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Sinta, Nur

Gadjah Mada University

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# Endogenous and Exogenous Explanations for the Financial Crises in Mexico, SE Asian and Russia

Dr Nur Sinta  
Gadjah Mada University

*ABSTRACT - This paper aims at proving empirically the superiority of an explanation for recent financial crises in emerging countries which combines endogenous and exogenous factors rather than focusing only on one of these two kinds of factors. To this end, empirical analysis on estimates of random effects models for statistics of Fisher is built. Elements of a similar explanation have been made in the context of a particular crisis. This contribution covers the crises (Mexican 1994, Asian 1997 and Russian 1998), thus covering most of the financial crises that took place during the last decade of the twentieth century.*

Since the collapse of the Bretton Woods system, the frequency of financial crises has increased significantly. Over the last decade, these financial turbulences have affected the countries of Southeast Asia and Latin America with particular brutality. Moreover, the financial crises of the nineties seem to differ from those that preceded them in that the fragility of the banking sector appears as one of the first symptoms and no longer - as was the case previously - as the ultimate result of other disorders (Kaminsky and Reinhart, 1996). This banking fragility of emerging countries may have eventually increased the degree of risk aversion of international investors. It was also more likely to lead to a different perception or reassessment by these investors of the risks incurred<sup>1</sup>. In both cases, this has resulted in increased volatility in international capital flows and increased contagiousness of financial crises.

The diversity of triggers of recent crises has revived an old debate: are the crises of the nineties mainly determined by endogenous or exogenous causes to the affected economies? The first diagnosis emphasizes the pre-existing fragility of economies (the fundamentals), while the second emphasizes the role played by complex and varied mechanisms of contagion or propagation.

To answer this question, three econometric specifications summarizing the different possible explanations for the origin of the crises are estimated and compared. Each of these specifications considers an endogenous variable, an index summarizing the degree and intensity of the crisis. To ensure the robustness of our conclusions, several synthetic indices of crises are used. Nevertheless, a binary dependent variable in the estimates in the manner of Frankel and Rose (1996) were not used, because the goal is not to predict the crisis, but rather to explain it from the direct effect of the explanatory variables.

Based on statistical tests of classical nested models and comparisons of model simulations with real values, the specification that best summarizes the observed reality are identified. Whatever the index used to define the crisis, the model with intermingling of endogenous and exogenous factors is maintained.

The stakes in this question are obvious. Depending on the answer, crises can be more or less predictable. They can indeed be more easily predicted if they are mainly of endogenous origin than if they are linked to exogenous factors. Depending on the diagnosis made, the range of countries likely to be contaminated is more or less extensive and also predictable. Finally, the type of response given to this question determines the therapeutics to be put in place to prevent or contain seizures. If financial crises are considered to be mainly related to exogenous causes, global solutions should be favored or, at the very least, strengthened international co-ordination, particularly to reduce excessive exchange rate fluctuations and interest rates. Countries with a high risk of contagion may try to avoid this risk through capital controls.

Conversely, if crises are produced by endogenous causes, then the burden of prevention and crisis resolution lies with the responsibility of the latter: the emerging countries themselves, to whom task of driving the necessary "reorganization", the "interior cleaning", the "*good housekeeping*" of their economy (strengthening prudential control, better macroeconomic management, *etc.*), in order to eliminate these causes of vulnerability.

A possible first diagnosis of the origin of recent financial crises interprets these as the result of the intrinsic fragility of the countries concerned or, in other words, the weakness of their fundamental: excessive government deficit and indebtedness, deficiencies of the banking system, overvaluation of the national currency, depletion of foreign exchange reserves, incompatibility between the macroeconomic policies pursued and the maintenance of a rigid anchoring regime for the national currency.

The poor internal allocation of external flows has also often been invoked to denounce the practice of collecting short-term foreign borrowed resources repayable in foreign currencies and using them to finance long-term loans (real estate loans) in foreign currency. It is easy to understand that this double misalignment (*currency mismatch* and *maturity mismatch*) carries with it the risk of financial difficulties.

In the case of the Asian crisis, the vulnerability of the banking system actually seems to have been "the weak link" of affected economies, which empirically confirms Tatsuyoshi (2000). This alternative perspective of the previous one attributes the main responsibility for recent financial disorders to the extreme volatility of international capital movements and, behind them, to the behavior of international investors.

A common feature of the financial crises of emerging countries in the 1990s is indeed a significant increase in short-term capital inflows during the period preceding the crisis, followed by a sudden reversal of these flows, which has almost always triggered the crisis. For example, private capital flows to emerging countries that had reached 140 billion dollars in 1996 fell to 40 billion in 1997 and are totally dried up the following year bank lending to Asian countries hardest hit by the crisis (Korea, Indonesia, Malaysia, the Philippines and Thailand) contracted sharply from \$49 billion in the first half of 1997 to -39 billion 1997 and -96 billion in bank loans to these countries, which had increased in 1995 by the equivalent of 5.5% of their GDP, decreased in 1997 by the equivalent of 10% of GDP.

The scenario considered here (crisis linked to exogenous causes) implies that the situation of a country contaminated by the crisis is not the determining cause. The transmission of the crisis from one country to another would tend to be effected by "pure contagion" in the sense given to this term

by Masson (1998), that is to say according to complex mechanisms which depend on the basic characteristics of the economies affected.

Another exogenous mechanism explicitly takes into account in this empirical study is the third-party market. The latter also seems to have played an important role during the recent crises in the countries of South-East Asia and Latin America (Kirrane 2017). The logic of pure contagion was theorized by Masson (1998). According to this author, it is a key element in understanding the speed and unpredictability of the crisis propagation process of the nineties.

Masson has shown that a crisis in one country can coordinate and polarize investors' expectations by changing them from one good to the other in a different economy. The mimetic behavior of agents (which is not necessarily irrational), the "flight to quality" (the search for the safest investments when the crisis breaks out in a given country), moral hazard phenomena can explain this particular contagiousness of recent crises.

However, Goldstein and Pauzner (2001) have identified a limitation of this work. Indeed, Masson could not explain by what precise mechanisms the phenomenon of pure contagion takes place. As a result, it is impossible to evaluate the probability of each equilibrium and, consequently, it is not possible to explicitly grasp the "mechanics" of the contagion. To overcome this problem, Goldstein and Pauzner (2001) addressed the case of investors diversifying their portfolios across two countries. The occurrence of a crisis in a country reduces the well-being of these investors and encourages them to rebalance their portfolios in order to manage risk or liquidity (flight to quality). Thus, the probability of a self-fulfilling crisis increases in the second country. Some countries are therefore at risk of hemorrhaging capital unrelated to their basic economic data.

By analogy to this reasoning, a common creditor can also induce a pure contagion effect. Indeed, a currency crisis in a country reduces the ability of domestic borrowers to repay loans that have been granted by foreign banks. In response to a large share of nonperforming receivables, foreign banks rebuild their capital by revoking loans in other countries (Pesenti and Tille, 2000). Similarly, Kumar and Persaud (2001) consider that the increase in risk can lead to pure contagion and that the mechanism of the transmission of this contagion will be through the portfolios of international investors including the financial link of the joint creditor. This mechanism seems to have had some influence in the Asian and Russian crises.

Another source of exogeneity also developed by Masson (1998) under the name of monsoon effect, explains that an apparently innocuous change in the United States, in Europe or in Japan (example: a rise in the interest rate) can provoke a major destabilization of the emerging countries, especially those whose economy is the most open on the outside and most strongly integrated with the international markets of capital external shocks are transmitted to these countries in an amplified way.

This mechanism seems to have played both in 1994 during the Mexican crisis and in 1997 at the time of the Asian crisis. In addition, the rise of the US dollar against the yen since 1994 may have also contributed to the deterioration of the current account balance of these countries (although the appreciation of the dollar is not enough to explain the slowdown in exports). The deep decline in global semiconductor prices in 1996 also contributed to this.

Mechanism highlights the role of trade interdependencies between the crisis country and the contaminated country. Indeed, devaluation following a currency crisis in a country reduces exports and increases imports of trading partners. This chain of commercial and currency contamination is a

well-known traditional mechanism for transmitting the economic difficulties at work in most old and new crises. However, in the same way as that of the common creditor, this mechanism is part of an exogenous determination of the crisis. Indeed, in the countries contaminated by this commercial channel, it is not the vulnerability of the economy that provokes the crisis, but it is the transmission of the crisis that degrades the fundamentals of the contaminated countries.

Obviously, the financial crises of emerging countries are neither exclusively endogenous nor exclusively exogenous. These two categories of crisis factors combine intimately, which - except in special cases - reduced interest in terms interpretations of "responsibility" exclusively national or international.

This idea is not new. In 1996, Sachs and Tornell Velasco (1996) had already defended about the 1994 Mexican crisis showing empirically a certain degree of vulnerability was a prerequisite for understanding the Tequila effect, including an overvalued real exchange rate and excessive growth of bank credit (lending boom), the one and the other associated with a low level of reserves.

Apart from the possibility of fundamentals, either very favorable or frankly unfavorable, there would be a critical intermediate zone characterized by multiple equilibria within which a speculative attack can occur, which can be described as a self-fulfilling the extent to which it results not from a modification of the fundamentals, but from a change in the behavior of the operators. The speculative attack, even if it is difficult to predict, is however not totally random since it results from an earlier fragility of the economy, that is to say from its entry into the risk zone, induced by an earlier degradation of its fundamentals. More generally, the idea of nesting endogenous and exogenous factors can be supported by two complementary arguments.

The explanation of crises by exclusively endogenous factors emphasizes that their eruption or propagation always relies on certain intrinsic weaknesses of the affected economies. However, this explanation has little meaning or interest when it is made *a posteriori*. Any economy whatsoever, be it the most powerful in the world, always has some weaknesses if we study it carefully. When the crisis intervenes without it being planned, including by the rating agencies, its "fundamentalist" reinterpretation *ex post* is akin to reconstruction, justifying anything after the fact.

The above argument also allows us to assert - conversely - that a crisis is deemed to be caused by exogenous factors of origin not because it would be independent of the fundamentals of the country, but because the underlying vulnerabilities of this one were not perceived (or perceived as such) by the agents. The crisis then acts as a "*wake-up call*". For this reason, it seems useless to try to explain recent crises solely by exogenous factors or by exclusively endogenous factors. These two interpretations finally present the same "fragility".

However, these endogenous causes did not act alone. They have been accompanied by other exogenous causes of contagion. In this article, we have considered two of them: the common creditor mechanism and the third party market. Thus, during these three episodes, the contagion would not have been very important if the contaminated savings were not vulnerable. In fact, Sachs *et al.* (1996) found these conclusions for the case of the Mexican crisis in isolation. Tornell (1999) found them in the case of the two Mexican and Asian crises. In our work, we have identified the occurrence of this phenomenon for the three Mexican, Asian and Russian crises. However, in order to ensure the correct economic specification of the model and the consistency of our estimation results, we analyzed the correspondence between the expected and observed values of the crisis index.

To conclude, it can be said that each of the two types of endogenous and exogenous causes has been decisive in the recent financial crises. However, the improvement in the quality of fit and the Fisher tests show that these factors have worked together, intimately combining. In other words, and without discussing the mechanisms of this imbrication, it can be concluded that during the crises we studied, the spread to the contaminated countries was caused by a vulnerability of these economies (insufficient reserves exchange rate in the face of the loss of confidence of investors international banking fragility, overvalued currency which aggravated the situation lack of competitiveness in the third market). This result confirms the idea that was already argued previously (Sandretto 2000).

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