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The microeconomic complexity derivatives: financial Crisis paradigms in Romania

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Abstract

An economic financial crisis is defined as a complex process whose characterization requires a systemic approach. The complexity lies, first of all, in the field of economic and social context of the continence both globally and regionally and nationally. Secondly, the research processes utilize a large volume of methods and indicators to facilitate addressing the factors that triggered the crisis, and maintain its State, these are necessary to the eradication of crisis and resuming the economic growth. The present work aims to reveal a scientific construction of complexity based on rules and paradigms used in analysis of quotations Exchange which enable to provide solutions and ways out of the economic financial crisis. we build our model based on several indicators as the development in the harmonised index of consumer prices of Romania ($\mathbf{I_{CPS}}$), and compared the results to the moving average of the same 12-month index and correlated it to growth rate for the period 2009 till 2015 and establish a projection to 2015. After we started to study the impact of currency exchange as paradigm playing a role on contributing to the crisis with the help of identify the currency pressure indicator which calculates the additive in the form of a weighted rate computed according to the relationship between the exchange rate Dynamics (CS), interest on loans growth rate (r) and dynamics (res) international reserves to get a closer look on how Romanian national Bank perform in such conditions and if there politics succeeded to make difference in holding out the great rescission.

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*Keywords:*Microeconomic complexity; Economic crisis; paradigm; financial regulation; economic cycle; stability

1. Introduction

The global financial and Economic Crisis falls within the category of complex phenomena in which impose the construction of paradigms (Kuhn, 2008), unanimously accepted, as a specific example of formulations and solutions of a scientific issues, geared toward finding solutions out of the crisis. They provide models and forms of problem solving, in which complex entities comprise elements of theoretical, instrumental and methodological. Rules are

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derived from the paradigms, but they can guide the research even in the absence of the rules. The paradigm is often used to describe as a reference system that determines the way in which we perceive the world. The term is usually used to describe a general state of mind of a person. Modern theories of complexity applied to the paradigms, deals with the phenomena of nature, approach, society, social sciences, computers, and communications, using methods such as modelling or simulation (Vasconcelos, 2011). They are virtual methods.

Crises impact have determined a demand for an evaluation system in the inter change mode of components in accordance with flexibility dynamism of reference systems, this paper is a component of a larger topic studying commercial systems in crises conditions dedicated to build models of proportional effects generated by the crises, the condition caring out with success such experiences, is the knowledge of all factors of the independent variables which have a triggering roll to the crises states, indenturing them. Their knowledge requires the use of appropriate instruments and concepts, which are partially known or still existent, since the lack of comparable previous experiences. However, it can identify factors triggering a specific crisis of a certain economic system or economy, without the possibility of generalizing the causes and identifying common solutions/theories. The utility of complex theories would be anticipatory character and aprioristic. Knowledge, in the case of complex phenomena is partial, ' a posteriori' and serves to identify partial explanations and lessons from the past that can form a trigger for a crisis.

Far too often, debates on a crisis agenda behave in tandem of the results-solutions, explanations otherwise for the obsession of neoclassical empirical pragmatism and nationalization activism. It's pointless, however, any attempt to "control" of the crisis-as announced by official reports-in the absence of any analysis of cause to the fundamental and anatomical *s* of business cycle.

2. The specifics of the current economic crisis

According to the dictionary of Economics (Daniel, 1999), the economic crisis means a state of difficulty in the economic activities, rift, a sudden change in economic activity, the result of the slowdown, stagnation or decline in yields of economic activities. Starting from this definition we effectuated a literal scientific research

By extension, situation, depressing the economy as a whole, for some sectors, regions, economic illness of the economic body that marks the breaking serious economic balance especially between production and consumption, supply and demand, with direct effects on prices, the occupancy grade of production factors. The economic crisis is the turning point of the economic cycle when expansion phase give away in front of depression. If used as a growth rate indicator of gross national product, it can be observed periods when this rate is positive and high, and other times lower and even negative (Feldkircher, 2014 and Agarwal, 2013). Theoretically, each cycle contains four phases: expansion, peak, recession and limit (the crisis). An economic crisis triggering inputs entrepreneurs to act in order to determine the qualitative changes in the conditions and the growth of their business portfolio. Global economy incorporates all the affairs in which entrepreneurial capitalism occupies a place of reference in the rigorous system of relationships with complex economic environment. Restrictive institutional context position the entrepreneur in directing its investments depending on the quality of his institutional business model and the dynamic evolution of the crisis.

A number of economists have addressed the current economic crisis from a perspective of a long economic cycle (Kondratieff and Bălăceanu, Bentoiu, 2007). After a period of economic expansion in which the conjunction of certain key scientific discoveries have enabled the emergence of a group of new technologies, which have stimulated investment, demand and employment, accessibility of new products for an increasing number of people from many countries, Economy and markets were saturated registering sharp declines in growth rates,, investment flows have contracted, companies have recorded losses, and affect the level of employment, over the supply of economic goods, including international trade. The causes of this twist, specific phase of economic recession, are complex structural: the globalisation of financial markets and financial innovations, in conditions of poor regulation or even totally lack of them, or the proliferation of conflicts of interest. In the last decade, the intensification of cross-border capital flows and increasing use of derivative financial instruments/toxic or the growth of shadow banking sector, with very poor regulations covering it, converge in to triggering a financial crisis, with unprecedented economic effects, in global scale and intensity.

The current financial crisis triggered in 2007 puts its mark on the whole countries differently, with serious consequences on national plans, economic and social report, as well as regionally and internationally, in the form of investment flows, reducing disruptions to the financial markets and stock exchanges, at the level of economic stability in general, through significant mutations in the structure of income and expenditure with direct repercussions on the purchasing power and the workplace (Garratt, 2014).

What is happening is in fact a shift change in the paradigm that financial markets tend towards equilibrium, the paradigm based on the relationship between virtual thought and reality, supporting the idea that the interpretations and misconceptions, plays an important role in the shaping history (Soros Foundation, 2008). According to Soros, market participants cannot base decisions solely on knowledge, and their subjective perceptions may influence not only market prices, but also the basics, that are supposed to reflect the prices. Accordingly, the participant thinking is influenced both cognitive and participatory or manipulative in different degrees of interdependence and interrelation. To measure the impact of the crisis in the Romanian economy statistical techniques, descriptive analysis models of stock exchange quotations have been used.

3. Research Methodology

The ECB defines price stability on the basis of the index and the annual percentage rate in the euro area. The $\mathbf{I_{apc}}$are calculated on the basis of harmonised standards, for the assessment of inflation convergence criterion, as required in Article 121 of the Treaty of Amsterdam and by the ECB for the assessment of price stability, with the aim of monetary policy. They are mandatory for all European Member States. Under the conceptual aspect, the $\mathbf{I_{apc}}$are indices of Laspeyres-type price and annual indices are calculated as a mobile base, using the annual change of weights. For the $\mathbf{I_{apc}}$it is used Common Classification for harmonised Indices of consumer prices (COICOP/$\mathbf{I_{apc}}$). The $\mathbf{I_{apc}}$are compiled and publish a methodology with the reference period beginning with 2005 = 100. Growth rates $\mathbf{R_{apc}}$are calculated on the basis of the levels of $\mathbf{I_{apc}}$ -based chain in relation to the preceding month $\mathbf{R_{apc}}^{(w/(M-1)}$ and the corresponding month of the previous year $\mathbf{I_{apc}}^{(M/(M-12))}$.

The components of the harmonised index of consumer prices are prices for 61,1% of consumer goods and services prices to 38.9%. The methodology of calculation of $\mathbf{I_{apc}}$ is approved by the European Central Bank and the Statistical Office of the European Community which, for the euro area, defines price stability expressed a value close to the level of 2% in the Harmonised Rate of consumer prices.

Methodology in calculating the harmonised index are used by the National Institute of statistics, weighting coefficients derived from the structure of expenditure of Romanian consumers through the family budget survey. In Figure 1 is the development of the harmonised index of consumer prices $\mathbf{I_{apc}}$, as compared to the moving average of the same 12-month index. If you consider the threshold of 2%, then the graph can be positive or negative difference compared to 2% in the $\mathbf{I_{apc}}$. In Figure 1 it is observed that in May there was a level of inflation (a net increase of 8.5% from April 2011). After which he enrolled on a downtrend until the period April-June 2012, when convergence zone (2%+/-0.2%).

4. Paradigms and rules pertaining to consumer prices

The crisis is a process that is perceived by members of the Community (including entrepreneurs); by increasing in prices and by default the emergence of inflation, one of the components of the crisis. It is generated by the perception of the effects of higher goods and services. The emergence into the mainstream of inflation shall be measured by means of *the harmonised index of consumer prices-* $\mathbf{Y_{ap}}$-that captures changes in the level of prices and tariffs for goods and services in retail development. Harmonized Indices of consumer prices ($\mathbf{I_{apc}}$) are intended for international comparisons of inflation. The ECB defines price stability on the basis of the annual rates of change in the euro area.

In September 2013 is recorded absolute minimum period of 1.1 percent, below the level of convergence of 2% (Bob & ot., 2013). The chart gives the distance between $\mathbf{I_{apc}}$and the 12-month moving average (the second criterion of comparison rates M/(M-12). With black bands are dealers, on increasing trend, the distances between $\mathbf{I_{apc}}$andthe moving average and the white stripe on the descending trend, the distances between the moving averages **of the** $\mathbf{I_{apc}}$

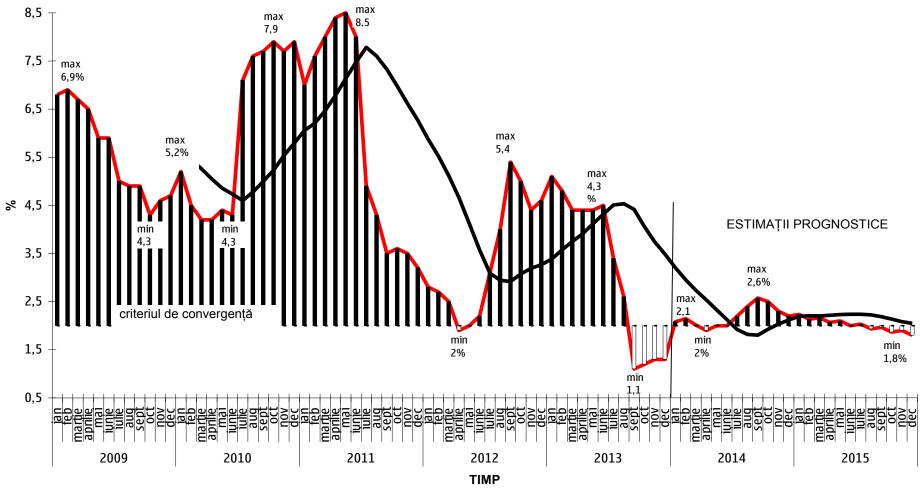

Fig. 1.

The maximum recorded in last June 2013 marks a drop below the level of convergence with the 1.3% to 1.8%. A new paradigm is likely to shape up as the paradigm of absolute minimum with three conditions: (1) series of $\mathbf{I_{apc}}$ reaches a *minimum level*- $\mathbf{I_{apc}^{max}}$= **min;** (2) the values $\mathbf{I_{apc}}$lies near the convergence criterion of 2%-**1.8%** $\mathbf{> I_{apc\,(t)} >}$ **2,2%;**(3) minimum series $\mathbf{I_{apc}}$ attain the minimum level of whole - $\mathbf{I_{apc}^{min}}$ **= min;** then it announced a minimum neighbourhood that will appear in the near future $\mathbf{I_{apc\,(t+z)} = min}$ where **t** is the index of the current period and the next period index z, **z = 1, ..., 12.***In the above mentioned conditions occurs an increase in consumption, followed by an increase in the demand for contractors involving a succession of decisions based on cautious growth hypothesis circulating capital invested.*

5. Currency pressure Paradigms

From a financial stand point, you can appreciate the impact of the crisis with the help of currency pressure indicator which calculates the additive in the form of a weighted rate calculated according to the relationship between the exchange rate Dynamics (CS), interest on loans growth rate (r) and dynamics (res) international reserves (Rocaru, Carrier, Rose, 2006). At the level of the Romanian economy, using data published by the National Bank of Romania, was calculated to pressure the currency index for the period 2009-2013. The calculation formula is as follows:

$$\mathbf{PV_{i,t} = ((1/^2\sigma_{cs}) * ((\Delta\, cs_{i,t})/cs_{i,t-1})) + ((1/^2\sigma_r) * ((r\, \Delta_{i,t})\, r_{i,t-1}))\text{-}((1/^2\sigma_{res}) * ((res\, \Delta_{i,t})/res_{i,t-1}))}$$

where:

I = 2009...,2013, t = 1, ..., 12, and. ..

dispersions σ^2_{cs}, σ^2_r, σ^2_{res} measures the degree of volatility or spreading of the statistical series three, the exchange rate, interest rates on credits and international reserves.

Being an aggregate index was needed for a maximum point in the corresponding rate expresses the highest pressure and minimum pressure is lowest (see table 1).

Table 1. Rate Pressure net nominal value (RVN)

	Maxime locale					Minime locale			
	RVn	**R_{CS}**	**R_{da}**	**R_{ri}**		**RVn**	**R_{CS}**	**R_{da}**	**R_{ri}**
05. 09	1,7%	-0,63%	-1,94%	7,55%	04. 09	-1,2%	-2,02%	-0,39%	-1,14%
10.09	0,7%	1,08%	0,61%	0,43%	01.10	-1,5%	-1,99%	-1,69%	-0,76%
03.10	0,8%	-0,73%	-3,91%	7,14%	07.11	-1,5%	1,14%	-2,02%	-3,77%
09.10	0,7%	0,60%	-1,25%	2,82%	04.12	-1,11%	0,25%	-2,91%	-0,59%
06.11	1.5%	1,97%	-1,9%	4,44%	08.12	-1,00%	-0,71%	0,99%	-3,29%
09.11	1,8%	0,75%	2,29%	2,3%	04.13	-1,4%	-2,26%	-3,42%	-0,61%
09.12	1,5%	-0,35%	0,09%	4,69%	08.13	-1,2%	0,22%	-1,14%	-2,77%
03.13	-0,1%	0,15%	-0.87%	0,47%	11.13	-3,0%	-0,03%	-2,80%	-6,21%
07.13	0,5%	-1,13%	-1,03%	3,72%					

6. Rules of the credit institution's paradigm applications

This crisis is not entirely the result of the collapse of the real estate market overheated or mortgage sector with high degree of risk in the USA. According to Keynesian theory on consumption, increasing prices of the properties real estate has been supporting, through the multiplication of a mortgage and higher level of consumption. New mortgage loans have fuelled consumption and indebtedness and all of this based on the value of the property increased artificially. If this process is supported by the Government, by guaranteeing the loan property legislation and bodies' specific financial welfare state, then there is no justification for what the lender would exhibit risk aversion. Under these conditions, the development of real estate market exacerbated was based solely on the assumption their prices rise perpetual. Thus arose the various derivative financial instruments, traded with the consent of the FED.

The lending excesses led to the imminent demise of the real estate market and, immediately, to the entire financial market. The phenomenon of bubble exist even on the local government credits, credits for purchases of companies, hedge funds, commercial and industrial loans, corporate bonds, commodities and derivatives for credit risk transfer, a little-regulated market (Roubini, 2009).

The indicator on the Romanian market growth rate of interest on loans has a significant trend (see table 1, columns 4 and 9 and the graph in Figure 3). In the period 2009-2013, the rate of increase was scored on a downtrend with oscillations between-3,914% and 2.29%.On the graph's x-axis are inscribed with the maximum points and minimum gauge pressure nominal value net rate. It is observed that in most cases there are opposing trends between the rate of interest and the rate of increase in aggregate net nominal pressure.

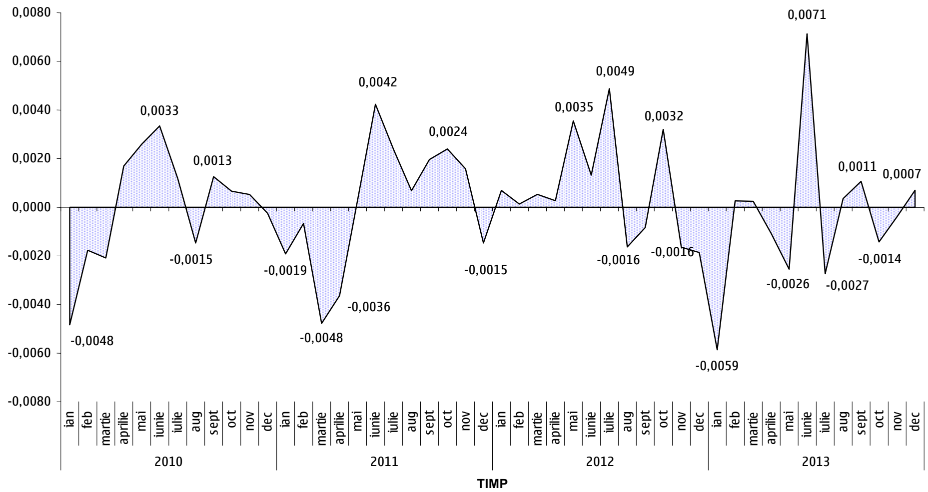

Fig. 2.

The motivation for defining in this way the pressure indicator is that in the case of a currency attack the monetary authority has two options: either is trying to maintain the exchange rate (in the case of fixed currency regimes) by reducing the reserves and/or increasing interest rate, either is renouncing at supporting the exchange rate and then the currency is strongly devaluing.

The use of inverse variance as weighting factor is justified by the fact that a greater importance is given to factors with lower volatility (the most important factor for determining the crisis is changing the international reserves).

Also, by using constant weights for all countries, is ensured the comparability between countries of the pressure indicator and of crisis indicator, especially in the economies with fixed exchange regimes (exchange rate volatility is lower in this case, which would have caused a larger share of the exchange rate).

7. Conclusions

Some studies (Edison, 2000 or Miller and Omarova, 2004) did not include the interest rate in the calculation of the pressure indicator, but the omission is motivated in most cases by the lack of data for emerging countries. Other studies (Berg, Borensztein and Pattillo, 2004) explain the lack of interest rate by the fact that the exchange rate depreciation and the increasing of the interest rate are different events, and its use in the pressure indicator would result in an aggregate estimation of those two events. (Bussiere Fratzscher (2002) and National Bank of Romania Studies, March 2006) For this reason, the Governments of various countries have proceeded to the recapitalization of some banks and financial institutions.

The crisis drives also the reference currency depreciation in the global economy, and the effect translates into considerably higher prices for imports and a lower standard of living.

Regarding the **currency regime**, have outlined several options considered as opportune targets depending on immediate and future needs for development of the economy:

- maintaining an independent monetary policy and the free fluctuation of the exchange rate, which granted levers to combat recession, but introduced a disruptive element of uncertainty for business (Shen,208);
- fixing the exchange rate considering the accountability on the recourse to the devaluation practice, which reduced the pressure on the business environment through the convertibility channel and let inoperable the adjustment of monetary policy. (Sa,2014);

- application of an adjustable rate, in terms of maintaining some control mechanisms over the capital movements, which required additional costs, thus facilitating corruption behaviours. (McKibbin,2013).

The option for certain exchange rate regime is dependent to a large extent on the affiliation to an international financial institution, in particular IMF. The international financial institution recommends measures of fiscal and monetary policy for the purpose of restoration of macroeconomic balances, especially of the budget deficit, the current account deficit and the external balance of payments deficit. Most often, macroeconomic policy guidelines proposed by IMF exceed its functions defined by the status of the institution, which hampers the chances of growth and development, deepening the structural imbalances and creating dependency on international finances.

Thus, the recommendation of fiscal austerity based on raising taxes and cutting expenditure in order to avoid the massive budget deficit (measures recommended for countries like Thailand, Indonesia, Korea) had as effect the contraction of aggregate demand and, more drastically, the generation of panic at the level of local and regional markets, creating a boomerang effect. Also, the structural reform required as a condition for granting loans, such as closing insolvent banks or eliminating the practice of granting lucrative monopolies to specific client companies in some fields of activity, is not falling into the fundamentalist doctrine of the market, but, on the contrary, represents an attempt to take over control of the markets. IMF also recommends initially raising interest rates at very high levels, in order to increase the interest of foreign investors, the following being the attack on national currency, capital run and vertiginous growth of inflation. Naturally, the concerned countries, in particular Asian countries, would have had to resort to devaluation of the national currency, until the time in which the currency would have become bargains for investors, so cost effective. Sachs (2008) argues that choosing not to increase interest rates, Governments would have avoided financial panic fuelling; the result would have been represented by modest devaluations, with moderate influences on the economy (Agarwal, 2013).

The debt accumulation on international financial markets is also a consequence of how IMF acts. As central banks lacked sufficient authority and financial reserves for economy, rescue programs have been put together, adopting the following strategy (Soros, 2008): commercial banks have extended their obligations, international financial institutions have made cash infusion, and debtor countries have agreed the introduction of austerity programmes designed to improve balance sheets of payment. In most cases, commercial banks have also had to address the quantities of cash, allowing to debtor countries to be up to date with the interest payment. The rescue packages represented a remarkable achievement in terms of international cooperation. Among the participants were found: IMF, Bank of International Settlements, some Governments and central banks, as well as a huge number of commercial banks.

The international financial crisis has led to the emergence of important conduct changes of economic processes and phenomena, to the deepening of macroeconomic and regional imbalances, to the identification of new values of basic research in what concerns the achievement and implementation of some aggregate indicators with the role of predicting future developments in the economy, as well as of reducing the magnitude of the negative effects generated by the crisis.

The current crisis has arisen on the background of monetary system failures transmitted through monetary policy and its instruments. What caused the current economic crisis is the result of some potentiating measures of the global economy based on a mix of monetary and fiscal policies which supported artificially the currency demand independently from structural policies, namely deepening the imbalance between nominal and real convergence.

The effects of globalization at international level are also reflected in the high ability of spreading the economic imbalances through transmission channels (of external supply and demand, of exchange rate, of national reserve, contractually, of wealth, of balance sheet) that induce fears and especially contractions in the real economy, at the level of economic activity, with strong repercussions on employment levels, respectively on the social action sphere.

Amid the economic and social imbalances exacerbation of countries, the financial institutions, together with Governments, have developed various anti-crisis programs to identify the causes that have led to severe economic contraction in the last period and to identify solutions to reduce the negative effects. Thus, the anti-crisis programs are designed to inject liquidity into the economy, to train the sustainable growth of the economy through the implementation of lax monetary policy, with effect of synergy on the solvent consumption and on production, to identify measures of fiscal policy, and especially its optimal levers through which generate higher budgetary revenue than budgetary expenditure.

When the political and social stability, gained with great efforts, threatened to lose, in a first instance, the third component, that is, the economic stability, the reunification process and enlargement of the European Union is questioned because, almost inevitable, essential factor -stability- risks to disappear subsequently. Unfortunately, an eventual widespread instability in Europe is not even likely to disrupt very seriously the other factors of global power. Moreover, the emerging superpowers would only benefit from the EU destabilisation, because an important player would be removed, at least temporarily, on the international scene.

Europe does not provide now, externally, almost anything vital: it is still an excellent commodity market, a viable partner for important trade flows, has extensively qualified work force, but with a high cost compared to Asian markets, has proper infrastructural and logistical features for business development. But no longer offers a lot of excessive indispensable technology, no longer distributes essential information and in terms of energy is rather acutely dependent. And, perhaps the most important issue, is represented by the loss of stability, both from the point of view of financial markets and from the standpoint of societal relations (lately have been intensified the trade union movements, the street movements caused by marginal losses in the democratic process, e.g. the most recent case, Ukraine).

And yet, the footprint of democracy, stability, prosperity, of dialogue as the only "weapon" of the unity model in diversity of EU is still well established in the global consciousness, constitute an element at least latent of massive influence of the world evolution. It is the global superpower niche of European Union, as long as all or part of the components does not degrade.

Economic stability can be achieved in part through price stability, with positive effect on purchasing power, through an appropriate mix of fiscal, monetary and structural policies, through which should be ensured the stability of the business environment and hence a high level of employment, as well as budgetary coherence to support social policies.

Achieving the long-term objective of monetary policy, respectively maintaining a low and stable inflation, constitutes a real challenge for both industrialised economies and emerging economies. In the case of the latter, central banks might face a more difficult task: that of responding to real and nominal shocks, because the financial markets are insufficiently mature and operate with less diverse instruments. Such shocks are usually caused by unanticipated changes in food and energy prices and in administered prices, as well as of massive flows of capital, which impose limitations to the effectiveness of monetary policy. These limitations make the need of implementing a compensatory policy mix all more imperative. Without the support of other economic policies, there is the risk that price stability to be achieved at the expense of other macroeconomic balances, which may prove ultimately an auto-reversible process.

Banks unwisely entered in the game of creation and distribution of financial products, applying questionable risk management techniques. In these circumstances, it is absolutely necessary to regulate better, rigorous, the financial markets, covering areas where there is obvious shortage of regulators. The history and development of the crisis, shows that those who say that financial industry can bet on self-regulation to avoid such consequences, are utopians. It is required a revision (improvement) of the regulatory framework of the operations of investment vehicles. It is necessary also to be regulated the use of financial instruments (such as CDOs, derivative), so that the transparency of the markets to be rebuilt and investors to be informed adequately on the assumed risks. As banks are required minimal mandatory reserve, an analogue rule is applied also to non-bank financial institutions. The maximum permitted size of the leverage should be regulated. But more extensive and rigorous regulations do not mean reversal of financial liberalization. On the contrary, to keep financial markets open to not cause major damages, direct or collateral, it is necessary for these markets to benefit from the rigorous, effective rules.

As a result, deregulation as expansionary monetary policy adopted since 1980s, has encouraged massive borrowing of households and companies. When the financial system has snapped and the loans could not have been returned, it has been opened the gate of an economic crisis whose solving requires convergent measures and prudential and structural policies.

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