



THE COMBINED CYCLE THEORY

AN ALTERNATIVE ANALYSIS



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ABSTRACT

The objective of this work is to present a possible “combined cycle theory” resulting from the merger of two different theories; in one side from the endogenous monetary cycle theory and on the other from Schumpeter’s productive cycles, along with the calculations of Xavier Gabaix.

The paper is organized as follows; First, we give an overview of the history of the economic cycle theories, where we can find the main scientific contributions in this field; Second, we explain the theory of endogenous monetary cycle and we will try to demonstrate it using data its correlation with reality, as exemplified by the current economic crisis in Spain; Third, we define the production cycle theory of Schumpeter and try to find empirical evidence by Xavier Gabaix calculations; And fourth, we discuss a critique of other cycle theories, emphasizing its erroneous assumptions and finally we present the conclusions.

At the end you can find Appendix 1 where we present a critique of methods of national accounts for not taking into account essential aspects of the economy.

FIRST PART: HISTORY OF ECONOMIC CYCLE THEORIES

One of the issues of greatest concern to economists is the explanation of how and why economies have recurrent episodes of boom-bust. Most explanations try to determine three essential aspects: 1) What kind of disturbances affect the economies (exogenous or endogenous, real or monetary ...); 2) from which channels disturbances expand; and 3) What factors cause disturbances to persist over time.

From this point of view we can divide cycle theories into two main groups: a) endogenous theories b) exogenous theories.

A. Theories of endogenous cycle

Under the terms of these theories, business cycles are rooted in the behavior of the economy itself. Authors who defend this type of disturbance claim that market economies show inherent instability resulting in overproduction or underconsumption crisis originating in its own operation. In this sense, models of endogenous cycles show the existence of discrepancies between the stock of capital and consumer demand, which, therefore, will cause adjustments in the relationship between investment and demand to return to equilibrium.

Until the mid-sixties, the main contributions to such theories were originated from the works done by Keynesian economists from Oxford and Cambridge. We can divide these works into two groups: The linear accelerator-multiplier models and non-linear deterministic models. Because of the significant limitations of this works, they favored the emergence of rational expectations approach (Muth, 1961)

B. Theories of exogenous cycle

This second block corresponds to the theoretical contributions of the real cycle or Walrasian. From the point of view of these authors, economic fluctuations arise due to the cumulative effects of recurring character exogenous random disturbances. - Technological innovations, demographic changes, changes in the price of raw materials-

These ideas are based on so-called stochastic models of economic cycle, originally developed by Frisch (1933) and Slutsky (1937). Both authors attempt to show that, under certain monetary restrictions, linear dynamic systems with difference equations for consumer spending and investment generate variables cyclical fluctuations when subjected to exogenous shocks. These oscillations tend to fade over time but never get to do so because of further disruptions in addition to the above.

In linear stochastic models, that formalize the principle of acceleration of investment, the cycle length and their trend to damp over time depend on the structural parameters of the equation system subjected to disturbances, while the intensity of oscillations reflects the nature of the impulse itself.

Zarnowitz (1992) argues that although the exclusionary distinction between stochastic models (exogenous) and deterministic models (endogenous) is interesting for pedagogical purposes, but the economic cycle of the real world include elements of both theories combined in different proportions. Therefore, in this paper we will try to explain economic cycles, and in particular the current one being lived in Spain, under an endogenous theory (theory of endogenous monetary cycle) and other exogenous (combination of the theory of creative destruction of Schumpeter and the empirical works of Xavier Gabaix)

1. The contributions of Keynes and his disciples

To Keynes, economic cycles are a result of changes in investment spending caused by fluctuations in the expected marginal efficiency of capital. As this relies on businesses expectations, the 'waves of euphoria and depression' generate 'self-fulfilling prophecies' of boom and economic crisis.

When optimism is widespread, the expected marginal efficiency of capital increases, employment growth, consumption expands (in a lower rate than production), and entrepreneurs increase their investment back. However, as it increases, 'bottlenecks' start appearing on certain relatively scarce resources. Thereby increasing the cost of capital goods tend to decrease the expected cash flows. Therefore, a wave of pessimism that expands unemployment and lower consumption of optimism comes after. This scenario can

be amplified by increasing the demand for money because of speculation, by which agents wait for the crisis to end and bond prices rise again.

From the contributions of Keynes, a series of models begin to develop based on the model of the English economist. The thirties were characterized by the development of endogenous cycle multiplier-accelerator models (Harrod, 1936; Samuelson, 1939; Metzler, 1941 and Hicks, 1950). The multiplier-accelerator model was initially introduced by Harrod (1936), becoming the framework for cycle researchers in later decades. Three years later, Samuelson (1939) would show that the combination of the Keynesian multiplier with the principle of investment acceleration, resulted in a model that, depending on the value that their parameters adopt, allowing explosive cyclical swings to be generated, prone to dim, or to be regular over time. In 1950, John Hicks developed a dynamic model of accelerator-multiplier in which the exogenous imposition of limits to the evolution of the cycle prevented its explosive behavior. Parallel to the works of accelerator-multiplier were the 'non-linear deterministic' models proposed by Kalecki (1937), Kaldor (1940), and Goodwin (1951). These authors presented nonlinear dynamic systems formally different to linear structures developed by Samuelson and Hicks.

In general, all Keynesian-based mathematical models presented significant limitations despite its large size. First, they failed to demonstrate the explanatory and predictive capacity of its models. Second, the models generated excessively recurrent cycles compared to what actually happened in real-world scenarios. And third, the agents had no expectations and committed systematic errors when in fact cycles show a very regular behaviour. These shortcomings of Keynesian models would lead to the development of rational expectations (Muth, 1961) subsequently applied to the models of economic cycle by Lucas (1972) and Barro (1976).

2. The contributions of the Chicago school

The oil crisis of the seventies, characterized by high inflation and unemployment, would end the dominance of the Keynesian paradigm in the economics profession. In the Keynesian approach a scenario of stagflation was not conceived. In fact, under the influence of the Philips' curve, demand policies were conceived as instruments to reduce the unemployment

rate by generating inflation. The reaction of Friedman (1968) to any attempt to systematic management of the Phillips curve to reduce the unemployment rate would focus on two key points: First, to Friedman, the use of monetary policy may have positive short-term effects because of economic magnitudes take some time to restructure, but are useless in the long term where the only change will be seen in the nominal variables (money neutrality in the long term); Second, Friedman believes that money is the key factor that causes the cyclical fluctuations in production and employment around their natural values. Therefore, the indiscriminate use of monetary policy is the main cause of economic instability.

For Friedman, to accept the existence of an inverse relationship between inflation and unemployment it is to assume that agents have no expectations about future inflation levels that would change their current behaviour. The author admits that short-term agents can suffer 'money illusion' when they notice their nominal wages have increased even at lower inflation rates, but ultimately the agents realize that they are losing purchasing power because their real wages adjusted for inflation tend to fall. Consequently, the inverse relationship between inflation and unemployment can only be temporary, and will disappear in the long run.

In this new scenario, accepting the agents are equipped with adaptive expectations (Cagan, 1956), if the monetary authorities would still to try to permanently exploit the tradeoff between inflation and unemployment, they could only do so by successive and unexpected increases of the inflation rate. Put in another way, given the assumption of 'money illusion', that characterizes the workers in the short term, governments should continually surprise them in their inflation expectations by successive accelerations of the general price level. However, the only long-term outcome of the monetary expansion would be an 'inflation bias' linked to its discretionary use (Barro and Gordon, 1983). Opposite to the Philip's curve model of augmented expectations, in 1993 Friedman developed a model of alternative monetary cycle which he called 'plucking model'. According to this economist, the growth figures for the US economy in the second half of the twentieth century supported the existence of an 'upper limit' effect, ie, growth rates were on average lower than a higher ceiling, but tended to it. In Friedman's plucking model, full employment growth is interrupted by a monetary imbalance: a contraction of the monetary aggregate supply pulls down economy, placing it below its path of long term growth and causing a recession. These tugs are interpreted as random economic politic mistakes that reduce the monetary bid or do not increase it in

response to increased money demand. The resulting excess money demand, along with the rigidity shown by prices and wages, generates a recession followed by a subsequent recovery, which could be helped or not by applied expansionary demand policies. Since in the 'plucking model' artificial booms are not possible, cyclical fluctuations in economic activity are only produced below its growth path in the long term as a result of institutional rigidities. This would explain the monetarist interpretation of the Great Depression, according to which the artificial boom prior to 1929 would not have played any significant role, but only the subsequent policy of the Federal Reserve that would have allowed the money supply to fall.

3. The real cycle models

The rational expectations revolution culminated in the development of neoclassical economics and the real economic cycle models. The latter (Kydland and Prescott, 1982 and Long and Plosser, 1983) are built on two key assumptions. First, they consist on dynamic general equilibrium models (Walrasian) with competitive markets, continuously flushed to the corresponding equilibrium prices. And secondly, they are supported by a representative agent structure endowed with rational expectations, continually maximizing its objective function in a world of perfect information.

At its most extreme version, the assumption of rational expectations implies that agents know the structure and functioning of the economic system in which they must make their decisions, so they can anticipate the consequences of any systematic monetary policy measure, canceling both their current short and long term effects. This is called 'proposition ineffectiveness of economic policy' of Sargent and Wallace (1975). On the other hand the assumption of perfect information means that agents can discriminate between real character disturbances or disturbances with monetary origin. The combination of these elements defines real cycle models as equilibrium structures and models which the assumption of neutrality of money in the short and long term is verified.

During the eighties and nineties, the real cycle theorists analyzed the effects of different types of shocks and the mechanisms allowing their propagation mechanisms. Among this

works, the ones developed by Kydland and Prescott (1982), Long and Plosser (1983) and King and Plosser (1994)- who would analyze the role of technology shocks as a source of cycles- are the ones that stand out.

4. The monetary cycle models with rational expectations

These models attempt to refute the hypothesis of short-term money neutrality. The main contributions of the authors of such theories are:

- a) Neoclassical models in which the assumption of perfect information, Phelps (1967) and Lucas (1972), is reflected. These authors attempt to show that, in a world of incomplete information, variations unexpected of money can cause temporary changes in real economic activity, due to problems extracting the signals contained in prices, namely, the Agents do not perform short-term price rises and currency and this may create temporary imbalances. Lucas was the first author to focus on rational expectations. This author develops a general equilibrium framework where all markets clear and producers optimize their objective functions. However, producers have problems with incomplete information that make impossible for them to know if the price increase is general or specific to their market. Accordingly, as already mentioned, the currency turmoil may affect the productive structure even in the short term, so that the hypothesis of neutrality of money in the short term is removed. Only when economic agents realize that the price changes are due to monetary causes they will correct its actions by bringing the economy to its initial or natural balance. Critics of this type of model are varied. On the one hand, Lucas is criticized because he doesn't have a propagation mechanism that explains how monetary shocks affect the real economy. On the other hand, if the problems of imperfect information become an essential cause of fluctuations, society could avoid them if given the information needed.

- b) Noe-keynesian monetary cycle models. In these works demand shocks are not neutral in the short term as a result of price and wage rigidities, attributed to: 1) The existence of uncompetitive markets (Blanchard and Kiyotaki, 1987 and Ball and Romer, 1991; 2) The presence of 'menu costs', ie, prices show some downward

rigidity if the company expects net benefits derived from their reduction to be negative. (Akerlof and Yellen, 1985; Mankiw, 1985 and Blanchard and Kiyotaki, 1987; 3) Rigidities in wages as a result of long-term wage contracts, payments of 'efficiency wages' and insiders-outsiders models (Fischer, 1977 and Taylor, 1979).

To these factors, others could be added such as the failure of coordination between the economic agents, leading to multiple equilibria (Diamond, 1983), or asymmetric information and credit rationing (Stiglitz and Weiss, 1981 and Bernanke and Gertler, 1989).

PART TWO - AUSTRIAN ECONOMIC CYCLE THEORY

The following theory that we're going to analyze, emphasizes the importance of saving as the main factor in the economic development. But first, before we jump right in the theory, we will explain in which way savings affect the economy.

1- EFFECT ON THE PRODUCTIVE STRUCTURE OF CREDIT GROWTH FUNDED FROM A PREVIOUS INCREASE IN SAVINGS

As a way to introduce this section we are going to explain how an economy grows without the effects that carries a monetary expansion not backed by real savings. In the next section we will introduce the credit expansion not backed by savings that produces the long cycles and we will demonstrate that by applying the endogenous monetary cycle theory.

A. The three different ways of the voluntary saving process

The voluntary saving process carried out by the economic agents can be materialized in three different ways. First, capitalists from the different stages of the productive structure decide to modify the proportion in which they were reinvesting the income derived from their productive activity. Second, the owners of the original factors of production (workers and owners of natural resources) decide not to consume the same amount of their available income that they were consuming, but from a certain point, they choose to reduce their consumption investing the monetary units they're not longer consuming and thus become capitalists. And in third place, not only the owners of the production factors but also the capitalists, as they perceive income from benefits, choose not to consume the same amount of their income any longer, but to spend a part of it lending it to capitalists from the different stages of the productive process to undertake an expansion of their activities. This third proceeding is implemented through the credit market.

B. The first effect of voluntary savings: The effect derived from the disparity of benefits that emerges between the different productive stages.

Not surprisingly, increased savings and therefore a decrease in consumption, will lead to significant losses or decreases of profits from businesses which activities are in the

closets stages to the consumer (direct consumer goods). The fact that profit losses occur in the final stages of the structure does not affect - immediately- the earlier stages to consumption (capital goods), that continue experiencing a positive difference between their income and expenses similar to those enjoyed before the increased savings. Only after a dilated period of time the depressive effect of increased savings on the final stage of direct consumer goods will start being noticeable on the closest stages to it, this negative influence being weakened as we rise through the the productive stages further from the final consumer. As a consequence, the increased savings will cause a big disparity between the accountable profits obtained from the businesses dedicated to the first stage of capital goods, and the ones that develop their activities further from the final stages of consumption.

A temporary extension of the production process tends to occur. This means the capitalists, aware that the nearest stages to final consumption give worse results than those further stages, begin a process of investment towards more distant stages causing, as usual, that the benefits of the different stages are equalized by the competitive process. Increased savings translates into a reduction in the interest rate and that will send a signal to traders: the consumption / saving preferences have changed and it is time to invest.

In this context it would be expected an increase, that normally would occur, in the prices of production factors by increasing investment in stages furthest from consumption, although it's not always the case. Indeed, every increase in demand for production factors in the stages furthest from consumption it's neutralized or balanced, for the most part or totally, by the parallel increase in the supply of such productive resources, that can be verified to be the same resources being gradually released from the stages nearest to the consumer, which are obtaining financial losses and are therefore forced to restrict their investment expenditure on these factors.

Finally, the decline in consumption will increase savings, investment and productivity of the economy to expand the farthest productive stages of consumption, which obviously are the ones that boost productivity. The outcome of these processes is a lower current consumption resulting in greater future production.

C. The second effect: The effect of the decrease in the interest rate on the market price of capital goods.

The decrease in the interest rate leads to any increase in voluntary saving has an important effect on the value of capital goods, especially on those that are used in the earliest stages and have greater contribution and duration to the production process. Obviously, the market value of a capital good tends to even the discounted value by the interest rate of their expected future income stream, and the discounted value increases as the interest rate gets lower. * The formula we use to calculate this value is as follows: $a = [1 - (1 + i)^{-n}] / i$

Therefore, if people start to value relatively less present goods (increased savings), then the market price of capital goods and durable consumer goods will tend to increase; and the longer the trend continues the longer it will increase, as long as they participate in productive stages furthest from final consumption and temporarily more distant. Thus, capital goods, which are already used and experienced a significant increase in price as a result of the decrease in the interest rate, will be produced in greater amounts, which will lead to a horizontal expansion in the structure of capital goods (ie, an increase in the production of already existing capital goods). Simultaneously, the decrease in the interest rate will show that many production processes or capital goods that had not been considered profitable, begin to be profitable, and entrepreneurs will start to undertake them. Indeed, many technological innovations and new projects were not undertaken by business men because they thought that, at the previous interest rate prior to the increase in savings, they weren't profitable.

D. The third effect: The so-called "Ricardo Effect"

An important aspect related to the increase in voluntary savings produces is its effect on wages. In general, when an increase in savings occurs, prices of consumer goods tend to experience a reduction. And if, as often happens, nominal wages or incomes proceeding from work remain constant, by reducing the price of consumer goods there will be an increase in real wages of workers employed at all stages of the productive structure ($w = W / P$).

This increase in real wages as the result of increased voluntary savings means that, in relative terms, is interesting for entrepreneurs in all stages of the production process, replacing labor by capital goods. Or to put it another way, increased voluntary savings –by means of rising real wages- sets a trend in the whole economic system that leads to lengthen the stages of the production structure, making them more capital-intensive. David Ricardo in his "Principles of Political Economy and Taxation" (1817) concludes that: "Every rise of wages, THEREFORE, or, wich is the same thing, every fall of profits, would lower the relative value of Those Which Were produced commodities with a principal of a durable nature, and would elevate proportinally wich Those Were produced With the capital more perishable. A fall of wages Would Have Precisely the Contrary effect ". And in the appendix of the same book he says: "Machinery and labor are in constant competition, and the former can not be employed Frequently Until labor rises". The Nobel laureate economist Hayek explains Ricardo effect saying: "With high wages and a low actual rate of profit will take highly capitalistic investment forms: entrepreneurs will try to meet the high costs of labor by introducing very labor-saving machinery, the Which kind of machinery it will be profitable to use only at a very low rate of profit and interest "(FA Hayek, 'Profits, Interest and Investment and Other Essays on the Theory of Industrial fluctuations', Routledge, London 1939)

E. Conclusion

As a result of the combination of the three effects just discussed and that are driven by the corporate profit-seeking process, a new structure of even deeper capital goods stages will tend to occur. In addition, we note that, although there has not been a decrease in the money supply neither an increase in the money demand has been verified, a general decline in the price of goods and consumer services is originated and it is only originated from increased savings and productivity, resulting from a more capital-intensive production structure.

Therefore, this is the healthiest and most sustainable process of economic growth and development conceivable: with less imbalances, tensions and conflicts from both an economical and social standpoint. It has been historically verified on several occasions, as demonstrated in the most reliable studies. Among others, Milton Friedman and Anna J. Schwartz, referring to the period 1865-1879 in the US, where there was virtually no increase in the money supply concluded: "The price level fell to half level in initial STI the course of less than fifteen years and, ath the same time, economic growth preceeded rapit at a rate

... Their coincidence casts serious Doubts on the validity of the view now held Widely That secular price deflation and rapid economic growth are incompatible "(Milton Friedman and Anna J. Schwartz, A Monetary History of the United States 1867-1960, Princeton University Press, Princeton, 1971, p. 15). And Alfred Marshall, referring to the period 1875-1885 in England said: "It is doubtful Whether the last ten years, Which are Regarded as years of depression, but in Which Have Been there few violent movements of prices, have not, on the whole , conduced more to solid progress and true happiness than the alternations of feverish activity and painful retrogression PRECEDING Which Have characterised every decade of This Century. In fact, I regard violent fluctuations of prices as a much greater evil than a gradual fall of prices "(. Alfred Marshall, Official Papers, Macmillan, London 1926, page 9) .Another final example would be George A. Selgin, Less Than Zero: The Case for a Falling Price Level in a Growing Economy, Institute of Economic Affairs, London 1997.

2. The Endogenous Monetary Cycle Theory

In this section we present the theory of endogenous monetary cycle. This theory originates from the capital theory of Eugen Böhm-Bawerk at the end of s. XIX (Appendix 1) and was initially raised by Ludwig von Mises (1912, 1928) and further developed by Friedrich A. von Hayek (1929, 1931) and Murray N. Rothbard (2000, 2001). More recently, Jörg Guido Hülsmann (1998), Roger W. Garrison (2001) and Jesús Huerta de Soto (2006), have improved it.

A. Introduction

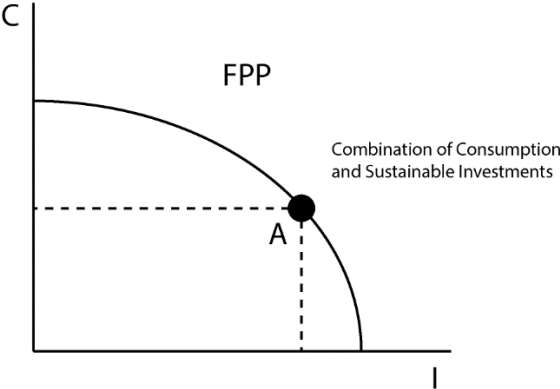
This theory argues that an expansion of credit not backed by real savings will cause an expansion of the production processes in a fashion not demanded by economic agents (households and firms). That is, an artificial credit expansion generates distortions between intertemporal decisions of producers and consumers, which eventually leads to an increase of investment in long-term projects (construction for example) that the market will not be able to absorb, creating, at the end of the process, overcapacity and idle resources. The

new production structure is not responding to the wishes and needs of agents reflected in their decisions on savings / consumption, therefore investments that become stimulated by a false credit expansion will not have a market to be refer to. To illustrate the theory we assume a totally balanced economy and for this we will use the approach developed by Garrison. We should also mention that authors outside the line of thought of the Austrian School (that develops this theory) as Anna Schwartz (see Evans-Pritchard, 2008) and Jonh Taylor (2009) have also identified credit expansion, caused by very loose monetary policies, as the cause of the current crisis.

B. The Garrison Model.

The model we present contains three interconnected charts. First, we have a production-possibility frontier (PPF) that represent the choices of economic agents with regard to savings and consumption, that is, their intertemporal preferences. As we know, in the absence of idle resources, movements along the curve represent different distributions of savings / consumption and those are the sources of different growth curve once investment processes are completed.

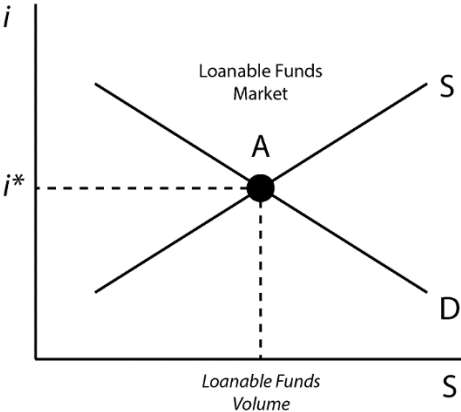
FIGURE 1: production-possibility frontier



Moreover, we know that in an economy its agents spend their savings not only through direct investment but by financial intermediaries, through the loanable funds market. In this market

the supply curve represents the volume of real savings that exists in the economy, and the demand is constituted by the willingness of employers to participate in the production process financed through credit. The equilibrium price (where demand meets supply) is the natural rate of interest, and at the same time represents the rate of temporary preference of economic agents.

FIGURE 2. Loanable funds market

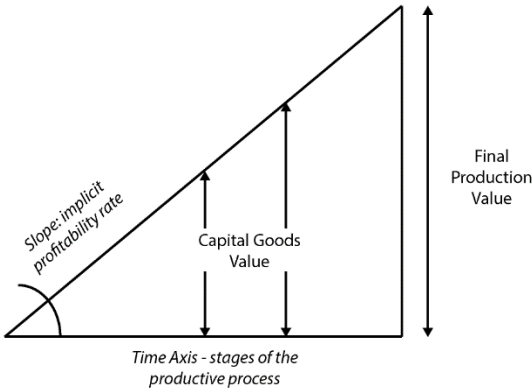


Wicksell (1935) defines the natural rate of interest as the one that balances supply and demand for real capital, and the type of market (or money) as the effective interest rate. This distinction between the two variables leads to the definition of monetary balance. On the monetary balance the market interest rate is equal to the natural interest rate. Wicksell called the equilibrium interest rate normal interest rate. Wicksell's monetary equilibrium is characterized by the verification of three conditions; First, the normal interest rate equates to physical marginal productivity of real capital; Second, the normal interest rate must equal investment demand financed through loans and supply of savings ex ante; And third, at normal interest rate the aggregate demand is equal to the aggregate supply both in real and monetary terms. Therefore, the natural rate of interest is the neutral interest rate in the sense that it ensures stable prices. These equilibrium conditions set the stage for the development of the so-called cumulative processes of inflation and deflation (cycles), starting when the money interest rate deviates from the natural interest rate.

In the absence of credit expansion processes not backed by real savings (balance sheet expansion by central banks), the market for loanable funds coordinates investment plans of entrepreneurs with savers' savings plans. In this case the interest rate that balances this market coincides with the temporal preferences of the agents.

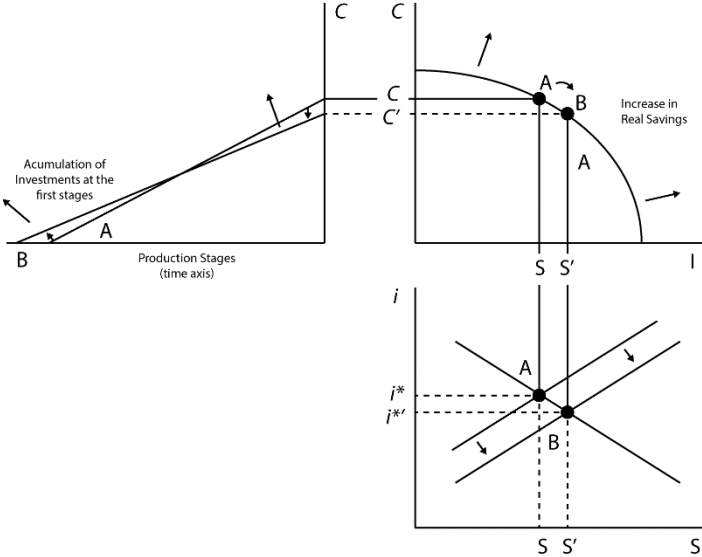
The next aspect to keep in mind is that production takes time and this is where Hayek's triangle (1931) enters. The relationship between the final production (consumer goods) and the time required to perform it are depicted on the sides of a triangle. Time is represented as a series of production stages from left to right on the horizontal axis. At each stage of the production process capital goods are produced in the subsequent step to finally reach the consumer goods. The total final product to be produced to meet the immediate needs of consumers is represented on the vertical axis and, finally, the hypotenuse represents the value of capital goods, whose slope reflects the implied profitability of the various production stages. This profitability will tend to be unique by the business arbitration process, ie competition pressures equalization of benefits, which tend to equalize the interest rate mentioned above.

FIGURE 3: The structure of production, the Hayek triangle



Finally, if you interconnect the three graphs we find the relationship between the production structure and the PPF through consumption. The following graph shows an increase in real savings as explained previously.

FIGURE 4: Growth based on prior savings



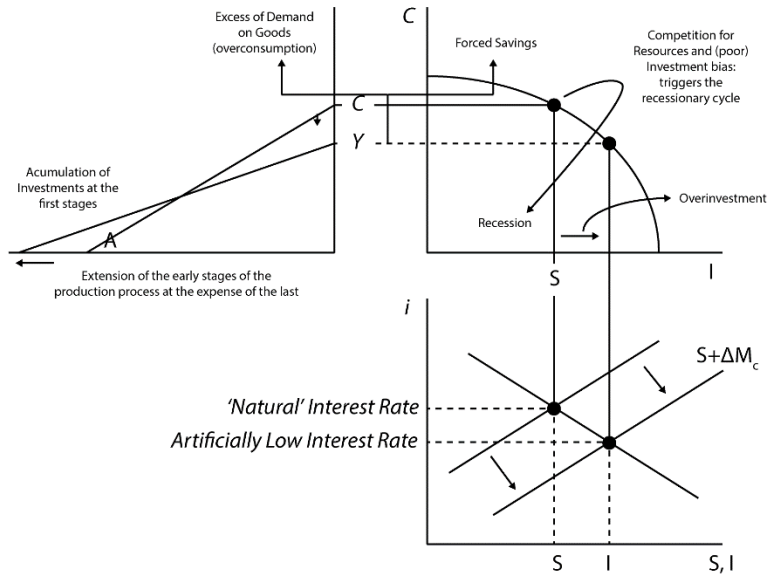
With this we have the theoretical tools to understand the reactions that will be found in the before a credit expansion caused by an artificial lowering of interest rates by central banks. In the next section we use this theory to try to explain the economic crisis that currently exists in Spain.

C. Expansive-recessionary economic cycles

Economic growth will be unsustainable when it is not supported by the time preferences of the agents, ie, when the underlying investment savings does not exist and is created by the banking system (endogenous money). The following figure shows the economic reaction to a credit expansion unsupported by savings. We assume that time preferences are constant and therefore the money supply of real savings will remain constant while, if there is a credit

expansion by artificial lowering of interest rates, the effective money supply will indeed experience changes. This lack of coordination between temporary agents' preferences and behavior in the investments will cause a phase of economic boom that will eventually end up causing a crisis in the way shown below.

FIGURE 5: The Austrian business cycle



When there is a process of credit expansion, interest rates are lower than those that would have prevailed in the absence of that process. In this sense, Hayek argues that production fluctuates because interest rates on bank loans diverge from their corresponding Wicksellian rates, that is, those that would equal the supply of savings from savers and the demand for business investment.

The process of credit expansion, caused by an artificial lowering of interest rates, produces two basic distortions in the functioning of capital markets. First, savers receive a compensation for their savings lower than they expected according to their intertemporal decisions on savings / consumption, discouraging savings. Second, investors will increase their investment, given the fall in interest rates, on longer projects and in those that would not take place, for being unprofitable, at the natural interest rate that would be expected in the absence of credit expansion. As a result, lacks of coordination arise between

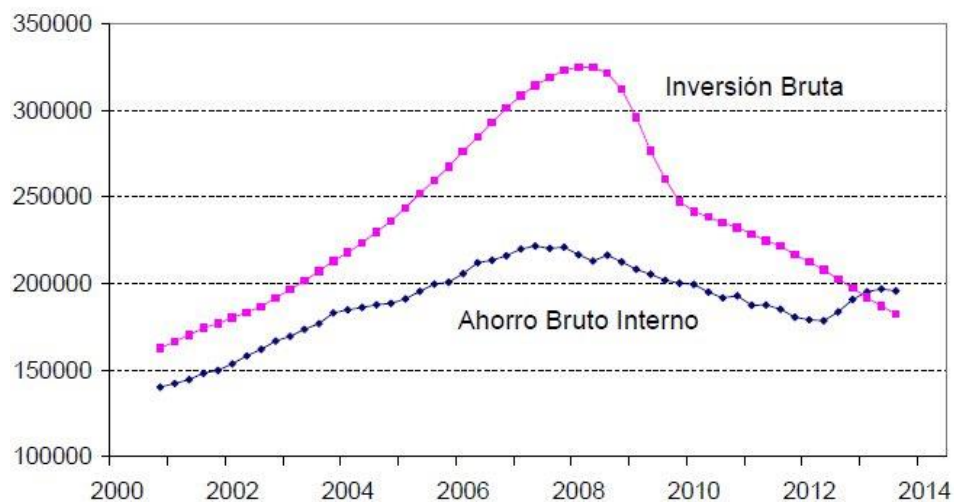
intertemporal decisions of consumers and savers, the market sends fictional signals that encourage, on the one hand investors to invest more and, on the other hand, savers to save less. The result is a disparity between savings and investments that will bring along a boom phase and mass euphoria.

Given that investors want to invest more and savers want to save less, the economic agents compete for economic resources and that causes a temporary shift of the economy beyond its FPP (Figure 5). In this process, instead of having a transfer of resources between investors and savers –that would balance the market- the agents compete for them. The result is that investors will win the dispute, producing a bias investment and forcing economic agents to consume less than they would like to, causing what Hayek calls ‘forced savings’. This situation is inconsistent and the temporary and artificial expansion that takes place in the FPP will end up strangling the initial growth phase, becoming a recession.

The logical consequence, as stated before, is that in the initial phase of the cycle a lack of coordination occurs between the level of savings (or its growth rate) and the level of investment (or its growth rate). The following chart shows these variables in the Spanish case. Let’s see if the theory is consistent with the empirical evidence.

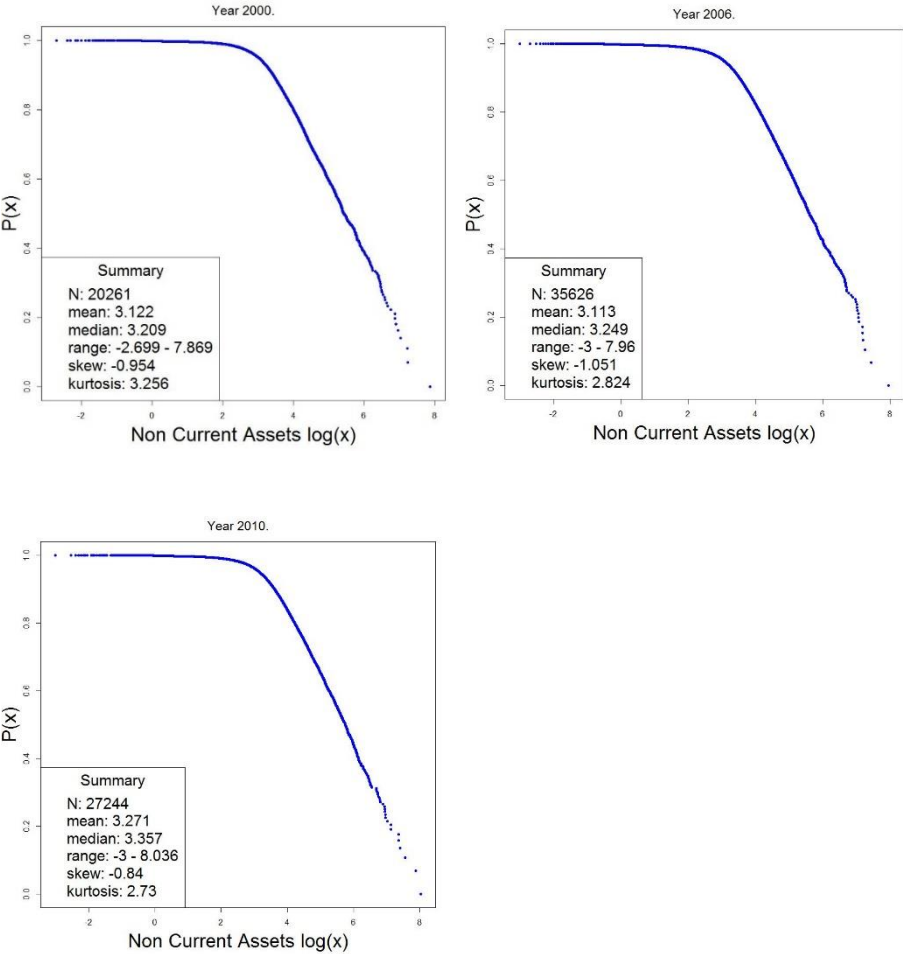
CHART SAVINGS AND INVESTMENT IN SPAIN DURING THE CYCLE

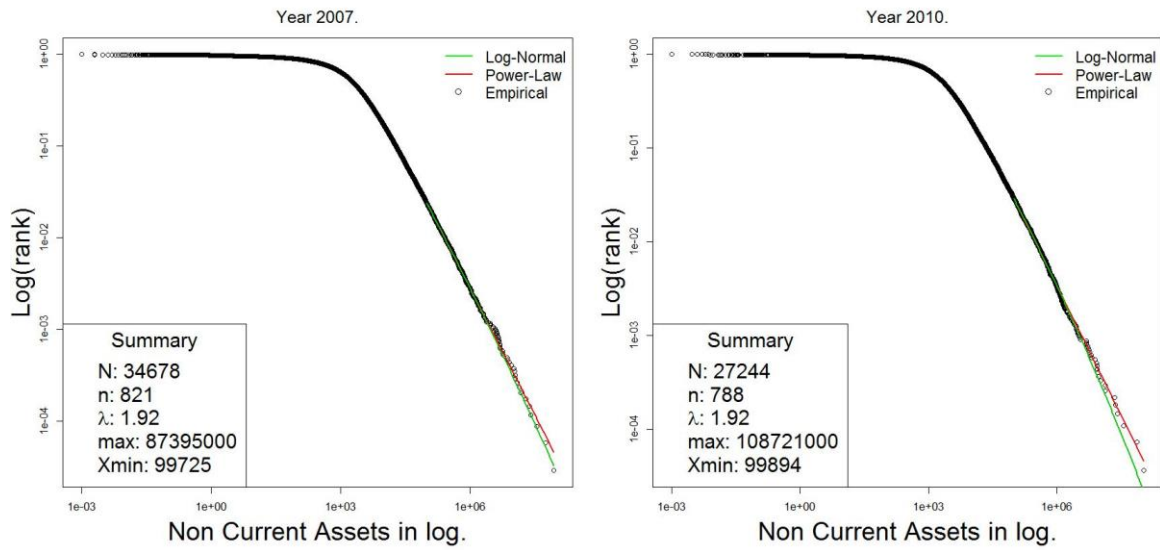
España: Ahorro vs Inversión (mill. Eur/año).



Another aspect that highlights the theory is that entrepreneurs undertake long-term investments that either will not be completed or will not have a demand. The following graph shows the distribution of fixed assets in the balance sheets of large firms in Spain does not change during the economic cycle.

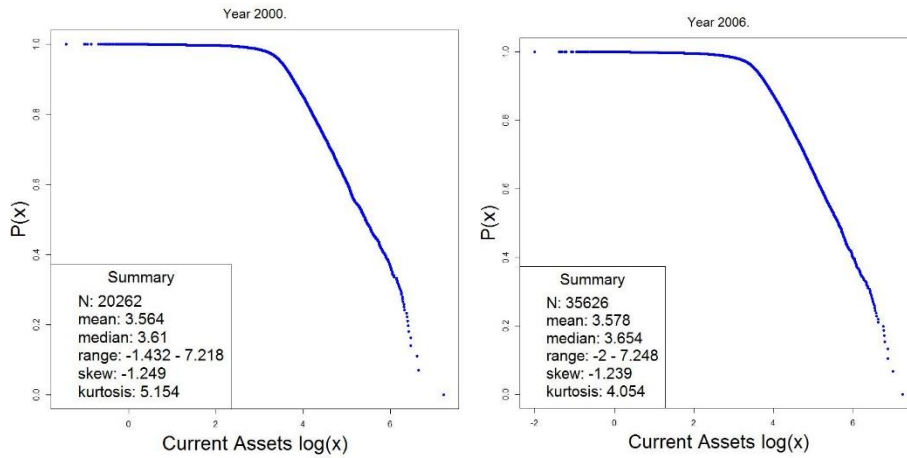
FIXED ASSETS EVOLUTION GRAPHIC largest companies

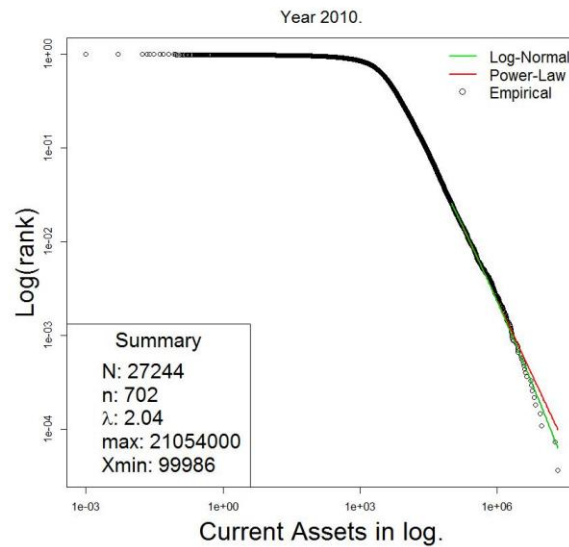
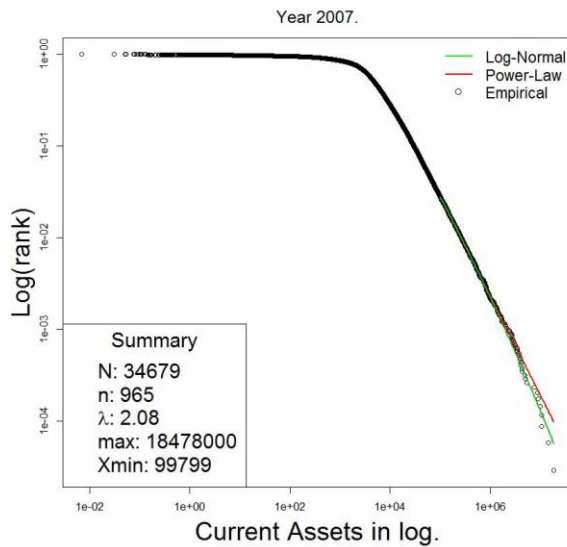
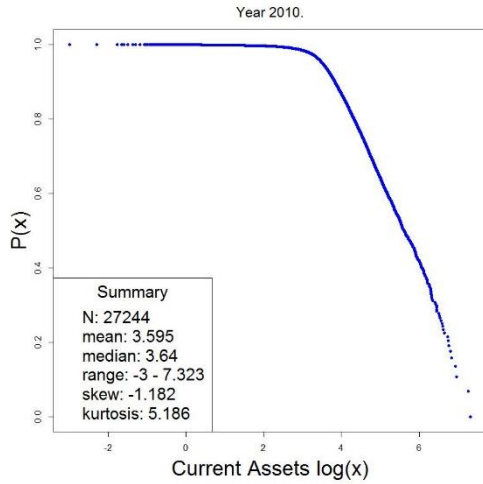




We can interpret, therefore, that when companies invest in fixed capital they do it long-term. This fixed capital cannot be restructured, therefore they must, in the recessionary period, adjust the variable capital causing massive layoffs. The following graph shows the distribution of variable capital in the main Spanish companies during the cycle.

VARIABLE ASSETS EVOLUTION GRAPHIC largest companies

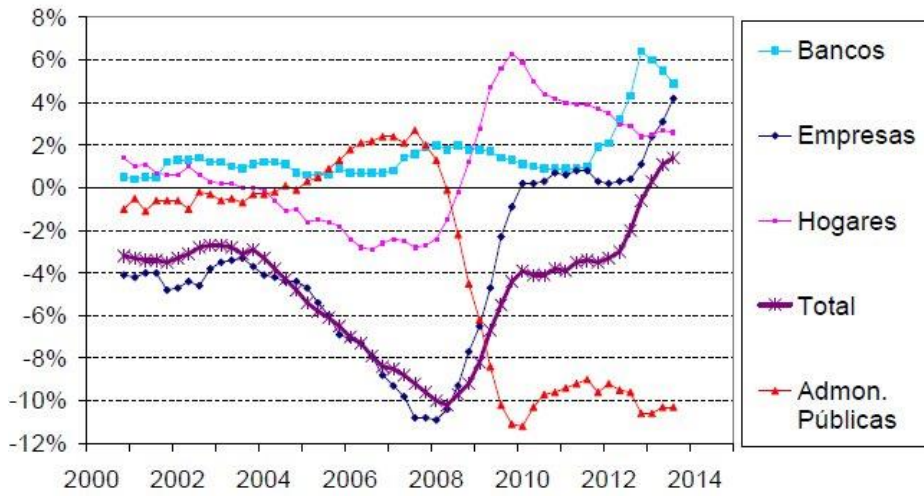




The lowering of interest rates, as has been said, will not only cause an excessive increase in leverage in an economy but will also discourages savings leading to increased consumption. Consequentially, an inflationary growth -sooner or later- ends up causing a crisis (stagflation). We are, therefore, in a scenario in which consumption and investment increase and saving decreases relatively, or remains at the same levels. In the next set of graphs we show the combination of all these factors in Spain during the cycle.

EVOLUTION GRAPHICS consumption, investment and savings.

Capacidad (+) Necesidad (-) de financiación (% s/ PIB)



Private consumption graph:

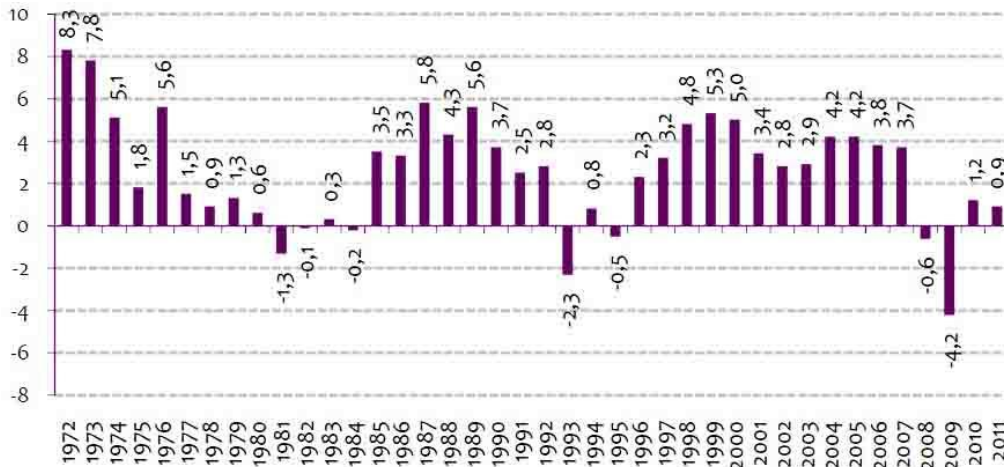


Chart Debt families:

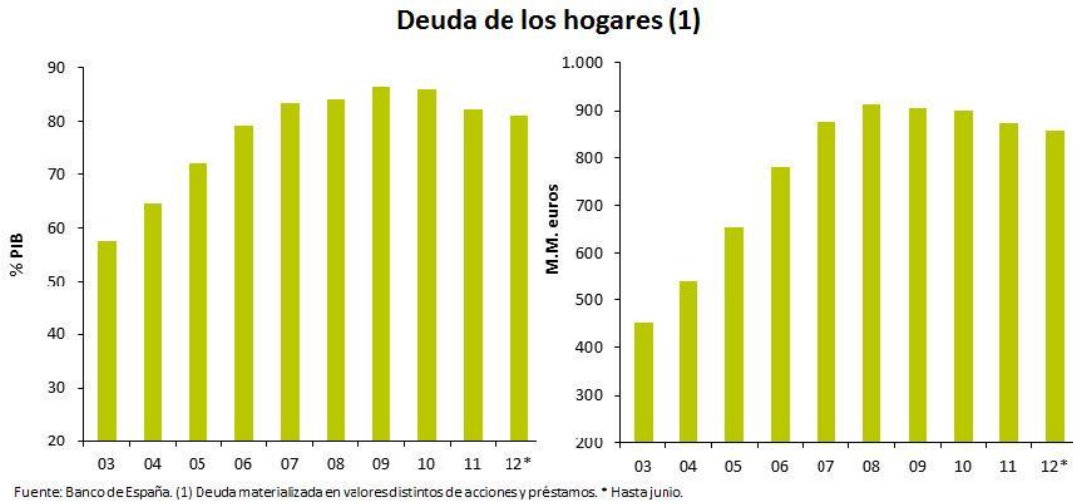
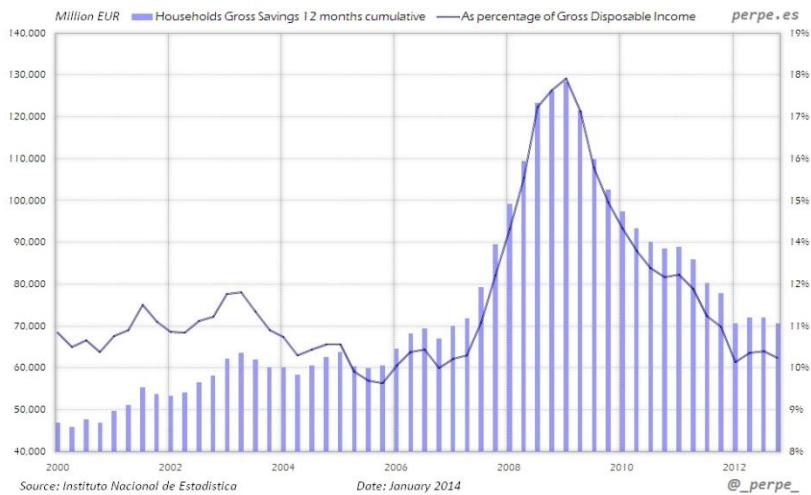


Chart saving families:

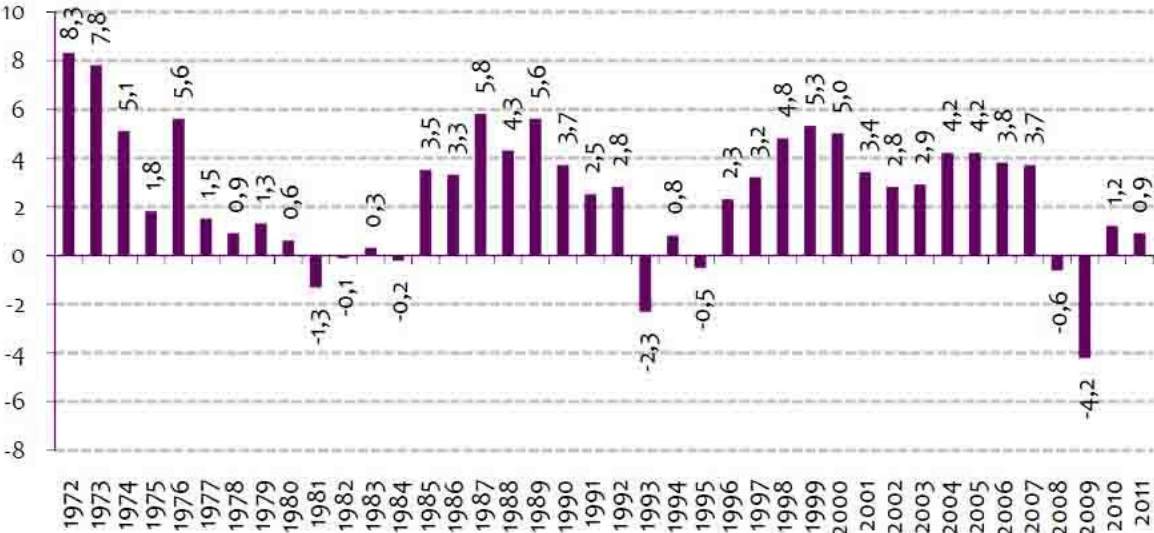


In this sense, Garrison characterized unsustainable growth processes as scenarios tagged by bad investment processes and over-investment in certain stages of production oriented intensive goods in time and capital (houses, cars ...) that the market will not be able to clear. While bad investment processes and the misallocation of resources lead to a contraction in economic activity, overinvestment makes economic adjustment, defined as the process of correcting the mistakes of the previous stage of monetary bubble, slow and painful.

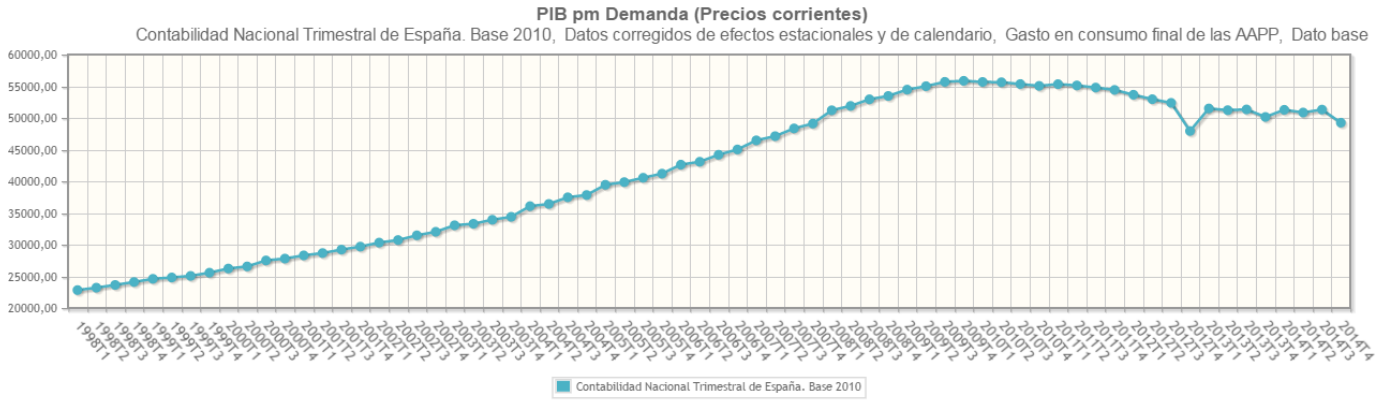
When inherent tensions in the initial expansive cycle arise, the excess demand for consumer goods causes an increase in its price, increasing the profitability of the final stages of the production process at the expense of those in which it were previously invested in (furthest from the consumption). However, earlier stages of the productive process (more capital-intensive) need new financial flows to complete long-term projects initiated during the boom or bubble economy phases. Therefore, apart from the inflationary pressures associated with the excess demand for consumer goods and overinvestment, a dispute for bank credit between the first and last stages of the production process, causing an increase in interest rates. Thus, the scenario that sets the beginning of the crisis is characterized by increased production costs and reduced profit expectations in those sectors that were heavily invested during the phase of 'irrational exuberance' prior. Consumption will begin to slow down, especially that of those goods which are usually bought on credit (houses, cars ...), and the economy will enter a recession tending to debug investment mistakes.

Let's see again if the theory is consistent with the empirical evidence. In the next set of charts we can observe how consumption, inflation and the interest rate evolved in Spain.

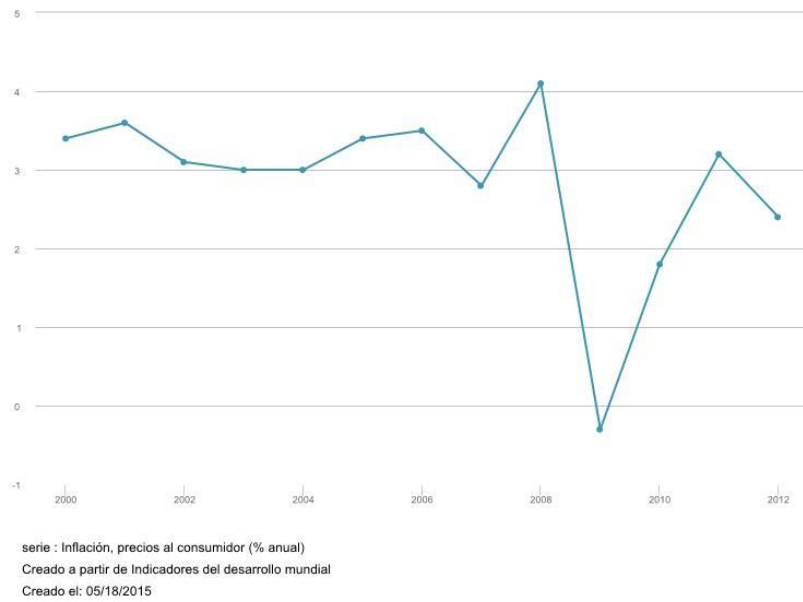
PRIVATE CONSUMPTION TREND CHART:



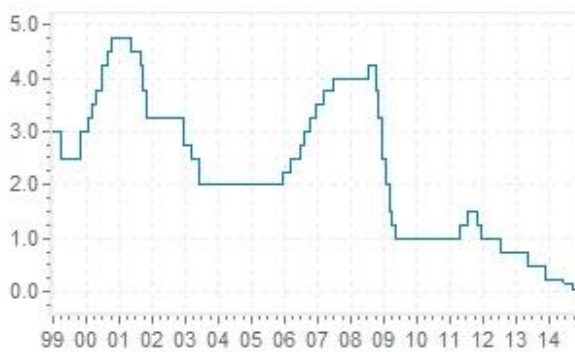
GOVERNMENT CONSUMPTION CHART:



INFLATION TREND CHART:



INTEREST RATE DEVELOPMENTS CHART



3. The process of credit expansion and maturity mismatch

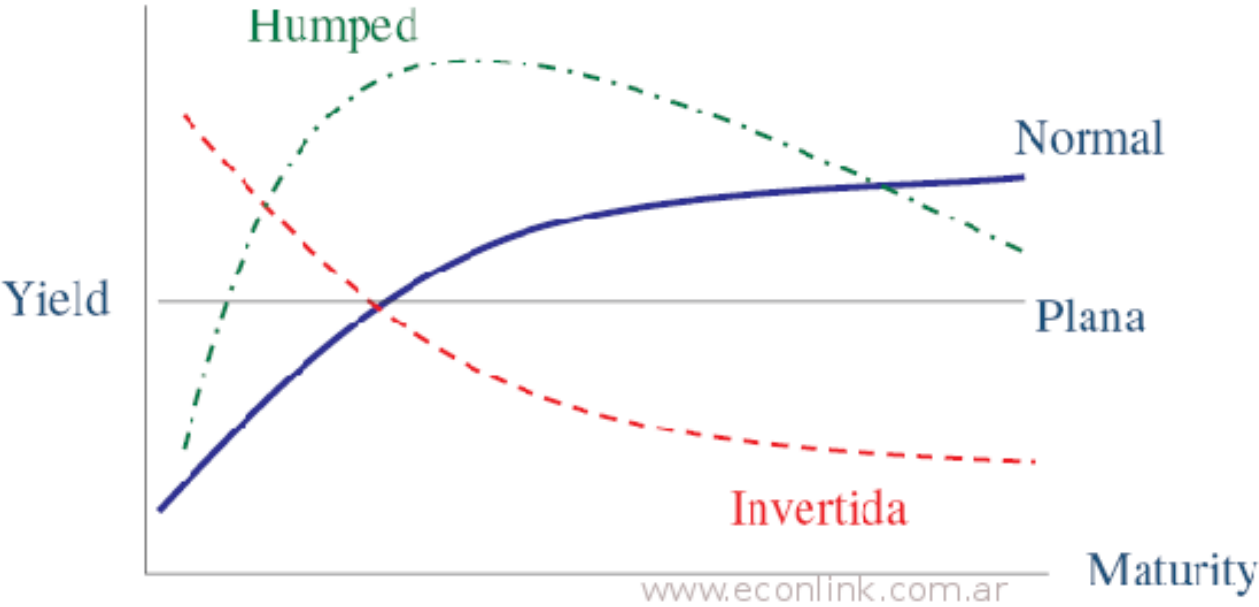
Credit expansion is the execution of banking practices that violate the 'golden rule' of banking, ie credit expansion with unbacked savings. In the words of Karl Knies (1876): "For the activity of the banks as negotiators of credit the golden rule holds, that an organic connection must be created between the credit transactions and the debit transactions. The credit that the bank grants must correspond quantitatively and qualitatively to the credit that it takes up. More exactly expressed, "The date on which the bank's obligations fall due must not precede the date on which its corresponding claims can be realized." Only thus can the danger of insolvency be avoided."

The qualitative relationship between loans granted and received (savings) can be defined in modern language as "mismatch deadlines" and otherwise, non-taxation between the period of saving and investment, is known as 'mismatch deadlines'. In fact, credit expansion and maturity mismatches are the same thing. Therefore, we define credit expansion as the granting of loans not backed by real savings throughout the lifetime of that loan. As an enlightening example: Imagine an agent that saves thousand euros deposited in an institution for one year; The bank now has thousand euros that can lend to one year if it fits deadlines, but if it chooses to lend them more than a year the debt he owes to his client will expire sooner than the credit granted, thus producing a process of maturity mismatch and, therefore, a credit expansion that will distort the economy. When banks or financial institutions take short-term liabilities for long-term investing, they expand credit and violate the 'golden rule'.

This process of maturity mismatch and credit expansion poses the following economic problem: The credit supply for certain periods increases, even when individuals do not save or reduce their consumption by the same amount (quantitative ratio) and in the same terms (qualitative relationship). Consequently, the supply of credit does not accurately reflect the rates of time preference of agents causing clear distortions in decision-making processes of consumers-savers and entrepreneurs-investors.

The strategy of borrowing short-term and lending long-term is risky because the continuous renewal of debts that banks have with their customers is necessary, but despite all this there are huge incentives to commit these irregularities. These incentives are based on the existence of a price curve of money (profit curve) up, so as the term increases so does the interest rate, and therefore, banks' interest is borrowing short-term to invest long-term. The same goes for the creation of deposits: Banks create deposits that pay at very low interest, lending all that the reserve laws allow them to a much greater interest (Basel III).

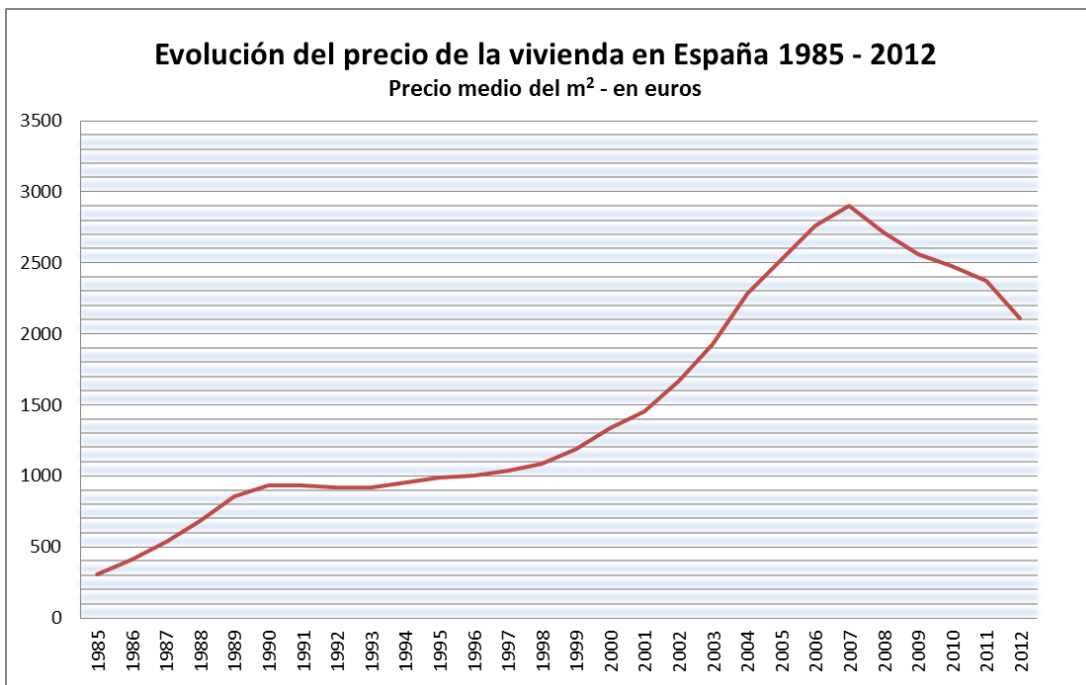
In this regard, it should also be noted how the maturity mismatch, linked to the processes of credit expansion, affects interest rates. First, the dynamics of development of new deposits by banks and their competition for appropriating these new deposits will lead to higher short-term rates. Second, the maturity mismatch and the new supply of long-term credit will lower the long-term interest rates. The end result is a return curve that will tend to flatten violating in this way the law of time preference_(to equal returns, next time preference). In fact, many argue that the beginning of a recession denotes the reversal of the return curve, ie, when short-term interest has a higher demand than long-term interest.



4. Credit expansion, asset price bubbles and current account imbalances

The distortions in the real economy generated by credit expansion processes are also reflected in three other areas: market assets, in the financial system and the balance of payments.

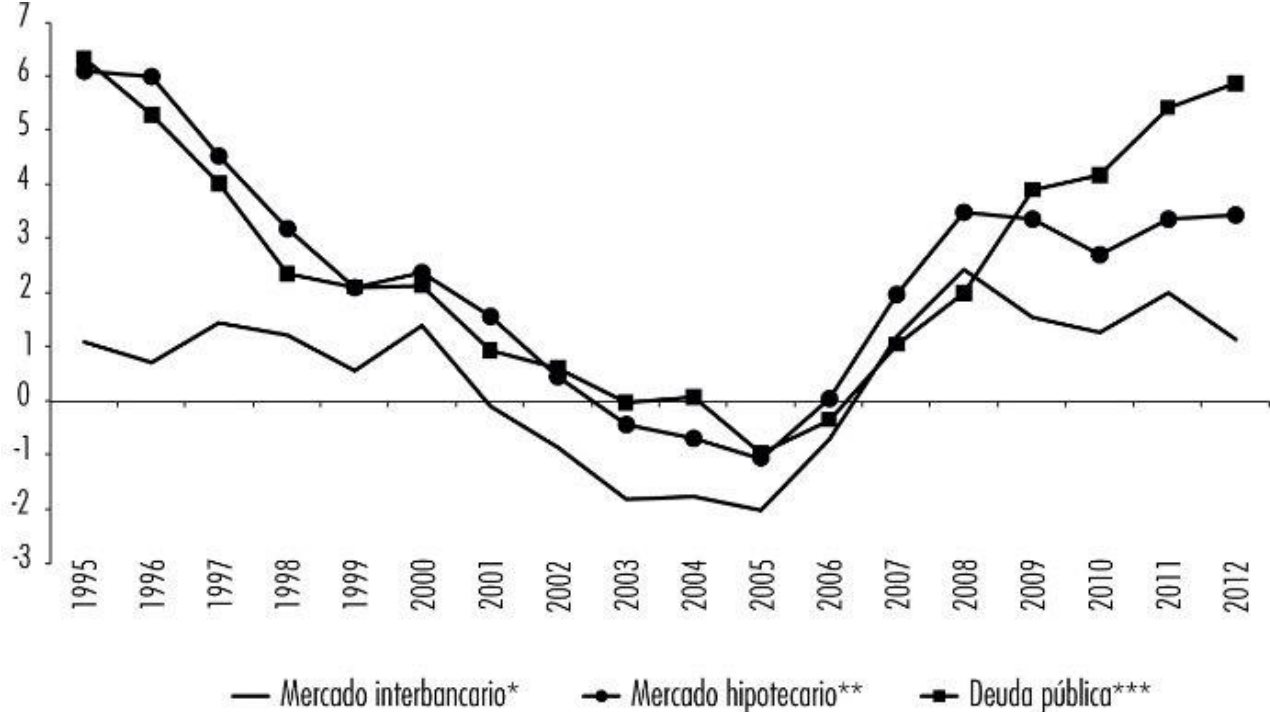
First, as interest rates in the long term decrease, the present discounted value of the cash flow generated by assets, increases its present value which increases its price. This in turn generates bullish price expectations over the prices of receptor credit assets (in Spain for example real estate) that will make the asset be seen as a reservoir of value to protect against future expected inflation. Speculators may even own debt to artificially low interest rate inflating asset prices, enlarging therefore the extension of fiat debt. As a result, the price bubble created by the processes of credit expansion tends to feed itself because the rising prices of assets are used as collateral for new projects that will further inflate the bubble.



Second, when as a result of a process of credit expansion a bank incurs in maturity mismatch, they are increasing their illiquidity problems. The rise in asset prices strengthens the expansion of bank credit for three main reasons: 1) The increase in the price of certain assets that are valued at market prices expands the bank balance. Consequently, the banks

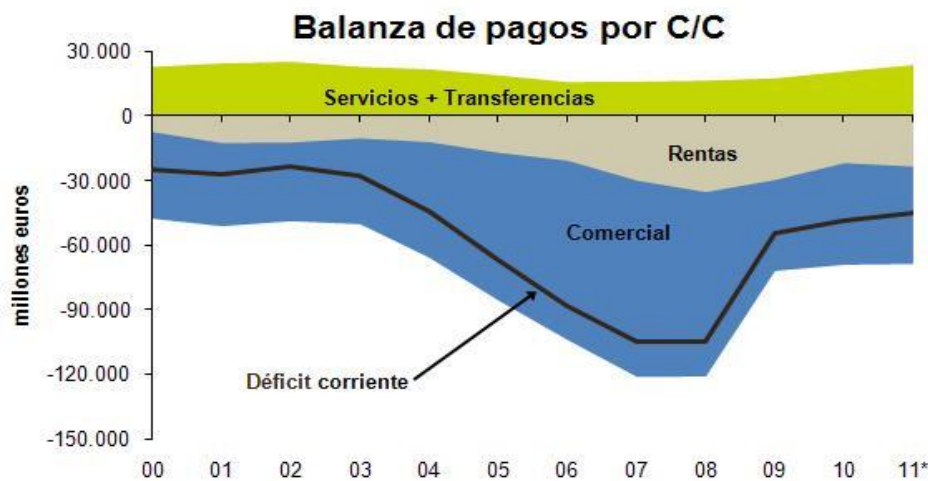
decide to further increase the granted loans; 2) Rising asset prices provides banking intermediaries increased collateral to obtain funds in the interbank market and in central banks' auctions and 3) As the price of assets of bank customers increases, banks are more willing to provide new loans. Knowing this, it is unclear how the banks end up having risk of illiquidity, since the assets that initially inflated the balance sheets of banks and increase the collateral to be recorded at market prices, as the bubble bursts and prices fall both balances as collateral creating decrease risk of illiquidity and even insolvency, in the worst case scenarios (for example Bankia).

GRAPHIC EVOLUTION REAL INTEREST RATE IN INTERBANK MARKET, MORTGAGE AND PUBLIC DEBT:



And finally, credit expansion in an economy is filtered out in the form of increased demand for goods, services, and foreign production factors that cover the consumption needs of the country and complete the investments being made at the domestic level. Even if other

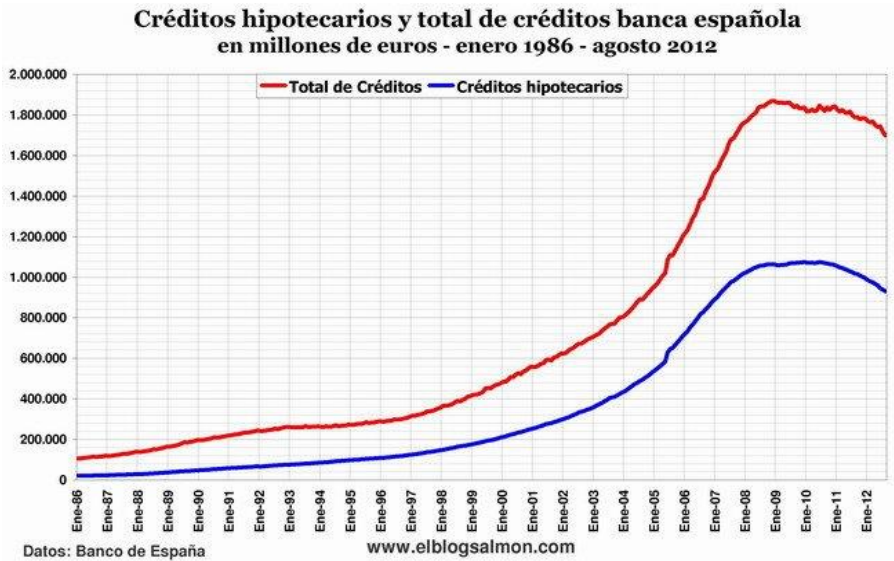
economies also expand credit, it will be those nations that do it at a faster rate that will show a greater ability to increase its current account deficit. Therefore, the current account deficit is one of the possible symptoms that the economy is expanding lending volume over the actual real savings. However, this variable cannot be used as an appropriate measure of savings-investment imbalance, because what matters is not that all domestic investment is financed by domestic savings, but the Second, when as a result of a process of credit expansion a bank incurs maturity mismatch, they are increasing their liquidity problems. The rise in asset prices strengthens the expansion of bank credit for three main reasons: 1) The increase in the price of certain assets that are valued at market prices expands the bank balance. Consequently, they decided to further increase the allotted appropriations; 2) Rising asset prices provides banking intermediaries increased collateral to obtain funds in the interbank market and in auctions of central banks and 3) As the price of assets of bank customers increases, banks are more willing to provide new loans. Knowing this is unclear how the banks end up having risk of illiquidity, since the assets that initially inflated the balance sheets of banks and increase the collateral to be recorded at market prices, as the bubble bursts and prices fall both balances as collateral creating decrease risk of illiquidity and even insolvency, in most cases you record (for example Bankia).



Fuente: Banco de España. *Acum. 12 meses hasta junio.

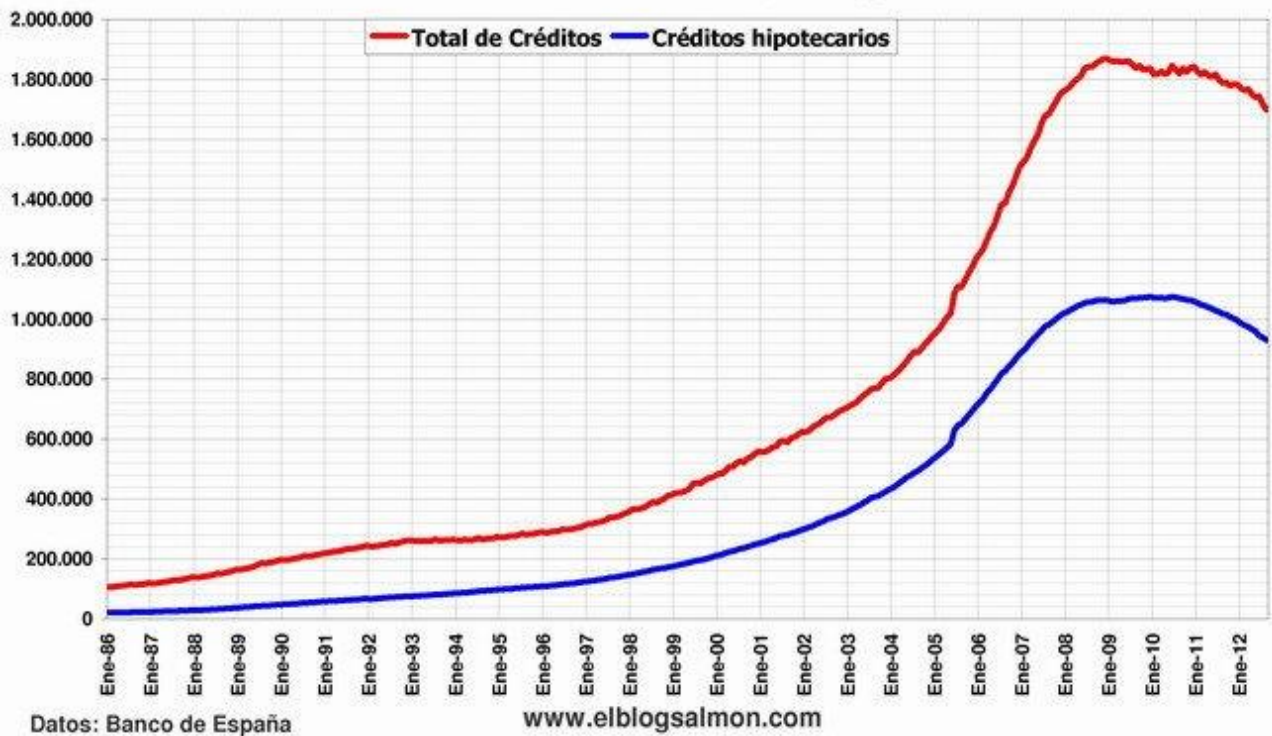
Over the course of time, at some point the bursting of the bubble phase occurs. This turnaround, which constitutes the second phase of an expanding-recessionary cycle, can

come from any of the areas mentioned above. Thus, the economy would enter a downward spiral: the problems of illiquidity and bank insolvency, increase in number defaults, credit contractions, declines in asset prices, financial panics, liquidations, contractions of the economic activity and unemployment.



iones, contracciones de la actividad económica y desempleo.

Créditos hipotecarios y total de créditos banca española en millones de euros - enero 1986 - agosto 2012



Índice de morosidad en España

Porcentaje de créditos morosos (%)
(volumen de créditos morosos en millones de euros)



5. The role of central banks, insurances and implied warranties

The policies of the central bank, government insurances and implied warranties may prolong boom stages considerably.

Central banks can provide a liquid market for assets that would otherwise be illiquid. Commercial banks can indebt short-term with the central bank indefinitely, expanding credit without fear of not being able to refinance. As a result, due to the actions of central banks, commercial banks join the process of maturity mismatch and credit growth so much easier. On the other hand this is normal, since the function of the central bank is to be the lender of last resort.

Also, you can expect that governments come to the rescue of insolvent banks emphasizing moral hazard behavior within the banking system itself, encouraging greater risk-taking. Therefore, the security and privileges network created around the banking business enables maturity mismatches of banks to be higher levels that otherwise could not be reached.

This is also true when the government directly insures banks and financial institutions. Government guarantees allow financial institutions to incur into low interest rates debt to invest in riskier projects, because they are backed by the government (deposit insurance fund). Therefore, and finally, the guarantee system leads to increased risk-taking banks and investors, who rely on the support of government authorities.

PART THREE: THE BUSINESS CYCLES OF JOSEPH A. Schumpeter and granular HYPOTHESIS OF XAVIER GABAIX

In this section we present another business cycle theory which emphasizes production cycles of businesses. As we've seen already at the beginning of this work, our goal is to show that the fluctuations occurring in an economy are caused by a superposition of forces; on the one hand the trend is set by endogenous monetary factors (Austrian theory) and secondly innovation cycles and shocks suffered by businesses move around that trend (Schumpeter' theory and Xavier Gabaix' hypothesis). To prove this, in this section we will describe the cycle theories of Schumpeter and its connection with Xavier Gabaix' calculations. Then through an econometric calculations we will find there is a correlation between the evolution of aggregate output (GDP) without trend and fluctuations in sales of the largest companies in Spain, to see if it is true that innovation cycles / production of businesses do exist and they overlap the long-term and main cycle, affected by monetary and endogenous factors.

1. The theory of innovation

We define innovation through the production function. This function describes how much product quantity varies when there's a variation in the amount of factors. Therefore we will simply define innovation as the formulation of a new production function. This includes the case of a new commodity, as well as a new form of organization, such as a merger, opening new markets, etc. For the cases in which innovation is of a technological origin, we could have defined it directly with reference to the so-called laws of physical returns. Innovation breaks any such curve and replaces it by another that shows greater production increases at all times. We can also define innovation relative to the cost of money. Whenever a given amount of product costs less to produce than it did before the same or a smaller amount, we can be sure, if input prices have not fallen, there has been an innovation somewhere. Therefore, we will say that innovation pushes cost curves continuously and this will lead to imbalances because new cost curves will replace the old ones. In Schumpeter's words: "What dominates the landscape of capitalist life and is, more than anything else, responsible for our impression of a prevalence of decreasing cost, which causes imbalances, fierce

competition and other things like that, is the innovation, system intrusion of new production functions ceaselessly moving existing cost curves ".

At this point, we should repeat the same argument in terms of two known concepts thanks to Marshall: internal economies and external economies. Regarding the former, the most rational division of labor and the better organization increases the amount of product. In Schumpeter's words: "If, for example, a small tailor decides to hire a specialist in sewing buttons only because it increases his business, and if, having made that decision early on, had also obtained from the beginning a quantity equal to the one being produced now, then the only possible reason why he did not take this decision before is because labor is an expensive factor".

As for the latter, external economies are reductions in unitary costs, which are due to favorable circumstances that influence the growth of an industry, especially in its growth in a given locality. External economies generally have their most remote origin in the internal economies of some auxiliary industry (RF Kahn, Economic Journal, 1935, p. 11). If an industry grows, some company may specialize in the production of machinery required for the industry, for example.

To emphasize strongly the modus operandi of innovation, now we will discuss a number of assumptions that can be observed from our cost analysis:

First, innovations imply the construction of new plants and equipment, which requires time and investment. Henceforth we understand by innovation a change in some production function.

Second, in general we argue as if every innovation was incorporated into a new company created for this purpose. This is the fundamental reason why companies do not always exist and others may die in a 'natural way'. And the 'natural' cause is its inability to keep pace with innovation. Any company that works just on established lines can still be a source of profit in a capitalist society, and the day comes to all of them in which they stop producing interests or even assume the depreciation of their assets. We imagine new production functions that are introduced into the system through the action of new companies created for this purpose, while existing companies -or old ones- during a time they work as before, and then react adapting to the new order of things, under the competitive pressure of cost curves that move

down. This organization faithfully describes the situations and struggles we see really when examining capitalist development, and in particular the nature of the imbalances and fluctuations.

Third, we assume that innovations are always associated with the rise of new leaders. It explains why new production functions do not usually come from old businesses and, therefore, as its introduction in the marketplace is originated from the competition against the old production functions, forces them to transform. We should observe the case of large companies, particularly giant ones, which often are but shells within which a staff that is constantly changing can go from innovation to innovation, and therefore continue to maintain its size -die or grow- over time.

2. The business cycles of Schumpeter

Now that we have introduced the concept of innovation in Schumpeter's words, we are now going to expose his theory of business cycles.

A. First approach

Schumpeter began describing his model with many simplifications that later he abandoned: perfect competition, perfect balance, lack of savings, constant population. The first approach is a long way from historical facts. In this economy the mere increase in knowledge, plus the incentive for profit, induces an entrepreneur to undertake something new borrowing money to build its plant and equipment. "So are other entrepreneurs, and after them many others, in increasing numbers, following the path of innovation, which gradually pave the way for successors, by accumulating experience and the removal of obstacles". The production of consumer goods decreases as employers compete for the production factors with their newly-created bank balances. This alters the partial equilibrium of businesses and industries across the economy, announcing losses for some and gains for others; but at this stage companies that do not innovate, together, increase profits, because they pay only part of the increased income, but in the second round, before new products reach the market, obtain the whole income. When the products of entrepreneurs finally come to market, the total output of the economy increases way more than it was previously reduced. The old

companies are now faced with a new source of imbalance. However, some companies increase their demand and obtain unexpected profits. In addition, the negative effects may be more than compensated as long as the business activities continue. Over time, business activity slows down and finally stops. It would stop, apart from doing so by accidents and incidents, first because in any case their chances are limited and eventually the elimination of their profits occur, because of competition, and that's when the innovative drive will be exhausted; and second, because innovation alters the equilibrium, meaning that "fluctuations and successive attempts to adapt to changing temporary situations" and "the impossibility to calculate the costs and revenues in a satisfactory manner".

The above sequence of events corresponds to what is generally known as prosperity and recession.

B. Second approach. The secondary wave.

In the phase of prosperity, investment from innovative activity increases consumer spending almost as fast as the cost of producers. "Old companies react to this situation, and many will speculate with it. A new factory in a village, for example, means more business for local shopkeepers, which consequently will place larger orders to wholesalers, who in turn will do the same with the manufacturers, and they will increase production -or will try to do so- and so on. But, in doing so, many people act under the assumption that exchange rates observed will continue indefinitely, and will perform transactions resulting in losses as soon as the facts will fail to verify this assumption. The new debt will no longer be limited to entrepreneurs, and deposits will be created to finance the general expansion, with each loan to induce for more loans, and each price increase will lead to another price increase". This is the known cumulative process that Schumpeter termed 'secondary wave'. Mistakes, waves of optimism and excess debt are the main factors of this theory, which plays such an important role in other theories.

"All this does not necessarily mean panic or crisis, but easily causes panic or crisis." It leads to the 'vicious spiral', which is defined by two effects: 1) "Any fall in values that requires liquidation, fully induces a mechanical decline of values"; and 2) The pessimism may play a causal role as people realize how much there is to liquidate, or even get hysterical about it. Consequently, it is likely that the process may overflow the equilibrium state towards it is

moving, and may enter another phase characterized by the 'abnormal liquidation', ie because of a revision of the values downward and a contraction of operations that will often reduce them, in a completely irregular shape, below their equilibrium quantities.

But when depression has run its course the system starts to return to a new equilibrium zone. This is the so-called recovery or revival. And with that the Schumpeter innovation cycle is completed.

3. The relationship with the calculations of Xavier Gabaix

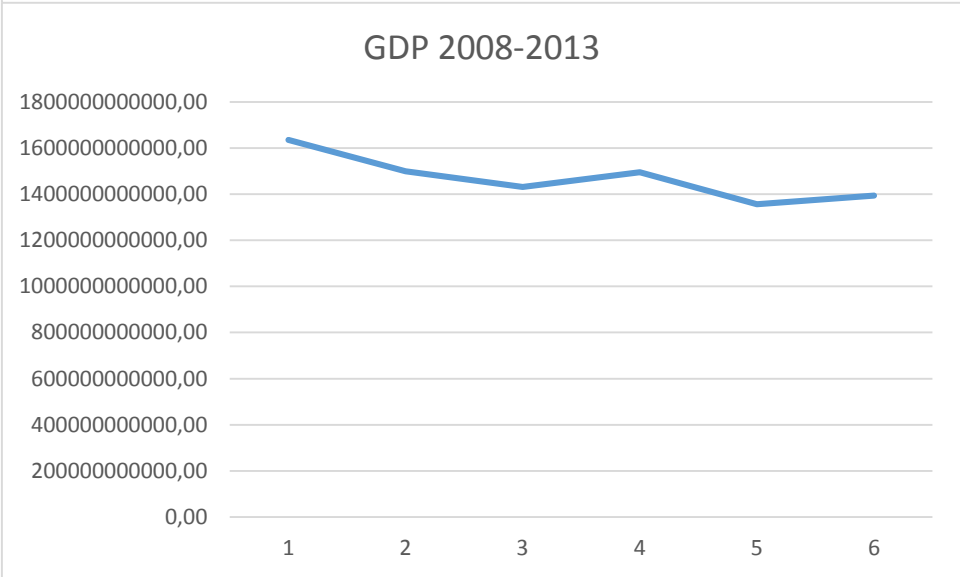
According to Xavier Gabaix, fluctuations in aggregate production can be explained by idiosyncratic shocks that affect large enterprises. We, from Schumpeter's theory, are going to assume that these production fluctuations are the result of innovation cycles and, as shown by Schumpeter, big companies are the ones that suffer or are benefited from innovation cycles the most: First because if large companies wouldn't be continually innovating they would disappear; and secondly, because every great company has emerged from a great innovation or application of new methods that replace the previous ones. Therefore, from our point of view, if we examine the fluctuations of large companies and observe that there is a decreasing marginal correlation in regards to aggregate production (GDP) –being eliminated its trend- we can conclude that are large companies (or new ones that become huge such as Facebook) the ones setting the production cycles Schumpeter called 'secondary waves'. We have already demonstrated that the main wave is monetary and endogenous, therefore, with this we would have completed our own business cycle theory: a combination of long-term cycles and short-term business cycles.

4. Calculations

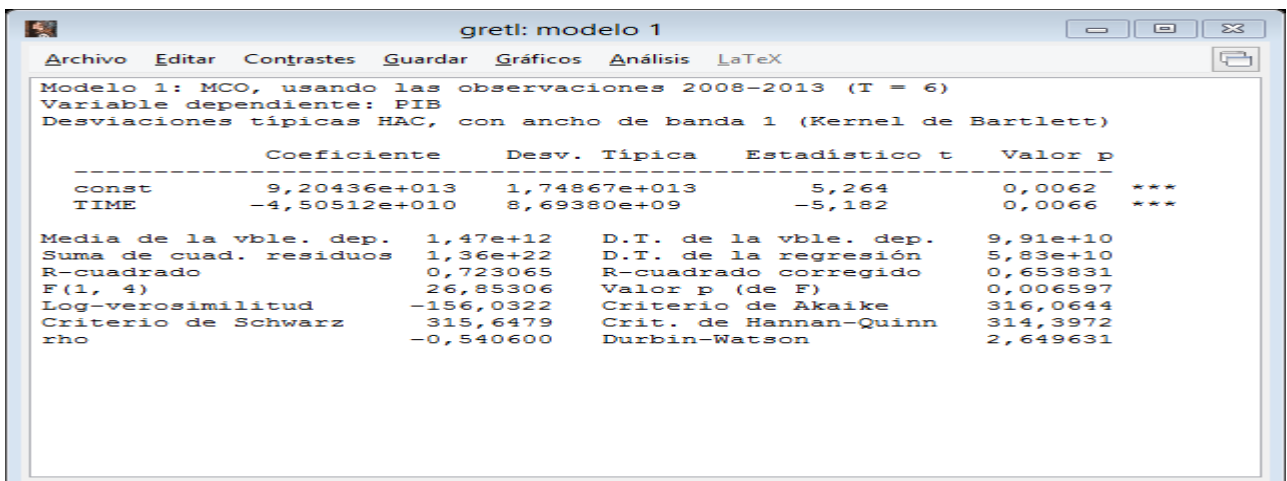
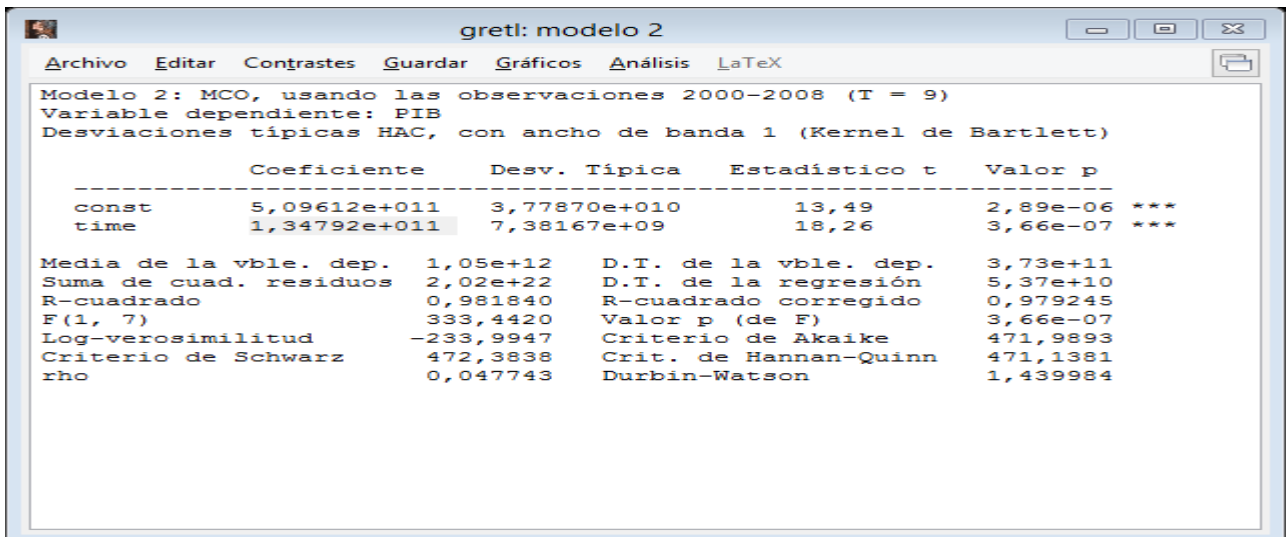
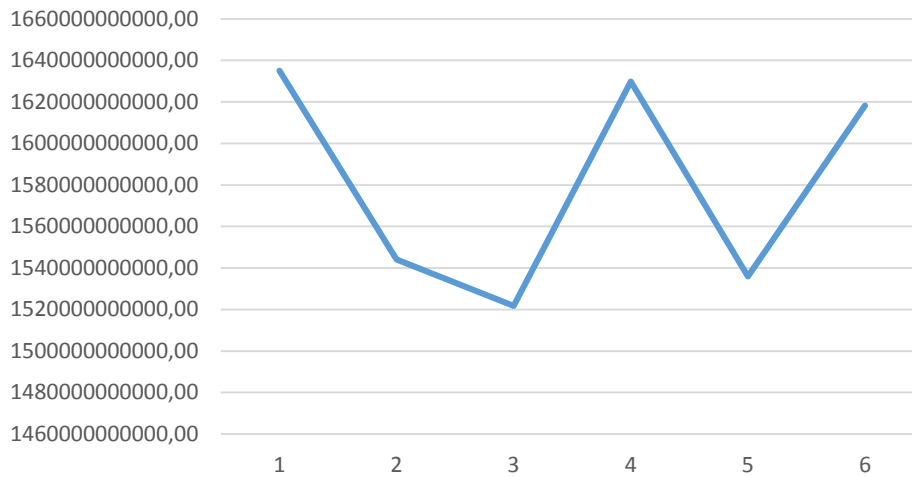
First, let's expose GDP data in Spain separated into two periods with and without tendency, first from 2000 to 2008 (expansion) and secondly 2008-2012 (recession). Then we will show how we have removed the trend series.

| TIME | time | GDP | GDP without tend |
|-------|------|-------------------|------------------|
| 2.000 | 0 | 595.402.616.547 | 595.402.616.547 |
| 2.001 | 1 | 625.975.838.926 | 491.183.838.926 |
| 2.002 | 2 | 705.145.868.624 | 435.561.868.624 |
| 2.003 | 3 | 906.853.273.138 | 502.477.273.138 |
| 2.004 | 4 | 1.069.601.981.710 | 530.433.981.710 |
| 2.005 | 5 | 1.157.247.674.476 | 483.287.674.476 |
| 2.006 | 6 | 1.264.486.722.861 | 455.734.722.861 |
| 2.007 | 7 | 1.479.265.709.740 | 535.721.709.740 |
| 2.008 | 8 | 1.635.049.580.162 | 556.713.580.162 |

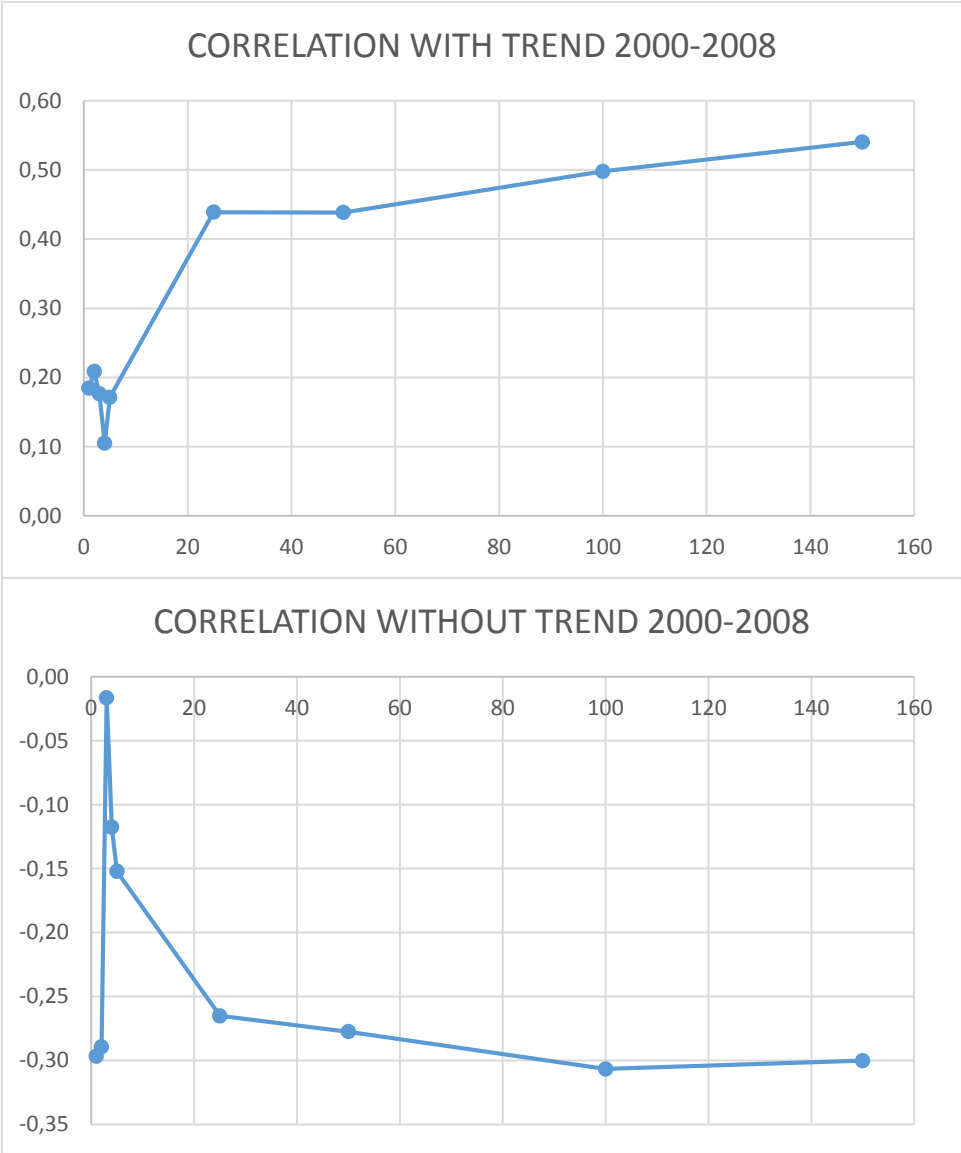
| TIME | time | GDP | GDP without tend |
|-------|------|-------------------|-------------------|
| 2.008 | 0 | 1.635.049.580.162 | 1.635.049.580.162 |
| 2.009 | 1 | 1.498.984.446.174 | 1.544.035.646.174 |
| 2.010 | 2 | 1.431.587.612.302 | 1.521.690.012.302 |

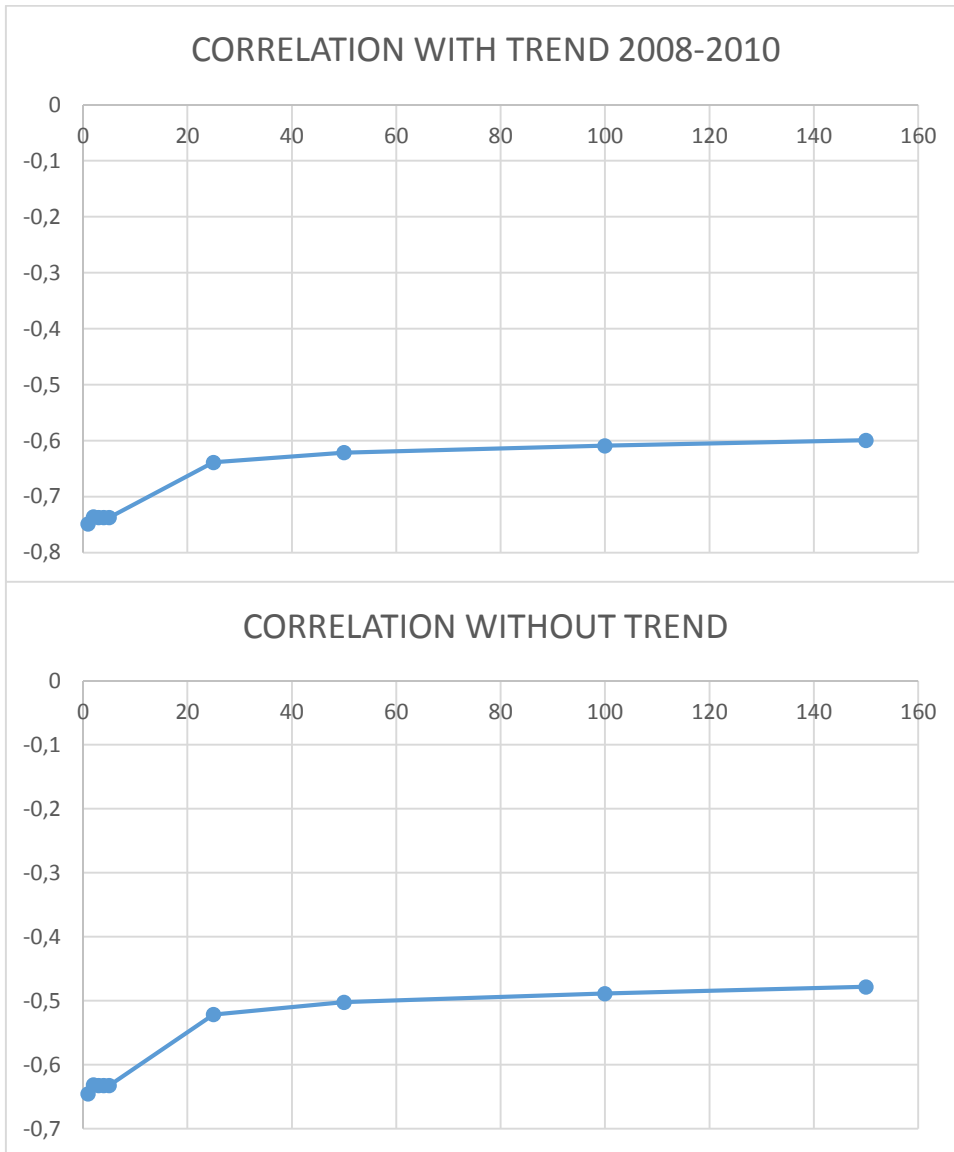


GDP WITHOUT TREND 2008-2013



Now we will study the evolution of the coefficient of correlation between sales of large enterprises and the evolution of GDP, both with and without trend. Number one is the first company, the two is the sum of the first to the second and so on. Because of lack of data, we can only study the correlation between the six largest companies and the GDP between 2000 and 2010. For future studies will have to expand the number of companies as well as the study period. The results are:





The results show that the theory approaches pretty well the empirical evidence. However the calculations made are very basic and we would need to part from a deeper database, and improve them with even more factors, perhaps: For example, when you remove the tendency of our series we take into account the evolution of aggregate productivity and it should be taken in consideration as this is not a monetary factor. In future research we will deepen and this theory of combined cycles will be improved, but for now, we will keep it simple just to show that there's an apparent correlation that might be interesting to study deeply.

PART FOUR: CRITICS TO ECONOMIC CYCLE THEORIES AND CONCLUSIONS

After studying the main theories of the economic cycles the different schools of thought present, we can raise a critic and point out their weaknesses.

The fundamental error that we see in the Keynesian theory -and in part also in the plucking model of Friedman- is that the authors reason that those aggregated macroeconomic terms are beyond the problems of microeconomic adaptation inherent to cycles. Both models suffer from not understanding the essential influence that the interest rate, as we have said, reflects the rate of intertemporal preference of economic agents. The interest rate, and credit expansions, set the production structure and therefore, according to the theory of endogenous monetary cycles, is responsible for the processes of expansion-recession that economies repeatedly experience. Indeed, both the Keynesian and monetarist schools adopted a macroeconomic approach to explain microeconomic fluctuations, none of the two schools arises whether the microeconomic composition of the productive structure is sustainable. Economic problems are reduced to monetary variations or aggregate demand, ignoring the real distortions that may arise under these macromagnitudes. In short, both approaches seek to draw relationships between macromagnitudes -GDP, CPI, money supply, unemployment, aggregate investment...- that actually are unrelated to each other except for the connections between micro-economic levels investment, credit, employment and production of each company and industry, as determined by their relative prices against the competition and its recourse to borrowing.

Moreover, these theories tend to consider the interest rate or the credit volume as entirely monetary and non-real phenomena so that only affect the economic system by allowing a higher level of investment and hence aggregate production. Indeed, the interest rate is the market price that relates the monetary value of current goods to the monetary value of future good. Hence, the interest rate for each term is the price that allows to coordinate the decision plans of savers and investors. If by manipulating the credit supply by the banking system interest rates reduce long-term, investors find profitable to expand its projects longer-term, even when savers are unwilling to wait that much time to access the resulting goods, namely, a process of maturity mismatch that causes a lack of intertemporal coordination of savers

and entrepreneurship. Therefore, these new investments will not increase the wealth of society but just the opposite: bad decisions will immobilize savings in the form of projects that should be abandoned before completion.

Having said this we must also make a critic to theorists from the Austrian school. These authors rightly focus their research on the imbalances produced in the real economy, in its various stages, which cause monetary expansion and low interest rates policies, but obviate other shorter cycles that also exist: the innovation cycles. Indeed, the business process of continuous innovation and competition will lead the process Schumpeter called "creative destruction." As already explained, companies that innovate in its initial process, promote an expansion of their general activity but when new products replace the old ones, there will be a necessary adjustment of the activity. It is true that this problem is qualitative and hardly quantitative, but we believe that the theory of Xavier Gabaix might be a good empirical approach to this theory. Gabaix exposes the fluctuations of big companies can explain up to 30% of the fluctuations experienced by the GDP of a country.

In conclusion we can say that the credit expansion and artificially low interest rates are responsible for the 'long cycles' but alongside them appear other 'short cycles' much shorter and produced by 'creative destruction.' It would be futile to think that the creation of the computer would not entail initially a negative shock that would bankrupt many companies forcing the economy to a readjustment to the new technologies. It's the new technologies and capital accumulation that make a country to progress and increase its wealth, but we must accept that these innovations displace previous ones and produce shocks -that we might call exogenous- although they have an endogenous cause. In short, economic cycles are not due for exclusive endogenous or exogenous factors, but the combination of both realities shape the development of our economies.

APPENDIX 1

The statistics used in national accounts express the monetary value of final goods produced in an economy. It can be made on a gross basis, excluding depreciation, or on a net basis, minus depreciation. But both measures are still gross as in their calculations the volume of intermediate goods that are produced or in production are excluded, and are not sold as finished goods. The important thing is to study what happens to the savings and gross investment, that is, with the aggregated value in monetary terms of the earlier stages of intermediate goods, prior to consumption, amount that remains hidden if we focus exclusively on the study of the accounting magnitudes in net terms. Basically, national accounts statistics suffer from two fundamental flaws; First, the figures for gross domestic product (GDP) conceal the existence of different stages in the production process; And secondly, the Gross Domestic Product (GDP) does not collect the total monetary gross expenditure that occurs at all stages or production sectors of the economy, because in their calculation only the production of goods and services delivered to end users are taken into account. Thus as shown by Ramon Tamames, the Gross Domestic Product (GDP) "can be defined as the total value of all final goods and services produced within a nation in a year [...] We are talking about final goods and services that are excluded from intermediate character to avoid double counting of the same value" (Fundamentos de Estructura Económica, Alianza Universidad, p. 304). Likewise you can consult the book of Enrique Viana Remis in which it is stated that "the distinction between intermediate inputs and depreciation has led to the belief that the former are excluded from added value and the second included in the added value. So that's how we distinguish between gross added value added -including depreciation- and net added value -that excludes it-. Therefore, both output and income may be gross or net, depending if they include or exclude depreciation" (Lecciones de Contabilidad Nacional, Editorial Civitas, p . 39). As we can see the label of gross is given to figure that remains net, as intermediate inputs are excluded. But not always national accounting manuals have ignored these facts, for example in the works of JR Hicks and A.G. Hart an explicit reference to the great importance of the temporal dimension has in every process of production of consumer goods is stated, "The products resulting from these early stages are useful but not directly useful products to meet the needs of consumers. Their utility will be found in its use in the later stages, at the end of which a product directly requested by consumers will arise... A production good may be technically concluded in the sense that the particular operation is required to produce it, or may not be

technically finished, but still in process, in which its own stage concerns. In either case, it is a production good, because three steps were needed before the result of the process fell into the hands of consumers."(Estructura de la Economía: introducción al estudio del ingreso nacional, p. 35-36).

Therefore, only a small proportion of total capital is included in the figures of the Gross Domestic Product. Indeed, GDP includes the value of sales of fixed assets or long-term assets, such as buildings, industrial vehicle, machinery, tools, computers, etc., which are completed and sold to end users during the exercise, being considered, therefore, as final goods. But it does not include the value of the current capital goods, non-durable intermediate products, or capital goods not yet completed or already completed goods that move from one stage to another along the production process, and, obviously, they are different from the specific intermediate goods that are incorporated into each final good. That is, GDP takes into account only the fixed or equity lasting over, but not the working capital.

In addition, GDP is an aggregate of added values which excludes the most important part of intermediate goods. The only reason given by theorists of national accountings for this figure is that, with this approach, they avoid the problem of 'double counting'. But from the standpoint of economic theory this argument is based on a narrow accounting conception and is very dangerous, as it eliminates the enormous amount of computing corporate effort that each year is dedicated to the production of intermediate goods, which is the part most important economic activity and is considered not worth evaluating. Our best estimate would be a kind of Social Gross Income. Mark Skousen, in his *The Structure of Production* (p. 191-192) proposes the introduction of a new account in the national accounts, that'd be denominated 'gross national output'. Relative to the gross national output that could be calculated for the US, Skousen concludes: "First, Gross National Output (NCE) was nearly double GDP, just thus indicating the degree to Which GDP underestimates the total spending in the economy Second, consumption dealer to only 34. percent of the total national output, far less than what Suggest GDP figures (66 percent); Third, business outlays, Including intermediate inputs and gross private investment, is the largest sectors of the economy, 56 percent larger than the consumer-goods industry GDP figures Suggest That the capital goods industry Represents a minuscule 14 percent of the economy." (Figures for the US for 1982). These declines show that statistics of the national accounts are not really a true

reflection of the economic structure of a country and they can be misleading, and certainly, to predictions about cycles totally unrelated to reality.

In the words of Jesus Huerta de Soto: "If the accounts of the national accounts were changed and they'd be made truly gross, thus including all intermediate products, we could easily track the proportion that represents the quantity spent every year in service and consumer goods, in relation to the total amount spent in the intermediate stages. "

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