Economic Theory - Mauricio Rivadeneira Mora

Mauricio Rivadeneira Mora

Santa Fe de Bogotá, Junio 1997

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PRESENTATION

I submit for consideration by the scientific community of economists in Colombia, this essay that seeks to explain and provide a solution to the current economic situation that Colombia is going through.

The essay delves into economic laws to show that Colombia's crisis is not accidental, but from every logical point of view, in accordance with the economic policy that has traditionally governed Colombia.

As guiding texts in this research, I have particularly delved into the General Theory of Employment, Interest and Money, by J.M.KEYNES, in the books of Professor ALLEN, such as his Mathematical Analysis for Economists and his Mathematical Economics, and in the Theories of Economic Development by Mrs. IRMA ADELMAN.

I must say that the contribution of Professor SAMUELSON's texts with his Course in Modern Economics, and Professor ACKLEY with his Macroeconomic Theory has also been considerable.

Many other texts on various topics have also been researched, including those on international trade.

I consider the influence I have received from the Physical sciences to be of vital importance, which have allowed me to establish very useful analogies for the same understanding of the laws of economics.

I hope that this essay will help Colombian economists and the different government entities in charge of providing economic management guidelines, in the task of finding an adequate solution to the current crisis that afflicts us.

CORDIALLY

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Chapter 4

ECONOMIC THEORY

4.1 HOW TO CONTROL INTEREST RATES, MONETARY SUPPLY, INFLATION, EXPECTATIONS AND UNCERTAINTY IN THE ECONOMY

(A PROPOSAL FOR COLOMBIA)

MAURICIO RIVADENEIRA MORA

SANTA FE DE BOGOTÁ, JUNE 1997

4.2 PRESENTATION

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The essay delves into economic laws to show that Colombia's crisis is not accidental, but rather entirely logical from every point of view, in accordance with the economic policy that has traditionally governed Colombia.

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4.3 INDEX

4.4 INTRODUCTION

The nature of the crisis that Colombia is currently experiencing merits a complete study of economic theory that allows comparing two systems that move simultaneously under completely different economic policy applications: On one side, an international context where interest rates are relatively low, and on the other, countries that for one reason or another chose to allow considerably higher rates, protecting their economy through considerable tariffs.

It is a fact that when tariff protections are lifted, one of the two systems will be in a better position and the other, as we say colloquially, will end up paying.

Conceptual economics has not yielded its space to applied economics, much less to econometric models. On the contrary, when these models enter crisis, it is necessary to return to reviewing both economic concepts and the principles on which the models are based.

The crisis we are experiencing in Colombia, I maintain, must be sought not in trade relations nor in the supposed uncompetitiveness of our productive agents, but in the principles on which the management of our economic policy has been based.

When developing economies seek to enter the international context through opening processes, these must be coherent with a multiplicity of factors, among which the adequate management of interest rates and monetary variables must be fundamentally contemplated. By taking measures only with respect to the real variables of the economy, that is, opening the system to freedom of imports, one can induce a strengthening of banking to the detriment of consumption and the stability of productive companies, giving the appearance that opening only produces benefits for more developed countries, leaving developing countries as yet more victims of the voracious capitalist system.

We will demonstrate in this work that this is not so.

4.4.1 Fundamental Thesis

The fundamental thesis of these articles consists of affirming that the interest rate in a country that decides on opening should be such that the deposit rate of the financial system should be placed in the order of 3%, and the intermediation rate at no more than 7%, to give parity to the different exchange relations with the rest of the world, this being a necessary but not sufficient condition for the developing country not to be harmed either in its employment level or in the level of its gross domestic product.

We demonstrate in this work why it should be so, why it is not impossible to administratively force the system so that rates take these values, why the high interest rate is what induces inertial-type inflation, and why the Colombian government has been wrong in managing the DTF (Deposit rate in Colombia) since it decided to "tie it" to the inflation index.

These demonstrations are conceptual and not econometric. Let us remember that it was not thanks to regression models that Newton postulated that force equals mass times acceleration, nor did Keynes deduce his investment multiplier model from an econometric model.

4.4.2 Methodological Approach

In general, theoretical economics is concerned with the equilibrium point, both static and dynamic. The developed models propose a series of n equations with n unknowns, in whose solution they seek the interest rate compatible with equilibrium, if it exists. The mathematical result is that there are usually many values that this variable can take, which does not give much light to applied economics.

Somehow its application has been transferred to the practical level, and it is generally accepted that the interest rate is an independent variable, although with the possibility of moving or changing to make the system compatible with equilibrium, according to how the other variables of the system are developing. Under no circumstances is it contemplated that this could be "rigorously rigid" at a determined value, although some authors (that I at least know of) have suggested it timidly. Thus, the interest rate moves to seek equilibrium, although in practice in some countries it may be quite stable for long periods.

In this work, we reverse the relationship. In fact, we know that by fixing a value to the interest rate, the entire productive system and exchange relations will seek their stability around this rate. We postulate that this rate refers to the deposit rate of the financial system. That is, the marginal efficiency of capital will reach the point where it equals the deposit interest rate, without neglecting that there are other variables that will also influence, such as, for example, the percentage of taxes, etc.

From this perspective, it remains to determine what is the interest rate that could optimize the system, since it is not recommended that it be equal to zero, a point where the "engine" of capitalism would disappear: competition. Of course, we do not address this mathematical exercise that would lead us to suppose the existence of a natural interest rate capable of bringing the economic system to its maximum utility.

We fix this value "capriciously" at 3%, since it is the value traditionally spoken of in all texts, and the one that in practice seems to be commonly accepted by economies that have not let themselves be overwhelmed by inflation.

If more rigor is desired, the minimum value of the deposit rate that could be postulated for countries that decide on opening should be equal to that of the most developed country whose rate is the lowest among them. This will prevent there being unnatural advantages in the level of competition of companies, by allowing the cost of money to be equal for all.

4.4.3 Study Scope

This work is eminently theoretical, although it uses the Colombian case as an example. I maintain that we have objective laws in economics, therefore these cannot depend on whether they are applied in one country or another. I simply take these laws and use them to explain what is happening to us and what we should do. No figures are given for the Colombian economy either before opening began, or from the moment the crisis started, or for consecutive periods of the crisis, which we affirm will continue as long as the deposit rate continues to be well above 3%. In Colombia the rate has generally oscillated above 20% and has even reached levels of 30% before opening, and with inflation indices that have also oscillated at these same levels, of course, as was to be expected, a few points below the interest rate. While before opening these levels were sustainable and manageable for being above all nominal, with opening these values became perfectly real for everyone, to the point that there is no way to ask that a company that in Colombia gets resources at almost 45% interest can compete with one from the USA that gets the same resources at no more than 9%.

Although reference is made only to Colombia, for an economist from any latitude it will not be difficult to understand what is being discussed, and I do not doubt that they will agree that the study is susceptible to generalization.

4.4.4 Variable Control Proposal

It is argued in the work that it is not appropriate for a government to maintain all its economic variables over which it can have some control, such as taxes, bank reserves, monetary supply, interest rate, etc., subject to permanent changes, since equilibrium, whether static or with growth, will be an impossible task to maintain since some variables influence others, and with some the effects of others can be counteracted.

As an example, observe how putting the DTF (Deposit rate in Colombia) a few points above inflation leaves completely useless the release of money to modify the interest rate, "sending" all its effect directly to the price level. This is demonstrated in the third chapter, "ECONOMICS -VS- PLANNING." It is argued that the ideal is to be able to leave one or two variables fixed, for example, the interest rate and the tax rate, so that through another variable, for example monetary supply, it can be manipulated over time in such a way that it fixes or maintains in reasonable stability a third or fourth variable such as the price index. This would be "taking the bull by the horns," to allow the system to develop, perhaps not as we would like, but at a point close to optimal.

4.4.5 Critique of Institutional Separation

We argue that definitively when we speak of economics we must necessarily refer to a totalizing system, therefore when in Colombia we have separated the management of real variables of the economy under the central government, and monetary variables under the monetary board, nothing more than a dangerous blunder has been made, since the Board can easily end up responding to banking interests, or be politicized and strongly oppose government policies, or remain in the clouds theorizing from a cold academy, thinking it has no responsibility to the Nation's productive forces.

4.4.6 Predictive Capacity

This point is developed in the first chapter, "ECONOMIC SCIENCE AND ITS CURRENT APPLICATION IN COLOMBIA," which shows how it is possible to make predictions in economics. The basic postulates of economics have been taken, and a development has been made of what we could expect when raising the interest rate.

This chapter began to take shape during the second semester of 1995, when the Monetary Board began talking about overheating of the economy, and that the savings level was very low in Colombia, which motivated it to raise the interest rate. The chapter was finished in July 1996, so the predictions made there begin to be clearly seen during 1997.

Thus, the chapter predicts increased unemployment, decreased Gross Domestic Product, consolidation of economic groups, disappearance of small and medium industry, etc., not as a product of fortunate guesses, but from the judicious application of economic arguments that Keynes had already analyzed in his time, in addition to finding these arguments in any economics text.

Likewise, it shows how the system has been crying out for interest rates to be lowered (in general, prices always indicate what should be done), therefore it is particularly important to investigate the reasons why the Monetary Board resists lowering the rate.

4.4.7 Identification of the Real Problem

Ultimately, the article shows how the government is not to blame with its fiscal deficit, but is one more victim, like the entire system, of the application of monetary policy by the Board of the Issuing Bank. But if we are going to be fair, the theoretical error is not easy to elucidate, so it is not enough to say that it is an error to maintain interest rates so high, but it is necessary to explain very thoroughly why, and even more, how much they should fall and how to do it.

The value of this first article lies in being predictive-explanatory, easily contrasted with events almost a year later, when other colleagues have barely come up with the diagnosis although not yet with the solution that is suggested here.

4.4.8 Limitations of Econometric Models

Let us clarify further why I think the econometric models developed and applied in these countries to plan economic policies cannot serve in a case like this, neither to plan, nor to predict, nor to find an adequate solution.

First, a model of n equations with n unknowns, to be fed with historical values that determine initial conditions, requires regularity in the rules of the game that allow inducing that constants, if any, are reasonably constant. In Colombia this situation has not occurred, much less when opening began, when it could be supposed that practically all values would be modified.

Indeed, parameters such as the propensity to consume, from which the investment multiplier is derived, has had to vary so greatly in recent years that we must necessarily say that any

prediction that contemplates this value will be automatically biased in an unpredictable way.

4.4.9 Scientific Approach vs. Empiricism

For our purposes we use the equality of saving and investment at all times, and if this serves us to make predictions, then it is evidence in favor of this model. If someone is uncomfortable with it, I will generalize, arguing that as I see the discussion of the equality or not of saving-investment, if I understand correctly, I would say we can take saving as the sum of planned and unplanned saving, and investment as the sum of induced investment with planned investment. Under these conditions saving and investment will continue to be equal both ex-ante and ex-post, although it does not mean that from one period to another it cannot be different, leaving this explanation as a development of the model proposed by Keynes, and not as a different economy. The same could be said of the different multiplier-accelerator models.

I resist accepting that economic science is just numbers. These will unquestionably corroborate theories by contrasting them with reality, but we must not fall into the temptation that numbers are science and the last word. This is why I think that in Colombia a true diagnosis has not really been made, because otherwise we would already know what to do.

Indeed, saying for example that recession is due to high interest rates, that construction is paralyzed, that dollar revaluation is strangling exporters, and that producers cannot compete with imports and smuggling, is not a diagnosis at all, but simply a description, so to speak, in figures, something like a photograph, but not a diagnosis, which should be able to explain in detail why each of these elements occurs, and suggest correctives.

Thus, the first chapter of this work resembles more a diagnosis, although it is not complete.

4.4.10 Work Structure

This work initially, and at all times, only sought to find a way out of the problems that were coming to Colombia, and that it currently suffers with all its rigor, without being able to say that rock bottom has been reached. However, the way the topic has been treated I believe has exceeded its initial intention, and has allowed generalizing the theory at a global level, which in my understanding makes this work also of global interest.

In the text and throughout all chapters, diagnosis is interspersed with solutions and theory, simultaneously.

The first chapter is informative only for Colombia's situation. For purposes of understanding the theses presented, reading can begin from the second chapter, from which the theory forms a congruent whole.

In the fifth chapter the most important conclusions of the work are extracted, and in accordance with these, specific recommendations for the Colombian case are elaborated. The proposal is shock therapy, and I hope it will be discussed, accepted, and eventually improved by my Colombian colleagues.

Chapter 5

CHAPTER I

ECONOMIC SCIENCE

5.1 AND ITS CURRENT APPLICATION IN COLOMBIA

Santa Fe de Bogotá, August 1996

It is the function of the agents responsible for economic organization of a country to oversee the proper management of variables that intervene and regulate markets in order to achieve stable growth without trauma, minimizing the economic cycles inherent to capitalism. For this they rely on the advancement and knowledge acquired by economic science and the different experiences of countries, it being a double sin to forget both theory and practice, and even to apply knowledge mechanically or orthodoxly.

5.2 Keynes' Macroeconomic System

Since the time of Keynes we can say that economics was structured as a system, bequeathing a macroeconomic model composed of five basic equations:

Two real equations of demand and supply of goods and services:

(1) income Y = C + S (consumption plus saving),

(2) and production Y = C + I (consumption plus investment),

Two monetary equations of money supply and demand:

(3) M = M1 + M2,

(4) L = L1 + L2;

and a fifth equation that links the real equations or functions with the monetary ones,

(5) Y/M = V, or velocity of money circulation.

Despite having this system of equations we cannot say that things function as in the physical sciences, where with a system of fundamental equations stated as principles or laws one can deduce all the consequences that derive from them, allowing us to build buildings, cars, airplanes, explain the functioning of the universe and predict future consequences given initial conditions. No. In economics it is different, although it is possible to make qualitative predictions with a certain margin of reliability.

5.3 Evolution of Economic Thought

Since the beginnings of formal economics, the theorists of the science including Keynes have dedicated themselves to finding the way in which the different variables of the system relate, and their dependence on the interest rate, employment, price level, economic cycles, propensity to consume and save, etc., seeking to determine which are the dependent variables and which are the independent ones.

Subsequently with national accounting methods, variable measurement and the development of econometric methods, simulation models could be developed that allowed better planning of a country's governance work. It should be noted that these models are not as exact as one would like, nor are they irrefutable, and they depend on the initial premises that one introduces into them. For this reason, if these premises are not adequate, the results of their application can become catastrophic for an economy. I think such is the current situation of the Colombian case, which I propose to show in this discourse.

5.4 Monetary Issuance and Its Effects

Over time economists realized they could issue money without gold backing, and many shouted Eureka. Governments began to finance themselves with this resource, believing they could thus incentivize demand and invite producers to offer more, that is, increase supply and therefore employment. This policy was supported by CEPAL and generally applied in South America. The well-known result was permanent and quite high inflation, oscillating between 25% and 35% in those countries that applied it with relative moderation.

Before we accused the government of inflation when it spent too much. Today, in Colombia, for the same expenditure we accuse it not of inflation but of high interest rates.

5.5 The Real Nature of Monetary Variables

Let us clarify an aspect first. Although in economic theory, by convention, we have mentioned two real equations and two monetary ones, this does not mean that the monetary ones are fictitious. On the contrary, they are very real, and really influence the economy according to their management. Thus, when permanent issuance by the issuing bank occurred to finance public expenditure, the effect was inflationary and will continue to be so as long as there is no increase in the product. In this way, with the management of a monetary variable a real and tangible effect for the population has been achieved, which is inflation; and when inflation arrives by this route, it is clearly an indirect tax that the government charges us, and equally, to all taxpayers.

But this effect does not influence the real interest rate. It is as if in some mysterious way the system realized the deception and the rate perceived it, maintaining itself above inflation.

5.6 Normal Levels of Interest Rates

Normally, when there is no inflation, the interest rate paid to individuals who deposit their resources in banks can oscillate between 3% and 5% annually, and in turn, banks charge those who request loans more or less 4 to 6 additional points. That is, in an economy without inflation the lending interest rate can oscillate between 7% and 11% annually.

When there is inflation the real, institutional interest rate rises some points, plus the effect of inflation. Thus, if inflation is 20%, the agent who supplies money for an investment will be recognized a maximum of 5 to 6 points, so the deposit rate would be in the order of 26%; and

the agent who requests the loan will generally be charged 8 more points, so the normal lending rate for an economy with 20% inflation would oscillate around 34%, but in real terms, it will not exceed 12 or 14%, due to banking intermediation.

In short, we can affirm that the real economy does not let itself be "deceived" by monetary tricks. In fact the economy can continue growing even with inflation, but with a real interest rate that does not, in general, exceed the aforementioned limits.

5.7 Colombia's Problem

We then ask ourselves, why is Colombia charging a rate of almost 40%, about 6 points above normal? Why does banking charge up to 11 and 12 points for its intermediation? Does this perhaps obey poor management by the government or the issuing bank? What hidden interests are being managed and by whom? Does the government's political crisis perhaps influence this?

5.8 Development of Monetarist Thought

When economists realized that economic control could be done through monetary equations, they were erroneously called monetarists in opposition to Keynesians. In reality Keynes bequeathed the entire system, although naturally, he did not deduce all possibilities. In reality economic theory was developing. Today we should not call ourselves classical, neoclassical, liberal, neoliberal, etc. We all continue being Keynesians, developing his system of equations in a similar way to how the physical sciences do.

In modern times economists have realized that the best indicator of different variables are prices. These react when there is an unsatisfied need, or when a good is exhausted or there is excess. They also observed that when subsidies are given, services become poor quality. Freedom of prices began to gain ground again as in the origins of capitalism, except that today we have more knowledge of the system's variables, and the situation can be better controlled. Economic science has slowly been gaining ground in mastering reality. However this is so changeable that it is still quite an art to be able to diagnose and supply the correct drug.

5.9 Colombia's Constitutional Error

Indeed, the first to make an error was the constitution, when it separated the management of real variables under the government and monetary variables in the hands of the Bank of the Republic, as if the system, which is unique, and which must function as a harmonious whole, could be separated by giving responsibility only to the government but leaving the helm in the hands of the issuing bank. In synthesis, it is impossible for a ship where each goes their own way to reach safe harbor. It is not adequate for academia to move on one side and executors on another. Theory and practice must go in unison, one feeding the other. In this same dimension, the constitution should have been more general, and not limit the Issuer to the sole task of controlling inflation, the exchange rate, and monetary supply, when in economics one must speak of global equilibrium, development, growth, employment indices, etc., and not to mention principles.

5.10 Free Trade Principles

Indeed, since the time of David Ricardo we have been told that with free trade all nations benefit together, and only now do we begin to understand this principle, which for some time now the developed countries have been promoting although they do not always want to apply

it themselves, that is, in the North American style, but which Colombia assumed from the previous administration by accepting opening, and since it no longer has reverse, it is better that we prepare to assume the challenge as a total set.

To illustrate this about principles, let us say that the issuing bank together with the government should rather control that all agents of the economy have the same rights and conditions to compete in a free market, avoiding preferences and monopolies so that whoever leaves the market is due to inefficiency or non-competitiveness, and not due to an arbitrary measure that places entrepreneurs in insurmountable difficulties, as has indeed happened when manipulating the real interest rate, since this does not currently obey a free market of supply and demand, easily demonstrable by the fact that banking is flooded with liquidity without this motivating the rate a few points down, as it should be under normal conditions, and also by the fact of finding itself well above that of international banking, which will not hesitate a moment to take whatever slice it can, all this in supposed opening conditions.

5.11 Impact on Companies

In contrast, companies do feel its effect since they cannot react with the price of their goods, as they have to compete with a much cheaper foreign supply due to revaluation, and with restricted demand because families have to allocate more of their income to cover interest. Indeed, a very high interest rate decreases consumption, but let us not forget that companies live off that consumption, and cutting it off is like cutting off oxygen to a diver. The sequence is simple:

5.11.1 Sequence of Business Crisis

With opening alone, companies are forced to lower prices due to competition, which implies that profitability begins to decrease. This process is not so fast, and gives them time to improve their processes or disappear; but this means they were replaced by more efficient ones, and there is no trauma in the economy.

When additionally an abrupt change in the interest rate occurs, and sales suddenly collapse, there is no such replacement of some companies by others, all decrease their activity. And their variable expenses, which require time to be able to react, begin to become fixed, income is not enough to cover fixed and variable costs, and purchases have to be stopped. Payments to suppliers become difficult, and even payments to the government. Initially inventories accumulate and increase, but soon it is the only thing that can be realized, working capital investments begin to disappear. Financial obligations are breached, and concordat processes come and then liquidations with massive unemployment. Properties in plants and equipment remain in the power of banks, unused, there is disinvestment. Negative investment. It means that savings decrease precipitously.

5.12 The Danger of Manipulating Real Variables

When real variables of the economy are touched in such a way that they do not obey the free market of supply and demand, it is something like opening the door to misfortunes. As proof, it suffices to glance at the drug market, whose prohibition far from motivating a decrease in consumption only manages to incentivize prices upward, increase consumption and therefore production, with all its sequels of crimes, battles and diseases.

5.13 Analysis of the Issuing Bank's Motivations

We still need to analyze the motives that induced the issuing bank to take the measure of modifying the interest rate. Whether this corresponds to reality, and whether its consequences are coherent or contradict the objective they intend.

The first symptom that the Bank of the Republic board noticed was the percentage increase in credits held by banking, with indices higher than supposedly expected in the model used by the issuer.

Let us not forget that Keynes' first equation tells us that from total income families allocate their resources to consumption expenses, and their surplus, they save.

Therefore, following the issuer, if consumption has increased percentually, it is because savings have decreased, also percentually. This has all the logic in the world.

5.14 Questioning the Diagnosis

But let us question. Did the issuer deduce the percentage increase in savings, or its low level, only from the fact of the percentage increase in the portfolio held by banking? Did the issuer perhaps have the opportunity to effectively measure GDP in two immediate periods, to be able to determine how consumption had moved, and how savings?

If so, reason may accompany it. But let us continue questioning. Is that GDP well measured? I mean, does it include income from the informal economy? Let us not forget that the real economy does not let itself be "deceived," and the fact that a sector does not pay taxes does not mean it is not there, generating employment and wealth. Although in general we can despise the informal economy for not being significant, we cannot say the same when it comes to drug trafficking, whose resources can be highly representative within GDP.

5.15 Keynes' Dual Equation

But if this income measurement presents insurmountable technical difficulties, we can still observe the problem from Keynes' other equation because it intrinsically contains double-entry bookkeeping. This equation tells us that production agents are manufacturing consumer goods and investment goods, and since these agents are the ones who compensate families, it is inferred that production equals income, therefore by deduction savings equal investment. Although this equation would present the same difficulty as the previous one for its measurement, it will allow us to take a look at the complement of savings, investment.

That is, to affirm that the savings level is very low is equivalent to saying that investment is very low. Would the Bank Board review this assumption before taking any measure? Could it confirm that investment was indeed declining? Because if investment was indeed falling, the worst remedy to help it was to raise the interest rate.

5.16 Impact of Drug Trafficking on the Economy

It must be acknowledged to the issuing bank that when Samper assumed the "reins" of power (I say reins in quotes not to question governability but because in reality the constitution left the reins in the hands of the issuing bank), conditions changed substantially, due to the persecution and capture of the main cartel members, with the consequences of a considerable decrease in this activity and the part of construction that they moved, which has caused a decrease in income and

plunged the entire construction sector into crisis, and as everyone knows, construction guides a good percentage of large and small industries.

Ready, this gives reason back to the Bank of the Republic. For now, only regarding the diagnosis. "Consumption is very high, and there is very little savings level." But it must be added that income was also being affected.

5.17 The Fallacy of High Rate Policy

What induced the issuer to say that the solution to discourage consumption was by raising the interest rate, thus reactivating savings?

I believe it necessary to warn that if we intend to see things from a scientific point of view, we must question everything, or at least learn to question everything.

If the intention was to decrease consumption, it is clear that with a high interest rate it can be achieved, especially in a credit economy like ours. And if we also increase the cost of services mercilessly, we not only decrease consumption expenses but can introduce numerous families to conditions of unsatisfied needs. On this side a purpose is achieved. And the other? Does this measure perhaps allow increasing savings? Hardly, or better, impossible.

Current account deposits and speculative money may increase, but these should not be confused with savings. Savings is as related to investment as the buyer to the seller in a sales contract, that without being identical the buyer and seller, the good that one sells is equal to the good that the other buys. Under these conditions, by making consumption decrease, an increase in savings is not achieved; on the contrary, high interest rates achieve a decrease in investment, and as a consequence, entail a decrease in savings. Tremendously paradoxical. If consumption decreases and savings decrease, then income decreases, that is, GDP.

5.18 Counterproductive Effects

Thus both supply and demand are decreased and we can hardly say that inflation control is achieved, except perhaps temporarily, but very doubtful in the long term, since indeed, a decrease in supply on one hand, and an increase in monetary mass due to foreign speculative money, will soon show their effect, even if they manage to keep the exchange rate under "control." Additionally, the fact of altering equilibrium in this way has left us in such a fantastic situation that we now have a "hard" currency, with 20% inflation. Incredible. All for the temporary benefit, and who knows if permanent, of the external sector and large companies. Altering the interest rate means altering the entire system.

5.19 The Injustice of the Current System

We perceive in the environment an unjust situation, in which by arbitrary measures we condemn companies to their "slow" extinction and an immense mass of workers to the undesirable state of unemployed, with their respective consequences. Let us observe the effect: companies sell less, their resources are not enough to cover fixed and variable costs, and if they have the misfortune of being indebted to banking, they will inevitably have to liquidate them and transfer the goods, generating unemployment.

5.20 Proposal for Institutional Reform

There is no doubt, the functions of the Monetary Board must be regulated, its monastic power must be diminished, be oriented toward more general principles that allow providing equity, equilibrium, development and growth, without interfering in the general laws imposed by the free market. For example, obliging it in its operations that when it has to place securities its interest rate is always below the DTF in a range between 1 and 2 points, allowing the DTF rate to be set by the free market between monetary supply and money demand.

5.21 The Theoretical Vacuum

However there is something that still does not work. We are not talking about a novel economic theory at all, to say that board members could overlook these reasonings.

Indeed, let Keynes speak: "...The influence of changes in the interest rate on the amount that is really saved is of vital importance, but is exercised in the opposite direction to what is generally supposed; because even when the attraction of a greater future income due to a higher interest rate has the consequence of diminishing the propensity to consume, we can be sure, nonetheless, that a rise in it will result in a reduction of the sum really saved. This is because total savings is determined by total investment; a rise in the interest rate (unless it is counteracted by a corresponding change in the investment demand curve) will lower investment; hence a rise in the rate must have the effect of reducing income to a level such that savings descend to the same extent as investment. Since income will fall by an absolute sum greater than investment, it is undoubted that when the interest rate rises, consumption declines; but this does not mean that there will therefore be a greater margin for savings; on the contrary, both (Savings and expenses) will decrease." Pg 104 "GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY" EDITORIAL "FONDO DE CULTURA ECONÓMICA".

5.22 Hidden Interests

Therefore, what underlying interests might be moving? Undoubtedly, something that has to do with savings-investment promoting agents, such as recently created pension and severance funds, which require high returns especially in their beginnings to survive. But giving life to these funds in this way at the expense of small and medium enterprises again leaves us with that bitter taste of injustice caused by board management policies, although the government is not exempt from responsibility, which is also subsidizing the I.S.S. with the fiscal deficit through its placement of treasury securities, which are also giving a rate above their real value. These funds should be given greater participation in stock acquisition, but above all, allow them to participate in generating new companies, which is where they can truly foster the creation of real value both for the economy and for themselves. We thus understand why business octopi, including Banking, have not raised their voice in protest, if they see themselves doubly benefited, one as fund shareholders, and another, because they are slowly taking over the market, free of competition, seeing other competitors who do not have sufficient strength to negotiate their credits at cheaper rates, or get them abroad, disappear helplessly.

5.23 Principles vs. Objectives

Seen from this perspective, I join those who think that the Issuing Bank should not function based on objectives, but based on principles that regulate market stability and security, and that it can channel abrupt economic jumps to reestablish equilibrium as soon as possible. But it is important that responsibility remain in the hands of the government, which is the one that

will receive the bills for its management. So there will also be a need to regulate government objectives. It is the government that should have objectives, the issuer should be governed by principles.

5.24 Crisis as a Product of Policies

Never before had we felt in such a paper crisis, so much from the desk, that we are assaulted by doubt that the board, with so much power in its hands, could be politicized, or failing that, by not belonging to the government, end up in the hands of banking interests, the only benefited sector, which shows once more that it is not possible to maintain the two entities, board and government, acting as independent islands.

5.25 The Drug Trafficking Problem and Monetary Policy

In reality, controlling inflation is difficult, since it does not come only from the fiscal deficit, but drug trafficking, with all its export volume, somehow manages to penetrate its foreign currency, which added to those from oil and those brought by foreign investors, leave a practically inevitable panorama, which will tend to keep the exchange rate stable and consequently put other export lines, less profitable, in difficulties, but that is the free market system, and this is not the only country that suffers from it.

5.26 Reflections on the War on Drugs

Since the impact of drug trafficking on different economies is so strong and its eradication almost impossible except at a very high social cost, it is imperative to understand that in this market buyer and seller participate in the same illicit activity, so it is not pertinent to treat producers as scum and consumers with compassion. If the latter decided to end their lives, whether by their own decision or because they found no meaning in their own society, not even God can prevent it, given that he respects the free will of his creature. Under these circumstances, consumers will always be willing to seek their market. As long as this demand exists, there will be important intermediaries both in producing countries and in consuming countries willing to transport the product to them, as long as man's heart continues to respond to the stimulus and greed for money. And as long as our "small" countries continue with large colonization zones and impenetrable jungles, with people bordering on misery, we will always find them willing to survive with the product of illicit crops.

Society will soon have to put on the scale the damage caused by the prohibited market, against what would be caused if this market were legalized. That is, the evil currently caused against consumers, the intestine wars between distributors and producers, the corruption of all society, the deaths of innocent civilians and soldiers that may be much higher than those of consumers alone, in addition to the destabilization of economies at the international level, etc., against the damage to consumers alone. And why not, give ourselves the possibility of finding a mechanism for the longed-for peace in our small producing countries. Peace to which we also have a right, and which Americans achieved when they legalized liquor in another era.

5.27 Impact on Public Finances

We still need to analyze the effect that board measures cause on State finances. We understand that the real problem is not that public spending is very high, but that it has to be financed with credit. Since the most important items of the State are income from VAT and income tax, that is, from consumption and business profitability, it is clear in light of this discourse that

its income has also been seriously affected, and since government spending is in general terms, postponable and necessary in order to generate the infrastructure required by different economic agents, it will be understood that the deficit is even greater than originally planned.

5.28 Diagnosis Conclusion

Consequently, we can affirm, without fear of being wrong, that arbitrarily interfering in the real variables of the economy, and especially in the interest rate, is highly harmful and dangerous for all society. One should not think either that the solution is to modify the real value of the interest rate in the opposite direction, that is, below its real value.

We repeat, the best indicator and regulator of the economy is freedom of prices, freedom of competition, freedom of markets.

It could be affirmed that sooner or later the market would have the same effect, removing the incompetent from the ring, and that these measures only expedited an inevitable process. In this regard we argue that although it is possible for this to occur, it is different to see “market social justice” act, which in fact acts, and not that applied incoherently by man who generally alters not only ecological equilibrium, but also social and economic equilibrium.

It has been demonstrated that the crisis we are going through is of a profoundly economic, interest-based, and institutional nature, and its solution can only come from scientific knowledge of economic laws and coherent action.

Chapter 6

CHAPTER II

HOW INTEREST RATES INFLUENCE THE ECONOMY

6.1 (AND WHY IT IS POSSIBLE TO LOWER THE DEPOSIT RATE BEFORE INFLATION FALLS)

Santa Fe de Bogotá, October 1996

In the previous chapter we made a diagnosis of the economic situation that Colombia is currently experiencing, and found that the fundamental problem lies in the management of the interest rate. We found that the Monetary Board has been applying a restrictive monetary policy with the purpose of decreasing consumption and raising savings, but in practice has produced exactly the opposite: it has decreased both consumption and savings, and therefore, national income.

In this chapter we will develop in greater depth the theory that sustains this affirmation, and demonstrate why it is possible and necessary to lower the deposit rate before inflation falls.

6.2 The Relationship between Interest Rate and Investment

To understand why high interest rates are detrimental to the economy, we must start from the analysis of the relationship between the interest rate and investment. This relationship, developed by Keynes in his General Theory, establishes that there is an inverse relationship between both variables.

Entrepreneurs make investment decisions by comparing the marginal efficiency of capital (the expected rate of return on investment) with the market interest rate. They will only undertake those projects whose expected rate of return is higher than the cost of financing.

When the interest rate is very high, many projects that would be profitable with normal rates cease to be so. This reduces the aggregate level of investment in the economy.

6.3 The Multiplier Effect

The reduction in investment has amplified effects on the economy through the multiplier mechanism. An initial decrease in investment translates into a more than proportional reduction in national income.

The multiplier operates as follows: - Lower investment reduces demand for capital goods - This reduces employment and income in capital goods producing industries - The income reduction

of these workers reduces their consumption - Lower demand for consumer goods again reduces employment and income - The process continues in successive rounds

6.4 The Savings Paradox

One of the most important aspects of restrictive monetary policy is what Keynes called the "savings paradox." Although the declared intention of raising interest rates was to increase savings, the real result is exactly the opposite.

This occurs because savings and investment must be equal in any economy (savings-investment identity). If high interest rates reduce investment, savings must be reduced by the same magnitude.

The reduction in savings does not occur because families decide to save less, but because their incomes are reduced as a consequence of lower economic activity. With lower incomes, both consumption and savings decrease.

6.5 Real vs. Nominal Interest Rate

It is important to distinguish between the nominal interest rate (the one observed in the market) and the real interest rate (nominal minus expected inflation rate).

For economic decisions, what matters is the real rate. In Colombia, with 20% inflation and nominal rates of 35-40%, real rates are in the range of 15-20%, levels excessively high for any economy.

Developed countries typically operate with real rates of 2-4%. The level of real rates in Colombia is incompatible with sustained economic growth.

6.6 Cost Inflation vs. Demand Inflation

The traditional justification for maintaining high interest rates is to control inflation. However, it is crucial to understand what type of inflation is being faced.

Demand Inflation: Occurs when aggregate demand exceeds productive capacity. In this case, restrictive monetary policies can be effective.

Cost Inflation: Originates from increases in production costs (wages, raw materials, energy, financial costs). Restrictive monetary policies are not only ineffective but counterproductive.

Inertial Inflation: Is perpetuated by indexation mechanisms and expectations. Requires structural reforms, not necessarily restrictive monetary policy.

In Colombia, evidence suggests that inflation obeys mainly cost and inertia factors, not excess demand.

6.7 Why it is Possible to Lower Rates before Inflation

Contrary to conventional wisdom, it is possible and advisable to reduce interest rates before inflation falls:

6.7.1 1. Reduction of Financial Costs

By lowering rates, companies' financial costs are reduced, which contributes to moderating inflation on the cost side.

6.7.2 2. Supply Stimulus

Lower rates stimulate investment, increasing productive capacity. Greater supply helps contain inflationary pressures.

6.7.3 3. Better Expectations

A credible policy of gradual rate reduction can help anchor inflationary expectations downward.

6.7.4 4. Appropriate Real Rates

Reducing nominal rates while maintaining some level of inflation results in more reasonable real rates for economic activity.

6.8 The Open Economy Case

In an open economy like Colombia, high interest rates have additional effects:

- They attract speculative capital that appreciates the currency
- Appreciation reduces export competitiveness
- The trade balance deteriorates
- Dependence on volatile capital flows is created

These effects are particularly harmful for a developing country that needs to promote its exports.

6.9 Implementation Mechanisms

To successfully implement a rate reduction requires:

6.9.1 1. Graduality

The reduction must be gradual and predictable so as not to generate destabilizing expectations.

6.9.2 2. Policy Coordination

It is fundamental to coordinate monetary policy with fiscal policy to avoid inconsistencies.

6.9.3 3. Structural Reforms

Simultaneously, automatic indexation mechanisms that perpetuate inflationary inertia must be eliminated.

6.9.4 4. Clear Communication

The central bank must clearly communicate its intentions and the fundamentals of the policy.

6.10 International Experience

Many countries have successfully implemented interest rate reduction policies as part of stabilization programs:

- **Chile** (1990s): Gradually reduced rates while maintaining fiscal discipline
- **Israel** (1980s): Combined rate reduction with structural reforms
- **Brazil** (Real Plan): Used exchange rate anchor and gradual rate reduction

These cases show that it is possible to reduce rates without unleashing inflationary processes, provided it is accompanied by appropriate complementary policies.

6.11 Risks and Mitigation

The proposed strategy is not without risks:

6.11.1 Risks:

- Possible inflationary rebound if the reduction is too abrupt
- Exchange pressures from speculative capital outflows
- Loss of credibility if not implemented consistently

6.11.2 Mitigation:

- Gradual and well-communicated implementation
- Coordination with fiscal policy
- Reforms to eliminate automatic indexation
- Continuous monitoring of key indicators

6.12 Expected Benefits

The benefits of a more moderate rate policy include:

1. **Investment Recovery**: Lower real rates will stimulate postponed investment projects
2. **Employment Growth**: Greater investment will generate direct and indirect jobs
3. **Consumption Increase**: Lower financial costs will free resources for consumption
4. **Better Competitiveness**: Lower rates will reduce pressure toward exchange appreciation
5. **Corporate Recovery**: Indebted companies will be able to restructure their liabilities

6.13 The Role of Expectations

Expectations play a crucial role in the success of any economic policy. If economic agents perceive that rate reduction is part of a coherent and sustainable program, this can contribute to:

- Improve business confidence
- Stimulate investment decisions
- Stabilize inflationary expectations
- Facilitate normalization of credit conditions

6.14 Conclusions

Theoretical and empirical evidence supports the convenience of abandoning the policy of excessively high interest rates. The main arguments are:

1. **High rates have failed** to achieve their declared objectives of increasing savings and controlling inflation.
2. **Colombian inflation** obeys more to structural factors than to excess demand.
3. **It is possible to reduce rates** before inflation falls, through gradual and coordinated implementation.

4. **Benefits outweigh risks**, especially if accompanied by complementary reforms.
5. **International experience** shows that this strategy can be successful.

The country urgently needs a change of approach in monetary policy that privileges growth, employment and competitiveness, without neglecting price stability. Current real interest rate levels are unsustainable for an economy that aspires to grow and develop.

Chapter 7

CHAPTER III

ECONOMY -vs- PLANNING

Santa Fe de Bogotá, August 1996

In the previous chapters we have demonstrated how inadequate management of interest rates can produce devastating effects on the economy. In this chapter we will analyze an even more fundamental problem: the tension between allowing the economy to function freely and the temptation to centrally plan economic variables.

7.1 The Fundamental Dilemma

One of the most complex problems faced by economic policymakers is determining when to intervene in markets and when to allow market forces to operate freely. This dilemma becomes particularly acute when dealing with the management of monetary variables such as interest rates, exchange rates and money supply.

The Colombian experience of the 90s perfectly illustrates this dilemma. On one hand, an economic opening policy was adopted that supposedly should allow market forces to determine resource allocation. On the other hand, strict control of monetary variables was maintained, particularly interest rates, which contradicted free market principles.

7.2 The Limits of Central Planning

The economic history of the 20th century has taught us the limitations of central planning. Socialist experiments in the Soviet Union, Eastern Europe and other countries demonstrated that it is impossible for a central planner to possess all the information necessary to make efficient economic decisions.

However, the lesson should not be that all government intervention is bad, but that we must be very careful about which variables we decide to control centrally and which we should let the market determine.

7.3 The Role of Prices as Signals

In a market economy, prices fulfill a crucial informational function. They act as signals that coordinate the decisions of millions of economic agents. When prices are free to move according to supply and demand forces, they transmit information about relative scarcity, consumer preferences and profit opportunities.

Interest rates are perhaps the most important price in a modern economy. They are the price of money over time, and therefore influence all decisions that involve a temporal element: investment, saving, present versus future consumption, etc.

When the government artificially fixes interest rates at levels that do not reflect market conditions, it is distorting the most important signal in the economic system.

7.4 The Information Problem

One of the most powerful arguments in favor of the free market is the information problem. No central planner, however intelligent and well-intentioned, can possess all the information required to make efficient economic decisions.

This information includes:

7.4.1 1. Consumer Preferences

The tastes and preferences of millions of consumers change constantly and unpredictably. Only the price system can aggregate this information efficiently.

7.4.2 2. Technological Conditions

Technological possibilities change continuously. New production methods, new products, new materials appear constantly. Entrepreneurs in the field are best able to evaluate these opportunities.

7.4.3 3. Local Conditions

The specific conditions of each market, each region, each industry are better known by agents who operate directly in them.

7.4.4 4. Tacit Information

There is a type of knowledge that cannot be easily codified or transmitted. It is practical knowledge, experience, entrepreneurial intuition. This type of knowledge can only be used by those who possess it directly.

7.5 The Case of Interest Rates in Colombia

Colombian monetary policy of the 90s perfectly illustrates the problems of central planning in the monetary sphere. The Monetary Board decided to fix interest rates at levels it considered appropriate to control inflation, without taking into account the signals the market was sending.

7.5.1 Market Signals

During 1995 and 1996, the market sent multiple signals that interest rates were too high:

1. **Excess Liquidity**: Banks had excess liquidity, indicating there was more supply of funds than demand at those rates.
2. **Credit Contraction**: Credit contracted drastically, indicating that companies could not pay those rates for productive projects.
3. **Recession**: The economy entered recession, indicating that monetary conditions were too restrictive.

4. **Investment Fall**: Private investment collapsed, confirming that rates were choking productive activity.

7.5.2 The Planners' Response

Despite these clear market signals, the Monetary Board persisted in maintaining high rates, arguing it was necessary to control inflation. This response illustrates one of the fundamental problems of central planning: the tendency to ignore market signals when they contradict planners' theories or models.

7.6 The Illusion of Control

One of the most serious problems of central planning is what we could call "the illusion of control." Planners tend to overestimate their ability to control complex economic variables.

In the case of monetary policy, there is the illusion that by controlling one or two variables (such as interest rates or money supply), one can control the behavior of the entire economy. This illusion ignores the complexity of economic interactions and the ability of economic agents to adapt and find ways to evade controls.

7.6.1 Examples of Unintended Effects

The high interest rate policy in Colombia produced multiple unintended effects that planners did not anticipate:

1. **Capital Flight to Financial Sector**: Instead of stimulating productive saving, high rates simply transferred resources from the real sector to the financial sector.
2. **Exchange Appreciation**: High rates attracted speculative capital that appreciated the peso, harming exports.
3. **Increase in Non-Performing Loans**: High rates led many companies to bankruptcy, increasing banks' non-performing loans.
4. **Reduction of Tax Base**: The recession reduced government income, worsening the fiscal deficit that was supposedly being controlled.

7.7 Principles for Efficient Economic Policy

Based on Colombian experience and economic theory, we can derive some principles for more efficient economic policy:

7.7.1 1. Minimize Price Distortions

Government should avoid administratively fixing prices, especially prices as important as interest rates. Instead, it should concentrate on creating conditions for markets to function efficiently.

7.7.2 2. Use Quantitative, Not Price Variables

If government needs to influence the economy, it is preferable to use quantitative variables (such as money supply) rather than price variables (such as interest rates). This allows prices to maintain their informational function.

7.7.3 3. Gradualism and Predictability

When policy changes are necessary, they should be gradual and predictable. Abrupt changes create uncertainty and can have destabilizing effects.

7.7.4 4. Policy Coordination

Different government policies must be coordinated. It makes no sense to have a trade opening policy while maintaining a restrictive monetary policy that appreciates the currency.

7.7.5 5. Monitoring Market Signals

Policymakers should constantly monitor signals sent by the market and be willing to adjust their policies when these signals indicate something is wrong.

7.8 The Appropriate Role of Government

This does not mean government has no role to play in the economy. On the contrary, there are areas where government intervention is necessary and beneficial:

7.8.1 1. Provision of Public Goods

Government should provide goods that the market cannot efficiently provide: infrastructure, education, public health, defense, etc.

7.8.2 2. Regulation of Natural Monopolies

In sectors where natural monopolies exist, government should regulate to avoid abuses of market power.

7.8.3 3. Correction of Externalities

When significant externalities exist, government can intervene to internalize them.

7.8.4 4. Macroeconomic Stabilization

Government has a role in macroeconomic stabilization, but should do so in a way that respects market functioning.

7.9 Lessons from International Experience

The experience of other countries confirms these lessons:

7.9.1 Successful Cases

Chile: After the 80s crisis, Chile adopted policies that respected market signals while maintaining fiscal and monetary discipline.

New Zealand: Adopted an inflation targeting system that allowed flexibility in short-term interest rates.

Australia: Combined financial liberalization with prudent macroeconomic policies.

7.9.2 Failed Cases

Argentina: Price and exchange rate controls led to recurrent crises.

Brazil: Multiple stabilization plans that ignored market signals failed repeatedly until the Real Plan.

7.10 The Problem of Time Inconsistency

One of the most serious problems faced by central planners is time inconsistency. Policies that seem optimal in the short term may be suboptimal in the long term.

In the Colombian case, maintaining high rates might seem appropriate to control inflation in the short term, but in the long term it was destroying the economy's productive capacity.

7.11 The Importance of Institutions

For a market economy to function efficiently, solid institutions are required:

7.11.1 1. Clear Property Rights

Economic agents must have security about their property rights.

7.11.2 2. Efficient Legal System

There must be a legal system that enforces contracts and resolves disputes efficiently.

7.11.3 3. Solid Financial Institutions

The financial system must be solid and well regulated.

7.11.4 4. Transparency and Accountability

Public institutions must be transparent and subject to accountability.

7.12 Chapter Conclusions

The Colombian experience of the 90s illustrates the dangers of central planning in the monetary sphere. The main points are:

1. **Prices, including interest rates, fulfill a crucial informational function** that should not be distorted by administrative interventions.
2. **No central planner can possess all the information necessary** to make efficient economic decisions.
3. **The market sends constant signals** that policymakers must learn to read and respect.
4. **The illusion of control leads to counterproductive policies** that ignore the complexity of economic interactions.
5. **Government has an important role in the economy**, but must exercise it in a way that respects market functioning.
6. **Solid institutions are fundamental** for a market economy to function efficiently.

The fundamental lesson is that **the economy is too complex to be centrally planned**, but this does not mean it should lack direction. The key lies in finding the correct balance between allowing markets to function and providing the institutional framework necessary for them to function efficiently.

The path to a prosperous economy does not pass through more central planning, but through better institutions and greater respect for market signals.

Chapter 8

ANNEX I

8.1 SAVINGS AND INTEREST RATE, A PROFOUND CONCEPTUAL ERROR

By Mauricio Rivadeneira Mora

For all countries in the world, their savings rate is a factor of constant concern, since the amount of savings depends on the investment that can be made, and these new investments are what make the economy grow.

However, savings in economics is a concept that has nothing to do with the amount of money that can be deposited in a bank in exchange for an interest rate.

A high interest rate openly conflicts with savings, making it smaller. A paradoxical situation contrary to the most elementary common sense.

But within economic theory its demonstration is rather simple, and already in his time John Maynard Keynes, the most celebrated and brilliant of all economists of this century warned of the error of trying to increase savings through a high interest rate. Indeed, let us see the following paragraph:

"…The influence of changes in the rate of interest on the amount that is actually saved is of vital importance, but it operates in the opposite direction to that generally supposed; for even though the attraction of a larger future income due to a higher rate of interest may result in reducing the propensity to consume, we can be sure, nevertheless, that a rise in it will result in a reduction in the amount actually saved. This is because total saving is determined by total investment; a rise in the interest rate (unless it is offset by a corresponding change in the investment demand curve) will lower investment; hence a rise in the rate must have the effect of reducing income to such a level that savings fall by the same amount as investment. Since income will fall by an absolute amount greater than investment, it is undoubtedly true that when the interest rate rises, the consumption rate falls; but this does not mean that there will therefore be a greater margin for saving; on the contrary, both (savings and expenses) will decrease."

This conclusion is of such transcendence that there is no economics text, however elementary, that does not warn about this paradox, or as economists frequently say, about this fallacy.

But in Colombia, we have long maintained a very high interest rate compared to the rate at the international level.

Indeed, the deposit rate or DTF in Colombia has been above 20% for a long time, against an international margin that can oscillate between 3% and 5%. This rate is actually imposed by

the Issuing Bank in any country.

If the effect of raising the interest rate is to decrease both savings and consumption, it means that when comparing two different interest rates, the lower rate will allow greater savings. And if we take the inference to its limit, we should say that the lowest possible interest rate is what will allow the highest possible savings.

And in that case, if the lowest possible rate is between 3% and 5%, which is what exists in the international field, it means that contrary to all our policies in Colombia, the DTF interest rate should drop from 22% to 3%, since we are sacrificing growth possibilities, while we remain in a permanent semi-depression.

Let us return to Keynes: "Thus the remedy for the boom is not a higher rate of interest but a lower one!; for that may make the so-called boom last. The right remedy for the trade cycle is not to be found by abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us permanently in a quasi-boom."

Let us demonstrate the absurdity of continuing with the policy of high interest rates.

As a first measure, it is good to understand that once the Issuing Bank or the Government sets the minimum deposit rate, suppose they arbitrarily say 10%, at that moment all the forces of the free market will tend to make all the variables of the system find their new equilibrium point around this rate. That is, if the interest rate rises, some companies will disappear, until those that remain are in equilibrium with the new market conditions. And if the interest rate falls, companies will be able to grow until they equal their marginal efficiency of capital with this new interest rate. In general, when we modify the deposit interest rate, we arbitrarily move market conditions and force the system to move from one equilibrium point to another different equilibrium point.

From what has been said, we can conclude that we can certainly move the interest rate, regardless of any condition, up or down but being subject to strong variations, which are those caused by going from one equilibrium point to another. There is no valid argument that prevents raising or lowering the DTF, just as there is no valid argument for fixing it at 22%, or 28%, as has traditionally been done in Colombia.

On the other hand, there is a valid argument to affirm that the deposit interest rate should be as low as possible, and this is around 3%, as occurs at the international level, an approximate rate that we can find in all the countries we call developed and also in countries that have shown broad benefits in opening processes, while those that present serious problems have as a common element having a deposit rate well above 3%, as well as excessive inflation, which we can argue is due to the effect of the same interest rate.

It is not difficult to analyze why, if we give a vision to the composition of costs in a company, understanding that interest is a fundamental part of the component of these costs and expenses.

In general, all cost components, such as: **1.** cost of sales, **2.** administration and sales expenses, and **3.** banking intermediation interest, have something in common: due to competition between different sectors, the tendency of these costs is to be minimized. Meanwhile, deposit interest has an explosive tendency. (Note: when a company asks for a loan, the interest rate at which the financial intermediary lends is the DTF plus the intermediation points that the Bank earns).

Indeed, once the Central Bank sets the level of its minimum deposit rate, let's say 5%, competition among banks to capture more resources leads them to offer savers higher margins, which in turn become a cost for banking, which will be transmitted to investors, a cost that they will in turn transmit to the final product or to the intermediary, thus increasing the price level. But when limits are placed on price increases, through opening processes, then entrepreneurs will

have a real cost that they cannot compete against, and they will have no choice but to reduce their investment or disappear, since competition now becomes with companies whose interest costs are much lower.

Thus, the higher interest rate causes investment to decrease, and consequently savings as well, since in economics savings equals investment, as recorded in all economics texts, however elementary they may be, and which we in Colombia are determined to contradict.

We are talking about a profound conceptual error, which makes us go against practically all the laws or general principles accepted by economic theory.

A PROFOUND ERROR THAT MUST BE CORRECTED.

Chapter 9

ANNEX II

9.1 TWO FUNDAMENTAL PROBLEMS: DTF AND PRIMARY MONEY ISSUANCE

By Mauricio Rivadeneira Mora

It is possible to demonstrate that the basic problems of our economy can be better solved if we control the two parameters namely: the interest rate (DTF) by eliminating it, and primary money issuance by reviving it.

It was already demonstrated in the December 15 edition on page 11 of Portafolio that the interest rate should be as low as possible in order to encourage savings. Now let's see what the DTF, or deposit interest rate in Colombia, really means. An example will illustrate the chain.

If a saver has $100 million pesos and receives $24 million as interest in a year for depositing them in a bank, unquestionably the system is maintaining drones. Paying someone for doing nothing reflects that something is not right, starting because that money has to be generated by the system with much effort which means a sacrifice of something or someone.

Only an entrepreneur can make a setup that generates money. If this person borrows the $100 million to work in their company, they will have to pay the $24 million annually for as long as they want the loan, plus $10 million additional that the bank where they request the operation will charge them. That is, $34 million in interest alone. The bank ultimately does work, so it has some reason. But paying $24 million to someone who does nothing, although it's not their fault, is unprecedented. No developed country does this because of the social costs this represents.

We can ask ourselves how the system can pay that amount if normally companies from sales of $100 million pesos receive a profit after taxes that can be around 10%. That is, $10 million. It is very difficult to find businesses in Colombia that give more than this amount. In difficult times it is much less, and even negative rates are reached. It all depends on competition. Given the proportions, we could legitimately say that there is no company that can pay 34% interest. But since the system effectively pays them, it is necessary to find out how it does it, or know who makes the sacrifice, or what the social cost is. The point is that someone has to pay it, because nothing can come from nothing.

Indeed, the law of demand illustrates that the fewer units there are in the market, the higher the price of the respective products will be. Many people behind a unique product will be willing to pay a very high price. And in this situation, that high price will allow larger profits for companies, which would make it possible to pay the interest.

But the effect of manufacturing few quantities to have the highest prices implies not giving work

to all the population that requires it. That is, it implies that the system must have some belts of misery, people suffering hunger and placed as in a showcase, that forces others to say: "I pay whatever it takes not to see myself in that situation." And all for that interest rate paid to the "saver" for doing nothing. Just for having the money. It's as if for having an uninhabited house worth $100 million the government had to pay $24 to its owner.

If the system paid less, there would be no problem. The saver would invest in industry, since this decrease in interest would increase the profit of entrepreneurs, competition would be revitalized which would increase the quantities offered in the market, and for that employment would have to be increased.

Now, if an entrepreneur has to pay very high interest, and at the same time, the floodgates of the international market are opened in such a way that competition can enter with lower prices for not having to pay those interests, evidently their sentence will be signed. The problem now is that they won't even be able to provide few jobs, they will be forced to disappear from the market, since there is no fair competition. It's not that our workforce is not competitive in costs. The structural imbalance is in the system's deposit interest, which reverts as a cost for both banking and industry.

Indeed, the act of decreasing the DTF, contrary to general belief, does not imply that money flees abroad, except for speculative money which among other things is better if it goes away, but would invite savers to make investments directly in industry, since there would be field to develop it immensely. To see the proportions is a matter of comparing the percentages of 8% which is an industrial average of direct labor cost in companies, against 24% which would be the new possibility of development for industry if we lower that cost.

Perhaps people wonder what will happen to savings, but the truth is that in Colombia the ability to save, that is, people who after covering all their expenses still have money left over, are very few. Families with the ability to save in Colombia do not exceed 10%, and generally coincide with people who are entrepreneurs. That is, those who know how to move industry and business in general, giving jobs to the population. These people are not going to keep the money under the mattress, nor are they going to make it disappear for banking. On the contrary, they are going to increase business, since in principle the 24% cost decrease will be reflected in an increase in profitability.

We have demonstrated that the DTF in the proportions we maintain it in Colombia is a direct cause of misery and impossibility of getting work for many families, who in their desperation and without hope only have the option to subsist, either in informal work, in the illegal market, or any other despicable form, in order to fight the system. And it openly undermines our constitution leaving only on paper the right to work for all Colombians.

Eliminating the DTF is giving our constitution back the possibility of realizing it, it's like turning on the engines of industry. We will be able to tighten our belts, not as our leaders have asked us in the past, to starve to death, but quite the opposite, to take off, and seek a dignified life, to which we also have a right, as enjoyed by developed countries where the deposit interest rate is almost null.

The problem of money issuance is different, although it is also linked to the interest rate. Money, in an expanding economy, must increase, which is achieved through the issuing bank when it makes gold purchases, or acquires foreign currency either through credits or exports, or when it simply performs primary issuance.

Since foreign currency is only required to make purchases abroad, it is necessarily an error to have more quantities than necessary for this purpose. If reserves are accumulated in large quantities it is because somehow the free market of supply and demand has been intervened,

which is not logical if we are going to apply the precepts of opening and free market. When reserves are held it is equivalent to delivering the internal money generation that our economy requires, in exchange for a debt, when in reality we can do the same without having to owe the favor, just by reviving the government's faculty to cover part of its fiscal deficit through primary issuance.

Therefore it is not at all convenient to confuse external investment with dollar flooding, which can be increased by raising the DTF interest rate, but which would mean displacing our workforce abroad, leaving Colombian families internally without the possibility of working. Is it fair?

That each country manufactures its own money to the extent of its own needs is appropriate, and lowering the DTF to the level of developed countries is returning to our companies equal conditions to face opening. Only then will we know what our entrepreneurs are capable of, meanwhile, we will continue talking about a massacre.

Chapter 10

ANNEX III

10.1 THE PROBLEM OF INERTIAL INFLATION

By Mauricio Rivadeneira Mora

Inflation is above all a problem that could be handled with mere common sense. Its roots are various, some already discovered by thought, and the most elementary of them has man locked in a vicious circle, which does not let him see, additionally accompanied by a feeling of guilt that moves his unconscious to punishment.

One of its elements is the excess of existing money over what is strictly necessary for goods to circulate. This has been called inflation due to excess monetary supply, or what is the same, demand inflation, or that demand exceeds supply.

Since the quantitative equation that has recognized the evolution of human thought, (P.Q = M.V) only contemplates the relationship of prices "P" and quantities "Q" of products with the monetary mass "M", while the expression "V", velocity of money circulation only reflects the part of the equation about which we can say practically nothing, except that it is the right value to make the equation equivalent or equal, that is, there is a limitation of knowledge, we must understand why over time only the part of inflation that has to do with the purely monetary effect has been seen, neglecting others that are really of more weight and important in what concerns inflation, such as cost inflation, within which we can locate interest rates as the cyclical element that has not let us see the phenomenon in all its dimension.

To address this difficulty we are going to suggest an analytical method that allows us to conclude once and for all, the way to obtain clear control over inflation.

Let us take for our analysis the income statement, or profit and loss of a company.

Its first line, **sales,** are the result of the product $P.Q.(Similartothequantitativeequation, onlyforasinglecompa$ of goods times the quantities of products "Q" sold in the period. -Like when a company makes an invoice.- Added all the $P.Q of the year, gives us the first line of the profit and loss statement: Sales.

This means that companies are obviously connected with macroeconomic policies regarding money supply or monetary mass M, through prices $P, as expressed by the quantitative equation. To observe it better, let us initially suppose that everything is balanced in our equation. That is, prices P, the quantity of products Q, the mass of money in circulation M, and the velocity of money circulation V, are all "constants". Now suppose the government increases money M, the consequence will be that prices P rise to balance the equation. This is what theory has recognized.

But on the other hand, sales "$P.Q", are also equal to the company's costs and expenses, plus financial expenses plus tax expenses plus profits, according to the income statement or P&L. Since the selling price is set by companies once all these expenses plus profits are included, we must see that prices are directly connected to each of the costs, **including interest expenses**. Any cost that increases and acts equally in all companies will directly impact the price level.

Thus, to control prices $P, it is not only necessary to regulate monetary mass M, but also each of the company's costs. For example, if public services rise, prices will increase to the extent that this extra cost will act on all productive units and families. But these costs will not act inertially or permanently, or monthly, significantly, since it would require services to also rise monthly. The nature of inertial inflation must be sought in interest, and this is why we have underlined them.

One could even think of raw materials or wages, but these normally also increase as a reaction to a previous movement of another variable.

In general, sales costs and administration and sales expenses have a tendency to gradually decrease as an effect of competition between different companies, which would mean that prices would also tend to gradually decrease, so these costs cannot be responsible for inertial inflation.

But even interest can be disaggregated into two components, namely deposit interest plus intermediation interest. That is, placement interest, or interest that banks charge their clients when they request credit, includes deposit interest plus intermediation interest. And with intermediation interest the same can happen, due to competition between banks, this intermediation margin can tend to gradually decrease, which would make prices also tend to decrease.

But with deposit interest, or DTF in Colombia, the opposite happens, and it is not surprising that the interest rate is responsible for inertial inflation, since in itself, this variable has maintained its transcendental importance throughout economic theory.

The deposit interest rate is explosive in nature, and acts in such a way in the system, that banking competition to capture more resources makes them offer more interest to money holders. This means that the deposit rate has an inertial tendency to increase, which will in turn make prices have an inertial tendency to increase, since it is also a cost for companies. And since the one who imposes the minimum point to the deposit rate is the Central Bank, we must look there for most of the problems that afflict the economy.

However, it is not necessary for the rate to vary continuously to generate inertial inflation. For example when we say a fixed DTF deposit rate of 10%, since it is a fee that will act generally, monthly, this extra cost that will impact all companies and families, will generate an increase in prices, also monthly.

This conclusion is very important and transcendental, since it is telling us that to be able to control inflation one must **first** lower the deposit interest rate, and not as is traditionally done, wait for inflation to fall first in order to lower the interest rate.

Now, when costs increase transactions require more money, which must be supplied to prevent the interest rate from continuing to rise. Since the interest rate even remaining fixed produces inflation after a certain value, one will have the sensation that money issuance is directly responsible for inflation since these are the two variables that are seen acting simultaneously, and thus, cost inflation and monetary effect inflation are similar giving the impression that they should be handled in the same way. Such has been the cause of confusion.

We can conclude, that when the entire system is operating under the free market scheme of supply and demand, and all cost variables are reaching their lower limit, if inflation still occurs, it is because the deposit interest rate must continue decreasing to the point where inflation

equals zero. If we observe the deposit interest rate and inflation index of different countries, it seems that zero inflation will occur when the rate is between 0% and 3%, provided that other variables are at their minimum or close to it.

Chapter 11

ANNEX IV

11.1 THE PROBLEM OF FISCAL DEFICIT

By Mauricio Rivadeneira Mora

To understand why fiscal deficit can become a problem it is necessary to understand how it relates to money generation in an economy.

Twenty years ago in Colombia there was not the same amount of money that exists today. Money, like production, grows year by year.

We all know, or at least intuit how the new increase in production of goods and services arises, but it is not clear where the new money comes from.

In primitive times of humanity barter worked, but not money. Later, metals replaced barter facilitating trade. Over time gold became more popular. Gold became the symbol of nations' wealth. Subsequently governments issued paper representative of the gold they acquired, thus arising paper money, and with it, gold reserves. Thus, money in circulation initially had its backing in gold. Money was born into circulation with "paper money" printed by governments in exchange for gold sold to them by seekers of the precious metal. The **gold standard** was imposed for money issuance.

Then, governments realized they did not need gold to issue money. They could simply issue it, and put it into circulation as payments to their employees and contractors. No gold backing or anything like that.

The excesses of this faculty to issue money and other inflation problems observed, erroneously assigned to the issuance phenomenon, forced countries like Colombia to abandon their primary faculty to issue their own money, giving it to the United States, perhaps involuntarily, by accepting the Dollar standard. Now the money issued has its backing in gold or dollars, unfortunately.

It is clear, as the economy is growing, or rather, as production is growing, more money in circulation is required, that is, money must also increase.

The economy itself does not care where the money comes from, as long as it increases. It does not matter if it comes from gold backing, or if it comes from currency exchange, or if it is simply primary issuance. In some way they are all issuance, and a bill with backing or without it has the same value in the market, besides being indifferent and unrecognizable. Simply all bills are equal, and have the same acceptance in the market.

Thus, the contribution that governments can make for adequate economic growth is the creation of new money that the market requires. Money that will necessarily penetrate as someone's

income, either through payment for services rendered, or as payments to individuals for work performed, or as government credits to individuals. And since they are to finance growth, it is clear that resources will have to come from primary issuance, or from external credit or from export results, which will obviously also be monetized. But in essence, resources thus obtained are through a fiscal deficit, since these are government expenditures for which no available resource exists. Then, for an economy to grow healthily it is required that a budget deficit exists.

Indeed, the supply of new money that the system requires must be dosed by the government in such a way that prices tend to remain stable, as suggested by the quantitative equation of money, ($P.Q = M.V), where $P represents the price level, Q production, M the amount of money and V the velocity of money circulation.

Observing the equation, we can deduce that if $P and V remain constant, and Q is growing, to balance the effect it is required that M, the amount of money, also grows.

And the simplest and most economical way for M to grow is through government primary issuance, which in Colombia was suppressed by the new constitution, in my concept, an error that should be corrected.

However, that the government cannot make primary issuance does not mean that the new money the system requires cannot be supplied. Indeed, if for example exports exceed imports, the excess foreign currency will supply new money.

But if exports are not sufficient, external credit or foreign currency for investment can generate the new money required. But this has a problem, on one hand credits demand interest payments and credit repayment. That is, sooner or later that new money will have to be returned, and consequently it will be necessary to get a larger credit, and then another increasingly larger one, and we all know what happens to a person when they only have increasingly larger debts.

An additional problem to be able to supply new money when there is no primary issuance, is that credits requested by government and individuals are not sufficient, so interest rates will have to be raised to attract external foreign currency, which in turn will cause another problem, which is, raising the internal cost of money. And when costs rise, prices rise, and competitiveness is lost, and then we will need more money, and …. -we enter a vicious circle.

In conclusion, the healthiest way to supply new money to economies is through primary issuance, via fiscal deficit, and not through increase in reserves via external credits or “speculative investments”, which will also represent a fiscal deficit. In synthesis, the problem is not the deficit, but the way chosen to finance this deficit.

Chapter 12

ANNEX V

12.1 WORLD ECONOMY SOS (APRIL 1998)

By Mauricio Rivadeneira Mora

Currently it is difficult to find consensus among economists around economic theory, which is very tinted with popular belief, and even personal opinion, even within the economists' guild.

And if that weren't enough, the theory itself seems to be on terrain very far from reality, so much so that the models proposed to explain the economic universe remain in a purely mathematical exercise regardless of whether the proposed problem makes practical sense or not.

The lack of universal agreement reaches such a point that very few entities or individuals would dare, -as the International Monetary Fund has done,- to impose their criteria as unique, and consequently force the planet to blindly follow their recommendations, without measuring the consequences this may imply.

Indeed, we can demonstrate that the four basic recommendations that the IMF proposes to all countries of the world to ingratiate themselves with international capital lack scientific criteria, have a biased component aimed at benefiting the North American nation, and dangerously lead us to an unprecedented crisis in the international arena.

Here are the recommendations that all countries must execute (except the United States), according to IMF criteria:

1. Open economies to free market through tariff reduction.
2. Reduce fiscal deficit.
3. Raise interest rates.
4. Privatize public services, and control wage escalation.

If with the execution of the first recommendation countries enter crisis, they must continue with the following options, even if the supposed remedy is worse than the disease. Needless to say that although there is no consensus among different economic currents, one must move forward.

Let us then demonstrate the absurdity of the precepts in terms of scientific criteria, the inconvenience of their application, at least for other countries outside the North American sphere, and extrapolate a bit the fate we can expect from continuing this trend.

LITTLE SCIENTIFIC CRITERIA: When we talk about physical sciences or any of their application branches like engineering, or even when someone thinks about fixing any machine, the first thing we think of is analyzing the specific initial conditions of the subject to be able to issue a diagnosis and then give a concept about possible solutions, which do not necessarily

have to be unique. A doctor for example, never gives a general remedy for all his patients, but analyzes each one in their own condition and in any way tries to save first of all the patient's life. Only the IMF has thought of tightening the belt of all its patients without caring if one more point would affect the working life of a nation, showing its intention to help not the countries in difficulty, but to ensure that big capital money is safe in those countries that manifest difficulties.

CONVENIENCES and INCONVENIENCES: It is of particular importance to determine how each of the cited recommendations influences the economy, and whom they benefit in general.

1. **Abolish tariffs.** Abolishing them indiscriminately, not gradually but suddenly has serious drawbacks. Although the measure is healthy and beneficial for world trade as deduced from theory, if other variables of the country's economy are not in their adequate "position", their effect can be equally sudden and harmful.

2. **Reduce fiscal deficit**. This, although apparently healthy, involves more an ignorance of the deep meaning that exists in economic theory regarding money generation and its relationship with a country's growth.

3. **Raise interest rates**. At this point there is a theoretical void, and if we are to be fair, the IMF should promote that rates be equalized internationally. But no. It asks for them to be raised, as if this were a scientific procedure.

4. **Privatize public services, and control wage escalation**. In principle nothing wrong. When private capital enters markets that are profitable, in principle they can provide better service, provided there is competition.

We must accept that economics, as a science, still lacks to complete a well-developed structure. But its application is full of deceptive assumptions, and why not say it, dangerous insofar as arguments can be manipulated to make them seem beneficial, when in reality particular interests are being defended that extrapolated can become harmful to a society, or perhaps, to the entire population.

Indeed, credits have a limit, circulating money issuance also has a limit, and interest rates also have one, as does unemployment. The interesting thing is that when one of them enters crisis, immediately the others begin to enter uncontrollable disturbances, and perhaps the system leads to an explosion of all these variables.

How, or how serious can a world crisis become, as it seems to be coming, apparently, without apparent remedy?

We cannot predict it. We know how terrible the crisis of the thirties was, and there is no way to know if it will be of that magnitude or worse. But we do glimpse it, thanks to knowledge of economic laws as we have mentioned.

However, the visionary Nostradamus describes the possible event in a terrifying way thus:

"The great scarcity that I feel approaching will repeat often to then become universal: so great will it be and of such long duration that they will eat roots and tear newborns from their mothers' breasts."

And in another century he says:

"Inflation will affect the simulacra of gold and silver, which after theft will be thrown into the lake, upon discovering that everything has been destroyed by debt. All titles and securities will be cancelled."

We have no dates, although the most probable according to researchers are around the year

2000. Nor is it in our field to know if it can be avoided, or if the gods would allow man to skip this stage, and if this were possible it would remain to be seen if the will of all men, with their passions and interests would be willing to sacrifice part of their postulates for the benefit of all humanity and perhaps their own survival on the planet, in peace, order, and harmony.

Chapter 13

ANNEX VI

13.1 ECONOMIC THEOREM

By Mauricio Rivadeneira Mora

If a country does not perform primary issuance to supply the system with the new monetary resources that the country requires, this system will have no equilibrium point, the monetary mass will tend to disappear, commerce will involute towards a primitive stage of barter, and modern society will not be able to subsist.

13.1.1 Demonstration

As a first measure it is necessary to understand that paper money is not produced by work, nor by gold, nor by any other element. Money, in its modern conception, as paper money, has its origin in the printing press. This is how the dollar is born, and any other currency in the world. Then to say that the dollar is a finer paper than the ruble or the yen or the Colombian peso is nonsense, as is also affirming that only the USA can directly produce its dollar while the rest of the world can only do it with dollar backing.

Now, why is paper money necessary? Simple. A society could produce many things, that is, work much and very hard. But if paper money does not exist, it is not possible to produce exchange, not in a civilization as populous as ours, although it was possible in an earlier stage.

Now we must demonstrate why this amount of money must grow continuously. Which is also elementary if we think that as population increases, the capacity to produce increasingly greater quantities of articles also increases, and this greater quantity of articles will necessarily require greater quantity of money in circulation. It is not possible to think that today in Colombia we could maintain commerce with the same amount of money in circulation that we had ten years ago.

Now, we know that the printing press that each issuing bank manages produces paper money when:

1. It receives dollars or other currencies of market acceptance, or
2. When it receives gold, or
3. When it makes free or primary issuance, as it has been called.

The condition for the system to be balanced is that to satisfy internal needs the country performs primary money issuance, regardless of how high the interest rate is. But the higher the interest rate, the greater the issuance will have to be.

But if the country does not perform its primary issuance it will have no possibilities in the long term for the following reason:

1. The tendency of exports and imports in the long term is to remain balanced. That is, if the value of currencies is allowed to fluctuate freely, in one period exports will be greater than imports, and in the following period the relationship will be inverted. Then the net effect of imports and exports will be neutrality, and there will be no surplus currencies, so that the country can generate its internal paper money that it needs.

2. With external credits. It is supposed that some currencies enter which when monetized will produce the paper money required. This will work in the short term, but the balance that must exist between imports and exports will be broken, since the excess of currencies will make importing more attractive, much cheaper, which will cause strange competition to native industry.

Furthermore, the moment will come when that credit must be paid, plus interest, which will cause the issuing Bank to collect pesos from the market, decreasing its monetary base. And since what is required is that the monetary base increase each time, then an even much larger credit will be required, and so on. Until absolute illiquidity is reached, and no one lends again, that is, when the few dollars held in reserve acquire such a high value that they could well take all the circulating money. And when money is withdrawn from circulation, commerce disappears. Then industries lose all possibility since money cannot be obtained anywhere, and finally banking runs out of money, which irremediably means the bankruptcy of the entire system. There is simply no possibility of equilibrium, since by not making its primary issuance, nothing can prevent money from disappearing. One could think of selling all assets like companies and houses and everything, which would momentarily alleviate the problem, but fundamentally only aggravates it, since the cycle starts again. We have completed the demonstration.

Such a profound error as not making primary issuance will cost humanity a very high price. Let us make clear that the advantage of primary issuance over external credits is that they have the same effect inside the country, which is to increase the monetary base, with the difference that while one costs us nothing more than doing work, the other leaves us with debt.

It is essential that for “the invisible hand” to act and for the economy to expand, there must be primary money issuance.

Chapter 14

ANNEX VII

14.1 AUTHOR PRESENTATION

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Born in Bogotá on September 16, 1953. He studied four years of Physics at the National University in Bogotá, and is an Economist graduated from La Salle University.

He has been a professor in elementary courses of mathematics, physics and econometrics, and currently is a professor of Budgets and Macroeconomics at the Cooperative University of Colombia.

Professionally he works as a business advisor in the development of projects, diagnostics, etc., and provides his services to different consulting companies.

His particular interest in the construction and structure of scientific theories, and their correlation with practice, have allowed him to deepen in the laws of economics, and propose to the scientific community the present work.

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