A SURVEY ON THE DRIVERS AND MECHANISMS OF FINANCIAL CRISES[1]

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Abstract. This paper aims to investigate the origin and to analyze the mechanisms of forming the main economic imbalances previous to financial crises. For this purpose we first outline a typology of crises depending on the characteristic symptoms, and we identify statistical indicators corresponding to the main drivers of the instabilities, specific to each category of crises. Second, a classification of these factors will be performed depending on their share in producing effects and the intensity of propagation of the effects over the economical results. Finally, we define a set of essential variables in triggering financial crises, along with the interdependences between them.

Keywords: Financial crises, Financial fragility, Credit, Indebtedness

JEL Classification: E44, E51, F34, G14

1. Introduction

After almost four years[2] from the triggering of the global financial crisis, the economic debates and research are continuing to focus on the origins, mechanisms and transmission effects of the crisis in the entire world. As usually

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[2] It is considered that the beginning of the financial crisis took place on August 7, 2007, once with the suspension of withdrawsals by the French bank BNP Paribas for some of the mutual funds administered, due to the lack of liquidities.

after such an event, the theoreticians, taken by surprise and criticized for the inability to unravel in due time the mechanisms of such phenomena, are trying to adjust the old theories to the new reality. The research achieved is oriented preponderantly in two directions: the epicenter of global financial instability (US crisis), and the mechanism through which the initial imbalances amplified and transmitted in the other countries.

The conclusions of such studies are useful for the scientific community but, for the decision makers of the European states affected by the external shocks, they are not helping too much in their effort to minimize the impact of the crisis. This is because, in the first place, the complexity and dynamics of the financial system of US are rarely met among European countries, much less in the East-European countries, including Romania. In the second place, the understanding of the transmission channels is not leading to consistent solutions for mitigation of the crisis effects, because we refer either to the real economy channel (trade) or to the financial one (capital flows), a country cannot afford to close itself commercially or financially, only from fear of external shocks that can arise on these paths. The essential element for the decision makers, in their effort to prevent internal economic crises, is the increase of national economies' immunity to face such global financial imbalances.

In order to study the initial economic conditions of the countries captured gradually by the crisis, more specifically for checking the existence and analysis of the way of forming national financial vulnerabilities, which led to significant differences between countries regarding the impact of the crisis, a first step is the identification and quantification of statistical indicators corresponding to the main imbalances specific to financial crises. Also, it's useful to classify them depending on their share in producing effects and intensity of propagation of the effects over the economic results. This step allows measuring the structural economic factors that increase the probability of a financial crisis and revelation of their contribution to the triggering of the current crisis - essential elements for the decision makers, in their attempt to maintain economic stability.

In this study we first present a typology of the financial crises depending on characteristic symptoms, and analyze the main drivers of instability and identify the specific statistical indicators. This way we study, on one hand, the tendencies and regularities regarding the action ways of these factors and, on the other hand, the triggering mechanisms of the crises. Second, we make a classification of the determinant factors, depending on their share in producing effects and the intensity of propagating the effects over the economic results, and define a set of

essential factors in triggering financial crises along with the interdependences between them.

2. Types of financial crises, the main drivers and specific indicators

The financial crises, either bank, currency, external debt or other type of crises, occurred in different areas of the world in the past four decades, and generated a rich and increasing specialty literature that tries to find the origins, nature, effects and dynamics of these extremely complex phenomena. The endeavors of the international scientific community in this area focused either on building theoretical models to explain the mechanisms that lead to financial instability, or on quantifying the influence of financial variables on the real economy, in order to forecast the negative effects of these variables.

As Krugman (2009) notes, although "the crisis is like nothing we've ever seen before", yet "it's like everything we've seen before". Indeed, "the description of earlier global crises leads to a déjà vu sense" (Bordo & Landon-Lane, 2010), as we will see in the following, reason for which we consider that the presentation of a typology of financial crises and a brief analysis of the specific symptoms will be of real use for understanding the current economic imbalances. Equally, this analysis allows to theoretically ground some statistical indicators corresponding to the main causes of the crises and facilitates the interpretation of the behavior of variables.

The history of the financial crises is approximately two centuries[1], but the last four decades (after the failing in 1971 of the monetary system based on fixed exchange rates around the dollar, agreed at Bretton Woods) saw a substantial growth in the frequency of crises. This period corresponds to a growth, also exponential, of three elements, which constitute *the premises of financial instability*: (i) diversity and complexity of the assets traded on the financial markets; (ii) liberalization of the international capital flows; (iii) deregulation of the financial institutions.

The three phenomena had, mainly, two *consequences*: (a) increasing the indebtedness of the economic actors (financial institutions, firms, households

[1]It is considered that the first global financial crisis took place at the London Stock Exchange, in 1825, when the spectacular increase in assets prices was followed by their collapse (Neal, 1998).

and government) and interdependence, especially of the financial institutions, so that when one of them is in a difficult situation, instability spreads by a "domino effect" to all others, (b) intensification of the international capital flows, with a similar effect of increasing global interdependence, but also with a destabilizing effect on source countries and destination countries for financial flows.

Depending on their *origin*, the factors generating financial crises can be divided into: (i) endogenous, consisting of imbalances of the national economy, previous to crisis; (ii) exogenous - external shocks, self-validating crises and speculative attacks. As regards the second category of causes, the capacity of the decision makers to prevent a financial crisis is limited, but not void, because also in this case the initial economic conditions are playing a decisive role in mitigating/ amplifying the impact, as with the current crisis. A more detailed presentation of the *major causes* at the origin of the financial crises over time leads to the following categories of factors: (a) expansionary fiscal and monetary policies; (b) counter-cyclical economic policies; (c) financial liberalization and international capital flows; (d) self-validating crisis, in which expectations are playing a crucial role in producing an event; (d) moral hazard and irrational behavior of financial market actors, leading to indebtedness and periods of boom, followed by collapse of asset prices.

If we study the types of imbalances by *characteristic symptoms*, the typology of financial crises is becoming more complex. We present below such a classification, beside the main indicators by which the determinant factors of the economic instability specific to each type of financial crisis can be quantified.

2.1. Currency crises determined by financing fiscal deficits

The most representative crises of this category were the ones in South America, in the '60-'70s. As Krugman (1979) shows, this type of financial instabilities appear when, under a fixed exchange rate, a monetary expansion appears due to excessive credit, especially with the purpose to finance fiscal deficits. The increase in the money supply put pressure on the exchange rate, and the efforts to maintain it lead to gradual loss in the foreign reserves and favors speculative attacks. Speculators guess that foreign reserves will eventually be exhausted, the authorities will become unable to maintain the exchange rate, and the currency will be devalued; they borrow large amounts of domestic currency and change it into foreign currency, thus influencing the foreign exchange market equilibrium and resulting in collapse of the currency. Another theory, promoted by the Flood, Garber (1984) and Obstfeld (1986) models, argues that actually the speculative attacks are representing the main cause of these crises, as they are

generating the reduction in foreign exchange resources, in order to sustain the currency.

For some of the European countries, the danger of currency crises of this type disappeared after adopting the common currency (Euro), the issue of currency in the Eurozone being controlled by ECB[1]. For the other EU members, candidates for the Eurozone, the stability of the exchange rate is very important because maintaining it around ±15% is an obligation to enter the ERM[2]. Also for the non-EU countries the currency stability constitutes one of the primary objectives of macroeconomic politicy. As representative indicators of the phenomena jeopardizing the stability of the currency we can use: expansion of the money supply, of the domestic credit and the one to the public sector, fiscal deficit and public debt, evolution of the foreign reserves. Also, the ratio of the monetary mass to the foreign reserves shows the capacity to support the exchange rate in case of speculative attacks, and the increase in the internal interest rate shows the efforts to attract foreign capital in order to sustain the exchange rate.

Another consequence of credit expansion is to increase demand and consumption of imported goods (with sticky prices given by the world market) and deteriorate trade balance, along with increased demand for non-tradables and increased relative price of these products against foreign ones, i.e. an appreciation of the currency in real terms. Indicators such as the current account deficit and the real exchange rate can signal these unfavorable evolutions.

2.2. Currency crises due to countercyclical economic policies

Representative of this type of financial crisis is the failure of the European Monetary System (EMS) during 1992-1993. This system of fixed exchange rates between currencies of the member countries has generated some theoretical models to reveal the conflict between the government attempt to control inflation and exchange rate, on the one hand, and to maintain a high level of economic growth, employment, etc. by an expansionary monetary policy, on the other side. Therefore, if the first category of crises has as an essential cause excessive lending and expansion of the monetary mass, in this case it seems to be the

[1] European Central Bank.

[2] ERM (Exchange Rate Mechanism) aims mainly at ensuring the stability of exchange rates and prices, according to the convergence criteria stipulated in the Treaty of Maastricht. Before adopting the Euro currency, the candidate countries have to participate in ERM at least two years.

reverse of the medal, namely the negative effect over the real economy of a constraining policy, necessary to support the exchange rate.

Under these circumstances, abandoning the parity by the authorities is not coming out from the exhaustion of foreign reserves, as previously, but from the fact that under recession periods an expansionist monetary policy is the only solution to avoid an unfavorable evolution of the real economy (Obstfeld, 1996). On the other hand, Ozkan and Sutherland (1995) show that, under a fixed exchange rate, an increase in external interest rate involves a corresponding increase in the internal rate, necessary to maintain the exchange rate. This will lead to decrease in output, generating also pressures on the exchange rate. Another consequence for increasing the internal interest rate is that it will determine the increase in the financing cost and debt service cost for the public sector, and will cause problems for funding and profitability of the banking sector. Alternatively, the option for devaluation has as a negative consequence the increase in the value in national currency of the external debt.

For Eurozone and ERM countries, the monetary policy of ECB[1], i.e. the conditions imposed by ERM can be in contradiction with the needs of the real economy. The evolution of the domestic product and other real indicators in relation with the short-term interest rate, the difference between the internal and external rate, and also between the volume of public and external debt can constitute indicators that reveal the probability of such crises.

The decision to maintain the exchange rate will depend on all the implications listed above. When economic conditions balance turns towards the negative implications of maintaining the rate, it creates expectations of future devaluation of the currency by the authorities. The speculative attacks occur soon, causing devaluation themselves; thus, a self-validating crisis occurs. Obstfeld (1994) shows that such expectations can also lead to increase in wages, unemployment, and interest rate, which forces the government to give up maintaining the exchange rate. As in the previous case, the phenomenon can take place backwards: speculative attacks force the government to increase the interest rate up to an unbearable level for the real economy. In methodological terms, the implications of hypothesis of the self-validating crises consist in the impossibility to be detected early, due to the absence of some specific symptoms that can be measured by statistical indicators.

[1] ECB sets the rate of refinancing interest, charged on operations through which the central banks deliver liquidities to commercial banks of the states in the Euro Area.

2.3. Currency and banking crises due to inflows and outflows of foreign capital

2.3.1. Effects on the capital account

The measures taken to liberalize cross-border capital movement and diversification of financial assets have led to the intensification of these flows on the global level. The crises in Mexico (1994-1995) and Asia (1997-1998) constituted an opportunity to study empirically the risks of massive inflows of foreign capital in the national economy. The risks are not hard to guess: the actual massive inflows of capital represent potential massive outflows of capital in the future, leaving the economy "exposed to the latest mood of Wall Street traders" (Sachs et al., 1997).

Firstly, as McKinnon and Pill (1994) show, the substantial inflows of foreign capital give rise to an increase in the aggregate demand and an excessive lending (for reasons detailed in the next section), with all related negative effects: increase in consumption and deterioration of the current account balance, increase in prices for non-tradable goods and appreciation in real terms of the currency, decrease in competitiveness and economic growth.

Sudden capital outflows can occur, for example, following the increase in the external interest rate, following the devaluation of the foreign currencies, which reduces the competitiveness of the national companies in which the foreign capital was invested, or due to investors' pessimistic expectations. These can be based on certain unfavorable economic conditions, which induce to every investor the belief that the others withdraw their capital and trigger a self-validating currency crisis; as a consequence, the capital has to be withdrawn in time in order to avoid losses[1]. Another explanation of withdrawals is the "herd behavior" of the investors, which takes place when a crisis appears in one of the neighboring countries, similar to the macroeconomic conditions. As indicators of the vulnerabilities previous to such phenomena, it is necessary to verify first the increase in capital inflows in a short period of time, the difference between the internal and external rate of interest, evolution of the real exchange rate, general macroeconomic conditions (GDP, unemployment, etc.).

The sudden outflows of capital generate an increase in the capital account deficit, which has to be offset either by selling foreign exchange reserves, or by raising the current account surplus. The latter requires, as a short-term solution,

[1] The phenomenon is known in the economic literature as "the Tequila effect" due to its origin - South America.

either a real depreciation of the currency in order to stimulate competitiveness (by nominal depreciation, the prices being rigid in the short run), or a reduction in consumption. The necessary nominal depreciation is bigger as the deficit of current account, increases and the currency is appreciated, in real terms. Consequently, these indicators are relevant in appreciating the capacity to counteract the negative effects of the capital outputs. As relevant is also the ratio of the foreign reserves to different measures of the external debt, especially the short - term debt.

The risk to withdraw large capital depends considerably on the structure by time horizons of the foreign investments. Fernandez-Arias and Hausmann (2001) demonstrate that the direct investments are the most stable during crises, being constituted preponderantly of fixed assets, with small liquidity, hard to sell in a short time. The portfolio investments are more volatile due to increased liquidity, but also due to the global diversification of portfolios and asymmetric information problems, which cause similar behaviors of the managers of the investment funds (Calvo and Mendoza, 2000). As regard to the private loans, Sula and Willett (2009) prove that they have been the most volatile during Asian crises (1997). One of the reasons is that, in the periods of financial instability, the liquidity crisis is reflected in the increase in interest rate, which in its turn increases the credit risk, which determines the financers to suspend the lending (Bailey et al., 2000). As a result, the indicators of capital inflows have to be divided by the mentioned types of investment.

2.3.2. Effects on the banking system

The capital inflows constitute important sources of financing the banks. Because the deposits cannot be increased on short term, in order to extend credit and implicitly the profit, the banks have to borrow, increasing therefore their leverage and deteriorating the quality of the assets by granting risky credits. This way the banking system became more fragile. Also, over lending involves the formation of speculative bubbles in the real estate and stock markets, a hypothesis supported by Borio and Lowe (2002), which examines graphically the apparent correlation of domestic credit and an index of asset prices.

Besides over lending, Bernanke (2005) sustains that, due to the savings excess on the global level, the inflows of foreign capital determined a reduction in the long-term interest rate and, as a consequence, in the gap between short-term and long-term interest rates. On the other hand, Taylor (2009) thinks this reduction in long term interest is caused by the expectations for low

responsiveness of monetary policy to the inflationist tensions[1]. The reduction in the spread has as an effect a decrease in banks' profitability, because they borrow on short term and lend on long term. Under these circumstances, in order to maintain the return on the capital invested by shareholders, the managers tend to offer risky credits and increase even more the leverage (Haldane et al., 2010). As indicators signaling the weakening of the banking system the following can be analyzed: the size of the domestic credit, the bank leverage (evolution of the credit-to-deposit ratio), indicators of the credit risk (risk premiums[2]), measures of profitability of the banks (return on assets[3] and equity[4]), all these correlated with capital inflows (especially the external borrowings of the resident banks), and with the long term - short term interest rate spread.

When external funding is discontinued due to the increase in external interest rate or accumulation of an overwhelming private debt, which increases the lack of confidence of the investors, then the money demand and the interest rate start to increase. Asset prices collapse due to massive sales in pursuit of cash, equity decreases, credit risk increases and banking system fragility can cause a financial crisis of large scale. This happens especially since the banks have a portfolio of assets whose value depends on the development of the housing and stock market. The crisis of liquidities on the interbank market can be revealed first by measuring the interbank interest rate (on short term), the increase of which shows the lack of liquidities on this market. Second, the interbank spread (between the interbank rate and the policy rate of the central bank) and the TED[5] spread (between the interbank rate and the Treasury bill rate) reveal the refinancing difficulty of the commercial banks, i.e. the credit risk and reduction in liquidities on the interbank market. On the stock market, the liquidity can be expressed by the ratio of the volume of transactions (turnover) to stock capitalization.

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[1] The interest rate on long term reveals the money market expectations regarding future evolution of the short term interest rate, i.e. an increase to fight inflation, or a drop to stimulate the economy under recession.

[2] The risk premium on lending consists in the difference between the rate charged by the commercial banks on credits (considered risky) and the rate for Treasury bills (perceived as without risk). Also we can use the difference between the interest charged on lending and the one offered for deposits.

[3] Return On Assets (ROA) = Net income after taxation (net profit) / Total Assets.

[4] Return On Equity (ROE) = Net income after taxation / Equity.

[5] TED is an acronym of *Treasury-Bill* and *ED*, the ticker symbol for the Eurodollar futures contract.

The lack of confidence in the banking system leads to the withdrawal of internal deposits by residents and creation of deposits abroad[1], which affects both the domestic banking system, due to the decrease of the liquid assets, and the exchange rate, by massive exchanges of domestic currency against foreign currency. As a consequence, the reduction in domestic deposits and increase in the external ones of the residents can also reveal the weakening of the banking system.

Diaz Alejandro (1985) and Velasco (1987) warn over another potential danger: when the banking sector under difficulty is sustained by the central bank through inflows of liquidities, the increase in monetary mass can put pressure on the exchange rate and therefore generates a "classical" currency crisis.

2.4. Banking crises caused by an inadequate monetary policy

The initiators of this theory (Austrian School - von Mises, 1928, 1933), generally avoided by the literature due to the difficulty to verify it, considered as a first cause of the succession of the periods of expansion and contraction of the economy - manipulation of the interest rate and money supply by the central banks[2]. The monetary policy was accused to favor the economic crises starting with the Great Depression from 1929-1933, the head of the US Federal Reserve himself acknowledges, by a frequently quoted statement[3] (Bernanke, 2002a). Also currently, authors such as Landais (2010) argue that most of the financial crises and recessions of the past were triggered and intensified by inappropriate monetary policies. The negative effects of such policies are presented below:

2.4.1. Effects of maintaining interest rate under the optimum level

Firstly, the increase and maintenance of the policy rate under the optimum level of the market results in increased demand for credit, situation agreed by the banks and followed by the expansion of credit supply, and money supply growth in excess of the domestic product rate. Regarding the investment credit, many companies that previously were not profitable, according to the decrease in

[1] The phenomenon is known in the economic literature as "capital flight".

[2] The importance of manipulating the monetary mass is revealed, ironically, by a famous statement attributed to the banker Mayer Rothschild (1744 - 1812): " Give me control of a nation's money supply, and I care not who makes its laws".

[3] Ben Bernanke, addressing to Milton Friedman, on the anniversary of the latter: "Regarding the Great Depression, you're right, we did it. We're very sorry. But thanks to you, we won't do it again".

lending rates, have now become profitable, leading to a poor allocation of resources and artificially increasing demand and price for production factors. On its turn, the consumer credit will increase the demand and the price of goods and services, because the supply cannot satisfy the demand. The increase in prices reduces the investors' and consumers' access to the production inputs, i.e. goods and services, which cannot carry on anymore without borrowing, closing the vicious circle of credit.

The inflation generated by excessive credit is a reason for banks to charge higher interest on long - term credits, invoking the future decrease in purchasing power, signaled by the inflationist expectations. The decrease in the short-term rate together with the increase in long-term rate represents obviously a combination in favor of the banks, because their profit increases proportionally to this spread. Also, Weise (2001) shows that the recommendations of the representatives of banking system[1] had a large influence over the rate of the interbank interest targeted by the Federal Reserve, during the period of Volcker-Greenspan's leadership.

On the other hand, the consumers, as long as they now have access to goods and services on credit, ignore the additional price (interest) paid, the decrease in the purchasing power (due to inflation) of the money earned, and the fact that they incur debts. In their turn, the companies accept the indebtedness because they are usually over-optimistic as regards the success of the initiated business and the possibility to return the credit, besides obtaining profit. The government also agrees over lending, for fiscal reasons and because the politicians are frequently financed by large corporations, the interest of which is to increase prices and sales. Therefore, a low interest rate is sustained by all economic actors.

One of the negative effects of a low interest rate and over lending is to form speculative bubbles, because a lot of credits are taken for speculative purposes, for investment in assets the prices of which are increasing. Increasing asset prices lead to even more credit demand, through the wealth[2] and balance-sheet[3]

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[1] In the US, the Federal Advisory Council - FAC is made up of representatives of the most important private banks and has a large influence on the monetary policy decisions.

[2] The wealth effect consist in raising credit demand and consumption, as raising prices of household assets make consumers to perceive themselves to be richer.

[3] The balance-sheet effect consist in raising credit demand of firms and households, as raising asset prices lead to increasing the value of collateral presented to the banks, in order to obtain a credit.

effects. Taylor (2007) argues that the reduction in the policy rate under the optimum set given by the " Taylor rule"[1] is that leading to the increase in the demand for real estate credits and, as a result, in the prices in this market in the period 2003-2006. Also, Ahrend et al. (2008) demonstrate that the increase pace of the mortgage credits, of the real estate and construction investments, and consequently of the real estate asset prices are all strongly correlated with the deviation of the interest rate from the Taylor rule. The intensification of lending activities increase banks dependence on these collateral assets, which have a considerable risk because of their high price volatility, depending on the expectations for credit supply. By financing such investments, the bank takes over part of the risk assumed by the debtor (investor).

The problem appears when the credit supply is reduced and the asset prices decrease because any speculative bubble is a Ponzi-type mechanism, where money are earned as long as new investors appear, investors who support the demand. The reducing asset prices generate waves of non-performing loans and lead to instability of the national financial system and also the international one as well. Gavin and Hausmann (2006) conclude that almost every financial crisis in the analyzed countries was preceded by a fast increase in the bank lending, measured as proportion in GDP. Also, Eichengreen and Arteta (2000) calculated that one percentage increase in the domestic credit rate (relative to average) increases the probability of a banking crisis in the next year by 0.056 percent. Despite the above mentioned, the monetary policy of the " Greenspan doctrine" supporters – Greenspan (2002) and Bernanke (2002b) - did not try avoiding such effects, declaring that the formation of speculative bubbles need not be prevented, efforts being necessary to be oriented towards minimizing effects when the bubbles burst.

The value of central banks / ECB policy rate below the optimum level given by Taylor rule (where statistical data are available), along with the downward trend of the real interest rate of CB / ECB, can be considered as signals of an expansionist monetary policy and can be correlated with the lending rate and the asset price index.

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[1] According to the Taylor rule, the target short-term nominal interest rate (rt) has to verify the relation: $r_T = \pi + r^* + \lambda_1(\pi - \pi^*) + \lambda_2(GAP)$, where π=inflation rate as measured by the GDP deflator, π*=desired rate of inflation, r*=real equilibrium interest rate assumed, GAP=output deviation from the potential one, λ1 and λ2= positive shares which add up to one.

2.4.2. Effects of increasing interest rate

When the central bank wants to stop the negative effects of the economic expansion, the increase in interest rate does not bring back the economic growth to an adequate level as regards the allocation of the available resources, but leads to the other extreme - recession. Taylor (2007) mentions that, once the interest rate was restored at the optimum level, the decrease in the demand reduces the asset prices, increases the rate of non-performing credits, and leads to the collapse of the mortgage-backed securities, with negative consequences over the banking system. Also, Hardy and Pazarbasioglu (1999) show that a period of increase in inflation, followed by a sudden reduction, is significantly raising the probability of a financial crisis.

Further based on the classic effect of the increase in short-term interest rate - gradual increase in the long-term interest and reduction in *demand* for credits - Adrian et. al. (2010) analyze the effect of the interest spread (short term - long term) reduction generated by a constraining policy (increase in the short-term rate) of the central bank. They show that the spread decrease reduces the bank profitability, which in turn may cause shrinkage of credit *supply* and a more pronounced growth in the lending risk premiums. This phenomenon happens when the increase in short-term interest is not followed by a proportional increase in the long-term one, due to either the high level of savings on global level, or the money market expectations (see section 2.3.2).

The two effects of economic contraction can be pursued by analyzing the evolution of the key interest rate of the central bank, along with the asset prices, short term – long term spread, bank profitability and credit risk premium.

According to the theories above, the monetary policy is responsible both for the over-lending periods and for the shrinkage of credit in the economy. This cycle seems to be agreed both by politicians and the private sector; they probably believe that the effects of the recession are not a big price to pay for the prosperity during the economic expansion period.

The next hypothesis considers the economic agents as the main source of financial fragility.

2.5. Economic distortions and vulnerabilities due to over-indebtedness

The distortions generated in the economy with the appearance of the pyramidal system of debt have continued to be an actual cause of financial instability,

though it is the oldest cause, blamed for centuries[1]. Although not leading directly to financial crises, the indebtedness generates at least two negative effects that favor the financial instability: (i) worsening the balance-sheet of non-financial economic actors (households, firms, government), (ii) dependence of the economy on credit supply offered by the banking system, because money can only be injected into the economy if someone (a person, a company or the state) incur a debt.

2.5.1. Effects on the balance-sheet of non-financial economic actors

It is a general tendency of private economic actors to make irrational decisions and over-borrow during the economic prosperity periods, due to the positive expectations regarding the investment return, as shown in Minsky's financial fragility theory (1992a,b)[2]. (Palley, 2006). On the other hand, an increasing share of population adopt a consumerist culture, intensely promoted by mass media, which offers the incentive to borrow independently of risks and consequences, which incentive does not last without an answer from the banks.

Initially, high economic growth periods correspond to high debt levels, which in turn will sustain the growth. Progressively, a deterioration of the internal balance-sheet of non-financial economic actors (households, companies, government) occurs. The deterioration of the balance-sheet is amplified by the inefficient use of working time by employees, because a substantial part of the income is used for the payment of interest, which sometimes even exceeds the initial price of the purchased good. Consequently, the indebtedness partially cancels the positive effect of labor productivity increase on the welfare of population and nation, as a whole. Although the economy produces more and more goods and services, a great part of the incomes obtained from their sale is used for the payment of interest, so that the high rates of economic growth are not reflected in the disposable income of the population. According to Minsky, economic units successively pass through three stages, corresponding to their indebtedness and liquidity: hedge units, speculative units, Ponzi units. As the interest payments and the debt/income ratio increase, economic activity will slow down. Thus, the

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[1] The former president of the US, John Adams (1735-1826), said: "There are two ways to conquer and enslave a nation. One is by the sword. The other is by debt".

[2] For an extensive analysis of models of financial instability developed by Minsky and the followers of his theories (Taylor & O'Connell, Foley, Vercelli and others) see Palley (2009) and Iancu (2010).

economy will periodically tend to instability and collapse, because the real sector cannot generate the cash-flow necessary to sustain such financial claims (Crotty, 2009).

The same thing happens in the case of public debt, with the difference that the amounts used for the payment of interest are provided from taxes, therefore they are also borne by population, their disposable income decreasing even more. This way, part of the public revenues are not anymore invested in education, medical system, infrastructure, etc. All these lead to income redistribution from the real sector to the financial one.

The above - mentioned also apply to international level. Firstly, an increase of the external public debt is noticed, with a negative role in national sovereignty, especially regarding the independence of the economic policy decision making process[1]. On the other side, the external debt service needs additional resources from exports or other sources, wasting a part of the revenues obtained by selling the domestic product. Consequently, trade does not represent anymore a simple exchange of goods, mutually advantageous, but it becomes a means of obtaining incomes at any cost, whether the terms of trade are favorable or not.

The over-indebtedness is also caused by the fact that, according to the „heterodox" monetary theories, the credit demand is the one that determines the bank loan volume. Afterwards, banks procure the required reserves for the newly created deposits by central bank refinancing operations. The role of the latter is limited to the moderation of credit, by adjusting the refinancing interest rate for the liquidities offered to commercial banks. Otherwise, the central bank adopts an "accommodative" policy, providing the necessary liquidities to the banking system (Moore, 1989). This way, the money supply represents an endogenous variable of the money market, because the central bank does not impose anymore the credit supply by specific operations[2] that influence bank reserves, but only it follows the money demand from the commercial banks.

The above hypothesis is supported by the empiric analyses made by Kydland and Prescott (1990). Investigating the US GDP cycle, they found that the evolution of monetary aggregate M2 precedes the business cycle, M1 is pro-

[1] I refer to IMF, WB financing, etc.

[2] I refer to the repurchasing agreements (repo) by which the central bank buys/sells securities to the commercial banks, for the purpose of increasing/decreasing the bank required reserves, which further determine the increase/decrease in money supply through the money multiplier mechanism.

cyclical, while the monetary base follows the business cycle. Therefore, the M2–M1 difference (deposits on term) is the one that initiates the business cycle, followed by the credit reflected in the deposit accounts (M1), and the monetary base (liquid money and bank reserves to the central bank).

Otherwise expressed, the deposits established through lending precede the cash injected by central bank. So the credit supply does not depend entirely, anymore, on the reserves obtained by selling government securities to the central bank, but on the contrary, the excessive credit determines the central bank to print sufficient currency for preventing the liquidity problems arising from massive withdrawals, generated by self-validating panics or other causes. Additionally, the development of the asset-backed securities and their trading on the financial market increased the funding sources and the credit potential of the banks, which become more and more independent from the central bank in this respect. Consequently, the credit monetary transmission channel loses effectiveness, and the credit limit is mainly given by the (increasing) incentive to consume from the private sector.

During the economic contraction periods, either due to a constrictive monetary policy, or to the decrease in prices of certain assets consequently to the burst of speculative bubbles, or to the outflows of foreign capital, the increase in interest rate will progressively generate credit shrinkage, deterioration of bank balance-sheet, firm and household income decrease, inability of paying the debt overdue, decrease of banks incomes and non-payment of their financial obligations to depositors and external creditors. The growing interdependence between financial institutions worsens the situation because the non-payment of certain financial obligations generates further imbalances, culminating in deep financial crises, as the current one.

The evolution of the household balance-sheet may be revealed by the liabilities / assets ratio, net financial wealth[1], net wealth[2], disposable net income[3] and indebtedness degree[4]. For companies representative are the indicators of indebtedness[5] and liquidity. At the national level, the statement of liquidities may

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1 Net financial wealth of households = Financial assets (cash, bank deposits, stocks, insurance policies, pension funds) – Financial liabilities (credits).

2 Net wealth of households = Net financial wealth + Non-financial assets

3 Disposable net income of households = Income – Fees, Contributions, Current expenses.

4 Indebtedness of households = Debt service (principal, interest, commissions) / Income.

5 Indebtedness of firms= Liabilities/Assets or Liabilities/Equity.

be analyzed by: net external assets, total external debt, short-term debt and public debt / GDP ratios, external debt service / export, short term external debt / foreign reserves. Also, the incapacity of servicing external public debt may be expressed by the evolution of the interest rate for government bonds, or by its deviation from the similar interest of a sample–country with a high economic stability degree.

2.5.2. Economic dependence on the bank credit supply

Due to the interest on debt, the due amount (principal + interest) exceeds the quantity of newly created money. Although the volume of goods and services produced in the economy increases, the debt cannot be paid by products, but by money. Because it is impossible to return the money that was not created, the reimbursement on time of the debt due cannot be made unless more and more debtors increase the money supply by their assigned credits. This is because the monetary mass periodically decreases when the principal of the credit is repaid to the banks. This will increase even more the debt level, so that there are necessary both an even bigger quantity of money injected by credit, and a raise in the domestic product, which would sustain the money demand. The internal debt (principal + interest) receives an exponential trend, exceeding by far the monetary mass.

The pyramidal system of perpetual indebtedness is in a permanent danger of collapse, because its operation, and the economy, generally, entirely depends on the credit supply of the banking system. If debtors did not exist, the monetary mass would implode, which makes the economy to be assigned to the banking system. Only the time range from the reception of the credit to its reimbursement stops the absence of money not to bring the financial system down, which causes a high fragility of the economic system. During the recession periods with credit restriction and contraction of the monetary mass, there will always be debtors unable to pay their obligations to creditors, and the foreclosure on mortgages and other forms of collateral leads both to financial instability, as well as to gradual wealth transfer from the population to the banking sector. The ratio of private and total debt service payments to monetary mass or GDP represents the most significant indicator for estimating the loan reimbursement capacity.

2.6. Banking crises due to the weak regulation of the financial sector

Either due to foreign capital inflows, increase in savings, or to an expansionist monetary policy, the over-lending happens when the financial sector is not

enough regulated, which is one of the main causes of the current crisis. Unlike a company, a bank collapse causes more profound effects on the economy, including massive withdrawals of deposits from the other banks, together with non-payment of the debt contracted on the interbank market.

Because of their nature, the banks present a high leverage degree, higher with the other economic agents, along with a low liquidity of assets. In periods of economic expansion, banks tend to increase leverage to maximize profits and thus the capital income to shareholders; the phenomenon is usually accompanied by an increase in external exposure rates.The higher leverage is, the higher the probability of losing capital and default an asset depreciation involves. On the other hand, the decrease in assets and capital value leads to a capital / risk-weighted asset ratio below the required level[1]. The solutions consist in capital increase (hard to obtain under crisis conditions), sale of assets (for "fire" prices, if possible – because part of assets are not liquid on short term), and loan reducing. Moreover, the assets are used by banks as collateral for short-term loans, and the decrease of collateral value generates the cut in financing, and deleveraging, which is made by asset sales, as in the previous case. Also, the decrease in external financing may be due to external causes. The massive sales contribute to the more accentuated decrease in asset prices of financial institutions, which perpetuates the vicious circle. These phenomena are specific to the current crisis, where the spark that started the vicious circle was the decrease in prices in the real estate sector.

For the above reasons, the capital and the other reserves need a special attention, as they represent the safety element in case of asset devaluation or decrease in financing sources. Also, certain restrictions regarding the interest rate on lending and deposits, the types of granted credits, the categories of financial assets owned in the portfolio, or the international transactions have a decisive role in diminishing of bank vulnerability in case of an external shock. The importance of regulation was empirically validated by authors like Ahrend and others (2009), who proved the correlation between deregulation and financial innovation, on the one hand, and the increase in asset prices, especially the real estate ones, on the other hand.

Palley (2009) and Crotty (2007) explain the process of deregulation through three drivers: (i) efforts/pressures exerted by financial institutions – which see

[1] According to Basel III proposal, the ratio ofcapital to total assets (weighted by the risk degree) will have to be at least 8%, as previously, and the ratio between tier 1 capital and assets – minimum 6%.

their profits diminished – on the regulatory agencies; (ii) the inclination of regulators to forget the lessons of the past and to comply with the neoclassical theories that state the death of the business cycle and the efficiency of the financial markets as regards the correct asset pricing with respect to expected risk and return; (iii) financial innovation – the most effective method for avoiding the old regulation – together with the lack of constant updating of regulation for keeping pace with innovation. Consequently, "good regulation inevitably sows the seeds of own destruction by providing an incentive to innovate" (Palley, 1998).

The deregulation tendency of the financial sector (banks + non-banking financial institutions) in the last decades led to the progressive raise in leverage, which increased the liquidity and solvability risk. This trend was also induced by the unprecedented development of the non-banking financial sector, which is not subject to regulations specific to banks. At the same time, it led to a decrease in liquidity and increase in the asset risk, all these increasing the banking system fragility, a correlation empirically proved by Arteta, Eichengreen (2002) and Noy (2004).

Additionally, the securitization phenomenon has gained momentum, by which securities are issued, whose revenues are based on, or guaranteed by, the financial flows generated by a group of assets (including mortgages[1]). The fragility effect of the banking sector resides in the fact that the current regulations allow for the removal of these asset-backed securities from balance sheets, so that the bank is not committed anymore to allocate capital for them. Also, the fragility results also from the international trade of these assets, which created a "weaknesses chain" between the financial institutions from different countries – one of the most important channels of transmitting the crisis in Europe. Once a liquidity shock appears in one of the countries, this external exposure generates a global crisis of the financial system.

The liberalization measures of the financial sector increase the competition between banks, which decreases their profitability. Banks become tempted to attract more internal and external capital by offering high interest on deposits and using the capital for risky investments and credits (Reinhart and Montiel, 2001). As Gavin and Hausmann (1996) reveal, when such a bank increases the rate of interest fon deposits, their volume also increases, to the detriment of the other banks' profitability. The latter will be constrained to increase the interest too - in

[1] In the middle of 2008, 60% of the mortgages in the United States were securitized (Blanchard, 2009).

order not to lose deposits - simultaneously with the lending increase, which keeps their profitability unaltered.

The indicators of bank deregulation may constitute significant signs of vulnerability to the external shocks. In this respect, the fragility of the banking system could be revealed by indicators as liquidity (reserves level, capital, provisions for non-performing loans), loan quality, and leverage. Also, a high degree of external exposure of the resident banks, measured by the level of the external debt, indicates an increased vulnerability.

3. A classification of the main indicators of the financial crises

It has to be mentioned that any typology of financial crises is an artificial and abstract one because, in fact, the crises present a multitude of negative effects, corresponding to more symptoms of the previous classification. For example, the most common combination is the one between the exchange rate instability and the crash of the banking system, called “twin crises” precisely to the very high probability of simultaneous occurrence of generating factors. Also, a relaxed monetary policy is strengthened by the deregulation for the financial institutions and, therefore, it leads to over-indebtedness and balance-sheet deterioration of the economic agents. Thus, although some of the presented phenomena within the previous section did not have a direct noticeable influence over the triggering of the present crisis, an analysis of the economic vulnerabilities that influenced the impact of the crisis must consider as many potential causes of the financial instability.

In the economic literature there are extensive classifications of the preliminary symptoms of the financial crises, the most representative being the ones performed by Kaminsky (1998, 1999, and 2003). Based on the study of the previous crises, Kaminsky and other IMF researchers like Demirgüç-Kunt and Detragiache (2005) or Duttagupta and Cashin (2008) have tried to define sets of essential indicators for financial stability, along with critical thresholds for each indicator, for the purpose of building some early warning systems potential financial distress. The classifications accomplished the mentioned studies distribute the indicators by economic sectors (banking, current account, capital account, the real economy sector, the external sector, etc.), but do not delimitate the initial factors from the disequilibria generated by them. For this reason, we have considered it is necessary to make a classification that will provide, for each type of financial crisis, three categories of variables – identified along the

previous section: (i) the initial factors, which generate the disequilibria; (ii) the determinant factors, which generate the symptoms; (iii) the characteristic effects (symptoms). We present such a classification in the table below:

Table 1. Initial Factors, Determinant Factors and Symptoms of Financial Crises

Initial factors	Determinant factors	Effects (Symptoms)
Fiscal deficit Public debt Monetary expansion	Over-lending Over-lending to the public sector Real currency appreciation Competitiveness decrease Rising current account deficit Rising internal interest rate Decreasing foreign reserves	Nominal currency depreciation
GDP decrease Raising external interest rate	Rising external interest rate together with decreasing GDP Rising public sector financing cost	Nominal currency depreciation
Foreign capital inflows and outflows Raising external interest rate	*Capital inflows:* Over-lending Real currency appreciation Competitiveness decrease Rising current account deficit Rising house and stock prices Rising bank leverage Rising bank external exposure Rising bank FX exposure Decreasing quality of loans Decrease in short term – long term interest spread Decrease in bank profitability	*Capital outflows:* Nominal currency depreciation Decreasing foreign exchange reserves Decreasing housing and stock prices Liquidity crisis in the banking system Non-peforming loans Decreasing internal deposits Rising external deposits of residents
Inadequate monetary policy (interest rate fluctuation)	*Decreasing interest rate:* Over-lending Rising house and stock prices Rising bank leverage	*Increasing interest rate:* Decreasing house and stock prices Liquidity crisis in the

Initial factors	Determinant factors	Effects (Symptoms)
	Decreasing quality of loans Decrease in short term – long term interest spread Decrease in bank profitability	banking system Non-peformingt loans
The over-borrowing tendency	*Expansion period:* Deterioration of firms and household balance-sheet Deterioration of international investment position Discrepancy between internal debt and the available money stock	*Recession period:* Default of private debt, non-performing loans Liquidity crisis in the banking system Default of public external debt
Deregulation Liberalization of the financial sector	*Expansion period:* Over-lending Rising bank leverage Rising bank external exposure Rising bank FX exposure Decreasing quality of loans Decrease in bank profitability	*Recession period:* Liquidity crisis in the banking system

4. Final remarks

The analysis of the symptoms characteristic of each type of crisis leads to of some similarities regarding the main determinants. We notice the iteration of two important groups of factors. The first one corresponds to “balance of imbalances” (current account and capital account) and of the exchange rate. The second consists in over-lending, the rising asset prices, the deterioration of the firm and household balance-sheet position and the fragility of the banking system. We may see that the second factor group has a superior weight producing the symptoms. The most frequent factor that appears in Table 1 seems to be over-lending, followed by the fragility of the banking system, increasing indebtedness and asset risk; on the third place, there is the formation and burst of speculative bubbles. In turn, these three factors originate in the massive foreign capital inputs, the expansive policy of the central bank, the inclination of the private sector to over-borrow and the deregulation of the financial institutions.

On the other hand, if we consider the amplitude of the negative effects presented within the typology of financial crises, we notice that it considerably differs from

one category to another, which leads to the necessity of classification, also according to this criterion, of the determining factors. Therefore, we find short-term crises, with a relatively low impact over the real economy, and crises with more profound effects, with a longer duration and, as a consequence, with a long period of convalescence of the economy, too. Within the first category, we may classify the currency and bank crises, where an inadvertent monetary policy, the deficit of capital account, the negative effect over the real economy of maintaining the exchange rate, or the speculative attacks lead to the movement of the exchange rate to a new equilibrium. Such crises occured immediately after the falling of the monetary system agreed at Bretton Woods (1944-1973), in Latin America in the '70s, in the EMS members in 1992-1993, in the northern European countries in 1991-1992, in Latin America in 1994-1995, in Asia in 1997-1998. Also, here we may classify the liquidity crises, which generated defaults of the external public debt, like the ones in Russia, Brazil and South Korea, in 1997-1999.

By studying the second category of profound long-term crises, we reach the Schwartz's (1996) conclusion, namely that a financial crisis is in essence a banking crisis, the rest of the elements existing only as aggravating circumstances. Indeed, even in the more pronounced currency crises, like the ones in Mexico (1995) or Sweden and Finland (1991-1992), the vulnerability of the banking system was the one that indirectly favored the "Tequila effect", i.e. the impact of the EMS crisis. Much stronger is the direct impact of the current banking system crisis. Within two and a half decades since Schwartz's observation, we have seen not only an increase of the financial sector in importance within the economy, as regards the revenues, but also the expantion of the claims/debts that have led to a broad financial interdependence within the economic actors, at national and global level. Therefore, some factors like over-lending, bank leverage, defaults of the private sector debtors, the formation and the burst of the speculative bubbles, the bank raising external exposure and reducing profitability, all these may generate, by the domino effect, ample liquidity crises of the banking system, which causes national/global financial crises. These factors also represent the main determinants of the current financial crisis, although its virulence was influenced by many other elements.

By cumulating the two structuring criteria, more precisely the weight in producing the effects and the intensity of the propagation of effects, it results in the following set of essential factors (indirect and direct) producing the financial crises, together with the interdependences between them.

Table 2. Essential factors in triggering financial crises

Initial (indirect) factors / Determinant (direct) factors	Foreign capital inflows	Monetary expansionist policy	Deregulation of financial system	Decreasing short term – long term interest spread	Decreasing bank profitability	Over-lending
Over-lending	◄┘	◄┘	◄┘		◄┘	
Decreasing short term – long term interest spread	◄┘					
Decreasing bank profitability			◄┘	◄┘		
Bank leverage	◄┘		◄┘		◄┘	◄┘
Bank external and FX exposure	◄┘		◄┘		◄┘	
Quality of bank assets						◄┘
House and stock prices	◄┘					◄┘
Firm and household balance-sheet deterioration						◄┘
Currency appreciation in real terms Decreasing competitiveness Current account detererioration	◄┘					◄┘

The identification of the above indicators, corresponding to the main disequilibria specific to the financial crises, is useful because it enables us to verify the existence and analyze the formation of national financial vulnerabilities that couse to considerable differences between the countries, regarding the impact of the present global financial crisis.

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