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Distribution channels of financial crises in emerging markets

Abstract

This article evaluates the distribution channels of financial crisis of 2008. As an assessment of the crisis is encouraged to use the index of pressure on the financial market (EMP). As a result, estimates using the probit model for developed and developing countries proved to increase in the share of financial distribution channels of financial crisis. For the CIS countries index is calculated pressures in the financial market and assesses the distribution channels of financial crisis.

Keywords

Distribution channels of financial crisis, probit modeling, index of pressure on financial markets, financial crisis, developing countries, CIS countries.

The financial crisis has a negative impact not only on the financial sphere, but on the whole economy. Both developed and developing economic systems face financial crises that "spill over" from one country to another. Channels of contagion are the study objects for domestic and foreign researchers, however, issues related to distribution channels of the last financial crisis of 2008, remain poorly studied. At the same time if the objects of research are often both developing and developed countries in Europe and Asia, CIS countries, are not practically studied. In this study, using an econometric model the distribution channels are estimated for the 2008 financial crisis in developed countries, developing countries and CIS countries.

Economic and financial systems in the world are becoming more integrated due to the rapid expansion of international trade in goods, services and financial assets. Simultaneously with the process of economic integration the level and pace of financial integration are increasing. For all its benefits, financial integration is accompanied by certain costs, since it can lead to increased sensitivity of the countries to financial crises.

Most researchers tend to conclude that the Mexican crisis of 1994/95, the Asian crisis of 1997, as well as the Russian crisis in 1998 spread through certain channels within a short time "flowing" from one country to another. Table 1 provides a brief overview of the research results on key factors and distribution channels of the crisis obtained by foreign authors.

Table 1
The study of distribution channels of financial crises

| Authors | Period | Countries | Channels and factors | Methods of estimation | Main conclusions |
|---|-------------|---|---|-------------------------|---|
| Eichengreen et al. ¹ | 1959-1963 | 20 industrialized countries | Macroeconomic factors | Probit model | The main trading channel and macroeconomic similarities were defined significant |
| Edwards, S. ² | 1992-1998 | Argentina, Chile, Mexico | Short-term interest rates | GARCH | Revealed a sequence of transmission of the trading channel |
| Ahluwalia, P. ³ | 1990-2000 | 19 countries in Latin America, East Asia and others | Macroeconomic factors | OLS model | Studied episodes of Hispanic, Asian and Russian crises, identifies trade and financial channels |
| Cerra, V., & Saxena, S. C. ⁴ | 1985-1998 | Indonesia | Financial market indicators | OLS model, probit model | Financial channel for distributing the crisis was the most significant |
| Нараyasу ⁵ | 1996 - 1998 | Thailand and the Philippines | Interest rates and stock market indexes | Granger causality, VAR | Crisis as a result of the banks integration |

¹ Eichengreen, B., Rose, A., & Wyplosz, C. (1996). Contagious currency crisis. *Scandinavian Economic review*, 98(4), 463-484.

² Edwards, S. (1998). Interest rate volatility, contagion and convergence: an empirical investigation of the cases of Argentina, Chile and Mexico. *Journal of Applied Economics*, 1, 1.

³ Ahluwalia, P. (2000, February). Discriminating contagion: an alternative explanation of contagious currency crises in emerging markets. IMF Working Paper No. WP/00/14. Washington, DC: International Monetary Fund.

⁴ Cerra, V., & Saxena, S. C. (2000). Contagion, monsoons, and domestic turmoil in Indonesia: a case study in the Asian currency crisis. IMF Working Paper No. WP/00/60. Washington, DC: International Monetary Fund.

⁵ Nagayasu, J. (2000). Currency crisis and contagion: evidence from exchange rates and sectoral stock indices of the Philippines and Thailand. IMF Working Paper No. WP/00/39.

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|---|-----------|--|--|--------------|---|
| | | | | | |
| Fasika Haile, Susan Pozo ⁶ | 1960-1998 | 57 developed and developing countries | Macro-economic factors, trade, financial channels, the indicators for crisis early warning | Probit model | The reason for the spread of the crisis is the trade channel, proof of the significance of the crisis early warning indicators in the economy |
| Mironova Y.A. ⁷ | 1998 | 25 countries in Eastern Europe and CIS | Macroeconomic factors, the trade channel | Probit model | The importance of trade channel was revealed, the ways of crisis spread crisis were founded in the CIS |
| Rupa Duttagupta, Paul Cashin ⁸ | 1990-2005 | 50 developed and developing countries | Macroeconomic factors, financial and trade channels | Logit model | Inflation, international reserves, credit growth of the private sector, the banking channel cross-flow crisis were significant at 99% level |

Analyzing Table 1 we note that there is no single conception, which explains the speed and direction of spread of financial crises, as well as channels for their transmission. Every financial crisis has its own distribution channels and its own characteristics depending on region and level of development of various countries. In most cases, it is assumed that the crisis is spreading from a certain "zero" country (the country where the crisis began) to all other countries. "Domino effect" or "cascade effect" occurs when the crisis is passed from one country to another one, and they both have an impact on third country. The main reason for "overflow" of earlier financial crises is the trade channel, and the "domino effect" is confirmed for the 1998 financial crisis. Masson⁹ suggested two general approaches to determining the causes of the spread of financial crises. The first approach explains the spread of crises through trade integration and similarity of

⁶ Fasika Haile, Susan Pozo, Currency crisis contagion and the identification of transmission channels, *International Review of Economics and Finance* 17 (2008) 572–588

⁷ Mironova Y.A. Contagion. Theory and practice in the annex to the 1998 crisis <http://eerc.ru:8088/details/Project.aspx?id=208>

⁸ Rupa Duttagupta, Paul Cashin. Anatomy of banking crises in developing and emerging market countries. *Journal of International Money and Finance* xxx (2010) 1–23

⁹ Masson, P. (1999). Contagion: Macroeconomic models with multiple equilibria. *Journal of International Money and Finance*, 18, 587–602.
Masson, P. (2004). Contagion: Monsoonal effects, spillovers, and jumps between multiple equilibria. In Pierre-Richard Agenor, Marcus Miller, David Vines, & Axel Weber (Eds.), *The Asian financial crises: Causes, contagion and consequences*. Cambridge: Cambridge University Press.

macroeconomic parameters. Crisis "spills over" between the countries during the changes of main macroeconomic indicators.¹⁰ The second approach explains the spread of financial crises on the basis of financial integration, external effects, changes in the behavior of investors or other financial intermediaries. At the same time crisis in one country is the cause of the crisis in other countries without a significant impact on their macroeconomic performance. The crisis spread because of a "market sentiment", or interpretation of economic information by investors. The second approach explains the spread of financial crises on the basis of financial integration, external effects, changes in the behavior of investors or other financial intermediaries. At the same time crisis in one country is the cause of the crisis in other countries without a significant impact on their macroeconomic performance. The crisis spread because of "market sentiment" changing, or because of economic information interpretation by investors.¹¹

1. *Macroeconomic indicators.* "Common shocks in one region can cause the simultaneous occurrence of crises in different countries. Calvo, S., and Reinhart, C. M.¹² consider that the sharp rise in interest rates in the U.S. in early 1980 and 1994 provoked two Mexican crises in 1982 and 1994. A more recent example is the increase of the dollar rate in 1995-1997 and slowing of economic growth in Japan, which together could contribute to the Asian crisis (see Baig, T., & Goldfajn, I¹³).

2. *Trade channel.* Trade relationships explain the spread of financial crises by the price effect (reducing the international competitiveness) and "income

¹⁰ Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious currency crises: First tests. *The Scandinavian Journal of Economics*, 98, 463–484., Gerlach, S., & Smets, F. (1995). Contagious speculative attacks. *European Journal of Political Economy*, 11, 45–63. Goldstein, M. (1998). The Asian financial crisis: Causes, cures, and systemic implications. *Policy analyses in international economics*, Vol. 55. Washington: Institute for International Economics.

¹¹ Calvo, G. A. (2005). Contagion in emerging markets: When wall street is a carrier. In G. Calvo (Ed.), *Emerging capital markets in turmoil: Bad luck or bad policy?* (pp. 313–328). Cambridge: MIT Press. Calvo, G. A., & Mendoza, E. G. (2000). Rational contagion and the globalization of securities markets. *Journal of International Economics*, 51, 79–113. , Kaminsky, G. L., & Reinhart, C. M. (2000). On crises, contagion, and confusion. *Journal of International Economics*, 51, 145–168.

¹² Calvo, S., & Reinhart, C. M. (1996). Capital flows to Latin America: Is there evidence of contagion effects? In G. Calvo, M. Goldstein, & E. Hochreiter (Eds.), *Private capital flows to emerging markets after the Mexican crisis*. Washington, DC: Institute for International Economics.

¹³ Baig, T., & Goldfajn, I. (1999). Financial market contagion in the Asian crisis. *IMF Staff Papers*, 46, 167–195.

effect".¹⁴ When there is a financial crisis in the country, its main trading partners are experiencing negative effects because of loss of competitiveness, and because of reduced demand in the crisis country. Both of these effects, price and income, appear in foreign markets of major trading partners. Negative impact on the spread of the crisis may be exacerbated when there is "domino effect"¹⁵.

3. *Information channel.* If a crisis occurs in one country, investors perceive it as an alarm, believing that other countries will soon also be subjected to this phenomenon¹⁶. Thus, the crisis is spreading among countries due to changing expectations, while there is not always deterioration of economic parameters.

4. *Financial channel.* There are many mechanisms of crisis spread on the financial channel, which is expressed as the integration of the banking sector and in the relationships of stock and currency markets in different countries.

Calvo¹⁷, for example, explained the financial channel of the financial crisis through simulation of asymmetric information in the stock and currency markets¹⁸. According to Calvo's opinion, there are both informed and uninformed investors in the financial market. Currency devaluation and the stock prices fall in one country which can cause financial losses, and informed investors start selling off their assets. In this case, uninformed investors may misinterpret these actions as a sign of return on assets decreasing in the local market, which reduces the value of shares and other financial assets in countries with prosperous macroeconomic environment.

International commercial banks could also face a liquidity problem by providing loans in different regions. When there is deterioration of the quality of loans in one country, banks may try to reduce the risks of its loan portfolio by

¹⁴ Gerlach, S., & Smets, F. (1995). Contagious speculative attacks. *European Journal of Political Economy*, 11, 45–63., Glick, R., & Rose, A. K. (1999). Contagion and trade: Why are currency crises regional? *Journal of International Money and Finance*, 18, 603–617.

¹⁵ Consider three countries: A, B and C. Assume that A and C are major trading partners. In a number of reasons a country's currency depreciates. As a consequence of the "price effect" and the "income effect" in a country subjected to speculative attack. Further, country C will also face a crisis by passing it on trade channels from countries A and B.

¹⁶ Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious currency crises: First tests. *The Scandinavian Journal of Economics*, 98, 463–484. Goldstein, M. (1998). *The Asian financial crisis: Causes, cures, and systemic implications. Policy analyses in international economics*, Vol. 55. Washington: Institute for International Economics.

¹⁷ Calvo, G. A. (2005). Contagion in emerging markets: When wall street is a carrier. In G. Calvo (Ed.), *Emerging capital markets in turmoil: Bad luck or bad policy?* (pp. 313–328). Cambridge: MIT Press.

¹⁸ Valdes, R. (1995). *Emerging markets contagion: Evidence and theory*, documento de trabajo del banco Central de Chile, No. 7.

reducing lending activities in other countries. Kaminsky, G. L., & Reinhart, C. M.¹⁹, as well as Van Rijckeghem, C., & Weder, B.²⁰ call this phenomenon the contribution of the "common lender" in the spread of the crisis.

Given the opportunity to influence the considered channels for distribution of the global financial crisis in 2008, we define the following model to identify the most significant of them:

$$P(C_{it} = 1) = \text{prob}[\beta_0 + \beta \cdot X_{it} + \gamma_1 \text{trade}_{it} + \gamma_2 \text{finance}_{it} + \varepsilon_{it} > 0], \quad (1)$$

where

X_{it} is vector of macroeconomic variables. It includes the growth rate of M2 money supply, commercial (trade) credit, real GDP, the ratio of current account balance to GDP and the unemployment rate and consumer price index.

Trade_{it} represents the trade channel of contagion. In our study, trade channel is represented by two parameters: trade_{it}^1 and trade_{it}^2 . Trade_{it}^1 is calculated as the average sum of exports and imports of country i within period t , and trade_{it}^2 is calculated as the ratio of exports plus imports to GDP of country i within period t .

Finance_{it} reflects the financial channel of contagion. In our model financial channel is represented by three indicators: finance_{it}^1 is calculated as the ratio of direct investment in terms of GDP of country i within period t ; finance_{it}^2 is calculated as a stock yield index of country i within period t ; finance_{it}^3 is calculated as the dynamics of the exchange rate of country i within period t .

The proposed model was estimated for example in OECD countries²¹, developing countries²² CIS countries²³. In the calculations we used quarterly data

¹⁹ Kaminsky, G. L., & Reinhart, C. M. (2000). On crises, contagion, and confusion. *Journal of International Economics*, 51, 145–168.

²⁰ Van Rijckeghem, C., & Weder, B. (2001). Sources of contagion: Is it finance or trade? *Journal of International Economics*, 54, 293–308.

²¹ Australia, Austria, Belgium, Britain, Germany, Holland, Denmark, Greece, Ireland, Italy, Japan, Norway, Portugal, Finland, France, Sweden, Switzerland, Japan.

²² Argentina, Brazil, Israel, Indonesia, Japan, Korea, Latvia, Malaysia, Mexico, New Zealand, Peru, Poland, Romania, Singapore, Slovakia, Slovenia, Thailand, Turkey, Philippines, Sri Lanka, South Africa.

²³ Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Ukraine.

from 1990 to 2010 of International Financial Statistics (IFS) IMF²⁴, as well as data information agency “RosBusinessConsulting”²⁵ for yield calculation of stock indices.

As the research methodology used probit modeling, which is a common method of estimating (see Table 1). Probit modeling is a binary choice model: the parameter $P(C_{it} = 1)$ takes the value 1 if there is a crisis in the country and 0 if there is no crisis. On the one hand the last financial crisis caused by falling U.S. stock indexes began in October 2007, on the other hand - the spread of movements and the crisis in other countries took a certain period (lag time), i.e. crisis in other countries could begin in a few months.

To determine the dates of onset and course of the financial crises in our study, we calculated an index of pressure on the financial market (EMP), which represents a weighted average of exchange rate changes, international reserves and interest rates. Pressure index in the financial market (EMP) is a reliable indicator of the crisis in the economy, the calculation of the index for each country is made by comparing the performance of the country with indicators of the basic country. The basic country in our model the USA is taken as the source of the latest financial crisis.

In the foreign literature different approaches to calculating an index of pressure on the financial market is present. For the first time Girton and Roper suggested²⁶ to calculate this figure in 1977. According to their method of EMP was calculated as the sum of the percentage change in the exchange rate and foreign exchange reserves of the Central Bank: $EMP_t = \Delta e_t + \Delta r_t$. The idea of Girton and Roper was developed by Roper D., Turnovsky S.J.²⁷, who represented the EMP index as a linear combination with unequal weights of the exchange rate

²⁴ We used the following data: line rf (exchange rate, average for period), line 32 (the commercial (trade) credit), line 34 +35 (M2), line 99b (GDP), line 99b.r (real GDP), line 64 (the consumer price index), line 78ALD (current account balance), line 67r (unemployment rate), line 70 DZF (exports of goods and services), line 71 DZF (imports of goods and services), line 79abd (direct outgoing investments), line 79lad (direct inward investment).

²⁵ www.rbc.ru

²⁶ Girton, L., & Roper, D. (1977). A monetary model of exchange market pressure applied to postwar Canadian experience. *American Economic Review*, 67, 537–548

²⁷ Roper D., Turnovsky S.J. (1980). Optimal Exchange Market Intervention in a Simple Stochastic Macro Model. *Canadian Journal of Economics*, Vol. 13, No. 2, 296–309.

and monetary base: $EMP_t = \alpha_1 \Delta e_t + \alpha_2 \Delta b_t$, where Δb_t is a change in the monetary base, α_1 and α_2 are weight changes in the exchange rate and monetary base, respectively. Weymark D.N.²⁸ in 1995 offered the formula for calculating the index pressure:

$EMP_t = \Delta e_t + \eta^d [\Delta d_t^a + (1 - \lambda_t) \Delta r_t]$, where Δe_t is exchange rate change; Δd_t^a is change in commercial credit ; Δr_t is change of the central bank reserves level; η^d is conversion rate; λ_t is the proportion of sterilized foreign exchange intervention in the overall percentage of interventions.

In this paper we use the methodology proposed by Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996)²⁹:

$$EMP_{it} = \frac{1}{\sigma_e} \frac{\Delta e_{it}}{e_{it}} - \frac{1}{\sigma_{res}} \left(\frac{\Delta res_{it}}{res_{it}} - \frac{\Delta res_{ust}}{res_{ust}} \right) + \frac{1}{\sigma_i} (i_{it} - i_{ust}), (2)$$

where e_{it} is the price of U.S. dollar in the currency of country i within period t; σ_e is the standard deviation of the relationship $\left(\frac{\Delta e_{it}}{e_{it}} \right)$; res_{it} is the international currency reserves of the country within period t; σ_{res} the standard deviation of the difference between $\left(\frac{\Delta res_{it}}{res_{it}} \right)$ and $\left(\frac{\Delta res_{ust}}{res_{ust}} \right)$; i_{it} is the annual interest rate of the money market of country within period t; i_{ust} is annual interest rate money of the basic country market in the period t; σ_i is the standard deviation of the difference $(i_{it} - i_{ust})$.

According to the traditional approach, the country's financial market is under pressure, if the EMP index exceeds certain limits, i.e.:

$$\text{Crisis} = \begin{cases} 1, & \text{if } EMP_{it} > \beta \sigma_{EMP} + \mu_{EMP} \\ 0 & \text{in other case} \end{cases} \quad (3)$$

²⁸ Weymark D.N. Estimating Exchange Market Pressure and the Degree of Exchange Market Intervention for Canada. *Journal of International Economics*, 1995, Vol. 39, 273—295.

²⁹ Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious currency crises: First tests. *The Scandinavian Journal of Economics*, 98, 463–484.

where σ_{EMP} is the standard deviation of the pressure index on the financial market; μ_{EMP} is the average value of the index. In other words, the financial crisis occurs when the pressure in the financial market is "abnormally high". The main problem of this methodology lies in finding the boundary, which determines the critical value of the index. Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996)³⁰, for example, proposed as the boundary to use the average value of the index increased by 1.5 standard deviations (the approach used in our study), Kaminsky, G. L., & Reinhart, C. M.³¹ used in their works an average value of the index increased by 3 standard deviations. One of the modern approaches is to find the critical value of the index using the theory of extreme values, based on modeling using the Monte Carlo method.

In our work the data of International Financial Statistics (IFS) and International Monetary Fund is used to calculate the index of pressure on the financial market.

Figure 1 shows the calculated monthly index of EMP for the period from February 1990 through July 2010 for 49 countries (OECD countries, developing countries and CIS countries).

³⁰ Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious currency crises: First tests. *The Scandinavian Journal of Economics*, 98, 463–484.

³¹ Kaminsky, G. L., & Reinhart, C. M. (2000). On crises, contagion, and confusion. *Journal of International Economics*, 51, 145–168.

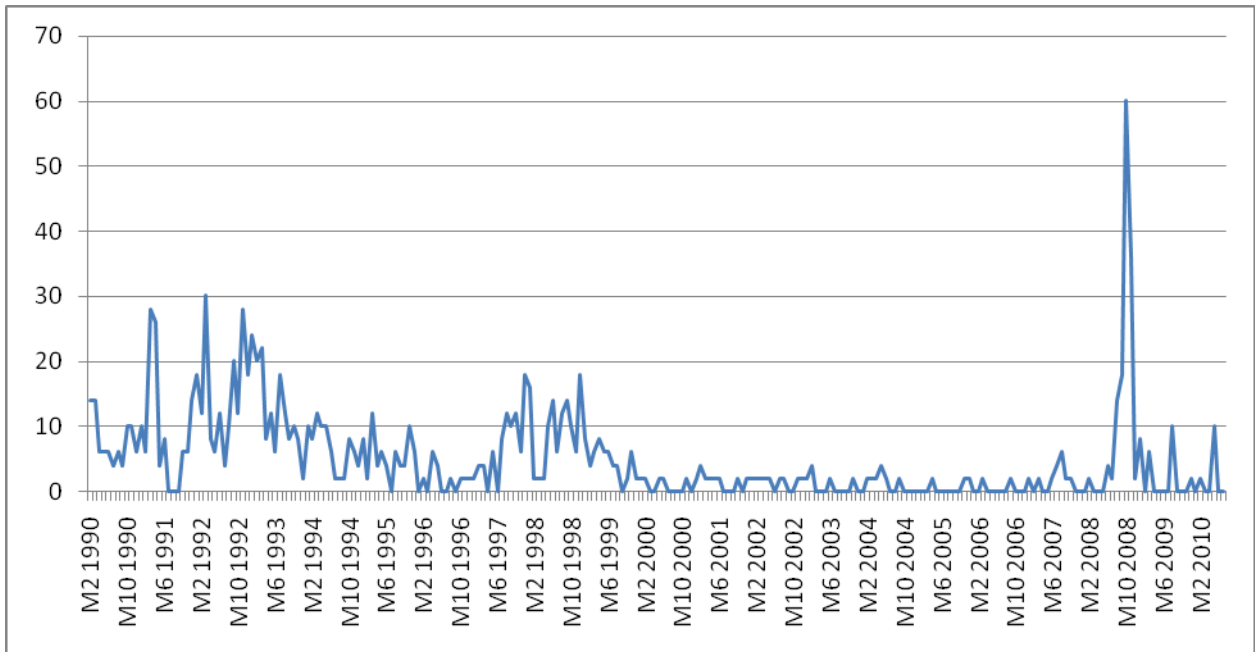


Figure 1. Number of countries facing financial crisis (as a percentage of the total number of the countries): 49 OECD countries, developing countries and the CIS countries

Fig. 1 and Fig. Figure 2 shows the number of countries facing a crisis as a percentage of the total number of countries to be considered. In this case, the graph in Fig. 1 constructed according to the 49 countries, as in Fig. 2 – according to 9 CIS countries. It may be noted the adequacy of the index change of the financial pressure of a crisis in the economy. Most countries are in crisis in 1997/98, 1998/99 as well as in 2008, which corresponds to the Asian financial crisis, Russian financial crisis, as well as the global economic crisis in 2008. In addition, some countries have struck by the crisis in 1994/95, which corresponds to the Mexican crisis of "tequila".

The recent financial crisis in 2008 differs from previous crises by distribution "scale". This crisis includes the largest number of countries: since 1990 60% of the surveyed countries are in crisis in 2008.

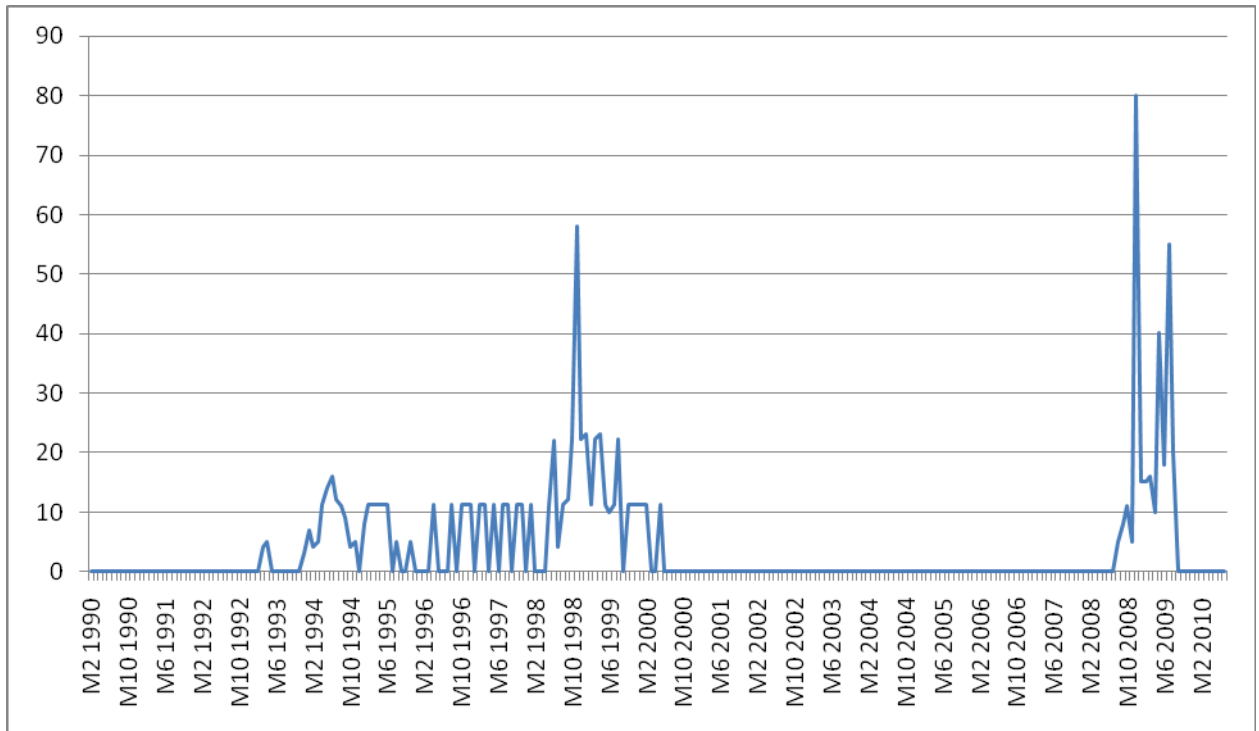


Figure 2. Number of countries facing a currency crisis (as a percentage of the total number of the countries): 9 CIS countries

As for the CIS countries, this region is unique in the sense of the impact that the global financial crisis in 2008 due to the closure of national economies and low integration of the world financial markets, some countries suffered minimally, while the crisis has affected the other countries quite dramatically. Figure 2 shows that 55% to 80% of the CIS countries have experienced pressure on financial markets in late 2008 - the first half of 2009. The lowest values of EMP belong to Azerbaijan, Turkmenistan and Uzbekistan. Russia, Ukraine and Armenia which suffered from the crisis more than other countries in the region.

Thus, the period of financial crisis of 2008 based on the calculated indices was determined. The evaluation panel probit model, compiled from 43 countries are listed in Table. 2, the data is taken for the period from 1990 to 2010.

Table 2
The estimation model (1) results of financial crises distribution channels

| Variables | Estimation |
|-----------|---------------|
| Constant | -2.86 (-5.47) |

| | |
|---------------------------|-------------------------|
| Trade1 | 0.13 (11.22) |
| Trade2 | -0.00 (-0.29) |
| Finance1 | 0.07 (0.38) |
| Finance2 | -1.89 (-3.80)*** |
| Finance3 | -0.00 (-1.06) |
| % of current account/GDP | -0.02 (-0.82) |
| Growth of Domestic credit | 0.01 (0.33) |
| Growth of real GDP | 0.02 (2.33)** |
| Inflation | 0.02 (4.64)*** |
| Growth of M2 | -0.01 (-0.50) |
| Unemployment rate | -0.12 (-4.80)*** |
| Number of observation | 1485 |

Values in parentheses are z-statistics. Critical values of z-statistics at a significance level: *** 1% (2.575) ** 5% (= 1.96) and * 10% (1.654)

The resulting model is generally adequate, since the P-value for the LR-statistic equals 0.0125. The value of coefficient R_{MF}^2 is equal to 0.50123, indicating the presence of a moderate relationships between the explanatory variables and the dependent variable and characterizes the constructed model as adequate. With the help of Jacques-Bera test the hypothesis of normal distribution of residuals is not rejected at a significance level of 0.04. The absence of residual heteroscedasticity confirmed by Harvey test. Akaike and Schwarz statistics are 1.4212 and 2.0854.

Authors of previous studies (Table 1) in the study of the main channels of contagion have come to the conclusion that one of the main channels of contagion is the trade channel, i.e., the crisis is spreading among major trading partners. However, in our study the trade distribution channel proved to be statistically insignificant. Spread of the crisis occurs mainly through financial channels, the reason for this is to strengthen the financial integration of equity markets. Financial markets around the world demonstrate the growing integration both within national borders and beyond, contribute to this liberalization, globalization and information technology. Liberalization in developing countries has led to the abolition of restrictions on pricing on various financial assets, which is one of the preconditions

for financial integration. Technological advances in electronic payments and communication systems have significantly reduced the opportunities for arbitrage between the financial centers, thereby contributing to greater international capital mobility. Benefits of financial integration include the strengthening of macroeconomic stability, efficient allocation of resources, development of entrepreneurship and innovation, but the main disadvantage is that financial integration is the cause of the spread of financial crises.

Thus, the financial markets of developing and developed countries are increasingly integrated into and become one of the most important distribution channels of financial crises. You can also note an increase in the velocity of propagation of the financial crisis through financial channels, if we compare the number of countries in crisis (Figure 1). With the trade channels crisis covers the maximum amount of 30% of the surveyed countries, the crisis of 2008, the number doubled, and covers 60% of countries. Table 2 also evaluated the macroeconomic parameters. Analysis of these indicators allows us to establish that the probability of a crisis increases with the increase in unemployment, with a reduction in GDP growth, higher inflation. These indicators can be used as indicators of the crisis, therefore, timely detection of changes in macroeconomic parameters presented, as well as the government's implementation of an adequate monetary, investment and social policy is imperative to prevent the crisis or reduce its negative effects. Table 3 provides an assessment of distribution channels of financial crises for the countries of CIS. In the absence of data on some of the parameters studied (not all CIS countries have capital markets), these figures were excluded from the model.

Table 3

The evaluation model (1) estimates of distribution channels of financial crises for the CIS countries

| Variables | Estimation |
|---------------------------|-------------------------|
| Constant | 0.67 (1.20) |
| Trade2 | -1.18 (-2.27)** |
| Finance1 | -3.46 (-3.74)*** |
| Finance3 | 0.11 (3.37)*** |
| Growth of real GDP | 0.01 (0.94) |
| Growth of Domestic credit | 0.01 (0.57) |
| Inflation | -0.01 (-0.33) |
| Growth of M2 | -0.06(-2.89)*** |
| Number of observation | 418 |

Values in parentheses are z-statistics. Critical values of z-statistics at a significance level: *** 1% (2.575) ** 5% (= 1.96) and * 10% (1.654)

The value of coefficient R_{MF}^2 is equal to 0.4059, which indicates the presence of a moderate relationships between the explanatory variables and the dependent variable and characterizes the constructed model as adequate. For the CIS countries commercial and financial channels and common macroeconomic parameters were statistically significant.

Most likely to spread the crisis to neighboring countries linked by close trade relations and have low stocks of foreign reserves. Thus, we can say that having reserves can depreciate the pressure on the exchange rate and protect the country from crisis. Also in case of spread of the crisis on trade channel, the country can diversify its trade and / or together to fix their exchange rates to prevent financial crises, leading to loss of international competitiveness. If the distribution of the financial crisis dominates the channel, governments need to apply capital controls. Some researchers believe that in order to balance the financial channels to the interference of such organizations as the World Bank and IMF.

Despite the fact that this study does not offer a rigorous formal econometric or mathematical models to predict the crisis, the results may have practical importance for two reasons. First, they provide a signal about a possible crisis for

several months before its occurrence (using the concept of index EMP). Secondly, they allow you to identify the causes of the crisis and its distribution channels, which can be extremely useful for the development of preventive anti-crisis measures. In addition, the proposed tools can be really effective and useful in a difficulty to access statistical information systems in most CIS countries, which provides a very limited ability to apply rigorous econometric models.

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