

MINSKY'S FINANCIAL INSTABILITY HYPOTHESIS *VERSUS* AUSTRIAN BUSINESS CYCLE THEORY

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Abstract: This article represents a detailed theoretical analysis, focusing on two heterodox theories: the Minsky's Financial Instability Hypothesis and the Austrian Business Cycle Theory, particularly in the light of the 2008 crisis. It provides a theoretical comparative analysis of these theories and a review of the empirical studies of two approaches.

Keywords: Economic crisis, interest rate, austrian business cycle theory, financial instability hypothesis.

JEL Classification: E32, E44, E52, E58.

Resumen: Este artículo ofrece un análisis teórico detallado, centrado en dos teorías heterodoxas: la Hipótesis de la Inestabilidad Financiera de Minsky y la Teoría Austríaca del Ciclo Económico, especialmente en vista de la crisis de 2008. Este trabajo proporciona un análisis comparativo teórico de estas teorías y una revisión de los estudios empíricos de ambos enfoques.

Palabras clave: Crisis económica, tipo de interés, teoría austriaca del ciclo económico, hipótesis de inestabilidad financiera.

Clasificación JEL: E32, E44, E52, E58.

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I INTRODUCTION

«...the validity of a particular theory is a matter of its logical derivation from general assumptions which it makes».¹

Lionel Robbins

The financial crisis that started in 2008 can be quantitatively distinguished from other crises by the extent and depth of the subsequent economic recession.

Overall, the qualitative differences of the 2008 crisis are indeed significant. The principal differences in the general market environment relate to the overall size of financial markets relative to the size of the real economy as well as to the introduction of innovative financial products such as securitization and derivatives. An unprecedented coordination between global authorities and individual governments has resulted in the explosion of national debts worldwide.

This phenomenon is viewed in the context of macroeconomic policy. The scale of the crisis revealed the fragility of the banking and financial systems not only at the national level, but globally. This dysfunctionality has led to a questioning of the fundamental economic theories which form the basis of monetary, banking and business cycle theories.

Particularly, the subprime crisis exposed the limitations of contemporary business cycle theory. Ignoring the issue of resource reallocation and neglecting to properly take into account the relationship between the real sector and financial sectors proved to be disastrous. In light of the latest financial crisis, the highly fragmented analysis parameters associated with different modern economic theories such as «representative agent», «homogeneous capital», and «unified goods», demonstrate the very limited explanatory power of these models outside the «status quo».²

¹ Lionel Robbins, 1949 [1932], p. 116.

² Modern business cycle theories of different schools of economic thought: Neo-classical, New Keynesians, Monetarist.

There are only two business cycle theories that analyze the interdependence between the financial and real sectors with emphasis on how investment projects are financed: Minsky's Financial Instability Hypothesis (FIH) (2013 [1982]) and the Austrian Theory of the Business Cycle (ATBC) (Mises 1912, 1928; Hayek 1929, 1931).

These two theories support the notion that financial instability is a precursor of an economic downturn. Indeed, the use of excessive debt financing and the practice of making risky loans are now regarded as a path to severe economic instability and ultimate financial collapse.³

Nevertheless, the FIH and the ATBC present different points of view on the causes of the financial crisis and the subsequent response. The different views are historically a product of the debate between the Banking and Currency schools.

Wolf (2014, p. 6) underlines that despite the differences, these two theories support the idea that crises are inevitable in the current economic system.

Minsky explains in detail the speculation process and over-indebtedness of economic agents during periods of expansion. This logic was reflected in the financial crisis of 2008. Minsky's FIH clearly illuminates the course of events in the recent financial crisis.

The ATBC offers a comprehensive and coherent analysis of changes in relative prices and the capital structure as a result of monetary manipulation.

The objective of this article is to demonstrate the similarities and differences of these two theories. This article represents a detailed, systematic examination of these two theories, particularly in the context of the 2008 crisis. It examines the main theoretical points of the FIH and the ATBC and provides a theoretical comparative analysis of the two approaches. A review of the existing empirical studies of these theories will be given.

³ The theoretical comparative analysis that was done in Peniaz Ph.D. dissertation (2016) concluded that the ATBC and the FIH offer a better explanation of the 2008 crisis compared to all competing contemporary approaches.

II RELEVANCE OF ATBC AND ANALYSIS OF THE EMPIRICAL STUDIES

1. **The ATBC: method and hypothesis**

The Austrian Business Cycle Theory developed by L. von Mises and F. von Hayek in the beginning of the 20th century is still valid and relevant. It provides a comprehensive explanation of the causes and the course of economic crises.

Today, the ATBC is still applied to the analysis of economic phenomena. In addition, it was enriched and complemented by the contributions of contemporary authors such as Jörg Guido Hülsmann (1998), Roger W. Garrison (2001) and Jesús Huerta de Soto (2006 [1998]).

The method and analysis assumptions of the ATBC are a competitive advantage compared to other theories. In this section, we will focus on these important elements.

The main methodological foundations of the ATBC are methodological individualism, methodological subjectivism and recognition of the importance of the entrepreneurial process as opposed to static equilibrium. The object of economic science in the tradition of the Austrian school of economics is human action, defined as the purposeful employment of means to attain ends.

Methodological individualism is an approach to the analysis of socio-economic phenomena according to which each phenomenon must be explained in terms of the individuals' behavior (plans, habits, actions, etc.).

According to this concept social phenomena are considered as the result of individual actions. The ends of a social group are always deduced from the ends of the individuals that compose the group. It means that collective intelligence does not exist. This approach assumes that a cause-and-effect relationship does not exist between macroeconomic aggregates. In order to understand the relationship between economic variables, it is necessary to turn to the motives of human behavior.

«It is uncontested that in the sphere of human action social entities have real existence. Nobody ventures to deny that nations, states, municipalities, parties, religious communities, are real factors determining the course of human events. Methodological individualism, far from contesting the significance of such collective wholes, considers it as one of its main tasks to describe and to analyze their becoming and their disappearing, their changing structures, and their operation. And it chooses the only method fitted to solve this problem satisfactorily» (Mises, 2011 [1949], p. 42).

Methodological subjectivism means that the economic analysis of human interaction or institutions is based on the subjective value attributed to particular actions by the analyzed individual. Methodological subjectivism focuses on the relevance that individuals attribute to actions.

The element of subjectivism in the Austrian approach is particularly evident in the interpretation of value, information or costs. In the Mengerian tradition, value is a judgment of an individual about the importance of goods in relation to that of other goods. The value is subjective because it is relative to a person. It is ordinal; we can neither add values, nor apply mathematical functions to determine them.

Hayek (1986) emphasizes the subjective nature of information. Each individual has partial (incomplete) information that he interprets subjectively. Personal and subjective perception that individuals have of their environment guides them in their choices.

«The knowledge of the circumstances of which we must make use never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess» (Hayek, 1945, p. 521).

Information is progressively dispersed on the market. The movement of the economy towards equilibrium is realized by trial and error when each individual adjusts his anticipations and his actions taking into account the new information emerging on the market.

This vision of information leads to three important conclusions. Human action is dictated by uncertainty. The uncertainty is

inescapable. Entrepreneurs make production decisions today to meet future demand. Entrepreneurs' mistakes are inevitable and intrinsic to the market economy.

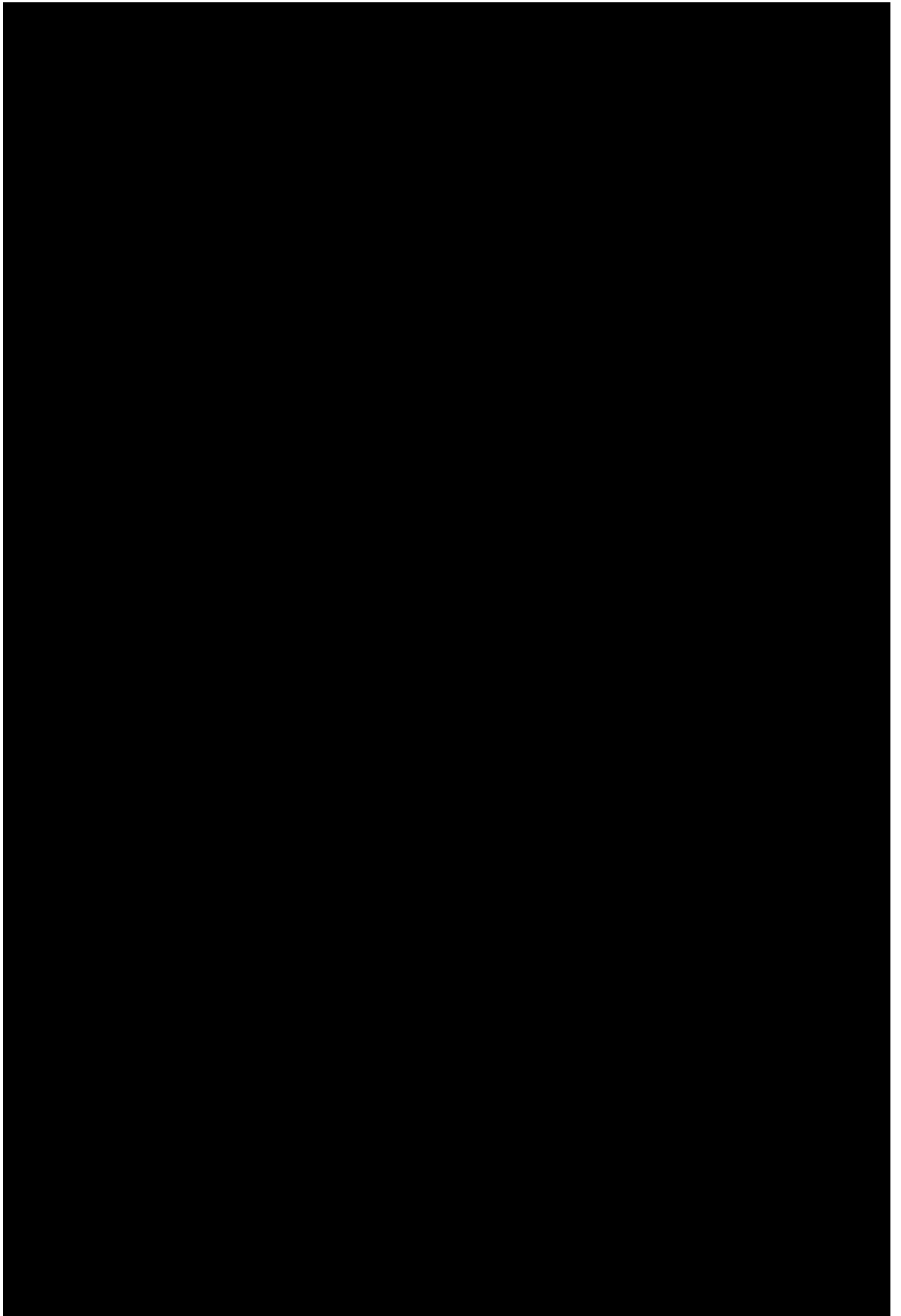
The ATBC is based on the intersection of several lines of Austrian economic thought: Menger's theory of goods and value, Böhm-Bawerk's theory of capital and interest, Wicksell's theory of the natural interest rate, Mises's theory of money and credit, and Hayek's theory of relative prices and the capital structure. Each of these theories is based on the methodological principles discussed above.

In the *Principles of Political Economy* (1950 [1871]), Menger introduced notions of good and subjective value. He classified goods according to their economic nature: consumers' goods or goods of the first order and producers' goods or factors of production or goods of higher order (useful only indirectly in satisfying wants). The order of classification indicates the causal relationship to and remoteness from want satisfaction (Menger 1950 [1871], pp. 56-58). The time is a very important factor in the production process and implies the existence of uncertainty (*ibid.*, P.68):

«The time period lying between command of goods of higher order and possession of the corresponding goods of lower order can never be completely eliminated. Goods of higher order acquire and maintain their goods-character, therefore, not with respect to needs of the immediate present, but as a result of human foresight, only with respect to needs that will be experienced when the process of production has been completed.»

With the disappearance of wants, the characters of first-order goods and corresponding higher-order goods disappear. The closeness of higher order goods to certain needs makes their usage in another production project more difficult.

Money plays an important role in the ATBC analysis. Money is a commodity widely used in society as a means of exchange. The demand for money depends on the purchasing power of the monetary unit, which in turn refers to the demand for money. This logical circularity is solved thanks to Mises' regression theorem which incorporates time into the analysis. To explain the demand for money at any time, we must resort to the monetary prices of the



money» with paper money initiated by government. According to Hülsmann (2010 [2008]), paper money did not emerge spontaneously on the free market. A sequence of typical events determined the establishment of this monetary order in all Western countries (ibid, p. 114):

«Firstly the government establishes a monopoly specie system, either directly by outlawing the monetary use of precious metals, or indirectly through the imposition of a bimetallic system. Then it grants a legal-tender monopoly to the notes of a privileged fractional-reserve bank. Finally, when the privileged notes have driven other remaining means of exchange out of the market, the government allows its favored bank to decline the (contractually agreed-upon) redemption of these notes. This suspension of payments turns the former banknotes into paper money.»

The emergence of banknotes issued by the fractional reserve institutions; the status of a central bank as a privileged financial institution; the establishment of the monopoly producer of a legal-tender; the abolition of the use of precious metals in trade — all these factors led to the establishment of paper money with administratively manipulated «value» in all Western countries.⁵

Fractional reserve bank operations in conjunction with the introduction of a legal tender produce a significant inflationary effect leading to a re-distribution of income and the creation of business cycles (ibid, pp. 101-102).

Economic calculation and the relative price system — as a regulator of intersectoral allocation of resources — play a decisive role in the ATBC analysis. The emergence of money has made economic calculation possible. The monetary price system solved a problem of economic calculation and allowed projects' profitability to be defined, which guides the investment behavior of entrepreneurs.

However, the scope of economic calculation is not limited to business management issues. It determines the resource allocation in the economy and especially the distribution of capital between

⁵ Since 1971 the world has «abandoned the gold standard». All countries use paper money at a forced rate.

different production projects. Thus, the price system directs entrepreneurs to efficient investment opportunities and determines the optimal allocation of resources in the economy.

Time is a rare factor and an important parameter in the Austrian analysis. In a developed economy production goes through the roundabout methods of production (Böhm-Bawerk, 1880). The roundaboutness of production corresponds to the reduction of the proportion of work dedicated to consumer goods' production and the increase of the proportion of work dedicated to the capital goods' production. The roundabout methods ensure the establishment of a more productive production structure that produces more consumer goods. The roundabout methods of production require savings. The savings proposed on the time market depend on the preference for the present. This means that economic agents choosing between two homogeneous goods at different moments of time prefer the «earlier good» to the «later good».

«Time for man is not a homogeneous substance of which only length counts. It is not a more or a less in dimension. It is an irreversible flux the fractions of which appear in different perspective according to whether they are nearer to or remoter from the instant of valuation and decision. Satisfaction of a want in the nearer future is, other things being equal, preferred to that in the farther distant future. Present goods are more valuable than future goods.» (Mises, 2011 [1949], 560).

Another important element of the ATBC theory is the theory of the natural interest rate presented by Knut Wicksell in his book *Value, Capital and Rent* (1892). It serves as a starting point for Austrian analysis. The natural interest rate reflects a value differential between a present good and a future good based on the preference for the present. In other words, the natural interest rate reflects the time preferences of individuals for present over future consumption. The natural interest rate formed in the time-market reflects the time preferences of individuals and determines the time allocation of resources or, in other words, the intertemporal structure of production. Changes in the time preferences of individuals induce changes in the time structure of production. The natural

interest rate determines the length of the production structure according to individual time-preferences and the market interest rate reflects its effectiveness.

The market rate of interest does not systematically deviate from the natural rate without monetary intervention (add Hülsmann, 2008). The fractional reserve banking system is able to increase the money supply and influence the amount of loanable funds offered on the market. This monetary intervention reduces the market interest rate. However, this fall in the rate does not reflect the change in the time-preferences choices of economic agents.

2. Presentation and contemporary aspects of the ATBC

«True, governments can reduce the rate of interest in the short run. They can issue additional paper money. They can open the way to credit expansion by the banks. They can thus create an artificial boom and the appearance of prosperity. But such a boom is bound to collapse sooner or later and to bring about a depression» (Mises, 1944, p. 251).⁶

Ludwig von Mises

The ATBC provides an explanation of economic fluctuations driven by monetary factors. According to the ATBC, the economic cycle is generated by monetary injections into the economic system. They cause the reduction of the interest rate below the natural rate. It induces changes in the time structure of capital and triggers an artificial boom:

«The credit expansion leads to an erroneous allocation of production factors, especially labor. It directs them to the jobs which cease to be profitable as soon as inflation ceases to accelerate.» (Hayek, 1975 [1931], p. 98.)

⁶ Mises, 1944, p. 251.

Starting a new production project, the entrepreneur counts on a higher rate of return than the market rate of interest. Inversely, the entrepreneur lends out his savings if the market interest rate is higher than a particular rate of return. If the market rate decreases, the entrepreneur increases the volume of his investment projects — independently from the usual sources of financing: credit or profit. Interest rate changes provoke a reallocation of investment resources and it thus generates changes to the structure of production.

An economic cycle may be represented as a sequence of logical events. Initially, credit expansion causes a decrease of the market rate of interest below the natural rate; thus, loanable funds become more accessible to the entrepreneur. Consequently, the increase in lending creates an investment boom and the number of investment projects increases. It leads to the increase in demand for goods of higher-order (capital goods or producers' goods).

«The projects would not have been thought «profitable» if the rate of interest had not been influenced by the manipulations of the banks. Therefore, they would not have been undertaken. Nevertheless they were found «profitable» and can be initiated.» (Mises, 1936, p. 461)

In turn, the price increase of capital goods causes a shift in production factors upstream, leading to more production of capital equipment. This process induces the extension of the production structure. In the long term, a production structure using more efficient industrial methods can offer more consumer goods at lower prices. However, the implementation of such a structure requires time and resources. Due to a lack of real savings, multiple production projects usually cannot be sustained.

It is important to distinguish a decrease of the rate of interest caused by credit expansion from a decrease of the rate of interest caused by changes in time-preferences. In the latter case, it's a reduction in time preference which leads to a genuine increase of savings. It means that individuals agree to limit their consumption during the period of development of the new production methods.

On the other hand, in case of the rate of interest decrease due to credit expansion, there is no time-preference change. Individuals

do not reduce their consumption. So there is no increase in real savings to finance additional investment projects initiated as a result of the reduced interest rate. According to the ATBC, if the interest rate falls following the change time preferences, the economic cycle will not take place (Mises, 1949, pp. 550-566).

However, a lower interest rate encourages individuals to save less and consume more. Problems begin to emerge when the income that was created earlier to pay for increasingly scarce producer goods shifts over to pay for consumer goods which are offered in the market in limited quantities.

«Producers spent the increase of money supply which enabled them to increase their demand for production goods and, subsequently, this increase became an income for consumers» (Hayek, 1975, [1931] pp. 118-119).

The introduction of new fiat money causes prices to increase. This upward movement cannot continue forever. There are two possible scenarios. According to the first, the banking system continues the credit expansion. Prices as well as wages continue to rise to a corresponding extent. High inflation encourages agents to get rid of the money which loses its value and make use of real goods instead of money, which ultimately leads to the collapse of the monetary system. Under the second scenario, inflationary pressure forces interest rates to increase, projects previously considered profitable are no longer so. Artificial expansion eventually gives way to an economic crisis.

The relative price of consumer goods increases. Skousen (1990: 313-315) noticed that each recession was accompanied by an increase in the relative prices for consumer goods. This phenomenon, in cases where resources are limited, creates the necessity of a new allocation of production factors according to consumers' preferences and shifts resources downstream (to the industries that produce consumer goods).

«A crisis is a moment when a real economic situation unfolds and painful adjustments (shrinking of the structure of production) take place. It brings the economic system back to its

temporary balance between consumption and investment» (Filleule, 2010, p. 170).

The return to shorter production methods is inevitable. Investments that were previously profitable can no longer be considered as such. They cannot generate the expected returns. When interest rates rise, entrepreneurs have to terminate their projects, selling assets in order to lend the money earned from these sales at a higher rate of return.

Capital goods are not homogeneous; they cannot be interchangeably used in all types of production projects. For example, it is impossible to use the same oven for the production of bricks and for baking bread. Some production equipment may become unusable and be irrevocably lost. Certain production goods may be used in new projects, but only after adjustment (Mises, 1949, p. 582).

In order to avoid bankruptcies in industrial sectors which are the furthest away from consumption, entrepreneurs put up their assets for sale. However, this leads to a steep drop in production equipment prices and financial asset prices. This situation induces an economic depression.

A financial crisis is a discovery period that exposes all the unsustainable investments generated by credit expansion. It is a period where distortions created by credit expansion are corrected. Crises can be explained as situations where economic agents become aware of their mistakes and the consequences of their mistakes. The repetition of errors in the cycle has a common cause — government intervention, and more particularly, government intervention in the monetary sphere (Hülsmann, 1998). Hülsmann presents the business cycle theory as a general theory of error cycles. He affirms that «the business cycle theory must be grounded in a general theory of the recurrence of clusters of errors» (ibid, p. 3).

Credit expansion is unable to increase the supply of real goods — it only redistributes them. By continuing to reduce interest rates banks cannot prevent the advent of a depression; they can merely delay its onset and thus aggravate the previously created imbalances.

Thus, an expansionary monetary policy puts downward pressure on the market interest rate. The market interest rate is pushed below the natural rate. This stimulates investment in the short term. When the interest rate rises this process operates in the opposite direction. The costs of the crisis will be high if projects are not quickly liquidated while costs are still relatively low.

According to Austrian Economics, an economic crisis will be avoided if the artificial prosperity fueled by the preceding credit expansion does not actually take place.

Fragility is embodied in the system of fractional reserve banking, because in case of a panic the banks will not be able to respect their commitments. The operation of this system became possible with the establishment of a lender of last resort. Today this role is assumed by the central bank, which will lend the necessary liquidity to the banks in case of difficulty. Thus, this incentivizes irresponsible behavior of financial intermediaries who can undertake risky transactions, yielding high profits without fear of possible negative consequences. In the economic literature this phenomenon is called «moral hazard.»⁷ It adds to the explanation of the current crisis.

The fractional reserves system engenders this moral hazard (Hülsmann, 2006). Banks are encouraged to reduce their reserves because they rely on other banks, the central bank or the government in the event of a crisis. It shows that the operating principle of the fractional reserve system puts the banking system on the path of credit expansion, and, therefore, of the business cycle. Thus, reformation of the monetary system is essential to prevent these destructive economic cycles. Establishment of the gold standard with a full-reserve banking system would be the best means to avert economic cycles (ibid).

The logical sequence of ATBC remains coherent in light of the subprime crisis (Salerno, 2012). Within a fractional reserve system, low interest rate policy and financial innovations such as securitization and credit default swap (CDS) have favored credit expansion.

⁷ «Moral hazard is situation in where a person makes a decision about the level of risk to take, while something bears the cost if a thing goes wrong.» Krugman(2009, p. 63)

The credit expansion favored the development of subprime loans, over-indebtedness of private economic agents and state agents.

Méra (2014, pp. 140-156) demonstrated that the moral hazard resulting in the existence of the current monetary system is one of the determining factors in the development of CDS markets. When financial institutions can count on the support of public authorities in case of difficulty (bailout by the government or the central bank), financial agents are encouraged to take more risk in order to earn higher profit. Thus, the risk arising from CDS is only partially borne by one of the parties. It leads to an increase of supply and demand of CDS (Méra, p. 156). It explains the direct influence of moral hazard on the growth of derivative markets. Méra (2014) also demonstrated the contribution of CDS in increasing the indebtedness of the economy. CDSs facilitate the accumulation of debt, including the accumulation of public debt (Méra, 2014, p. 131).

The analysis of the Regulatory Arbitrage role in the 2008 crisis is presented in Lermyts' thesis (2015). In particular, failing regulations allowed financial agents to implement bypass strategies in prudential rules, notably through the using of CDS (Lermyte, 2015, p. 32). As a result, banks reduced their equity and increased the volume of loans.

Salerno (2012) emphasizes that an economic boom is characterized by malinvestment and not by overinvestment. He focuses on the fact that the manipulation of interest rates affects not only the length of the capital structure, but also the temporary structure of household consumption. The author showed how the illusory profit and inflation-raised income of producer factors lead to faulty assessment by households of their «pure wealth». Overconsumption of the boom phase is also associated with malinvestment, generated by the reduction of interest rates triggered by the increase of fiduciary credit.

Salerno (2012) clarifies that the «secondary deflation» observed during the recession phase is basically based not on an accidental decrease in the money supply, but on the correction of distortions in relative prices caused by over-evaluation of assets during the boom euphoria. These analyses complete the explanation of the ATBC and underscore its relevance in the light of the global crisis.

3. Analysis of the empirical studies of the ATBC

The ATBC is based on methodological individualism, methodological subjectivism and dynamic economic analysis. This explains the complexity of the mathematical formalization of the ATBC and thus a very small number of existing empirical studies are available for review. The most noteworthy of the contemporary authors who performed empirical studies related to the ATBC are Keeler (2001), Garrison (2003), Mulligan (2002, 2006), Hughes (1997), Cwik (2008), Bismans and Mougeot (2008).

Among the earliest empirical works on ATBC, we would like to mention Rothbard's book *America's Great Depression* (1963). Rothbard describes the Great Depression in the United States in the framework of the ATBC. He cites the inflationary policy of the Federal Reserve from 1921 to 1929 and demonstrates that the following depression was not caused by speculation as such, but by credit expansion. Many political decisions during this period including the interventionist policy of the Hoover administration made the situation worse. Also, Rothbard proposed an alternative measure of production — private product, and provided a method for its calculation for the periods under consideration before and during the Great Depression. Rothbard argues that government spending or government revenues (the greater of the two indicators) may be considered a burden for private national product. The gross / net private product is calculated as the difference between GNP / PNN and the product created by government and public companies. The gross / net private product remaining in private hands is calculated as the difference between the gross / net private product and total public revenue or expenditure (the greater of the two indicators).

Hughes (1997) demonstrated the distribution of credit expansion in economics during the American crisis of 1990-1991. In the beginning of the cycle, new loans attracted by the price rise of capital goods flowed into industrial sectors. Later, consumer goods prices rose and loans moved to the sectors producing consumer goods.

Keeler (2001) used quarterly data from the United States from 1959 to 2000 and analyzed the last eight economic cycles that took

place during this time period. The levels of 3-month interest rates were correlated much more strongly with money supply growth than with long-term rates levels. Keeler used the difference between these two rates (spread) to measure the natural interest rate. Keeler shows that the origins of crises are linked to monetary expansion that led to relative price distortions.

Cwik (2008) examined the impact of expansionary monetary policy on the prices of capital goods. He underscores that the rise of the interest rate and the rise in production factor prices are two elements that trigger an economic slow-down. Cwik demonstrates how an enterprise can acquire a failing business component and turn it into a profitable business through the liquidation process during a crisis period. Production goods should be sold at reduced prices in order to transform the malinvestments into «legitimate» investments. Increases in savings make the acceleration of the transition process possible. Neither expansionary fiscal policy nor expansionary monetary policy can prevent a recession. The author considers that more liberal policies on merger and acquisition (M&A) activity could stimulate economic recovery.

Callahan and Garrison (2003) analyzed the technology boom and the economic slowdown of 2000-2002. They studied the Cantillon effects⁸ caused by monetary injections during the dot-com recession. The authors traced the pathways by which this new money was injected by the Fed through the banking system and eventually reached the dot-com startups.

Mulligan (2006) carried out an empirical analysis of Austrian Business Cycle Theory, applying the Error Correction Model to monthly U.S. data from 1959-2003. He tested the correlation between spread, reflected credit expansion, and private consumption. The spread is calculated as a gap between the long-term and short-term interest rates. The spread increases in the beginning of

⁸ «Since new money does not reach everyone at the same time, the injection of money increases the purchasing power of those who receive the new money first, enabling them to bid resources away from those who receive that money at a later time. As a result, relative prices will change, resources will be reallocated and income will be redistributed during the time interval between money injection and its final permeation in the economy. These changes are referred to as the Cantillon Effects.» (Cheng and Angus, 2012, p. 2)

the expansion phase and then decreases into negative territory in the quarters preceding a recession (Mulligan, 2006). Credit expansion generates a rise in the spread and accelerates growth of real consumption and investment in the short-term period with the decline of all indicators in the long term. This hypothesis has been confirmed by Mulligans' analysis carried out on US data.

Bismans and Mougeot (2008) presented a fixed effects econometric model (panel data analysis), based on quarterly observations from four countries: Germany, the United States, France and the United Kingdom from 1980 to 2006. They demonstrated the existence of a long-term econometric relationship between the representative cycle variable — the real GDP / natural GDP ratio — and three other explanatory variables — spread, ratio between consumer and investment expenditure and the ratio between the consumer price index and the producer price index. Among the three variables introduced in the model, only the spread and the structure of relative expenditure of consumption and investment significantly contributed to the explanation of cyclical fluctuations. The results confirm that credit expansion generates business cycles and ripple through the economy by means of relative price changes.

The empirical studies of ATBC demonstrate the impact of money supply increase on the level of interest rates and the behavior of economic agents. They describe the changes in the relative prices of consumer goods and capital goods during a cycle.

III RELEVANCE OF THE FHI AND ANALYSIS OF THE EMPIRICAL STUDIES

1. **The theoretical foundations of the FHI.**

Hyman P. Minsky, notable representative of post-Keynesianism, developed a theory of business cycles, which can be found under the name the «Financial Instability Hypothesis» or «Financial Fragility Hypothesis» (1982). The FIH, proposed by Minsky, demonstrates the fragility of the current financial system.

The FIH, as the author noticed himself:

«[...] is a theory of how a capitalist economy endogenously generates a financial structure which is susceptible to financial crises and how the normal functioning of financial markets in the resulting boom economy will initiate a financial crisis.» (Minsky, 1977, p. 25).

This financial structure is defined as an economic relationship between borrowers and lenders, and the balance sheets of non-financial corporations, intermediaries and households, which reflect these relationships (Pollin, 1994).

Minsky affirmed that financial crises are endogenous in the current economic system. The financial structure plays a decisive role in the appearance of economic fluctuations.

At first, we present the theoretical foundations of the FIH. Minsky's analysis is a disaggregated approach. According to Minsky the microeconomic foundations (analysis of economic agent's behavior) is indispensable to explain macroeconomic phenomena (Minsky, 2004 [1954]). In particular, he focused on the relationship between companies and banks.

Minsky considers the concept of equilibrium to be irrelevant in the analysis of the real economy. He introduces the concept of «period of tranquility» (Minsky, 1986: 197) characterized by a robust financial system and a small number of innovations. During this period, the financial aspects of the investments are negligible. Nevertheless, «stabilizing is unstable»: the period of tranquility encourages risky and innovative behaviors guaranteeing a higher income. Thus, the capitalist economy is in a state of imbalance permanently. Instability is intrinsic in the capitalist system (Minsky, 1986).

According to Minsky, the contemporary economy is characterized by two price levels for capital goods: the «supply price», which depends on the conditions of production of investment goods and the «demand price», which depends on discounting expected gross rents over the life of these investment goods. The supply price of investment good is the price at which a company can acquire investment goods. It depends on the marginal costs of

production and the margin of the company. The demand price is calculated as follows: the expected income minus the costs from the use of these capital goods plus the liquidity premium. The firm invests only if the demand price is above the supply price.

Minsky's works on money present an important contribution of his generation to the *Banking School* tradition and defend the *banking principle*: the quantity of money in circulation must first and foremost depend on the wants of economic agents; the money supply must be adapted to business needs. The money supply is endogenous in the modern economy. The money is created inside the economy and is the result of the cooperation of private sector actors, in particular industrial companies and commercial banks. Thus, money is an asset that is created within the economy for the purchase of productive assets (Minsky, 1986, p. 223).

The financial institutions create money by crediting investors. Minsky points out that the creation of money is part of the investment financing mechanism (ibid, p. 224). The endogeneity of money plays an important role in the capital accumulation process. In the contemporary economic system, banks increase the financing capacity of the industrial sector through the creation of credit. The financial institutions respond to the loans demanded from companies, and if necessary, resort to a wide variety of financial innovations.

Minsky considers that the future is uncertain and that the expectations about the future are subjective. He supposes that the companies' financial strategies change over time. The economy exists in a historical time frame «where the past cannot be changed and the future is uncertain and cannot be known» (Arestis, 1988, p. 42). Economic agents find themselves facing asymmetrical information. Decision making occurs under conditions of uncertainty (Minsky, 1975, pp. 62-66).

Minsky uses the Keynesian concept of *lending risk*, which corresponds to the risk of default, and that of *borrower risk* which corresponds to the risk of insufficient financial income to pay the debt and the related interest.⁹ *Borrower risk* and *lending risk* reflect the

⁹ The terms *borrower risk* and *lender risk* were proposed by Keynes (1978 [1936], pp. 108-110).

psychological desire of economic agents to finance long-term investment projects. This is an important characteristic of the post-Keynesian business cycle concept. When a company uses more borrowed capital compared to its own funds (or operates on a higher leverage ratio), each of these risks will be higher. The *borrower* and *lending risks* are influenced by optimistic / pessimistic expectations. Thus, the *borrower risk* and the *lending risk* are determined by the financial leverage and the expectations of the economic agents.

2. FIH

The 2008 crisis has brought out the important role of the financial sector and its influence on the real economy. The financing of investment plays a crucial role during the business cycle. The first theorem of the hypothesis of financial instability says that:

«That the economy has financing regimes under which it is stable and financing regimes in which it is unstable.» (Minsky, 1992, p. 14).

According to the FIH, the economic dynamics are determined to a considerable extent by the method of financing of business investments.

At the beginning of the growth period, *hedge* finance predominates in the economy: the cash flows are sufficient to respect all contractual payment obligations. Firms tend to rely on their own sources of funding. The risks borrowers and lending are still high because they bear the imprint of the last crisis. The financial system dominated by hedge finance is ideal for preserving economic stability: real output is rising rapidly, prices are stable and the unemployment rate is approaching the natural rate. *Hedge finance* is the guarantee of a robust financial system.

However, stability is not inherent to the current economic system. The «state of tranquility» reinforces the optimistic expectations of economic agents; *borrower* and *lending* risks are reduced. This idea was described by Keynes (1978 [1936], p. 210):

«During a boom the popular estimation of the magnitude of both these risks, both borrower's risk and lender's risk, is apt to become unusually and imprudently low.»

Firms invest more and turn to banks due to lack of own resources to finance their projects. Banks are responding to this demand by increasing the number of credit.

Minsky has demonstrated that in the absence of reserves for lending, financial institutions satisfy investment demand of companies by using different financial innovations.

«In the American banking system, banks can raise the ratio of bank liabilities to bank reserves by substituting time for demand deposits, by substituting promises to loan (lines-of-credit) for actual loans, and by varying the efficiency with which reserves are utilized through interbank transactions in reserves, i.e., transactions in federal funds. Thus the effective quantity of money is endogenously determined. In addition firms can sell their.» (Minsky, 1975, p. 120)

Minsky and other post-Keynesians have attracted attention to different types of financial innovations used in the modern economy to increase the amount of credit: euro-dollar loans, securitization, off-balance sheet activity, derivatives (2015, p. 123).

The emergence of financial innovations and the reduction of borrower and lending risks influence the type of financing used by companies. Firms resort to excessive external financing, called by Minsky speculative finance units: cash flows are sufficient to pay the interest but are insufficient to satisfy a debt. Thus, companies are forced to resort to new credits to repay the old debts.

When interest rates rise, speculative finance turns into Ponzi finance: the cash flows are not sufficient to fulfill either the repayment of principle or the interest due on outstanding debts. Hence, companies are over-indebted. With the predominance of these two finance types in the economy, the financial system becomes fragile. As a result, the instability of the economy increases. Ponzi finance plays a key role in the creating of financial bubbles. Firms can no longer increase the loans to pay their debts and they are obliged to sell their capital goods. These sales, which take place

throughout the economy, lead to the fall in the prices of capital and financial assets. Business bankruptcies become more and more recurrent. The outbreak of the crisis is inevitable.

The stability of an economy is determined by finance regimes. Prosperity encourages the optimistic behavior of economic agents and, consequently, unstable finance regimes (hedge or speculative). According to Minsky, financial fragility is an integral part of the growth phase of the contemporary economic system where money is created endogenously. Thus, the business cycle can be interpreted as a change in the degree of fragility of the financial system.

3. Minsky's paradoxical conclusions and remedies for the crisis

According to Minsky, business cycles are an integral part of the economic system. In order to mitigate the effects of economic fluctuations, active State intervention is indispensable at the economic policy level and at the institutional level.

The lack of financial resources during the crisis must be eliminated by monetary intervention. In order to reduce the consequences of the crisis, Minsky offers several remedies.

In the first place, the systematic monetary injections due to an expansionary macroeconomic policy will support the global demand. This objective must be ensured by the presence of *Big Government*. Minsky considers that during the crisis the expansionary policy permits the companies to carry out commitments to creditors.

In the second place, to prevent the deepening of the financial crisis, the *Big Bank* must assume the role of lender of last resort and provide liquidity to financial institutions at all critical moments. However, the interventionist policies can create moral hazard because loan repayment guarantees by the *Big Government* encourage indebtedness (Minsky, 1986, p. 213). This contradiction was named by post-Keynesians «Minsky's paradox».

The endogenous theory of money, that is the foundation of Minsky's hypothesis, leads to the conclusion that monetary policy is not efficient to control financial markets. All government attempts to moderate the crisis can cause a deeper economic depression.

Minsky assumes that an increase in the part of consumption in aggregate demand and the use of less capital-intensive production methods make the economic system more robust and, thus, more resistant to financial disorders (Minsky, 1985, p. 53).

In order to stabilize the financial system, the limitation of speculative finance and Ponzi finance is essential. Minsky offers some proposals to limit the financial instability: the simplification of the financial system, the limitation of long-term projects finance by short-term credits, strict requirements on liquidity towards the balance sheets of financial institutions.

The FHI has no detailed analysis of the change in the structure of the economy forced by investment finance change and by increasing of indebtedness.

Nevertheless, the FHI points to the fragility of the current financial system. It provides a detailed and consistent analysis of the debt process of economic agents during the cycle. Thus, the FHI can be applied to describe and explain the increase of indebtedness through financial innovations (CDS, securitization) during the last subprime crisis. The focus on the financial side of crises makes this theory plausible in the light of the 2008 crisis.

4. The empirical studies of the FIH

Several empirical analyses of the FIH were realized after the subprime crisis. Studies explaining the increase in indebtedness through the financial innovations (securitization, derivatives) and banking regulation were realized by Tymoigne (2009). He demonstrated the encouragement and the diffusion of Ponzi finance in economics over the last thirty years.

A large number of empirical studies of the FIH are essentially focused on different types of financing during the cycle. According to the first theorem of the FIH, in economics there are certain types of financing that make it stable and other types of financing that make it unstable. Based on this criterion, Minsky proposes to classify firms into three categories: 1) firms that use the hedge finance regime; 2) firms that use speculative finance; 3) firms using

Ponzi finance. When the last two types of financing predominate, the financial system becomes fragile and precarious.

In his article «The Empirical Analysis of the Minsky Financial Instability Hypothesis», Mulligan (2010) presented empirical studies of Minsky's theory using a large quarterly dataset of publicly traded North American firms and foreign companies listed on North American stock exchanges (8707 companies in total) over the period 2002-2009. Mulligan used the financial ratio based on the interest coverage (CI) to classify these companies according to three categories determined by Minsky: $(\text{profit} + \text{interest charges}) / \text{interest charges}$. When CI is greater or equal to 4, we talk about hedge financing. When it is between 0 and 4, it is speculative financing and if CI is less than 0, we talk about Ponzi financing.

Mulligan's calculations showed that the number of companies using Ponzi and speculative financing was particularly high (73%) during the 2002 recession. Then, this proportion decreased during the recovery and increased again during the prosperity: companies had borrowed more. Ponzi and speculative financing reached their peak in 2008 when the economy went into recession. The percentage of companies that used speculative and Ponzi financing declined to 62% in the second quarter of 2004 and then increased steadily, from 62% in 2004 to 68% in 2006 and 73% in 2008. This effect is much more visible for large companies, which empirically supports Minsky's arguments.

The evidence of increased speculative financing and Ponzi financing is more striking when each firm is weighted by its market value. At the beginning of 2008, there was a significant growth in speculative and Ponzi financing. In the fourth quarter of 2008, coinciding with the financial crisis, the percentage of the total market value of companies using speculative and Ponzi financing dropped dramatically. This phenomenon can be explained by a stock market overvaluation of these companies. Mulligan's studies provide a solid empirical basis and help explain the situation of over-indebtedness in the economy during the crisis through the FIH.

The same kind of studies were realized by Russian economists Beshenov and Rozmainsky (2015). They explained the accumulation of debt by Greek public and private sectors. The behavior of the Greek State is a classic example of speculative financing represented

in the FIH. Government revenues were insufficient to meet creditors' commitments well before the 2008 crisis. During the subprime crisis, Greece used Ponzi financing: the revenues were not enough to repay debt, not even to pay interest (Beshenov et al., pp. 128-135).

The private sector represented by the thirty-six largest Greek companies was analyzed in the same way as in Mulligan's article. The authors applied less stringent criteria for determining speculative financing (CI value between 3 and 0). The leverage for these companies increased from 74.5% in 2001 to 90% in the end of 2007 and to 109.45% in the end of 2008. This reflects an extremely heavy indebtedness borne by the private sector. In the end of 2008, companies using speculative and Ponzi financing represented 61% of the sample. The crisis has aggravated the financial instability. In 2013, only 17% of companies used hedge financing, three companies of the sample officially declared bankruptcy (Beshenov et al., pp. 136-140). The over-indebtedness of the State and the firms has pushed the Greek economy into a deep depression.

The empirical studies of the FIH demonstrate the influence of financial instruments on the behavior of economic agents. They describe the transition to excessive debt during the cycle. However, it is clear that the expansion of credit is at the origin of this over-indebtedness of the industrial and financial sectors.

IV

FHI VS ATBC: COMMON POINTS AND DISAGREEMENTS

After the detailed analysis of two theories of business cycles, we can conclude that some ideas presented by the FHI are very close to the ideas of the ATBC. Our analysis of the two approaches used by each theory shows the points of convergence and divergence between the ATBC and the FIH.

Both theories use microeconomic foundations in their analysis. Both schools of economic thought prefer dynamic analysis to the general equilibrium concept used in mainstream analyzes. The ATBC and the FIH are based on a causal explanation of relations in the real economy. The Austrian school of economics and the post-Keynesians regard uncertainty as an integral part of economic

activity and emphasize the importance of subjective judgments in the economic activity and more generally in economic science.

Nevertheless, the ATBC and the FHI have certain important differences that lead to diametrically opposed conclusions.

Unlike the ATBC which is based on the complex and developed capital theory, the FHI does not analyze the capital structure. Minsky pays attention only to investment financing schemes while neglecting the changes in the real economic structure. This distinctive weakness of this theory does not allow for developing a complete vision of the business cycle and the crisis in particular.

A fundamental divergence between the two theories is expressed by the monetary theories used by the FHI and the ATBC. The opposition of two theories goes back to the debates between the Banking School and the Currency School. The different conception of the money explains the disagreements of two schools about the crisis origin and the remedies to overcome it.

The Austrians consider expansionary monetary policy as a main cause of economic crisis. A decrease of the market interest rate below its natural level leads to the increase of investment and consumer spending. This phenomenon provokes illusory short-term economic growth. But when the interest rate rises under inflationary pressure, this process works in the opposite direction and ends up by triggering the crisis. This is explained by the lack of resources to carry out all the investment projects started during the boom period. For the Austrian school the crisis is not an imminent phenomenon, but a result of credit expansion. The policy recommendation of the ATBC is abstention from State intervention into the financial and real spheres of the economy.

According to Minsky, a capitalist economy endogenously generates the financial structure subjected to the financial crises. The period of tranquility encourages the risk taking and leads to the investment increase. Banks respond to business demand for investment financing by increasing the volume of credits. Hedge finance turns into speculative finance and ultimately to Ponzi finance. Minsky considers that the financial fragility increase is an integral part of the growth phase of current economic system where money is created endogenously. Minsky emphasizes the importance of the role of the State during the crisis. It consists mainly of increasing

public spending. The Central Bank must act as a lender of last resort and provide the liquidity to banks and financial institutions in the case of difficulties.

The ATBC and the FIH join in the idea that the crisis is determined by the boom that precedes it. However, Minsky cannot provide an explanation of the origin of the expansion phase. Minsky takes up the idea of Fisher's deflationary spiral and is not able to explain the initial cause destabilizing the period of tranquility and triggering the economic cycle. According to the ATBC, the boom is artificially initiated by monetary expansion and the manipulation of interest rates. This explanation remains relevant and consistent in the light of the 2008 crisis.

After a deep examination of two theories, it can be noted that the convergences and the similarities between two approaches are quite superficial. The theories have fundamental divergences that explain their totally opposed proposals for overcoming the crisis. Among these points of divergence, we have to emphasize the question of the homogeneity/heterogeneity of capital and whether the nature of economic cycles is endogenous or not.

V CONCLUSION

«The use of mathematics necessarily leads the economist to distort reality by making the theory convenient for mathematical symbolism and manipulation. Mathematics takes over, and the reality of human action loses out.»

Murray N. Rothbard¹⁰

The ATBC and the FHI seek to explain the causes of economic fluctuations, which represent a complex set of interrelated phenomena in the real economy.

¹⁰ Rothbard (2006 [1995], P. 379)

Despite their superficial resemblances, the two theories have profound divergences that explain their diametrically opposed proposals to overcome the crisis.

The FHI remains relevant in the light of the last crisis due to its analysis of the financial relationship between banks and investors during the cycle. However, this theory of cycle remains incomplete. Indeed, Minsky has no viable explanation for triggering economic expansion. The FHI thus neglects the analysis of the real economic structure during the cycle. In consequence, the changes in the capital structure as a result of the increase in the volume of credits and the reallocation of resources during the expansion and the crisis are entirely absent in its analysis.

This gap is filled by the ATBC, which presents a comprehensive analysis of the causes and course of the business cycle. The ATBC analysis is based on a well-developed capital theory which relies on the importance of production time.

In the light of the recent crisis the ATBC is not losing its timeliness or importance. It shows how monetary manipulations influence the behavior of economic agents and cause a change in the production structure.

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