking), and in a less half the money on currency and banknotes. Although it can be raised serious doubts that

the money credit is really a capital good, what is true is that what it is, but with a nuance that later we will explain.

The capital money, the second of the list, it is also money and credit in nothing differs from the bank money that is part of the money supply. Is money treasured that has been extracted from the money supply, and which remains unused in the Capital Market.

The third form of capital are debt securities. It is what is normally understood by debt and always carries the implicit commitment to return an amount of money in the future. The debt securities should not be confused ever with the bank credit that can catch the public sector or by the private sector with the banking system (that is what is commonly understood traditionally for a debt), and it should be understood that any degree of debt is the equivalent of buying or having a capital good, even if there is the commitment of being returned in cash over a period of time. The reason, as we shall see later, is that the issuance of a debt security does not imply the creation of money, credit, and as such it does involve the granting of credit by the banking sector.

For this reason, a title of debt is not money, nor can it be considered never money because, as we will see, it is only an indirect way of owning a capital good. The reason for the confusion comes from the fact that some debt securities, for example, government bonds are perfect substitutes of money because the Central Bank changes the money without any loss (at least that is what happens, the titles of the treasury of the most creditworthy countries), but it is clear that in spite of this cannot be considered as money.

***THE DEBT.** We understand debt money that is owed to someone as a result of the granting of a loan. A part of the debt comes from credit granted by the banking system, but it is not, or much less, the most important part of the debt securities that exist in the market, which are formed mostly by the issuance of debt securities.*

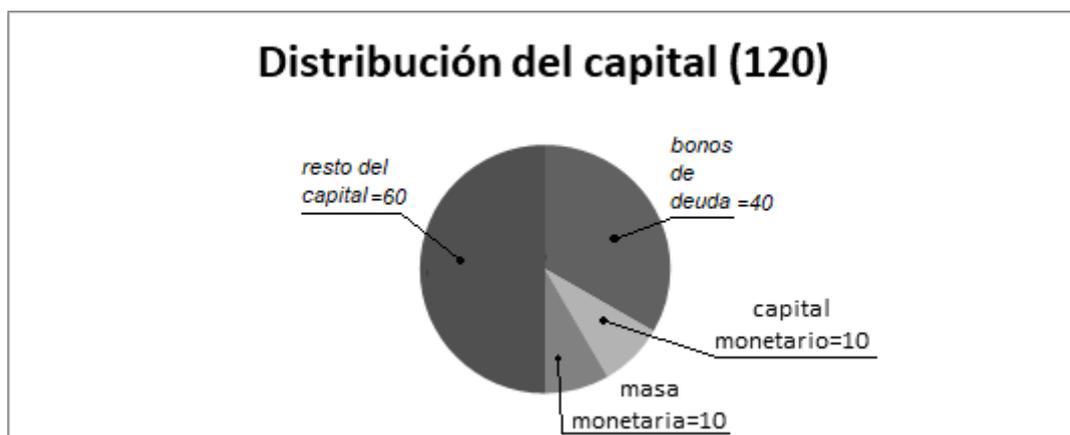
*The commitments made by the issuance of debt securities shall not be considered a debt, because it actually involves the transfer indirectly, of the capital good that secures the debt and, at all times, will be what we receive in the event that the title of the debt is not recovered at maturity.*

*Technically, a debt security is equivalent to the object that receives a lender in exchange for a sum of money. Who committed the object can return the money and retrieve the object, but in the event that it is not returned the money, the lender is left with the object determined. For this reason, anyone who purchases a debt security, you should ensure that the capital good that supports it have enough value to cover the debt.*

The fourth form of capital is capital itself. It's what we identify with the housing, the rights of property, the number of assets listed on the stock exchange, debt securities, money banking and the rest of the many other goods that are also part of this category, because they produce income or can produce them.

We know that the arbitration of the Capital Market makes all capital goods in counterparts, and although the reason for the existence of the capital goods is only physical, that is to say, the

productive, the function that has the capital within a monetary economy goes beyond, since it is the medium that is used within the economy to keep the savings. We will have to wait to the exposure of the Financial Theory of Growth to understand the relationship between savings and capital goods. For now, we simply indicate what amount of savings (wealth) is conserved in each of the forms of capital that we have appointed. We're going to choose to display a country as large as the US, which will give us a very general perspective and exact composition of the Capital Market:



In the attached chart shows what proportion of the wealth is conserved in each of the four forms of capital in the US and in the year of 2019:

<i>capital goods</i> .....	120 MM
<i>marketable debt</i> .....	40 MM
<i>money banking</i> {	
<i>capital monetary</i> .....	10 MM
<i>mass monetary</i> .....	10 MM

Thus, the total value of the wealth (the valuation of the aggregate capital) in the US amounts to the beginning of 2019 to about 120 million of millions of dollars, of which about 60 MM, 50 per cent, are preserved by the possession, direct capital assets (land, homes, offices, companies, assets, etc), while the rest is preserved indirectly in the form of debt securities. About 40 MM, about 33 percent of the total savings, are debt securities on the capital assets: corporate bonds, bank debt, treasury bonds etc., The debt is only an indirect way of owning capital goods, because the interest they pay for the debt come from the income produced by the capital backing (although it is not entirely true for the student loan and consumer). The rest, about 20 MM of dollars is the bank money circulating in the economy and in the economy today is bank money (at least, it is in the USA). About half, about 10 MM, about 8 percent of all the capital, is the money that is not used for purchase within the US, while the other 10 MM are used to buy in the international markets (the dollar is the reserve currency) so that it is not capital monetary treasured (although here we will consider capital money to keep it separate from the money that shape the supply of money within the US). We see little or no money is kept and treasured as money in the Capital Market.

(The bank money is not, and never can be, a debt security, as it is not a debt to the person who owns and uses, but if it is formally a debt that they assume those who believe when you accept a credit. This invites the money credit to be counted twice, once in the possession of someone, and again as a debt security issued in favor of the bank that granted the credit).

*THE CAPITAL MARKET. The gigantic Capital Market in which are sold and purchased capital assets, not to be confused ever with the much more modest Consumer Market, selling and buying consumer goods, although both markets seem to walk entangled and it is very difficult to distinguish one from the other. What is certain is that the nature of both markets is so different and both are so decoupled from each other that we can say that “the money is bought and sold in the Consumer Market is different from the money that can be bought and sold in the Capital Market”.*

*This is the reason, and no other, so that the constant of Fisher seems to be so volatile and the monetary equation seems not to be met:*

$$k_F \cdot (M + MC) \neq PIA$$

*M = mass of monetary  
MC = capital monetary*

*When the money that is used in the Consumer Market (which is money) and the money that will be treasured as capital money, and is used to calculate the money supply M of the economy, it is very evident that the monetary equation is not going to be fulfilled.*

## **2. DIFFERENCE BETWEEN CAPITAL MARKET AND THE CONSUMER MARKET**

Once we accept that there are two types of assets in the monetary savings, then we must accept that the laws governing the Capital Market to set the prices of capital goods are also very different from the laws that governed the Consumer Market to set the prices of consumer goods. In fact, this is what we have been trying to show in the last few chapters. Let us enumerate explicitly some of the many differences between the two markets:

- 1) The Market Capital is, first of all, the place in which it saves. Although the capital as such, has nothing to do with the savings, nor its growth has nothing to do with the growth of savings, what is certain is that the people retain their wealth (savings) in capital goods because the price of capital goods will be consistent to the extent that the income that it produces. That is the reason why, under normal conditions, people tend to retain very little money treasured as money, because the money is subject to inflation and lose their value, while the capital goods will not happen.
- 2) It can be said that there are two different kinds of money in the economy, which is used to buy on the Market of Consumption, and the form of the money supply, and which is used for treasured in the Market of Capital, and that capital money. Both markets are so different, and they are so strongly decoupled from which it can be said that the money that is used in a market that is different from the money that is used in the other market. Although this is, of course, is only a manner of speaking.

- 3) In the Consumer Market, the constant of Fisher league an amount of money  $M$  concrete with the cash flow generated by the purchase of goods, the  $PIA$ :

$$k_F \cdot M = PIA$$

In the Capital Market, on the contrary, do not need a specific amount of money to maintain the flow of purchase of capital goods, and so there is an equation equivalent to the monetary equation. The capital money is a capital good, and, in this sense, the Capital Market functions as a barter economy. This is the reason, as has already been mentioned, by which the total amount of money in the economy is the sum of the money supply  $M$  and capital monetary  $MC$ , does not meet the monetary equation:

$$k_F \cdot (M + MC) \neq PIA \quad \left. \begin{array}{l} \text{amount} \\ \text{of money} \end{array} \right\} = M + MC$$

What it does not prevent the monetary equation is true when only using money supply  $M$  in the expression.

- 4) In terms of how to determine the prices of different goods, it is also very different from a market to another. At the microeconomic level, the equation governing the Capital Market and gives value to the capital goods, it is the 1st law of Robinson:

$$r_j = i \cdot \aleph_j \cdot k_j$$

While the benefits are those who determine the price of goods in the Consumer Market (the Principle of Asymmetry):

$$P = (Q^o - Q)^{-1} \cdot B$$

The same can be said of the difference in the way in which is set by the average prices in both markets at the macroeconomic level. Thus, the Equation of Closure is the one that is responsible for assigning an average price of all the goods consumed in an economy:

$$\bar{p} \cdot \bar{q} = PIA$$

Where  $\bar{q}$  and  $\bar{p}$  are the average value of the price and the average quantity of goods consumed. While it is the 2nd Law of Robinson's the one that says the price of the aggregate of all capital assets that exist in the economy:

$$K = \frac{\langle \alpha \rangle}{\aleph \cdot i} GDP \quad \text{2nd Law of Robinson}$$

Both markets, the capital goods and consumer goods, are very different and are used for different things, being his dual existence, the essential feature of the monetary economy, that has nothing to do with a barter economy.

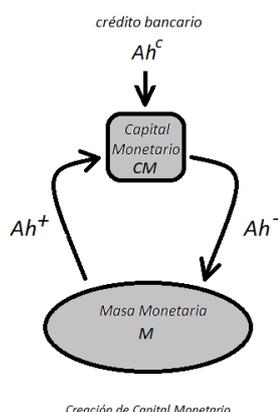
Perhaps the best way to understand the essential difference that exists between the money of the money supply and the money from the capital money either to display two processes of the real economy that are clearly differentiated the two forms of money:

a) The quantitative expansion (quantitative easing).

The decoupling economic between the Consumer Market and the Capital Market helps to explain very well why, after the deflation of 2008, the vast amount of money that has been spent by the Federal Reserve in the buy the assets of all kinds there has been no inflation in the U.S. (more than 4 million of millions of dollars were created from nothing and spent by the Federal Reserve between 2009 and 1012). When it is accepted that all the money that is spent in the purchase of assets tends to stay mostly within the Capital Market as capital money, without ever wearing off in the Consumer Market, then you understand very well why there is no inflation.

Although the cause that gives rise to and maintains an inflationary process is very diverse, an increase in the money supply without an increase similar to the actual production always has as a consequence a rise in prices. Although it is not, or much less, the only cause, that causes inflation of prices, nor the most frequent, if it is a consequence very clear from the Equation of Growth, so that it is impossible for the more than 4 million that created the Federal Reserve and

spent in the purchase of assets, have been able to get to spend it in the Consumer Market. Even a small part of that amount has been able to become a part of the money supply, and that is the reason of the absence of inflation:



*“The money injected by the Federal Reserve or has been treasured as capital money in the Capital Market, or has replaced the money is destroyed by the return of bank credit”*

The figure below may help you understand the process and the difference between the money that is used in each of the markets. It is shown that the only connection between the Consumer Market and the Capital Market, is carried out through the flows of saving and dissaving of the agents that participate in the economy, however, the purchase of assets that makes the Central Bank with money created out of nothing, happens within the Capital Market. It is part of the flow  $Ah^C$ , and not have to change anything in the amount of money in the money supply, which is what can affect inflation. What has happened is that savers have changed doubtful assets that possess the money in to the fear of an overall drop in its price, but without any intention of spending the money on consumption goods (in aggregate terms). Therefore, the massive injection of more than 4 million of million of dollars in purchasing shares of all types from 2008, has not had practically no influence on the prices of consumer goods, because savers have no intention of spending his wealth, which is now preserved in money and not in assets.

Since then, a portion of the money injected by the Federal Reserve has finished replacing the bank money destroyed with the return of credit, but has never been spent on the Consumer Market. When we develop the Theory of Financial Growth and to understand the nature of money, credit may be also to understand what that actually means that the money that is used in Consumer Market and the Capital Market does not become one in another with ease.

b) The international balance of payments.

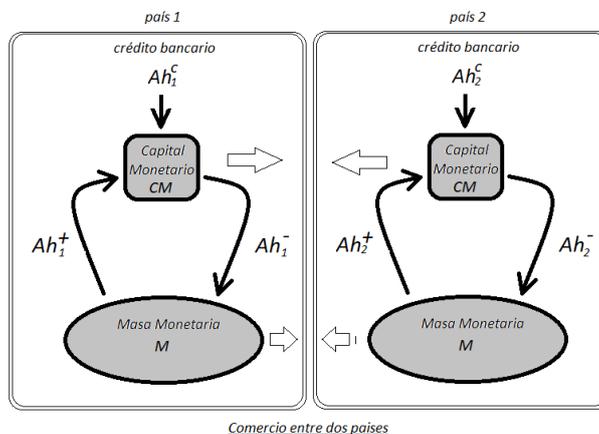
Another place where it is very well appreciated by the huge difference that exists between the money of the money supply and the money that is kept in capital monetary we can see it in the exchange rate problems that's causing the trade between countries that work with different currencies.

While the decoupling between the Capital Market and the Consumer Market of each country remains dependent on only the flow of saving and dissaving that change slowly, the same does not happen with the cash flows between capital markets in both countries, which change rapidly in the measure in which allows for the free movement of capital. The same thing happens with the flow of exchange of the sale between the Consumer Markets of each of the countries, when we assume that there are legal limitations, although their changes, as is logical, there are slow (the figure below describes the real situation in which the exchange flows between the two markets).

Let's look at the situation, considering the trade between two countries as a single economy divided between two sectors, with the added difficulty that the currencies of each country are different. To simplify the problem without losing realism, we assume that:

- a) There is a rate of change between the two currencies.
- b) There are two interest rates, interbank, one for each country.
- c) There is a balance no deficit in the cash flow of exchange between the two countries (most important). That is to say, there's not accumulated any amount of currency in any of the two countries.

We know that the last assumption is very unrealistic in the real economy, where it is very difficult



to find any country that does not accumulate foreign currency to stabilize the exchange rate of its currency. However, it is easy to reach the conclusion that any accumulation of foreign currency, by and large, that is, will not be able to avoid for a long time the permanent disequilibrium between currencies, so imposing the condition of equality in the cash flows of exchange (the balance) is an imposition needed to know where are the difficulties that force equilibrium is satisfied.

Already we deduced in chapter 2, the basic equation that you need to fulfill an economy divided into two sectors. In particular, the set of two equations is the following:

$$\frac{1}{k_F} \frac{dx_1}{dt} = -a \cdot x_1 + b \cdot x_2 - ah_1$$

$$\frac{1}{k_F} \frac{dx_2}{dt} = a \cdot x_1 - b \cdot x_2 - ah_2$$

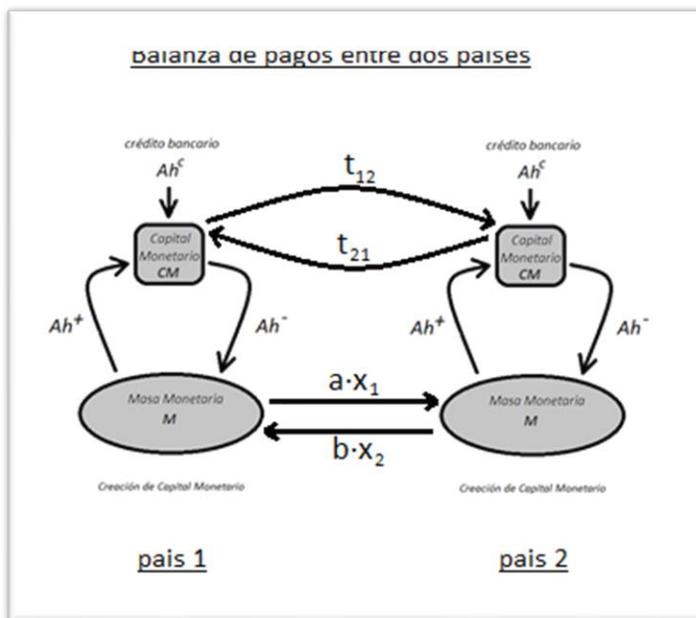
(the economy of two countries)

Where the parameter “a” is the percentage of the PIA that spends the first country to the second country, and “b” is the percentage of the PIA that spends the second country in the first. The variable  $x_1$  and  $x_2$  are the PIA of each of the countries (which we identify here with the expense), and the variables  $ah_1$  and  $ah_2$  are the flows of net savings between the consumer market and capital within each of the countries. (recall that the equations have their equivalent equations expressed with the GDP, with no more than replace the constant Fischer for the equivalent to the GDP). That is to say:

$$a \cdot x_1 \rightarrow \text{expense of the country 1 country 2}$$

$$b \cdot x_2 \rightarrow \text{expense of the country 2 country 1}$$

$$ah_2 \text{ and } ah_1 \rightarrow \text{net savings of the country 1 and country 2}$$



The figure below clarifies a bit the meaning of each of the parameters and of the flows. What we want to show now is that the imposition of the monetary flow between countries is zero is equivalent to impose that the trade deficit between the countries is equal to the flow of credit that is made between the capital markets of both countries (negative savings).

When we assume an exchange rate  $e_{12}$  between coins, then from the point of view of the first country tiene which met for the

money that enters or leaves the country, in their own currency, is zero:

$$a \cdot x_1 - e_{12}(b \cdot x_2) = t_{12} - e_{12} \cdot t_{21}$$

Where it has introduced a new parameter  $t_{ij}$  to give account to the financial flows of exchange between the capital markets of the different countries. The expression tells us that, when imposed, the equilibrium in the balance of payments, the trade deficit for purchases of a country's deficit ends up in the own Capital Market as a foreign savings, either by purchase of capital or granting credit. Which can be really amazing when you understand what this means:

*“The net money you spend one country in another country in consumer goods, has to come back as a flow of savings, in the own currency, the country's surplus made in the deficit country”*

Obviously, the need to save the country's surplus within the deficit country to which obliges the condition of equilibrium in the balance of payments, met quite a few times between countries and when it does, the performance is temporary and only keeps balanced the balance of payments for a limited period of time, which can be checked very easily with the empirical data. What we are trying to say, and what we shall show a little later when we study the exchange rate crisis, is that it is impossible to maintain a balance of trade deficit.

*THE CAPITAL MARKET. The existence of the Capital Market is the social consequence more important that you have the monetary economy. If in feudalism, and in other complex forms of social organization, the division of the population into two social classes is based on the appropriation "pure and simple" of what the earth produces by the class aristocratic (the only means of production of the time), it is in the rights of property over the means of production where capitalism finds itself the basis for the structuring of society in two different classes those who derive their income from the ownership of assets that produce income and those who derive their income from their work.*

*Although at present, the two social classes are not separated into castes clearly differences, it is very predictable that when the economy to stabilize and prevent the economic crises, the concentration of wealth in a few hands, make it real, the separation into two castes, differentiated according to the origin of its revenues. In fact, just as denounced by Thomas Piketty in his book "Capital in The twenty-first Century", in the united states and in Japan are becoming more and more visible the two social classes differentiated.*

*Let us observe, that the division into three social classes, annuitants, capitalists and workers, which makes David Ricardo in the early EIGHTEENTH century according to the source of income, it is ideological and is made with the sole intention to legitimize the moral superiority of the nascent entrepreneurial bourgeoisie of the time of Ricardo, in front of the old and parasitic aristocracy. But what is certain is that, from the point of view of monetary, corporate profits have nothing to differentiate it from the rent of the land.*

*Although the German economist Karl Marx, reported in "The Capital" tricky concept behind the denial of the benefit of the capitalist to the risk that assumes who advances the money from the investment, fail to see where is the trap of the argument of Ricardo and throw off when he points out to work as the sole source of the creation of wealth, without understanding that, in the structures are sufficiently complex, the total is always greater than the sum of the parts. The society creates wealth thanks to the cooperation of the parties, but it is stupid to say that it can be distributed in a "fair" between the parties, which is very evident that belongs to all.*

### **3. HOUSING AS A CAPITAL GOOD**

One of the great social problems of all times has been, and remains, the high price that the housing in relation to wages. The odd mix that comes together in a house, where it binds to the

nature of a capital good is not reproducible with the provision of a service that is essential to the life of the people, converted to housing in an object, especially attractive to those who want to save at the same time ensuring the capture without the risk of a monetary income.

If these two general features, we joined two other particular properties that make the house particularly attractive as an investment, then no one should be no surprise that the home has become a capital good single that almost always is behind all the speculative bubbles, and whose price goes up without stopping. We are referring, first, to the ease with which investment in housing fits into any pocket, be poor or rich, as investment in housing covers, from the modest purchase of a single housing to put it on rent, to the large and anonymous investment funds, the holders, in the centers of the world's most important cities, of entire buildings with a large number of homes and offices dedicated to the rent. The second major attraction of the home is that it can be maintained without time to dwell without incurring any loss to any appreciable value.

We can understand then that the problem of housing come from very far away, as far away as the ancient, legendary and monetary Rome. Chronicles of Marco Licinius Crassus, who later would be known to history as the consul who defeated Spartacus, he owed his immense fortune to the dark and some clear speculations in real estate in the old town centre of Rome. We see that the housing problem is far from being a new problem, and the world, which has always been in the economic a monetary economy, has had to fight at all times against the nature of housing as a capital good that inevitably leads to be the source of all kinds of currency speculation.

We are going to explain one of the few things that can be done to, if not solve the problem, at least mitigate as much as possible its consequences more dire.

If the housing was a well reproducible, the only thing that would have to do to fix the problem would be to build housing to meet the need there is of them, as it happens with cars and other goods reproducible. But, as the house may only occur in very limited quantities and each time farther away from the place where it is needed, any solution to the shortage is to be found on the side of buyers: *limiting the number of people or institutions that they can purchase a home.*

Let us observe that there are two reasons why someone may want to buy a home. One, to live in it, and, another, to save, or to acquire an income from it. Although it is very clear that many times both can go together and get to be hardly distinguishable, no one will deny that if it is limited to the acquisition of housing as a means of savings or investment will be much reduced demand for housing and very probably will lower the price in the middle in that this is one of the main reasons why that is acquired by the housing and, therefore, the cause that is pulling up the prices.

According to the logic of the reasoning above, we can distinguish four sequential levels that must be passed through to lower prices:

LEVEL ONE. Outlaw the purchase of new homes for all legal persons (companies, investment funds, banks, etc) so that only individuals are able to retain home ownership, whether to use it as a first home or use it for rent. This way you will be eliminating from the market a good number

of potential buyers and the sale prices to come down more or less important according to the true contribution to the purchase of homes from institutional investors.

LEVEL TWO. It is very possible that you have not so many savers institutional as we like to believe, and if there is, you may be interested in highly specific sectors, such as city centers or neighborhoods, selected, and have no influence on the price of housing out of these sectors. In such a case, it would be limiting the purchase of housing to the individuals, for example, by limiting the amount of savings that can accumulate in the housing, one or two, or three times the price of the housing officer that they enjoy, of course, setting a ceiling. This can greatly reduce the amount of people who compete for the purchase of a house and will not be detrimental to almost anyone that uses a second home as a source of income, a means of savings or inheritance to their offspring, but it will be out of the market to many other people using the housing as a means with which to protect a large heritage of the risks of other types of investments more risky.

LEVEL THREE. It is possible that, even taking the two previous measures, there are certain areas that will not significantly lowers the price of the home or your car, especially in the urban centres and some areas considered a luxury for a variety of reasons. In such a case, and when it is deemed necessary to lower the price of housing in these “special areas” for reasons of social utility, can be limited by the possession by a person to a single house within a special area, whether or not the usual housing, allowing the user to have more housing in areas that are not limited. That is to say, it is not permitted to have more of a home at any of the many areas that are considered special.

LEVEL FOUR. In areas that fail the above measures, then it only remains to limit the price for rental of the apartment. This is often done as a last resort in the present, in large urban centers, but we believe that it is very unlikely that the measures proposed in the first three levels do not give a result, even in the major urban centers. Please note that the pressure in the price of the centres of a large city is also a result of the pressure on the prices of the periphery.

It is evident that the implementation of the four actions that are recommended can lead to some mischievous and certain traps, but that's going to be inevitable in any proposed solution and should not be taken into account as a criterion to rule out the solution that is proposed. There is no reason that the right to private property have to be above the right to have a first decent housing, moreover, when the proposed solution, only limits the purchase of a home to those who already have a home. Both rights are not incompatible because limiting a right does not imply cancel it.

PART IV  
THEORY FINANCIAL  
GROWTH

## THE CONVERSION OF THE MONEY ON RENT

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04 of march in the year of 2021

### 1. THE RATE OF BENEFIT

From the most remote antiquity has always been understood that the money that is spent on the creation of businesses, often referred to as investment, is the engine of economic growth. So much so that in the texts of 200 years ago is identified to the word “capital” with the money that is paid or is spent with the purpose of obtaining an income. Is the idea, for example, is very well appreciated in the writings of David Ricardo:

*The rent is that portion of the products of the earth, which is paid to the landlord for the use of the powers original and indestructible soil. Often, however, confounded with the interest and profit of capital, and, in popular language, the term is applied to what you will pay annually a farmer to his landlord. If, of two farms adjacent to the same extent, and of the same natural fertility, one had all the amenities of the farm buildings and, in addition, were properly drained and removed, and divided advantageously by hedges, fences and walls, while the other had none of these advantages, it naturally would pay more compensation for the use of a, which by the use of the other; however, in both cases this remuneration would be called rent. But it is evident, that a portion of the money that will be paid annually by the farm improved, it would be by the powers that be original and indestructible soil; the other portion would be paid for the use of the capital which had been employed to improve the quality of the land, and in the construction of the buildings that were necessary to secure and preserve the products.*

David Ricardo (1817)

*Principles of political economy and taxation*

We have already mentioned, that Ricardo difference the profit to an investor, the income obtained by the owner of the land, that's why Ricardo noted in the text, in the language of popular, there would be no difference between the rent that is paid by the “use of the powers

*original and indestructible of the soil*”, and the income that pays for *“the improvement of the quality of the land, and the construction of buildings”*. However, we have also commented that it is a way of interpreting the profit purposes only ideological seeking to justify the physical nature of the capital.

From Ricardo, the nature of capital happens to be physical and to be associated with spending a physical to create the capital good, and cease to have a financial nature that is associated to the valuation of financial benefits that it produces, and as such associated with it ... *“the language popular”*:

$$\text{rate of profit} = \frac{\text{surplus monetary}}{\text{amount of the money you invested}}$$

It is the same vision that we can find, as in the TWENTIETH century, in the work of Piero Sraffa. In his work, *“the Production of goods for other goods,”* defines the rate of profit tending exclusive to the physical nature of the production, as the ratio between the surplus physique of a commodity and the amount of that commodity that is spent in the production:

$$\text{rate of profit} = \frac{\text{quantity of output produced} - \text{amount spent}}{\text{amount spent}}$$

Sraffa does not seem to realize that what he identifies in his work with *“the amount spent”* is actually a part of the final production that is reused in the process and, although don't take advantage, it is not an expense or may be considered an expense because they do not have to pay anything for it. For example, a portion of the oil that is obtained in the extraction of the oil must be spent in the extraction process, which decreases the amount of oil available that is obtained, but there is no sense to consider it an expense because that what is consumed is being generated in the same production process.

The abandonment of the financial nature of the capital and its replacement by the physical nature of capital, it is a path of no return that starts with David Ricardo, but that is well used by economists working for the private universities in the U.S. to hide without any embarrassment which is actually the capital: *a well that produces an income*. It is therefore not a penalty, an economist from the likes of Piero Sraffa have not read with enough attention to the writings of Joan Robinson, in which it shows that the capital can only be assessed using a rate of interest beyond the production process, and has been seduced by the apparent logic that contains the physical nature of the capital when it defines the rate of profit as a ratio linked to the physical nature of the production, despite the fact that a deeper analysis would reveal that the terms that appear in the definition lack of any sense.

When an investor buys a barrel of wort before fermentation and after three years sold as wine is fermented at a higher price, it is evident that we can define a coherent way, the profit rate of the investment as the ratio between the benefit obtained from the sale of the wine and the expenditure which it did to buy the barrel of wort. But this apparent clarity in the definition of the rate of profit when it refers to the benefit that is obtained from the sale, on-time service, as in the example of the wine, it collides with the absence of clarity when you try to generalize the idea to the business of a wine cellar, that is to say, when you try to explain the benefit in the production of a well reproducible.

What is the benefit that is obtained from a winery that is engaged in the business of fermenting wine? Explain the reason why this question cannot be answered using the rate of profit.

The accounting equation has to fulfill necessarily any company within a monetary economy is one that matches the company's revenues with the expenses, including, in the latter, the benefit is split between workers and employers. In particular, for a business basic is met:

$$Q_{ii}^o p_i = \sum_{j=1}^n Q_{ij} p_j + B_i^{cap} + B_i^k$$

Let us observe that in the expression there is no term that can be linked to money allegedly involved in a “investor”. Any expense that is necessary to be done in the company, for example, to replace the machinery, what we assume is included in the expenses of the accounting expression and is paid, as with all costs, to be part of the monetary income that gets the company. Also the income that gets the owner of the company, and the wages paid to the workers, out of the income. All the costs, whatever they may be, are paid for with the revenue.

All the money you spend for the company, running costs and maintenance, the cost to pay to the workers, or the expenses that meet the income that they receive the entrepreneurs, out of the income generated by the economic activity, so that the term “amount of money invested,” which appears in the expression of the rate of profit is not meaningful. The company works without any inverter have to provide any money from the outside.

When, instead of analyzing the profit from the sale of a single barrel of wine obtained from the purchase of a single barrel of wine, we analyze a winery in the purchased continually casks of wine, and are sold continuously wine barrels, we find that it is not possible to identify any expenditure on investment. In the case of a winery, to speak of the investment has only sense at the beginning, while the winery creates and does not produce a surplus of cash, but no sense when the company is already working and any necessary expenses to carry out the economic activity it is paying the difference between the proceeds from the sale of the wine casks, and the costs for the purchase of barrels of wort. When this occurs, the company is giving an annual flow of benefits that do not require any investment, and is not at all clear how it should be defined a rate that reflects the benefit associated to the mercantile activity of the winery.

We see that the difficulty arises because it is impossible to identify “the money is invested” when the company is already producing a surplus of money, since there is no “money spent”. The very idea of investment in which is based the formula for the usual rate of profit makes no sense for a company that is already producing. Then, if the businesses do not need a continued investment in order to obtain benefits, how it should be understood the money that appears in the rate of profit, and that is considered a necessary expense advanced by the investor? Worse yet, how do you account for the income that is perceived by the possession of the company when, as we see, it is not necessary to advance any money for the company to produce a surplus?

It is very evident that *“the income which comprises a capital good to their owners, it is not the service you get for risking the money that companies need to produce and in nothing is the*

*difference of the income that is received by a landowner.* The idea that the benefits are received by risking the money needed for the production does not hold, as it does not hold the very idea of the rate of profit.

The lies never walk alone. Always accompany many other lies with the only purpose of preventing that we can distinguish between them all the truth, which is nothing other than the pure and simple a privilege for the few over the many. The truth simplest of all.

## 2. THE CONVERSION OF THE MONEY ON RENT

The problem to define a parameter that, being consistent with the financial nature of capital, determine the profit who created a capital good is an easy solution when it comes to the problem in aggregate terms, focusing our attention on the reaction that exists between the aggregate rent and the amount of money you need to put in the game to get it, forgetting for now the problem of knowing the particular benefit that you can get an entrepreneur particular while creating a capital good.

Let's start by defining a parameter macro that informs us of the value of the aggregate capital throughout the economy, and we will show the reason nothing is clear that the monetary savings are so terribly efficient in its performance at the time of putting into operation the entire productive capacity of the society, regardless of the destruction of the natural resources that this entails, nor the terrible consequences for the environment, your unstoppable desire to grow.

The extraordinary facility that have a monetary economy to achieve the maximum production capacity can be found in the immense economic incentive that has the conversion of a stock of money in a flow of income, that is to say, in the immense incentive that exists for the creation of capital goods. To view it, we are going to assume an economy in which grows the *GDP* thanks to an injection of money, no matter now if this growth is purely inflationary or, on the contrary, it is real and increasing production. In such a situation we know, thanks to the Equation Aggregate of Conservation, that the *GDP* grows at a rate proportional to the constant of Fisher:

$$\frac{dGDP}{dt} = -k_F \cdot Ah \rightarrow \Delta GDP = -k_F \cdot Ah \cdot \Delta t$$

The expression says that *when injected into the money supply of a stock annual of money, of value (Ah · year), the national income increases at a rate proportional to the constant of the Fisher and the stock annual injected.* If we now use the expression to calculate in terms of increasing the value of the capital goods, assuming that the parameters  $\alpha$ ,  $\beta$ ,  $\gamma$  change little annually, we have:

$$dK = \beta \cdot GDP \rightarrow \frac{dK}{dt} = -\beta \cdot k_F \cdot Ah \rightarrow \Delta K = -\beta \cdot k_F \cdot Ah \cdot \Delta t$$

The expression relates the aggregate growth of the capital with the cause, the injection of cash, which can be stated as a principle:

*THE GROWTH PRINCIPLE: In a monetary economy, the nominal growth of capital is proportional to the growth of the money supply  $M$ , the constant of proportionality is the product of  $\beta$  for the constant of Fisher:*

$$dK = \beta \cdot k_F \cdot dM \quad \beta = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i}$$

Where  $\langle \alpha \rangle$  is the participation of the income of capital in the GDP, after-tax. In particular, for an economy of Piketty in which  $\bar{\kappa} = 1$ , we have:

$$dK = \frac{\langle \alpha \rangle}{i} k_F \cdot dM$$

*THE PRINCIPLE OF ACCUMULATION: The amount of capital that exists in an economy that is proportional to the money supply of the economy, being the constant of proportionality is the product of  $\beta$  by the constant Fischer:*

$$K = \beta \cdot k_F \cdot M \quad \beta = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i}$$

*This is a remarkable result because it tells us not only that there is a limit on the amount of wealth that can be accumulated in an economy, but, in addition, that the amount is fixed and does not depend on the savings in the economy.*

But then we will return to this important point, we are interested in now is not so much to point out that the nature of financial capital limits its value to a multiple of the amount of money that is used to carry out trade, something that is very noticeable, but the relationship allows you to define a parameter that indicates to us that the benefit is obtained when the money is invested becomes capital goods:

*Defines "Capital Efficiency" of the whole economy to the ratio between the increase of capital and the increase of the money supply that causes it:*

$$\text{Efficiency of the Capital} \equiv \mu = \frac{\Delta K}{Ah \cdot \Delta t} = \beta \cdot k_F = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \cdot k_F$$

The parameter, although it is defined in increments, it is clearly a static setting that is obtained by dividing the aggregate capital  $K$  by the money supply  $M$  of the economy and allows us to understand without any difficulties, given the high value—that is, the origin of the immense capacity devourer of resources that show the monetary savings. Recalling that  $\beta$  is in the present environment "six" and that the constant of Fisher is "two", we have:

$$\mu = \beta \cdot k_F \cong 12 \rightarrow \begin{cases} \beta \cong 6 \\ k_F = 2 \end{cases}$$

The efficiency of the conversion of money into income has a value close to 12. That is to say, that for every euro that is injected annually in the money supply are obtained, on the average, about 12 euros in capital goods, although, of course, nothing prevents the value of the new capital to be only of inflation. Such a high value of the conversion of money into income gives us a very accurate idea of the reason why the monetary savings tend to the full employment of all resources when it is not restricted to, for one reason or another, the necessary growth of the money supply.

THE CONVERSION OF MONEY IN RENT. *With a value of the efficiency of the capital close to 12, it is not very difficult to understand why, when the economy is left to the mercy of the markets, they become a terrible threat to all ecosystems that inhabit the planet.*

*Any natural resource, however insignificant it may seem to us to the value that you have, you'll no doubt find to be exploited and produce revenue as long as there is a promise of benefits, so immense.*

*What remains of the amazon rainforest will be devoured completely in less than a decade for the immense monetary incentive that presents the destruction of a unique ecosystem to replace it with immense plantations of soy, to even be viable in the future for the poor quality of the land on which it sits.*

*If, at least, the most underprivileged people in Brazil to obtain some benefit from the destruction of the forest, we could head down and look the other way thinking of the people who come out of poverty and have a better life, but unfortunately not even have that consolation, and what will happen will be very different. Any advantage you will get that have nothing to do, because the logic of those who use the money to convert it into income will not allow you to increase wages at the expense of the income and what that will bring the destruction of the forest will be more poverty and more poverty.*

*It is also not difficult to understand why the jungle of Borneo, one of the few primary tropical forest that are left, will be converted into a huge palm oil plantation. No one should be surprised either that the forests of Canada or the siberian tundra soon be followed by the same steps. The capital has its own logic.*

*Only from the policy it is possible to successfully fight off the immense incentive that feeds the growth of the monetary savings. The natural resources belong to us all, and we have the obligation of preservation to maintain the life of generations to come. We cannot continue to let the rent-seeking to become human beings in a locust plague that ravage without any advantage in real environment in which they live. For it is this work, for us to become aware of that it is what is pushing us to the physical destruction of the planet on which we live and we learn to control it.*

THE INCENTIVE OF CAPITALISM: *A monetary economy, even in the case that it is already at full employment, have a big incentive to find ways to further increase the production, and with it the share of GDP that goes to pay the rent of capital, since any increase in spending means an increase of the capital stock is proportional to the parameter  $\beta$ :*

$$\Delta K = \beta \cdot \Delta GDP$$

*Obviously, when the increase in cost is only for inflation, the growth of the capital will also be only a nominal one, but this should not blind us to the fact that what drives us blindly to the physical destruction of our planet has its origin in the immense benefit that is obtained from the use of money to organize:*

*“the conversion of a stock of money in a flow of income”*

*This being the essential feature of any monetary economy, and where it lies both its strength and its weakness.*

Capitalism, or, better said, the cash economy, are the most efficient machinery ever conceived for the creation and accumulation of assets that produce income currency, which is called commonly the capital. This last point, prides itself very well when we express the efficiency in function of the interest rate and the other variables:

$$\mu = \frac{\langle \alpha \rangle}{\bar{\aleph} \cdot i} \cdot k_F \rightarrow K = \frac{\langle \alpha \rangle}{\bar{\aleph} \cdot i} \cdot k_F \cdot M$$

- 1) The value of capital depends inversely on the rate of interest, so that the conversion of money into income will be greater the lower the interest rate of the economy. Not only the capital of new creation will be more valuable when the interest rate is reduced, but also the capital already existing will see increased its value.
- 2) Will also increase the value of the aggregate capital when to increase the share of the income in the *GDP*, after-tax, the parameter  $\langle \alpha \rangle$ . That is the reason why the participation of the income of capital in the *GDP*, should be measured after taxes and not before income taxes, because the value of capital depends on the income it produces to their respective owners.

(It is also the reason, and no other, by the economists who work for the universities of the united states propagate in the text books that lowering taxes is good for the economy)

- 3) Finally, and not least important, the value of the uncertainty  $\bar{\aleph}$  want to be as close as possible to 1, which will only occur to the extent that there is legal certainty. Or to say it bluntly, the more guarantees you that the law is not going to change on a whim or that taxes don't go up, the more nearby it will be the value of the uncertainty to 1. Therefore, the fewer political decisions can be taken, more peace of mind will not alter the status quo, and closer to “1” will be the uncertainty. Also in this, it has a very active role economists who work for the private universities of the USA, and propagated without sleep economic theories that advise you not to act to the governments.

In short, the variables of which depends on the value of the capital goods are:

- The rate of interest.
- Taxes on capital.
- Legal security on the private property.

The origin of the cash injection that causes the growth of the economy can be diverse, and we will address the issue when a little more detail when considering the Financial Theory of Economic Growth. In the case of an economy in isolation, the source of the injection is double, money, credit backed by debt, or money cherished in the Market of the Capital that is spent in the Consumer Market (what we will see in the next chapter). In the case of an economy that is not isolated, the two sources already cited, we have to add a third, the money coming out of the economy, either by imbalances in the trade balance or imbalance in the input or output of capital money.

In the following article, we will analyze in depth the Credit System, and we will see the mechanism of money creation in the monetary savings, but now all of that does not affect us.

### 3. THE EFFICIENCY MICROECONOMIC OF THE CAPITAL

The analysis performed in the previous section was based in its entirety in the equation aggregate of conservation, and it is, therefore, a macroeconomic analysis. The efficiency of monetary relates the aggregate value of the capital goods to you according to the cause, the amount of money that the form of the money supply, but does not answer the question about what is the benefit that is obtained when you create a capital good, such as, for example, any of the basic companies in which we have divided the economy. To answer the question, and remain consistent with the definition of macroeconomic which we have given of the efficiency, we need to relate the price of a capital good for anyone with the money that they need to carry out economic activity:

$$\mu_j = \frac{(\text{value capital})_j}{(\text{money})_j}$$

The efficiency of monetary  $\mu_j$  of a capital good either be defined as a ratio between two stocks of cash, the market value of the capital good (for example, a company) and the amount of money you put into play during the economic activity, according to the definition:

$$\mu_j = \frac{k_j}{m_j} \rightarrow \begin{cases} k_j = \frac{\alpha_j}{i \cdot \aleph_j} \cdot (B_j^{cap} + B_j^k) \\ m_j = \frac{1}{k_F} \cdot (B_j^{cap} + B_j^k) \end{cases} \rightarrow \mu_j = \frac{\alpha_j \cdot k_F}{i \cdot \aleph_j}$$

Where the various parameters that appear to have the usual meaning. Thus, the term  $\alpha_j$  is the share of the surplus  $(B_j^{cap} + B_j^k)$  that the company dedicates to pay the rent of capital, and the

parameter uncertainty  $\aleph_j$  is determined in the market. It should also be noted that the constant Fisher  $k_F$  that appears in the expressions is one that relates the money supply with the surplus or *GDP*, and we are assuming that is still valid in each of the sectors and for each of the basic companies that have divided the production. The money supply,  $m_j$ , associated to a company or basic sector of the economy is the same mass of monetary ran for the monetary equation is fulfilled also at the micro level; what we call the Equation of Fischer. We now use the masa monetary to generalize the efficiency of monetary to each and every one of the basic companies.

*Defines "Capital Efficiency Microeconomic"  $\mu_j$  of a generic company, the ratio between the valuation of the company in the Capital Market and the supply of money that is at stake when carrying out the economic activity:*

$$\mu_j = \frac{(\text{value of the capital})_j}{(\text{money})_j} = \frac{\alpha_j \cdot k_F}{i \cdot \aleph_j}$$

*The expression has meaning to the extent that they make sense to assign to each company the same value of the constant of Fisher for the whole economy. Otherwise, the expression will not have any sense.*

The meaning of the Efficiency of Microeconomic it is very subtle, because, unlike what happens with the rate of profit, there seems to be nothing in the definition that it is related to the physical cost of creating the company, which is not entirely true. The money supply which appears in the denominator is the amount of money that is necessary to freeze to be able to carry out the economic activity of the enterprise, and although it can never be considered an expense of the physical, it is certain that not can be removed, saved, or used for something different that is not to sustain the economic activity of the enterprise.

*But, what is the benefit of creating a new business? That matters very little.*

*When an entrepreneur sees the opportunity to build a company at a price lower than the price you will have on the capital market, it is very likely that they are encouraged to build borrowing money. This is what Keynes meant when getting, the coined the term "animal spirits". But it is well understood that the benefit that you obtain an employer of an investment will be completely uncertain and will depend upon the actual difference you get between the money that has been spent in building the company and the price at which it finally ends valuing it the Capital Market, which, as we know, depend on the income that you have been able to capture.*

*There is, therefore, anything resembling a profit rate that is equal in all industries thanks to the free movement of capital, as supposed to David Ricardo. There is also the capital as a factor of production, as propagated by the economists who work for the private universities of the USA. Although that does not preclude, of course, that the "money" that you borrow to carry out the investment (which was as they called in the time of David Ricardo for the "capital") is directed to those industries where employers think that there are more business opportunities. In the words of Ricardo:*

*"It is then the desire, that every capitalist has, to divert their funds from a job it is less profitable to more profitable, which prevents the market price of the commodities continue for a period of*

*time far above or far below its natural price. It is this competition which adjusts the value of exchangeable goods, which after paying the wages for the labour required for their production, and all other expenses required to replace the capital employed in its original state of efficiency, the remaining value, or the surplus of each trade must be proportional to the value of the capital employed."*

*David Ricardo, 1817  
(Principles of Political Economy and Taxation)*

*In this paragraph, Ricardo explains that the businesses that pay a higher interest rate for borrowed money, attract to your sector the money that venture capitalists have to invest, which will equalize the rate of profit in all industries (which we know that it is a wrong idea). In the time of David Ricardo, the term "capital" is used to refer to the money that pays in exchange for an interest, that is what living a lender and that is very clear in the paragraph.*

*Also Ricardo makes it very clear with the phrase "...the remaining value, or the surplus of each trade must be proportional to the value of the capital employed...", the value that is assigned to a company is the fitness cost of creating it, understand it, proportionate to the surplus, although it does not explain why it has to be achieved proportional. That is to say, Ricardo says that the business benefit is proportional to the capital invested without it being clear why.*

*Also Ricardo distinguishes between the "lender" and the "investor", probably because he realized the trap that falls when it identified the two figures, as it is very clear that who lends money is a rentier not very different from the one who owns land, even more so when a legal system supports the repayment of the debts. On the contrary, the investor is someone who risks their own money, without that it is not clear that the difference of a lender that lends itself to itself.*

*However, thanks to the tireless work of the economists who work for the private universities of the USA, in the present annuitants do not exist; all are investors who derive their income from risking your money.*

**What is the Efficiency Monetary money?** The money is a capital good, and, as such, has an efficiency determined:

$$\mu_{\text{money}} = \frac{\alpha_{\text{money}} \cdot k_F}{i \cdot \kappa_{\text{money}}} \xrightarrow[\kappa_{\text{money}}=1]{\alpha_{\text{money}}=1} \mu_{\text{money}} = \frac{k_F}{i}$$

**What is the efficiency of monetary a home?** Very high, since then. The amount of money annual at stake to carry out the maintenance of a home is usually very small in relation to the market value of the home.

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**What is the relationship between the efficiency of the entire economy and the efficiency of each of the capital goods that form?** The efficiency of the entire economy is the weighted average of the efficiency of each of the capital assets with respect to the benefits:

$$\mu = \frac{\Delta k_{\text{capital}}}{Ah \cdot \Delta t} = \frac{\sum \mu_j \cdot (B_j^{\text{cap}} + (B_j^k))}{\sum (B_j^{\text{cap}} + (B_j^k))} = \beta \cdot k_F$$

The same can be said for the efficiency of a well-either formed by the sum of the various capital goods.

**Influence of inflation.** It only remains for us briefly discuss the influence of the inflation in the creation of capital. As has already been said, and according to the theory that we have exposed, for an economy to grow, it is necessary that the money supply grow without hindering the economic processes:

$$\frac{dPIA}{dt} = -k_F \cdot Ah$$

But, the Conservation Equation can't tell us that part of the flow of money injected into the economy will cause inflation, and part will go to increase the production of goods. In general, we must assume that both events are taking place to a greater or lesser extent, and both the average prices of the products  $\bar{p}$ , as the total amount of products  $\bar{q}$  present in the economy will be growing. It is easy to see that when it separates the real growth of capital growth, inflation, and defines the growth rate of real capital and the rate of growth of inflation on the capital in the same way they are defined for the *GDP*, both agree:

$$\left\{ \begin{array}{l} \text{rate of inflation} \equiv \pi = \frac{\bar{q} \cdot \Delta \bar{p}}{\bar{q} \cdot \bar{p} \cdot \Delta t} = \frac{\Delta k_{\text{inflation}}}{k \cdot \Delta t} = \pi_k \\ \text{rate of growth} \equiv g = \frac{\bar{p} \cdot \Delta \bar{q}}{\bar{q} \cdot \bar{p} \cdot \Delta t} = \frac{\Delta k_{\text{real}}}{k \cdot \Delta t} = g_k \end{array} \right.$$

What is not an unexpected result, as the *GDP* and the capital are related by the parameter  $\beta$ , we assume that changes little over time. Therefore, the real growth rate of capital is equal to the rate of real growth of the *GDP*, and the same thing happens with the rate of growth of inflation, both of which are identical to the capital and to the *GDP*. Taking both of these rates to the conservation equation we have:

$$\pi + g = k_F \cdot \frac{Ah}{GDP} \rightarrow \boxed{\pi + g = k_F \cdot \tau} \quad \left\{ \begin{array}{l} \tau = \frac{Ah}{GDP} \rightarrow \text{rate of creation of money} \\ \text{relative to GDP} \\ \tau_k = \frac{Ah}{K} \rightarrow \text{rate of creation of the money} \\ \text{with respect to capital} \end{array} \right.$$

The new money is injected into the money supply has a dual function, part is dedicated to increasing inflation of the existing capital, and part is dedicated to increasing the actual amount of new capital, or what is the same, to increase the amount of consumption goods that support the new capital.

## **FINANCIAL THEORY OF THE GROWTH**

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### **1. THE MONEY CREDIT**

All the work up here to be developed would be sentenced to the most absolute irrelevance, if we failed to address the most important question that underlies a monetary economy:

*Who makes the money?*

But it is very evident that, to answer this question, first it is necessary to answer the question of what money is and what use is money in the economy, because we can see, with not a little astonishment, that when you talk about money in any economics book, is never defined the money and it is understood that who the book knows what it is.

Since then, we all have a very clear idea of what the money is for, but it is too scary to think that those who lead the Central Bank would not have any idea of what the money is for, despite the fact that they are able to create 4 million of millions of dollars without even batting an eye.

***THE MONEY.** We define money as anything that exists within a monetary economy that is in compliance with:*

- 1) you Can buy any good or service offered for sale.*
- 2) Meets the Monetary Equation:*

$$k_F \cdot M = \sum p_i \cdot q_i$$

*where M is the amount of money that is used within the economy,  $k_F$  is a constant and the sum represents the cash flow of purchases.*

*Throughout history, many things have been used as money. From the gold, a rare metal with which we tend to associate almost always the money, until the salt or tobacco, which in specific regions and so it's very punctual, have been used as money without too many problems. It can be said that almost anything can make money, and it can be shown that almost anything that's been done in some time of money.*

*Therefore, the nature of money cannot be material, and that whatever is used as money, may not be your nature material as appropriate to its value. In this respect, nor that the money is for,*

*and what gives value to the money, can have its origin in the physical nature of what we use as money. Its nature and its value has to come from somewhere else.*

*Here we have defined the money stating the only two properties that must meet "something" for it to be considered "money". There is no other consistent way to define it.*

In today's economies, although it can seem strange, that is used for more than a century as money is the bank credit. It is not difficult to verify that the bank credit satisfies the two properties that define the money:

- 1) You can buy him anything that you have to sale, at least within the country where it is issued by the bank credit.
- 2) Your use complies with the Monetary Equation, at least that we believe to have demonstrated that happens in the economies in which the means of production are mostly private.

Therefore, from now on, we will consider that all the money that exists within the economy is not money credit, that is to say, *"the money provided by the banks when granting you a credit"*, which are the commercial and investment banks the only ones who have the legal privilege of creating money when they grant a credit and destroy it when it returns, assuming that:

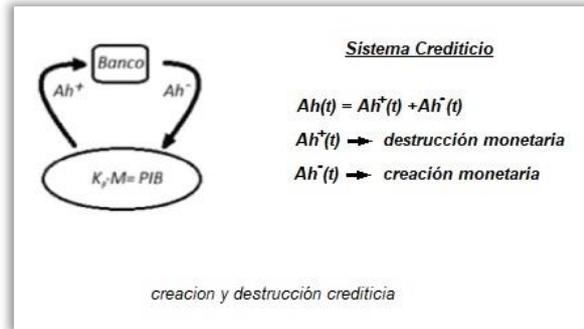
- a) All the money is created by the credit.
- b) The money has no physical value.
- c) The money can be manufactured in the quantity that you want.

The confusion that prevails in the present about the nature of money is tremendous, and the reason why is not because it is hard to know, who, how, and when, is made the money, but because economists working for the private universities of the united states are doing everything possible to hide, who, how and when it is manufactured the money within the united states. Now that we know what the money is for and who is using it, we can create a theory consistent about how the banking system.

Let us remember that, whatever the nature of what is used as money within the economy, are the flows of saving and dissaving that appear in the Vector Equation of Conservation, it creates it and what destroys the money of the money supply, regardless of whether the money is the money in cash, cash credit, or of any other nature are made:

$$y_j = x_j + ah_j + \frac{1}{k_F} \frac{dx_j}{dt} \quad \begin{cases} ah_i^+ \equiv ah_j > 0 \rightarrow \text{saving} \\ ah_i^- \equiv ah_j < 0 \rightarrow \text{deficit} \end{cases}$$

In the equation, the components of positive vector savings represent the flow of money that is extracted from the money supply, and that we identify with the savings that go directly to the Capital Market; while the components are negative represent the money that is injected into the money supply, which we identify with what we call deficit (or credit) and comes from the money in the Capital Market.



In fact, the Equation Aggregate of Conservation, which relates the *PIA* (or *GDP*) with the aggregate flow of savings, was obtained on the basis of the relationship of money supply *M* with the flows of saving and dissaving:

$$\frac{d}{dt}PIA(t) = k_F \cdot \frac{dM}{dt} \xrightarrow{\frac{dM}{dt} = -[Ah^+(t) + Ah^-(t)]} \frac{1}{k_F} \frac{d}{dt}PIA(t) = -[Ah^+(t) + Ah^-(t)]$$

But in the above equation is not easy to know which are the flows of saving  $Ah^+(t)$  and credit  $Ah^-(t)$  in an economy in which money is created by banks when granting you a credit.

In today's economies, the money does not have a physical nature, and is only a registration bank that change holder when it is used to pay on the exchanges, and that is created out of nothing when it is granted a bank loan, and is destroyed when it is returned. Therefore, it would be desirable to express the flows of saving  $Ah^+(t)$  and credit  $Ah^-(t)$  that appear in the equation of conservation, depending on the flow of credit  $Ah^C(t)$  and the flow of hoarding  $Ah^S(t)$ , which are variables that if we can get to know and predict very well because they are closely related to the changes undergone by the bank records.

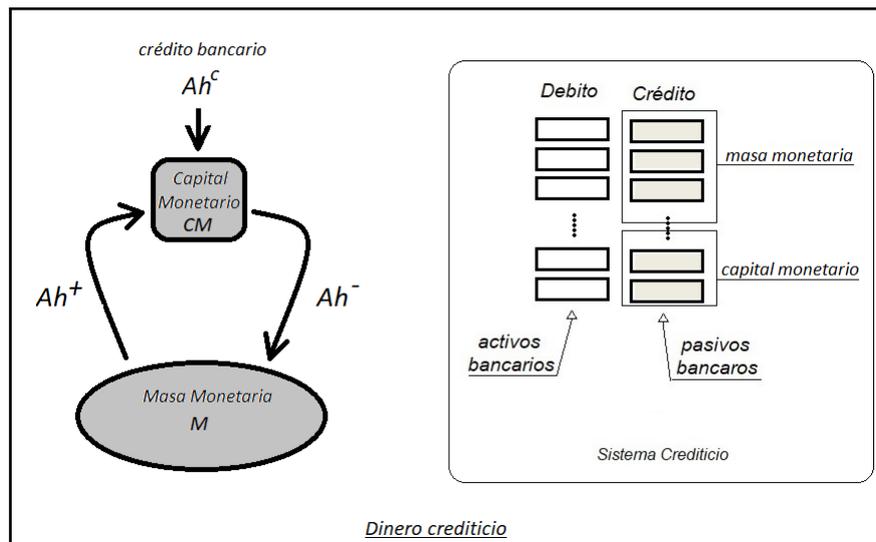
In the analysis, they are not going to introduce new concepts, neither about the money nor about the economy and we're going to limit to explain the relationship that they have the bank records with the vector-saving  $Ah$  that appears in the Vector Equation of Conservation. To do this, we'll start by making a simplified description and idealized in the Banking System, but at the same time completely realistic, as that will allow us to establish very general way, the limitations imposed by the creation and destruction of money to the economic growth of the economy.

## 2. ECONOMY MONETARY PURE CREDIT

The process of money creation credit is extremely simple, and it is the result of the evolution of the organization from an economy based on metallic money (gold standard) to an economy based on money, banking created as a bank loan. The process of credit creation is depicted in

the figure below is very simplified, but complete and rigorous supposed to accept that only exists in the bank money created by the banks as an accounting entry when granting a loan, which is consistent with the reality that surrounds us and with the idea that the Central Bank does not make any money, as in fact occurs for very strange that seems to us.

The figure shows that the two markets, the Capital Market and the Consumer Market, along with the cash flows of input and output to reflect the activity bank. In the right-hand side, shows the bank records that carries out the accounting within the banking system. Let's look more closely at the different cash flows that are created in the process.



### The Flow of Credit $Ah^C$

The banking system creates money through a procedure that is extremely simple:

- 1) When a bank gives a loan, it creates two bank accounts in the name of who receives the loan. In one of them scores a positive balance that will allow the person receiving the loan to spend more than what is entered by economic activity. It's what we call money credit, bank money or, simply, money, and will increase the money supply when a loan is spent on consumer goods. In the other account is noted down in a negative balance, indicating the amount of money that has to be returned to cancel the loan, either in the form of periodic instalments, at maturity, or in any other way. This last record is generally considered to be an asset of the bank. The annual flow of bank money is created through credit him is the flow  $Ah^C$  that comes out of nowhere and ends in the capital Market, in figure.
- 2) When the person spends the positive balance of the credit account, the money will end up divided between the accounts that have the different banks. It is a part of the flow of  $Oh^-$ , which appears in the figure coming out of the Capital Market and entering the Consumer Market, indicating three things. The first, that the money transfer is accepted by all and is the money that's how the economy works. The second, that it is money that did not exist before granting the loan. The third, which is virtual money that you do not have a reality outside of the banking system and the legal system that supports it, so

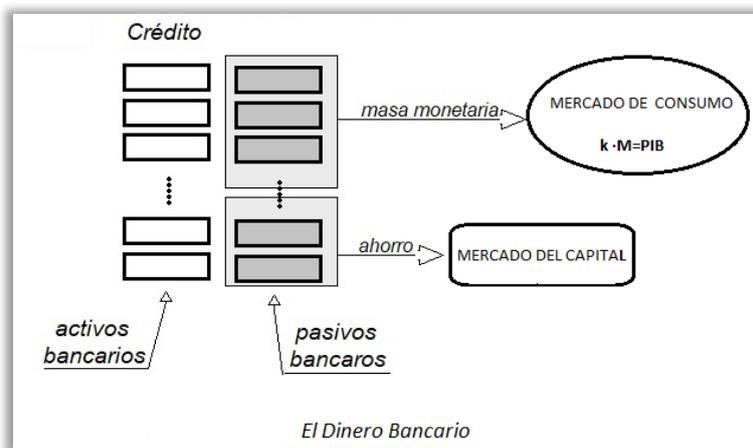
that it always remains within him (we have assumed that there is no other type of money, such as paper tickets, gold, etc).

- 3) No bank creates “formally” no money when you grant a credit because the net balance of all bank records is always zero: “when granted a credit, you create two accounts, one with a positive balance and the other with a negative balance, that is void”. However, the account with positive balance is the money of legal tender that is used to purchase goods and is backed by the legal system of the country. The money is “trust” which will run from then on throughout the economy and that way, both the money supply as the capital money, and can only be destroyed when it is returned to the credit and cancelled the two accounts, the balance of the positive and the negative balance. That is the reason why the bank money always true that:

$$\text{Bank money} = \text{debt credit}$$

The mysterious equality that always exists between the amount of bank money who possess the agents within the banks and the amount of money owed the agents, the banks, shows that all of the money that is being created in the economy is being created as a debt.

It is here, precisely, where lies the magic and the charm of an economy totally credit: “All the money in the economy is a debt of someone and is being backed by the goods or the income of someone”. It can be said that the persons who are made the money really credit are the people who apply for credit and spend it, and that is the reason why they are required to return in the future. It is they who are supporting really the money is credit created by the banks.



The attached figure shows the result of the process of creating credit that we have described. In it appear the bank records that are used for accounting and point out the role of each one of them:

- a) The records from the right are the total amount of money in the economy, which we have called the “cash credit” or “money bank”, and are divided between those that form part of the money of the money supply, and those that form part of the capital money with the functioning of the Capital Market, the latter being what people keep in the

Bank as savings (in reality, hoarding). Both types of money are records only and, therefore, indistinguishable from one another, but they have in common that they are money that you should always owe someone. ALL THE BANK MONEY IS A DEBT OF SOMEONE.

- b) The records from the left are the records which record the money owed to banks, but they are not money, but the “active ingredient” of the bank that backs the money that has been created in the form of credit.

It is observed the pairing of the records of debit (assets of the Bank) and the records of credit (Bank liabilities) which requires that the sum of both have to be always zero, indicating that all of the money created by the bank is credit, and is backed by a debt. There is No creation of money net, but there is creation of money or credit transfer, the flow  $Ah^C$ .

*Who creates the money bank? Let's look at that who has created the money really credit it is he who receives the money from the loan and what it spends, since it is he who supported you with your heritage or your income.*

*The bank's role in this whole story is of vital importance to the trust in “the system trust”, because it is the bank who guarantees to the Central Bank and to all of society that the issuer's actual bank money is going to pay back the money the bank has set for him or, on the contrary, it is the bank who return. In this sense, the bank is who is backing the money that has issued the debtor.*

*The beauty that holds the money, credit, and its danger is that the money is created with the commitment to be returned, which requires banks to find new debtors that you take the old credits are canceling because otherwise the money with which the economy works will be destroyed, with dire consequences:*

*“Money is a debt, and when it returns the debt, the money disappears”*

*The immense beauty surrounding this fact is not without a very real risk, and the same thing that the rose has thorns so that no one take, also the money credit can make us bleed when not handled with care, since the amount of money in the economy depends on the fickle desire of agents to spend money on credit, what Keynes called the animal spirits.*

### The flow of aggregate Savings $Ah$

In the figure also appear flows  $Ah^+$  and  $Ah^-$ , that continue to have the same meaning and represent, respectively, the money that is removed from the money supply through the cost savings and the money that is injected by the deficit, pudiendo come to this last, as we know, both of savings prior as credit. The sum of the two flows is the aggregate savings  $Ah(t)$  that appear in the equation of conservation and governs both the  $GDP$  as the  $PIA$  of the economy:

$$\frac{1}{k_F} \frac{d}{dt} PIA(t) = -Ah(t) = -(Ah^+ + Ah^-) = - \sum (ah_i^+ + ah_i^-)$$

$$ah_i = ah_i^+ + ah_i^- \rightarrow \begin{cases} ah_i^+ \rightarrow \text{saving the agent} \\ ah_i^- \rightarrow \begin{cases} \text{credit of the agent} \\ \text{deficit of the agent} \end{cases} \end{cases}$$

The components of the vector savings represent the sum of the two different flows that each of the agents removed or enter the Consumer Market (the money supply).

### The Flow of Savings $Ah^S$

In the same way that the Banking System creates money loans, also destroys money when the credits are returned; the process of creation involves the process of destruction and both are inseparable from one another. For this reason, we have defined a single vector  $Ah^C$  to represent both the creation and destruction of money by the banking system, being the sign of the vector which indicates which of the two processes dominates in aggregate terms.

However, not all money is created when banks provide a credit ends up being spent on consumer goods, nor all the money you save (and has been extracted from the money supply) is used to return a bank loan. In both cases, the money ends up treasured in the Capital Market. It is what we have called capital money, and may have its origin both in the creation of money through the bank credit as in the extraction of money from the money supply. The changes in the amount of capital money is what we call the flow of savings  $Ah^S$ , even if the right thing would have been to call it stream of hoarding.

***THE PROBLEM OF MONEY CREDIT.** When the amount of bank money decreases because they are returned more credits that you are awarded, it is very likely that the savings is extracting more money from the money supply that which is injected with the credit. Then the amount of money in the money supply decreases and the economy goes into recession:*

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -Ah(t) \xrightarrow{Ah(t)>0} \Delta GDP < 0 \text{ (recession)}$$

*The granting of credit will typically end up being injected into the economy and extraction that makes the saving does not always made to repay a loan, so that the credit system can create bubbles and recessions according to grant more or less credits.*

*The problem, or the great disadvantage, that features the use of bank money is created in the form of debt is the amount of money the supply of money depends on the amount of bank debt that they assume the agents. If, for some reason, these were to decide to reduce your debt with the banks, or the banks decide to reduce the amount of credit that have been granted, then very likely will also decrease the money of the money supply, which will enter the economy inevitably in a recession.*

Although we have just sketched briefly on where to find the source of the crisis credit (the destruction of the money credit because of the obligation of explicitly returning it), it is necessary to delve a little deeper in our analysis prior to deduce accurately the equation that governs the economic growth in the monetary savings.

### 3. THE EQUATION FOR GROWTH

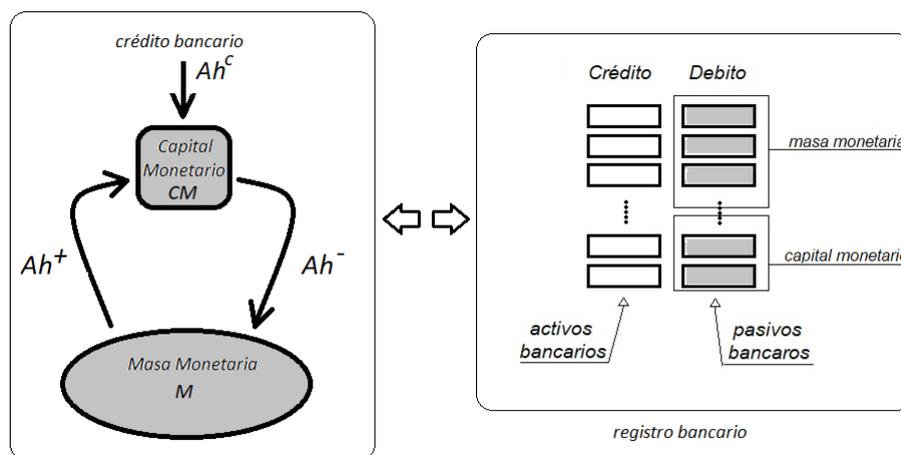
People tend to think of money as something physical that has value by itself, however, the money with which they work all the economies of the world is money credit created by the commercial and investment banks through the credit and that it has no value by itself. At least 90% of all the money circulating in the economy is a debt to someone, and the banks make their profit from the interest you are charging for that debt.

For example, in the USA there are about 20MM of dollars of money banking of which, 10MM are the money-form of the money supply and the other 10MM are, almost in its entirety, the money that is used for the international trade. For this reason, here we have assumed from the beginning that the real economy is an economy of pure credit in which all of the money is the money of credit that has been created as a debt, which is almost completely true. That's not going to alter in any way the generality of the conclusions that we reach, despite the fact that the money bank can co-exist with another type of fiat money, as are the tickets.

Our problem is not so much to understand that the money is a bank loan that the same thing that can be created that can destroy you, but to express the equation of conservation added in function of the changes in the bank records due to the flows  $Ah^C$  and  $Ah^S$ , instead of making it rely on the flow of savings  $Ah$ , as it is expressed now the equation:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -Ah(t) = -(Ah^+ + Ah^-) = f(Ah^C, Ah^S)$$

To do this, let's look at the right part of the figure attached on where to show the bank records with the two types of money there is, the form of the money supply and the capital money. We know that both types of money are used for things different, since one is used for the purchase,



Creación del Dinero Bancario

and the other is idle, but we also know that both types of money are indistinguishable from one another because both are a register bank in nothing differ. Therefore, to express the monetary

flows  $Ah^+$  and  $Ah^-$  that enter and leave the Consumer Market, in function of the changes that occur in the bank records is not easy, although it is not an impossible task to carry out:

- 1) The flow  $Ah^C(t)$  that arises from nowhere to finish in the Capital Market, is the amount of money (bank) that create or destroy the banks when granted and cancelled loans. Represents the annual change in the amount of bank money,  $MB$ , which is created by the credit and may become negative when the flow of a refund of credits is greater than the flow of credit creation, which basically destroys the bank money. Therefore:

$$\frac{d MB}{dt} = Ah^C \quad MB \equiv \text{Capital monetary}$$

- 2) The capital monetary,  $MC$ , is the amount of money that the agents retained for various reasons (mainly for reasons of liquidity in the Capital Market. It is, of course, savings or money treasured and en the figure it is implicitly assumed that all the money credit is always created as capital money and that it is then, when it is spent in the Consumer Market, when it happens to be the money of the money supply. Therefore:

$$\frac{d MC}{dt} = Ah^C + Ah^+ + Ah^- \quad MC \equiv \text{capital monetary}$$

- 3) The flow  $Ah^-(t)$  out of Capital Market and ends up in the Consumer Market, is what they're calling deficit. It is the annual amount of capital money spent on the Consumer Market becoming in the money supply and its origin may be, the savings prior or bank credit that is spent on investment or consumption. It is also the sum of the components are negative the vector-saving  $ah_i$  that appears in the equation of conservation.
- 4) The flow  $Ah^+(t)$  out of the Consumer Market and ends in the Capital Market. It is the annual amount of money that you extracted from the savings of money and became the capital money. Its origin may be the real savings or the savings required by the return of a loan, but that is irrelevant.

From the figure it follows that the amount of money in the money supply  $M$ , the amount of capital monetary  $MC$ , and the amount of money bank  $MB$  (credit), are related by the Equation Bank:

Equation Bank

$$\text{bank debt} = \text{mass montaria} + \text{capital monetary}$$

$$(MB = M + MC)$$

The Equation Bank is the basic expression that describes the entire financial system, and we must not let its apparent simplicity we engatuse. Its importance is very well appreciated when, thanks to her, we can relate in aggregate terms the different cash flows with the changes in the bank records:

$$\left. \begin{aligned} \frac{dM(t)}{dt} &= -Ah^+ - Ah^- \\ \frac{dCM(t)}{dt} &= Ah^S = Ah^+ + Ah^- + Ah^C \\ \frac{dBM(t)}{dt} &= Ah^C \end{aligned} \right\} \xrightarrow{BM=M+CM} \frac{dM}{dt} = Ah^C - Ah^S$$

Expression of the latter, which when substituted in the equation for aggregate conservation, gives us the most important expression of the whole economy, the equation of Growth:

$$\frac{d}{dt} GDP(t) = k_F \cdot [Ah^C - Ah^S] \quad \text{Ec. Growth}$$

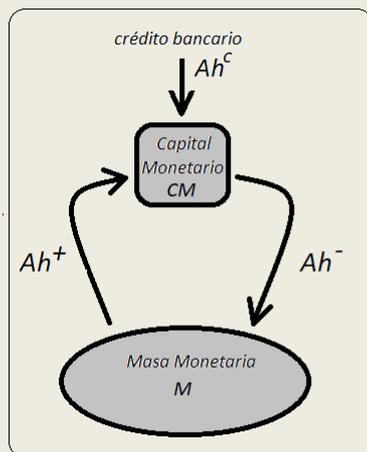
The Equation for the Growth tells us that “the economic growth is proportional to the difference between the growth of the amount of money banking  $Ah^C$  and the growth of the amount of money totesorado  $Ah^S$ ”:

$$\frac{d}{dt} GDP(t) = k_F \cdot \left[ \frac{dMB(t)}{dt} - \frac{dMC(t)}{dt} \right]$$

Which is logical, since the difference between the money created by banks when granting credit and the money that treasures the savings, the money is flowing into the money supply and raise the *GDP*.

The expression of the Equation Aggregate of Conservation in function of the flow of credit and savings, we call the Equation of Growth because it is the equation that governs the economic growth within the monetary savings.

#### DEDUCTION OF THE EQUATION OF GROWTH



#### Deducción de la Ecuación del Crecimiento

$$\left. \begin{aligned} \frac{dM(t)}{dt} &= -Ah^+ + Ah^- \\ \frac{dCM(t)}{dt} &= Ah^S = Ah^+ - Ah^- + Ah^C \\ \frac{dBM(t)}{dt} &= Ah^C \end{aligned} \right\} \xrightarrow{BM=M+CM} \frac{dM}{dt} = Ah^C - Ah^S$$

$$\boxed{\frac{d}{dt} PIB(t) = k_F \cdot [Ah^C - Ah^S]}$$

The funny thing is to check that the expression states that, in aggregate terms, it is possible to hoard any amount of money that you want, as long as the amount of money credit grows faster than the amount of money that is treasured; or saying it another way, the flow of saving (hoarding) can be as large as you want, as long as the money comes from the creation of bank credit and non-monetary (that is what explains why the cash injection of more than 4 million of

million of dollars has not affected the real economy or inflation, because the money is stashed in the Capital Market).

Of course, the reason why we are the crisis, credit and the economy enters recession is that, because it decreases the money supply, regardless of the amount of savings that accumulate:

$$\begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ \frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^C(t) - Ah^S(t)] \xrightarrow{Ah^C(t) < Ah^S(t)} \Delta GDP(t) < 0 \end{array}$$

Later we will see that this is what explains the economic crises that plague periodically to the real economy.

We will use the rest of the chapter to explain the exact meaning of the Growth Equation.

*STEVE KEEN. In the first edition of the Theory of Madrid, we call the Equation of the Growth with the name of "The Equation of Keen". We thought that by naming it so, we were just acknowledging the work of the Australian economist Steve Keen on the identification of the growth of the debt as the source of the economic crisis. Something that all economists would agree to recognize, despite the fact that, in reality, Keen is very removing paint in 2010 when formulating a relationship between aggregate demand, the GDP of an economy and the debt-to explain the fall in production, completely ignoring that it is the bank credit that drives the changes in the GDP in the economy:*

"This is obvious when viewed in aggregate demand, according to my definition: as the sum of GDP plus the change in debt (on which this demand is spread for goods and services and asset markets). Even when debt levels continue to fall, because fall less rapidly, there has been a boost to aggregate demand from the debt, because the debt is declining less rapidly in 2010 than in 2009."

The problem is the private debt and the future of the USA is the deleveraging  
Steve Keen, September 20, 2010

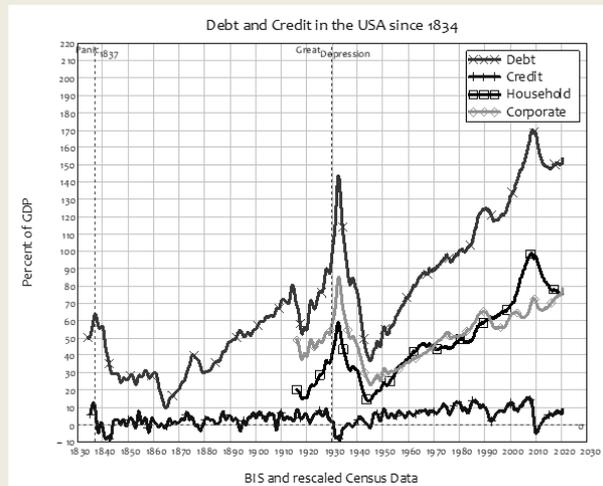
*However, the situation changes completely, to the end of the second decade, when Steve Keen, perhaps by the influence of the so-called "Monetary Theory Modern", seems to realize that it's only in the destruction of bank money is in where to look for the cause of the credit crisis that regularly the monetary savings. For example, and as input to the third decade, Steve Keen, seems to have understood that the aggregate demand depends on the bank credit, as indicated in a draft of chapter 2 of his next book, published in December of 2020:*

"This is similar to the theory of Aristotle comets (which was preserved in astronomy ptolemaic) that comets were unpredictable, because they were atmospheric phenomena (Aristotle 350.C.). The scientific revolution copernican, which overthrew this vision of the world, he showed that comets were inherently predictable, because they are celestial objects that orbit the Sun.

In the same way, the "unpredictability" of crisis such as the Great Recession is the product of the false model of money in the loanable funds of the paradigm of neoclassical. The correct model of money and debt which was originated by the bank shows that crises are caused by the credit becomes negative (Wave 2019), and that most recessions are caused by the decrease of the credit, but not at

all negative. This causal relationship between the credit (which is identical in magnitude to the annual change in private debt) and the economic performance endows the capitalist economies of a tendency to accumulate higher levels, and higher private debt. This phenomenon is more evident in the majority of capitalist economies, the United States of America, see Figure 6.

Figure 6: Debt and private credit in the U.S. since 1834



This chart identifies the three major economic crises in the United States: the Great Recession, the Great Depression and the "Panic of 1837". What, have you not heard speak of the "Panic of 1837"? Neither had I, until I came up with this chart Census in 1949, Census, 1975), but after doing so, it seemed to me that in that moment was "an economic crisis so extreme as to erase all the memories of disorders previous financial" (Roberts, 2012, p. 24). In each of these crises, the credit fell from a historically high level, became negative and remained negative for a substantial period, see Table 4.

Table 4: Magnitude of the credit and duration of the negative credit in the major economic crisis of ee.UU.

Crisis	Credit			Years Negative Duration <sup>18</sup>
	Maximum	Minimum	Change	
Panic of 1837	12.2	-8.9	21.1	6.2
Great Depression	9.1	-9.1	18.2	8.2
Great Recession	15.4	-5.3	20.7	2.6

Each crisis changed only when the decrease in the credit be stopped. But the renewed growth driven by credit growth occurred at the expense of an increasing ratio of private debt to GDP, with this increase in finished either by another crisis, or by wars that made the ratio of private debt to come down drastically due to the momentum of the "war Economy" to GDP: nominal growth of GDP reached 32%, dc during the Civil War of the united States (1861-65), 29% during the First World War (1914-1918) , and 29% again during the Second World War (1939-45), far surpassing the maximum rate of credit growth during these periods (0.2% of GDP dc, to 8.6% and 4.5%, respectively)."

Steve Keen, 2021

*This remarkable change in the way we see the problem of the crisis, allows you to check that indeed, the Equation of the Growth is valid, which makes Steve Keen's more deserving, even if it should be that the equation takes his name. However, we have the impression that Steve Keen is leaving seduced by the so-called Monetary Theory Modern and is helping spread, which we regret very much.*

*Steve Keen does not seem to realize that the so-called Monetary Theory Modern, is a theory that has been built solely with the intent to destroy the euro, something that we think with what he will not agree. Our fear is that, like many other economists of prestige become an acolyte most of those who have built the theory and unwittingly, to contribute to spreading the idea that it is necessary to destroy the euro.*

*For this reason, and for no other, we do not believe very little convenient to name the equation most important part of the economy with the name of Steve Keen, uniting the Equation of the Growth to a person who is very possible to end up being manipulated by those who are behind the Levy Economics Institute of Bard College, which are the ones that have really built the theory.*

*We hope that our fear is unfounded.*

#### **4. FINANCIAL THEORY OF ECONOMIC GROWTH**

Now that we know how the banks make money through credit, it is possible to explain how he ends up the money converted in capital goods (income) and outline, albeit very short, a theory of growth that is consistent with the financial nature of capital and the role of bank credit on economic growth. Let's start by explaining two basic aspects that are always present when creating a new capital goods:

- a) The cash Injection that produces the spending on physical goods thanks to the loan.
- b) The return of the money of the loan.

Despite the fact that the most likely source of the money used for the investment in new capital is almost always the money from the business benefits, here we are going to assume that any investment is always done with borrowed money, and that, therefore, must be returned to paying interest.

When an employer asks for a loan to devote to the creation of new capital, and was granted, receives an amount of money that will end up being spent on wages and goods in the Consumer Market. In this sense, who invests through a loan, you first inject money into the economy in the short period of time that lasts the investment, to remove it then slowly the economy and finally return it. Therefore, the underlying question is always in the granting of any loan is very easy to make: *where does all the money that was committed to return who signed the loan?* In a more concrete way, where she finds the debtor:

- The money of the principal.
- The money from the interest.

- The money from the profits.

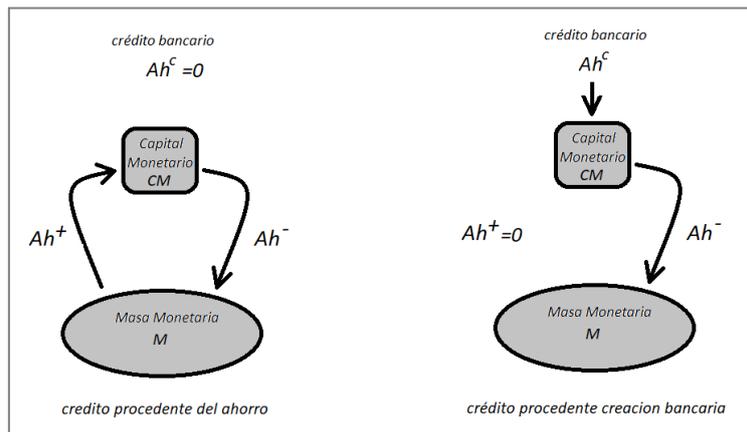
The question this question is not idle. The amount of money to return is always higher than the amount of money that is granted with the loan, so it is very important to understand where you get the largest amount of money you have to pay back to pay off the debt, because, although it is obvious that a debtor particular, you can take the money out of many places, the same is not true in the aggregate.

*The investment in a capital good must always return more money than was spent to create it, but where it goes in terms added that money.*

Let us observe that, even when we think that the money that was spent on the investment was created out of nothing, it is urgent to respond to the question of how it is possible to extract from the economy more money is injected, since the return of the credit always involves the return of an amount greater than that which is received with the loan, and this without counting the benefits that should result in the investment. Here we are going to answer the question from a point of view strictly financial, and you'll soon see why.

a) The cash Injection.

In the accompanying figure are the two possible origins of the money that is used to make an investment: savings and prior to the creation of bank money. When the money comes from the savings prior (we assume that through the issuance of a debt security) there will be no net creation of bank money or increase of the money supply, while in the second case, when the money is newly created, because it is money from a bank loan, if there will be an increase in the money supply.



In the left-hand side of the figure is shown in a case in which there is no money creation and the money comes from the savings prior, in this case  $Ah^c = 0$ . In the right area, there is no saving prior and all the investment money comes from the bank credit, in such a case there is monetary creation and  $Ah^c > 0$ . To see the difference between the two situations, it is better to decompose the aggregate savings into its two components, the saving and dissaving or credit:

$$\frac{d}{dt}GDP(t) = -k_F \cdot [Ah^+ + Ah^-] \rightarrow \begin{cases} Ah^+ = Ah^- \rightarrow \Delta GDP = 0 & \text{savings} \\ & \text{prior} \\ \begin{cases} Ah^+ = 0 \\ Ah^- < 0 \end{cases} \rightarrow \Delta GDP > 0 & \text{creation} \\ & \text{bank} \end{cases}$$

When the money of the investment comes from savings, prior to the injection in net cash in the money supply is zero, because the amount spent by the entrepreneur in the investment ' $ah^-$ ' is the same amount that you previously extracted the savings  $Ah^+$  and the  $GDP$  of the economy does not suffer any change. On the contrary, when  $Ah^+ = 0$ , the money you spend entrepreneur  $Ah^-$  comes from the creation of money banking and then the  $GDP$  grows because there is an injection net of money in the money supply.

From the point of view of capital, the same thing happens with the  $GDP$ . When the money of the investment comes from savings, prior to the growth of the capital will be zero in the aggregate, while when there is money creation, since the constant of Fisher worth approximately "two" and  $\beta$  has an approximate value of 6, the increase in capital to be about twelve times the flow of cash injection that has caused:

$$\Delta k_{capital} = \beta \cdot k_F \cdot Ah \cdot \Delta t \rightarrow \Delta k_{capital} \approx 12 \cdot loan$$

We see that the aggregate result is as expected. Even if there is no problem to which an individual entrepreneur engage with their productive activity the income necessary to ensure that the value of the capital that has been created is greater than the debt that has been contracted, in the aggregate, only there will be a net creation of capital and, therefore, growth, when the investment money comes from money creation of new bank:

*"The money from the savings can be invested and creating a new capital in individual terms, but cannot create a new capital in the aggregate,"*

(The process which created new capital goods using only the savings prior is the typical process of creative destruction that describes the austrian economist of the early TWENTIETH century, Joseph Schumpeter, in which the creation of new capital is always done at the expense of the destruction of the capital already existing. It explains in detail a little later).

#### b) The return of the debt.

Suppose an entrepreneur who has borrowed money for the creation of a new capital good (either to individuals or to a bank), you have been given and what has been spent in making the investment. Let's say you've managed to capture the income enough so that the market value of the new capital good is greater than the debt contracted. It is now, to repay the loan, when it is found that in aggregate, the debt cannot be returned ever.

Let us imagine the case more favorable to the employer, when the creditor (either an individual or the bank) is only required to pay indefinitely the interests of the debt, without forcing him never to return to the main. In such a case, the income that the company produces built with borrowed money has to reach in order to satisfy, at least, the interests of the debt. In particular, and according to the First Law of Robinson, we have:

$$B_i^{cap} = q_{ii}^o P_i - \sum_{j=1}^n q_{ij} P_j - B_i^k > \text{bank interest} \rightarrow k_i = \frac{B_i^{cap}}{i \cdot \mathfrak{R}_i} > \text{debt}$$

Let us observe that when the employer gets to meet the above condition and the market value of the company's newly created  $k_i$  is greater than or equal to the value of the debt that has been contracted to create it, it can meet its commitments in three different ways:

- 1) You can use the income it produces the new capital to repay the principal and interest of the loan:

$$B_i^{cap} > \text{bank interest} + \text{instalment of the main}$$

- 2) You can return the debt by selling a part of the new capital, which has a market value exceeding the debt:

$$k_i > \text{debt}$$

- 3) You can use it indefinitely a part of the revenue produced by the new capital to meet the interests of the debt, without getting to return never the main:

$$B_i^{cap} > \text{bank interest}$$

And this is the surprise. In individual terms, an employer can repay the debt of any of the three ways without any problem, but, in aggregate terms, such a thing is not possible and the principal of the credit may not be returned ever. To understand why, in aggregate terms, the money is credit created by the banking system, cannot be returned is never the reason of this section and that's where lies the grace of the Financial Theory of the Growth that we are developing because this is the idea that we're going to now explain what gives the internal consistency of the Theory's Financial Capital developed in the previous topic.

Let's start by discarding the first and the second option, in which the employer returns the debt. It is not difficult to see that, in aggregate terms, the repayment of the principal together with the interest, the first option involves removing of the money supply, at least, as much money as you put in the investment, that is to say, implies a net savings null or positive. Imply, even when the money from the credit comes from the creation of bank money, since the payment of interest makes that is returned more money than you invested. It is also what happens in the second option, when you sell a part of the new capital in order to obtain money with which to repay the principal of the debt, because who purchase the new capital must have been saved previously, the amount of money that is spent on investment. In both cases, it is removed from the money supply, at least, as much money as he injected the investment and, therefore, there can be no net growth of the money supply, and there can be no net growth of the economy or of the capital.

Only in the third option, when you don't return never the principal of the debt and kept indefinitely the payment of the interest, there is growth in the money supply and is given in terms of aggregate growth, as it ensures that it never is removed from the money supply more money injected into the investment. That is to say, only in the third case, when the debt comes to be never, satisfies the inequality added:

$$\text{loan} \geq \text{savings}$$

Inequality, which guarantees that there will be economic growth and, therefore, capital growth, though this may be only nominal, because it ensures the creation of bank money. Recall that the condition for the growth according to the Equation of Growth, that is:

$$\boxed{\begin{array}{c} \text{Economic growth} \\ \downarrow \\ \frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^C(t) - Ah^S(t)] \xrightarrow{Ah^C(t) > Ah^S(t)} \Delta GDP(t) > 0 \end{array}}$$

Specifically, the expression tells us that the increase in nominal  $GDP$  is double that of the flow of cash injection that has caused (throughout the paper we are assuming that the constant of Fisher goes “two”). What we know, also results in a proportional increase of the part of  $GDP$  that goes to pay the income from capital:

$$\Delta GDP = k_F \cdot Ah(t) \cdot \Delta t \xrightarrow{r_{capital} = \alpha \cdot GDP} \Delta r_{capital}(t) = \alpha \cdot k_F \cdot Ah(t) \cdot \Delta t$$

The value of the aggregate capital increases proportionally to the constant of the Fisher and the injection flow of the bank money that is granted with the credit:

$$\text{loan-to-savings} = Ah^C(t) - Ah^S(t) = Ah(t)$$

$$\Delta k_{capital} = \beta \cdot k_F \cdot Ah \cdot \Delta t \rightarrow \Delta k_{capital} \approx 12 \cdot \text{bank credit}$$

From the point of view added, provided that the investment money comes from the money creation and always that is not returned, the cash injection produces some twelve times the “value” in capital goods. The result, which was already reached before, but that allows us to explain now why the money credit may not be returned ever.

Let us note that the Equation for the Growth says that you cannot decrease the money of the money supply, without which the economy enters a recession, which requires that the money from the savings to be returned to the economy to the deficit. But the savings is not what is creating the new capital, but the increase of the bank money that is created with the granting bank credit (the flow of credit, when we assume is hoarding null):

$$\Delta K = \frac{\langle \alpha \rangle}{\bar{N} \cdot i} k_F \cdot \Delta M = \frac{\langle \alpha \rangle}{\bar{N} \cdot i} k_F \cdot Ah^C \cdot \Delta t \sim 12 \cdot Ah^C \cdot \Delta t$$

But in the aggregate, saving money is used to invest in the purchase of new capital, which is only possible when the cash injection that produces the credit you get it. Let us observe that the entrepreneurs have created the new capital borrowing money that comes from savings and money creation, and therefore a part of the new capital they create does not belong to them, but that belongs to those who have given them the money. The new capital belongs, a part to saving money, the other party to the bank credit and the rest to the employer, the latter being part of the real benefit that you get the entrepreneur of your investment:

$$\Delta K = \Delta K_{savings} + \Delta K_{credit} + \Delta K_{entrepreneur} \sim 12 \cdot Ah^C \cdot \Delta t$$

The expression tells us that, although saving money may not be what they are creating the new capital, in financial terms, that does not mean that you do not need to create it in physical terms.

In fact, to be able to save it is necessary that the money-saving investment, either buying new capital or to be provided, which is indifferent and which requires that the growth of capital is sufficient to absorb the savings that are done within the economy. In the opposite case, the savings will end treasured and the economy will end up in a recession.

There is a relationship between the money you save and the bank money that must be created, which is not difficult to obtain. When we look the previous expression in annual terms, we have:

$$\frac{\Delta K}{\Delta t} = \frac{\Delta K_{savings}}{\Delta t} + \frac{\Delta K_{credit}}{\Delta t} + \frac{\Delta K_{entrepreneur}}{\Delta t} = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot Ah^C$$

But,  $\frac{\Delta K_{credit}}{\Delta t} = Ah^C$ , so that:

$$\frac{\Delta K_{savings}}{\Delta t} + \frac{\Delta K_{entrepreneur}}{\Delta t} = \left( \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F - 1 \right) \cdot Ah^C$$

The new capital that creates the cash injection will be divided, almost in its entirety, between the entrepreneurs who create it and the investors (lenders) that fund, and that seems logical and coherent until we realize that the previous relationship requires that:

$$\frac{\Delta K_{savings}}{\Delta t} \leq \left[ \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F - 1 \right] \cdot Ah^C \sim 11 \cdot Ah^C$$

Or, another way, in aggregate terms, the increase of the money supply, which we are now identifying with  $Ah^C$  (the creation of bank money), must be sufficient for the growth of capital in order to absorb the savings.

In a few simple numbers tell us that that's not always going to be easy to fulfill, especially when the economy grows slowly. For example, when the real growth of an economy is of 1%, the actual creation of new capital round to 12% of GDP, so that an annual savings should be kept well below that figure (for power save). When we accept that a part of the new capital will remain the employers as well as benefits (a part of the new capital should either keep it as entrepreneurs, or if not, would engage in no new business), then the constraint is even stronger."

The problem of saving is that it forces the economy to keep growth to a minimum to be able to absorb it, which is not going to be possible in an environment of low growth or no growth. In fact, what we show is that in a monetary economy must be that the GDP growth is at least a sixth of the money you save:

$$\Delta K_{savings} \ll \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \cdot \Delta GDP \rightarrow saving \ll 6 \cdot \Delta GDP$$

That is a remarkable result.

There is so much beauty in the money credit. In aggregate terms is a whiting that bites the tail: "the credit increases the spending, nominal, increased spending, nominal increases nominal income, the increase in nominal income increases the nominal amount of capital, and, finally,

the increase in nominal capital supports the money from the credit” which can be formulated as a law, the Law of Accumulation of Capital:

**THE LAW OF ACCUMULATION.** In a monetary economy, the aggregate value of capital is proportional to the amount of money that the form of the money supply, being the constant of proportionality is the product of  $\beta$  by the constant Fischer:

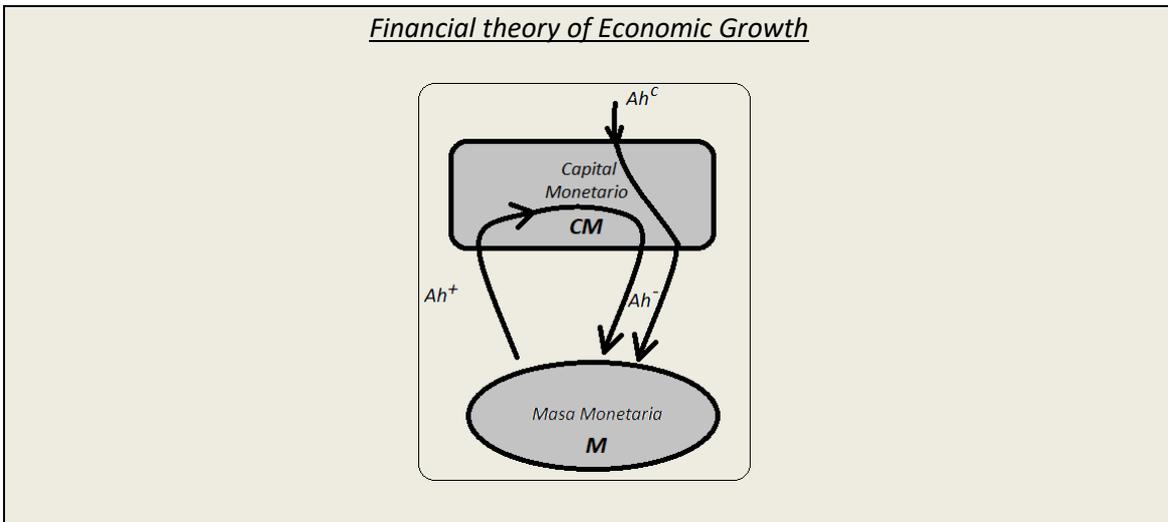
$$K = \frac{\langle \alpha \rangle}{\bar{\alpha} \cdot i} k_F \cdot M$$

**Corollary to this:** In a monetary economy of pure credit, money credit is backed by a part of the value of the capital that sustains, so that, in aggregate terms, you can't return the money credit without also destroying the capital to back it up.

The Law of Accumulation is much deeper than it seems his short statement, and shows a very sophisticated that the capital is the inevitable consequence of the use which we make of the money to organize our economy. We, the people, are not the ones that we use money as a tool made to our service, but, on the contrary, it is the money that imposes its own logic and forces us to relate to others in a way very specific. The money is structuring our society, even though there is in reality no imposition of yours that force us to do so.

In aggregate terms, the amount of capital that creates the cash injection is more than enough for the entrepreneur to be able to support the bank credit with which to create the new capital, as long as you're able to capture as a rental, part of the increase in income produces the cash injection that makes the investment. Of course, a part of the growth of the capital, or perhaps all, will be inflationary, but now we just want to show that the paradox about the origin of the profit on an investment, it is resolved when it is understood that the capital created a stream of income that pays for a smooth flow of interest generated by the debt from which it was born. For this reason, the debt-credit is not returned ever, in aggregate terms.

The analysis that we have done traverses a sequence of statements that we call the Financial Theory of Economic Growth, and that we summarize below:



FIRST. Entrepreneurs, whether with money saved previously, either with money credit created out of nothing by banks, invest purchased goods in the Consumer Market. Is the flow  $Ah^-$  of the figure.

The flow  $Ah^C$  is the annual amount of money the credit (money bank) created by the banks from nothing, while  $Ah^S$  is the flow of hoarding that increases the amount of money saved. The difference  $(Oh^C - Oh^O)$  is the annual amount of money that was injecta in the money supply, and it is true that:

$$-(Ah^+ + Ah^-) = (Ah^C - Ah^S)$$

SECOND. When the injection of cash  $(Ah^C - Ah^S)$  is positive grows nominal GDP, in part causing inflation and in part by causing increased production, at the same time it increases the value of the capital goods in about 10 or 12 times the annual amount of the cash injection. In particular, according to the Law of Growth, the increase in the value of capital is:

$$\Delta K = \frac{\langle \alpha \rangle}{\bar{n} \cdot i} k_F \cdot (Ah^C - Ah^S) \cdot \Delta t \quad \text{Ec. Growth}$$

How much it grows, real GDP and how much it grows the royal capital is uncertain, but it is true that both the rate of inflation  $\pi$  as the growth rate  $g$  is the same for both the GDP and the capital  $K$ :

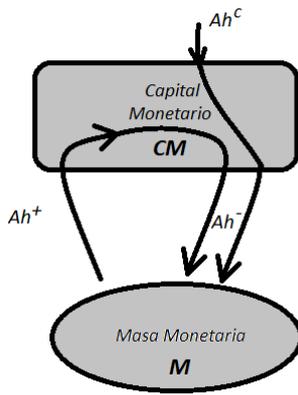
$$\boxed{\pi + g = k_F \cdot \tau = \beta \cdot k_F \cdot \tau_k} \left\{ \begin{array}{l} \tau = \frac{(Ah^C - Ah^S)}{GDP} \rightarrow \text{injection rate} \\ \text{with respect to GDP} \\ \tau_k = \frac{(Ah^C - Ah^S)}{K} \rightarrow \text{rate of injection} \\ \text{with respect to capital} \end{array} \right.$$

THIRD party. In the aggregate, and for the economy to nominal can grow, all the money that is extracted from the economy by saving has to be borrowed and returned to the economy in the form of spending, but this is only possible when the money that is given to credit is not returned by the savings. In the opposite case, when the money from the credit is returned, there will be no changes in the money supply in the best of cases, and in worst case there will be removing net and, as a result there will be a recession, and as such affirms the Equation of Growth:

$$\frac{d}{dt} GDP(t) = -k_F \cdot [Ah^C - Ah^O] \xrightarrow{Ah^C - Ah^S > 0} \text{recession}$$

## 5. GROWTH WITHOUT MONETARY CREATION AND GROWTH WITHOUT SAVING

To understand a little better the role that the Financial Theory of the Growth reserve of savings, we are going to analyze the growth of the economy in two cases not at all unrealistic.



A first case will be that of an economy where there is no monetary growth is significant, we think that is the situation that has been giving in the last 10,000 years because of the widespread use of gold as money.

The second case will be that of an economy in which there is no net saving significant (hoarding), that is the situation that tends a monetary economy when you have a inflation, at least, in a discrete manner. It is the normal situation of an economy, where the credit is granted with money from a part of the savings and in part from the creation bank.

Let's look at the attached figure that the loan for the investment or consumption, the flow  $Ah^-$ , you can proceed in both the savings prior  $Ah^+$ , as of the creation of money to supportio  $Ah^C$ , remains impossible to distinguish from each other, in aggregate terms. Now we are going to study how changes in the economy, according to the source of the money of the loan:

**a) Economy without monetary creation**

A very interesting situation is the case of an economy where the amount of money does not change because the banks only lend money previously saved. In an economy as well, as is logical, there can be no growth of the *GDP* or capital, according to the Equation of Growth, but nothing prevents that, thanks to the advancement of technology, the emergence of new firms more productive than the existing ones and eliminate them.

***ECONOMY OF SCHUMPETER:** "we Call economy of Shumpeter, to an economy that is true there is no monetary creation and not necessarily any loan is done with money saved":*

$$\frac{d}{dt} GDP(t) = k_F \cdot [Ah^C - Ah^S] = 0 \qquad \text{Economy of Shumpeter}$$

*In an economy of Shumpeter, both the GDP as the value of the aggregate capital remains unchanged.*

Let's look at an economy of Schumpeter has several features that can be confusing to a lot:

- 1) Economy is zero-sum. Despite the fact that there may be increase in productivity, the *GDP* does not grow, and the aggregate value of the capital either, so any new capital that is created has to be at the expense of the destruction of the capital already existing. The new companies, probably a lot more productive, have replaced the old companies, much less productive, but without an increase that's why the aggregate value of the capital.
- 2) There may be hoarding. The saving does not have to return necessarily to the economy as spending on credit. When not applying for loans because the technological momentum has been exhausted or has not increased growth of the population, the economy will enter a recession if the flow of saving (hoarding), exceeded credit.

In practice, this is an impossible situation, since any increase in production will force prices down, which we have already commented that it is not possible to happen in aggregate terms. However, there may be a situation very similar to when an economy grows much more slowly than it could grow because of an insufficient monetary creation, for example, because of the gold standard, and the slow physical growth of the amount of gold.

Joseph Alois Schumpeter was an economist austro-american who lived in the first half of the TWENTIETH century. The mentality in a very conservative, is further highlighted by their powers of observation with its capacity of interpretation of the economic reality that surrounded him. Yours is the idea of “the creative destruction of capital” that extols without any modesty the central role of the entrepreneur in economic growth, and that is the reason why you remember him.

#### CREATIVE DESTRUCTION SCHUMPETER

*There is nothing to prevent an economy has a strong productivity growth, and that however there is a weak GDP growth and the valuation of the aggregate capital because the supply of money grows very slowly.*

*A situation like this, with a slow nominal growth of the economy, and to a strong increase of the productivity, it was the situation that was going throughout the EIGHTEENTH and NINETEENTH century in Europe. Especially, during the period of time from 1820 to 1870, the so-called Pause in Engels. It was a period very strange, in that the extraordinary development of the technology coexisted with the misery working more absolute, without that were never understand how they could be both facts that in themselves seem contradictory. We think that it is very important to understand what was the cause of this apparent contradiction of capitalism, and to avoid so that you can re-repeated in the future.*

*In an economy, there is nothing to prevent people from saving and banks to channel those savings into investment, granting credit to create new productive capital. In fact, until the arrival of money banking and because of the stiffness of monetary demanded the gold, all the new investment depended on the savings prior because of the growth of the stock of gold was limited to times very punctual as the discovery of gold in California.*

*Obviously, the Equation of the Growth does not exclude that in an economy based on gold and with a monetary growth is very slow, has a great creation of new companies because of the investment spending financed with the money from the savings, but if it forces to eliminate the already existing companies, so that in the aggregate, has not net increase of capital.*

*The new enterprises created with the loan of the money previously saved, only to give way if they manage to capture a portion of the expenses that would capture the existing companies, since they do not have to increase the money supply, there will be no increase in spending. But this is guaranteed in an environment of strong technological innovation and major scientific breakthroughs such as the one that accompanied the first industrial revolution. When the introduction of a new technology reduces the number of workers needed to produce the same amount of goods as before, there is a strong increase of the business benefit for new businesses*

thanks to the reduction in spending on wages. This makes the new companies, more productive, there will be step-by eliminating the existing companies, less productive.

It seems like a perfect world to a keen observer, as Joseph Schumpeter, who is in awe of the destruction of the old industrial fabric that opens the way to a new industrial fabric, with much less need of work. Before your eyes shows increases of extraordinary productivity without perceived the tremendous inconsistency that represents the slow growth in nominal GDP that goes with it:

- The savings of the investors provide the necessary funds for investment in new businesses.
- The creation of new businesses more and more productive replace the old almost continuously, but there is an even growth of the production.
- Inflation close to zero rounds the extraordinary landscape.

Since then, He is enthusiastic about the economy that you see at the end of the NINETEENTH century, which shows a business that is renewed without discontinuity becoming more and more productive thanks to the strong investment. But when we look more closely at this “happy world” that shows an economy in boiling, with a slow growth, we see that the economic situation in the remaining workers is inhumane and terrible, and the misery reaches a level unthinkable just a few decades before, when the economy was still based on agriculture, and had just technology. Schumpeter does not see the poverty that moves the working population to cause structural unemployment and low wages, something that looks Engels a few years before, and that is the reason why you are writing the communist manifesto along with Marx:

1) Thanks to the dramatic rise in productivity, the goods are produced each time with less labor, which creates a strong structural unemployment that could absorb without problems and a rapid growth of the economy. But the expected growth does not happen because the slow growth of the money is limiting. There will be unemployment everywhere because the economy is producing nearly the same thing, but with a much much lower number of workers.

(Especially when the structural unemployment will board the rural migration, as indeed happened during the whole of the industrial revolution, but particularly during the Pause of Engels)

2) even Though the economy is not growing fast enough to absorb the growing surplus of the working population, if you are saving enough to invest in new technologies every time more productive to replace the old almost without discontinuity, and that every time they need less labor. A process of “creative destruction” that is going to cause more and more unemployment, and more and more misery working in the middle of a binge of technological progress unprecedented in the history of mankind.

That was the time that he had to live to Engels. It was the time that saw the birth of The Communist Manifesto. It was the era that saw the growth of the “reserve army” that so magnificent tells Karl Marx in Capital. It was also the era of the gold standard, and the absence

of a Central Bank became any expansion of bank credit in a credit crisis that I passed the misery everywhere:

*“...a spectre is haunting Europe, the specter of communism...”*

*(Banking crises occurred without apparent discontinuity during the NINETEENTH century, in cycles lasting between 7 and 11 years. So much so, that the doctor and French economist Joseph Clément Juglar, the identified without difficulty in his book “trade shocks and their reappearance on a regular basis in France, England and the United States” published in 1862, and for this reason they are known as cycles of Minstrel).*

Perhaps at this point it is good to quote Karl Marx, when attributed wrongly to the structural unemployment of his time to the form of capitalist production:

*“...if the existence of overpopulation working is a necessary product of accumulation or of the development of wealth on a capitalist basis, this overpopulation becomes a lever of capitalist accumulation, even more, in one of the living conditions of the capitalist mode of production. Is an **industrial reserve army**, a contingent available, which belongs to the capital so all as if it criase and maintain at their expense...”*

#### **b) Economy with money creation, but no net savings.**

What is normal in an economy is the money of the loan applicable to both savings prior as of bank money is created out of nothing. In fact, there is no way to distinguish a money of another, and it can be verified that the majority of the large companies do not use the credit of the banks, but use the issuance of debt securities, or the issuance of shares to capture the money in savings, while bank credit and monetary creation that implies, serves in general to finance small and medium-sized companies, the mortgage loan and the consumer, and also, although less, to finance the public deficit.

This combination of savings and creation credit allows growth rates as high as china, which in some years has surpassed the 10% of the *GDP*, with little inflation. It is also what caused the miracle productive of the US during the Second World War and the 30 glorious years that succeeded it, also without just inflation.

But this does not prevent us analyze what happens in an economy in which there is no saving them, and where the banks can create all the bank money that is needed for investment by granting credit. According to the Equation of Growth, will be the flow of bank credit to  $Ah^C$ , when it is spent on consumption or investment, and becomes part of the money supply, to determine the nominal growth of the economy, whether or not inflationary:

$$\frac{d}{dt}GDP(t) = k_F \cdot [Ah^C - Ah^S] \xrightarrow{Ah^S=0} GDP(t) = k_F \cdot \int Ah^C(t) \cdot dt > 0$$

We see that it is not necessary that you have savings prior for the economy to invest, take advantage of the technological innovations and grow, since the origin of the money needed for the nominal growth of the economy is always in the process of money creation through bank credit:

$$\pi + g = k_F \cdot \frac{Ah^c}{GDP} \rightarrow \boxed{\pi + g = k_F \cdot \tau} \begin{cases} \tau = \frac{Ah}{GDP} \rightarrow \begin{array}{l} \text{rate of creation of money} \\ \text{relative to GDP} \end{array} \\ \pi \rightarrow \begin{array}{l} \text{rate of creation of inflation} \\ \text{on GDP} \end{array} \\ g \rightarrow \begin{array}{l} \text{rate of growth} \\ \text{with respect to GDP} \end{array} \end{cases}$$

The inflation that may appear on the economy is going to depend on whether the increase in income that causes the injection of cash from the bank credit is captured, or not, by the sale of new products or, on the contrary, it is limited to up the prices of existing products.

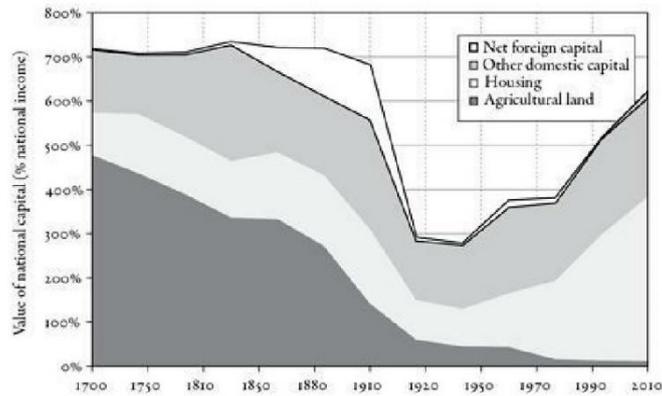
Arrived up here, we could ask ourselves the question of what is the savings. If it was only with the growth of bank money is it possible to satisfy the needs of investment, then what is the role of savings in the economy. It is not easy to answer this question, because surely the only reasonable response is: “because people like to save”.

However, this way of looking at things can bring us to the mistaken idea that the companies they invest because they expect to get more capital, which almost never is true. Let us remember, that there is a fixed amount of capital within an economy that requires employers to fight for him. The entrepreneurs will not only invest to attract new capital, but most of the time they invest to preserve capital, who already have, precisely because capital is limited and it does not occur, thanks to the savings but the cash injection:

$$K = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot M$$

For this reason, a very large number of investment companies are done looking for to keep intact their share of the market, that is to say, to maintain their income, which can be interpreted as a self-creative destruction that forced the companies and, as a consequence, the increase in the overall productivity of the economy, though that does not increase the value of the company.

Let's take a look at the graph that presents Thomas Piketty in his book, “capital in The twenty-first century” in order to understand it:



Capital en Francia, 1700-2010

Although it is not observed in the graph because it is normalized by *GDP*, from 1700 to 1900, for almost two hundred years, the economy grew very slowly, due mainly to the inability of creating money out of nothing. However, despite the slow nominal growth of the economy, it is very well seen in the graph that there was a redistribution very strong income existing. Agriculture, for example, went from hoarding 2/3 of the income to buy only 1/7 of it at the beginning of the TWENTIETH century. That loss just as important of income relative to a few sectors in favour of other sectors, it was a consequence of the increase of productivity in agriculture, which strongly reduced the expenses required to produce the same. This is precisely what is observed in the graph of Piketty.

For example, the feed needs to grow to the population grow, but technological innovation can reduce the cost of producing food very quickly, which frees up resources in agriculture that are employed in other sectors and makes the participation of the food in *GDP* to fall heavily (despite the fact that agricultural prices, not lower in nominal terms).

Of course, this does not mean that the farmers could see diminished their nominal income, rather the opposite, but if it indicates that the increase of benefits in agriculture was not couple to the increase of their productivity, and that is because the increase in productivity is a global phenomenon that almost never capitalizes on who does it, because the increase of the productivity of a sector is partitioned into increases in productivity in all sectors.

*WHO PAYS THE INFLATION RATE?* In an economy where there are no savings prior and all the money bank of new creation happens to the money supply through credit for consumption or investment, we can expect that there will be inflation without have a clear idea of what value you can achieve. But, to the extent that entrepreneurs do well on their investments and manage to increase their income through increased production, and not of the prices, the inflation will be limited.

Of course, that's going to depend a lot of the technological moment. If there is an increase in the productivity or if there is an increase in growth of the population, we can expect that the increase in inflation will be moderate.

Who pays the money created by the banks when the spending credit ends to produce inflation? It is paid for using the money. All we will need more money to carry out the same exchanges

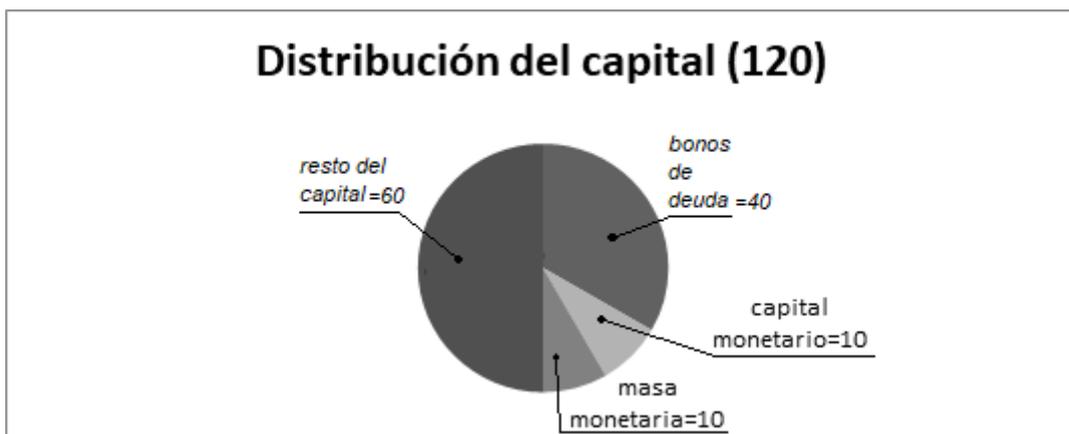
where prices are higher, while those that asked for the loans they can repay an amount of money with less purchasing power than they spent. Both items are cleared.

## 6. CAPITAL, DEBT AND MONEY

Financial Theory of Capital shows us a vision of the economy that surrounds us is very different from the mechanistic view of the physical nature of the capital. When we see the growth of the capital as the accumulation of produced goods thanks to the investment of savings, and we accept that the capital is the value that makes the Capital Market of the future income that is obtained from the possession of a good production, then the savings shown its true nature independent of and separate completely the productive process. This is very important, because now the saving is only possible to the extent that the amount of capital grows endogenously, and is shown impossible when the growth of capital is not capable to absorb the savings to be made.

The idea is not difficult to understand. Individuals save money and, subsequently, used their savings to acquire capital goods in the logical belief that, in this way, you are going to keep more safe from the vagaries of inflation. There is nothing interesting to preserve their wealth as money in an economy typically inflationary when the asset that can be bought in the bag to produce revenue of at least 4% of its value.

Let's look at that, the distribution of wealth among the various capital goods that could be expected from the nature of financial capital is the one that really is observed:



In the attached chart shows what proportion of the wealth is conserved in each of the four forms of capital within the united states, in the year of 2019:

capital goods.....	120 MM
debt added { bonus.....	40 MM
{ capital monetary.....	10 MM
{ mass monetary.....	10 MM

Thus, the total value of the capital goods in the US (land, homes, offices, companies, etc. that is to say, the wealth, according to Piketty.), amounts to around 120 million dollars at the beginning of 2019, of which approximately 60MM. Of them, 50% are retained by the possession, direct capital goods, while a 40MM, a 33 per cent of the total, are debt securities on capital assets (corporate bonds, mortgage debt, treasury bonds, student debts, etc.). Let us remember that the debt is an indirect way of owning capital goods because the rent you pay proceeds of the capital income that supports it. A few 10MM, 8 per cent of the savings, it is the money which is kept in the Capital Market (although later we will show that this is the money with which it carries out the international trade, as the amount of money that is retained as capital money is very small and is very far from reaching that figure), while the remaining 8%, other (10MM), is the mass of monetary use in the Consumer Market to support the purchases.

The money supply of 10 dollars, we have deduced the equation of the capital, which asserts that the value of aggregate capital is about 12 times the mass currency:

$$K = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot M \quad \left\{ \begin{array}{l} K = 120MM \\ M = 10MM \\ \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F = 12 \end{array} \right.$$

Given that the GDP of the USA is about 120MM, then the money supply that sustains the economy of the USA is about 10MM of dollars. Hence, we deduced that the savings that preserved in capital monetary are the rest of the 20MM of dollars that are in bank money, other 10MM of dollars, while later we will see that, very probably, the greater part of that money is being used to keep the international trade between countries, so the actual amount that is retained as capital money is very small or almost zero.

Let's look very briefly the difference between equity, debt and money, as well as the relationship between them.

We know that the arbitration of the Capital Market makes all capital goods in equivalent and that the reason that the people or institutions to retain the savings in one or another form of capital depends solely on the expectations they have about the evolution of its price in the future. We also know that the Financial Theory of the Capital says that the aggregate value of all capital is inextricably linked to the money supply of the economy:

$$K = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot M$$

That's why, everything would be much simpler if there were only capital goods and money, but it is not so. The economic reality that surrounds us is not so simple, and the simplicity of the expression that binds the value of the aggregate capital and the amount of money in the economy is only apparent.

What is the debt? What is a capital good? What is bank money a debt that is created when you ask for a bank loan?

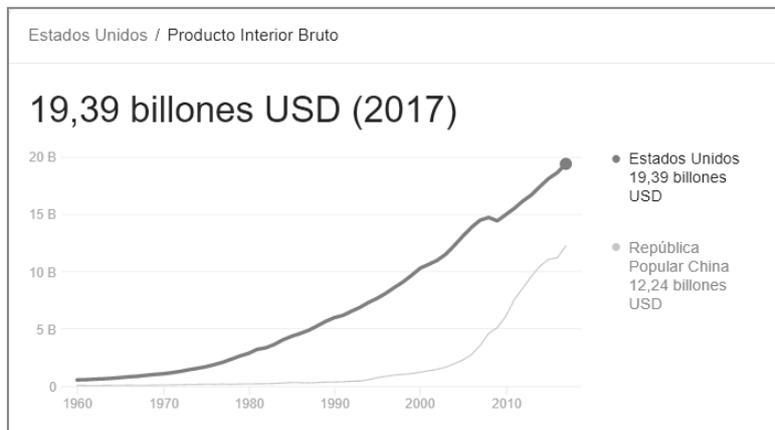
Let us look a little more detail of where to go out to different forms of capital:

**a) The money supply.**

If we look carefully at the chart below which shows the evolution of the *GDP* of the US and China over the last few decades can be very well seen that the united states has gone from having a *GDP* of around 500,000 million dollars at the beginning of the 1960s, to have at the end of the decade of 2010 with a *GDP* of close to 20 million of millions of dollars. That is to say, in an evolution that can identify very well with a nominal growth exponential, the *GDP* in nominal U.S. has increased almost 40 times in the last 60 years. Even more impressive has been the evolution followed by the *GDP* of China, where the nominal growth has clearly been exponential and in a period of time much shorter, a mere 20 years.

Let's look at that, *“to increase the flow of nominal spending more than 40 times, the banks of the USA have had that necessarily increasing the money supply at more than 40 times during this half century, according to the monetary equation”*

$$. k_F \cdot M = GDP$$



In particular, using the Equation Aggregate of Conservation it is possible to calculate exactly, the annual flow medium of money that have been manufactured banks in the USA during the last half-century, assuming that the flow of credit has remained proportional to *GDP* over this time:

$$\frac{dPIB(t)}{dt} = -k_F \cdot Ah(t) \xrightarrow{Ah(t)=to \cdot GDP(t)} GDP(t) = GDP_{or} \cdot e^{k_F \cdot a \cdot t} \rightarrow a \approx 2\%$$

The result that we obtain from applying the equation is very similar to the actual result. Please note that a nominal growth of 4 per cent per annum, half-real growth-and-half growth of inflation, such as the one followed by the economy of the united states this last half-century, you need an annual flow of money creation equal to 2% of *GDP*, which accumulated during the last 60 years are about 35 million of millions of dollars at current prices, that is to say, 1.7 times the *GDP* current corrected for inflation (that is only to create the money supply, and not counting all the other 10MM of dollars that we assume that they are used to keep the international trade. If we also have that money, the money creation has been the double).

Since then, this money does not belong to the banks, but charge a rate of interest for him as if they belonged. Although economists who work for the private universities of the USA always blame the government for making money and being the cause of inflation with its budget deficit,

the truth is that the only ones that make money are the commercial and investment banks when granting a bank loan. Therefore, have had to be them who have made a huge amount of money that is needed by the Consumer Market to function.

The “seigniorage”, which is the term used in economics to refer to the privilege of who made the money, and they now boast of commercial and investment banks, is the main source of profit of the banking system and we wonder what economic argument can justify a gift accumulated to the private banks of 35 million of millions of dollars (the amount that will be that is going to raise to almost 70 million of millions of dollars when you include the money that is kept as a capital money).

THE SEÑORAJE IN TERMS SPANISH. Let's look for a moment the following figures of the Spanish economy for the year of 2019:

GDP in 2019.....	1.244.757 M. €	}	→ ΔM = 1.5% of GDP
nominal Growth 3%.....	37.342 M. €		
real Growth 2%.....	24.895 M. €		
public Deficit 3%.....	37.342 M. €		

The data tell us that, during 2019, the supply of money has increased in Spain, a 1.5 percent of GDP (although the number may have nothing to do with the creation of bank internal, as the money may have come from outside, either thanks to the super skillful commercial or either thanks to foreign investment, since Spain is in Europe and its currency is the euro).

Who has made that money? It is not clear, since any bank of the European Union may have made when granting credits, but what we know are two things, that the Spanish government would have been able to afford half of the public deficit in 2019 yes he would have been able to issue the money needed to allow the nominal growth of the economy. But, is it desirable to do so?

THE BANKING SYSTEM. The money is a good that acquires its value by being a universal element of change, that is to say, because it allows you to buy everything that has been put up for sale. For this reason, and despite the fact that the current money fiat costs nothing to manufacture it, we know that you have value, and form part of our wealth.

The money has to be made and you have to manufacture that someone, and although throughout history there have been many of the goods that have made money (wheat, salt, copper, iron, silver, gold, tobacco), in the present, who make it are the banks when granting credit. By this, the money is wealth for who owns it and is a debt to those who supported, and runs the risk of being counted twice, once as money, and the other as an asset that produces interests: the credit with the creation of the bank money.

If we asked the manager of a bank what is the book value (capitalization) of your bank, the more likely it is to add up your assets and liabilities to calculate it, and tell us your net worth is zero, making it very clear that it is fake. The banking system is gaining interest for all the money in banking has been created to grant credits and that does not belong to him, so the book value is, in the case of the US, higher than 20MM dollars (accepting that all the money pays the average interest rate of the money).

*The seigniorage monetary taught in the private universities of the USA always associated to the privilege that has the Central Bank (the government) to make money from nothing, which, although it may be true because the FED can force banks to manufacture money for it in any quantity, a simple look at their account shows us that the statement is false (the Federal Reserve has only made money during the 2008 crisis when he had to rescue the banks, companies listed on the stock exchange and the government itself).*

*Obviously, for a long lie or try to hide the truth, has not been the Federal Reserve who has made close to 10 billion dollars to keep the exchange in the U.S. (which will be necessary to add another 10 MM of dollars more to support the global trade). It has been, on the contrary, the banking system who has made that money and it would be good to continue to do so, but under greater public scrutiny.*

*But... is it desirable that the money required to maintain growth is to be created by the government, and use, in part or in its entirety, to fund public services? This is a more interesting question than it appears at first sight because it tells us that the money or credit money bank can be seen from two different views, which creates two possible Banking Systems according to what support is required to grant credit.*

*BANKS ALSO CRY. The first thing is to understand that there are two ways to ensure that the borrower of a loan pay back the money borrowed:*

- *Credit backed by income.*
- *Credit backed by capital.*

*In fact, the Banking System supports mostly credit with capital goods, without seeming perceiving that the price of any capital proceeds from the benefit it produces (the income it produces). However, what is true for the private sector, it is also true for the public sector, in which the only collateral may include revenue from the tax and not your heritage (we assume that the government has no capital assets).*

*When we look at what it is that supports the bank money created by the credit by the Banking System, we can find three types of debtors different, as is the way of support debt credit:*

- *The Central Bank: Without any support (deciding the rate of interest).*
- *The private sector. Supported with capital goods (with the interest rate of the market).*
- *Consumers: it Supports with their revenue (with the higher interest rate).*

*During the last 200 years the Central Bank has intervened very little and the debt that has been contracted with the Banking System has been very modest, but the situation has radically changed with the 2008 recession. Today, an increasingly significant of bank money is being supported by the Central Bank. In particular, the amount of money owed by the Federal Reserve, the Banking System has gone from being almost non-existent, to reach about 5 MM of dollars, which is about half the money you need the U.S. economy to function.*

*Of course, that money is created for the Federal Reserve has not gone to pay the expenses of the government, but to replace the money the bank loans that have not been renewed by the private sector. That is to say, prior to 2008 the bank money was backed in full by credit granted to the private sector, while after 2008, a fourth part of the bank money, are the loans granted to the Federal Reserve (the Federal Reserve does not create money by itself) and are being supported by it:*

- Prior to 2008 → 100% money-bank private credit.*
- After the 2020 → 25% of bank money is credit due from the Central Bank.*

*In 2020, the 20MM of dollars of bank money existing in the US, about 5MM should the Federal Reserve (note that half of that money, about 10MM, are those which are used to carry out the trade).*

*In the other countries of the world the situation is worse. Not being the reserve currency, the amount of bank money in the economy of these other countries is approximately the amount of money that the form of the money supply. In the present, and in these countries, half of bank money should the Central Bank.*

*Why are you crying banks?*

*It is not very difficult to understand. The banking System has gone from charging interest on 100% of the money in the form of the money supply, to charge interest on only half of that amount, since the Central Bank does not pay interest currently. In addition, the rate of interest charged by the Banking System for loans has been reduced a lot, which is a torpedo direct to your source of income. If we add to this the non-payment of many credits because of the strong economic crisis in any of these countries (e.g., Spain), the weird thing is that they are not broken all of them. It is not uncommon to also see that charge almost any thing.*

*Banks have many good reasons to cry.*

## **(b) The capital money.**

Within a monetary economy there is not only the money used to buy in the Consumer Market, there is also the money that is stored in the Capital Market, which we call the “**capital money**” and that many times it is used to buy the different capital goods. All the money that exists in the economy is, according to what the event, or money that is used for the purchase, in the Market of Consumption, or money stashed in the Capital Market, despite the fact that both do not differ in anything because both types of money are only an accounting record within a commercial bank or investment.

As has already been mentioned, the Capital Market functions as a “barter market” in which there is not the money, or, better said, where money is only a well more than anything unlike other capital goods. This is the reason why the two forms of money are not converted easily to one another, so that an abrupt change in the amount of bank money that is kept in the Capital Market does not affect the amount of money the supply of money.

The latter has been seen with a lot of clarity after the huge injection of cash held by the Federal Reserve with the purchase of more than 4 million of millions of dollars in assets of all kinds in the Capital Market, and that nothing has affected the prices in the Consumer Market.

It is logical. The savings is what is done with the intention of disposing of consumption capacity in the future, and the fact that you change the way in which it is preserved, either an asset, a house, or money, doesn't change the reason why they were preserved. When the Federal Reserve bought all of those assets in the Capital Market what he did was to satisfy the desire of investors to change the financial assets in which they have their savings by money, but at any time the economizer had no intention of spending their savings, what I did or did not have money.

*THE CAPITAL MONEY. It is called "capital" money saver that preserves treasured in Capital Market, that is to say, the amount of savings that is preserved as money, and that is generally used to carry out the purchase of capital goods. Unlike what happens with the money that is used in the Consumer Market, there seems to be no relationship between the flow of purchase of capital goods and the amount of money needed to perform them, as happens in the Consumer Market, so that the amount of capital money could go from being void to contain million of millions in a short space of time, such as occurred in the years that followed the 2008.*

*In the Capital Market very little money can create a huge flow of exchanges of goods, capital, and a large amount of money you can generate very little flow of exchanges when it remains idle. Saying it another way, more technical, the flow of purchase in the Capital Market is not limited by the amount of capital monetary existing, and there is not in the Capital Market, a monetary equation that links the flow of exchange to the amount of capital money, as it happens in the Consumer Market.*

*The great difficulty in any monetary analysis, has to do with the great difficulty is to differentiate the two forms of money, as both the capital of money as the money supply are only a notation bank only to be distinguished by the usage of them within the economy.*

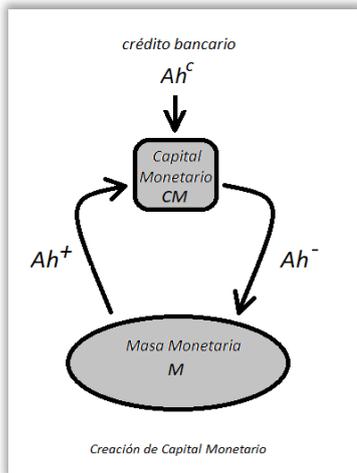
There are, in general, two ways of different in the economy to create the capital money. One is by the savings, and the other is through the creation of bank money.

1. By saving

capital money is created when someone pulls money out of the money supply and save. And vice versa, is destroyed when someone injects money into the money supply, spending capital money. Both are the flows  $Ah^+$  and  $Ah^-$  that is seen in the attached figure. It is very clear that in the process of saving and dissaving does not change the total amount of bank money that there is in the economy, but if you change your nature, which happens to be money to be capital money, or vice versa.

Let us remember that it was following this idea on the flow of money that is extracted from or injected into the Consumer Market, so which introduced the vector of savings within the accounting equation that describes any economic agent:

$$and_j = x_j + ah_j + \frac{1}{k_F} \frac{dx_j}{dt}$$



$$\left\{ \begin{array}{l} \text{saving} \equiv ah_j > 0 \rightarrow \text{extraction monetary} \\ \text{credit} \\ \text{deficit} \end{array} \right\} \equiv ah_j < 0 \rightarrow \text{cash injection}$$

Where the components are negative, it does not always come from the savings prior, as they can also come from the creation of bank.

## 2. By creating bank

When banks lend money to not only use the money already existing previously extracted from the mass of monetary savings (the mechanism that we have just seen), but also can lend by creating it out of nothing. Is the flow  $Ah^c$  that appears in the figure from the nothing, and represents the ability of banks to increase the total money in the economy by granting credits. The money that is created to grant a credit is capital, monetary, and only when it is spent in the Consumer Market in the purchase of consumer goods, is when it becomes a part of the money supply. Although not always have to end as well, and also can be spent on the purchase of capital goods and to stay in the Capital Market, such as occurred with the purchase of more than 4MM of dollars that the Federal Reserve spent on goods of all kinds.

(For example, when you assume a mortgage loan for the purchase of a home, the money from the credit remains in the Capital Market, as a residential property is a capital good. But who sells the house you can spend the money later in consumer goods, for example, when the builder paid for with the money from the sale of the expenses of the construction, and spends their benefits)

HOW MUCH MONEY IS RETAINED IN THE FORM OF CAPITAL MONEY? *The answer is that very little (we will see later why).*

*If we accept as valid the data that we've shown on the economy of the united states, then, are the debts owed to the banks by the public and private institutions amounted in the U.S. to about 20 million of million of dollars. It is what we have called the **Bank Credit** or **Mass Banking** and corresponds with all the money credit made by the banks:*

$$\text{Mass Bank} \approx 20 \text{ million million}$$

*If the amount of money that will be used in the Consumer Market is about 10MM, then the rest of the money, the other 10MM, must be capital money:*

$$\text{Capital Monetary Mass} = \text{Bank} - \text{Monetary} \approx 10 \text{ million million}$$

*That is to say, the total money that have been made with banks in the united states until 2020 is about 20 billion dollars, more or less equal to the value of GDP, half of which is used to make the economy work productive and the other half appears to be "liquid" in the Capital Market.*

*But our calculation is false.*

*A little later we will see that the amount of savings that preserves treasured as money is very small. 10MM remaining \$ are used mostly to maintain trade between the different countries and are not capital money (that is money from the money supply required to maintain the purchasing between countries).*

*THE MONEY CREDIT. Banks create money in the form of capital money, and are those who receive the loan they make money when they spend it in the consumer market. Therefore, the 20-million's of millions of dollars are deposited in banks across the world are two things at the same time. Is the money that you possess the owners of the bank deposits, but also the money that someone owes to the banks and for the banks to charge interest:*

*"the bank money what possesses someone, but there is also someone who owed"*

*What really magical money credit is that there is a relationship debtor/creditor of the non-consensual between those who have money and those that owe, on the banks appear as mere intermediaries. The beauty of the money credit resides, not so much in that it requires the payment of interest to the one who fabricated it to borrow, which means it has a strong incentive to return, but the return of the loan means that money is destroyed in an inverse process to that used to create it. Therefore, to keep the supply of money without changes requires, or that the credits are maintained in perpetuity, or that any credit that is returned will be assumed by any other debtor.*

*A beauty perverse, because as we will see, the amount of money credit may not decrease without which the economy into deflation.*

*The obligation to pay interest while not return the credit, it prevents the banks create it in excess, as it is the absence of debtors solvents, which limits the expansion of credit, but it is clear that they are not the banks that created the borrowing needs, but the technological moment for the pass to the economy.*

*On the contrary, it will present a very serious problem when employers do not want to continue asking for credits or wish to decrease that already have been granted because do not wish to continue to pay interest, since in such a case will be destroyed by the bank money, with disastrous results for the economy, which is going to enter a recession if the Central Bank does not avoid it, as we will soon see.*

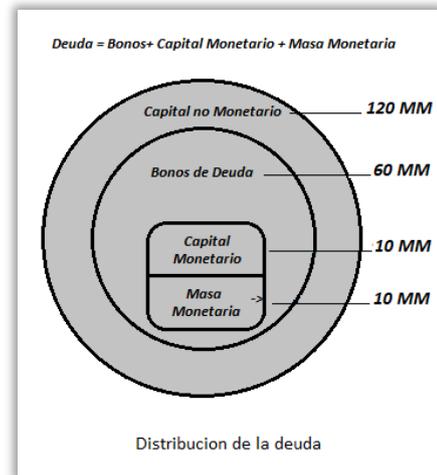
*The cash credit is one of the greatest intellectual achievements of the human being and should be put on a footing of equality, and without any fading, along with the invention of fire or the wheel.*

### c) The debt

In general, what is meant by “debt” is the sum of all the commitments that exist in the economy to return an amount of money in terms of time. A debt is basically a commitment to make a transfer of money in the future without the purchase of any service. It is not, therefore, an exchange of the sale.

The debt includes securities private debt, public equity, debt, and the bank credit (mechanism which creates the capital-monetary and monetary, that is to say, what we call money). The debt securities are called in colloquial language “bonds” and encompasses both the public debt to private debt. In the figure shows the distribution of the debt in the USA.

All the debt is backed in one way or another for capital goods. Thus, in 2019, the 60MM of dollars that must be americans, including 20 million of million of bank debt, are backed by the 120 million americans in capital goods.



But this way of seeing things is very misleading because a debt is a future obligation to repay an amount of money, and although the americans have wealth more than sufficient to support the debt, what is certain is that don't exist in the economy, by far, the 60 million's of millions of dollars owed by americans.

If the creditors decide not to renew the debt securities, and that is something that can happen, the debt could not be satisfied never because it does not exist in the economy enough money to satisfy her. That tells us that the debt securities are only an indirect way of owning capital goods, and may never be converted to cash, although that is issued with this intention.

All this was demonstrated for the bank debt when he explained the Financial Theory of the Growth and came to the conclusion that “*the debt to credit with which to create the new capital may not be returned never in aggregate terms*”, but the same is true for the debt securities issued by the companies and the government. Also the titles of debt collect the money saving extracts of the economy and the returns to the economy, but once the money becomes part of the money supply, in aggregate terms, as it may not be returned: “*The debt cannot be satisfied never in the aggregate, without which the economy enters a recession*”.

**THE TITLES OF DEBT.** *It is necessary to understand that the debt securities are a way to capture the income that it produces a good capital without actually possessing it, therefore, you should not think of them as money, because in the aggregate, are not money, nor can they be never. What is the difference between a debt security of the possession, direct capital good that backs it up is that, in appearance, the title of debt becomes in the money at expiration, what may be true in individual terms, but may not be true in aggregate terms.*

*Debt securities nor prevent any problem that already has the possession, direct capital good. In this sense, the value of the debt security will be maintained while the income produced by the*

*well of capital that supports it is to maintain (which is the same thing happens to the capital good).*

*When there is an escape widespread of investors toward the liquidity, the problem that cause the debt securities is the same in aggregate terms, no matter what amount of savings is held in the form of debt securities, and what amount is kept in the form of capital goods, since that is the lack of liquidity, which creates the problem and not if the savings is held in one or another form of capital.*

There is no problem with the debt securities that do not already have the capital goods, although both forms of savings they can create a very serious problem of liquidity when they try to convert into money, as we will see later.

PART V  
MONETARY THEORY OF THE  
CRISIS CREDIT

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04 of march in the year of 2021

### 1. THE CRISIS INEVITABLE

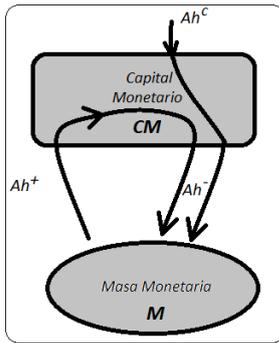
When we look at the changes in the production, which has suffered the world economy over the last 300 years, it is surprising to a lot of check who is full of abrupt and sharp declines in regular, which is named with the very appropriate name of “economic crisis”. The frequency and periodicity of the economic crises that suffers capitalism is so constant that we have come to formulate theories that relates to the periodic appearance of sunspots.

For this reason, since ancient times, economic crises are part of the mythology that surrounds and accompanies the scientific development of the economy and there's no economist that you do not have an explanation more or less elaborate on the reason why it appears. As it could not be less, we also develop a theory to explain it, but in our case, based on the deduction joint of the consequences of the Equation of Growth, the Principle of inflation and the creation and destruction of money, credit, or bank money. These three specific aspects of the economy will see that they are sufficient to explain together the downs periodic production that suffer the monetary savings.

### 2. THE CRITERION OF THE CREDIT

From the moment in which it was deduced the Equation Aggregate of Conservation we know that the extraction of money from the money supply causes automatically a decrease of the PIA of the economy (or GDP):

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -Ah(t) = -[Ah^+(t) + Oh^-(t)] \xrightarrow{Oh(t)>0} \frac{d}{dt} GDP(t) < 0$$



expression says that when the amount of money that is needed to perform the exchanges decreases, the  $GDP$  nominal of the economy must also decrease, which would not be a problem if it was not because the Principle of Asymmetry Buyer Seller tells us that the decrease in  $GDP$  is done by decreasing the production and non-decreasing prices. That is to say, any decrease in nominal money supply into the economy in a recession where the actual production decreases, which allows to explain the crisis, deflationary ravaging periodically monetary savings, explaining the reason that leads the economy to decrease the money supply.

The problem I practice posed by the use of the Equation of Growth, as it is right now, is the difficulty to measure the two cash flows that appear in the expression. Even in hindsight, when you just go and look at the accounting records and to check what has happened, it will be easy to measure the evolution of the flow of savings  $Ah^+(t)$  and the flow of credit  $Ah^-(t)$ , so there is not much hope that the conservation equation, as it is now, it could be used to predict the evolution of the economy and the future credit crisis. In fact, the reason for which it is introduced, the flow of creation of bank money  $Ah^c(t)$  and the flow of hoarding  $Ah^s(t)$  in the expression, it is because they are variables that are closely related with the bank records and are easily measurable and can be incorporated into economic models without a lot of complications:

$$-[Ah^+(t) - Ah^-(t)] = Ah^c(t) - Ah^s(t)$$

With the expression of the Equation of Growth based on the flow of credit and hoarding, it's very straightforward to find the condition that must be met for the economy to avoid ending up in a serious recession, which is no other than to prevent the flow of credit falls below the flow of hoarding:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^c(t) - Ah^s(t)] \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ Ah^s(t) > Ah^c(t) \end{array}$$

Saying it another way, when the increase of the amount of bank money (bank debt) is less than the increase in the money stashed, the economy will be extracting money from the money supply and will inevitably result in a recession:

The criterion of the credit. The necessary and sufficient condition for a monetary economy is not in recession is that the growth in the flow of bank credit to  $Ah^c(t)$  is greater than the flow of hoarding  $Ah^s(t)$ :

$$\text{Recession} \leftrightarrow Ah^c(t) < Ah^s(t) \text{ the Discretion of the Credit}$$

When the flow of hoarding to be void, shall be solely the flow of monetary creation, the governing Equation of the Growth and the criteria of the credit is reduced to:

$$\text{Recession} \leftrightarrow Ah^c(t) < 0 \text{ the Discretion of the Credit}$$

Almost always, it will happen that the flow of hoarding  $Ah^S$  is null or almost null and void, at least until the economic crisis is not shown in all of its ugliness, or while not involving the Central Bank and start to buy debt securities in order to avoid sinking the Capital Market. In such a case, the economy is directed by the flow of bank credit:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) \rightarrow \begin{cases} Ah^C(t) < 0 \rightarrow \text{spiral - saving} \\ Ah^C(t) > 0 \rightarrow \text{spiral of credit} \end{cases}$$

From this view a little more simplified, economic growth, and the economic recession are the two sides of the same coin that is shown according to the flow of credit to be positive, and increase the amount of money out of the economy or, on the contrary, it is negative and what to decrease. That is to say, depending on whether you're creating or destroying money from the money supply. In this sense, the flow of hoarding speaks of the amount of money that is taken from the money supply without allowing it to be destroyed (it is not a credit that is repaid), although for practical purposes it doesn't matter.

Both the spiral of credit, the growth, as the spiral of savings, the recession, are very well documented in the science of the economy since the mid-NINETEENTH century. In 1863, the French Clement Juglar demonstrated with statistical evidence that the dramatic fall in economic activity at intervals of 7 to 10 years were not isolated phenomena, but as a part of a fluctuation cycle of the commercial activity in the stock market and industrial. At present, although each university teacher explains the causes of the crisis according to their religious beliefs in the afterlife, none denies the existence of the boom and bust cycles of production that have been characterized from old to the monetary savings. Do not even dare to deny them the economists working for the private universities of the USA, although they are often blame them always to exogenous causes unpredictable and inexplicable, which is not very different to deny them.

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \rightarrow \begin{cases} Ah^C(t) < Ah^S(t) \rightarrow \text{spiral - saving} \\ Ah^C(t) > Ah^S(t) \rightarrow \text{spiral of credit} \end{cases}$$

But, although the equation of growth allows you to know the exact condition that poses an economy from the spiral of credit  $Ah^C(t) > Ah^S(t)$ , the spiral of saving  $Ah^C(t) < Ah^S(t)$ , nothing tells us about what specific aspects of economic activity converge to the hoarding and the credit may change, and there is a credit crisis.

Let us note that the equation for the growth even tells us what caused the credit crisis, nor if it can be avoided. It says nothing about how to get out of a recession once the economy has entered in it, so that, before anything, we must clarify the nature of the flow of savings and the nature of the flow of credit that appear in the expression to analyze what sort of relationship there is between the two flows and what other variables of the economy depend on.

### 3. THE SAVINGS CYCLE AND THE CREDIT CYCLE

The problem of credit and the consequences that it has on the evolution of the economy are much more serious than it seems at first glance a quick read of the Equation of Growth, because if growth is endogenous, and the need to invest in the credit depends on that, there seems to be no obvious way to avoid that the economy enters into a recession when the growth will stop and he will also stop the investment credit. It is very clear that the economy will enter a recession when leave is requested credit and the already granted to be returned, which makes the flow of credit becomes negative and starts to destroy money banking; or when, while the flow of credit does not stop, cannot be avoided that the flow of hoarding it exceed.

If we assume that the flow of savings  $Ah^+$  is endogenous and maintains a stable relationship with the  $GDP$ , which is what usually happens almost always, we can explain without difficulty the cycle of the rise and fall of the economy by using only the changes undergone by the spending on credit. In particular, when we assume that the savings are proportional to the expenditure (the Act of Saving Keynes) and there is no hoarding, that is to say, that all savings are returned to the economy in one way or another, either with the purchase of assets, or whether with the purchase of debt securities, we can forget about hoarding and pay only attention to the variations that suffers the flow of credit in order to explain the economic cycle:

$$\overbrace{Ah^+(t) = \tau_S GDP \cdot (t)}^{\text{Act Keynes}} \rightarrow \frac{d}{dt} GDP(t) + k_F \cdot t_S \cdot GDP(t) = k_F \cdot Ah^-(t) \text{ Ec. Keynes}$$

(The parameter  $\tau_S$  is the saving rate in relation to the  $GDP$ , and we assume constant). The equation we are still saying the same thing that you told us before, that for growth to the flow of spending on credit has to be greater than the flow of hoarding, but now appear the savings in the expression, is also the deficit  $Ah^-$ , of which only a part is a consequence of flow of credit:

$$Ah^-(t) = -Ah^+(t) + Ah^C(t)$$

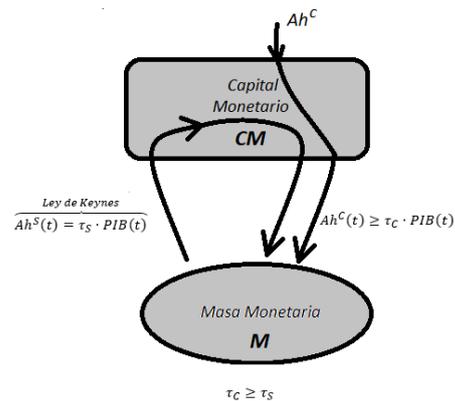
Now, the condition that the economy is not in recession is that the flow deficit will grow at least as fast as it grows, the savings, which forces the flow of credit to also grow in proportion to the  $GDP$  (as a minimum):

$$Ah^-(t) = \tau_S \cdot GDP(t) \rightarrow Ah^C(t) = -Ah^+(t) + Ah^-(t) = (\tau_C - \tau_S) \cdot GDP(t)$$

This is completely logical, as the money supply grows proportionally with  $GDP$ . Let us observe that the solution of the equation will be of the type exponential and the  $GDP$  nominal will grow or decrease depending on the credit get to stay positive, or not:

$$\frac{d}{dt} GDP(t) - k_F \cdot (\tau_C - \tau_S) \cdot GDP(t) = 0 \rightarrow GDP(t) = const. e^{k_F \cdot (\tau_C - \tau_S)t}$$

This condition is to be met without problems in an environment of technological change, when the economy recama a strong investment to meet the expected increase of the productivity, but it can be a complicated condition to meet in an environment of stagnation of technology where



there is no clear-cut way to increase productivity and, therefore, no good reason to invest. In this latter situation it will be difficult to avoid the recession, because it will be difficult for the flow of credit to be able to return the money that you extracted from the savings of the economy.

We see that, according to the situation of the credit we can clearly distinguish two economic cycles, one boom and one drop of the credit, with an intermediate phase that passes from one to the other:

a) The cycle of boom or credit cycle.

The credit cycle can be described by three phases that are feed back:

- 1) When, thanks to the technological change, there are expectations to increase the production, and with it the income of the capital, entrepreneurs borrow money to invest. We know that the economic incentive to invest is very high, as, in the aggregate, and when we assume negligible hoarding, the growth of the capital is about 12 times the flow of creating bank:

$$dK = \frac{\langle \alpha \rangle}{\bar{k} \cdot i} k_F \cdot dM = \frac{\langle \alpha \rangle}{\bar{k} \cdot i} k_F \cdot Ah^C \cdot dt \approx 12 \cdot Ah^C$$

In aggregate terms, the growth of capital is more than enough to support the money that you borrow for investment, which can proceed in both the savings prior to the creation of bank. The prize for capturing as rent a portion of the increase in income is very large, and it is easy to make large fortunes in a very short time. There is therefore a strong incentive to invest.

- 2) In such an environment, the money savings will be insufficient to satisfy the desire to invest, and banks are going to have a few problems to find people solvents that wish to borrow, and complete with bank loan the money needed to cover the investment needs. It is very clear that the economy is going to start a general process of economic growth, sustainable, as long as you keep the cash injection that from the investment credit.
- 3) The source of the money for the loans is two-fold. A party comes from the savings of the people who are increase their income, and another part comes from the creation of bank money. The part from the savings we know that does not increase in the aggregate the amount of capital goods, but it allows them to renew the existing capital in a process of creative destruction, of the type described by Schumpeter. The other part of the loan, the proceeds of the money creation through credit, is the one that increases the money supply and the *GDP* nominal of the economy, which will allow not only to renew and modernize the already existing companies, making them more productive, but that it will also increase the capital added to existing who is supporting the bank credits. The result is an economy of

full employment with a relative low inflation, which absorbs without problems to the work that will leaving you free to the implementation of the new technology:

$$\begin{array}{l} \textit{injection} \\ \textit{monetary} \end{array} [Ah^c(t) > 0] \rightarrow \begin{array}{l} \textit{growth} \\ \textit{with} \\ \textit{full employment} \end{array}$$

The injection of new money credit increases the disposable income that sustains the increase in aggregate expenditure, both in consumption and in investment, that is, it increases the *GDP*. That keeps the expectations of the entrepreneurs of capture in the form of an income part of the increase in the *GDP*, which starts a self-sustained process that lasts as long as the investment to produce increases in production and productivity.

We see that, in aggregate terms, the need for loans to invest above the savings is what allows it to grow the money supply that allows you to increase the income, which increases consumption, which will generate the growth of income from capital, which will support the new bank money.

b) The transition between the rise and the fall.

The three phases that we have described for the credit cycle, run with continuity until the technological momentum is exhausted. It is easy to see that the credit cycle can be traveled in the opposite direction without any problem and with dire consequences because of that the prices may not go down, and as such affirms the Principle of Asymmetry Buyer-Seller, but before we get to that, there is a stage of “transition”:

- 1) When there are few expectations of growth because the technological momentum that pushes the increase in productivity has been exhausted, the entrepreneurs stop asking for money to credit to invest. But the economy is still functioning normally and the flow of savings, as the income of the economy, remains unchanged.
- 2) Now, the banks start to have problems to find investors who grant new loans as older loans are going to pay. The flow of credit decays, while the flow of savings, which we assume is proportional to the *GDP*, is still without appreciable changes, and threatens to not find where to invest to be returned to the economy. The creation of bank money begins to stop because the decreasing need of credit is met first with the money from the savings.
- 3) The granting of loans for the investment is left to be the mechanism that creates the bank money, and now the banks start to replace it with a credit intended to maintain the consumption of those agents, and those companies that, while still being solvent, have been diminished their income because of the break in the injection of cash.

But, unlike the credit allocated to investment, that is not returned in the aggregate, because it is supported by the income of the capital goods that you create, the credit

that is intended to cover the deficit spending is only supported by the income already existing, and sooner or later will leave granted.

- 4) The creation of new bank money is going, stopping slowly as you go, stopping the granting of loans to cover the deficit spending, but the savings continues without pause or is to be detained with much more slowly stops the credit. It is only a matter of time that the savings do not find how to be returned to the money supply and the economy enters into a spiral of savings in the banks just granted credit and the agents desperately try to pay off their debts drastically reducing its deficit spending. When that happens, and bank credits, no longer to be renewed, then, not only is will no longer create money, but we will have begun to unravel the bank money or credit that shape the supply of money and keeps the economy running.

The decrease in the expenditure on investment as well as consumption, decreases the expectations of economic growth and decreases even more spending on credit, which begins the cycle “of savings” that will destroy you quickly throughout the industrial fabric of the economy.

c) The cycle of a drop or a savings cycle.

Once the flow of credit decreases until it becomes negative, a process is initiated that leads to the physical destruction of all business.

- 1) When the credit becomes negative, what we have is the physical destruction of the money that has been created by credit. That's equivalent to the extraction of net money from the money supply, or in other words, what we have is a constant decrease in disposable income, that is to say, of the economy's GDP:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^C(t) - Ah^S(t)] < 0 \rightarrow \Delta GDP < 0$$

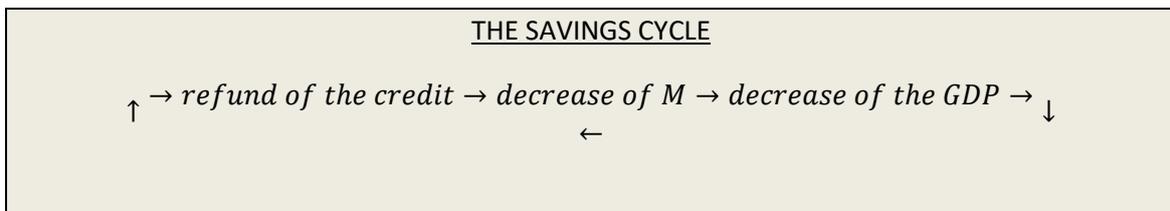
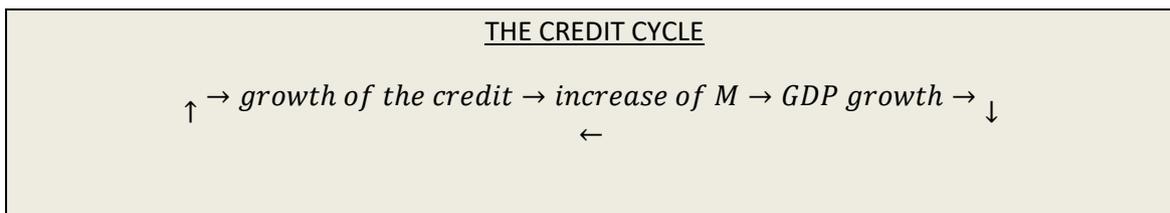
- 2) The consumption expenditure, which is not another thing that the *GDP*, declines and with it, decays also the income of the companies. There is too much production for the spending that is being done and this is not to diminish. Many companies will have to close. What? Very probably those that are most indebted and unable to continue maintaining it for a longer time a deficit spending.
- 3) Now the whole world trying to reduce costs to the decrease of the income, beginning with the settlement of the loan. Companies with difficulties applying to the banks of the renewal of the loans, but the banks understand that in an environment deflationary and without any expectation of growth will be very difficult that you can return them without resorting to the liquidation of the company. Banks, unknowingly, are adding to the problem by forcing the companies to return the credits. The return of the credits is producing the physical destruction of the money that the form of the money supply, causing the environment to become even more deflationary.

To aggravate the situation, the decline in income of companies implies a decrease of the income that it produces and, therefore, a decline in the value of capital that is backing loans. The banks are going to meet up with their very existence threatened, as a part of the debt will be unrecoverable when paid in capital that supports it.

Little more can be added to the gloomy picture that presents an economy in the throes of deflation. It only remains to add, that the destruction of the business fabric stops when you stop the return of the credit and saving becomes impossible. When that happens, the flow of savings becomes very small and the little credit that is granting restart the process of growth, but that may take a long time to occur spontaneously and it is important, as stated by Keynes, that the government start as soon as possible the injection of money in the money supply through government spending.

The first cycle, the credit, what initiates and maintains the desire of entrepreneurs to invest in new capital goods, which increases the spending credit that causes the growth of the money supply and, with it, the economy. The second cycle, the savings, what initiates and maintains the decrease in spending on credit because of bad expectations about future income. To describe both cycles, we assume that the flow of savings is relatively stable with respect to the *GDP*, while the weight of the changes in the money supply is what we attribute to the flow of credit that decreases or increases according to the time of technology and the expectations. Since then, neither the theory nor the conclusion change if you are assumptions about the savings are not met.

The following scheme shows the two cycles:



They are the two sides of the equation to the growth, and soar as spending on credit exceeds the hoarding flow (the latter which we assume is almost always null):

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \rightarrow \begin{cases} Ah^C(t) < Ah^S(t) \rightarrow \text{spiral - saving} \\ Ah^C(t) > Ah^S(t) \rightarrow \text{spiral of credit} \end{cases}$$

As we have already mentioned, the economists who teach in the private universities of the USA do not deny the existence of the booms and crashes of the economy, but they deny the role of private banks in the creation of money that they produce and, of course, the role of savings. For them, the crisis is explained by exogenous shocks, which is like blaming the aliens.

THE PROBLEM OF THE SAVINGS. But what actually creates the credit crisis? The Equation for the Growth says that you cannot decrease the money supply, without which the economy enters a recession, which requires that the money from the savings to be returned to the economy. But the savings is not what is creating the new capital, but the increase of bank money that creates the granting bank credit (the credit flow,  $Ah^C$ , when we assume is hoarding null):

$$\Delta K = \frac{\langle \alpha \rangle}{\bar{n} \cdot i} k_F \cdot \Delta M = \frac{\langle \alpha \rangle}{\bar{n} \cdot i} k_F \cdot Ah^C \cdot \Delta t \sim 12 \cdot Ah^C \cdot \Delta t$$

The problem occurs because the increase of capital goes hand in hand with the accumulation of savings and, in aggregate terms, the money in the savings can be greater than the amount of new capital created, which as we know is dependent on the monetary creation.

Let's look at that entrepreneurs create new capital borrowing money that comes from savings and money creation, and therefore a part of the new capital they create does not belong to them, but that belongs to those who have given them the money. One part belongs to the loan from the savings and the other part belongs to the bank credit. The rest of the capital is the real benefit that you get the entrepreneur of your investment:

$$\Delta K = \Delta K_{savings} + \Delta K_{credit} + \Delta K_{entrepreneur} \sim 12 \cdot Ah^C \cdot \Delta t$$

Let us observe that it is only possible that the equation is satisfied when the growth of the new capital is sufficient to absorb the savings that are done within the economy. In the opposite case, the growth of bank credit will be insufficient, and part of the savings may not be paid. In reality, the problem is more serious than it seems because it provides the money saving and then creates money with the credit, so the savings will begin to be enjoyed long before the credit becomes negative and the economy will enter a recession before it begins to be destroyed bank money:

$$\frac{\Delta K}{\Delta t} = \frac{\Delta K_{savings}}{\Delta t} + \frac{\Delta K_{credit}}{\Delta t} + \frac{\Delta K_{entrepreneur}}{\Delta t} \sim 12 \cdot Ah^C$$

But,  $\frac{\Delta K_{credit}}{\Delta t} = Ah^C$ , so that:

$$\frac{\Delta K}{\Delta t} = \frac{\Delta K_{savings}}{\Delta t} + \frac{\Delta K_{entrepreneur}}{\Delta t} \sim 11 \cdot Ah^C$$

The new capital that creates the cash injection will be divided, almost in its entirety, between the entrepreneurs who create it and the investors (lenders) that fund, and that seems logical and coherent until we realize that the previous relationship requires that:

$$\frac{\Delta K_{savings}}{\Delta t} \ll 11 \cdot Ah^C$$

*Or, another way, in aggregate terms, it is not guaranteed that all the savings in the economy ends by returning as an investment to the economy. In fact, a few simple numbers tell us that that's not always going to be easy that is satisfied when the economy grows slowly. For example, when the real growth of an economy is of 1%, the actual creation of new capital round to 12% of GDP, so that the annual savings should be kept well below that figure, as a part of the new capital will remain the employers as well as benefits (part of the new capital should either keep it as entrepreneurs, or if not, would engage in no new business).*

*The problem of saving is that it forces the economy to keep growth to a minimum to be able to absorb it, which is not going to be possible in an environment of low growth or no growth. In fact, what we show is that in a monetary economy it is true that the growth of the GDP has to be, as a minimum, a sixth part of money saving:*

$$\Delta K_{savings} \ll \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \cdot \Delta GDP \rightarrow saving \ll 6 \cdot \Delta GDP$$

*That is a remarkable result. Despite the fact that the expression is not a criterion very accurate to determine when the saving is going to become a problem, at least if it indicates that the savings is the problem that is behind the credit crisis:*

$$\tau_s \ll 6 \cdot \tau$$

*That is to say, the savings rate  $\tau_s$  has to be less than about six times the growth rate of the economy  $\tau$ . The expression displays in all its rawness, which cause the credit crisis, because the problem is not that the economic growth is insufficient, but that the savings is excessive.*

#### **4. THE LIQUIDITY OF THE CAPITAL MARKET**

The criterion of the credit and the Equation of the Growth of the proceeds, speak exclusively of the dependence of the GDP with money, or otherwise, speaks to us of the crisis, deflationary, which is created in the real economy because of the destruction of money, credit form of money supply, but in no time she tells us what role does the value of the capital goods in booms and falls of the production.

Although we know that the capital market and the consumer market are decoupled and only exchange money slowly through the credit and of hoarding, we also know that the price of each of the capital goods is a consequence of the income produced within the Consumer Market, so it would be logical to expect that any decrease of *GDP*, or even the mere threat of a decrease in *GDP*, affecting the price of capital goods, and then dropped his assessment within the Capital Market.

What is more, the influence between capital goods and consumer spending is reciprocal. Given that, in aggregate terms, a good part of the capital goods are owned indirectly through debt

securities, any threat of a decrease in income that occurs as a capital good will that a holder of the title try to make liquid and does not renew at maturity. Not only that, also the owners direct capital goods were to attempt to sell them to the threat that the income that they now produce not maintained in the future. The expectations, or the belief, that in the near future there will be a decrease of the income, whether or not it is true, causes an overall drop in the price of capital goods, to the point, that its price can fall below the debt that support, which is clearly an untenable situation from the point of view of accounting, which requires creditors to request that the credits are returned.

The dependence of the value of the capital assets with the income they produce, along with the support offered by the capital bank money with which they were created, it creates a circular dependency between the price of capital goods, the flow of expenditure (*GDP*) and the bank money that is crucial for understanding the dynamics of the capitalist economy, perhaps being in this particular area in where you can better appreciate the myopia chronic suffering from economists who devote themselves to the research within the public universities from all over the world. To not differentiate in their analysis between the Consumer Market and the Capital Market, economists can't understand how it affects the interdependence between both the growth or decline of the economy and, therefore, are unable to understand the dire consequences that the lack of liquidity in the Capital Market for all the productive economy.

To understand the terrible consequences for the whole economy, the lack of liquidity in the Market for Capital, we start remembering how to spread the people and the institutions of his wealth among the various capital goods that exist. For example, in the US, and in the year 2019, the cast is the following:

<i>Capital goods</i> .....	120MM (100%)
<i>Bonds</i> .....	40MM (30%)
<i>Capital monetary</i> .....	10MM (8%)
<i>Money supply</i> .....	10MM (8%)

We see that the saver USA retains the greater part of his savings in capital goods, either directly, 60MM of dollars, or indirectly by means of the debt securities, the 40MM of dollars, and it is therefore always afraid of losing their savings because of a sudden drop in its price. Not because of the expectations that have been formed on the income of the capital goods that retain their savings are not met, which is a risk that the investor takes when investing their savings in the purchase of a capital, but because it sinks the price of all capital goods. The fear that has any saver is that there will come a day that all the world wants to sell his assets because any saver expected that everyone is going to want to sell their assets, which makes the drop in prices in a self-fulfilling prophecy.

This is the great contradiction and the great danger that has an implicit valuation of the property within the Capital Market, and to understand the reason why you can't prevent something like that happening are not very difficult: where they're going to leave the 120MM dollars worth of assets that have the americans when they all decide at the same time sell them to preserve their savings in money? Of any site, obviously. Therefore, we will define the "liquidity" of the Capital Market in a way that allows us to have, if not a quantitative appreciation of what is liquidity, yes, at least a very accurate idea of the big problem caused by its absence:

*DEFINITION OF LIQUIDITY. We say that the Capital Market is a “liquid” when it is possible to sell any quantity of capital goods, without this affecting its price. We say that the Capital Market is “illiquid” when this is not possible, which is always.*

No one can deny that this definition of “liquidity” is very vague, although it has nothing to do with the idea usually has in the economy, associated with the amount of money that you have, for different reasons, and that introduces Keynes for the first time in 1936. The definition of liquidity, informs us that capital goods have a price to intrinsic that, when the market is “liquid”, it should not be affected by the amount of goods that are bought and sold. What it doesn't tell us much.

In addition, it follows easily from the definition that the Capital Market is not necessarily in “illiquid”, as the small amount of money that can be treasuring as capital money is totally inadequate to ensure that it is paid as a capital good what it's worth, regardless of the amount of capital goods offered for sale. It is very clear that in no place there are the 120MM of dollars that would be required to provide liquidity to the immense Market of the Capital of the USA.

If the Capital Market is, by definition, illiquid, where you can leave the money necessary to satisfy the desire to make liquid 120MM of dollars in assets of all classes? We have already said that, of any site. But when you think of it that way, in a little we differentiate ourselves from those who seek between tree and tree, trying to find the forest and conclude desperate, that it is because of so many trees so that it is impossible to find it:

*THE LIQUIDITY OF THE CAPITAL MARKET. If we remember that the Capital Market is very decoupled from the Consumer Market because the flow of saving and dissaving is very stable, so it is easily understood that the Central Bank can buy, with money made of nothing, all assets are offered for sale without any risk that the money you are finished creating inflation because they spend in the Consumer Market.*

*For example, if necessary, the Federal Reserve can be made from nothing 120MM of dollars that was valued in 2019 the capital of the USA and to buy it, taking the full security of that huge amount of money is not going to produce any inflation because it will not be worn in the Consumer Market, precisely because the 120 MM of dollars are the cost savings that americans want to retain as savings.*

*In fact, that was what he did in 2008 the Federal Reserve to prevent the american stock exchange collapsed, and a repeat of the disaster of 1928. In a period of just a few months, is created out of nothing more than 4MM of dollars and bought all kinds of financial assets in the Capital Market, thereby avoiding its price crashed, and with it, the entire economy of the USA. The result was that the Federal Reserve did more than 4MM of dollars in assets (and began to collect rents from them), while the savers were made with more than 4MM of dollars in money, which was what they wanted, despite the fact that not charged any rent from them.*

But what is ethical and moral, which the Central Bank intervenes in the Market of Capital by buying all kinds of assets to prevent its price from sinking? Why should I intervene the Central

Bank and save the wealth of those who speculate with the price of the stock? Why the Central Bank should save the wealth of the rich? There are two good reasons. The first because the wealth is not a thing only of the rich, the poor-savers, and second, because the collapse of the economy does not benefit anyone, but it hurts, especially, to the poor:

*In a monetary economy, capital goods are those that are supporting all the titles of existing debt, including a good part of the money credit that moves throughout the real economy, and that, as we know, was created as a debt credit someone. This was demonstrated in a very clear way to develop the Financial Theory of the Growth, and it was very clear that the money order loan, either to create new capital goods or whether it was to keep the deficit spending, could not be returned never in the aggregate, because it had become part of the money supply that maintains the exchange of buying and selling in the Consumer Market.*

*When someone has a due and you want to pay it, it is normal to sell a part of the capital goods to be able to return it, but that money can only come from the savings prior, which involves removing monetary if who gets the money to pay off the debt keeps as part of its wealth. In aggregate terms, the money is returned to settle the debt is part of the wealth of the creditor and is not intended to be spent except in the purchase of capital goods, so that the money does not come back to the money supply.*

*When someone pay off a bank loan, the situation is even worse, because like before the origin of the money is the removal of monetary, with the difference that now the money is not even preserved as money in Capital Market because the bank is to destroy the money that you created when granting credit.*

It is very clear that the Central Bank has to step in before the fall in the value of assets, which is only the first symptom that things are not going well and the economy will come under.

QUANTITATIVE EASING. *Where ended the more than 4MM of dollars that the Federal Reserve used for the purchase of assets?*

*The feature essential money credit is that it is a debt that has to be returned, or that they have to pay interest while not returned. Therefore, it is understood very well that there is a strong incentive to repay the credit, especially when he is being supported by the income of someone else and not for the income that it produces a good capital.*

*So, part of 4MM were to replace the money be destroyed with the return, and non-renewal, of a good portion of the bank loans and the other part, perhaps the most insignificant, they ended up treasured as capital money. The result, in aggregate terms, was that the Central Bank got into debt in order in 4 MM of dollars to the Banking System, being the Central Bank, who supported it from then on 4MM, the most of 10MM that are needed for the economy of the united states to work (if you don't count the other 10MM of dollars that are used in international trade).*

*It is important to remember that the amount of money the bank of the united states would be close to 15MM of dollars in that time, so that the decrease of 4MM bank money would have*

*destroyed the economy of the united states almost instantaneously yes the Federal Reserve would not have created the money.*

In individual terms, any debt can be repaid without creating any problem of solvency, since the settlement of a capital good, or it arrives to cover the amount of money that supports, or the lender takes the loss. But, the situation is completely different in terms of aggregates, and the payment of the debt is satisfied or not satisfied with the settlement of the capital good, means the destruction of the bank money when the debt is credit, which causes the decrease in the money of the money supply and the collapse of the economy.

*A VISION HISTORICA OF THE CREDIT CRISIS. There is a clear statement that during the NINETEENTH century took place on a regular basis the credit crisis, and this, despite the fact that the money was being backed by the gold metallic and the use of fiat money was very marginal.*

*The paradox of why the gold standard is inevitable from the credit crisis, it is understood very well when it is understood that the increase of the money supply that need the economy to grow is carried out thanks to the emission of paper money without gold backing. Given that growth is endogenous, and the amount of gold in circulation is fixed, it may be that the amount of gold doesn't grow enough to allow economic growth. In such a case it will be inevitable that the issuance of paper money without backing, to increase the money in circulation and to allow for growth.*

*(In fact, there is no way to know without a ticket concrete is, or is not backed by gold, since the backup of the tickets are always in aggregate and never on an individual basis.)*

*As is logical, when economic growth stops, the lenders are beginning to claim their debts, and then it becomes clear that a large part of the tickets may not be changed for gold, leading to the liquidation of all the paper currency. But this has been the paper currency who has been sustaining the growth of the economy, so that settlement of the paper currency by the inability to be exchanged for gold, will liquidate the money supply and, with it, the entire productive. In such a situation, the economy will sink so inevitable because the gold exists will not be enough to sustain the GDP reached thanks to the emission of paper currency.*

*The crisis of credit took place without discontinuity during the NINETEENTH century, until the early TWENTIETH century, the banker american J. Morgan joined to all the banks in the US and achievement avoid the banking crisis that threatened to ravage the country in 1905. From that moment on, at least in the US, the paper currency issued by any banks of the United States was backed by the gold of all banks in the united states. Obviously, that allowed the enhancement of the emission of paper money, and with it, the growth of the U.S. economy to levels that could hardly have sustained real growth of the amount of gold in the country.*

*The problem, as we know, is that it was only a matter of time that the growing amount of paper currency is called gold: "there is Only the belief that the gold of all the banks together was enough to satisfy the exchange of paper currency, kept the paper currency in circulation."*

*The 1929 disaster struck. The price of the assets listed on the exchange began to sink, and the banks began to claim the loans they had granted. The problem was no longer that people came to the banks to change their banknotes for gold (the U.S. had already transcended that level, and the tickets for a long time did not vary by gold), as virtually all existing money were tickets are backed by Reserve Federal. The problem was that the banknotes that were in circulation in the US were being destroyed, not because they could not be exchanged for gold, but because of the debts that had been created were liquidating!*

*Of course, at that time, this was too large to those who ran the Federal Reserve, and were unable to understand what I was sinking into the American economy, and with it, the world economy, was the lack of bank notes, and not the lack of gold. The USA authorities seized the gold in a posthumous attempt not to sink, without understanding that gold is the worst lifesaver for someone who is choking. The international trade virtually disappeared because no one wanted to use the little gold exists to support the purchases. The world economy just...collapsed, and only began to recover after 5 years, when the Second World War was already inevitable.*

*After the Second World War, the crisis, lenders have continued without discontinuity, and with dire consequences for the developing countries, but in the form of currency crises. The cause of this change was the acceptance of the dollar as a reserve currency in global trade. Logically, the only countries that have not suffered no crisis of change have been the US (only suffered a slight stagnation in the seventies) and those countries with a trade surplus, such as Australia or Germany, but we must not let the name change fool you, because what causes an exchange rate crisis is the same phenomenon that causes a crisis of credit, as we shall see a little later.*

*What if it was all different, it was the crisis hit in 2008, the stock market of the USA, which became a global crisis to be the dollar, the international reserve currency. As all the credit crisis, the crisis of 2008 begins with an overall drop of the credit that affects the disposable income and makes them fall to the GDP. This fall in GDP dropped the prices of capital assets (whether before or after either) and is fed back to the GDP when the banks start to not renew the credits of a generalized manner. It is the repayment of the debts which causes the extraction of money from the money supply and the fall of GDP, which in turn makes it fall in the price of the asset which is then fed back to the repayment of the debts, creating a credit crisis.*

*Evidently, the rapid action of the Federal Reserve prevented the disaster of 1929 was echoed a century later.*

A lack of liquidity in the Capital Market, as defined here, is that taking place today in all countries of the world due to the pandemic of early 2020. In particular, in Spain, the share price reflected by the IBEX35 has fallen more than 30% of its value without the European Central Bank has done nothing to prevent it.

*The pandemic in Spain. In the first months of 2020, the Spanish government decreed the confinement total of the entire population is not essential. From that time, and in just two weeks the IBEX35 index Spanish stock exchange, fell almost 30% of its value.*

*Is it justifiable to the fall of the valuation of assets in response to the expectations about its future profitability? No, clearly not. The potential loss on-time 20% or 30% of the annual profit of the business can't justify a fall in their price about 20 times that value. It is very evident that a fall as great as that observed, is only possible by the lack of liquidity in the market.*

*What happens in these cases in which it is expected an overall drop in the valuation of assets to be traded on the stock exchange, albeit mild, is that no one wants to be who pays that little drop of the price. They all want to be the first to sell the assets before they fall, attempting to others who take the loss expected, even if it is small and very pleasing in terms of media by the investor. But once started the race to the sale of the assets, the lack of liquidity makes its appearance and prices plummet to levels that do not justify the loss of expected income.*

*The cause is, of course, that there is not enough money in the Capital Market to buy all the assets that are put on sale, which makes dropping your price well below the price that reflects the real situation of the economy:*

*“the market has ceased to arbitrate the prices because it lacks the money needed to do so”*

*A slowdown in economic, which of course will mean a financial loss to someone, it is converted by the lack of liquidity in the market in an overall drop in the price of the assets of close to 30% or even a disaster of war could be justified.*

*Why not intervened, the European Central Bank in the same way that involved the Federal Reserve in the united states? Perhaps because the us authorities know what they are doing and the european authorities not?*

The problem of “liquidity” is a real problem facing any monetary economics, and shows very clearly the immense sword of Damocles hanging over the heads of more than 8,000 million people that live on this planet. The sad part of all this is that the political authorities are doing nothing to prevent it despite the fact that the solution offered by the Central Bank is so simple.

It is very evident that the liquidity of the Capital Market cannot be left to the free choice of economic agents, not only because they don't have enough money to provide liquidity to the market, but because they are the companies that make up the industrial fabric of the country as a whole what is at stake when you report the problem. What is threatened when there is a credit crisis is the real economy, the companies of the living people on this planet, and if those companies fall, fall also to the economy that sustains the well-being of more than 8,000 million people. We think that both the European Central Bank and the central banks of other countries, has the responsibility to intervene to prevent the fall in the price of the bags nations to sink the real economy.

## 5. THE EXCHANGE RATE CRISIS

Perhaps the most important event of the entire TWENTIETH century, even more important than either of the two world wars that ravaged the century, was the abandonment of gold as currency and the implementation in all the countries of the bank money created by the credit. From the moment in which each of the economies in the world agreed to issue their own currencies, and set a rate of exchange between them, it was inevitable that the coin is considered the more secure it is establish in the reserve currency with which to conduct trade between the countries. The implicit consent with the fact that all the economies had adopted the dollar backed by gold as a reserve currency after the Second World War, it became in the decade of the 70's in a consensus explicit when the gold left to support the dollar, and the crisis of change, which until then were solved with the rise of tariffs to prevent the output of gold in the country, became devaluations wild of the currency raging in the country's economy with a domestic inflation of prices just as wild.

The count of the succession of currency crises that occurred from then on is innumerable, and the poverty and desolation that they have left in countries that are suffering, unspeakable, despite the fact that almost all of them were easily avoidable. Perhaps for this reason, because they are easily avoidable when you understand what causes it, is where more clear and you see the dire consequences that it has for millions of people the propaganda of liberal economists who work for the private universities of the USA. Now we are going to develop a theory about their formation and dynamics in a way that the monetary authorities of a country, to have or not to have its own currency, can predict and avoid them without any difficulty, as we will demonstrate that a crisis of change (or a debt crisis), and in nothing is the difference of a credit crisis within an economy isolated.

We begin by recalling that the Equation of Growth is an equation macroeconomic treats the entire economy as a single country isolated, while the economic reality that we wish to describe, on the contrary, brings together a large set of countries working each one of them with a different currency and producing different goods. But, despite the obvious difference that there is between an economy isolated and a set of countries which trade with each other with different currencies, we see that the vision that emerges from the credit crisis, as caused by the extraction of money from the money supply when the flow of savings  $Ah^+$  is greater than the flow deficit  $Ah^-$ , it will remain valid:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \sim Ah^C(t) \xrightarrow{Ah^C(t) < 0} \text{Crisis of Change}$$

although you must complete the Discretion of the Credit, with an additional condition that, to give an account of the money flow that creates the trade.

In this new reality made up of many trading countries, the sensible thing to do is to describe the economy with only two sectors, the country with its own currency object of study and the rest of the world that trades on the currency of the reserves. To do this, we will use the system of two equations that describes an economy divided into two sectors, or two countries, that uses a single currency, and we deduced in the second theme of the exhibition when we talk about the Spain, Empty:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \quad (1)$$

Now, the coefficients “a” and “b” of the expression indicates the percentage of *GDP* that each country spends in the other country and are, by definition, positive (“1” is the country in the studio and “2” is the rest of the world). The flows of savings,  $ah_1$  and  $ah_2$ , continue to be the financial transfers between the Consumer Market and the Capital Market within each of the countries, that is to say, the flow of aggregate savings of each country, which is equal to the flow of savings less the flow deficit ( $Oh^+ - Oh^-$ ) in each of the countries:

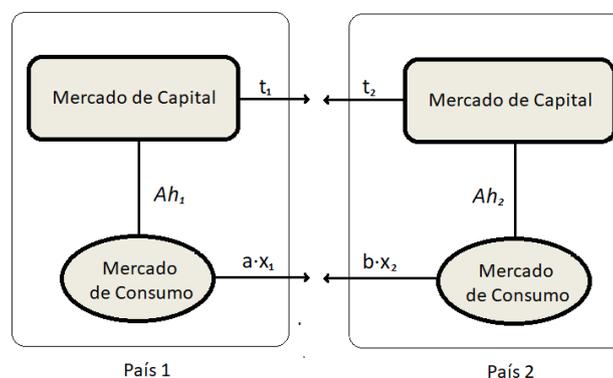
$$ah_i = ah_i^+ - ah_i^-$$

In addition, the flows that appear in each equation are expressed in the currency of each country, so that the equations should be written differently when expressed in a single currency:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ e_{12} \left( \frac{1}{k_F} \frac{dx_2}{dt} \right) &= e_{12} \cdot (a \cdot x_1 - b \cdot x_2 - ah_2) \end{aligned}$$

Being  $e_{12}$  of the exchange rate between coins and where the flows of the second equation are written in the currency of the second. But to avoid the hassle of dragging the coefficient of change in all of the expressions we will use the convention that the flows that appear in each of the accounting equations are expressed in the currency of the country, so that the term  $(a \cdot x_1 - b \cdot x_2)$  that indicates the flow of trade between two countries or regions, will have different values depending on the term appears in one equation or another, because it will be expressed in a different currency.

The figure below helps to clarify the situation a bit. The flow  $t_1$  and  $t_2$  are the flows of investment that each country does the other, and the flow  $(a \cdot x_1)$  and  $(b \cdot x_2)$  are the flows of expenditure that each country does in the other expressed in the same currency, and have a different value according to the equation in which they appear.



Thus, the two equations that describe the economy of the two countries are in the original way, but with the understanding that each one of them is expressed in a different currency:

$$\begin{aligned}\frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2\end{aligned}\tag{1}$$

Let us observe, that the expressions reveal the important role played by the trade deficit in the credit crisis, as the term  $(a \cdot x_1 - b \cdot x_2)$  acts, according to your sign, as an extraction flow of money in the money supply, or as a flow of cash injection, which adds to the extraction that have already done the own savings, so that the amount of money that must inject spending on credit to avoid the credit crisis is more to the deficit country and less to the country excess. The criteria for the economy is not in recession changed, being now necessary that the sum of the flow of aggregate savings and the trade deficit to be less than zero:

$$\frac{1}{k_F} \frac{dx_1}{dt} = -a \cdot x_1 + b \cdot x_2 - ah_1 \xrightarrow{\Delta x_1 > 0} -a \cdot x_1 + b \cdot x_2 - ah_1 > 0$$

The expression indicates that the trade surplus to help the country to grow, by allowing the savings exceed the deficit, without which the economy enters a recession. By contrast, a country with a trade deficit can enter into a recession even when the deficit exceeds the savings, because of the extraction of money that is the trade deficit. Or otherwise, the injection of cash net that you need to create the deficit spending, public or private, to prevent the economy enters a recession is higher in an economy with a trade deficit that in an economy with a trade surplus.

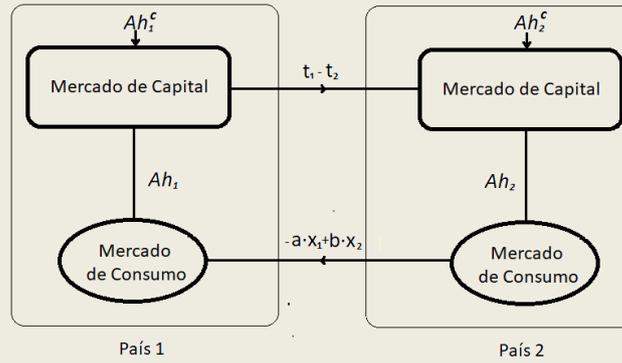
Although the figure is not shown explicitly, we are assuming that none of the countries can manufacture the currency of another country, nor can you store it, so that the balance of payments between the two countries should be zero (in reality the Central Bank can accumulate any amount of currency of the country with which it is traded, what is called the “reserve currency”, but that does not invalidate the analysis). This requires that the cash flows of each country to be null, in its own currency:

$$(-a \cdot x_1 + b \cdot x_2) - (t_1 - t_2) = 0\tag{2}$$

Or another way, the flow of spending in a country's trade in the other country, must be balanced with the financial transfer of credit of this country in the first one, since we have assumed that there is no buildup of foreign currency. The figure below clarifies what happens, and shows that the monetary flow between countries is equivalent to a circular flow that forces the balance of payments balance, or what is the same, requires that financial transfers between the capital markets are the same transfers to trade between the markets of consumption. It is when this condition threatens not satisfied when occurs the Crisis of Change, and the currency is devalued until it is fulfilled.

Let's look at this last statement with a little more detail.

**THE CRISIS OF CHANGE:**



The two equations of conservation that describes the evolution of the consumption of a country with its own currency that trades with the rest of the world as if only one country is involved, is:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \quad (1)$$

Where,  $(-a \cdot x_1)$  is the cost that makes the country the rest of the world,  $(b \cdot x_2)$  is spending the rest of the world in the country,  $ah_1$  is the flow of aggregate savings of the country and  $ah_2$  the flow of aggregate savings of the rest of the world. The figure below clarifies the situation a bit and also shows the flows of capital between the two countries. From the figure it follows easily that when there is no buildup of foreign currency, it has to be that the trade deficit is equal to the foreign loan (foreign investment):

$$-a \cdot x_1 + b \cdot x_2 = -t_1 + t_2 \rightarrow D(t) = T(t)$$

Where we have called  $D(t)$  of the trade deficit of the country and  $T(t)$  to the transfers of foreign:

$$D(t) = a \cdot x_1 - b \cdot x_2 \text{ and } T(t) = t_1 - t_2$$

Flows  $t_1$  and  $t_2$  are respectively the transfer financial Capital Market of the country and the Capital Market from the rest of the world. The condition for the occurrence of a credit crisis inside the country remains the same, but adding now the money flow that creates the trade:

$$-a \cdot x_1 + b \cdot x_2 - ah_1 < 0$$

It is interesting to put the expression in a function of the flows of credit and hoarding, as we've been doing. After some simple algebraic manipulations we arrive at the conclusion that the criterion of the credit, which gives the condition for a crisis of credit, remains unchanged:

$$\begin{aligned} Ah^S &= Ah^C - T + Ah \rightarrow Ah^C(t) - Ah^S(t) < 0 \text{ Crisis of Change} \\ Ah^S &= Ah^C - D + Ah \end{aligned}$$

However, to get the expression we have imposed the condition that all the trade deficit is returned to the economy as foreign loan, for what will be the condition of the real criteria that must be met to avoid the crisis of change:

$$-a \cdot x_1 + b \cdot x_2 = -t_1 + t_2 \rightarrow D(t) = T(t) \rightarrow D(t) \geq T(t) \text{ Crisis of Change}$$

What says the condition is not very difficult to understand. To do this, let's look at the accompanying figure, which shows the different cash flows that arrive at or depart to the Capital Market. We can see that, along with the loan from the savings prior to bank credit, is now the loan from the foreign investment, which has to be equal to the trade deficit when there is no accumulation of the reserve currency. The crisis of change occurs when the loan from the foreign investment that is insufficient to cover the trade deficit. When that happens, the currency must depreciate to restore the equality between the deficit and the foreign investment.

But the interesting thing comes from the cast of the new capital that is being created within the economy, which is now divided between savings, credit, foreign investment and the business benefit. The appearance of the new person who claims a part of the new capital, the foreign investor, is a result of deficit and makes it more difficult for the monetary creation you can create the capital needed to absorb the savings:

$$\Delta K = \Delta K_{savings} + \Delta K_{credit} + \Delta K_{international} + \Delta K_{entrepreneur} \sim 12 \cdot Ah^C \cdot \Delta t$$

Or another way:

$$\Delta K_{savings} + \Delta K_{foreign} \ll \frac{\langle \alpha \rangle}{\bar{N} \cdot i} \cdot \Delta GDP \rightarrow saving + inv. extrang. \ll 6 \cdot \Delta GDP$$

Which shows very clearly that the cause of the credit crisis is the same thing that causes the crisis of change and the problem remains in that the savings can be excessive and not in that economic growth is insufficient.

In general, to avoid a crisis of change, it is necessary that the trade deficit is returned to the economy as a loan, but the big difference is that the loan proceeds of foreign investment, the foreign money. That is to say, the main problem faced by a country with a trade deficit that you want to avoid the crisis credit, is not only in the difficulty to find from within the country to the people or institutions that want to spend on credit, which as we know can be a hard problem to solve, but to find within the foreign countries to the people or institutions that want to lend (or invest) within the country's deficit, as the balance of payments of each country must be zero:

$$-a \cdot x_1 - t_1 + e_{12} \cdot (b \cdot x_2 + t_2) = 0 \rightarrow D(t) = T(t)$$

It is the opposite that happens with countries that have trade surpluses, who find it easier to avoid a credit crisis because they can maintain a savings above the loan that can absorb the economy without entering into a credit crisis, although, as has already been mentioned, the trade surplus has to be invested in capital assets within a foreign country.

A crisis of change does not differ in anything from a credit crisis and its origin is the same: "the extraction of money from the money supply of the country", but this time the extraction monetary cause the trade deficit and must be returned as foreign investment.

**THE PROBLEM OF THE DEFICIT OF TRADE.** A country with a different currency of the booking (other than a dollar) and a trade deficit continued to enter necessarily into recession at a time is

not much larger than about 15 years, depending on the specific situation of each country and of the rate of interest paid by the foreign currency. Let's see why.

Suppose you are certain the three following statements:

1) we Assume that a country can't make money of another country, nor can it store it. Both of these conditions require that the balance of payments of each of the two trading countries is void in its own currency:

$$-a \cdot x_1 + b \cdot x_2 - t_1 + t_2 = 0$$

2) we will also Assume that all of the income that is obtained from the foreign investment is withdrawn and will not be reinvested in the country. Yes we call "i" to the average profitability of foreign investment, and we call Q(t) to the amount of accumulated foreign investment in the country, then the annual flow of income that is repatriate, is:

$$i \cdot Q(t)$$

3) we Assume the trade deficit constant. That is to say:

$$-a \cdot x_1 + b \cdot x_2 = \text{const.} = -d$$

With these assumptions we can calculate without difficulty what is the flow of foreign investment  $t_1(t)$  necessary to maintain the balance of payments is balanced, since it needs to cover, not only the trade deficit of the country, "d", but also the output of the benefits of the investment that has been made up to that time, the term  $i \cdot Q(t)$ . To do this, we first need to calculate is the amount of foreign money that has been invested in the country since the start of the trade deficit, up to the time "t":

$$\text{Amount invested} = Q(t) = \int_0^t t_1(s) \cdot ds$$

Quantity that when multiplied by the interest rate, gives us the annual flow that the country pays in interest for the foreign money that remains invested within the country (and, we assume that you repatriate):

$$\text{Interests returnees} = i_1 \cdot Q(t) = i_1 \cdot \int_0^t t_1(s) \cdot ds$$

Finally, the expression that we seek is:

$$t_1(t) = d + i_1 \cdot \int_0^t t_1(s) \cdot ds$$

The expression tells us that the annual flow of foreign investment is equal to the sum of the trade deficit current, which we have assumed constant, plus the payment of interest on the cumulative investment, and that we have assumed that repatriate in foreign currency (the term of the integral). The solution of the integral equation above, which is what interests us, is:

$$t_1(t) = d \cdot e^{i_1 \cdot t}$$

*Of course, the mere presence of the exponential in the solution informs us that the trade deficit can only be maintained for a very limited time, since it requires that the foreign investment grow exponentially. We see that it is the trade deficit who is creating the problem, although influences relatively little in the final outcome, and that the real cause of the disaster is the repatriation of income that is paid by the investments accumulated foreign, which makes it grow exponentially, the amount of money in foreign currencies that are repatriate.*

*The analysis showed that the higher the rate of interest before you will be disaster, so that a low rate of interest on loans in foreign currency may delay the problem a time, the same thing that a rise in the interest rate will speed it up.*

*That was what happened with the debt crisis of the seventies, when the US went up the interest rate on the dollar without thinking of the consequences. All economies of the world were sunk in unison, and only the surplus countries were saved from the burning.*

*For example, if we assume that the situation becomes unsustainable when the payment of interest by the foreign investment exceeds 10% of the GDP (because it is accepted that, as of that amount will be difficult to avoid the generalized flight of investors and the foreign exchange crisis), then, yes the economy has a trade deficit continued to 5% of GDP and an interest rate of debt of 5%, the situation will become untenable after:*

$$t_1(t) = d \cdot e^{i_1 \cdot t} \rightarrow 10\% \text{ GDP} = 5\% \cdot \text{GDP} \cdot e^{5\% \cdot t}$$

$$t \sim \frac{0,7}{5} 100 = 14 \text{ years}$$

*That is to say, a deficit country will have a foreign exchange crisis before they happen about 15 years. Since then, the situation of each country will be different and a trade deficit little help to delay the crisis of change, like a low interest rate, but how bad of an exponential function is that, sooner or later, ends up by becoming intractable. In addition, the crisis of change surely much will happen before that time comes in which the interests of the debt, exceed 10% of GDP, when savers national and international realise that the situation of foreign currency debt is unsustainable.*

The analysis showed without much difficulty that the trade-deficit countries are doomed, in the best of cases, to stagnation and, in the worst case, to a succession of systemic crisis in the exchange rate. A country that wants to grow, it has to be necessarily a country excess with respect to the rest of the world.

## **6. THE LIQUIDITY AND THE CRISIS OF CHANGE.**

Where more clear you can see the magnitude of the problem that creates the lack of liquidity in the Capital Market is in a world like the present, formed by many small countries that are used

internally by its own currency, but trade between them with the reserve currency (currently, the us dollar).

Usually thought of, and so say the economists working for the private universities of the USA, a country with its own currency you have at your disposal more tools with which to defend themselves against the ravages which can make the foreign competition within the country, or to avoid the crisis of change, but this statement should be clarified, much as we will see, because it can be shown that it is very far from reality, especially in regard to the possibility of avoiding the crisis of change.

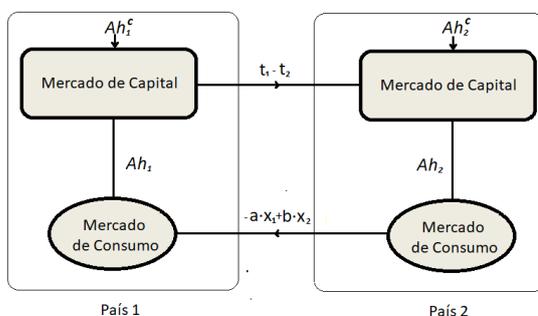
A simple look at the reality that surrounds us allows us to see that no country, regardless of its size, it has gotten rid of a crisis of change in the last 50 years, and only the countries with a trade surplus, such as Germany, Australia, China or Japan, they have managed to stay safe. We have already explained why this happens, and why the nation is forced to turn to the unsustainable debt in the reserve currency to replace the money that extracts of the money supply, the flow of trade deficit. For the duration of the trade deficit, it will be inevitable that the foreign currency debt bring the economy to a crisis of change.

But the analysis, as has been done, seems to indicate that it is possible to escape the crisis of change when you have a free flow of trade is balanced or surplus. However, when analyzed more slowly the statement above, the answer is no, that's not a country excess can ensure that they do not appear a crisis of change when the trade with the other countries is made in a foreign currency, although it is also true that when the economy of the country is very big, it is possible to avoid them without too many problems.

In the attached figure is explained graphically in where the problem lies.

There are two markets, and there are two flows in local currency that must be exchanged for foreign currency. One of the flows comes from the Capital Market and has its origin in the desire to have the savings in foreign assets and the other flow comes from the Consumer Market and has its origin in the desire to buy foreign goods. Both flows are in local currency and are against it flows in a foreign currency that must override them, because, as we have already mentioned, when we assume that there is no accumulation of reserves, it has to be that:

$$-a \cdot x_1 + b \cdot x_2 - t_1 + t_2 = 0$$



But this situation, as we have already seen, is unsustainable when there is a trade deficit, and will not be able to avoid a crisis of change in a short space of time.

However, let us note that it is possible to avoid the crisis of change if the equilibrium in the balance of payments is met independently in each of the two markets:

$$-a \cdot x_1 + b \cdot x_2 = 0 \text{ trade balance}$$

$$-t_1 + t_2 = 0 \text{ balance of capital}$$

When they meet the two conditions, the country does not need to borrow in foreign currency, and there will be no accumulation of unsustainable debt in foreign currency. But this is not a problem, and the monetary authorities of the country that trades with a currency that is not yours, you have enough tools to ensure that both equations are satisfied and the cash flows are balanced independently in each of the two markets. What can be achieved by manipulating two internal variables that are at your disposal: *“the interest rate and the exchange rate”*.

THE RATE OF CHANGE. To raise or lower the exchange rate between currencies is changes the amount of goods that it is possible to buy or sell between countries, and thanks to this, it is easy to get the balance of trade remains balanced, especially because both the prices and the quantities that are purchased on the international trade vary little in time and are very stable (since then, lower the purchasing power of your currency improves the sales on the outside, but at the cost of selling your work more cheaply).

THE RATE OF INTEREST. On the other hand, and even if the capital flows are very fast and unpredictable, acting on the interest rate of the money it is possible to maintain the flow of capital balanced independently of what is happening in the trade deficit.

Making use of both mechanisms, the manipulation of the interest rate on the money and the rate of change of money, economic theory current claims that it is possible to maintain balanced trade and exchange investor-independent manner, and thus avoid any crisis of change. However, there are doubts very serious about what this way of seeing things and to be successful, because, despite the fact that you get without any difficulty balance independently in the two markets, it is very clear that the society pays a high cost for it:

- 1) The exchange rate between currencies fixed the relative price at which it sells the work inside and outside the country, so any rise in the exchange rate of the currency also means the loss of purchasing power of wages. By it, you will not understand very well how many progressive economists, and who call themselves left-wing, are shown to be intransigent to any loss of purchasing power of wages due to inflation, and yet seem to be indifferent to the loss of purchasing power because of devaluation of its own currency to the currency reserve.
- 2) The interest rate of the money used by the market to determine the value of the capital goods, and you must secure it to the authorities so as to change as little as possible, There seems to be no good idea that the rate of interest set by sparing foreigners in the international capital markets.

Let us observe, that the manipulation usual made by the authorities of the two variables when there are economic difficulties, rising the rate of change and raising the rate of interest, is clearly detrimental to the workers and local entrepreneurs, so that is not at all clear that alternative policies, such as tariff protection, the prohibition of the free movement of money, they are not a policy much more successful to avoid the crisis of change.

But, despite the clear harm that the usual policies aimed at preventing the crisis of change, they cause the level of life of the inhabitants of a country, our interest is now focused on analyze whether monetary policy really get out of the country, the dreaded crisis of change, and the answer is no, even this belief is an illusion that can be very dangerous because you are only preventing the free movement of capital, coupled with tariffs on the movement of goods is possible to avoid a crisis of change.

THE MONEY LOCALLY, AS FOREIGN ASSETS. We know that when capital markets are liberalized, any person or institution may request a loan in local currency to the market interest rate and exchange it for the currency of reservation with the intention of investing the money in other country, or with the intention of treasure.

Evidently, no one will do such a thing if the interest rate that is requested by the local money is higher than the income that is expected when you change the money for the reserve currency, and invest in foreign assets. Therefore, when the monetary authorities want to balance out the exchange flows between the Capital Market and the rest of the world:

$$-t_1 + t_2 = 0 \text{ balance of capital}$$

can vary the rate of interest at which it lends money locally, to achieve the expectations that investors find greater profitability of assets in foreign currency are null and void. That fixed the interest rate, and prevents that the monetary authorities are free to decide the rate of interest, as it will come determined by the compliance of the condition of equilibrium.

The government is forced to raise the interest rate of their currency to prevent the escape of the savers to the reserve currency, raising or lowering the interest rate of the local currency to lower and raise the price of local assets so as to provide at least the same income that give the assets in foreign currency. A balance as well, it prevents the sale of assets in the local currency with the intention of exchange for the currency of the reserve, to buy assets abroad.

See with clarity, that the Market Capital of the World is the local currency as a capital good that yields an income and that can be valued, as is appreciated, the rest of the capital goods, giving it a price and an uncertainty:

$$money_{local} = \frac{income_{local}}{i \cdot \aleph_{local}}$$

Where the interest rate is the demand markets for the reserve currency, as it is the assessment that is done from the rest of the world the money local. The uncertainty  $\aleph_{local}$  is that which is "seen" from the rest of the world, while the "income" is none other than the average income that it produces an amount of money in reserve when it is exchanged for local currency and invests in capital goods local, as the reserve currency. Therefore, the same expression must also be true in the local currency, i.e., the income that it produces an amount of money local when it is provided, and that we assume no uncertainty, it is:

$$K = \frac{income}{i_{local}}$$

Equating the two expressions, we obtain a remarkable result:

$$\kappa_{local} = \frac{i_{local}}{i}$$

*The uncertainty with which it is seen from the foreign investment in local currency is equal to the quotient between the respective interest rates of the money (please note that the rate of interest of money is fixed by the monetary authorities to enforce the flow of input and output of the capital is the mule, which is the condition with which we have assumed that there is no crisis of change. Or another way, is the foreign exchange market international which fixed the interest rate on the money local, and with it the price of capital goods in the local market.*

Let us remember that the flows of money transfer between the Capital Market of the country and the rest of the world changing so very fast because it does not correspond with the physical investments real but with the valuation of the future incomes of those real investment, so that the purchase of capital assets is highly dependent on the expectations, real or not, who are the savers on the future price of the asset. The possible flight of investors toward the liquidity in an economy isolated causes automatically a credit crisis that unless you act the Central Bank, is now converted into a flight into the reserve currency that the Central Bank will not be able to meet because it lacks the possibility of creating a reserve currency.

We saw, when we analyze the liquidity of the Capital Market in an economy isolated it was always possible that an escape from the savers to the liquidity would drop the price of the asset, leading the economy to an inevitable crisis of credit when the banks and the lenders, on the side of caution, leave to renew the credit. It was then shown that only the intervention of the Central Bank, buying massive amounts of all capital goods put up for sale, it could prevent the fall in the price of the asset at the same time that allows for the repayment of the debts in an environment of liquidity, avoiding the credit crisis. And here is where the problem occurs, because it is very likely that the flight generalized to the liquidity in the reserve currency and not in the local currency, so that they first become liquid assets in the local currency, but not to keep it, but to exchange it for the currency of reserve which is the only one who can't create the country's Central Bank.

In this situation, the disaster is inevitable, because despite the fact that the Central Bank is able to purchase with local currency all the assets to the sale, so as to avoid the fall in the price of assets, you can't help that the currency itself is changed by the reserve currency, and finish, creating a crisis of change, because you do not have the reserve currency in amounts sufficient to monetize all of the assets of capital.

The problem is very clear: *“the Central Bank of the country can create any amount of money in their own currency, but you can't make up the reserve currency, so it has only two alternatives, or sinks the rate of change in order to change the local currency for the reserve currency, or prevents the free movement of capital, which is the same thing”.*

Of course, before that, governments usually resort to raise the rate of interest to make attractive the currency itself and prevent the escape into the reserve currency, but that is like trying to extinguish a fire by pouring gasoline. The higher the rate of interest at which the Central Bank pays its own currency, the greater will be the amount of money that will have to change by the

reserve currency, and the greater the crisis of change when you arrive. The only thing that gets the Central Bank with such a policy is to defer the problem to change to aggravate it.

We see that the Central Bank of a country with its own currency, although you can avoid a credit crunch, you cannot avoid a crisis of change when there is free movement of capital, so that is not at all clear that the real advantages offered to possess its own currency for a country small in comparison to the advantages of belonging to an economic area larger than can compete face to face with the reserve currency, as is the case with Europe, China, or India. The only solution is to not allow the free circulation of money, or otherwise, to confiscate the coin's reverse that gets the country of foreign sales to distribute them among all the agents according to their participation in the economy.

## THE SOLUTION TO THE CREDIT CRISIS

Clara Rojas García, Julia Rojas García, Pedro Rojas Sola  
4 march of the year of 2021

### 1. INTRODUCTION

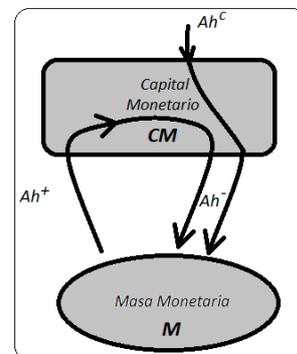
Given that the economic growth is what drives scientific discovery and technology, and since the investment is exogenous and depends heavily on the expectations of the entrepreneurs about the future growth, it seems very clear that if he wants to avoid that the economy enters a recession, you must be saving the need to adapt to the changes undergone by the investment spending and not the other way around.

However, the savings, the “propensity to save”, is an endogenous variable that depends on the income of individuals and increases when you increase this, what Keynes called, the Law of Psychological most important part of the economy, does not seem very clear how the monetary authorities can make the saving change to combine both variables and to avoid the crisis credit.

To understand this last point is very important, because no one seems to realize that, in aggregate terms, the imbalance that originate from the people that save is avoided with the deficit spending of the people who don't save. This being, a fact that is serious and of great importance because it increases income inequality, while not put limits on the savings with tax collection.

will Move the question to the equation for the growth trying to understand the implications of the savings in aggregate terms.

If you look at the attached figure, we see that the flow of credit  $Ah^C$  is not the only monetary flow from the Capital Market that is spent and becomes part of the money supply, but that there is another flow from the saving in advance, which may be much more important in magnitude than that. The sum of both, the flow of credit and the flow from the savings prior to forming the flow  $Ah^-$  that must be greater than the flow of savings  $Ah^+$ , so that the economy can grow:



$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^-(t) + Ah^+(t)] \xrightarrow{Ah^- + Ah^+ > 0} \Delta GDP > 0$$

We know, of how you got the equation of the growth, the need of the deficit  $Ah^-$  keep it higher than the savings  $Ah^+$ , has its origin in the need that the money supply does not decrease because of the money that you extracted from the savings, because that is what makes a decrease in the *GDP* of the economy. Therefore, the question that arises from the perspective that gives us the equation of the growth is:

*How can we ensure that the money that you extracted from the savings back to the economy?*

***THE FAILURE OF THE STANDARD THEORY.*** *In a time in which technological change takes a lot of money to introduce the new technologies, the investment is sufficient to return without any problem the money that you save the economy, not only that, part of the investment will be covered with the bank loan, which allows for economic growth. But in an environment of little technological growth, when companies have few needs of investment, the return of the money that you extracted from the saving becomes a serious problem of difficult solution, and it is not all clear that it must be done to return it to the economy.*

*The answer to the question is further complicated when we understand that the answer is going to depend on the vision that we have of the relationship that exists between capital goods and savings.*

*Let us observe, that when we see the capital as a collection of physical goods, then the savings, for very large it is, can always be spent on the purchase of physical goods that make up the capital and back to economy without causing any problem. It is then logical to act on the credit and put the incomprehensible lack of investment by lowering the interest rate until all of the savings to pay and spend.*

*But when we see the capital as the valuation of an income, the situation is completely different. Now the capital (wealth) does not increase when you spend your savings on the purchase of goods from physical, but, on the contrary, it is the growth of the amount of capital goods, which allows it to absorb the savings with sale. The flow of savings is spent on the purchase of new capital, and if this does not grow enough, because the technological moment is not conducive, or any other cause, the savings will not find in what to wear and not going back to the economy.*

*The calculation is very easy to make. Suppose an economy that saves 10% of *GDP*, but only has a real growth rate of 2% of *GDP*. In such a case, the real growth of capital is about 10 or 12 times the *GDP*, a value too low to get absorb all the savings that you are doing in the economy, as a part of the new capital should either keep it as entrepreneurs, or if not, do not ask for loans to invest.*

*The whole problem of the economy, as we already know, it is appropriate that the capital is not a physical reality but also financial.*

According to this analysis, it is very clear that the lack of control on the savings, and our inability to increase or decrease molding him / her to the changes in the need of investment that has the economy, is what makes that bank credit has diminished to become negative and the economy enters a recession:

$$-(Ah^+ - Ah^-) = Ah^C - Ah^S \xrightarrow{Ah^C < 0} \text{recession}$$

Despite this, all the solutions that are currently used to avoid the recession, passed by the act on credit, and not on the savings, which is really absurd, because the saving is an endogenous variable that depends on other variables that can be controlled, while the credit is an exogenous variable that depends on the needs of financing brought about by technological change and it is not possible to control it.

With the passage of time, and thanks to the development of the Banking System, to the emergence of the Central Bank and, above all, by the widespread use of bank money in the economy, you will have a clearer vision of what the paradigm used by the monetary authorities in the US to prevent the credit crisis. If we were to summarize the economic paradigm that seems to follow in the present, the Federal Reserve, it would be more or less like this:

- 1) Raise the rate of interest to decrease the bank money and avoid inflation.
- 2) To lower the interest rate to increase the money banking and avoid deflation.
- 3) Increase the government deficit spending to compensate for the contraction of credit.
- 4) Reduce the government deficit spending to compensate for the expansion of credit.
- 5) Provide liquidity in the Capital Market with the purchase of assets to prevent the fall of its price.

What is that you would have to add the drop systematic tax, although this cannot be regarded as strictly a part of the monetary policy of the Federal Reserve. That is to say, the policy that continues today the Federal Reserve is the same policy that has continued for 40 years, and is based in the act on investment, encouraging her to be able to absorb the savings.

For example, it is also the policy that has continued to Japan in the last 20 years and with whom there seems to have been nothing wrong in the last decade, if we omit, of course, that the public debt has reached levels close to 3 times the GDP of Japan, and that the slightest rise in the interest rate will clearly unsustainable. But, why would the public debt, to pay interest and to be unsustainable? or why it would even be returned, instead of monetize it directly? In fact, it is just what you are doing all the economies of the world today.

Summarizing, we can say that there are two basic mechanisms used by the Federal Reserve to prevent the US economy is in a crisis of credit, and both are trying to influence the amount of money that is invested in the economy and not the amount of money they save, as it would be logical:

- a) The public spending deficit or the "policy " keynesian".
- b) To lower the interest rate of the loans.

We will analyze in some detail each of these two mechanisms that act on the Consumer Market, and we'll try to separate the issue of financial instability, or the "*theory of the black swan*", which is the cause of the fall of prices in the Capital Market. Then, finally, we will discuss how it is possible to prevent the crisis credit by acting on the flow of savings.

## 2. THE POLICY KEYNESIAN

Since in order to prevent the credit crisis it is necessary to return to the money all the money that you extracted from the savings, Keynes proposes that the public spending deficit to be in charge of this, using directly borrow the money that you save the private sector (and not spend) and spending it in the satisfaction of public services or public investment. Although Keynes raises the proposal in 1936, in a context very different from that which we have brought up here to make the Financial Theory of the Growth, his proposal is very consistent and easy to understand, apart from being a good solution.

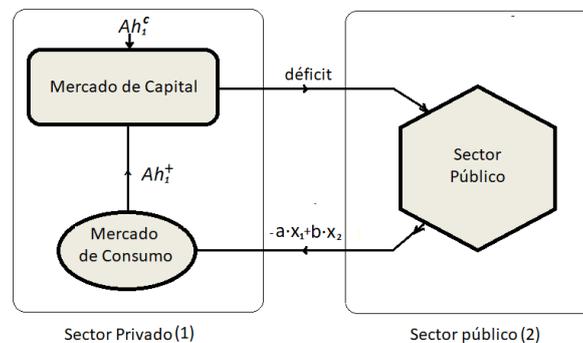
The only problem with the proposal of Keynes, and that is also very easy to understand, lies in the possibility that the public spending deficit becomes unsustainable at the time, in the case in which the policy of public deficit is financed by debt will be maintained indefinitely. Even Keynes believed that was possible. Your proposal is limited to a timely action in a situation of clear economic depression, such as that existing in the 1930s, and not a political action continued in the time indefinitely. To see this, imagine an economy divided into two sectors, the public sector and the private sector:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \quad (1)$$

Where the private sector is the first sector and the public sector, the second sector. Now the term  $(a \cdot x_1 - b \cdot x_2)$  is the public deficit, the difference between the money collected by the government in the private sector  $(a \cdot x_1)$  and the money that is spent by the government in the private sector  $(b \cdot x_2)$ . Let's also assume, for simplicity, that there is no growth of the money supply, which implies that the aggregate expenditure of the two sectors does not change and that the net savings of the economy is zero:

$$ah_1 + ah_2 = 0 \leftrightarrow ah_1 = -ah_2$$

What that simply means that *“the savings that is being done by the private sector is equal to the deficit that makes the public sector, or vice versa”*. The figure below shows the circuit.



Now it is very easy to understand the proposal made by John Keynes in 1936 to avoid the crisis, deflationary: *“the government has to spend on credit, in either investment or consumption, all the savings surplus that does not make the private investment”*.

$$\text{Public deficit} = a \cdot x_1 - b \cdot x_2 = ah_1$$

The private sector has decreased the spending without changing your income, and your savings net  $Ah^+$  is positive. The result is that the other sector, the public sector, it enters a trade-off, or increases in public spending, making it a deficit by borrowing it saves the private sector, or maintains the balance of the budget and let the economy enters into a recession because the saving does not return to the economy.

Keynes was the first economist who was made aware of the consequences that derive from the decoupling between people who save and people who invest credit. According to the opinion of the dominant theory in his time (and that is the theory that continue to stand in the present, the economists working for the private universities of the USA), the savings is balanced with the investment with the interest rate. It is called the Theory of Loanable Funds. But for Keynes it was very apparent that that was just an illusion, because when expectations of the entrepreneurs were promising, the private savings left to return to the economy through the investment credit and the economy fell into recession due to the spending insufficient.

Keynes thought that, in such a situation, it would be useless any attempt to encourage investment by lowering the interest rate:

*“you can lead the horse to the river, but you cannot force you to drink”*

Keynes, 1936

And the only sensible thing that can be done is for the government to act and to borrow the savings that you don't spend the private sector to spend it, compensating for the insufficient spending on investment with public investment. In this sense, the theory that exposes Keynes in 1936, it is very similar in many aspects to the Financial Theory of Growth that we have exposed here, and the solution it proposes Keynes really manages to avoid the decoupling between savings and credit.

***THE POLICY KEYNESIAN.*** *The economic policies proposed by Keynes, who uses the public spending deficit to return to the economy, the money it extracts the excess of savings, it was not used in the united states until the decade of the 80's of the TWENTIETH century, for the simple reason that before was not settled enough in economic thought. It was thanks to the economic policy conducted by the president D. Roosevelt in the 1930s to pull the US out of economic crisis which bases the policy Keynesian.*

*After the war, the private investment financed with bank credit grew steadily, injecting with a vengeance in the economy, the money necessary for the growth, while growing public spending was financed without recourse to the deficit, thanks to the tax rate progressive left by the presidency Roosevelt after the war. Were the so-called “thirty glorious years” of the postwar period, many limited until the end of the decade of the sixties and beginning of the seventies, when it appeared the oil crisis, although from the point of view of tax that we are now*

*considering, it is certain that the economic policy remained unchanged until the arrival of the Reagan presidency in the 80 years of the century.*

*It is very curious, but the narrative propagated by the economists who work for the private universities of the USA has nothing to do with what happened in reality.*

*The reduction of the taxes on the people with a higher income, which was constant since the war ended, he suffered a strong reduction with the arrival to the presidency of Reagan, already begun the decade of the 80's, at the same time that the public deficit was turned into chronic, and the public debt rose to levels never seen since the Second World War (much higher than those reached with the course public deficit, financed the Vietnam war). It was then when it started what can be called, without exaggeration, the "Golden Age of the Policy Keynesian", with three decades of presidencies republican with a high deficit public, along with a sharp reduction in the progressivity of taxes.*

*It's funny, but the long period of political keynesian only suffered a slight power outage, under president Clinton, who raised taxes on the wealthiest and decreased the public deficit in a progressive manner to achieve surplus at the end of his eight years in office. See it to believe it. All the republican president applying policy keynesian while Clinton, the only democratic president in thirty years of presidency, reducing the fiscal deficit to remove it raising taxes. Although, as could not be otherwise, the story told by economists working for the private universities of the USA is very different.*

*THE DEBT CRISIS. It is also very different from the explanation that gives those same economists of the crisis of change that suffer the majority of the countries of the world at the end of the decade of the 70's and early 80's.*

*Until the 70s, most of the countries, particularly the countries of hispanic americans, had maintained a low external debt thanks to an active policy of "import substitution", but the rise of oil in the early 70's, and the widespread corruption is inherent to the dictatorships imposed from outside in that time, rose from an unsustainable public debt because of the need of dollars that could only be achieved by means of the loan.*

*The subsequent rise in the interest rate by the Federal Reserve, already in the decade of the 80's, gave the lace to what was already a crisis of change announced in the country-hispanic americans, which in any way would not have taken a long time to occur. The default widespread, along with the subsequent opening of the domestic markets and the abandonment of the "policy substitution" that forced the International Monetary Fund, leave unprotected the domestic production of those countries, and to make the industry itself in a wasteland that pushes countries to specialize in the production of those products that lack the creditor countries: raw materials, food or manufacturing that absorbs too little work specialized in industrialized countries.*

*Once changed the domestic production, the country will no longer be able to re-up head, because the local industry has specialized in creating products for the industry, foreign, much more specialized in products of many value-added and more powerful economically than her. It sets and becomes chronic dependence industrial with respect to the industrialized countries, an*

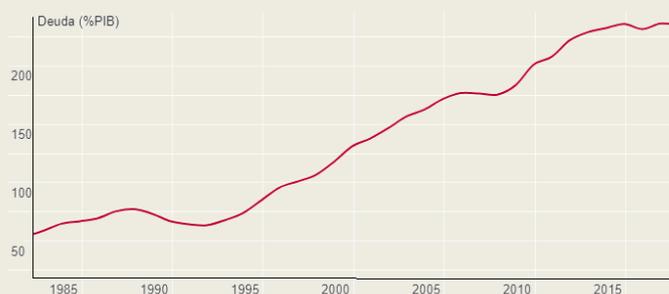
*unequal relationship that we analyzed with the Theory of Unequal Exchange, which will be very hard to break, and in the trapped indefinitely so-called developing countries.*

*The sad part of this whole story is that the economists who work for the private universities of the USA, they blame the local governments and the public deficits of the external debt, which is completely false, since the local government is indebted in dollars to meet the currency needs of the local industry and to maintain the free movement of capital, which requires the IMF and international relations. So, although it is true that the debt in dollars is public debt acquired by the government, who actually spend the dollars is the private sector, and not just in investment.*

As we have already mentioned when we analyzed the trade between countries, the policy keynesian is unsustainable in the time because of the public debt is increasing constantly, until it is priceless.

***THE PROHIBITIVO LEVEL OF PUBLIC DEBT.*** *The consequences of the savings are creepy. Not only is the source of economic instability facing all economies today, but also is the source of the prohibitive level that is reaching the public debt.*

*Currently, the dimensions that can reach the public deficit when used to prevent the credit crisis turns out to be, in some cases, truly outrageous. The attached figure shows the evolution of the public debt of Japan is the country that is often put as an example in this case.*



*It is observed the steady increase that has suffered the public debt japanese from the decade of the 90s of the last century, reaching in 2019 a cumulative value of about 2.5 times the GDP of the country. The evolution agrees very well with a policy of keynesian intended to satisfy an annual savings of the private sector in around 10% of GDP, after 30 long years accumulated a net savings of about 2.5 times the current GDP.*

*It is difficult to justify such nonsense, whose origin is the bursting of a housing bubble in the early 90s of the last century, lasted for nearly three decades.*

*It is very clear to the authors that if Japan had taken over the inevitable loss of value of the home, either because they assume the public sector, buying with money credit the homes of the japanese above its real value, or whether it is because the assumed sector private selling the homes to the actual value (perhaps it would have been the best thing that both sectors have taken a part of the loss of value of the housing), the situation had been resolved in a few years without too many problems. But the monetary authorities of Japan, on the contrary, they decided to lower taxes and to meet with the public deficit, the savings forced forced to to do a part of the private sector to purchase the homes they had purchased far above their value. That is to say,*

*instead of forcing the liquidation of the debts in the private sector, assuming the loss of value of the home (with public money), were debts to be paid, some with private savings, at the expense of the public deficit.*

*The end result can only be the same, you take a way or take another road. The difference between the two roads is in the time it takes to navigate them. If the Central Bank had taken up the price of housing, buy it the Japanese to the inflated prices of the bubble, hardly had come to spend the "two GDP," which spent when he decided to take the long way and left it to the Japanese to pay with his savings, little by little, their debts, leading to an environment deflationary that has lasted for more than two decades.*

*Many times it is not understood that you should never prevented a settlement of the debts because the only thing that is achieved by this is that the debts are settled for a much longer path. That is why it is so important that the Central Bank has the responsibility to provide liquidity in the Capital Market, which means, like it or not, you have to assume the cost of any bubble that people within the Capital Market, because the alternative is to allow the economy enters into a recession.*

*It is very important that the Central Bank has the responsibility to provide liquidity in the Capital Market to help the debt is settled as quickly as possible, no matter how high may be the price we have to pay for it.*

### **3. THE MANIPULATION OF THE INTEREST RATE**

As we already know, in the current monetary savings makes money is bank credit, so that when you upload the interest rate on the money, the loans are more expensive to maintain, and renew themselves in a lesser amount, and the amount of bank money grows more slowly as it did when the interest rate was lower. The opposite happens when you lower the interest rate, and the amount of bank money grows, because the amount of credit granted increases to be cheaper to pay the interest.

The dynamic is very similar to that described by the Theory of Loanable Funds, with the notable difference that the money that affects the interest rate is the money created out of nothing by the Banking System when granting bank loans, and does not affect the saving money. According to Keynes, and surely it won't be wrong a lot, the savings is a function more or less proportional to the income and its amount depends on little or nothing of the interest rate.

Be that as it may, the manipulation of the interest rate is shown as a very powerful tool to control the amount of bank money, thanks to the direct effect it has on the level of the flow of credit. So is the co-finances that awakens the mechanism in the monetary authorities, which rely upon all their hopes to the control exercised by the interest rate on the amount of money in the economy, in order to avoid that the amount of money banking decrease in excess, yielding a

recession or an increase in excess producing inflation. However, it is very clear that such an idea is an illusion that leads the economy to the disaster inevitable.

PAUL VOLCKER. *The use of the public deficit and the rate of interest as basic tools to control the flow of credit began to use the Federal Reserve at the beginning of the decade of the 80. It was right at the start of the Reagan presidency, when Paul Volcker took out the three major changes in policy from the Federal Reserve that would mark the monetary policy for the next 30 years:*

- 1) *it Was a strong tax rebate income higher, which increased very significant income inequality, and with them the savings.*
- 2) *increased very significantly the public deficit.*
- 3) *increased significantly the rate of interest.*

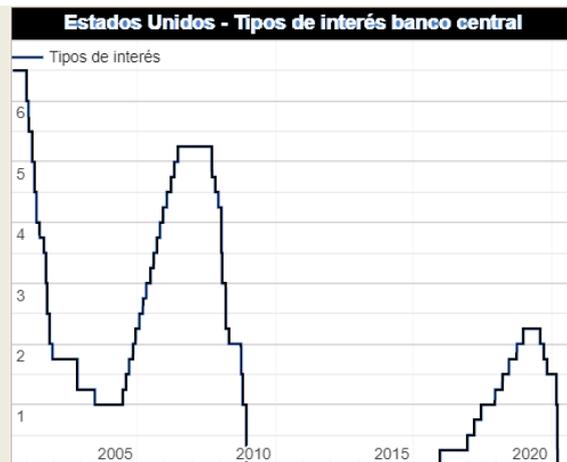
*The economic consequences of such an action are not difficult to predict. Public services remained virtually unchanged, and the middle class did not protest. Money banking declined rapidly, producing a mild recession, but also decreased the inflation and that has benefited the entire world, even to the banks. The lowering of tax benefited primarily to people of more income, but also increased the income of the middle class. Can you strange to anyone that Reagan is one of the most popular presidents of the second half of the TWENTIETH century?*

ALAN GREENSPAN. *Paul Volcker replaced it, still in the beginning of the Reagan presidency, Alan Greenspan, who rose to the level of "art" the manipulation of the interest rate to regulate the amount of money banking and the increase in the public deficit in order to absolve the savings, all to prevent the reduction of taxes on the rich will end in a credit crisis.*

*If something can be said of Greenspan, without anyone in doubt, is that we are in front of the person who has been modeling with her hands the last 40 years of capitalism. From then, it would be foolish on our part to attribute to a single person with such merit, but yes it is true that Greenspan is the visible head of the oligarchy that has used the Federal Reserve to return to the rich, the government of the world, with the explicit consent of the political class.*

*Greenspan is, before anything else, a fundamentalist economic identifies their political beliefs with the scientific knowledge that should emanate from the economy. Believe in the goodness of the "free market", and use all the resources made available by the Federal Reserve to stop doing to the markets in the USA and in the rest of the world. In this sense, it is undeniable that it is the person with the most influential and most have done for liberalism within the united states, and it is for that reason that he has held the chair of the Federal Reserve for almost 30 years, without a doubt, the most important position of this planet.*

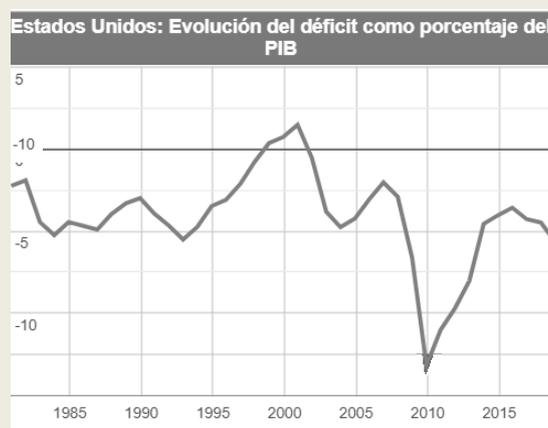
*To understand Greenspan, and to understand how the Federal Reserve modeled throughout the global economy, let us look at the figure below the changes in the interest rate on interbank do to stabilize the money supply since the beginning of the Twenty-first century.*



*It is very well seen as the interest rate decreases very rapidly from a level of 6% in 2001, at the start of the Bush presidency, up nearly 1% in 2004, already almost at the end of his presidency. The cause, although it does not appear in the graph, is to get out of a small recession that started in the US right with the turn of the century.*

*Then, for some inexplicable reason, it starts a rapid rise in the interest rate until it reaches about 5%, which could only end in a recession, as in fact happens (Bush criticized Greenspan that the rising cost him re-election). Why Greenspan's "down and up" in a very short period of time the rate of interest? What can justify the changes so abrupt in the rate of interest?*

*Now let's look at the public deficit in the same period.*



*It is easy to check that the public deficit, non-existent at the start of the century, has increased from 2001 to reach 5% of GDP, and begins to fall back in 2004, coinciding with the rise of the interest rate. We see that both policies are closely coordinated, so that the increases in the interest rate are associated with increases in the public deficit, and vice versa.*

*Although it does not show with a graph, also taxes on the rich is much reduced during the entire presidency to the republican Bush. It seems that the Federal Reserve continues during the period a policy very similar to the one followed during the Reagan presidency, lowering the interest rate and increasing the public deficit in order to avoid the recession of 2001, and by raising the interest rate and lowering the public deficit in order to avoid inflation in 2005.*

*But, is this the reason why the Federal Reserve low rates and then goes up?*

*In the late TWENTIETH century and early Twenty-first, almost at the end of president Clinton, Greenspan had risen considerably in the type of interest while the fiscal policy of the Clinton reduced the deficit to surplus, which was inevitable to bring the economy to a recession before the turn of the century, shortly after the start of the Bush presidency. In fact, the rise of the interest rate of the dollar was so high that produced a crisis of change in Southeast Asia and in Russia that plunged their economies (was it on purpose?). It was necessary, therefore, to increase spending on credit by lowering the interest rate to a position in the 1% helping the US economy to recover, at the same time increasing the public deficit, everything, until the situation seemed to be reversed in 2004.*

*(Financing the public deficit of the Invasion of Iraq in 2003, it came very well to the economy of the united states at that time, to be helping much needed injection of cash and the growth of the GDP, but this was not the objective pursued by the Federal Reserve)*

*As of 2004, the Federal Reserve decides that it was time to return to a rate of interest in more "normal" environment, a 3% or more, and began to raise it. It is observed, that at the same time it decreases public spending in coordination with the political authority to decrease the amount of money. Not only because Greenspan thought that the economy was overheating, but because there was the possibility that you were carrying a real estate bubble in the country, and Greenspan decided that it should deflate it.*

*Said and done, the Federal Reserve began to raise again the interest rate on the money, at the same time that the Bush administration cut the public deficit, stopping dry the two sources of injection of cash credit in the economy: the public spending deficit and private spending, financed with bank credit, and bringing the U.S. economy toward a recession.*

*It was an inevitable recession, and in fact was looking for, but Greenspan expected it to be short and transitory, as had happened on previous occasions. For example, such as occurred at the beginning of the Reagan presidency, such as occurred at the end of the presidency of Bush's father, or such as had occurred at the beginning of the presidency of Bush the son, just four years before. But what happened was not that.*

*Everything seemed to go well at first. As of 2005, the US economy was stopping slowly at the same time that was going up the interest rate and reduced the budget deficit. Alan Greenspan, the father of the manipulation of the interest rate, I was elated and it was not for less: nearly 20 years as president of the Federal Reserve raising or lowering the interest rate on the money, but in all that time, the U.S. economy would have been a serious setback. Since the year 1987, in which he served until the year 2006 in which he left him, the GDP of the USA was multiplied by 3 in real terms, without any shadow sight on the near horizon.*

*Alan Greenspan left the post with glory.*

*In 2006, Ben Bernanke, perhaps the most appropriate person in the world to hold that position, will replace him without knowing that, just a year after, I was going to have to deal with the more serious crisis of capitalism since 1929. But what made it different rising rate of interest this last time?*

#### 4. WHY IN 2008 WAS DIFFERENT (THE BLACK SWAN)

As is logical, the political keynesian can only stay until it reaches the country's capacity to pay interest on the growing public debt. From that moment on, the public deficit annual is going to be very limited and becomes insufficient to continue returning excess savings to the economy, even when it is used to lower the interest rate to zero.

To lower the rate of interest always give a respite to the economy, to ease the payment of the interest, both public debt and private debt, and allow the economy to continue to keep the deficit spending, but clashes with the interests increasingly close to zero, which seems to offer money at no cost. Both alternatives, to keep the public deficit and to maintain the private credit to people with more income to those who lend their savings, keep away the economy out of a recession, but it causes a sense of unease without source is defined that warns us that something has to go wrong with the simplicity of the reasoning that justifies lower the rate of interest.

The real problem presented by the economy once it has reached a situation in which they come together for an interest rate very low and a large debt to credit, it is not only that it has not been solved nothing and continue draining the savings because it has not diminished, but that makes its appearance on the scene a new player, this unsuspected, which gives the fret with all the hope that has been deposited with the Central Bank at an interest rate close to zero to prevent the credit crisis:

*“the financial instability or the black swan”*

Why in 2008 he was different? Why the US economy, after slowing to a complete stop because of the rise of the interest rate, do not return to growth in 2008 when it began to increase the public deficit and began to lower the interest rate to zero?

Although it can be easily proved that after doing all that, the U.S. economy recovered finally, this time the collapse of the price of the bag that came with the small recession that always caused the rise of the rate of interest was of such a magnitude, that the injection of cash that had to do to keep the cost was immense when compared with the mild injections of previous recessions. Despite this, it took almost three years before the economy started to show the first signs of growth. Why the change?

*THE RELATIONSHIP BETWEEN THE TWO MARKETS. The Theory of Madrid that we have developed revolves around the existence of two markets, the Consumer Market and the Capital Market, very decoupled from one another thanks to the stability of the monetary flows of saving and dissaving, but both highly correlated with the value of the interest rate on the money. It is precisely the capacity of the rate of interest of influence in both markets when you change, what characterizes a monetary economy, and what becomes terribly dangerous and unstable monetary policy when the interest rate approaches zero.*

Let us observe that raise or lower the rate of interest, not only increases or lowers the debt, credit, and therefore it increases or reduces the cost of maintaining the amount of money bank, that way the money supply, but also more expensive or cheaper capital goods, since the rate of interest is the reference that is used to determine its price.

Therefore, when low the interest rate to prevent that down the flow of credit and negative, we are also increasing the value of all capital goods, which is not a bad thing in and of itself when the interest rate is high, but it is a disaster when the interest rate approaches zero.

Let's see why.

The equation that relates the change in the aggregate value of the capital with the money supply is given by:

$$K = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot M$$

In which we assume that all the parameters appearing in it does not change, or change much more slowly than changes of the money supply, which as we know is equal to the money bank. But look at that expression says that when the monetary policy reduces the interest rate, the value of capital goods increases and, on the contrary, when interest rate increases, the value of the capital goods decreases.

Any change in the rate of interest, you will not only change the amount of money banking that exists in the economy, but that also changes the value of the capital goods. The problem appears when the interest rate is close to zero, because then the valuation of capital goods tends to infinity:

$$K = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} k_F \cdot M \rightarrow \left[ \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \right]_{i \rightarrow 0} \approx \infty \rightarrow K_{i \rightarrow 0} \approx \infty$$

The expression tells us that the decrease of the interest rate decouples the value of the capital flows income that sustain you, the do tend toward infinity the relationship between capital and income. As the interest rate approaches zero, the assessment that is carried out in the Capital Market on the present value of any future income becomes increasingly uncertain, the high of its value. Fluctuating a lot of value to future changes in the rent.

So, for example, if the interest rate is 5%, then, in an environment without uncertainty ( $\bar{\kappa} = 1$ ) and with a share of income  $\langle \alpha \rangle$  of 30% of GDP, the relationship between the aggregate capital and the income is worth 6. While that in the same environment, but with the interest rate of 1%, the relationship is worth 30:

$$\left[ \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \right]_{i=5\%} \sim 6 \quad \left[ \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} \right]_{i=1\%} \sim 30$$

Any small imprecision on the future income of a capital good, it is transmitted to the calculation of its current value multiplied by a factor of 30 when the interest rate is 1%, which makes it very inaccurate any valuation of the capital as the interest rate approaches zero.

When we remember that what you are referring to the Capital Market is the relationship between the value of a capital good and the income it produces, what we have called the uncertainty  $\bar{\kappa}_j$ , then it understands very well that a flight to liquidity within the market will be much more likely the closer to zero is the rate of interest, because the greater the losses you will suffer the saved case you do not flee to time to the liquidity.

$$dK = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i} dPIB \rightarrow \begin{cases} \xrightarrow{i=5\%} dK = 6 \cdot dPIB \\ \xrightarrow{i=1\%} dK = 30 \cdot dPIB \end{cases}$$

We see, that the interest rate close to zero becomes the valuation of the capital goods very vague, making the flight to liquidity becomes much more frequent, in addition to much more costly in the event that, because the fall of the assessment is from a higher value. Or another more graphic way, it is more likely to appear:

*“the black swan”*

The disaster in the one that had ended the world economy would have been huge, if the Federal Reserve does not get to act quickly injecting liquidity in the Capital Market, saved the banks and many other companies that needed money to pay off their debts. But remember that the problem is creating the money out of the savings that need to be returned to the economy in one way or another, and none of the mechanisms that you are using the Federal Reserve to prevent a credit crisis is reducing income inequality, which is what makes the saving is kept very high. Savers are those who have a surplus of income that do not know on where to save.

## 5. THE PROBLEM OF EXCESS SAVINGS

If we had to point out which is one of the most important consequences of the financial nature of the capital is one that asserts that the capital goods are not the product of the savings, but the savings are possible because it is created capital goods. Is that statement which identifies the excess of savings as the cause that is behind all the problems that have a monetary economy.

The equation of the growth shows the growth of *GDP* depends on the difference between the flow of savings and the flow of deficits, but it is not clear that we need to do, or how we manipulate both flows, to avoid that the economy enters a recession. However, the situation changes completely when we study, not the growth equation, but the equation of conservation of monetary flow from which it comes.

When we divide the economy into two great sections, the agents (or persons) who save and agents (or persons) not saving, and we assume that both are two differentiated groups of agents, it is possible to use for description of the system of two equations that describes an economy divided into two sectors:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah_1 \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 - ah_2 \end{aligned} \quad (1)$$

Where now:

$a \cdot x_1 \rightarrow$  a fraction of the expense of savers that ends up as income of the non-savers.

$b \cdot x_2 \rightarrow$  the fraction of the expenditure of non-savers that ends up as income from savers.

$ah_1 \rightarrow$  the net savings from savers.

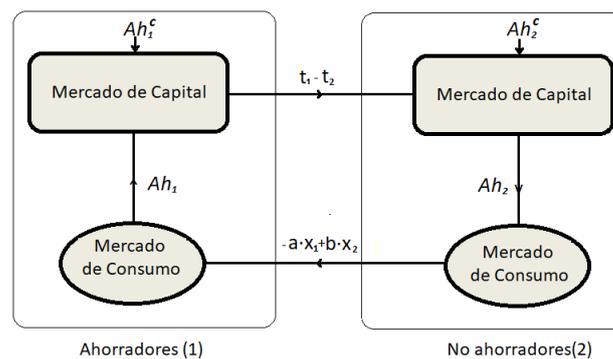
$ah_2 \rightarrow$  the net savings of non-savers.

The system of equations is very general, and although it is normal that each equation represents a sector as distinct from the productive system, or even representing different countries, what is true is that it can also be applied to any division into two parts of the economy, with the only condition that each sector is a sector-differentiated, we can associate an accounting equation, and that also satisfies the equation of Fischer, that is to say, that in each sector, it makes sense to define a mass currency:

$$k_F \cdot m_i = x_i \quad (\text{Equation Fischer})$$

If we assume that the division between savers and non-savers makes sense because each sector is formed by different agents, and because it is possible to associate to each of them a money supply that satisfies the equation of Fisher, then it is possible to understand what the actual problem that causes the saving analyzing the system of equations (1).

To do this, we separate the Consumer Market and the Capital Market of each of the two sectors, which belongs to the savers and the one that belongs to the non - savers. Now, the exchange flows that appear in each of the two equations of the system (1) represent flows outgoing or incoming, between the respective markets of consumption or capital of each of the sectors, as shown in the attached figure.



Recall that the solution of the system of equations (1) is studied in a very general sense in the second chapter, where it was used to explain the phenomenon of Spain Empty and the trade between countries, taking into account the Capital Market. According to this analysis, and when we assume, as it was there, that there is no money creation and, therefore, when we assume that the savings that make the savers should be equal to the deficit that make the non-savers, you come to a conclusion pretty logical place for long times:

$$ah_1 = -ah_2 \xrightarrow{t \rightarrow \infty} \begin{cases} x_1 = \text{const.} \\ x_2 = \text{const.} \\ a \cdot x_1 = b \cdot x_2 - ah_1 \end{cases}$$

The expression tells us that the non-savers can keep a spending deficit  $(-a \cdot x_1 + b \cdot x_2)$  above revenue, thanks to the money they receive to borrow from savers  $(-ah_1)$ . But no one will deny that this flow deficit can only be funded, in the aggregate, with the sale of the capital assets of the non-savers. There is a circuit of money, which has to be closed when we assume that there is no creation credit, in which the flow deficit between the Markets of Consumption has to be fed as a stream of loan between the Capital Markets, but it is clear that this circular flow of money has to be compensating in the Capital Market with a flow of capital goods from the non-savers to investors. Or saying it another way, the excess consumption of non-savers have to be funding necessarily with the sale of capital goods, and savers have to be increasing their wealth at the expense of the loss of wealth of non-savers.

To see this more clearly, we calculate the amount of money that must be in every moment of the non-savers if you do not would return the debts that are contracting. When we assume that the flow of loan is constant, the accumulated debt,  $Q(t)$  should increase linearly in time. However, the money that is owed must also include the payment of the interest on the debt already accumulated, so that the increase of the accumulated debt,  $\frac{dQ(t)}{dt}$  is given by the expression differential:

$$\frac{dQ(t)}{dt} = ah_1 + i \cdot Q(t) \quad Q(0) = 0$$

Where "i" is the interest rate of the debt. The solution of the equation is an exponential function grows without limit:

$$Q(t) = \frac{ah_1}{i} (e^{it} - 1)$$

Of course, debt can't grow without limits, and must finally be paid. In the figure it is observed that the monetary flow between the capital markets closes the circuit monetary and compensates for the deficit spending that is among the markets of consumption between savers and non-savers, and therefore, there must be a flow of capital goods from the non-savers to investors to liquidate by selling the debt that is accumulating. Or another way, is the sale of their property capital which is allowing to keep the deficit spending to non-savers (in the aggregate).

The result is truly remarkable, and it is also very problematic, because it says very clearly that the flow of credit between savers and non-savers may not be sustained indefinitely, and will stop when the non-savers don't miss any capital good that sell. But what really puts the hairs of the analysis is to verify that the reason that non-savers to take on debt, has its origin in money that extracts of the economy, savers, who are the ones that are leading to a deflationary currency, which reduces the income and forces the indebtedness of the non-savers.

*THE WEALTH OF THE RICH IS THE POVERTY OF THE POOR. The relationship between savers and non-savers can be written with the same system of equations that describes an economy divided*

between two sectors. When in addition we assume for simplicity that there is no money creation, which implies that the savings you make about is the deficit that others do, we have:

$$\begin{aligned} \frac{1}{k_F} \frac{dx_1}{dt} &= -a \cdot x_1 + b \cdot x_2 - ah \\ \frac{1}{k_F} \frac{dx_2}{dt} &= a \cdot x_1 - b \cdot x_2 + ah \end{aligned} \quad (1)$$

And it can be shown that, in steady state, the ratio between the income of savers and non-savers is given by the expression:

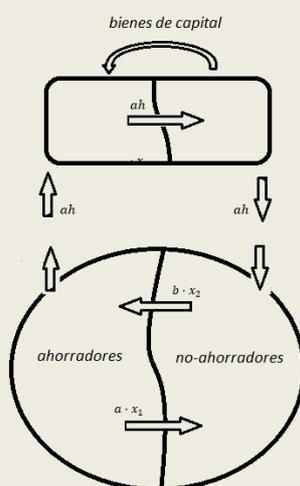
$$a \cdot x_1 = b \cdot x_2 - ah$$

In addition, the debt you accumulate, not sparing is given by the expression:

$$Q(t) = \frac{ah}{i} (e^{it} - 1)$$

Where "i" is the interest rate that you pay the debt. Since then, the debt is unsustainable, and in practice, the loan between sectors is maintained as long as the debt paid with the sale of capital assets that have the savers.

That is to say, when we consider the non-savers as a group are statistically separated from the group of savers, in the aggregate, the non-savers have to get rid of capital goods to maintain the debt. In the figure explains a little of this process.



It is now possible to understand without many difficulties which from about 30 years ago, the rich are getting richer and the poor are becoming more poor.

Of course, not all savings from savers has been spent by non-savers. The public deficit also absorbs a portion of the savings. For example, Japan's public debt amounted to about 2.5 times GDP, being the titles of the treasury a portion of the savings that have been made in Japanese savers. In addition, another part of the savings will be served for the purchase of new capital assets or to finance its creation, what is the same, because now it will belong to the savers. Despite all this, it is clear that when the saving is not absorbed by the deficit to the public or for

*the purchase of new capital goods, it will be the debt that has had to turn a large part of the middle class to keep your spending in an environment slightly deflationary because of the savings, who returned to the economy in exchange for his wealth, now, will belong to the savers.*

*Obviously, the analysis that we have done indicates that in an economy without growth, it is not possible to aggregate savings during times larger.*

We have also seen that the policy of spending keynesian cannot be the permanent solution to the problem of saving.

## 6. THE REVENUE SOLUTION TO THE PROBLEM OF SAVING

Once it is understood that is what creates the credit crisis, then it is not difficult to find a solution to the problem. Let us return once more to look at the equation for the growth that shows the evolution of the expense in terms of the flows of saving and dissaving:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^-(t) + Ah^+(t)] \xrightarrow{Ah^-(t)+Ah^+(t)>0} \Delta GDP < 0$$

We know that the extraction flow of the money that makes the saving does not must never exceed the injection flow of the money that is made using the credit and the purchase of debt securities. The problem is, as already said a century ago, Keynes, that those who save are different from those that spend on credit, and invest, and there is no reason why both flows are maintained balanced.

We also know that the fiscal and monetary policy that has been using for the past 40 years, is wrong because it is directed to maintain the flow of credit above the flow of savings, when the logical thing to do would be to act on the flow of savings. What is done, as we know, is to lower the interest rate on the money and to maintain indefinitely a government deficit spending but, as has been shown, none of the two policies can be sustained indefinitely in time, because the interest rate is perilously close to zero and the public debt increases to jeopardize the funding of public services, so that, in the best cases, both of these policies can only be on time, without getting to never be a definitive solution.

It is logical. Investment spending by the credit depends on the time of technology and, although it can be stimulated with the public spending deficit or lowering the interest rate, it is an exogenous variable over which you have no control. In contrast, the savings is an endogenous variable that depends in a first approximation of the income of each of the agents, and thus can be manipulated very easily by changing the level and progressivity of the income tax. That is to say, it can be expected that increasing and decreasing the income tax is possible to decrease the savings so that you will always be below the spending on credit.

What we propose here, is to make a progressive tax on the income in order to limit the savings, but separating in a very clear way the financing needs of public spending, fiscal policy designed to avoid a credit crisis, in such a way, that the rate that is used to finance public expenditure is clearly differentiated from the rate that is used to limit the savings by fiscal policy. We think that public spending must be funded with the money collected from income tax, and without having to resort to deficit, while, to solve the problem of saving, what we propose here is that the Central Bank, based on the analysis of the economic situation, point-of-way to separate the annual amount extra that must be raised to reduce the savings glut that threatens to sink the economy.

Specifically, and since the savings depends on a progressive income (The Act of Saving Keynes), the rate should be progressive with the income. There is, therefore, no reason why you have to be different than the rate that is used to finance public spending, and what we propose, in fact, is that it is the same.

The table below sets forth the proposal:

Tax the capital		income Tax, the income		Tax savings	
Multiple of the average net	annual property Tax	Multiple income average	effective tax rate of	Multiple of the average income	effective tax rate $\epsilon$ *
0,5	0%	0,5	10%	0,5	$\epsilon \cdot 10\%$
2	0%	2	40%	2	$\epsilon \cdot 40\%$
5	2%	5	50%	5	$\epsilon \cdot 50\%$
10	2%	10	60%	10	$\epsilon \cdot 60\%$
100	2%	100	70%	100	$\epsilon \cdot 70\%$
1.000	2%	1.000	80%	1.000	$\epsilon \cdot 80\%$
of 10,000	2%	10.000	90%	10.000	$\epsilon \cdot 90\%$

- The tax is the income, and el parameter  $\epsilon$  is a positive number that decides the Central Bank according to the economic situation.

The parameter  $\epsilon$  is a positive factor that decides the Central Bank sufficiently in advance, and depending on the economic situation. The first table is the proposal for a tax on the capital, which is discussed later, but that has nothing do with what we are dealing with now. The second table shows the rate usual, which is imposed upon the income, regardless of its origin, if it comes from the work or from the rent; it is the collection that is used to pay the cost of public services. In the third table shows the tax that we propose to reduce the saving; it is a tax equal of progressive tax usual on the income, but that does depend on a parameter  $\epsilon$  that changes as you change the general economic situation, so that the tax would ensure that any savings will not be reversed.

Let's look at that now, it is not necessary to manipulate the interest rate to increase the flow of credit, it is not necessary any government deficit spending. In addition, the money raised with this ultimate tax savings, you should not go never to finance public expenditure, but that must be devoted to facilitate the investment of the people of lower incomes, since the role of the tax is to reduce the amount of saving those who have more income.

THE ORIGIN OF THE INCREASE IN INEQUALITY. *The problem with the saving is not trivial, and can be aggravated by many reasons. Although now we do not wish to entertain be listed in a detailed way, if we're going to point out two of them because they are a result of deliberate certain fiscal policies that spread as a desirable economists who work for the private universities of the USA:*

- 1) The decline in the progressivity of taxes. *The continuous decline in the progressivity of the tax that's been happening since the second half of the TWENTIETH century, redistributes the weight control and increasing relatively to the people who have more income in relation to that of the people who can least income they have. This, in addition to causing an increase in inequality, increase the rate of savings, given that the propensity to save is greater the higher the income of the people (the Act of Saving Keynes).*
- 2) The increasing indebtedness. *The greatest savings of a part of the society induces the decrease of the income of the other part of the society, which forces this last to sustain your expenses with borrowed money. Let us remember, that the saving of a few is dissaving of others, and that only the creation of bank money tip the balance to the credit. Therefore, and even if it is only true when there is no money creation, we can say that is true:*

$$\sum ah_i^+ + \sum oh_i^- = 0$$

*That is to say, that savers are forcing the rest of the population to go into debt. It is very clear, you can only stay the aggregate consumption thanks to the deficit spending of those who are not saving, which redistributes income through the payment of interest or loss of capital goods. In the aggregate, it is clear that the process will exacerbate the inequality of wealth and, therefore, income.*

*Both cases feed back and pull in the same direction, growing the savings and making it more difficult for the credit to be able to stay on top of savings: "the loss of The progressivity of the tax increases income inequality, and the increase of inequality in income induces the increase in aggregate savings". The conclusion is very clear, the lack of progressivity of the tax exacerbates inequality.*

**PART VI**  
**THE POLICY FISCAL**

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Clara Rojas García, Julia Rojas García, Pedro Rojas Sola  
4 march of the year of 2021

### 1. THE THEORY OF MADRID.

We have used the previous chapters to respond in very concise way to several of the many basic questions raised by the monetary economy since its origin:

- The nature of money
- The basic equations that govern within a monetary economy.
- The formation of prices in the Consumer Market.
- The financial nature of the Capital.
- The formation of the prices in the Capital Market.
- The Financial Theory of the Growth.
- Causes of the credit crisis and change.

All this, based implicitly on three principles or postulates very simple about the nature of money:

1st Postulate. The amount of money is preserved in the trade of buying and selling.

2nd postulate. The amount of money meets the monetary equation, where  $k_F$  is the constant of Fisher:

$$k_F \cdot M = PIA$$

3rd Postulate. All the money in the economy is bank money, that is created when it is granted a credit.

Although we do not ignore that we have left without studying aspects of vital importance as the influence of public spending, we believe we have developed a theory sufficiently complete and accurate, and with sufficient predictive ability, as to analyze with precision the consequences of the decisions that are made daily in the field of political economy. In this sense, we believe that we have successfully completed the main goal that we have been moved to write this treatise on the monetary economy, which has not been another pointing to the mathematical structure underlying so-called free-market economy and of the limitations that this imposes on our way social organizing.

In particular, we think that it has shown, beyond any reasonable doubt, that within a monetary economy there are two markets are very different in nature, where they are bought and sold

two types of goods is also of a very different nature: *consumer goods and capital goods*. We think that we have also demonstrated, beyond any reasonable doubt, how the Principle of Asymmetry, the Financial Theory of Capital and the Theory of Bank Money together to explain together to one of the equations, the most notable of the economy, the Equation of Growth:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \quad (Eq. Growth)$$

Equation, we can obtain a vision that is very comprehensive and accurate account of the cause of the credit crisis and the crisis of change, at the same time he points out to us the best way to avoid them.

Arrived up here, now summarize by way of brief collection, the set of assertions that we have been fashioning little by little throughout the chapters of this treaty, and that we have named as The Theory of Madrid. The intention of the summary is to present the new economic paradigm and the set of the general lines of the monetary and fiscal policy to advise you to follow the monetary authorities to get out of the impasse that has dragged us to the loss of progressivity of the rate of tax to income, the absurd and growing public debt and the absurd interest rate close to zero that lends the money.

The purpose that has guided the development of this treaty has not been another to denounce the ridiculous and dangerous economic paradigm propagated by the economists who work for the private universities of the USA, who are advising the public debt, without justification, that advise on reducing the progressivity tax increase income inequality, which advise to lower the interest rate to zero that elevate the valuation of capital assets to carry the bags all over the world to a disaster foretold, but above all, the purpose that guides us has been to denounce the dangerous silence that saved have about who made the money in the shade, that there are no other investment banks. Are these american investment banks that out of whack with their loans in dollars to the real economy from the rest of the countries of the world, who neither have nor can have, a currency strong enough to meet them. Have been the us investment banks responsible for the asian crisis or the Russian crisis, or the crisis of 2008, although to do that they needed the cooperation necessary from the Federal Reserve.

## **2. THE NEW PARADIGM OF THE THEORY OF MADRID.**

### **On the nature of money.**

The definition as usual, which makes the economics of money is quite imprecise and inaccurate. For example, the book university of macroeconomics of more global spread, the "Samuelson", defines money as... *"everything that serves as a medium of exchange of common acceptance"*. Another definition is very common, not more clear, but perhaps a little more redundant would be:

*“Money is any asset or well-accepted universally as a means of payment for the exchange, and also performs the duties of being a unit of account and a store of value”*

Is redundant because “being a unit of account” and “deposit value” is the direct consequence of “to be accepted universally as a means of payment” and, however, the definition remains vague because “to be accepted as means of payment” lets us know that is what you are using as money in an economy, but it does not tell us if we are really in a monetary economy, that is to say, if it really is money. For example, there is evidence that, during the Second World War and in the concentration camps, the prisoners used the cigarettes as a universal medium of exchange, but it is not clear that they really be able to say that he had a monetary economy within the fields. Another example that shows that a definition so vague of money is insufficient to characterize show him some countries today as the Republic of Cuba, where it is very clear that there is money and it is very easy to identify, but where it is not at all clear that there is a monetary economy.

Therefore, in the Theory of Madrid, we define what is a cash economy, while also defining what the money is for, so that both concepts always go together:

*DEFINITION OF THE ECONOMY AND MONETARY POLICIES. It is said that an economy is a monetary economy where there is a well that you can purchase any other goods or service for sale, and the total quantity of which  $M$  meets the monetary equation:*

$$k_F \cdot M = \sum p_i \cdot q_i = PIA$$

*The monetary equation tells us that the value of money does not come from the material of which this fact, but the relationship that exists between the amount of money that exists and the cash flow from the purchase and sale, or PIA.*

That is to say, what characterizes a monetary economy is the existence of the money, which as defined implies the fulfilment of a quantitative relationship, measurable, and nature that, in the aggregate or statistical:

- 1) There is a universal good, the money you can buy any good or service offered for sale.
- 2) The amount of money  $M$  meets the Monetary Equation, where  $k_F$  is the constant of Fisher:

$$k_F \cdot M = \sum p_i \cdot q_i$$

The definition characterizes what the money is for, as well as the monetary economy in which they exist.

**In summary:** money is not only “what” that allows us to purchase any good or service that this for sale within the economy, but it is also the character that prints to the economy in which it is used. We say that an economy is a monetary economy when it exists, and use the money. Throughout the story, and dfrom the most remote antiquity, have been used countless things as money. From the gold, the commodity to be known that it has been used as currency, until the tobacco or the salt, being the essential feature of all of them, the true fact, that its value

comes not from the value of the commodity itself that is used as money, but that the flow of purchases meets the monetary equation. In fact, it is the monetary equation which indicates the social origin of the value of money, to relate the amount of money with the maintenance of the exchange flows within the economy. In the present, which is mostly used as money is the “bank money” is created when it was granted a loan (and are destroyed when it returns), and its value comes from that verifies the monetary equation:

$$k_F \cdot M = \sum p_i \cdot q_i = PIA$$

**On the money credit.**

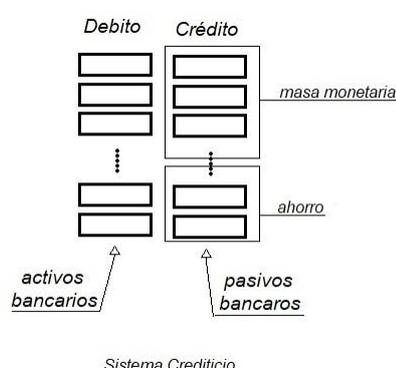
What makes money in the monetary savings current is the bank money created by banks when granting a loan. The public authorities-and, therefore, the citizenship has been granted to the commercial and investment banks the privilege of creating money, necessary, subject to some concessions.

It is not difficult to prove that the money is created when it was granted a credit, that's what we call money credit or bank money, and in this sense, who are creating the money really is who gets the credit, since he is the one who supports it, and promise to return it or pay interest while not return the item. The bank is only responsible for the alternative, and that is why it can fail, because your estate is insufficient to endorse all the money created. For example, the money created by banks in the united states is more than 20 million of million of dollars, clearly far superior to the backing assets of the banks.

In the attached figure shows the result of the process of creation and destruction of bank money through the granting and repayment of credit.

When they grant a loan, the bank creates two entries, or records, one that reflects the amount of money provided by the bank (which is used from then on as money), and another that reflects the money that is owed to the bank (is an asset of the bank, but it is not money, nor can it be used as money). Obviously the sum of all the records of all the banks must be always zero, indicating that all the bank money that is being used in the economy is a debt of someone (even the bank money used by the central Bank).

When it returns a credit, the opposite happens, and the money is destroyed. The bank settled the record where this annotated to the debt (the log on the left in the figure) and deletes the record that contains the money has been returned (it is the registration of the right in the figure).



Calculate the amount of money that is necessary to create to run an economy is not difficult. Using the monetary equation, and giving the constant Fischer a value of 2, we have for the 2019 and for the USA:

$$k_F \cdot M = GDP \xrightarrow{GDP=20MM \text{ and } k_F=2} M = 10MM$$

In current terms, the 10MM manufactured during the last 50 years, it's worth a few 35MM dollars, to which we must add the other more 10MM of dollars have also been produced and are used to keep the international trade, which raises the updated value of the money made only by banks in the USA to about 70MM of dollars at current prices.

The problem, or the great advantage, of bank money is created as debt that has to pay interest while not returned, and therefore there is a strong incentive to return and destroy the money created. It is a great advantage because the flow of interest paid by maintaining a credit prevents that the banks can create too much money and cause an inflationary process. And, it is a great disadvantage because there is a strong incentive to return bank loans, destroying the money and causing a deflation of prices, which, in times of recession, ended in a credit crisis or a crisis of change.

To sustain the balance of the amount of money credit is the magic that holds the monetary economy of which we are born, we live and we die more than 8,000 million people. The cash credit is, perhaps, the biggest exhibition of the genius of our society, or, perhaps, is the biggest shows of his recklessness, without it nothing is easy for the authors to take a position on the matter. However, we are inclined to think that the money credit, we know that it represents a debt that must be repaid, features many more advantages than disadvantages despite the fact that it is very easy to prove, so we believe we have done in the Theory of Madrid, which is his existence, which condemns the economy to suffer a crisis loan on a periodical basis.

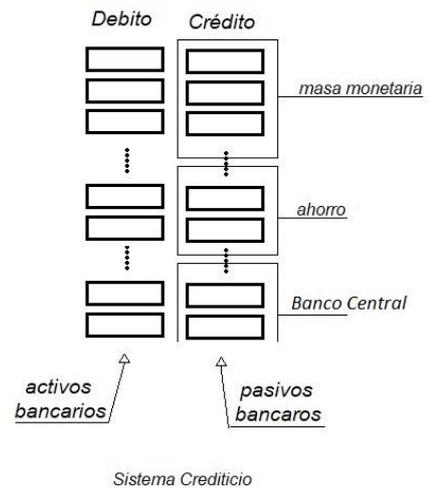
**In summary:** What you are using today as money is the bank money, that is created when banks provide a credit, and are destroyed when it is returned to the credit. The essential nature of bank money is to be a debt that supports who assumes the credit, while the bank that granted the credit is only a responsible alternative. The great advantage of money credit lies in that they can grow and adapt to the needs of growth of the economy, in addition to being the whole of the whole of society who supports it, but it has the major drawback that can be destroyed when no one wants to take the credit and payment of interests.

### **On the money created by the Central Bank**

It is important to understand that the Central Bank cannot create money banking by itself, and that only the commercial and investment banks have the privilege to create money when they make loans.

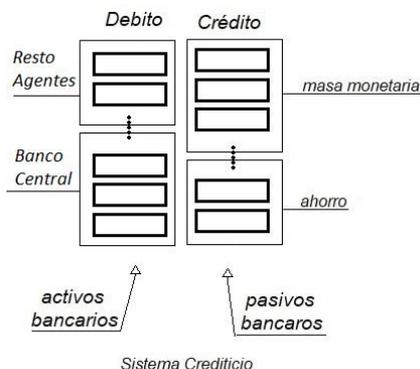
The attached figure shows us again the process of creation of bank money, that is same you need to follow the Central Bank to get money:

- 1) The Central Bank requesting a loan to the banking system, and this creates the money as a credit, that in nothing is the difference with the credit that is granted to an individual.
- 2) The Central Bank has, since that time, two records in the Banking System, one that indicates the amount of money that the Central Bank should be to the Banking System, and another where it appears the money that the Central Bank can afford to spend.
- 3) Once the Central Bank has been granted the credit (which you cannot refuse any commercial bank or investment), you can spend it on the purchase of assets (capital goods), you can lend to commercial banks or investment that so request or you cannot do anything with him, which is not usual that happens, (the Central Bank tends to be forbidden to buy consumer goods such as, for example, a front porch red).



It is observed that the Central Bank is like any other user of the Banking System, with the only difference that the Banking System does not reject their requests for credit, and is the Central Bank and not the Banking System that decides what interest rate you pay on the money borrowed (it is as well as regulates the interest rate of the market, paying to the others the money that you borrow at the interest rate that the same pay).

The overall result of the action of the Central Bank is presented in the attached figure:



- 1) The Banking System is preserved as an asset the amount of money credit that has been created for the Central Bank and that they should (they are bank reserves, which sometimes used the charge of the banks to limit the amount of money a bank can grant each bank).
- 2) The Central Bank can buy capital goods with the money that you send to create for him, or you can lend it to banks to pay off the bad loans that are not returned in exchange for the interest that he pays

for the money. In both cases, the money becomes part of the mass economy as the rest of the money, while the Central Bank remains as a debtor more of the banking system (the reserve).

The money spent by the Central Bank is money credit that is no different from that of the rest of the money credit. What makes money is unique (can't have two coins).

**In summary:** The Central Bank is a user most of the banking system and any amount of money that manufacture the banks for him, it appears on bank records as a credit more. The Central Bank is not the one who actually creates money, but if it is who set the interest rate when the mism9 says what interest rate you pay on the money they lend to the banks, although in the

textbooks written by the private colleges who are studying economics around the world say that they are the ones who make the money.

### **On the Banking System.**

The Central Bank does not make any money, but if you have the function of regulating the amount of money that can manufacture commercial and investment banks. Along the evolutionary process that has brought the economy to move from the use of metallic gold as money, the use of bank money (the bank records and notes), governments have been gradually changing the mechanism to limit or enable the creation of bank money by private banks. Currently, almost all central banks use the interest rate to get the bank money is created in the amount necessary to sustain the growth of the economy, while historically, it has been through the use of bank reserves (the debt owed by the Central Bank) as it has limited the amount of bank money that can be produced within the economy through the credit.

It is not very difficult to understand that there is a terrible confusion among economists with regard to what makes money in the present, as it has been in the gold and silver metal up to the current bank money without anything easy to establish a dividing line that mark the change from one system to another. If you need to put a dividing line in the last 500 years, it is safe to be put in the creation of the Central Bank, because it is at this time when the bank money (the ticket banking convertible into gold) is the official currency that allows you to buy any thing for sale within a country.

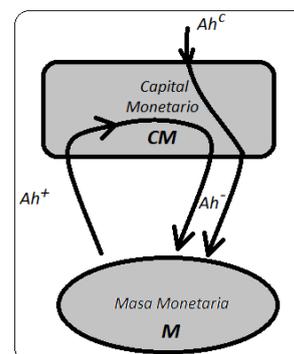
Therefore, when you listen to the economists who work for the private universities in the US say that money makes the Central Bank, we can easily understand that it is the banks and the banking system that is trying to protect by keeping your work in the unknown. It is also easy to understand why it is a private bank of Sweden who has the privilege of awarding the peace Prize. The one and the other only to the economy to make progress and find out which are the investment banks that cause the credit crisis and currency crises.

**In summary.** Are banks commercial and investment that make money banking and not the Central Bank. That is very danger for the entire economy, especially the investment banks that create money credit to the leveraged purchase of financial assets. Since then, the Central Bank sets the interest rate of the loan, but does not control the amount of bank money in the economy, especially one that is made for the purchase of assets in a process very similar to the *Quantitative Easing* that we have seen them perform to the Federal Reserve, with the difference that the Federal Reserve intervened giving liquidity to avoid that is to sink the price of the assets, while investment banks expect the asset price to sink before you buy them with money created out of nothing and without any risk.

### **On the Consumer Market and the Capital Market.**

One of the most important consequences that have the use of money in the society is that it divides all the goods that can be purchased in two categories differences, the goods that are consumed, so-called consumer goods, and assets that generate income, so-called capital goods.

In particular, the consumer goods are easily identified with those goods or services they produce in the companies with the intention of being consumed, which are almost all, and in which they also include physical goods with manufacturing companies. While capital goods are identified with the goods that you have the essential feature of producing income, as are the companies that produce consumer goods. For example, are capital assets, the companies listed on the stock market, the housing, or natural resources, ... that is to say, those goods whose main function is to produce other goods.



Capital goods are bought in the Capital Market, while consumer goods are bought in the Consumer Market, being one of the most essential features of a monetary economy that both markets set the prices very differently and are, therefore, very kludgy.

In the attached figure shows the two markets and the monetary flows that move between the two, being  $Ah^+$  the flow of savings that comes from the Consumer Market and  $Ah^-$  flow deficit is spent on the Consumer Market. While  $Ah^C$  is the flow of money creation, which in the current banking system is done through the granting of credits. That is the reason why, in the figure,  $Ah^C$  comes from nothing. The two flows that relate to the Consumer Market and the Capital Market, the saving and dissaving tend to be very stable in time, so that it can be said that the amount of money that there is in the one and the other market is relatively constant. Very different is the situation that is created by the flow of credit, that the intervention of the Central Bank or the intervention of the commercial and investment banks can do to change very quickly.

The money is used to buy on the Market of Consumption is the money that shape the supply of money  $M$  that appears in the Monetary Equation. While the money is stored in the Capital Market what we have called the "capital" money. It can be said that the two forms of money, the money of the money supply and the money gained, are very different from one another, despite the fact that both types of money are indistinguishable from one another, being both, bank money.

**In summary:** The use of the money divides the assets that exist within a monetary economy in two types differentiated, consumer goods, those goods that are produced with the intention of being consumed, and the capital assets, which are assets that produce income. Both goods are purchased in different markets, they set the price in a different way and are very decoupled (in the sense, that the monetary flows between them are very stable because it comes from only of saving and dissaving).

### On the Consumer Market.

The question that led to becoming the economists for at least 2,000 years, without receiving a response that is consistent, is how to set the prices of consumer goods. In part, the lack of a scientific theory to explain how prices are set within a monetary economy has its origin in that economists do not even agree on what a Theory of Prices is and is complete with the confusion that exists about the variables that depend on the economy.

Therefore, in the Theory of Madrid begins by stating that give an explanation on the prices is equivalent to prove that other economic variables depend on the prices and quantity of goods, which we understand are the two basic variables is necessary to explain in a Theory of Prices. It can be shown, and thus in conditions very general, that the prices are fixed when the vendors to secure the benefits that you obtain from the goods they produce. Also it can be shown, and thus in conditions very general, that the quantity purchased of each of the goods is decided by the buyers when they pass their income, according to their consumption preferences. This bond, between the prices and the benefits, on the one hand, and between the amount of goods and consumption preferences, on the other, is what we call in the Theory of Madrid, Principle of Asymmetry Buyer and Seller, complete with a set of statements of great importance, as the Beginning of Inflation and the Beginning of Closes.

In this sense, the Theory of Madrid follows the ideas of the Italian economist, Piero Sraffa, supporting all of the conclusions reached in his book “the Production of goods for other goods”, in particular the one that states that prices are set within a monetary economy for structural reasons, but filling in the gaps left without explaining their exposure. However, the theory official propagated by the private universities of the USA in the textbook says that the price and quantity produced of each good or goods are determined by the interaction between supply and demand, because, among other things, the supply and demand are the same thing and alone in the universe created by the imagination of economists, can be separated and can be defined separately. In the reality that surrounds us this is not possible, and everything that you purchase is also sold.

**In summary:** The price and the quantity sold of each of the goods is fixed by the “Principle of Asymmetry Buyer Seller”, which states that *“the prices are fixed when sellers decide the benefits derived from the sale of what they sold, while the quantity produced of each good is fixed when buyers decide how much of each good buy”*. The beginning has some far reaching consequences in the productive economy and shapes the social structure in which we live.

### **On the Principle of Inflation.**

One of the most important consequences which are deduced from the difference that exists between the decision to buy and the decision to sell, the name in the third chapter of this treaty as the Beginning of Inflation. The principle of inflation states that, *“in the aggregate, the price of the goods or services can only go up in price, and can never let down”*, because when you try to lower the price, what happens is that it decreases the number of goods that are sold, but not the price, that is to say, before the economy enters a deflationary what happens is that the tissue is destroyed.

Let us observe that the monetary equation asserts that it takes a specific amount of money to keep a flow of concrete exchanges:

$$k_F \cdot M = \sum p_i q_i$$

It is very evident, then, that a decrease of the amount of money in the economy will cause, according to the monetary equation, or a price reduction or a decrease of the production, or both at the same time. But it is not difficult to show that in the case of a decrease in the amount of money, it will be the production to decrease, and not the prices. This is what is stated in the Beginning of Inflation, the price of the goods cannot lower in the aggregate, so it is inevitable that it will be the production is lower in the case of a decrease in the money supply.

This last statement is really remarkable, because the Financial Theory of the Growth is going to explain the crises that plague a regular basis the economy as a result of the destruction of the bank money because of the non-renewal of the credits.

**In summary:** One of the most important consequence of the asymmetry that exists between the buyer and the seller within the monetary savings is the Beginning of inflation, which states that, in aggregate terms, the average price of the products may not be lower and can only go up. This implies in turn that, in the event that the amount of money in the economy to shrink, decrease the amount of actual production and us prices. Or another way, which creates the economic crisis is the destruction of the money.

### On the Capital Market.

An essential feature of the monetary economy is the emergence of assets that produce income, whose nature is entirely different from the nature of the consumer goods. To assets that produce income are called capital goods and their existence is differentiated also explains that your price is set in a distinct market, the Capital Market, and with a different mechanism to that used in the Consumer Market.

In the Theory of Madrid resorted to stating three laws of capital, the First Law of Robinson, the Second Law of Robinson and the Law of Piketty, to explain how it determines the price of capital goods:

- The First Law of Robinson: "The value of a capital good is equal to the income they produce, divided by the interest rate of the money and the uncertainty that the market assigns:

$$k_i = \frac{r_i}{\bar{\kappa}_j \cdot i} \quad (1st \text{ Law of Robinson})$$

- The Second Law of Robinson: "The added value of the capital goods is equal to the income they produce after tax, divided by the interest rate of the money and by the uncertainty factor:

$$K = \frac{\langle \alpha \rangle \cdot GDP}{\bar{\kappa} \cdot i} \quad (2nd \text{ Law of Robinson})$$

- The Law of Piketty: “In a stable economy, the uncertainty factor  $\bar{\kappa}$  is worth “1”, or otherwise, the aggregate value of the capital goods is equal to the income they produce after tax, divided by the interest rate on the money:

$$K = \frac{(\alpha) \cdot GDP}{i} \quad (\text{Law of Piketty})$$

The three laws of capital reflect the nature of financial capital, and discover the most remarkable result that has a monetary economy:

*“the added value of the capital goods is not dependent on the amount of savings that you make, without the amount of income in the economy”*

The Law of Piketty tells us what it is that dependency.

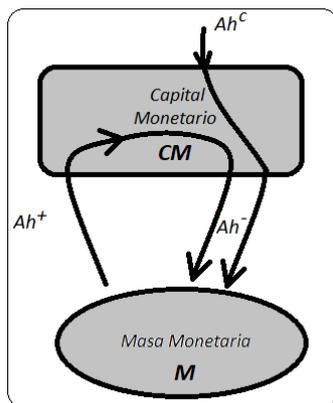
**In summary:** You can prove beyond any reasonable doubt, that the nature of the capital is the financial and valuation is equal to the present value of the future income that is expected to occur. In particular, in a stable economy, the aggregate value of all capital goods is equal to the average income that occur after tax, divided by the interest rate on the money:  $K = \frac{(\alpha) \cdot GDP}{i}$ , the equation to which we have named the Law of Piketty.

### On the economic growth.

Explicitly, the Financial Theory of the Growth that we have developed within the Theory of Madrid, identifies the growth of expenditure, the PIA, with the growth of the money supply that works in the real economy, or what is nearly equivalent, the growth of the *GDP* with the growth of the money supply *M*:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \quad \text{Ec. Savings}$$

where  $Ah^+$  and  $Ah^-$  are the flows of saving and dissaving that communicate the Consumer



Market with the Capital Market. According to the expression, the economy can only grow when you increase the money supply, which requires that the money injected flow deficit  $Ah^-$  in the Market of Consumption is greater than the money that extracts flow of savings  $Ah^+$ . In the attached figure is show the cash flows involved in the process.

It is possible to express the changes in the money supply in function of the changes in the amount of bank money and the money that is treasured. To do this, knowing that the flow of credit  $Ah^C$  is equal to the change of bank money and the flow

of hoarding  $Ah^S$  is equal to the change in the money treasured, it can be shown that:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \quad \text{Ec. Growth}$$

Thus, the Theory of Financial Growth means that when the time technology is enabling appear new investment projects and will appear new products that are going to require for their development of the financing through the credit, so that is the increase of the bank money that

originate from the consumption and investment credit, the flow  $Ah^C$ , which increases the disposable income of the economy and, therefore, makes it grow the expenditure or nominal  $PIA$  (or its equivalent, the  $GDP$ ).

The condition for the economy to grow is now that the increase of bank money  $Ah^C$  is greater than the increase of the money that is treasured  $Ah^S$ , what usually happens is always that grows the bank money, since that is treasured very little money. While there is no escape towards liquidity, which only happens when there is a credit crisis, the flow of hoarding  $Ah^S$  is very small or almost zero, and are the changes in the amount of bank money (the flow of bank credit) governs the economic cycle (it must be borne in mind that when the intervention of the Central Bank creating money from a bank to buy assets and provide liquidity to the market, the amount of money stashed changes significantly, but there is already in place a credit crisis):

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) \cong Ah^C(t) \quad (Ec. Growth)$$

Therefore, when growing the flow of credit, the economy grows without problems. However, once the flow of credit stops, and you start to return the credits, it is negative indicating that starts the destruction of bank money. When this occurs, then the flow of hoarding can become important and must be taken into account in the equation because it contributes to the extraction of money from the money with which the economy works.

The equation for the growth speaks of two opposing forces, the flow of credit and the flow of savings that, in an environment of intense technological change, work together to achieve levels of growth, notable which can be over 10% of  $GDP$ , without just cause inflation (for example, the chinese economy has grown in the last decades of the TWENTIETH century, with rates around 10% and an inflation rate that very few times it has been above the 3 or 4 per cent). But in an environment of weak growth of technology, the savings back against the economy and conspires behind the credit to produce a credit crisis.

The Equation for the Growth enables the formulation without many problems, the criterion that must be complied with to avoid appearing a credit crisis:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ Ah^+(t) > Ah^-(t) \end{array}$$

The criterion tells us that, when saving money is not returned to the economy, the deficit, the economy enters inevitable in a recession that will be more or less severe to the extent that savings are actually and decrease the money is part of money supply.

An equivalent expression is obtained when the equation of the growth spurt, the flows of credit and hoarding. If we assume that there is little hoarding, then, the decrease in the flow of creation of bank money, to be negative, it is what initiates the credit crisis:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^C(t) - Ah^S(t)] \approx Ah^C \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ Ah^C(t) < Ah^S(t) \end{array}$$

The criterion allows to explain without many problems, economic cycles, because it tells us that the cycles are driven primarily by the increase and decrease of bank money, that is to say, by the flow of credit.

CYCLE OF EXPANSION. When the population vegetative increases, either by migration or by internal growth, appears a boost endogenous aimed to increase the production with the financing loan. The increase of the loan is satisfied, in particular, the credit bank, which increases the disposable income of the economy and with it, the expense of the economy (or *GDP*) and the production.

Also the same thing happens when there are expectations to increase productivity and technological change. Then appears a boost endogenous aimed to increase the production that should feed through the loan, increasing the bank credit. The increase in bank credit increases disposable income, which increases spending and production.

In both cases, it is necessary to inject money into the money supply through bank credit, if you do not want to impede growth.

CYCLE OF RECESSION. Los problems appear when, or falls, the technological momentum and reduces the need to invest in the credit, or, the vegetative growth is small, or well, there are imitations structural, because then the savings can choke the flow of credit, not to find in which to invest. In such a situation, the creation of bank money can get to be reversed, because of the credits that are canceled without a renewed and which do not grant new credits. Everything seems to collude, now that the money you save not found who borrow and return it to the economy as deficit spending.

Once the destruction of bank money begins, the environment deflationary is fed back and makes it very difficult for any reversal of the economic situation. The economy inevitably deepens the recession because of the savings, not only does not stop, but increases. Is that in the Financial Theory of the Growth we have called “the problem of savings”, because the credit crisis is not created by the decline of the credit, but that is created by the excess of savings, not to find in which to invest.

The savings and credit competing for the low investment, drowning in a literal way the first to the second and causing a credit crisis.

**In summary:** The Equation of the Growth helps to explain very well the economic cycles that are subjected to the monetary savings:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \begin{cases} Ah^+(t) > Ah^-(t) \rightarrow \Delta GDP(t) < 0 \\ Ah^+(t) < Ah^-(t) \rightarrow \Delta GDP(t) > 0 \end{cases}$$

In particular, it is possible to establish a criterion (*the criterion of the credit*) to know when an economy enters recession:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \boxed{\text{Credit Crisis}} \\ \downarrow \\ Ah^C(t) < Ah^S(t) \end{array}$$

Or to say it with words, when the flow of credit is negative (that is less than the flow of hoarding), begins the destruction of bank money and the economy enters a recession inevitably. The time that passes since the criteria are met until the *GDP* begins to notice the decrease is about 6 months (the inverse of the constant of Fisher).

### **On the crisis of change.**

One of the truisms that have managed to ignore the economists working for the private universities of the USA, is the large amount of credit crises that have occurred over the last 50 years. As tends to happen in the economy, anything that does not appear in the textbooks or journals that publish the private universities of the USA is not there, and apparently, a crisis that does not affect the USA is not a crisis that deserves to be explained, and therefore does not exist.

Despite this, what is certain is that there has been an endless succession of crises in the exchange rate of the very few countries have escaped without being affected by a strong and traumatic devaluation of the currency, and which need an explanation. In the Theory of Madrid explain the exchange rate crisis in exactly the same mechanism that explains the credit crisis, with the aggravating circumstance that in this case the Central Bank cannot rely on the purchase of assets in order to avoid it, since almost all countries are committed to maintaining the free movement of capital without understanding that such a thing is impossible, in a monetary economy in which you can't manufacture the reserve currency.

As its name suggests, the dollar is called the reserve currency, because when there are problems savers to keep their liquidity in the reserve currency. So, when a Central Bank made money with the intention of buying assets to avoid a credit crisis, it is inevitable that the liquidity in its own currency is changed by the reserve currency, which they obviously will not be able to meet never the Central Bank, unless that hinder the free movement of capital.

**In summary.** For any one country, it is a suicide to maintain the free movement of capital, because it will be inevitable that in a crisis of change. When we look at the global economy is very well appreciated that most of the countries have undergone frequent crisis of change, with the only exception of some large countries, and with a balance of external trade very favorable, such as Germany. Basically, when you see a flight to liquidity and the Central Bank to create money to buy assets of every kind, can't avoid it that all the money made changes to the reserve currency, creating a crisis of change. Or another way, when there is free movement of capital, it is inevitable that a flight to liquidity is finished in a foreign exchange crisis.

### **3. RECOMMENDATIONS ARISING FROM THE THEORY OF MADRID.**

The short summary above about the most important affirmations that have been made over the treaty, and that we have named as the Theory of Madrid, we show very clearly a vision of the economy very different from the paradigm that spread in their text books the economists working for the private universities of the USA. We believe therefore, that it is very important to expand the separate some aspects which are deduced from the Theory of Madrid, but that fall outside of the conclusions that are derived strictly from the mathematical structure of the theory, and that, therefore, they enter into the thorny field of political economy and of the opinion. Or in another way, we're going to list a set of recommendations that, although it is deduced in a very clear way of the Theory of Madrid, are not conclusions inevitable and fall in the field of political opinion.

### **On public spending.**

Yes, we understand that public spending is done because the citizens have decided that certain goods and services are paid jointly and provided in a public way, such as with health, the sewer, or the roads, then it is difficult to understand why the amount of money collected by the tax does not cover the expenses necessary to meet the public service proposed.

It is amazing to hear reason to economists who work for the private universities of the USA, which should be reduced to the money collected with taxes, because what is considered excessive, while at the same time complain that they do not lend themselves well to public services. Are the same economists who claim to reduce the public deficit, while at the same time claim that lower tax revenues, without never come to say what public services are those that must leave given because of the decrease in the collection.

Don't need to be an economist, or have a phd in economics to understand that you should first decide what services are satisfied in a public way (so common), and then, logically, we should calculate what level of taxes should be set to raise the money needed to pay for them.

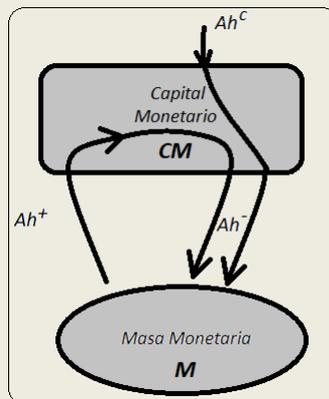
***WHO BENEFITS THE DEFICIT OF THE PUBLIC? It is not very difficult to know. For example, assume a hypothetical society in which they are certain the two following statements:***

- a) Taxes are levied in proportion to the income of every citizen. Specifically, suppose that the total cost of satisfying the public services requires a single tax equal to 50% of the income of each person.*
- b) The society is divided into two parts, the entering average of 200,000 euros per year (the rich) and the entering average of 20,000 euros per year (the poor).*

*In such circumstances, and while we do not know what is the number of wealthy citizens, or what is the number of poor citizens, we do know that in the event that public spending is financed in its entirety without recourse to the loan, the first pay in taxes to 100,000 euros each, and the seconds 10.000 euros.*

*Suppose now that the economists of the private universities of that society, they convince the citizens that the best thing for everyone is not to collect as many taxes and borrow the money that is raised, but that makes high to meet the public services. In particular, suppose that you*

pass of the flat rate of 50% of the income to a 25%, borrowing the rest, but who? What within society, on who you can borrow the money needed to meet the public expenditure?



Let us look once more the figure below where the flows of saving and dissaving among the Consumer Market and the Capital Market.

It is easy to reach the conclusion that the government can only finance the deficit in two ways, with the money from the savings or the money that comes from the bank credit, although in the aggregate, it is impossible to know which of the two items does the money that the government borrows. Despite all of this, it is very clear that, in aggregate terms, the government is borrowing to the citizens the money you have saved through the reduction of taxes.

In the economy of the example, the wealthy citizens will be able to provide government-50.000 euros are saved thanks to the reduction of the taxes, while the poor citizens will be able to provide only 5,000 euros. When only a part of the money from the tax cut saves it, then the savings that the citizens do  $Ah^+$  does not cover the public deficit and the banking system will create new money  $Ah^C$  and lend to the government.

What is important is to understand that, in the aggregate, the wealthy citizens come out ahead when public expenditure is covered with loan rather than covered with the collection of the taxes, as they are the citizens that the more taxes they pay, the more they save. In the example, the wealthy citizens not only you are saving up to 50,000 euros per year in taxes, but that since then the government will be giving interest for them. Or another way, the government is creating debt securities whose income paid from the proceeds of the tax.

When we look at the amount of the public debt reached by the different countries of the world, the folly acquires dyes dantean. In 2019, the public debt of the united states reaches the 20MM of dollars, the debt of the european union is more than 10MM and the debt of Japan reaches the 10MM euros.

The direct consequence of increasing public debt, is to create an income backed by the government and supported by the income public, as it could not be otherwise, tends to be part of the savings of the citizens richer.

It is a very burlesque in aggregate terms, as they borrow citizens with the money you save thanks to the reduction in taxation. Which can only benefit higher-income individuals, who see become a saving money that would otherwise have had to pay in taxes.

For example, the USA has a public debt of around 100% of *GDP*, indicating that the federal government has forgiven in tax their citizens richer approximately 20MM of millions of dollars, which is updated reach the sum of about 35MM of dollars. But the most serious thing is not that, what is more serious is that over pays you interest on them, which is already the top. What can argue economists who work for the private universities in the U.S. in order to justify such nonsense? Even worse is the situation suffered by Japan, whose government has a public debt build-up, which comes to 250% of its *GDP*, What can you justify a public debt as well?

When we understand that all of that public debt is the money that had been raised with the tax and when we heard economists who call themselves progressives who are in favor of further increase in the public deficit, then it is easy to understand the state of total madness in the one who has entered the economy.

**In summary:** you can't be justified in any rational way that the public spending that the citizens have decided to take together do not cover with money raised by the tax and have to resort to systematically debt to finance it. Therefore, it is desirable that public spending is always do with the money collected from taxes. On the other hand, any imbalance timely that the government is obliged to take recourse to debt, you should always be carried out with specific objectives and separately from the tax levy intended to finance public spending. For this reason, that it appears in the Constitution of Europe that the national governments can't have a bigger deficit 3% of *GDP* and are required to keep public debt controlled, it is always good news.

### **On the fiscal policy keynesian.**

In economics it is often called “the fiscal policy keynesian”, the increase in the public deficit, with the intention to avoid the spiral of savings in entering the private sector when there is the threat of a credit crunch, which has its own logic. Let us observe that, in aggregate terms, the policy Keynesian achieves two very important goals:

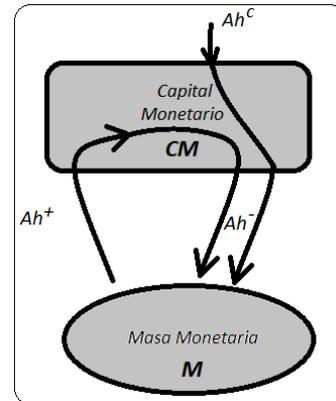
- 1) Returns the private savings to the economy, to borrow and to spend it.
- 2) Restores the growth of bank money who has stopped making the private sector, to keep part of the deficit spending with bank credit.

What is shown very clearly in the accompanying figure. There it is observed that the flow of savings  $Ah^+$  can be returned to the economy when the government borrows and spends way deficient. Not only that, the public spending deficit must be large enough so that, in aggregate terms, a party has to meet with bank credit. Only that way you can ensure that the flow of dissaving  $Oh^-$ , cubre savings, and the bank credit required for the growth of the economy. When we assume that there is no hoarding and  $Ah^S = 0$ , we have:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] = Ah^C > 0$$

In this sense, the policy Keynesian is ideal, as that government deficit spending is in charge of returning the part of the private savings that do not borrow the private sector, in addition to ensuring that bank credit is sufficient to ensure the growth of the money supply.

But it is important to be very clear that the public deficit is unsustainable at the time, at least in the quantities that are seen to take in the present (Japan already has a public debt of close to 2.5 times the GDP), because of the overall decrease of the tax rate to the income of the richest people, which aggravates the problem of saving instead of fix it up, and force, to what they call political keynesian, to maintain high levels of public debt unsustainable.



**In summary:** it is called fiscal policy keynesian policy that uses the public spending deficit to return the money of private savings to the economy. What would be an excellent idea, but it was because the increase of the public debt becomes unsustainable over time. In addition, the problem that creates the savings are compounded when the public deficit is because of a reduction of tax, as that contributes to the amount of money you save is larger than it would be without the implementation of the policy. We think, and so confirms the Financial Theory of the Growth, there is no reason to think that with an absurd reduction of taxes is going to avoid a deflation by excess savings.

### On the interest rate.

According to the Financial Theory of Capital, the interest rate is the benchmark used by the Capital Market to determine the price of capital goods, so that it would be very desirable that its value remains unchanged, and, if possible, above the 3 percent.

However, at present, central banks use the interest rate as the basic variable to control the amount of money that is created in the economy, so as to avoid both inflation and deflation. It is logical, as the interest rate makes it more expensive or cheaper to keep a bank loan, which is where all the money banking that exists in the economy. Therefore, the higher the interest rate, the greater the incentive to repay the credit and banking and destroy the money that was created with the credit. And the same thing will happen when you lower the interest rate of the loans, which will be cheaper to keep the credit with the creation of the bank money.

However, to manipulate the interest rate to control the amount of bank money that there is in the economy, it is no good idea because the value of capital goods depends inversely on the rate of interest, as stated by the three laws of capital. For example, according to the Law of Piketty, the value to the tendency to aggregate capital within an economy is:

$$K = \frac{\langle \alpha \rangle \cdot GDP}{i}$$

*Law of Piketty*

We see that when the interest rate is close to zero, the imprecision with which one determines the price of capital goods is very high. This can be easily checked by deriving the law of Piketty with respect to income:

$$\Delta K = \frac{\langle \alpha \rangle}{i} \Delta GDP \rightarrow \begin{cases} i = 5\% \rightarrow \Delta K = 20 \cdot \langle \alpha \rangle \cdot \Delta GDP \\ i = 1\% \rightarrow \Delta K = 100 \cdot \langle \alpha \rangle \cdot \Delta GDP \end{cases}$$

The expression tells us how much to increase the added value of the capital goods when increasing the income they produce, for a rate of interest concrete. You see very clearly that when the interest rate is 1% changes in the valuation of the capital are 5 times greater than when the interest rate is 5%. That is to say, when you lower the interest rate, the more uncertain will be the calculation of the value of capital, and the more unstable it will be the Capital Market.

**In summary:** The function of the rate of interest is to serve as a reference for valuing capital assets (assets that produce income) and must remain unchanged and higher than 3 percent. For this reason, you should avoid its use in order to make monetary policy with her.

### On taxes.

Here we will distinguish two kinds of taxes, those that are intended to fund the public services and those who are devoted to develop fiscal policy.

TAXES TO FINANCE THE PUBLIC SERVICES. The basic function of the tax is that citizens contribute, jointly and according to your income, the money needed to pay for the services that have been determined to be provided in common. We understand that the decision of what these are services of a public nature, is decided by the citizens, because here we assume that the political system by which society is organized is democracy. The universal, free education, universal health care and free access to justice is universal and free, are one example of the many services that citizens can access free of charge and that can be managed in a public way, and funded through taxes. Therefore, there is no justification for economic or political, that have to use leverage because the fund is insufficient to meet the public expenditure, thus violating the mandate citizen. When a government allows the spending deficit is because you are using your taxes to a different function of the financing of the common expenses, and, therefore, they are disobeying the citizens.

In that sense, it is a good idea that the tax rate on the income is progressive, so that those who most benefits obtained from the economic system, are also those that most contribute to keep it, as is reflected in the articles of the Constitution. Neither can be understood because reason is posed exemptions that alter the progressivity of the tax.

TAXES TO AVOID THE CRISIS OF CREDIT. Although the taxes should only be collected with the purpose to finance public services, and should not afford any exemption, what is certain is that they are ideal to avoid the excess of savings. The equation for the growth says very clearly that

the savings  $Ah^+$  has to be returned as an expense  $Ah^-$  to the economy, yes we want to avoid that the economy enters a recession:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \approx Ah^c(t) \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{|c|} \hline \text{Credit Crisis} \\ \hline \downarrow \\ \hline Ah^c(t) < 0 \\ \hline \end{array}$$

So a way that is very obvious to resolve the problem that is created when individuals save in excess without investment credit are sufficient to absorb it, is to penalize the income.

You have to understand that it is not possible to penalize directly saving because it is not possible to distinguish the savings of the investment, since both things are the same. The only thing that can be done is to penalize the income of a very progressive because, in aggregate terms, the savings is greater the higher the income (the Act of Saving Keynes). There's not much sense to encourage investment by the same, because it is not possible to distinguish the investment of savings.

The question may appear if you put a tax on extra income, very progressive, is what to do with the money raised. Since then, it should not be used to pay for the public services, since it was not with that intention so that it is raised. We think that the best thing is to devote them to grant credit to a negative interest rate for investments in sectors of interest, such as, for example, to the ecological reconversion.

**In summary:** it Would be desirable to separate the financing needs of the public services of the need to limit the savings to avoid a credit crunch. We think that you should not ever use the "extra" money raised with the fiscal policy to maintain or increase public spending, because that is not the reason for which the money is collected.

### On the rule of 2 percent inflation.

One of the most important affirmations that makes the Theory of Madrid is one that makes reference to the existence within a monetary economy of two types of distinct goods, consumer goods and capital goods, which are purchased in different markets. For this reason, it is important to note that when, in economics we speak of inflation refers only to the rise in the price of consumer goods, without taking into account anything that may be happening with the price of capital goods.

Despite the fact that there is much evidence that inflation is an autonomous process, which has little or nothing to do with the increase of the money supply, it is also true that an increase of the amount of money that the form of the money supply causes inflation of prices when it is not accompanied by a rise in the production. It is this last one, so it follows very clearly from the equation of growth:

$$\frac{1}{k_F} \frac{dPIB}{dt} = Ah$$

The equation predicts that when injected an amount of money in the money supply, the nominal power consumption of the economy increases. Part of the increase in the consumption will be real and will be as a result of the increase in the quantity of products purchased, but there is no doubt that the other party will only be inflation and will be as a result of the price rise. For this reason, when you want to avoid inflation, what it does is to limit the growth of the money supply, limiting the flow of credit, that is achieved by increasing the interest rate on the money.

But what is the level of inflation that should make you jump the alarms that advise to increase or decrease the amount of bank money that is created with the credits?

It is not easy to set a particular level, but an idea that does not seem far-fetched is to increase the bank money when the amount of credit when the rate of inflation threatens to fall below the real growth rate of the economy (at least, while the inflation rate does not exceed 3 or 4 per cent):

$$\pi \geq g \quad \text{objective monetary}$$

However, in Europe, the Central Bank sets an absolute level for the 2% inflation without taking into account the value of the rest of the variables, which makes no sense. We think that to be guided exclusively by the rate of inflation in the country can easily lead to wrong conclusions, and it is a folly that can cost very expensive for the country.

A BAD EXAMPLE. Let's look at the Spanish economy during the year of 2019.

GDP in 2019.....	1.244.757 M. €	}
nominal Growth 3%.....	37.342 M. €	
real Growth 2%.....	24.895 M. €	
public Deficit 3%.....	37.342 M. €	

*It looks very clear that it is an economy almost deflationary, in which inflation is running below of growth, indicating that it is injecting money in the economy.*

*The situation in Spain is complicated. On the one hand, Spain is required to limit public spending deficit to 3% of GDP by the Treaty on Stability of the EEC, and, on the other hand, the private credit remains scarce, most likely due to the accumulation of debt, which still dragged on since 2008. Be that as it may, the injection of cash from the public expenditure and private credit seems to be insufficient to meet the needs of growth of the Spanish economy, which is a crime against humanity when we observe that the country has a youth unemployment which stands at almost 30 percent.*

*Now, if you look at the balance of trade of Spain, it is found that Spain has surplus, indicating that Spain does not currently have structural problems that limit their growth. It is very evident that there is an unjustifiable lack of money that is hampering the growth of the Spanish economy because it should be going out money, surely, to make payment of the private debt, even more so when we see that the unemployment tour in Spain to 13 percent*

*There is No justification possible to stop the injection of cash into the hands of private banks spaniards, who, as the logical, they have their own difficulties accounting which forced him to prioritize his personal interest above the public interest. In this sense it is very clear responsibility*

to the European Central Bank to ensure that the money is injected into the economy of the European countries on the quantity required, without delegating this function in a banking system that can be “touched” and that it is impossible to develop this function.

If Europe wants to one day be Europe, so the European Central Bank will be the European Central Bank.

**In summary:** One of the functions priority of the Central Bank's monetary policy is to ensure that you are creating the amount of money necessary to maintain the economic growth. To do this, the most important criterion used by the Central Bank to know if you are creating the amount of bank money that is sufficient to allow growth, is to look at the value that achieves the rate of local inflation of the money. If I had to give a rule blind that follow, one that will not be able to do damage to the economy while the economic growth is not very large (<4%), it would be the following:

$$\pi \geq g \text{ Objective Monetary}$$

That is to say, “the central bank should make sure to inject enough money into the economy, so that the inflation rate  $\pi$  is above the real growth rate of the economy  $g$  when the growth is not very large ( $g < 4\%$ )”. The rule will only be able to give problems when the real growth rate is very high, so that it is interesting that the inflation rate does not exceed 4% or 5%, although the numbers are not accurate.

**On the problem of the liquidity of the Market of Capital.**

The Capital Market is very different from the Consumer Market. While the flow of trade within Market Consumption meets the monetary equation and need a specified amount in order to function, the Capital Market functions as a barter market where the money is an asset and where it does not need a specified amount in order to function. In this sense, the arbitration within the market makes it equivalent to a debt security to any other asset on the market, so that the amount of money that is within the Capital Market depends solely on the desire to savers have more or less money treasured as an asset, without which that amount has no relationship with a flow concrete exchanges in the market. Therefore, any liquidity problem that arises within the Capital Market does not have its origin in the lack of money to carry out the exchanges, but in the desire to keep part of the savings in the form of money.

When we look at the US, and in the year of 2019, the distribution of savings between the different capital goods, we can realize that the needs of liquidity in the Capital Market can get to be immense:

<i>capital goods</i> .....	120 MM
<i>debt added</i> {	<i>bonus</i> .....40 MM
	<i>capital monetary</i> .....10 MM
	<i>mass monetary</i> .....10 MM

YES, all savers, in a moment of panic, decided not to renew the debt securities and to maintain liquid savings, there would be no economy, not even close, enough money to satisfy the more than 40 MM of dollars that are owed. Even worse, since all capital assets are equivalent, savers may also wish to make liquid for the rest of the capital goods and the most 120MM who possess the americans should be exchanged for money, which would be clearly a problem without a solution, unless you act the Central Bank.

Unfortunately, the “flight to liquidity”, which is the name with which knows the situation that arises when all savers to sell their assets because they believe that its price will drop in the future, is a “self-fulfilling prophecy aspect” that can occur at any time, without reason that the widespread belief that such an event will occur. In fact, it is a phenomenon that has occurred countless times, in all countries of the world and in all ages, and it is inevitable that flies repeated, at least you put the remedy.

Regardless of the panic, stock market this more or less justified by the economic situation, the only thing certain is that a flight to liquidity, you can only stop if the Central Bank acts as the buyer of last resort, of very vigorous way, and while the panic lasts. Only by accepting to purchase all the titles that savers have been put up for sale may be avoided sinking its price.

*Very recently, in march of 2020, the problem of the liquidity of the Capital Market has grown to become clear very clear when in just a week, the IBEX35 fell almost 40% without the European Central Bank did nothing to prevent it.*

*Does it make sense that something like that happening? Does it make sense to collapse the economy of a country because the European Central Bank does nothing? Does it make sense that they vaporize the savings of the people (even if they are the savings of the rich) because of a clear situation of panic that nothing is different from the bank panics that hit economies during the NINETEENTH century? Why has not acted on the European Central Bank, as it has been done by the Federal Reserve in the united states?*

*The liquidity within the Capital Market is a very serious issue that can ruin a country of much more rapid and violent that a conventional war or a few atomic bombs. Yes the europeans want Europe to persist in time, it is necessary that the European Central Bank to intervene vigorously and to take care of provide liquidity to all the markets of Europe, without exception.*

All of this leads us to ask why the Central Bank is not responsible for providing liquidity to the Capital Market, not only in exceptional situations, when it is very clear that no one else can do it, but also in normal situations, when the commercial and investment banks do not seem to have any problem to provide liquidity to the market by granting credit.

Here we are going to propose the procedure to be followed by the Central Bank to give liquidity to the capital market all the time, preventing it from sinking, and that isn't speculate with it.

The “purchase guarantee” of assets.

The Central Bank should provide liquidity to the Capital Market by using the “purchase guaranteed titles.” The basic idea is that any holder of an asset that is traded in the stock can sell it to the Central Bank at a fixed price related to the price that you have at the time of the

sale. In particular, and as an example, the rule to follow by the Central Bank may be the following:

*“The Central Bank purchase any amount of the securities listed on the stock exchange, a 3% below the price that they had the titles a week before your sale.”*

Or otherwise, the Central Bank intervenes and purchase any asset whose price falls 3% below the price that was listed a week before. This simple rule will prevent for any panic in stock and will bring stability to the Capital Market in the same way that the guarantee of bank deposit eradicated the bank panics for many decades. The rule is complete with another rule that guides the sale of securities by the Central Bank:

*“The Central Bank will sell any title that possesses when its price is 2% higher than the price you bought it”*

This becomes a business to bring stability to the Capital Market. In fact, this is what the large institutional investors normally, and just stop acting so, before fleeing generalized to the liquidity, when the money we manage is insufficient. Let us observe, that the Central Bank will have losses with those titles don't get to catch ever the price at which it bought more 2%, because it does not come to be sold ever, but we believe that the losses will be compensated too many for the benefit of the 2% that gets those titles that have been recovered from the price and is to be sold. A business round.

The advantages of the existence of the “purchase guaranteed” are very clear:

- 1) Prevents the financial panic immediately, since the sale of securities for fear that their price goes down at a rate above 3% weekly, cannot be given. It is the same thing that happens when the Central Bank ensures the money of the bank deposits of savers, the banking panic no longer occurs because savers can be removed without loss of the money (although that does not prevent the banks continue breaking).
- 2) There is no danger of moral hazard because they do not choose a few specific assets, but those whose price goes down too fast and meet minimum requirements of transparency in its management, something that the Central Bank can always force it to be done through regulation.

Note that the only danger that faces the Central Bank is that you purchase the titles above its actual value, so that the difficulty “to ensure the assets” is to be found in the difficulty for the Central Bank to determine the Uncertainty  $\aleph_j$  of each of the asset that you purchase. But that is precisely what that tells us the Law of Piketty, at least in aggregate terms. According to the 1st Law of Robinson:

$$k_j = \frac{\langle r_j \rangle}{\aleph_j \cdot i} \rightarrow \begin{cases} \langle r_j \rangle \rightarrow \text{renta\_capital} \\ \aleph_j \rightarrow \text{Uncertainty} \\ i \rightarrow \text{rate of interest} \\ k_j \rightarrow \text{precio\_capital} \end{cases}$$

Where  $\langle r_j \rangle$  is the income of the capital good after taxes are paid. For a particular asset, if the market has valued exactly how a capital good either, the sharp drop in its price will be due very probably to the lack of liquidity in the market, so that the purchase of capital by the Central Bank will be successful. In addition, in aggregate terms, the Factor of Uncertainty is worth "1", so that the Central Bank can stop applying the rule if it considers that it is in a bubble because  $\bar{\kappa}$  is less than "1".

**In summary:** The Central Bank should be who is in charge of providing liquidity to the Capital Market in a transparent manner and stating when, how and where to intervene by buying securities. Except in limited circumstances, the amount of money that is retained as money capital (money) is very small, so that the liquidity of the Capital Market cannot be satisfied unless the Central Bank to act as a buyer of last resort, particularly in situations of panic. Here we propose that the Central Bank use of so permanent a specific mechanism, "the purchase guaranteed titles", to avoid any fast sinking of the bag (though, to be able to carry it into effect, it is necessary to prevent the free movement of capital).

#### **On the creation of money credit.**

When analyzing the privilege of the creation of bank money who has given the Central Bank to commercial banks and investment makes it very difficult to justify two things, a huge amount of money that they earn the banks thanks to the seignorage, and the immense benefits of giving liquidity to the Capital Market.

In addition, no one will deny, that states these benefits are united two other no less important. The first, the capacity of the banks to decide to which sectors of the economy directs the investment, to decide which sectors are granted credits and what not, which implies a high "moral hazard," which is also very difficult to justify. The second, the ability to manipulate the price of assets to have the capacity to grant loans to leverage in certain assets and not in others.

There is no doubt that lend money, and when it is money created out of nothing, a cost that must be borne by the one who receives the money and backs it up, and that very well may be collected by the interest rate of the money. But thus think of the credit, as if only it were a service that has to be paid, it is a mistake to egregious that it forgets the important role of credit in the current economies, as is the credit that directs the growth and its control enables you to control which sectors are growing and which sectors do not grow. The credit is like water in a desert region, and who manipulates is the one who actually drives the economy of the region. Therefore, it is necessary to separate the banking business of money creation, since both may have interests that differentiated without this having that reproach him to anyone.

In particular, what we propose here, is that the Banking System has limited the total amount of bank money that you can create to 25% of the value of the *GDP*, which is approximately equivalent to half the money you need the economy to function. Leaving the Central Bank with the responsibility of granting the rest of the credit, the other half of the money needed to keep the Consumer Market, according to political reasons and the environment.

**In summary:** it would be desirable to separate the “management” of the money of the “creation” of money, which currently make the commercial and investment banks must be separated by a function of the other. We propose to limit the amount of credit that can be granted by the banking system to no more than 25% of the *GDP*, which is approximately half of the amount of money that is needed for the Consumer Market to work, and let the rest of the credit granted by the Central Bank with political criteria.

The previous collection of affirmations is a summary rather consistent of the consequences of the financial theory of the capital and of the set of basic equations that describes the monetary economy, and that we think reflect quite accurately the problems and contradictions that create savings and credit. It should also be clear that, even though we have not built a theory of trade, all of the statements that have been made are still valid, both for open economy as an economy in isolation.

#### **4. THE PROGRESSIVE TAX ON THE CAPITAL OF PIKETTY**

Currently, the fiscal policy that is used in almost all the countries of the world to avoid the crisis credit reverts to the cash injection from the government deficit spending, which is often called “the policy keynesian”, but with the absurd added to lower the progressivity and the amount of the tax to the revenue with the idea of activating the economy, exacerbating the problem that creates the savings in time to fix it. This policy, while it is true that avoids a recession because you get to return the money that you extracted from the savings in public spending deficit, it has the serious drawback that increase without limit on the public debt accumulated, and with it, the cost of debt service (Japan takes more than two decades using this fiscal policy and public debt is now more than 2x the value of its *GDP*).

Fiscal policy is always accompanied by monetary policy, especially when the burden of the public debt is so high that it prevents the government continue to use the public spending deficit to absorb the savings. The Central Bank will resort to lowering the rate of interest of money, which decreases the amount and the payment of the interest, not only of the public debt, but also of the private debt. For example, from nearly a decade ago the rent you pay the public debt in the richer countries (Europe and USA) is close to zero or even negative.

Also this monetary policy is exhausted when the interest rate reaches zero, and although low cost that you have to maintain the credit, the private sector does not ask for credit for making investment. This is when the Central Bank uses monetary creation to buy the public debt, but even this mechanism collides with the limit of the amount of debt that it is possible to monetize and exhausts.

These three policies complement each other in a sequential manner. First it draws on the public deficit, then, when drains are used to lower the interest rate, and eventually monetize the debt, both public and private, leading the economy to the edge of the cliff, where “black cinema” will soon make its appearance. The Theory of Madrid that we have developed in these pages demonstrate, beyond any reasonable doubt, that these three policies are not sustainable in the time, and sooner or later will be insufficient to stop the credit crisis.

The underlying problem that currently have the economy of the rich countries is their desire of wealth, that is to say, the existence of an excess flow of savings that has no where to back up because the capital goods grow very slowly. According to the Financial Theory of Capital, capital goods are not created by the accumulation of savings, so the savings may very well be higher than the growth of capital, which automatically creates a credit crisis:

$$\Delta(\text{Flow of Savings}) > \Delta(\text{Capital}) \rightarrow \text{Credit Crisis}$$

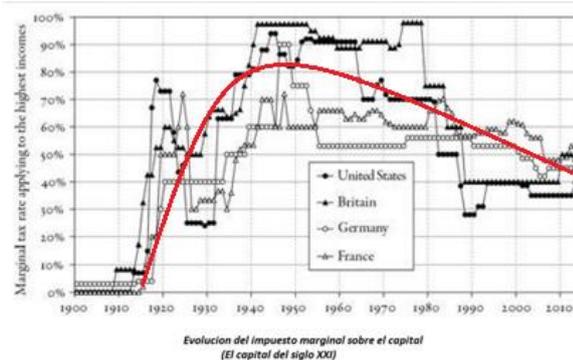
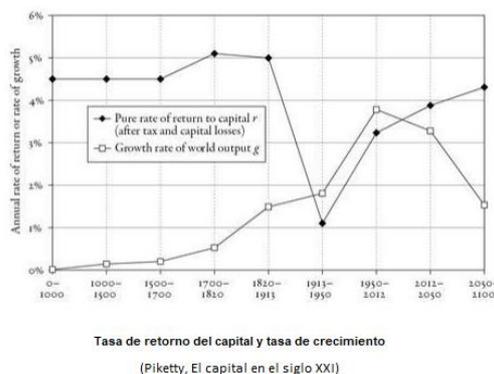
Precisely, the expression that is used as a criterion for determining when the economy goes into recession shows is the “Criterion of the Credit”:

$$Ah^C(t) - Ah^S(t) < 0$$

That says almost the same thing, because the difference between the flow of credit and the flow of savings is proportional to the new capital, creating the investment. Therefore, the only fiscal policy consistent is to do more progressive the tax rate to the income from work as of the rent, at the same time which raises its value for attacking that which is causing the problem, that is not another thing that the savings:

*“By increasing the marginal rate on income, both from work and from the income from the capital, limited disposable income and is limited to the amount of money that can be saved, attacking the substance of the problem, without diminishing by the growth”*

In the book, Piketty shows two graphs that clarify why the uplift of the marginal rate on income really solve the problem that creates the excess of income that is not spent. On them is show the evolution of marginal rate on income from capital, not including those that are applied on the income of the work, but the consequences of them are generalizable:



The graph on the left you can see the sharp decline that suffers at the beginning of the TWENTIETH century, the average rate of return on equity after tax, which passed the 5 per cent to 1 per cent after the end of the second great war to the mid-TWENTIETH century, due to the increase of the tax rate to the capital. From there, the curve shows very well how the rate of return on capital increases gradually, reaching levels close to those reached during the EIGHTEENTH and NINETEENTH century, because of the gradual reduction of the tax rate to the capital.

Along with the rate of return on capital, Piketty also shows the changes the tax rate to the capital, which allowed us to corroborate the Theory's Financial Capital beyond any reasonable doubt. In the graph to the right is the curve with the changes of the marginal rate on income from capital and inheritance taxes, and you see, quite clearly, the inverse correlation with the valuation of the capital goods that makes the dial. Notes, as the progressive rise of taxes on people with higher incomes initiated at the beginning of the TWENTIETH century, reaches the climax at the end of the second world war, and as from then on, the constant reduction of taxes on higher incomes, increase the value of the capital goods in terms of aggregates (we have over drawn in red the involute of the tax rates of the different countries for the sake of clarity).

The increase in revenues in the first decades of the TWENTIETH century served to finance the increase of social services, and also to finance also the preparations for the war that was coming, but the elevation of tax rate on income from capital and capital itself, did not prevent the impressive economic growth of the twenties, nor prevented the economic recovery of the united states during the administration of Franklin D. Roosevelt already well into the thirties. In the graph are also observed, "The glorious thirty years" have elapsed after the end of the war, which correspond with the top of the mountain of the curve on the tax rates, confirming that rates high on the income, instead of falling to capitalism, make it flourish.

*THE TEACHING OF THE ECONOMY. We can't stop pointing out that the loss of progressivity of the income tax coincides with the commendable work of propaganda carried out by economists working for the private universities of the USA started in the 70's, that not only did the government decreased the tax rates to the income from the capital, but also left captive and disarmed, the unions and associations of workers who defended and defend the wages of workers. Both facts together, make up the income of the richest people in the detriment of the less rich because they are poor people that each time they contribute more to pay it with their wages and the wages are slowly decreasing with respect to the income from the rents.*

*The direct consequence is the increase in savings and the increasing difficulty to return it to the economy when this is not growing fast enough. But not only were the taxes, it was the ideology that was to be transmitted from then on the teaching as economic science.*

*Little by little, the trade union, the policy of Franklin D. Roosevelt strengthened in the decade of the 30's, were becoming irrelevant in the united states, accused by the economists who work for the private universities of the USA to promote the unionized workers at the expense of those who were not union members, through coercion and violence:*

*"How can unions raise the wages and improve the working conditions of their members? The unions get their market power by making the legal monopoly of the provision of services of labor*

*to a company or a particular industry. Based on this monopoly, force companies to offer wages, benefits and working conditions above the competitive level. For example, if the plumbers are not unionized earn \$20 per hour in Alabama, a union may negotiate with a great enterprise of building a wage of \$30 per hour for their plumbers. However, the agreement is valuable to the union only if you can limit the access of the company to alternative offers of work. Hence, under a convention typical of collective bargaining, the companies agree not to hire plumbers that do not belong to the union, not to hire outside plumbing services and do not outsource to companies that are not unionized. Each of these measures help to prevent the erosion of the monopolistic control of the union over the plumbers who work for the company. In some industries, such as steel and automobile, the unions have tried to unionize the industry, in such a way that the unionized workers of the company do not have to compete with non-unionized workers of the company B. All of these steps are necessary to protect the high rates of salary from the unions."*

*Samuelson, 2002*

*Already entered the twenty-first century, Samuelson, the economist most prestigious of all those who have worked for the private universities of the USA, was teaching feedback so manifestly false on the trade unions in the text book university the most widespread of the world.*

However, unlike the justification based on the need to limit the savings that we have exposed here, Thomas Piketty justified in the "common utility", the desirability of a return to the progressive rate of the income that also functioned during the war and post-war. No one is spared, that the motive which underlies the proposed tax, which we do ourselves, is based primarily on practical considerations based on the desirability of avoiding the different savings that cause income inequality, while the background pattern that underlies the proposal of Piketty is fundamentally ethical turn in his argument to the spirit with which drafted the universal Declaration of Human Rights to try to justify it:

*Men are born and remain free and equal in rights. Social distinctions may only be based on common utility.*

*Universal declaration of the Rights of Man*

Without wanting to downplay the importance of the ethical motivation that pushes the proposal of Piketty, and we think that is enough by itself to be considered completely valid, here we make the observation that the urgent need to return to the tax rate of the immediate post-war period is more than justified by the undoubted decline that is going to cause in the private savings, what is going to avoid having to resort to public spending deficit and to go down to zero, the rate of interest of the money to prevent the economy enters a recession. Even more, when we already know that both of these policies, the public spending deficit and the decrease of the rate of interest, cannot be sustained indefinitely.

We believe we have demonstrated the undoubted "common utility" that you have to recover the progressivity of the tax rate to the income, regardless of whether from work or from the

income. Not only because the more benefits they get from the society must also be of the most help to keep it, but because they impede the savings, as we know, is a very progressive with the entry:

- 1) Limited and decreases the saving, preventing the credit crisis that causes the excess savings.
- 2) Makes the society a little less uneven and a little more fair, since it decreases the income of the richest with respect to the less wealthy, to make them contribute more to the maintenance of public spending.

What remains for us to analyze now, are the concrete consequences that have the proposal made by Piketty:

Progressive tax on the property			progressive Tax on the income	
Multiple of the average net	annual Tax on property	inheritance Tax	Multiple of the average income	effective tax rate of
0,5	0,1%	5%	0,5	10%
2	1%	20%	2	40%
5	2%	50%	5	50%
10	5%	60%	10	60%
100	10%	70%	100	70%
1.000	60%	to 80%	1.000	80%
10.000	90%	90%	10.000	90%

In the table below displays the tax rate proposed Piketty on the income, the sum of the from and the incomes of capital and labour, and on the possession of capital and inheritance:

- On the income, the sum of the income from work and capital.
- On the value of the capital.
- On the inheritance of the capital.

Let's analyze them briefly:

**The progressive tax on income.** *Piketty proposes a tax on the sum of the income from work and income, a very progressive and similar to that which existed in the immediate post-war period. So it seems that seeks to Piketty this rate is to limit the accumulation of capital by using the revenues from capital income, but without a work around that can be maintained in the capital already accumulated.*

Rates that are listed in the table are very similar to those that were in force during the Second World War, and 10 years later, and there is empirical evidence very contrasting that a tax of such features does not imply any threat to the growth of the economy and, therefore, of the capital. There are currently many countries, such as the nordic countries and France, in which the taxes on income are very progressive and have a public expenditure that exceeds 50% of

GDP, and it hasn't stopped it from being among the countries with the highest income in the world, then or now.

***Progressive tax on the inheritance of the capital.*** *Piketty proposes a strong progressive tax on the inheritance of the capital assets, which blends very well with the idea of abolishing inequalities that have their origin in the inheritance. That we all have the same opportunities, regardless of the wealth of our parents, leaving it up to our work and effort is the only thing that will reward you with an income different, an idea is very republican who takes a very wrong with the familial nature of the human being.*

The logic that employs Piketty is impeccable and difficult to refute when what is sought with an inheritance tax so heavily progressive is to equalize opportunities for all. But, a rate that you can get to eat 90% of the value of what we do not have any sense when we realize that the single death of our parents can plunge into poverty (relative to the disposable income that we had before their death). It is not logical that the parents spend all their income on the education and well-being of their children without any limitation, to deprive you of that education and well-being when we die. The equality of opportunity that we should enjoy all you can't depend on our parents to die prematurely, before that they may spend their wealth in the us.

They have neither sense nor logic. *A just society should not necessarily be an equitable society, and the rationality that is sometimes alleged to pursue equity is, many times, the site where they are hiding our most deep prejudices and our most profound irrationality.*

***The progressive tax on property.*** *The value of the rate proposed Piketty to record the accumulation of capital is so high that it eliminates any real possibility of accumulating capital in excess of about 100 times the average capital, that is to say, any accumulation of up to 20 million euros will be impossible.*

We think that a tax of those features is out of place, and it is going to be interpreted by the citizenry as a collections without sense. We think that such a tax is an error, and the citizens never going to let it put a tax rate of those features, regardless of whether they are poor or you are rich.

Piketty says in "Capital and Ideology" that the property tax has had a long history marked by controversy leading up to its implementation, because of the diversity of interest that is at stake. He says with so much success that the result is disparate from that struggle of interests, is what explains the different capital assets are taxed so differently, but all give the same income, and makes the acute observation that real estate always have a tax rate much higher than the assets listed on the stock exchange, probably because the economic elite did not generally keep your wealth in real estate or real estate assets. Tends to be the most disadvantaged in economic those who have little wealth to be saved in a home, but that observation, although very accurate, is hardly enough to justify the high and progressive rate proposed by the capital goods.

What we would like to point out in this discussion, prior to the exposure of an alternative proposal on a tax rate commensurate with the Financial Theory of the Growth, is that:

*The soul of the capital is the income that it produces. "The capital is the price they have assets that produce an income and its value will be negative when the income it produces to be negative"*

We think that the tax rates proposed by Thomas Piketty reflects the mistaken idea that they have about the nature of the capital, which he considered to be the result of the accumulation of physical savings, something that is completely false. Piketty gravel capital as if it were something physical that has been building up, not realizing that the large estates, such as the one that has Bill Gates, are a result of technological change, and not from any accumulation of physical capital that has been making Bill Gates with his savings. Bill Gates hasn't saved anything in his entire life, and the people as the living from the income produced by the capital that they have, but you never saved that capital (no one can save the fortune that has Bill Gates).

Try to prevent the entrepreneurs with a lot of talent (and a lot more luck, as the one that had Gates), to accumulate a wealth whose origin is located in the economic growth and the financial nature of the capital, and not in the savings or investment that you have been able to do as entrepreneurs, it is a collective suicide that may not be justified in rational terms. If you prevent the capital could be created are not going to create. When you prevent that you have the capital, or when you want to prevent is the formation of dynasties inherited, you must be careful not to kill the capital goods in the process, because they are the prize that makes the economy grow.

## 5. THE INCOME TAX AS A SOLUTION TO THE PROBLEM OF SAVING

We can distinguish three good reasons why it is desirable that citizens, businesses and institutions to pay taxes. The first, because the citizens want that many services are funded with the money that is contributed by all. The second, because it can be used in part to correct the inequality of wealth generated by the economy when left to their free will. Third, because it can prevent the credit crisis that causes the savings, making the tax is very progressive.

Precisely, for all these good reasons are mixed without discontinuity and without that it is easy to separate from each other, that is what Piketty says, in "Capital and Ideology", that the reasons justifying what to tax and how to burn is something that will always be subject to a strong social debate. In that sense, and without wanting to close the topic, we are going to present three ideas that emerge from the financial theory of capital and that we believe to be true:

- 1) The value of all capital goods in an economy is given by the expression:

$$K = \beta \cdot k_F \cdot M \beta = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i}$$

Where  $\langle \alpha \rangle$  is the participation of the income in the *GDP* after the tax, and  $\bar{x}$  goes “1” when the economy is growing in a stable way, what happens most of the time.

- 2) The tax rate annual net on a specific amount of capital goods, the sum of which falls on the income it produces and which rests on the fact of having them, must not exceed the value of the annual income they produce, because if that happens, the capital would not have any value for those who possess it. The equation that marks the limit in the aggregate, is:

$$A \cdot C_{medium} \cdot \gamma \geq A \cdot C_{medium} \cdot rate_{capital} + A \cdot C_{medium} \cdot \gamma \cdot rate_{income}$$

Where  $\gamma$  is the rate of return on capital,  $C_{medium}$  is the average capital per person and the product  $A \cdot C_{medium}$  is the amount of capital that is taxed. The expression we mark the amount of capital  $A \cdot C_{medium}$  above which, with a few tax rates concrete, the income that produces after-tax is negative and the capital will disappear in more or less time:

$$\gamma \geq rate_{capital} + \gamma \cdot rate_{income}$$

- 3) The capital that is acquired by inheritance should be considered as legitimate as the one that is acquired by the union, or which is acquired by the revaluation of the capital already existing. Therefore, the rate that you are put to the increase of the heritage should not depend on the concrete form which has acquired the capital.

Since we assume that any tax that is put to the inheritance, you must also put it on the saving is done, or the increase in the valuation of the capital that makes the market, our proposal does not envisage any rate that depends on the different source that comes from the increase in wealth, so to avoid the inequality of income coming from different inheritance, what we propose is an annual fee on the price of capital, so that for all practical purposes is equivalent to a tax on the inheritance.

Therefore, if we accept, as indicated by Piketty, that solely for the purpose of imposing a tax on the amount of capital, it is not to raise in order to pay for the public services, but to prevent to form dynasties that can be sustained indefinitely in time in the heritage of the capital, then the only source to finance public expenditure is a tax on the income.

The table below shows what we thought would be a tax rate reasonable:

Progressive tax on the property			progressive Tax on the income	
Multiple of the average net	annual Tax on the property	Tax on the increase*	Multiple of the average income	effective tax rate of
0,5	0%	0%	0,5	10%
2	0%	0%	2	40%
5	2%	50%	5	50%
10	2%	50%	10	60%
100	2%	50%	100	70%

1.000	2%	50%	1.000	80%
10.000	2%	50%	10.000	90%

\*Includes savings, donation, inheritance, and the revaluation

#### TAXES ON INCOME TO COVER PUBLIC SPENDING.

We start from the opinion, that all government spending must be paid only with a tax very progressive on incomes, from whatever source. In the table on the right are the different rates according to the total income of each citizen, the sum of wages and capital income. Is identical to that proposed Thomas Piketty, and assume that is enough to raise approximately 50% of *GDP*, which is the public spending in a country such as France (may not appear different subtleties that always has the practical implementation of any system of taxation, such as VAT or as a tax, because it is our intention to give you a general idea about the need to separate the tax for defraying the public expense, of those other taxes that they get to keep the savings, and who we think should be used for other purposes).

#### RATE ON THE AMOUNT OF CAPITAL IN ORDER TO AVOID THE ACCUMULATION OF WEALTH.

In the column on the left is the annual tax on the value of the accumulated capital. We observe a flat rate of 2% which is not progressive and that only relieve her of payment to those who have a capital of less than 2 times the average capital, which in France amounted to 400,000 euros in the present (capital half in France is 200,000 E).

The function of this tax is to prevent the accumulation of wealth. That's why, in the column farther to the right, in gray, is the equivalent rate of a tax on timely inheritance that would raise the same thing. That is to say, we can choose to put a rate on time to the inheritance, of 50% or make an annual rate of 2% on the amount of capital that it owns, with the exemption noted. In both cases raise the same, approximately (the calculation is not anything precise), but both rates would have approximately the same effect on the accumulation of capital proceeds of the inheritance.

To see that both of these rates are more or less equivalent, suppose that all capital changes hands every 30 years (people still do not live forever, and we assume that all capital is inherited or donated every 30 years on average). If we want to raise the same, with an annual rate on the price of the capital that what is collected thanks to a rate of 50% by gift or inheritance every 30 years (to prevent dynasties, as proposed by Piketty), then the annual rate on capital will be approximately:

$$(1 - x)^{30} = 0.5 \rightarrow x \sim 2\%$$

That is to say, a levy of 50% on the increase in wealth by inheritance, is equivalent to what is collected for 30 years to impose an annual rate of 2% of the capital (30 years is the time we assume that it takes all the capital in change of owner). In the table appears in the grey column.

Obviously, it is more practical to impose an annual rate of 2% on all of the existing capital (up to 2 times the average capital), riding the slope of who inherits what and taxing promptly any inheritance or donation with a single rate of 50% that will not be understood by the citizenry.

THE TAX ON THE INHERITANCE. A tax average of 50% of the value of any gift or inheritance, it will be very difficult for it to be accepted and understood by the citizenship (even for those who have less capital and are exempt from the rate), and we suggest that the collection is replaced by an annual rate equivalent to 2% on all of the existing capital. That will produce the same effect over time and will be much more understandable and a lot easier to pay to be distributed over a period of time of about 30 years.

People are born with a strong sense of protection towards our children, and we tend to make a big effort to accumulate wealth with the only intention to pass as an inheritance to our death. The people will not understand that they pay a deposit tax on the inheritance, and look for any trick to avoid it, something that can be achieved with relative ease that have a lot of money but that will be difficult to avoid those who don't have both. It is easier to evade a tax point in time that occurs in the donation or inheritance, a tax that was to last over 30 years.

We believe that the discussion does not have color.

Please note that the tax rate of 2% a year, which we are proposing, guarantee that any equity above 2 times the estate will be paid to the treasury department its own value in about 50 years, provided that the collection of the tax does not diminish the value of the property on which it is imposed (and the half of its value in about thirty years old when if it goes down):

$$50 \text{ years} \cdot \frac{2\%}{\text{annual}} \cong 100\%$$

That is to say, that the capital will be wiped out, in the aggregate, in about a century when you do not have in mind the revenue-producing capital goods. But given that the tax on the income also includes income and are strongly progressive, it will be very difficult for the great fortunes can perpetuate itself through the savings of the income that you get your wealth, so that the previous figure of 100 years will be significantly reduced. You can only benefit from the inheritance spent on consumer goods, which annihilates the capital and prevent the dynasties.

To view it, you just have to calculate the effective rent, which produces an amount of capital to its owner once deducted the tax. The expression:

$$A \cdot C_{\text{medium}} \cdot \gamma \geq A \cdot C_{\text{medium}} \cdot \text{rate}_{\text{capital}} + A \cdot C_{\text{medium}} \cdot \gamma \cdot \text{rate}_{\text{income}}$$

We mark the limit at which the income will be negative for its owner because you will have to pay in taxes, the more money you charge for rent. This happens approximately between 2 and 5 times the average capital current of a country such as France, as reflected in the accompanying table:

Effective rent of capital			
Multiple of the average net	annual Tax on the property	effective Rent of the capital $\langle \gamma \rangle$	Time of the annihilation of the capital (years)

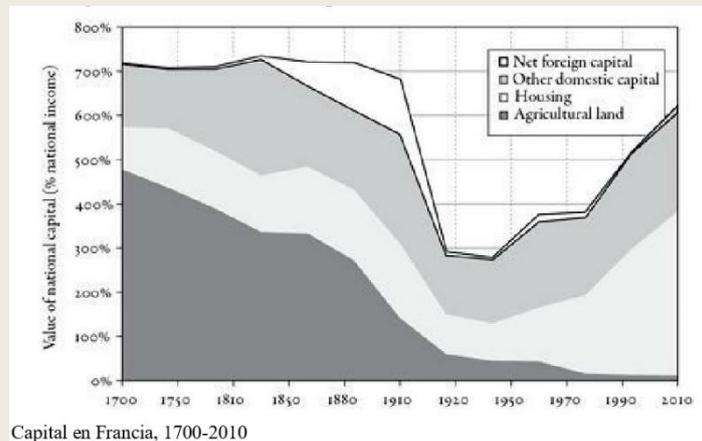
0,5	0%	to 2.7%	-
2	0%	1,8%	-
5	2%	0,5%	-
10	2%	-0,8%	300
100	2%	-1,1%	160
1.000	2%	-1,2%	111
to 10,000	2%	-1,7%	80

To obtain it, we have assumed an average rate of return of the goods of capital of 3% (a figure is very consistent with an economy of slow growth as the current), and used the following expression:

$$A \cdot C_{medium} \cdot \langle \gamma \rangle = A \cdot C_{medium} \cdot (\gamma - \gamma \cdot rate_{income} - rate_{capital})$$

Of course, it is possible to raise the tax rate on the annual capital above 2% without any problem, but it is not a good idea to do it progressive because the tax on the income that is produced in the capital is already sufficiently progressive.

**The Curve of Piketty.** We have already mentioned that there are many reasons to give to Thomas Piketty the Nobel Prize. Without being the most important of them all, we like to point out the curve that shows the evolution of the value added of capital in relation to the GDP of how one of those reasons.



In fact, as we demonstrate by making use of the Financial Theory of Capital, the “hole” that is observed in the curve is a direct consequence of the increase in taxes on capital income, so that simply returning to the tax on the income you had in the post-war period it would return immediately to the valuations of capital, which is observed in the graph of Piketty and that are in the environment of about 4 times the GDP. Obviously, well below the valuation of the capital today.

If, in addition, the increase in the progressivity of the income tax is complete with a tax on the possession of any type of capital of 2% per annum, the value of the capital would fall even more, and prevent almost completely the existence of dynasties inherited.

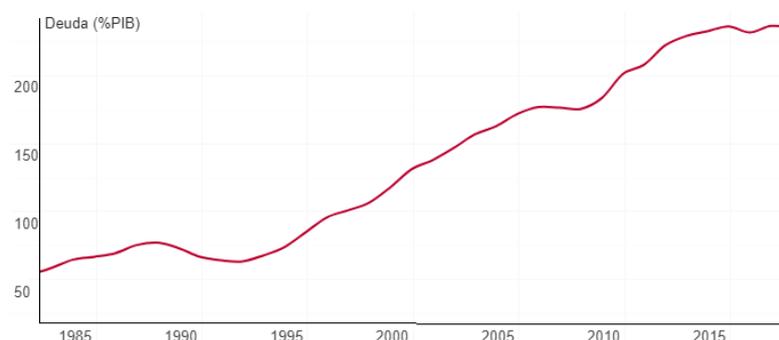
*Thomas Piketty proposes to allocate the proceeds of this last tax (2% on the annual value of the capital goods that you possess), to provide a minimum equity to all young people when they reach 25 years of age, regardless of their income or the wealth that you already have, something that is very difficult to not be in full agreement.*

## TAXES ON INCOME IN ORDER TO LIMIT THE SAVINGS

It has already been shown that the reason why the economy enters a recession is because the flow of credit becomes negative and starts to destroy money out of the economy, or if you prefer, because the savings will extract more money from the money supply that is returned with the deficit. When the technological momentum stops, the investment credit is stopped also, being then inevitable that the savings will treasure and finished causing a decrease of the *GDP* that is fed back by becoming a credit crisis.

The fiscal policy that remains in the present to solve the problem, which uses the public spending deficit to absorb the savings and return it to the economy as spending, is a solution that can be maintained while the amount of the debt and the payment of the interest does not become prohibitive, which ends up happen sooner or later, even when you lower the interest rate. But, although lower the rate of interest of money relieves the payment of interest and allows you to continue to keep the deficit spending of the government, becomes unstable to the valuation of capital goods, so it cannot be kept low in a long time. The policy keynesian, in the best of cases, it is a point solution which is not sustainable in time.

Consider, for instance, what has happened in Japan. There, the rate of interest is close to zero for decades, and is the public spending deficit who is returning the savings made by the private sector. In 2020, the public debt japanese reached 250% of *GDP*, probably the highest in the world, and sooner or later will be unsustainable even for Japan. In addition, an interest rate close to zero does increase the price of the asset up to stratospheric heights, causing instability in the valuation that makes the Capital Market. Both situations will, sooner or later, that disaster is inevitable and the japanese economy to sink.



In the attached figure is observed the increase in near-constant of the public debt japanese from the decade of the 90's, showing at the same time so very conclusive that the private saving is proportional to the *GDP*, as suspected Keynes. We know that, within an economy in isolation, the sum of the debt of public and private savings is zero in the aggregate, when there is creation,

banking, and the evolution of Japan is left approximated very well by an economy isolated that it is not growing or grows very slowly. If we assume that the debt comes from the savings of the Japanese and very little of the money creation, then:

$$\begin{aligned}
 \text{public debt} &= \int_0^t Ah(s) \cdot ds \xrightarrow{Ah=\tau_s \cdot GDP} = \tau_s \cdot \int_0^t GDP \cdot ds \xrightarrow{GDP(t) \sim \text{constant}} \approx \tau_s \cdot GDP \cdot t \\
 &\rightarrow \frac{\text{public debt}(t)}{GDP(t)} = \tau_s \cdot t
 \end{aligned}$$

It responds very well to what is observed in the graph, suggesting that the savings have remained proportional to the *GDP* as we have assumed. This allows you to easily calculate rate of annual savings from the Japanese that has been absorbing the public deficit in half. Assuming that the Japanese economy has grown very slowly, as in fact has been happening these past few decades:

$$\frac{\text{savings}}{GDP} = \tau_s \sim 10\%$$

It is very clear that the situation in Japan is absurd by unsustainable. The public spending in Japan has been absorbing the private savings that have been doing the Japanese (probably to pay the mortgage debt), and has been returning to the economy, avoiding deflation. The net result of the process has not been the transfer of private debt to public debt as usually thought, but the maintenance without the sense of a flow of savings of 10% of *GDP* at the expense of the public debt, without which you know that you have spent about 10MM of euros owed by the public sector.

**THE PUBLIC EXPENDITURE.** *It is very clear that the role of public spending is to pay for the public services that citizens have decided that you assume in a common way, and it makes no sense to use it for absorbing the private savings to doing what is known as fiscal policy Keynesian, even when the public spending deficit can be paid with money made of nothing (don't change nothing to the problem that creates the excess of savings).*

What we propose here, is to make a progressive tax on the income in order to limit the savings, but separating in a very clear way the financing of public expenditure in the fiscal policy designed to avoid a credit crisis, in such a way, that the rate that will be used to finance public expenditure is clearly differentiated from the rate that is used to carry out fiscal policy. We think that public spending must be funded with the money collected from income tax, and without having to resort to deficit, while, to solve the problem of saving, what we propose here is that the Central Bank, based on the analysis of the economic situation, point-of-way to separate the annual amount extra that must be raised to reduce the savings glut that threatens to sink the economy.

Specifically, and since the savings depends on your income and what we assume is proportional to the *he* (The Act of Saving Keynes), the rate should be progressive with the income. There is, therefore, no reason why you have to be different to the rate that is already being used to finance public spending, and what we propose, in fact, is that it is the same.

The table below sets forth the proposal:

<b>Tax the capital</b>	<b>income Tax, the income</b>	<b>Tax savings</b>
------------------------	-------------------------------	--------------------

Multiple of the average net	annual property Tax	Multiple income average	effective tax rate of	Multiple of the average income	effective tax rate $\varepsilon$ *
0,5	0%	0,5	10%	0,5	$\varepsilon \cdot 10\%$
2	0%	2	40%	2	$\varepsilon \cdot 40\%$
5	2%	5	50%	5	$\varepsilon \cdot 50\%$
10	2%	10	60%	10	$\varepsilon \cdot 60\%$
100	2%	100	70%	100	$\varepsilon \cdot 70\%$
1.000	2%	1.000	80%	1.000	$\varepsilon \cdot 80\%$
of 10,000	2%	10.000	90%	10.000	$\varepsilon \cdot 90\%$

- The parameter  $\varepsilon$  is a positive number that decides the Central Bank, according to the situation.

The parameter  $\varepsilon$  is a positive factor that decides the Central Bank sufficiently in advance, and depending on the economic situation. The first table is the proposal for a tax on the capital, which is discussed later, but that has nothing do with what we are dealing with now. The second table shows the rate usual, which is imposed upon the income, regardless of its origin; it is the collection that is used to pay the cost of public services. In the third table shows the tax that we propose to reduce the saving; it is a tax equal of progressive tax usual on the income, but that does depend on a parameter  $\varepsilon$  that changes as you change the general economic situation.

We think that the money raised with this ultimate tax, doesn't need to go never to finance public expenditure, since the role of the tax is to reduce the amount of saving those who have more income. Therefore, it should be used only to promote private investment and private spending of those who do not have sufficient income to do so for themselves.

**PART VI**  
**THE POLICY FISCAL**

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4 march of the year of 2021

### 1. THE THEORY OF MADRID.

We have used the previous chapters to respond in very concise way to several of the many basic questions raised by the monetary economy since its origin:

- The nature of money
- The basic equations that govern within a monetary economy.
- The formation of prices in the Consumer Market.
- The financial nature of the Capital.
- The formation of the prices in the Capital Market.
- The Financial Theory of the Growth.
- Causes of the credit crisis and change.

All this, based implicitly on three principles or postulates very simple about the nature of money:

1st Postulate. The amount of money is preserved in the trade of buying and selling.

2nd postulate. The amount of money meets the monetary equation, where  $k_F$  is the constant of Fisher:

$$k_F \cdot M = PIA$$

3rd Postulate. All the money in the economy is bank money, that is created when it is granted a credit.

Although we do not ignore that we have left without studying aspects of vital importance as the influence of public spending, we believe we have developed a theory sufficiently complete and accurate, and with sufficient predictive ability, as to analyze with precision the consequences of the decisions that are made daily in the field of political economy. In this sense, we believe that we have successfully completed the main goal that we have been moved to write this treatise on the monetary economy, which has not been another pointing to the mathematical structure underlying so-called free-market economy and of the limitations that this imposes on our way social organizing.

In particular, we think that it has shown, beyond any reasonable doubt, that within a monetary economy there are two markets are very different in nature, where they are bought and sold

two types of goods is also of a very different nature: *consumer goods and capital goods*. We think that we have also demonstrated, beyond any reasonable doubt, how the Principle of Asymmetry, the Financial Theory of Capital and the Theory of Bank Money together to explain together to one of the equations, the most notable of the economy, the Equation of Growth:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \quad (Eq. Growth)$$

Equation, we can obtain a vision that is very comprehensive and accurate account of the cause of the credit crisis and the crisis of change, at the same time he points out to us the best way to avoid them.

Arrived up here, now summarize by way of brief collection, the set of assertions that we have been fashioning little by little throughout the chapters of this treaty, and that we have named as The Theory of Madrid. The intention of the summary is to present the new economic paradigm and the set of the general lines of the monetary and fiscal policy to advise you to follow the monetary authorities to get out of the impasse that has dragged us to the loss of progressivity of the rate of tax to income, the absurd and growing public debt and the absurd interest rate close to zero that lends the money.

The purpose that has guided the development of this treaty has not been another to denounce the ridiculous and dangerous economic paradigm propagated by the economists who work for the private universities of the USA, who are advising the public debt, without justification, that advise on reducing the progressivity tax increase income inequality, which advise to lower the interest rate to zero that elevate the valuation of capital assets to carry the bags all over the world to a disaster foretold, but above all, the purpose that guides us has been to denounce the dangerous silence that saved have about who made the money in the shade, that there are no other investment banks. Are these american investment banks that out of whack with their loans in dollars to the real economy from the rest of the countries of the world, who neither have nor can have, a currency strong enough to meet them. Have been the us investment banks responsible for the asian crisis or the Russian crisis, or the crisis of 2008, although to do that they needed the cooperation necessary from the Federal Reserve.

## **2. THE NEW PARADIGM OF THE THEORY OF MADRID.**

### **On the nature of money.**

The definition as usual, which makes the economics of money is quite imprecise and inaccurate. For example, the book university of macroeconomics of more global spread, the "Samuelson", defines money as... *"everything that serves as a medium of exchange of common acceptance"*. Another definition is very common, not more clear, but perhaps a little more redundant would be:

*“Money is any asset or well-accepted universally as a means of payment for the exchange, and also performs the duties of being a unit of account and a store of value”*

Is redundant because “being a unit of account” and “deposit value” is the direct consequence of “to be accepted universally as a means of payment” and, however, the definition remains vague because “to be accepted as means of payment” lets us know that is what you are using as money in an economy, but it does not tell us if we are really in a monetary economy, that is to say, if it really is money. For example, there is evidence that, during the Second World War and in the concentration camps, the prisoners used the cigarettes as a universal medium of exchange, but it is not clear that they really be able to say that he had a monetary economy within the fields. Another example that shows that a definition so vague of money is insufficient to characterize show him some countries today as the Republic of Cuba, where it is very clear that there is money and it is very easy to identify, but where it is not at all clear that there is a monetary economy.

Therefore, in the Theory of Madrid, we define what is a cash economy, while also defining what the money is for, so that both concepts always go together:

DEFINITION OF THE ECONOMY AND MONETARY POLICIES. *It is said that an economy is a monetary economy where there is a well that you can purchase any other goods or service for sale, and the total quantity of which  $M$  meets the monetary equation:*

$$k_F \cdot M = \sum p_i \cdot q_i = PIA$$

*The monetary equation tells us that the value of money does not come from the material of which this fact, but the relationship that exists between the amount of money that exists and the cash flow from the purchase and sale, or PIA.*

That is to say, what characterizes a monetary economy is the existence of the money, which as defined implies the fulfilment of a quantitative relationship, measurable, and nature that, in the aggregate or statistical:

- 3) There is a universal good, the money you can buy any good or service offered for sale.
- 4) The amount of money  $M$  meets the Monetary Equation, where  $k_F$  is the constant of Fisher:

$$k_F \cdot M = \sum p_i \cdot q_i$$

The definition characterizes what the money is for, as well as the monetary economy in which they exist.

**In summary:** money is not only “what” that allows us to purchase any good or service that this for sale within the economy, but it is also the character that prints to the economy in which it is used. We say that an economy is a monetary economy when it exists, and use the money. Throughout the story, and dfrom the most remote antiquity, have been used countless things as money. From the gold, the commodity to be known that it has been used as currency, until the tobacco or the salt, being the essential feature of all of them, the true fact, that its value

comes not from the value of the commodity itself that is used as money, but that the flow of purchases meets the monetary equation. In fact, it is the monetary equation which indicates the social origin of the value of money, to relate the amount of money with the maintenance of the exchange flows within the economy. In the present, which is mostly used as money is the “bank money” is created when it was granted a loan (and are destroyed when it returns), and its value comes from that verifies the monetary equation:

$$k_F \cdot M = \sum p_i \cdot q_i = PIA$$

### On the money credit.

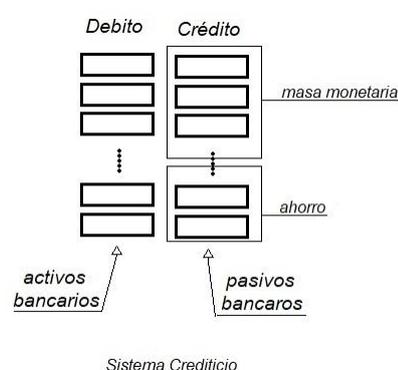
What makes money in the monetary savings current is the bank money created by banks when granting a loan. The public authorities-and, therefore, the citizenship has been granted to the commercial and investment banks the privilege of creating money, necessary, subject to some concessions.

It is not difficult to prove that the money is created when it was granted a credit, that's what we call money credit or bank money, and in this sense, who are creating the money really is who gets the credit, since he is the one who supports it, and promise to return it or pay interest while not return the item. The bank is only responsible for the alternative, and that is why it can fail, because your estate is insufficient to endorse all the money created. For example, the money created by banks in the united states is more than 20 million of million of dollars, clearly far superior to the backing assets of the banks.

In the attached figure shows the result of the process of creation and destruction of bank money through the granting and repayment of credit.

When they grant a loan, the bank creates two entries, or records, one that reflects the amount of money provided by the bank (which is used from then on as money), and another that reflects the money that is owed to the bank (is an asset of the bank, but it is not money, nor can it be used as money). Obviously the sum of all the records of all the banks must be always zero, indicating that all the bank money that is being used in the economy is a debt of someone (even the bank money used by the central Bank).

When it returns a credit, the opposite happens, and the money is destroyed. The bank settled the record where this annotated to the debt (the log on the left in the figure) and deletes the record that contains the money has been returned (it is the registration of the right in the figure).



Calculate the amount of money that is necessary to create to run an economy is not difficult. Using the monetary equation, and giving the constant Fischer a value of 2, we have for the 2019 and for the USA:

$$k_F \cdot M = GDP \xrightarrow{GDP=20MM \text{ and } k_F=2} M = 10MM$$

In current terms, the 10MM manufactured during the last 50 years, it's worth a few 35MM dollars, to which we must add the other more 10MM of dollars have also been produced and are used to keep the international trade, which raises the updated value of the money made only by banks in the USA to about 70MM of dollars at current prices.

The problem, or the great advantage, of bank money is created as debt that has to pay interest while not returned, and therefore there is a strong incentive to return and destroy the money created. It is a great advantage because the flow of interest paid by maintaining a credit prevents that the banks can create too much money and cause an inflationary process. And, it is a great disadvantage because there is a strong incentive to return bank loans, destroying the money and causing a deflation of prices, which, in times of recession, ended in a credit crisis or a crisis of change.

To sustain the balance of the amount of money credit is the magic that holds the monetary economy of which we are born, we live and we die more than 8,000 million people. The cash credit is, perhaps, the biggest exhibition of the genius of our society, or, perhaps, is the biggest shows of his recklessness, without it nothing is easy for the authors to take a position on the matter. However, we are inclined to think that the money credit, we know that it represents a debt that must be repaid, features many more advantages than disadvantages despite the fact that it is very easy to prove, so we believe we have done in the Theory of Madrid, which is his existence, which condemns the economy to suffer a crisis loan on a periodical basis.

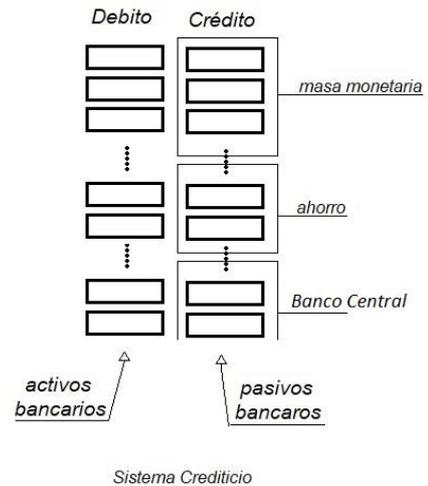
**In summary:** What you are using today as money is the bank money, that is created when banks provide a credit, and are destroyed when it is returned to the credit. The essential nature of bank money is to be a debt that supports who assumes the credit, while the bank that granted the credit is only a responsible alternative. The great advantage of money credit lies in that they can grow and adapt to the needs of growth of the economy, in addition to being the whole of the whole of society who supports it, but it has the major drawback that can be destroyed when no one wants to take the credit and payment of interests.

### **On the money created by the Central Bank**

It is important to understand that the Central Bank cannot create money banking by itself, and that only the commercial and investment banks have the privilege to create money when they make loans.

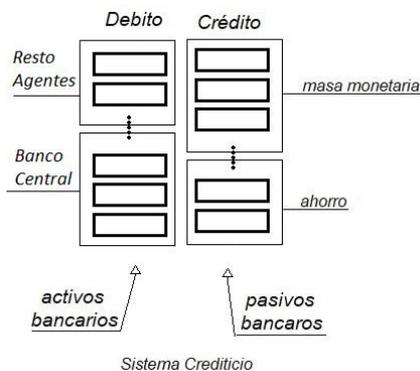
The attached figure shows us again the process of creation of bank money, that is same you need to follow the Central Bank to get money:

- 4) The Central Bank requesting a loan to the banking system, and this creates the money as a credit, that in nothing is the difference with the credit that is granted to an individual.
- 5) The Central Bank has, since that time, two records in the Banking System, one that indicates the amount of money that the Central Bank should be to the Banking System, and another where it appears the money that the Central Bank can afford to spend.
- 6) Once the Central Bank has been granted the credit (which you cannot refuse any commercial bank or investment), you can spend it on the purchase of assets (capital goods), you can lend to commercial banks or investment that so request or you cannot do anything with him, which is not usual that happens, (the Central Bank tends to be forbidden to buy consumer goods such as, for example, a front porch red).



It is observed that the Central Bank is like any other user of the Banking System, with the only difference that the Banking System does not reject their requests for credit, and is the Central Bank and not the Banking System that decides what interest rate you pay on the money borrowed (it is as well as regulates the interest rate of the market, paying to the others the money that you borrow at the interest rate that the same pay).

The overall result of the action of the Central Bank is presented in the attached figure:



3) The Banking System is preserved as an asset the amount of money credit that has been created for the Central Bank and that they should (they are bank reserves, which sometimes used the charge of the banks to limit the amount of money a bank can grant each bank).

4) The Central Bank can buy capital goods with the money that you send to create for him, or you can lend it to banks to pay off the bad loans that are not returned in exchange for the interest that he pays

for the money. In both cases, the money becomes part of the mass economy as the rest of the money, while the Central Bank remains as a debtor more of the banking system (the reserve).

The money spent by the Central Bank is money credit that is no different from that of the rest of the money credit. What makes money is unique (can't have two coins).

**In summary:** The Central Bank is a user most of the banking system and any amount of money that manufacture the banks for him, it appears on bank records as a credit more. The Central Bank is not the one who actually creates money, but if it is who set the interest rate when the mism9 says what interest rate you pay on the money they lend to the banks, although in the

textbooks written by the private colleges who are studying economics around the world say that they are the ones who make the money.

### **On the Banking System.**

The Central Bank does not make any money, but if you have the function of regulating the amount of money that can manufacture commercial and investment banks. Along the evolutionary process that has brought the economy to move from the use of metallic gold as money, the use of bank money (the bank records and notes), governments have been gradually changing the mechanism to limit or enable the creation of bank money by private banks. Currently, almost all central banks use the interest rate to get the bank money is created in the amount necessary to sustain the growth of the economy, while historically, it has been through the use of bank reserves (the debt owed by the Central Bank) as it has limited the amount of bank money that can be produced within the economy through the credit.

It is not very difficult to understand that there is a terrible confusion among economists with regard to what makes money in the present, as it has been in the gold and silver metal up to the current bank money without anything easy to establish a dividing line that mark the change from one system to another. If you need to put a dividing line in the last 500 years, it is safe to be put in the creation of the Central Bank, because it is at this time when the bank money (the ticket banking convertible into gold) is the official currency that allows you to buy any thing for sale within a country.

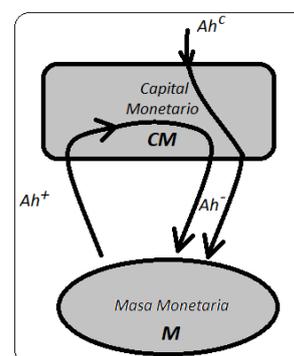
Therefore, when you listen to the economists who work for the private universities in the US say that money makes the Central Bank, we can easily understand that it is the banks and the banking system that is trying to protect by keeping your work in the unknown. It is also easy to understand why it is a private bank of Sweden who has the privilege of awarding the peace Prize. The one and the other only to the economy to make progress and find out which are the investment banks that cause the credit crisis and currency crises.

**In summary.** Are banks commercial and investment that make money banking and not the Central Bank. That is very danger for the entire economy, especially the investment banks that create money credit to the leveraged purchase of financial assets. Since then, the Central Bank sets the interest rate of the loan, but does not control the amount of bank money in the economy, especially one that is made for the purchase of assets in a process very similar to the *Quantitative Easing* that we have seen them perform to the Federal Reserve, with the difference that the Federal Reserve intervened giving liquidity to avoid that is to sink the price of the assets, while investment banks expect the asset price to sink before you buy them with money created out of nothing and without any risk.

### **On the Consumer Market and the Capital Market.**

One of the most important consequences that have the use of money in the society is that it divides all the goods that can be purchased in two categories differences, the goods that are consumed, so-called consumer goods, and assets that generate income, so-called capital goods.

In particular, the consumer goods are easily identified with those goods or services they produce in the companies with the intention of being consumed, which are almost all, and in which they also include physical goods with manufacturing companies. While capital goods are identified with the goods that you have the essential feature of producing income, as are the companies that produce consumer goods. For example, are capital assets, the companies listed on the stock market, the housing, or natural resources, ... that is to say, those goods whose main function is to produce other goods.



Capital goods are bought in the Capital Market, while consumer goods are bought in the Consumer Market, being one of the most essential features of a monetary economy that both markets set the prices very differently and are, therefore, very kludgy.

In the attached figure shows the two markets and the monetary flows that move between the two, being  $Ah^+$  the flow of savings that comes from the Consumer Market and  $Ah^-$  flow deficit is spent on the Consumer Market. While  $Ah^C$  is the flow of money creation, which in the current banking system is done through the granting of credits. That is the reason why, in the figure,  $Ah^C$  comes from nothing. The two flows that relate to the Consumer Market and the Capital Market, the saving and dissaving tend to be very stable in time, so that it can be said that the amount of money that there is in the one and the other market is relatively constant. Very different is the situation that is created by the flow of credit, that the intervention of the Central Bank or the intervention of the commercial and investment banks can do to change very quickly.

The money is used to buy on the Market of Consumption is the money that shape the supply of money  $M$  that appears in the Monetary Equation. While the money is stored in the Capital Market what we have called the "capital" money. It can be said that the two forms of money, the money of the money supply and the money gained, are very different from one another, despite the fact that both types of money are indistinguishable from one another, being both, bank money.

**In summary:** The use of the money divides the assets that exist within a monetary economy in two types differentiated, consumer goods, those goods that are produced with the intention of being consumed, and the capital assets, which are assets that produce income. Both goods are purchased in different markets, they set the price in a different way and are very decoupled (in the sense, that the monetary flows between them are very stable because it comes from only of saving and dissaving).

### On the Consumer Market.

The question that led to becoming the economists for at least 2,000 years, without receiving a response that is consistent, is how to set the prices of consumer goods. In part, the lack of a scientific theory to explain how prices are set within a monetary economy has its origin in that economists do not even agree on what a Theory of Prices is and is complete with the confusion that exists about the variables that depend on the economy.

Therefore, in the Theory of Madrid begins by stating that give an explanation on the prices is equivalent to prove that other economic variables depend on the prices and quantity of goods, which we understand are the two basic variables is necessary to explain in a Theory of Prices. It can be shown, and thus in conditions very general, that the prices are fixed when the vendors to secure the benefits that you obtain from the goods they produce. Also it can be shown, and thus in conditions very general, that the quantity purchased of each of the goods is decided by the buyers when they pass their income, according to their consumption preferences. This bond, between the prices and the benefits, on the one hand, and between the amount of goods and consumption preferences, on the other, is what we call in the Theory of Madrid, Principle of Asymmetry Buyer and Seller, complete with a set of statements of great importance, as the Beginning of Inflation and the Beginning of Closes.

In this sense, the Theory of Madrid follows the ideas of the Italian economist, Piero Sraffa, supporting all of the conclusions reached in his book “the Production of goods for other goods”, in particular the one that states that prices are set within a monetary economy for structural reasons, but filling in the gaps left without explaining their exposure. However, the theory official propagated by the private universities of the USA in the textbook says that the price and quantity produced of each good or goods are determined by the interaction between supply and demand, because, among other things, the supply and demand are the same thing and alone in the universe created by the imagination of economists, can be separated and can be defined separately. In the reality that surrounds us this is not possible, and everything that you purchase is also sold.

**In summary:** The price and the quantity sold of each of the goods is fixed by the “Principle of Asymmetry Buyer Seller”, which states that *“the prices are fixed when sellers decide the benefits derived from the sale of what they sold, while the quantity produced of each good is fixed when buyers decide how much of each good buy”*. The beginning has some far reaching consequences in the productive economy and shapes the social structure in which we live.

### **On the Principle of Inflation.**

One of the most important consequences which are deduced from the difference that exists between the decision to buy and the decision to sell, the name in the third chapter of this treaty as the Beginning of Inflation. The principle of inflation states that, *“in the aggregate, the price of the goods or services can only go up in price, and can never let down”*, because when you try to lower the price, what happens is that it decreases the number of goods that are sold, but not the price, that is to say, before the economy enters a deflationary what happens is that the tissue is destroyed.

Let us observe that the monetary equation asserts that it takes a specific amount of money to keep a flow of concrete exchanges:

$$k_F \cdot M = \sum p_i q_i$$

It is very evident, then, that a decrease of the amount of money in the economy will cause, according to the monetary equation, or a price reduction or a decrease of the production, or both at the same time. But it is not difficult to show that in the case of a decrease in the amount of money, it will be the production to decrease, and not the prices. This is what is stated in the Beginning of Inflation, the price of the goods cannot lower in the aggregate, so it is inevitable that it will be the production is lower in the case of a decrease in the money supply.

This last statement is really remarkable, because the Financial Theory of the Growth is going to explain the crises that plague a regular basis the economy as a result of the destruction of the bank money because of the non-renewal of the credits.

**In summary:** One of the most important consequence of the asymmetry that exists between the buyer and the seller within the monetary savings is the Beginning of inflation, which states that, in aggregate terms, the average price of the products may not be lower and can only go up. This implies in turn that, in the event that the amount of money in the economy to shrink, decrease the amount of actual production and us prices. Or another way, which creates the economic crisis is the destruction of the money.

### On the Capital Market.

An essential feature of the monetary economy is the emergence of assets that produce income, whose nature is entirely different from the nature of the consumer goods. To assets that produce income are called capital goods and their existence is differentiated also explains that your price is set in a distinct market, the Capital Market, and with a different mechanism to that used in the Consumer Market.

In the Theory of Madrid resorted to stating three laws of capital, the First Law of Robinson, the Second Law of Robinson and the Law of Piketty, to explain how it determines the price of capital goods:

- The First Law of Robinson: "The value of a capital good is equal to the income they produce, divided by the interest rate of the money and the uncertainty that the market assigns:

$$k_i = \frac{r_i}{\bar{\kappa}_j \cdot i} \quad (1st \text{ Law of Robinson})$$

- The Second Law of Robinson: "The added value of the capital goods is equal to the income they produce after tax, divided by the interest rate of the money and by the uncertainty factor:

$$K = \frac{\langle \alpha \rangle \cdot GDP}{\bar{\kappa} \cdot i} \quad (2nd \text{ Law of Robinson})$$

- The Law of Piketty: “In a stable economy, the uncertainty factor  $\bar{\kappa}$  is worth “1”, or otherwise, the aggregate value of the capital goods is equal to the income they produce after tax, divided by the interest rate on the money:

$$K = \frac{(\alpha) \cdot GDP}{i} \quad (\text{Law of Piketty})$$

The three laws of capital reflect the nature of financial capital, and discover the most remarkable result that has a monetary economy:

*“the added value of the capital goods is not dependent on the amount of savings that you make, without the amount of income in the economy”*

The Law of Piketty tells us what it is that dependency.

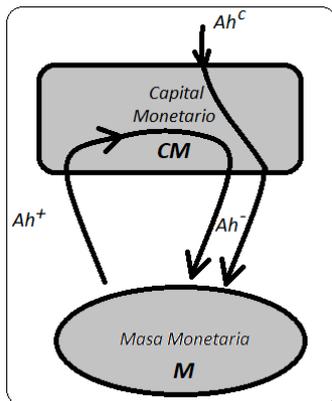
**In summary:** You can prove beyond any reasonable doubt, that the nature of the capital is the financial and valuation is equal to the present value of the future income that is expected to occur. In particular, in a stable economy, the aggregate value of all capital goods is equal to the average income that occur after tax, divided by the interest rate on the money:  $K = \frac{(\alpha) \cdot GDP}{i}$ , the equation to which we have named the Law of Piketty.

### On the economic growth.

Explicitly, the Financial Theory of the Growth that we have developed within the Theory of Madrid, identifies the growth of expenditure, the PIA, with the growth of the money supply that works in the real economy, or what is nearly equivalent, the growth of the *GDP* with the growth of the money supply *M*:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \quad \text{Ec. Savings}$$

where  $Ah^+$  and  $Ah^-$  are the flows of saving and dissaving that communicate the Consumer



Market with the Capital Market. According to the expression, the economy can only grow when you increase the money supply, which requires that the money injected flow deficit  $Ah^-$  in the Market of Consumption is greater than the money that extracts flow of savings  $Ah^+$ . In the attached figure is show the cash flows involved in the process.

It is possible to express the changes in the money supply in function of the changes in the amount of bank money and the money that is treasured. To do this, knowing that the flow of credit  $Ah^C$  is equal to the change of bank money and the flow

of hoarding  $Ah^S$  is equal to the change in the money treasured, it can be shown that:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \quad \text{Ec. Growth}$$

Thus, the Theory of Financial Growth means that when the time technology is enabling appear new investment projects and will appear new products that are going to require for their development of the financing through the credit, so that is the increase of the bank money that

originate from the consumption and investment credit, the flow  $Ah^C$ , which increases the disposable income of the economy and, therefore, makes it grow the expenditure or nominal  $PIA$  (or its equivalent, the  $GDP$ ).

The condition for the economy to grow is now that the increase of bank money  $Ah^C$  is greater than the increase of the money that is treasured  $Ah^S$ , what usually happens is always that grows the bank money, since that is treasured very little money. While there is no escape towards liquidity, which only happens when there is a credit crisis, the flow of hoarding  $Ah^S$  is very small or almost zero, and are the changes in the amount of bank money (the flow of bank credit) governs the economic cycle (it must be borne in mind that when the intervention of the Central Bank creating money from a bank to buy assets and provide liquidity to the market, the amount of money stashed changes significantly, but there is already in place a credit crisis):

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) \cong Ah^C(t) \quad (Ec. Growth)$$

Therefore, when growing the flow of credit, the economy grows without problems. However, once the flow of credit stops, and you start to return the credits, it is negative indicating that starts the destruction of bank money. When this occurs, then the flow of hoarding can become important and must be taken into account in the equation because it contributes to the extraction of money from the money with which the economy works.

The equation for the growth speaks of two opposing forces, the flow of credit and the flow of savings that, in an environment of intense technological change, work together to achieve levels of growth, notable which can be over 10% of  $GDP$ , without just cause inflation (for example, the chinese economy has grown in the last decades of the TWENTIETH century, with rates around 10% and an inflation rate that very few times it has been above the 3 or 4 per cent). But in an environment of weak growth of technology, the savings back against the economy and conspires behind the credit to produce a credit crisis.

The Equation for the Growth enables the formulation without many problems, the criterion that must be complied with to avoid appearing a credit crisis:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ Ah^+(t) > Ah^-(t) \end{array}$$

The criterion tells us that, when saving money is not returned to the economy, the deficit, the economy enters inevitable in a recession that will be more or less severe to the extent that savings are actually and decrease the money is part of money supply.

An equivalent expression is obtained when the equation of the growth spurt, the flows of credit and hoarding. If we assume that there is little hoarding, then, the decrease in the flow of creation of bank money, to be negative, it is what initiates the credit crisis:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = [Ah^C(t) - Ah^S(t)] \approx Ah^C \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \text{Credit Crisis} \\ \downarrow \\ Ah^C(t) < Ah^S(t) \end{array}$$

The criterion allows to explain without many problems, economic cycles, because it tells us that the cycles are driven primarily by the increase and decrease of bank money, that is to say, by the flow of credit.

CYCLE OF EXPANSION. When the population vegetative increases, either by migration or by internal growth, appears a boost endogenous aimed to increase the production with the financing loan. The increase of the loan is satisfied, in particular, the credit bank, which increases the disposable income of the economy and with it, the expense of the economy (or *GDP*) and the production.

Also the same thing happens when there are expectations to increase productivity and technological change. Then appears a boost endogenous aimed to increase the production that should feed through the loan, increasing the bank credit. The increase in bank credit increases disposable income, which increases spending and production.

In both cases, it is necessary to inject money into the money supply through bank credit, if you do not want to impede growth.

CYCLE OF RECESSION. Los problems appear when, or falls, the technological momentum and reduces the need to invest in the credit, or, the vegetative growth is small, or well, there are imitations structural, because then the savings can choke the flow of credit, not to find in which to invest. In such a situation, the creation of bank money can get to be reversed, because of the credits that are canceled without a renewed and which do not grant new credits. Everything seems to collude, now that the money you save not found who borrow and return it to the economy as deficit spending.

Once the destruction of bank money begins, the environment deflationary is fed back and makes it very difficult for any reversal of the economic situation. The economy inevitably deepens the recession because of the savings, not only does not stop, but increases. Is that in the Financial Theory of the Growth we have called "the problem of savings", because the credit crisis is not created by the decline of the credit, but that is created by the excess of savings, not to find in which to invest.

The savings and credit competing for the low investment, drowning in a literal way the first to the second and causing a credit crisis.

**In summary:** The Equation of the Growth helps to explain very well the economic cycles that are subjected to the monetary savings:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \begin{cases} Ah^+(t) > Ah^-(t) \rightarrow \Delta GDP(t) < 0 \\ Ah^+(t) < Ah^-(t) \rightarrow \Delta GDP(t) > 0 \end{cases}$$

In particular, it is possible to establish a criterion (*the criterion of the credit*) to know when an economy enters recession:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = Ah^C(t) - Ah^S(t) \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{|c|} \hline \text{Credit Crisis} \\ \hline \downarrow \\ \hline Ah^C(t) < Ah^S(t) \\ \hline \end{array}$$

Or to say it with words, when the flow of credit is negative (that is less than the flow of hoarding), begins the destruction of bank money and the economy enters a recession inevitably. The time that passes since the criteria are met until the *GDP* begins to notice the decrease is about 6 months (the inverse of the constant of Fisher).

### **On the crisis of change.**

One of the truisms that have managed to ignore the economists working for the private universities of the USA, is the large amount of credit crises that have occurred over the last 50 years. As tends to happen in the economy, anything that does not appear in the textbooks or journals that publish the private universities of the USA is not there, and apparently, a crisis that does not affect the USA is not a crisis that deserves to be explained, and therefore does not exist.

Despite this, what is certain is that there has been an endless succession of crises in the exchange rate of the very few countries have escaped without being affected by a strong and traumatic devaluation of the currency, and which need an explanation. In the Theory of Madrid explain the exchange rate crisis in exactly the same mechanism that explains the credit crisis, with the aggravating circumstance that in this case the Central Bank cannot rely on the purchase of assets in order to avoid it, since almost all countries are committed to maintaining the free movement of capital without understanding that such a thing is impossible, in a monetary economy in which you can't manufacture the reserve currency.

As its name suggests, the dollar is called the reserve currency, because when there are problems savers to keep their liquidity in the reserve currency. So, when a Central Bank made money with the intention of buying assets to avoid a credit crisis, it is inevitable that the liquidity in its own currency is changed by the reserve currency, which they obviously will not be able to meet never the Central Bank, unless that hinder the free movement of capital.

**In summary.** For any one country, it is a suicide to maintain the free movement of capital, because it will be inevitable that in a crisis of change. When we look at the global economy is very well appreciated that most of the countries have undergone frequent crisis of change, with the only exception of some large countries, and with a balance of external trade very favorable, such as Germany. Basically, when you see a flight to liquidity and the Central Bank to create money to buy assets of every kind, can't avoid it that all the money made changes to the reserve currency, creating a crisis of change. Or another way, when there is free movement of capital, it is inevitable that a flight to liquidity is finished in a foreign exchange crisis.

### **3. RECOMMENDATIONS ARISING FROM THE THEORY OF MADRID.**

The short summary above about the most important affirmations that have been made over the treaty, and that we have named as the Theory of Madrid, we show very clearly a vision of the economy very different from the paradigm that spread in their text books the economists working for the private universities of the USA. We believe therefore, that it is very important to expand the separate some aspects which are deduced from the Theory of Madrid, but that fall outside of the conclusions that are derived strictly from the mathematical structure of the theory, and that, therefore, they enter into the thorny field of political economy and of the opinion. Or in another way, we're going to list a set of recommendations that, although it is deduced in a very clear way of the Theory of Madrid, are not conclusions inevitable and fall in the field of political opinion.

### **On public spending.**

Yes, we understand that public spending is done because the citizens have decided that certain goods and services are paid jointly and provided in a public way, such as with health, the sewer, or the roads, then it is difficult to understand why the amount of money collected by the tax does not cover the expenses necessary to meet the public service proposed.

It is amazing to hear reason to economists who work for the private universities of the USA, which should be reduced to the money collected with taxes, because what is considered excessive, while at the same time complain that they do not lend themselves well to public services. Are the same economists who claim to reduce the public deficit, while at the same time claim that lower tax revenues, without never come to say what public services are those that must leave given because of the decrease in the collection.

Don't need to be an economist, or have a phd in economics to understand that you should first decide what services are satisfied in a public way (so common), and then, logically, we should calculate what level of taxes should be set to raise the money needed to pay for them.

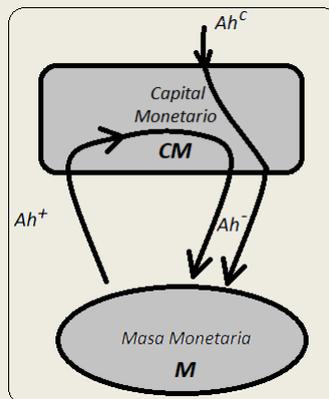
***WHO BENEFITS THE DEFICIT OF THE PUBLIC? It is not very difficult to know. For example, assume a hypothetical society in which they are certain the two following statements:***

- c) Taxes are levied in proportion to the income of every citizen. Specifically, suppose that the total cost of satisfying the public services requires a single tax equal to 50% of the income of each person.*
- d) The society is divided into two parts, the entering average of 200,000 euros per year (the rich) and the entering average of 20,000 euros per year (the poor).*

*In such circumstances, and while we do not know what is the number of wealthy citizens, or what is the number of poor citizens, we do know that in the event that public spending is financed in its entirety without recourse to the loan, the first pay in taxes to 100,000 euros each, and the seconds 10.000 euros.*

*Suppose now that the economists of the private universities of that society, they convince the citizens that the best thing for everyone is not to collect as many taxes and borrow the money that is raised, but that makes high to meet the public services. In particular, suppose that you*

pass of the flat rate of 50% of the income to a 25%, borrowing the rest, but who? What within society, on who you can borrow the money needed to meet the public expenditure?



Let us look once more the figure below where the flows of saving and dissaving among the Consumer Market and the Capital Market.

It is easy to reach the conclusion that the government can only finance the deficit in two ways, with the money from the savings or the money that comes from the bank credit, although in the aggregate, it is impossible to know which of the two items does the money that the government borrows. Despite all of this, it is very clear that, in aggregate terms, the government is borrowing to the citizens the money you have saved through the reduction of taxes.

In the economy of the example, the wealthy citizens will be able to provide government-50.000 euros are saved thanks to the reduction of the taxes, while the poor citizens will be able to provide only 5,000 euros. When only a part of the money from the tax cut saves it, then the savings that the citizens do  $Ah^+$  does not cover the public deficit and the banking system will create new money  $Ah^C$  and lend to the government.

What is important is to understand that, in the aggregate, the wealthy citizens come out ahead when public expenditure is covered with loan rather than covered with the collection of the taxes, as they are the citizens that the more taxes they pay, the more they save. In the example, the wealthy citizens not only you are saving up to 50,000 euros per year in taxes, but that since then the government will be giving interest for them. Or another way, the government is creating debt securities whose income paid from the proceeds of the tax.

When we look at the amount of the public debt reached by the different countries of the world, the folly acquires dyes dantean. In 2019, the public debt of the united states reaches the 20MM of dollars, the debt of the european union is more than 10MM and the debt of Japan reaches the 10MM euros.

The direct consequence of increasing public debt, is to create an income backed by the government and supported by the income public, as it could not be otherwise, tends to be part of the savings of the citizens richer.

It is a very burlesque in aggregate terms, as they borrow citizens with the money you save thanks to the reduction in taxation. Which can only benefit higher-income individuals, who see become a saving money that would otherwise have had to pay in taxes.

For example, the USA has a public debt of around 100% of *GDP*, indicating that the federal government has forgiven in tax their citizens richer approximately 20MM of millions of dollars, which is updated reach the sum of about 35MM of dollars. But the most serious thing is not that, what is more serious is that over pays you interest on them, which is already the top. What can argue economists who work for the private universities in the U.S. in order to justify such nonsense? Even worse is the situation suffered by Japan, whose government has a public debt build-up, which comes to 250% of its *GDP*, What can you justify a public debt as well?

When we understand that all of that public debt is the money that had been raised with the tax and when we heard economists who call themselves progressives who are in favor of further increase in the public deficit, then it is easy to understand the state of total madness in the one who has entered the economy.

**In summary:** you can't be justified in any rational way that the public spending that the citizens have decided to take together do not cover with money raised by the tax and have to resort to systematically debt to finance it. Therefore, it is desirable that public spending is always do with the money collected from taxes. On the other hand, any imbalance timely that the government is obliged to take recourse to debt, you should always be carried out with specific objectives and separately from the tax levy intended to finance public spending. For this reason, that it appears in the Constitution of Europe that the national governments can't have a bigger deficit 3% of *GDP* and are required to keep public debt controlled, it is always good news.

### **On the fiscal policy keynesian.**

In economics it is often called "the fiscal policy keynesian", the increase in the public deficit, with the intention to avoid the spiral of savings in entering the private sector when there is the threat of a credit crunch, which has its own logic. Let us observe that, in aggregate terms, the policy Keynesian achieves two very important goals:

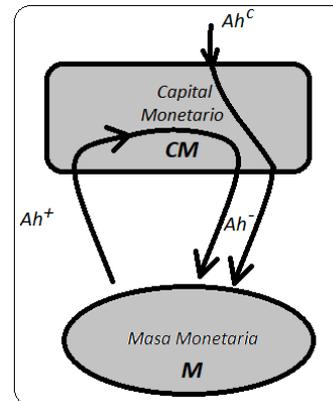
- 3) Returns the private savings to the economy, to borrow and to spend it.
- 4) Restores the growth of bank money who has stopped making the private sector, to keep part of the deficit spending with bank credit.

What is shown very clearly in the accompanying figure. There it is observed that the flow of savings  $Ah^+$  can be returned to the economy when the government borrows and spends way deficient. Not only that, the public spending deficit must be large enough so that, in aggregate terms, a party has to meet with bank credit. Only that way you can ensure that the flow of dissaving  $Oh^-$ , cubre savings, and the bank credit required for the growth of the economy. When we assume that there is no hoarding and  $Ah^S = 0$ , we have:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] = Ah^C > 0$$

In this sense, the policy Keynesian is ideal, as that government deficit spending is in charge of returning the part of the private savings that do not borrow the private sector, in addition to ensuring that bank credit is sufficient to ensure the growth of the money supply.

But it is important to be very clear that the public deficit is unsustainable at the time, at least in the quantities that are seen to take in the present (Japan already has a public debt of close to 2.5 times the GDP), because of the overall decrease of the tax rate to the income of the richest people, which aggravates the problem of saving instead of fix it up, and force, to what they call political keynesian, to maintain high levels of public debt unsustainable.



**In summary:** it is called fiscal policy keynesian policy that uses the public spending deficit to return the money of private savings to the economy. What would be an excellent idea, but it was because the increase of the public debt becomes unsustainable over time. In addition, the problem that creates the savings are compounded when the public deficit is because of a reduction of tax, as that contributes to the amount of money you save is larger than it would be without the implementation of the policy. We think, and so confirms the Financial Theory of the Growth, there is no reason to think that with an absurd reduction of taxes is going to avoid a deflation by excess savings.

### On the interest rate.

According to the Financial Theory of Capital, the interest rate is the benchmark used by the Capital Market to determine the price of capital goods, so that it would be very desirable that its value remains unchanged, and, if possible, above the 3 percent.

However, at present, central banks use the interest rate as the basic variable to control the amount of money that is created in the economy, so as to avoid both inflation and deflation. It is logical, as the interest rate makes it more expensive or cheaper to keep a bank loan, which is where all the money banking that exists in the economy. Therefore, the higher the interest rate, the greater the incentive to repay the credit and banking and destroy the money that was created with the credit. And the same thing will happen when you lower the interest rate of the loans, which will be cheaper to keep the credit with the creation of the bank money.

However, to manipulate the interest rate to control the amount of bank money that there is in the economy, it is no good idea because the value of capital goods depends inversely on the rate of interest, as stated by the three laws of capital. For example, according to the Law of Piketty, the value to the tendency to aggregate capital within an economy is:

$$K = \frac{\langle \alpha \rangle \cdot GDP}{i}$$

*Law of Piketty*

We see that when the interest rate is close to zero, the imprecision with which one determines the price of capital goods is very high. This can be easily checked by deriving the law of Piketty with respect to income:

$$\Delta K = \frac{\langle \alpha \rangle}{i} \Delta GDP \rightarrow \begin{cases} i = 5\% \rightarrow \Delta K = 20 \cdot \langle \alpha \rangle \cdot \Delta GDP \\ i = 1\% \rightarrow \Delta K = 100 \cdot \langle \alpha \rangle \cdot \Delta GDP \end{cases}$$

The expression tells us how much to increase the added value of the capital goods when increasing the income they produce, for a rate of interest concrete. You see very clearly that when the interest rate is 1% changes in the valuation of the capital are 5 times greater than when the interest rate is 5%. That is to say, when you lower the interest rate, the more uncertain will be the calculation of the value of capital, and the more unstable it will be the Capital Market.

**In summary:** The function of the rate of interest is to serve as a reference for valuing capital assets (assets that produce income) and must remain unchanged and higher than 3 percent. For this reason, you should avoid its use in order to make monetary policy with her.

### On taxes.

Here we will distinguish two kinds of taxes, those that are intended to fund the public services and those who are devoted to develop fiscal policy.

TAXES TO FINANCE THE PUBLIC SERVICES. The basic function of the tax is that citizens contribute, jointly and according to your income, the money needed to pay for the services that have been determined to be provided in common. We understand that the decision of what these are services of a public nature, is decided by the citizens, because here we assume that the political system by which society is organized is democracy. The universal, free education, universal health care and free access to justice is universal and free, are one example of the many services that citizens can access free of charge and that can be managed in a public way, and funded through taxes. Therefore, there is no justification for economic or political, that have to use leverage because the fund is insufficient to meet the public expenditure, thus violating the mandate citizen. When a government allows the spending deficit is because you are using your taxes to a different function of the financing of the common expenses, and, therefore, they are disobeying the citizens.

In that sense, it is a good idea that the tax rate on the income is progressive, so that those who most benefits obtained from the economic system, are also those that most contribute to keep it, as is reflected in the articles of the Constitution. Neither can be understood because reason is posed exemptions that alter the progressivity of the tax.

TAXES TO AVOID THE CRISIS OF CREDIT. Although the taxes should only be collected with the purpose to finance public services, and should not afford any exemption, what is certain is that they are ideal to avoid the excess of savings. The equation for the growth says very clearly that

the savings  $Ah^+$  has to be returned as an expense  $Ah^-$  to the economy, yes we want to avoid that the economy enters a recession:

$$\frac{1}{k_F} \frac{d}{dt} GDP(t) = -[Ah^+(t) + Ah^-(t)] \approx Ah^C(t) \xrightarrow{\frac{d}{dt} GDP(t) < 0} \begin{array}{c} \boxed{\text{Credit Crisis}} \\ \downarrow \\ Ah^C(t) < 0 \end{array}$$

So a way that is very obvious to resolve the problem that is created when individuals save in excess without investment credit are sufficient to absorb it, is to penalize the income.

You have to understand that it is not possible to penalize directly saving because it is not possible to distinguish the savings of the investment, since both things are the same. The only thing that can be done is to penalize the income of a very progressive because, in aggregate terms, the savings is greater the higher the income (the Act of Saving Keynes). There's not much sense to encourage investment by the same, because it is not possible to distinguish the investment of savings.

The question may appear if you put a tax on extra income, very progressive, is what to do with the money raised. Since then, it should not be used to pay for the public services, since it was not with that intention so that it is raised. We think that the best thing is to devote them to grant credit to a negative interest rate for investments in sectors of interest, such as, for example, to the ecological reconversion.

**In summary:** it Would be desirable to separate the financing needs of the public services of the need to limit the savings to avoid a credit crunch. We think that you should not ever use the "extra" money raised with the fiscal policy to maintain or increase public spending, because that is not the reason for which the money is collected.

### On the rule of 2 percent inflation.

One of the most important affirmations that makes the Theory of Madrid is one that makes reference to the existence within a monetary economy of two types of distinct goods, consumer goods and capital goods, which are purchased in different markets. For this reason, it is important to note that when, in economics we speak of inflation refers only to the rise in the price of consumer goods, without taking into account anything that may be happening with the price of capital goods.

Despite the fact that there is much evidence that inflation is an autonomous process, which has little or nothing to do with the increase of the money supply, it is also true that an increase of the amount of money that the form of the money supply causes inflation of prices when it is not accompanied by a rise in the production. It is this last one, so it follows very clearly from the equation of growth:

$$\frac{1}{k_F} \frac{dPIB}{dt} = Ah$$

The equation predicts that when injected an amount of money in the money supply, the nominal power consumption of the economy increases. Part of the increase in the consumption will be real and will be as a result of the increase in the quantity of products purchased, but there is no doubt that the other part will only be inflation and will be as a result of the price rise. For this reason, when you want to avoid inflation, what it does is to limit the growth of the money supply, limiting the flow of credit, that is achieved by increasing the interest rate on the money.

But what is the level of inflation that should make you jump the alarms that advise to increase or decrease the amount of bank money that is created with the credits?

It is not easy to set a particular level, but an idea that does not seem far-fetched is to increase the bank money when the amount of credit when the rate of inflation threatens to fall below the real growth rate of the economy (at least, while the inflation rate does not exceed 3 or 4 per cent):

$$\pi \geq g \quad \text{objective monetary}$$

However, in Europe, the Central Bank sets an absolute level for the 2% inflation without taking into account the value of the rest of the variables, which makes no sense. We think that to be guided exclusively by the rate of inflation in the country can easily lead to wrong conclusions, and it is a folly that can cost very expensive for the country.

*A BAD EXAMPLE. Let's look at the Spanish economy during the year of 2019.*

<i>GDP in 2019.....</i>	<i>1.244.757 M. €</i>	}
<i>nominal Growth 3%.....</i>	<i>37.342 M. €</i>	
<i>real Growth 2%.....</i>	<i>24.895 M. €</i>	
<i>public Deficit 3%.....</i>	<i>37.342 M. €</i>	

*It looks very clear that it is an economy almost deflationary, in which inflation is running below of growth, indicating that it is injecting money in the economy.*

*The situation in Spain is complicated. On the one hand, Spain is required to limit public spending deficit to 3% of GDP by the Treaty on Stability of the EEC, and, on the other hand, the private credit remains scarce, most likely due to the accumulation of debt, which still dragged on since 2008. Be that as it may, the injection of cash from the public expenditure and private credit seems to be insufficient to meet the needs of growth of the Spanish economy, which is a crime against humanity when we observe that the country has a youth unemployment which stands at almost 30 percent.*

*Now, if you look at the balance of trade of Spain, it is found that Spain has surplus, indicating that Spain does not currently have structural problems that limit their growth. It is very evident that there is an unjustifiable lack of money that is hampering the growth of the Spanish economy because it should be going out money, surely, to make payment of the private debt, even more so when we see that the unemployment tour in Spain to 13 percent*

*There is No justification possible to stop the injection of cash into the hands of private banks spaniards, who, as the logical, they have their own difficulties accounting which forced him to prioritize his personal interest above the public interest. In this sense it is very clear responsibility*

to the European Central Bank to ensure that the money is injected into the economy of the European countries on the quantity required, without delegating this function in a banking system that can be “touched” and that it is impossible to develop this function.

If Europe wants to one day be Europe, so the European Central Bank will be the European Central Bank.

**In summary:** One of the functions priority of the Central Bank's monetary policy is to ensure that you are creating the amount of money necessary to maintain the economic growth. To do this, the most important criterion used by the Central Bank to know if you are creating the amount of bank money that is sufficient to allow growth, is to look at the value that achieves the rate of local inflation of the money. If I had to give a rule blind that follow, one that will not be able to do damage to the economy while the economic growth is not very large (<4%), it would be the following:

$$\pi \geq g \text{ Objective Monetary}$$

That is to say, “the central bank should make sure to inject enough money into the economy, so that the inflation rate  $\pi$  is above the real growth rate of the economy  $g$  when the growth is not very large ( $g < 4\%$ )”. The rule will only be able to give problems when the real growth rate is very high, so that it is interesting that the inflation rate does not exceed 4% or 5%, although the numbers are not accurate.

**On the problem of the liquidity of the Market of Capital.**

The Capital Market is very different from the Consumer Market. While the flow of trade within Market Consumption meets the monetary equation and need a specified amount in order to function, the Capital Market functions as a barter market where the money is an asset and where it does not need a specified amount in order to function. In this sense, the arbitration within the market makes it equivalent to a debt security to any other asset on the market, so that the amount of money that is within the Capital Market depends solely on the desire to savers have more or less money treasured as an asset, without which that amount has no relationship with a flow concrete exchanges in the market. Therefore, any liquidity problem that arises within the Capital Market does not have its origin in the lack of money to carry out the exchanges, but in the desire to keep part of the savings in the form of money.

When we look at the US, and in the year of 2019, the distribution of savings between the different capital goods, we can realize that the needs of liquidity in the Capital Market can get to be immense:

<i>capital goods</i> .....	120 MM
<i>debt added</i> {	<i>bonus</i> .....40 MM
	<i>capital monetary</i> .....10 MM
	<i>mass monetary</i> .....10 MM

YES, all savers, in a moment of panic, decided not to renew the debt securities and to maintain liquid savings, there would be no economy, not even close, enough money to satisfy the more than 40 MM of dollars that are owed. Even worse, since all capital assets are equivalent, savers may also wish to make liquid for the rest of the capital goods and the most 120MM who possess the americans should be exchanged for money, which would be clearly a problem without a solution, unless you act the Central Bank.

Unfortunately, the “flight to liquidity”, which is the name with which knows the situation that arises when all savers to sell their assets because they believe that its price will drop in the future, is a “self-fulfilling prophecy aspect” that can occur at any time, without reason that the widespread belief that such an event will occur. In fact, it is a phenomenon that has occurred countless times, in all countries of the world and in all ages, and it is inevitable that flies repeated, at least you put the remedy.

Regardless of the panic, stock market this more or less justified by the economic situation, the only thing certain is that a flight to liquidity, you can only stop if the Central Bank acts as the buyer of last resort, of very vigorous way, and while the panic lasts. Only by accepting to purchase all the titles that savers have been put up for sale may be avoided sinking its price.

*Very recently, in march of 2020, the problem of the liquidity of the Capital Market has grown to become clear very clear when in just a week, the IBEX35 fell almost 40% without the European Central Bank did nothing to prevent it.*

*Does it make sense that something like that happening? Does it make sense to collapse the economy of a country because the European Central Bank does nothing? Does it make sense that they vaporize the savings of the people (even if they are the savings of the rich) because of a clear situation of panic that nothing is different from the bank panics that hit economies during the NINETEENTH century? Why has not acted on the European Central Bank, as it has been done by the Federal Reserve in the united states?*

*The liquidity within the Capital Market is a very serious issue that can ruin a country of much more rapid and violent that a conventional war or a few atomic bombs. Yes the europeans want Europe to persist in time, it is necessary that the European Central Bank to intervene vigorously and to take care of provide liquidity to all the markets of Europe, without exception.*

All of this leads us to ask why the Central Bank is not responsible for providing liquidity to the Capital Market, not only in exceptional situations, when it is very clear that no one else can do it, but also in normal situations, when the commercial and investment banks do not seem to have any problem to provide liquidity to the market by granting credit.

Here we are going to propose the procedure to be followed by the Central Bank to give liquidity to the capital market all the time, preventing it from sinking, and that isn't speculate with it.

The “purchase guarantee” of assets.

The Central Bank should provide liquidity to the Capital Market by using the “purchase guaranteed titles.” The basic idea is that any holder of an asset that is traded in the stock can sell it to the Central Bank at a fixed price related to the price that you have at the time of the

sale. In particular, and as an example, the rule to follow by the Central Bank may be the following:

*“The Central Bank purchase any amount of the securities listed on the stock exchange, a 3% below the price that they had the titles a week before your sale.”*

Or otherwise, the Central Bank intervenes and purchase any asset whose price falls 3% below the price that was listed a week before. This simple rule will prevent for any panic in stock and will bring stability to the Capital Market in the same way that the guarantee of bank deposit eradicated the bank panics for many decades. The rule is complete with another rule that guides the sale of securities by the Central Bank:

*“The Central Bank will sell any title that possesses when its price is 2% higher than the price you bought it”*

This becomes a business to bring stability to the Capital Market. In fact, this is what the large institutional investors normally, and just stop acting so, before fleeing generalized to the liquidity, when the money we manage is insufficient. Let us observe, that the Central Bank will have losses with those titles don't get to catch ever the price at which it bought more 2%, because it does not come to be sold ever, but we believe that the losses will be compensated too many for the benefit of the 2% that gets those titles that have been recovered from the price and is to be sold. A business round.

The advantages of the existence of the “purchase guaranteed” are very clear:

- 3) Prevents the financial panic immediately, since the sale of securities for fear that their price goes down at a rate above 3% weekly, cannot be given. It is the same thing that happens when the Central Bank ensures the money of the bank deposits of savers, the banking panic no longer occurs because savers can be removed without loss of the money (although that does not prevent the banks continue breaking).
- 4) There is no danger of moral hazard because they do not choose a few specific assets, but those whose price goes down too fast and meet minimum requirements of transparency in its management, something that the Central Bank can always force it to be done through regulation.

Note that the only danger that faces the Central Bank is that you purchase the titles above its actual value, so that the difficulty “to ensure the assets” is to be found in the difficulty for the Central Bank to determine the Uncertainty  $\aleph_j$  of each of the asset that you purchase. But that is precisely what that tells us the Law of Piketty, at least in aggregate terms. According to the 1st Law of Robinson:

$$k_j = \frac{\langle r_j \rangle}{\aleph_j \cdot i} \rightarrow \begin{cases} \langle r_j \rangle \rightarrow \text{renta\_capital} \\ \aleph_j \rightarrow \text{Uncertainty} \\ i \rightarrow \text{rate of interest} \\ k_j \rightarrow \text{precio\_capital} \end{cases}$$

Where  $\langle r_j \rangle$  is the income of the capital good after taxes are paid. For a particular asset, if the market has valued exactly how a capital good either, the sharp drop in its price will be due very probably to the lack of liquidity in the market, so that the purchase of capital by the Central Bank will be successful. In addition, in aggregate terms, the Factor of Uncertainty is worth "1", so that the Central Bank can stop applying the rule if it considers that it is in a bubble because  $\bar{\kappa}$  is less than "1".

**In summary:** The Central Bank should be who is in charge of providing liquidity to the Capital Market in a transparent manner and stating when, how and where to intervene by buying securities. Except in limited circumstances, the amount of money that is retained as money capital (money) is very small, so that the liquidity of the Capital Market cannot be satisfied unless the Central Bank to act as a buyer of last resort, particularly in situations of panic. Here we propose that the Central Bank use of so permanent a specific mechanism, "the purchase guaranteed titles", to avoid any fast sinking of the bag (though, to be able to carry it into effect, it is necessary to prevent the free movement of capital).

#### **On the creation of money credit.**

When analyzing the privilege of the creation of bank money who has given the Central Bank to commercial banks and investment makes it very difficult to justify two things, a huge amount of money that they earn the banks thanks to the seignorage, and the immense benefits of giving liquidity to the Capital Market.

In addition, no one will deny, that states these benefits are united two other no less important. The first, the capacity of the banks to decide to which sectors of the economy directs the investment, to decide which sectors are granted credits and what not, which implies a high "moral hazard," which is also very difficult to justify. The second, the ability to manipulate the price of assets to have the capacity to grant loans to leverage in certain assets and not in others.

There is no doubt that lend money, and when it is money created out of nothing, a cost that must be borne by the one who receives the money and backs it up, and that very well may be collected by the interest rate of the money. But thus think of the credit, as if only it were a service that has to be paid, it is a mistake to egregious that it forgets the important role of credit in the current economies, as is the credit that directs the growth and its control enables you to control which sectors are growing and which sectors do not grow. The credit is like water in a desert region, and who manipulates is the one who actually drives the economy of the region. Therefore, it is necessary to separate the banking business of money creation, since both may have interests that differentiated without this having that reproach him to anyone.

In particular, what we propose here, is that the Banking System has limited the total amount of bank money that you can create to 25% of the value of the *GDP*, which is approximately equivalent to half the money you need the economy to function. Leaving the Central Bank with the responsibility of granting the rest of the credit, the other half of the money needed to keep the Consumer Market, according to political reasons and the environment.

**In summary:** it would be desirable to separate the “management” of the money of the “creation” of money, which currently make the commercial and investment banks must be separated by a function of the other. We propose to limit the amount of credit that can be granted by the banking system to no more than 25% of the *GDP*, which is approximately half of the amount of money that is needed for the Consumer Market to work, and let the rest of the credit granted by the Central Bank with political criteria.

The previous collection of affirmations is a summary rather consistent of the consequences of the financial theory of the capital and of the set of basic equations that describes the monetary economy, and that we think reflect quite accurately the problems and contradictions that create savings and credit. It should also be clear that, even though we have not built a theory of trade, all of the statements that have been made are still valid, both for open economy as an economy in isolation.

#### **4. THE PROGRESSIVE TAX ON THE CAPITAL OF PIKETTY**

Currently, the fiscal policy that is used in almost all the countries of the world to avoid the crisis credit reverts to the cash injection from the government deficit spending, which is often called “the policy Keynesian”, but with the absurd added to lower the progressivity and the amount of the tax to the revenue with the idea of activating the economy, exacerbating the problem that creates the savings in time to fix it. This policy, while it is true that avoids a recession because you get to return the money that you extracted from the savings in public spending deficit, it has the serious drawback that increase without limit on the public debt accumulated, and with it, the cost of debt service (Japan takes more than two decades using this fiscal policy and public debt is now more than 2x the value of its *GDP*).

Fiscal policy is always accompanied by monetary policy, especially when the burden of the public debt is so high that it prevents the government continue to use the public spending deficit to absorb the savings. The Central Bank will resort to lowering the rate of interest of money, which decreases the amount and the payment of the interest, not only of the public debt, but also of the private debt. For example, from nearly a decade ago the rent you pay the public debt in the richer countries (Europe and USA) is close to zero or even negative.

Also this monetary policy is exhausted when the interest rate reaches zero, and although low cost that you have to maintain the credit, the private sector does not ask for credit for making investment. This is when the Central Bank uses monetary creation to buy the public debt, but even this mechanism collides with the limit of the amount of debt that it is possible to monetize and exhausts.

These three policies complement each other in a sequential manner. First it draws on the public deficit, then, when drains are used to lower the interest rate, and eventually monetize the debt, both public and private, leading the economy to the edge of the cliff, where “black cinema” will soon make its appearance. The Theory of Madrid that we have developed in these pages demonstrate, beyond any reasonable doubt, that these three policies are not sustainable in the time, and sooner or later will be insufficient to stop the credit crisis.

The underlying problem that currently have the economy of the rich countries is their desire of wealth, that is to say, the existence of an excess flow of savings that has no where to back up because the capital goods grow very slowly. According to the Financial Theory of Capital, capital goods are not created by the accumulation of savings, so the savings may very well be higher than the growth of capital, which automatically creates a credit crisis:

$$\Delta(\text{Flow of Savings}) > \Delta(\text{Capital}) \rightarrow \text{Credit Crisis}$$

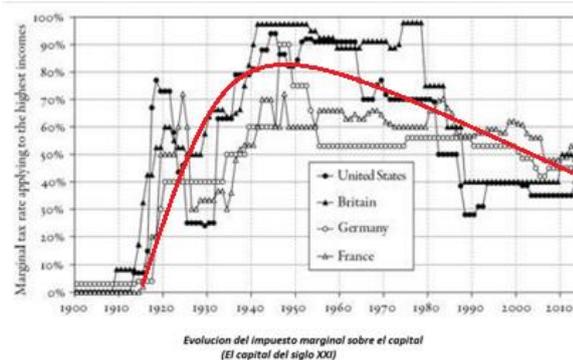
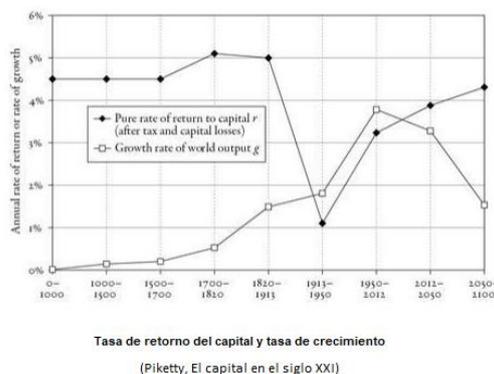
Precisely, the expression that is used as a criterion for determining when the economy goes into recession shows is the “Criterion of the Credit”:

$$Ah^C(t) - Ah^S(t) < 0$$

That says almost the same thing, because the difference between the flow of credit and the flow of savings is proportional to the new capital, creating the investment. Therefore, the only fiscal policy consistent is to do more progressive the tax rate to the income from work as of the rent, at the same time which raises its value for attacking that which is causing the problem, that is not another thing that the savings:

*“By increasing the marginal rate on income, both from work and from the income from the capital, limited disposable income and is limited to the amount of money that can be saved, attacking the substance of the problem, without diminishing by the growth”*

In the book, Piketty shows two graphs that clarify why the uplift of the marginal rate on income really solve the problem that creates the excess of income that is not spent. On them is show the evolution of marginal rate on income from capital, not including those that are applied on the income of the work, but the consequences of them are generalizable:



The graph on the left you can see the sharp decline that suffers at the beginning of the TWENTIETH century, the average rate of return on equity after tax, which passed the 5 per cent to 1 per cent after the end of the second great war to the mid-TWENTIETH century, due to the increase of the tax rate to the capital. From there, the curve shows very well how the rate of return on capital increases gradually, reaching levels close to those reached during the EIGHTEENTH and NINETEENTH century, because of the gradual reduction of the tax rate to the capital.

Along with the rate of return on capital, Piketty also shows the changes the tax rate to the capital, which allowed us to corroborate the Theory's Financial Capital beyond any reasonable doubt. In the graph to the right is the curve with the changes of the marginal rate on income from capital and inheritance taxes, and you see, quite clearly, the inverse correlation with the valuation of the capital goods that makes the dial. Notes, as the progressive rise of taxes on people with higher incomes initiated at the beginning of the TWENTIETH century, reaches the climax at the end of the second world war, and as from then on, the constant reduction of taxes on higher incomes, increase the value of the capital goods in terms of aggregates (we have over drawn in red the involute of the tax rates of the different countries for the sake of clarity).

The increase in revenues in the first decades of the TWENTIETH century served to finance the increase of social services, and also to finance also the preparations for the war that was coming, but the elevation of tax rate on income from capital and capital itself, did not prevent the impressive economic growth of the twenties, nor prevented the economic recovery of the united states during the administration of Franklin D. Roosevelt already well into the thirties. In the graph are also observed, "The glorious thirty years" have elapsed after the end of the war, which correspond with the top of the mountain of the curve on the tax rates, confirming that rates high on the income, instead of falling to capitalism, make it flourish.

*THE TEACHING OF THE ECONOMY. We can't stop pointing out that the loss of progressivity of the income tax coincides with the commendable work of propaganda carried out by economists working for the private universities of the USA started in the 70's, that not only did the government decreased the tax rates to the income from the capital, but also left captive and disarmed, the unions and associations of workers who defended and defend the wages of workers. Both facts together, make up the income of the richest people in the detriment of the less rich because they are poor people that each time they contribute more to pay it with their wages and the wages are slowly decreasing with respect to the income from the rents.*

*The direct consequence is the increase in savings and the increasing difficulty to return it to the economy when this is not growing fast enough. But not only were the taxes, it was the ideology that was to be transmitted from then on the teaching as economic science.*

*Little by little, the trade union, the policy of Franklin D. Roosevelt strengthened in the decade of the 30's, were becoming irrelevant in the united states, accused by the economists who work for the private universities of the USA to promote the unionized workers at the expense of those who were not union members, through coercion and violence:*

*"How can unions raise the wages and improve the working conditions of their members? The unions get their market power by making the legal monopoly of the provision of services of labor*

*to a company or a particular industry. Based on this monopoly, force companies to offer wages, benefits and working conditions above the competitive level. For example, if the plumbers are not unionized earn \$20 per hour in Alabama, a union may negotiate with a great enterprise of building a wage of \$30 per hour for their plumbers. However, the agreement is valuable to the union only if you can limit the access of the company to alternative offers of work. Hence, under a convention typical of collective bargaining, the companies agree not to hire plumbers that do not belong to the union, not to hire outside plumbing services and do not outsource to companies that are not unionized. Each of these measures help to prevent the erosion of the monopolistic control of the union over the plumbers who work for the company. In some industries, such as steel and automobile, the unions have tried to unionize the industry, in such a way that the unionized workers of the company do not have to compete with non-unionized workers of the company B. All of these steps are necessary to protect the high rates of salary from the unions."*

*Samuelson, 2002*

*Already entered the TWENTY-first century, Samuelson, the economist most prestigious of all those who have worked for the private universities of the USA, was teaching feedback so manifestly false on the trade unions in the text book university the most widespread of the world.*

However, unlike the justification based on the need to limit the savings that we have exposed here, Thomas Piketty justified in the "common utility", the desirability of a return to the progressive rate of the income that also functioned during the war and post-war. No one is spared, that the motive which underlies the proposed tax, which we do ourselves, is based primarily on practical considerations based on the desirability of avoiding the different savings that cause income inequality, while the background pattern that underlies the proposal of Piketty is fundamentally ethical turn in his argument to the spirit with which drafted the universal Declaration of Human Rights to try to justify it:

*Men are born and remain free and equal in rights. Social distinctions may only be based on common utility.*

*Universal declaration of the Rights of Man*

Without wanting to downplay the importance of the ethical motivation that pushes the proposal of Piketty, and we think that is enough by itself to be considered completely valid, here we make the observation that the urgent need to return to the tax rate of the immediate post-war period is more than justified by the undoubted decline that is going to cause in the private savings, what is going to avoid having to resort to public spending deficit and to go down to zero, the rate of interest of the money to prevent the economy enters a recession. Even more, when we already know that both of these policies, the public spending deficit and the decrease of the rate of interest, cannot be sustained indefinitely.

We believe we have demonstrated the undoubted "common utility" that you have to recover the progressivity of the tax rate to the income, regardless of whether from work or from the

income. Not only because the more benefits they get from the society must also be of the most help to keep it, but because they impede the savings, as we know, is a very progressive with the entry:

- 3) Limited and decreases the saving, preventing the credit crisis that causes the excess savings.
- 4) Makes the society a little less uneven and a little more fair, since it decreases the income of the richest with respect to the less wealthy, to make them contribute more to the maintenance of public spending.

What remains for us to analyze now, are the concrete consequences that have the proposal made by Piketty:

Progressive tax on the property			progressive Tax on the income	
Multiple of the average net	annual Tax on property	inheritance Tax	Multiple of the average income	effective tax rate of
0,5	0,1%	5%	0,5	10%
2	1%	20%	2	40%
5	2%	50%	5	50%
10	5%	60%	10	60%
100	10%	70%	100	70%
1.000	60%	to 80%	1.000	80%
10.000	90%	90%	10.000	90%

In the table below displays the tax rate proposed Piketty on the income, the sum of the from and the incomes of capital and labour, and on the possession of capital and inheritance:

- On the income, the sum of the income from work and capital.
- On the value of the capital.
- On the inheritance of the capital.

Let's analyze them briefly:

**The progressive tax on income.** *Piketty proposes a tax on the sum of the income from work and income, a very progressive and similar to that which existed in the immediate post-war period. So it seems that seeks to Piketty this rate is to limit the accumulation of capital by using the revenues from capital income, but without a work around that can be maintained in the capital already accumulated.*

Rates that are listed in the table are very similar to those that were in force during the Second World War, and 10 years later, and there is empirical evidence very contrasting that a tax of such features does not imply any threat to the growth of the economy and, therefore, of the capital. There are currently many countries, such as the nordic countries and France, in which the taxes on income are very progressive and have a public expenditure that exceeds 50% of

GDP, and it hasn't stopped it from being among the countries with the highest income in the world, then or now.

***Progressive tax on the inheritance of the capital.*** *Piketty proposes a strong progressive tax on the inheritance of the capital assets, which blends very well with the idea of abolishing inequalities that have their origin in the inheritance. That we all have the same opportunities, regardless of the wealth of our parents, leaving it up to our work and effort is the only thing that will reward you with an income different, an idea is very republican who takes a very wrong with the familial nature of the human being.*

The logic that employs Piketty is impeccable and difficult to refute when what is sought with an inheritance tax so heavily progressive is to equalize opportunities for all. But, a rate that you can get to eat 90% of the value of what we do not have any sense when we realize that the single death of our parents can plunge into poverty (relative to the disposable income that we had before their death). It is not logical that the parents spend all their income on the education and well-being of their children without any limitation, to deprive you of that education and well-being when we die. The equality of opportunity that we should enjoy all you can't depend on our parents to die prematurely, before that they may spend their wealth in the us.

They have neither sense nor logic. *A just society should not necessarily be an equitable society, and the rationality that is sometimes alleged to pursue equity is, many times, the site where they are hiding our most deep prejudices and our most profound irrationality.*

***The progressive tax on property.*** *The value of the rate proposed Piketty to record the accumulation of capital is so high that it eliminates any real possibility of accumulating capital in excess of about 100 times the average capital, that is to say, any accumulation of up to 20 million euros will be impossible.*

We think that a tax of those features is out of place, and it is going to be interpreted by the citizenry as a collections without sense. We think that such a tax is an error, and the citizens never going to let it put a tax rate of those features, regardless of whether they are poor or you are rich.

Piketty says in "Capital and Ideology" that the property tax has had a long history marked by controversy leading up to its implementation, because of the diversity of interest that is at stake. He says with so much success that the result is disparate from that struggle of interests, is what explains the different capital assets are taxed so differently, but all give the same income, and makes the acute observation that real estate always have a tax rate much higher than the assets listed on the stock exchange, probably because the economic elite did not generally keep your wealth in real estate or real estate assets. Tends to be the most disadvantaged in economic those who have little wealth to be saved in a home, but that observation, although very accurate, is hardly enough to justify the high and progressive rate proposed by the capital goods.

What we would like to point out in this discussion, prior to the exposure of an alternative proposal on a tax rate commensurate with the Financial Theory of the Growth, is that:

*The soul of the capital is the income that it produces. "The capital is the price they have assets that produce an income and its value will be negative when the income it produces to be negative"*

We think that the tax rates proposed by Thomas Piketty reflects the mistaken idea that they have about the nature of the capital, which he considered to be the result of the accumulation of physical savings, something that is completely false. Piketty gravel capital as if it were something physical that has been building up, not realizing that the large estates, such as the one that has Bill Gates, are a result of technological change, and not from any accumulation of physical capital that has been making Bill Gates with his savings. Bill Gates hasn't saved anything in his entire life, and the people as the living from the income produced by the capital that they have, but you never saved that capital (no one can save the fortune that has Bill Gates).

Try to prevent the entrepreneurs with a lot of talent (and a lot more luck, as the one that had Gates), to accumulate a wealth whose origin is located in the economic growth and the financial nature of the capital, and not in the savings or investment that you have been able to do as entrepreneurs, it is a collective suicide that may not be justified in rational terms. If you prevent the capital could be created are not going to create. When you prevent that you have the capital, or when you want to prevent is the formation of dynasties inherited, you must be careful not to kill the capital goods in the process, because they are the prize that makes the economy grow.

## 5. THE INCOME TAX AS A SOLUTION TO THE PROBLEM OF SAVING

We can distinguish three good reasons why it is desirable that citizens, businesses and institutions to pay taxes. The first, because the citizens want that many services are funded with the money that is contributed by all. The second, because it can be used in part to correct the inequality of wealth generated by the economy when left to their free will. Third, because it can prevent the credit crisis that causes the savings, making the tax is very progressive.

Precisely, for all these good reasons are mixed without discontinuity and without that it is easy to separate from each other, that is what Piketty says, in "Capital and Ideology", that the reasons justifying what to tax and how to burn is something that will always be subject to a strong social debate. In that sense, and without wanting to close the topic, we are going to present three ideas that emerge from the financial theory of capital and that we believe to be true:

- 4) The value of all capital goods in an economy is given by the expression:

$$K = \beta \cdot k_F \cdot M \beta = \frac{\langle \alpha \rangle}{\bar{\kappa} \cdot i}$$

Where  $\langle \alpha \rangle$  is the participation of the income in the *GDP* after the tax, and  $\bar{x}$  goes “1” when the economy is growing in a stable way, what happens most of the time.

- 5) The tax rate annual net on a specific amount of capital goods, the sum of which falls on the income it produces and which rests on the fact of having them, must not exceed the value of the annual income they produce, because if that happens, the capital would not have any value for those who possess it. The equation that marks the limit in the aggregate, is:

$$A \cdot C_{medium} \cdot \gamma \geq A \cdot C_{medium} \cdot rate_{capital} + A \cdot C_{medium} \cdot \gamma \cdot rate_{income}$$

Where  $\gamma$  is the rate of return on capital,  $C_{medium}$  is the average capital per person and the product  $A \cdot C_{medium}$  is the amount of capital that is taxed. The expression we mark the amount of capital  $A \cdot C_{medium}$  above which, with a few tax rates concrete, the income that produces after-tax is negative and the capital will disappear in more or less time:

$$\gamma \geq rate_{capital} + \gamma \cdot rate_{income}$$

- 6) The capital that is acquired by inheritance should be considered as legitimate as the one that is acquired by the union, or which is acquired by the revaluation of the capital already existing. Therefore, the rate that you are put to the increase of the heritage should not depend on the concrete form which has acquired the capital.

Since we assume that any tax that is put to the inheritance, you must also put it on the saving is done, or the increase in the valuation of the capital that makes the market, our proposal does not envisage any rate that depends on the different source that comes from the increase in wealth, so to avoid the inequality of income coming from different inheritance, what we propose is an annual fee on the price of capital, so that for all practical purposes is equivalent to a tax on the inheritance.

Therefore, if we accept, as indicated by Piketty, that solely for the purpose of imposing a tax on the amount of capital, it is not to raise in order to pay for the public services, but to prevent to form dynasties that can be sustained indefinitely in time in the heritage of the capital, then the only source to finance public expenditure is a tax on the income.

The table below shows what we thought would be a tax rate reasonable:

Progressive tax on the property			progressive Tax on the income	
Multiple of the average net	annual Tax on the property	Tax on the increase*	Multiple of the average income	effective tax rate of
0,5	0%	0%	0,5	10%
2	0%	0%	2	40%
5	2%	50%	5	50%
10	2%	50%	10	60%
100	2%	50%	100	70%

1.000	2%	50%	1.000	80%
10.000	2%	50%	10.000	90%

\*Includes savings, donation, inheritance, and the revaluation

#### TAXES ON INCOME TO COVER PUBLIC SPENDING.

We start from the opinion, that all government spending must be paid only with a tax very progressive on incomes, from whatever source. In the table on the right are the different rates according to the total income of each citizen, the sum of wages and capital income. Is identical to that proposed Thomas Piketty, and assume that is enough to raise approximately 50% of *GDP*, which is the public spending in a country such as France (may not appear different subtleties that always has the practical implementation of any system of taxation, such as VAT or as a tax, because it is our intention to give you a general idea about the need to separate the tax for defraying the public expense, of those other taxes that they get to keep the savings, and who we think should be used for other purposes).

#### RATE ON THE AMOUNT OF CAPITAL IN ORDER TO AVOID THE ACCUMULATION OF WEALTH.

In the column on the left is the annual tax on the value of the accumulated capital. We observe a flat rate of 2% which is not progressive and that only relieve her of payment to those who have a capital of less than 2 times the average capital, which in France amounted to 400,000 euros in the present (capital half in France is 200,000 E).

The function of this tax is to prevent the accumulation of wealth. That's why, in the column farther to the right, in gray, is the equivalent rate of a tax on timely inheritance that would raise the same thing. That is to say, we can choose to put a rate on time to the inheritance, of 50% or make an annual rate of 2% on the amount of capital that it owns, with the exemption noted. In both cases raise the same, approximately (the calculation is not anything precise), but both rates would have approximately the same effect on the accumulation of capital proceeds of the inheritance.

To see that both of these rates are more or less equivalent, suppose that all capital changes hands every 30 years (people still do not live forever, and we assume that all capital is inherited or donated every 30 years on average). If we want to raise the same, with an annual rate on the price of the capital that what is collected thanks to a rate of 50% by gift or inheritance every 30 years (to prevent dynasties, as proposed by Piketty), then the annual rate on capital will be approximately:

$$(1 - x)^{30} = 0.5 \rightarrow x \sim 2\%$$

That is to say, a levy of 50% on the increase in wealth by inheritance, is equivalent to what is collected for 30 years to impose an annual rate of 2% of the capital (30 years is the time we assume that it takes all the capital in change of owner). In the table appears in the grey column.

Obviously, it is more practical to impose an annual rate of 2% on all of the existing capital (up to 2 times the average capital), riding the slope of who inherits what and taxing promptly any inheritance or donation with a single rate of 50% that will not be understood by the citizenry.

THE TAX ON THE INHERITANCE. A tax average of 50% of the value of any gift or inheritance, it will be very difficult for it to be accepted and understood by the citizenship (even for those who have less capital and are exempt from the rate), and we suggest that the collection is replaced by an annual rate equivalent to 2% on all of the existing capital. That will produce the same effect over time and will be much more understandable and a lot easier to pay to be distributed over a period of time of about 30 years.

People are born with a strong sense of protection towards our children, and we tend to make a big effort to accumulate wealth with the only intention to pass as an inheritance to our death. The people will not understand that they pay a deposit tax on the inheritance, and look for any trick to avoid it, something that can be achieved with relative ease that have a lot of money but that will be difficult to avoid those who don't have both. It is easier to evade a tax point in time that occurs in the donation or inheritance, a tax that was to last over 30 years.

We believe that the discussion does not have color.

Please note that the tax rate of 2% a year, which we are proposing, guarantee that any equity above 2 times the estate will be paid to the treasury department its own value in about 50 years, provided that the collection of the tax does not diminish the value of the property on which it is imposed (and the half of its value in about thirty years old when if it goes down):

$$50 \text{ years} \cdot \frac{2\%}{\text{annual}} \cong 100\%$$

That is to say, that the capital will be wiped out, in the aggregate, in about a century when you do not have in mind the revenue-producing capital goods. But given that the tax on the income also includes income and are strongly progressive, it will be very difficult for the great fortunes can perpetuate itself through the savings of the income that you get your wealth, so that the previous figure of 100 years will be significantly reduced. You can only benefit from the inheritance spent on consumer goods, which annihilates the capital and prevent the dynasties.

To view it, you just have to calculate the effective rent, which produces an amount of capital to its owner once deducted the tax. The expression:

$$A \cdot C_{\text{medium}} \cdot \gamma \geq A \cdot C_{\text{medium}} \cdot \text{rate}_{\text{capital}} + A \cdot C_{\text{medium}} \cdot \gamma \cdot \text{rate}_{\text{income}}$$

We mark the limit at which the income will be negative for its owner because you will have to pay in taxes, the more money you charge for rent. This happens approximately between 2 and 5 times the average capital current of a country such as France, as reflected in the accompanying table:

Effective rent of capital			
Multiple of the average net	annual Tax on the property	effective Rent of the capital $\langle \gamma \rangle$	Time of the annihilation of the capital (years)

0,5	0%	to 2.7%	-
2	0%	1,8%	-
5	2%	0,5%	-
10	2%	-0,8%	300
100	2%	-1,1%	160
1.000	2%	-1,2%	111
to 10,000	2%	-1,7%	80

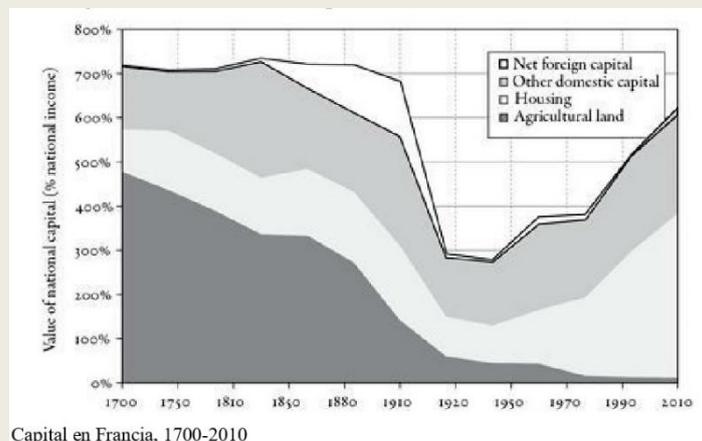
To obtain it, we have assumed an average rate of return of the goods of capital of 3% (a figure is very consistent with an economy of slow growth as the current), and used the following expression:

$$A \cdot C_{medium} \cdot \langle \gamma \rangle = A \cdot C_{medium} \cdot (\gamma - \gamma \cdot rate_{income} - rate_{capital})$$

Of course, it is possible to raise the tax rate on the annual capital above 2% without any problem, but it is not a good idea to do it progressive because the tax on the income that is produced in the capital is already sufficiently progressive.

**The Curve of Piketty.** We have already mentioned that there are many reasons to give to Thomas Piketty the Nobel Prize. Without being the most important of them all, we like to point out the curve that shows the evolution of the value added of capital in relation to the GDP of how one of those reasons.

In fact, as we demonstrate by making use of the Financial Theory of Capital, the “hole” that is observed in the curve is a direct consequence of the increase in taxes on capital income, so that simply returning to the tax on the income you had in the post-war period it would return immediately to the valuations of capital, which is observed in the graph of Piketty and that are in the environment of about 4 times the GDP. Obviously, well below the valuation of the capital today.



If, in addition, the increase in the progressivity of the income tax is complete with a tax on the possession of any type of capital of 2% per annum, the value of the capital would fall even more, and prevent almost completely the existence of dynasties inherited.

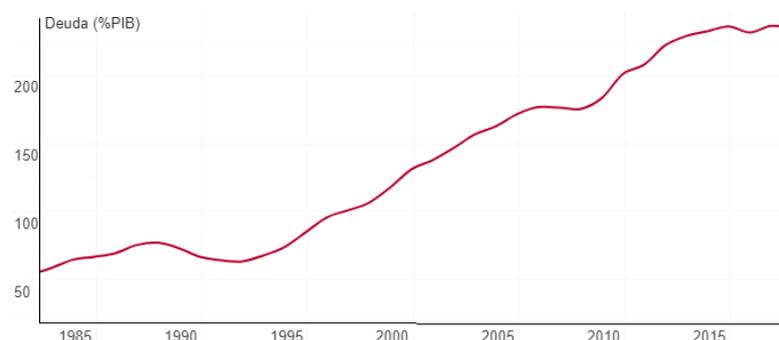
*Thomas Piketty proposes to allocate the proceeds of this last tax (2% on the annual value of the capital goods that you possess), to provide a minimum equity to all young people when they reach 25 years of age, regardless of their income or the wealth that you already have, something that is very difficult to not be in full agreement.*

## TAXES ON INCOME IN ORDER TO LIMIT THE SAVINGS

It has already been shown that the reason why the economy enters a recession is because the flow of credit becomes negative and starts to destroy money out of the economy, or if you prefer, because the savings will extract more money from the money supply that is returned with the deficit. When the technological momentum stops, the investment credit is stopped also, being then inevitable that the savings will treasure and finished causing a decrease of the *GDP* that is fed back by becoming a credit crisis.

The fiscal policy that remains in the present to solve the problem, which uses the public spending deficit to absorb the savings and return it to the economy as spending, is a solution that can be maintained while the amount of the debt and the payment of the interest does not become prohibitive, which ends up happen sooner or later, even when you lower the interest rate. But, although lower the rate of interest of money relieves the payment of interest and allows you to continue to keep the deficit spending of the government, becomes unstable to the valuation of capital goods, so it cannot be kept low in a long time. The policy keynesian, in the best of cases, it is a point solution which is not sustainable in time.

Consider, for instance, what has happened in Japan. There, the rate of interest is close to zero for decades, and is the public spending deficit who is returning the savings made by the private sector. In 2020, the public debt japanese reached 250% of *GDP*, probably the highest in the world, and sooner or later will be unsustainable even for Japan. In addition, an interest rate close to zero does increase the price of the asset up to stratospheric heights, causing instability in the valuation that makes the Capital Market. Both situations will, sooner or later, that disaster is inevitable and the japanese economy to sink.



In the attached figure is observed the increase in near-constant of the public debt japanese from the decade of the 90's, showing at the same time so very conclusive that the private saving is proportional to the *GDP*, as suspected Keynes. We know that, within an economy in isolation, the sum of the debt of public and private savings is zero in the aggregate, when there is creation,

banking, and the evolution of Japan is left approximated very well by an economy isolated that it is not growing or grows very slowly. If we assume that the debt comes from the savings of the Japanese and very little of the money creation, then:

$$\begin{aligned}
 \text{public debt} &= \int_0^t Ah(s) \cdot ds \xrightarrow{Ah=\tau_s \cdot GDP} = \tau_s \cdot \int_0^t GDP \cdot ds \xrightarrow{GDP(t) \sim \text{constant}} \approx \tau_s \cdot GDP \cdot t \\
 &\rightarrow \frac{\text{public debt}(t)}{GDP(t)} = \tau_s \cdot t
 \end{aligned}$$

It responds very well to what is observed in the graph, suggesting that the savings have remained proportional to the *GDP* as we have assumed. This allows you to easily calculate rate of annual savings from the Japanese that has been absorbing the public deficit in half. Assuming that the Japanese economy has grown very slowly, as in fact has been happening these past few decades:

$$\frac{\text{savings}}{GDP} = \tau_s \sim 10\%$$

It is very clear that the situation in Japan is absurd by unsustainable. The public spending in Japan has been absorbing the private savings that have been doing the Japanese (probably to pay the mortgage debt), and has been returning to the economy, avoiding deflation. The net result of the process has not been the transfer of private debt to public debt as usually thought, but the maintenance without the sense of a flow of savings of 10% of *GDP* at the expense of the public debt, without which you know that you have spent about 10MM of euros owed by the public sector.

**THE PUBLIC EXPENDITURE.** *It is very clear that the role of public spending is to pay for the public services that citizens have decided that you assume in a common way, and it makes no sense to use it for absorbing the private savings to doing what is known as fiscal policy Keynesian, even when the public spending deficit can be paid with money made of nothing (don't change nothing to the problem that creates the excess of savings).*

What we propose here, is to make a progressive tax on the income in order to limit the savings, but separating in a very clear way the financing of public expenditure in the fiscal policy designed to avoid a credit crisis, in such a way, that the rate that will be used to finance public expenditure is clearly differentiated from the rate that is used to carry out fiscal policy. We think that public spending must be funded with the money collected from income tax, and without having to resort to deficit, while, to solve the problem of saving, what we propose here is that the Central Bank, based on the analysis of the economic situation, point-of-way to separate the annual amount extra that must be raised to reduce the savings glut that threatens to sink the economy.

Specifically, and since the savings depends on your income and what we assume is proportional to the *he* (The Act of Saving Keynes), the rate should be progressive with the income. There is, therefore, no reason why you have to be different to the rate that is already being used to finance public spending, and what we propose, in fact, is that it is the same.

The table below sets forth the proposal:

<b>Tax the capital</b>	<b>income Tax, the income</b>	<b>Tax savings</b>
------------------------	-------------------------------	--------------------

Multiple of the average net	annual property Tax	Multiple income average	effective tax rate of	Multiple of the average income	effective tax rate $\varepsilon$ *
0,5	0%	0,5	10%	0,5	$\varepsilon \cdot 10\%$
2	0%	2	40%	2	$\varepsilon \cdot 40\%$
5	2%	5	50%	5	$\varepsilon \cdot 50\%$
10	2%	10	60%	10	$\varepsilon \cdot 60\%$
100	2%	100	70%	100	$\varepsilon \cdot 70\%$
1.000	2%	1.000	80%	1.000	$\varepsilon \cdot 80\%$
of 10,000	2%	10.000	90%	10.000	$\varepsilon \cdot 90\%$

- The parameter  $\varepsilon$  is a positive number that decides the Central Bank, according to the situation.

The parameter  $\varepsilon$  is a positive factor that decides the Central Bank sufficiently in advance, and depending on the economic situation. The first table is the proposal for a tax on the capital, which is discussed later, but that has nothing do with what we are dealing with now. The second table shows the rate usual, which is imposed upon the income, regardless of its origin; it is the collection that is used to pay the cost of public services. In the third table shows the tax that we propose to reduce the saving; it is a tax equal of progressive tax usual on the income, but that does depend on a parameter  $\varepsilon$  that changes as you change the general economic situation.

We think that the money raised with this ultimate tax, doesn't need to go never to finance public expenditure, since the role of the tax is to reduce the amount of saving those who have more income. Therefore, it should be used only to promote private investment and private spending of those who do not have sufficient income to do so for themselves.

## EPILOGUE

*How to terminate a treaty of nearly 300 pages, pretending to summarize all that he has, in just a couple of paragraphs? Perhaps it is presumptuous on our part, but in the present case, it is not so difficult as it seems if in the first paragraph, we formulate a question and we spent the second paragraph to answer it.*

*Where does the money from our savings?*

*A very simple question, that has an answer very short: "to nowhere". In aggregate terms, the money is barely treasures and the people save by buying something whose value increases over time, or, at least, remain unchanged. But, there are for sale within a monetary economy whose value does not diminish with time? Obviously, capital goods, because its value depends on the income they produce, which is stable in aggregate terms. If you want to save, money will have to spend on the purchase of capital goods, so you should have at the same time someone who wants to sell you the goods of capital that you have. But who would want to sell their property capital? Ah, that question is easy to answer and the answer is known all over the world!! The people that they have saved by buying capital goods and wish to des savings now selling them!!*

*What, then, where is the problem?*

*If you have followed the thread of reasoning, then you can understand that the savings, in itself, does not create any new capital good, so the savings will not cause any problem, or it will cause many problems, according to finds or does not find the capital to buy. But in an economy without real growth real capital does not increase:*

$$\Delta K = \frac{\langle \alpha \rangle}{\bar{K} \cdot i} \Delta GDP$$

*According to the equation most important part of the economy. The saving does not give problems in an economy without growth, provided that they meet that the amount of money that you want to save now is equal to the amount of money that you want to des savings now.*

*What we see now from where is the problem?*

*The problem is that not headed to an economy of slow growth that will have to be fulfilled that the aggregate savings is zero or nearly zero, that is to say, what to save someone is the same thing that des savings someone. It is a problem, because an economy in which this condition is fulfilled in an economy that already occurred in the past and that the majority of the population will find some desirable that in the future it will go back to it.*

*Imagine a society like today's, with barely any growth, and with the capital goods distributed very unevenly. A society with a 1% of the population owns 50% of the wealth and without growth. Why would des savings the 1% rich, when the wealth which has reported a considerable income? But then where will the capital goods that you are buying the savings? It is very clear that no part. It is very clear to the authors that the current instability of our economies is transient and the society will be inevitable, and after a credit crisis, towards an economy barely growing, and*

*the not to be just savings, with high inequality and very similar to that predicted by Thomas Piketty in Capital in The Twenty-first Century. In an economy as well, the rich will stop saving and with their immense consumption by making them a good part of the world economy to satisfy their whims and their excesses, as happened with the court of Louis XVI before you cut the head, and as is happening now. The middle class hardly going to be able to save money and get your heritage the heritage of their parents. The class most disadvantaged penalties if they save and will not inherit anything from their parents, also she will live exclusively of their income. Everyone, whether rich, middle and poor will live their income, without any of them save just.*

*The future that draws clearly the Theory of Madrid, unless a remedy, we could call it "the future of Piketty" because it is the same as that warns the economist frances, but we do not wish to fall back on Piketty like karma.*

*Nor is it the job of the authors to preach to anyone, but to show the future in which the monetary economy leads when it is left to the society to the freedom of choice, building to be able to see a solid crystal ball, the Theory of Madrid. We have done our work and built the ball, but to avoid the future that the ball shows, is not our thing, but your.*

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