CONTAGION PHENOMENA RESEARCH AS A METHOD OF FINANCIAL CRISIS MANAGEMENT

Ph.D. Victoria COCIUG
National Institute for Economic Research, The Academy of Sciences of Moldova, The Ministry of Education, Culture and Research, Republic of Moldova
E-mail: v_cociug@mail.ru
Ph.D. Student Denis MALENDRA
National Institute for Economic Research, The Academy of Sciences of Moldova, The Ministry of Education, Culture and Research, Republic of Moldova
E-mail: endramal20@gmail.com

Abstract: *The effect of the financial crisis, triggered in 2008, is currently perceived at the level of the economic system, although the financial system has already recovered. The causes of the financial disaster were multiple, but it is undeniable that due to strong strong inertia between the components of the financial system, but more with the cell, the crisis spread much faster than in previous crises. Interconnections in the banking system are a necessity, as not all institutions are specialized at the same time in attracting funds in the form of deposits and their use in crediting the economy. Some institutions are specialized in attracting deposits, others only in lending and must be regarded as essential elements that ensure redistribution of liquidity within the system, from surpluses to deficits. But these fund transfers are risk-taking, especially credit, which can cause contagion to the whole system and the loss of solvable banks that have not been able to assimilate the perceived risk from other banks with major financial problems. In order to prevent the emergence of a systemic risk, it is necessary to develop a mechanism to assess the system's vulnerability to the risks generated within the system and to the contagion effect in order to set maximum exposure limits to system elements through effective regulatory rules. This article aims to investigate the contagion phenomenon within a banking sector and how it can be delivered more quickly when there are strong economic relationships and interdependencies between the banks. It was found that contagion is not a local issue and should not be treated as it is, but it is much broader, expanding on more than one region, so it is important to find correlations between countries in order to reduce its effect, that financial markets have underestimated the risk and degree of interdependence between countries.*

Key words: *central bank, inflation, monetary policy, inflationist expectations.*
JEL Classification: *E31, E32, E52, E58.*

1. Introduction

Crises can be defined as situations characterized by pronounced instability and are therefore accompanied by volatility and growing uncertainty in most markets (capital markets, oil market, money and foreign exchange markets, the labor market, etc.). They arise after a period when the price of assets (whether or not financially) has increased artificially, and when the market becomes aware of this over-assessment, it reacts accordingly.

US economist Mishkin (1991) defines the crisis as *"the situation in which adverse selection and moral hazard are getting worse and markets are no longer able to channel resources to the most productive investment opportunities"*.

A similar approach is encountered by Milton Friedman (2009, pp.111-136), who believes that the crisis has a strong psychological dimension. Panic by market outlook, depositors throw themselves into a dangerously high number on their deposits in banks, and so the banking system enters a generalized collapse. In the opinion of French sociologist Edgar Morin (1976, pp.149-163), the crisis is often associated with a lack of conditions to allow for a decision to be made.

The theorist and professor in the US, Ian Mitroff (1988, pp.83-107), is of the opinion that; in some cases, the crisis is defined as an event with a low probability of occurrence but which has major implications for society, organizations or individuals.

In the process of crisis, the financial problems of some market actors are transposed into the financial statements of others, who were a priori rather cautious and not excessively exposed to risks, being totally unprepared to cope with the losses caused by imbalances in the system. The higher the degree of interconnection between the elements of the system, the greater the danger of contagion.

2. Defining the concept of contagion

The phenomenon of spreading or spreading the crisis is known in the literature as the "contagion effect". The term "contagion" comes from the medical field and has recently been introduced in the specialized economic literature. The interest of economists in the phenomenon of contagion of financial crises only grew in the second half of the 1990s, when the effects of crises spread from an emerging country to another emerging country became increasingly visible.

In fact, the first crisis in which the contagion was first observed was the Thailand crisis in July 1997 on the foreign exchange market when the Thai government decided to suspend the dollar anchor and adopt free float for the national currency - baht maintaining for a long time a fixed exchange rate encouraged the loan from foreign sources and attracting foreign investments that had a great deal of exposure to foreign exchange risk). Very rapidly this crisis has spread to all neighboring countries: the Philippines, Malaysia, Singapore, South Korea being among the most affected countries in the region. The crisis then spread over Russia and Brazil. Even developed countries in Europe and North America have experienced the effects of this crisis that has engendered more and more countries as a "domino effect".

Subsequently, contagion was defined by Eichengreen and Rose *as a mechanism by which shocks are transmitted between different countries or a correlation of economic status between two or more countries, beyond any visible macroeconomic link that can be interpreted as common shocks.*

This definition, however, does not allow identification of the specificity of contagion at the level of a single system or a single country. Most economists operate with the strict definition of contagion: *"contagion is a rapid increase in the link between different financial markets in times of crisis."*

A definition derived from the strict approach to contagion is that given by Kaminsky and Reinhart and Eichengreen and Rose (1998): *"the contagion effect is the situation where information about the existence of a crisis in another country increases the likelihood of a crisis on the ground local"*.

A number of authors (Gertsman, 1998; MacMahon and Trichopoulos, 1996; Edwards, 1999, pp.65-84) have further restricted the terminology of the contagion effect: "contagion is the situation where the magnitude and extent of international transmission of shocks exceeds the ex-ante expectations of market operators".

Introducing the concept of contagion in the literature on financial crises was based on the devastating effect they have on the level of income and welfare of a very large number of people and in a very short time (as in the case of a large-scale epidemic). Currently, there are several definitions of the financial crisis contagion effect:

- **The general approach:** contagion is the mechanism by which shocks are transmitted between different countries, generating a domino effect globally. Contagion can occur both in times of economic growth and in moments of crisis. The phenomenon is only taken into account when it comes to an internationally-spread crisis situation (it often forgets that there is also a "positive" contagion whereby growth or economic development is exported to other countries);
- **The restrictive approach:** contagion is the mechanism by which shocks are transmitted between different countries or when there is a correlation between two or more countries beyond any fundamental link between countries and which differs from the

common shocks these countries face. This definition refers to that additional driving effect between two or more countries explained by specific behavioral attitudes at investor or consumer level;

- **Strict approach:** contagion occurs when the correlation between two or more countries increases significantly in times of crisis compared to periods of lull. The definition basically refers to the influence the crisis may have on the intensity of the link between two or more countries.

In defining the concept of contagion, a number of links can be identified that can exist between different countries and explain the existence and extent of this phenomenon:

- ***the approach through financial relations:*** contagion is due to the connection of different economies to the international financial system. When a crisis situation occurs in a country, investment funds face massive capital withdrawals by investors, offsetting the issue of securities in a third country to attract liquidity. In this way, the initial shock is propagated to other countries as well. A similar phenomenon is that of multinational banks targeting excess liquidity to markets that offer high growth potential (emerging markets for example) and then withdraw them quickly when the first signs of crisis appear in the country of origin (this imbalances the debtor countries, the imbalance being further accentuated by the final or partial withdrawal of multinational banks from that market).
- ***approach through economic relations:*** contagion is conditioned by trade relations between different countries. When the exchange rate between two countries deteriorates or when two countries are in a strong competition on international markets, they are often tempted to gain a temporary competitive advantage from the exchange rate depreciation. Foreign direct investment and portfolio investment also contribute to this drive.
- ***approach through political relations:*** contagion is conditioned by diplomatic and political relations between different countries. This type of link is less studied in the literature when considering the effect of contagion. Many countries are part of various economic "clubs" that impose certain rules of conduct (for example, they may impose a particular currency regime). This membership in the different political groups often makes crises a cluster character. A country that is in a crisis and is part of this group is drawing all countries in the group into crisis.

The nature of the relationships, which condition the contagion and the way it manifests its effects, led to the delimitation of specific, well-defined types (Masson, 1998< Forbes and Ribobon, 2002):

- *The "monsoon" effect of contagion:* it is the result of a global imbalance that affects a large number of countries (even all countries affected) connected to the world economy. In this regard, numerous examples of crises that have been propagated in this way: the 1973 and 1979 oil crises, the rise in interest rates in Germany in 1992 in the context of the ERM crisis, the rise in US interest after the Mexican crisis of 1994.

- *"Spillover" effect:* it is due to the existence of a crisis in a particular country that is then propagated in a large number of countries. Kaminsky and Reinhart have called this fundamental-based contagion-based contagion effect. Examples of such contagion effects would be: the pronounced depreciation of the Japanese yen in 1995 against the US dollar that then generated the crisis in Southeast Asia (started in Thailand in 1997), the most affected countries in the region being the countries which had the most developed trade relations with Japan and the USA, the Mexican crisis of 1994, which then spread across several Latin American countries, the turmoil in Turkey in 2000, the dot.com crisis in the US and Europe in 2000, subprime "on the US credit market in 2007.

- *The "residual" type of contagion:* refers to changes in the economic situation in different countries that exceed the expectations of market operators and which are visible in the residual value ("white noise") of models testing the correlations between different economies (between country and several countries or between a country and the world economy).

- *The volatility contagion effect:* is a type of contagion primarily manifested in the capital markets (Edwards, 1998; Edwards and Susmel, 2000; Engle and Ng, 1993; Ito, Engle and Lin, 1990, 1992; Hamano, Ng and Masulis, 1990; Longin and Solnik, 1995; Ramchand and Susmel, 1998; Bennett and Kelleher, 1988; King and Wadhwani, 1990) and is intended to spread the growing volatility (the associated investment risk is on the rise) from the capital market to other capital markets. This kind of contagion is among the most studied forms in the literature.

The concept of contagion does not only address the impact of crises on the local level but also the channels through which these crises are spread internationally. We are also talking about the contagion effect when it comes to propagating a crisis in certain sectors across the economy. In defining the contagion effect, there is also a direct or indirect contact between countries (or sectors) affected by the crisis.

3. Contagion ways

The financial crisis has highlighted the importance of the interconnections of the financial system. Major disturbances, such as the failure or near failure of certain institutions, are spreading rapidly over the entire financial system. A seemingly solid system can actually be very fragile. This results from the fact that a large number of interconnections within the network serve as an amplifier shock rather than as a shock absorption.

Contagion is the basis for any analysis of financial crises, because it causes the initial shock to become a systematic event. For this reason, in order to understand the risks of the financial sector, it is necessary to penetrate these risks, as well as to the propagation paths. The increased use of complex transfer risk instruments and the speed of market transactions join the complexity and rapidity of potential crises spreading, making these risks difficult to quantify. Based on these ideas, contagion can be considered as a propagation mechanism that causes small systemic or characterized by idiosyncrasies that have systematic consequences.

The risk of contagion between banks is considered as an important element of systemic risk. Contagion in the banking system can be divided into two direct and indirect ways.

The financial dependence of banks on each other generates direct contagion, both through the payment system and through other operations such as direct loans, REPO agreements and other operations. Indirect contagion can occur through two channels. First of all, the market must accept that direct contagion exists, even if it is not the case. Secondly, if a bank faces financial problems, the market must be aware that other banks in the same system may be hit by the same problems, which may lead to the mass withdrawal of deposits from banks.

A bank faces financial problems when the market value of its assets differs from the market value of its liabilities in such a way that the market value of its capital becomes negative. Under these circumstances, the bank can not fulfill all its payment obligations to depositors on time and in full value. The bank needs to solve its payment problems quickly in order not to cause short-term deposits to be withdrawn.

The banking system is more affected by bankruptcy in the system than other enterprises in other areas of activity for the following three reasons:

1. the small size of the ratio between capital and total assets (high leverage effect);

2. the small amount of the ratio of liquid assets to total assets, which may condition the sale of profitable assets in order to deal with the payment obligations of the deposits;
3. Large ratio of sight and short-term deposits to total bonds (high potential for mass withdrawal), which will require rapid asset sales to pay deposits.

Banking in a system is also explained by the fact that banks are in close financial relation to one another by attracting resources from one another or placing resources one at the other. Under these circumstances, banks are more susceptible to systemic risk, and the problems of a bank can be easily passed to another bank and so on to other banks in the system. Cumulative negative effects are exacerbated by the fact that bank deposits are the main source of bank resources.

The bankruptcy of a bank that has financial relations with another bank affects the bank's ability to honor its payment obligations, so problems are transmitted from one bank to another.

It should be noted that the banks are interconnected not only by interbank credits or interbank deposits, but also by making or receiving money transfers in the process of interbank settlement of payments with other banks. Due to the fact that these transfers are very common, in a large amount, almost always are processed immediately and are concentrated among a number of participants, the failure of a settlement system participant can lead to postponement of payments and damage to the settlement system. The insolvency of the clearing process of payments can occur if the transfer and receipt of money means is not simultaneous, so these means are allocated before they are received.

Consequently, the credit is transferred from one participant to another. Inter-bank contagion is conditioned by at least the following three situations:

a. when total liquidity is not sufficient;
b. when market expectations create negative effects;
c. when the failure of a bank has negative effects on the other banks in the system.

Surveys on financial crisis contagion show that all channels of transmission of this effect are equally important. However, there are also views that some channels would have a dominant role (whether financial or non-financial). According to specialists, the main channels of transmission of the contagion effect are: international trade in goods and services (the opening of a country to international markets), the transfer of capital through financial markets (international credits, foreign direct investment, foreign portfolio investment) monetary, membership of certain integrationist groups, dependence of fundamental variables (financial and non-financial) between economies.

4. Conclusions

The recent, so costly, balance of banking system failures is the key to preventing recurrences. Banking crises are typically complex and different from one another due to the specific factors, the mode of manifestation and the effects caused.

Because the causal mechanisms are not fully understood, we can appeal to the classification of the characteristic symptoms, namely the crisis syndrome. In this respect, it is important to distinguish between epidemic (contagious) elements from the macro level to the micro-level and between them and the epidemic failure syndrome, especially associated with government interference and the generalization of the inefficiency in the functioning of the entire banking system. Each of these two manifestations of banking crises shows common symptoms with the other, but the review of the characteristics of a significant number of emerging countries cases suggests that these two syndromes are distinct.

In this respect, the IMF and the World Bank have initiated the "Financial Sector Assessment Program" (FSAP), which favored the implementation of unitary methodologies for macro-prudential analysis at member state level.

The purpose of prudential analysis is to limit systemic risk so that its effects are minimal. Greenspan notes on the EDF's objectives: "The second responsibility for ensuring monetary stability is the central bank's ability to use its own authority and expertise to prevent financial crises (including systemic banking disturbances) and to manage such crises once they appear ".

The global crisis has shown how a shock that comes from a distinct country or financial system can quickly spread to other markets. As with a closed economy, the nature of the balance sheets between institutions and financial markets affects size, external effects and the propagation direction. Globally, financial and propagation channels are much more complex. Many of the data needed to identify and track international links are not available and the institutional risk management system at global level is inadequate or simply non-existent.

Thus, we consider that the study of the contagion effect and its assessment is of major importance for the prevention of financial crises and can provide information to decision-makers on how to stop the contaminated process of the system.

References:

1. Ajayi, R. and Mougoue, M., *On the Dynamic*, 11.
2. Eichengreen, B. and Rose, A.K., 1998. *Staying Afloat When the Wind Shifts: External Factors and Emerging-Market Banking Crises*. NBER Working Papers 6370, National Bureau of Economic Research, Inc.
3. Edwards, S., 1999. How Effective are Capital Controls. *Journal of Economic Perspectives*, 13(4), pp.65-84.
4. Friedman, M. and Friedman, R., 2009. *Libertatea de a alege. O declarație personală*, Cap. 3: Anatomia Crizei, *Publica*, pp. 111 - 136.
5. Gerstman, B.B., 1998. *Epidemiology: An Introduction to Classic and Modern Epidemiology*. John Wiley.
6. MacMahon, B. and Trichopoulos, D., 1996. *Epidemiology: Principles and Methods*. Second Edition Little Bown.
7. Mishkin, F., 1991. *Anatomy of a financial crisis*. NBER Working Paper Series, 1991, no. 3934.
8. Mitroff, I., Pauchant, T.C. and Shrivastava, P., 1988. Conceptual and empirical issues in the development of a general theory of crisis management. *Technological Forecasting and Social Change*, 33, pp. 83 – 107.
9. Morin, E., 1976. Pour une crisologie. *Connexions*, 25, pp. 149-163.