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THEORETICAL AND EMPIRICAL SURVAY OF CONTAGIOUS FINANCIAL CRISES

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ABSTRACT

In this study it is focused on contagious effect of financial crises, which generally refers to the spread of market disturbances from one country to another. The main objective is providing a theoretical framework for the analysis of contagious financial crisis in this study. In order to provide such a framework first of all the concept of financial contagion is defined from different point of views, then the main channels of contagion; namely trade channel, economic integration, financial linkages and asymmetric information channel are presented. Lastly, some empirical applications in the literature of financial economics are explained briefly before the concluding remarks.

Keywords: Contangient Financial Crises, Trade Channel, Financial Linkages,Aasymmetric Information Channel.

ÖZET

Bu çalışmada piyasa aksaklıklarının bir ülkeden diğer ülkeye yayılması olarak anılan finansal krizlerin bulaşma etkisi üzerine odaklanılmıştır. Temel amaç bulaşıcı finansal krizlerin analizi için teorik bir çerçeve önerisi sunmaktır. Böyle bir çerçeve sunmak amacıyla ilk olarak finansal bulaşma kavramı farklı bakış açılarından tanımlanmış ve sonra da ticaret kanalı, ekonomik bütünleşme, finansal bağlantılar ve asimetrik bilgi kanalları ana bulaşma kanalları olarak sunulmuştur. Son olarak, sonuç bölümünden önce finans ekonomisi yazınında bazı deneysel uygulamalar kısaca anlatılmıştır.

Anahtar Kelimeler: Bulaşıcı Fainansal Krizler, Ticaret Kanalı, Finansal Bağlantılar, Asimetrlik Bilgi Kanalı.

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1. Introduction

The emerging market economies have been suffering from systemic financial crises since early 1980s. In the Latin American crises, economists focused on poor domestic policies instead of the systemic diseases and their contagion from one country to another. The term "contagion" was first introduced in Asian financial crises in 1996. Seeing that the financial crisis is beginning from Thailand spread to all other South Asian countries economists realized the importance of financial contagion.

Although financial crises are observed through changes in values of financial variables such as exchange rates, stock prices and interest rates, contagion effects of these crises occures because of several reasons such as trade channel, economic integration, financial linkages, assymeytric information. Within this framework, there are different definitions of contagion effects in the literature. Contagion has been defined in the literature in many different ways but mostly these definitions are based on financial grounds. Contagion, in general, refers to the spread of market disturbances from one country to another which is observed through comovements in financial variables. Contagious effect of financial crises explained in the literature as an increase in correlation of financial variables among different countries during crises.

Contagion linkages become increasingly important in explaining the vulnerability of emerging market economies, because these markets have been liberalized and have more direct access to foreign markets (Nagayasu, 2001, p.530). Considerable researches had investigated whether the crises in both Mexico and Asia in the 1990s resulted in contagion.

In this paper after explaining the concept of contagion in the first section, we gave a picture of the debate on the contagion channels in the second section, and some empirical applications are summarized in the third section.

2. Channels of Contagion

There are several ways in which the economic and financial disturbance of one country can be transmitted to other country, but there is not theoretical consensus on contagion channels through which financial crisis spillover. It is widely believed that strong trade and financial linkages provided a channel for financial contagion. Although it is still a testable hypothesis for Asian crises, many economists believe that, one important factor that may have had spread the crisis from Thailand to other countries in the region are the strong trade and financial linkages.

Common shocks are also important factors that may affect exchange rates or stock markets of several countries simultaneously. This could be a reaction of either a sharp decline in world aggregate demand or significant changes in commodity prices or large changes in exchange rates between major currencies (Khalid & Kawai, 2003, p.135).

On the other hand different measurements and methodologies can make different channels significant. Channels of contagion significantly depend on the characteristic of the crisis which measured and defined by different financial variables. When crises are measured by changes in sovereign bond spreads, financial competition becomes most significant factor to explain financial contagion. Whereas, when crises are measured by stock market returns, trade links and geographical factors appear to be relevant contagion channels (Hernandez & Valde, 2001, p. 203).

For example while trade links and geographical closeness appear to be relevant contagion channels during both the Thai and Brazilian crises in the case of the Russian crisis, financial competition is the only relevant contagion channel. However, there is a strong consensus among economists about that the main contagion channels are trade channel, financial linkages, economic integration and assymeytric information.

2.1. Trade Channel

One of the theoretically acceptable explanations of financial contagion channel is the strong trade relations among countries which spreads currency devaluation from one country to another. A study about 20 industrial economies from 1959 through 1993 shows that contagion is more likely to spread through trade linkages than through macroeconomic similarities(Eichengreen, Rose and Wyplotz, 1996, p. 37). Another research for 161 countries demonstrated that, trade linkages are important factors for contagion of crises and also these crises are regional rather than global because trade is more intraregional than international (Glick & Rose, 1998).

There are two types of trade links which create contagious effect of financial crises among countries. The most obvious one is bilateral trade among infected country and the other countries. Due to the geographic closeness trade patterns are generally regional and countries in same region tend to export and import each other. Through the trade channel among tarde partners,

instant effect of currency devaluation will be simultaneous and corresponding devaluation in another country. Otherwise when prices are sticky, a nominal devaluation would deliver a real exchange rate pricing advantage, at least in the short run. That is, countries lose competitiveness when their trading partners devalue.

The second type of link is more difficult to quantify, which involves competition in a common third market. For the countries in Asia and Latin America, identifying a common third party is not difficult. The United States' most important trade partners are Latin American countries and Japan's one are Asian countries. However this is not the case for all other countries. The case for third-party trade links is much more compelling for some of the Asian countries. Malaysia and Korea, in particular, export many of the same goods to the same third parties. This leaves Indonesia largely unexplained.

Third party trade also does not appear to account for the Tequila effects on Argentina and Brazil, whose exports have little in common with Mexican exports (Kaminsky & Reinhard, 2000, p.161).

Additional contagious effect of competitive devaluations appears in the financial instruments such as asset prices among trade partners or trade competitor countries. In consequence of devaluation in a trading partner or trade competitor country, the other country will devalue its currency in order to safeguard its own competitiveness. Anticipating this decision, investors would decrease the demand for that country's assets. This will trigger the financail crisis and, in this process additional pressure appears to validate investors' own expectations which lead the crisis through a self-fulfilling path.

2.2. Economic Integration and Financial Linkages

Through the economic integration which containes trade and financial linkages, a financial crisis in one country may procreate direct financial effects, such as reductions in trade credits, foreign direct investment, and other capital flows abroad. The spread of a crisis depends on the degree of financial market integration. Financial linkages cause contagion by direct financial linkages, financial market institutional practices, foreign investors' liquidity problems, and information asymmetries and herd behavior (Hernandez & Valde, 2001, p.206).

(i) Direct financial linkages refer to direct cross-country investments which tie corporate and financial sector returns.

(ii) Financial market practices refer to institutional arrangements whereby countries are treated as complementary assets and fund managers use simple ''rules of thumb.'' In this setting, a negative shock in a particular country generates less demand for the assets of other countries. One simple transmission mechanism arises when fund managers maintain fixed weights in different countries. Hence, after the stock market drops in a particular country, managers will pull resources out from other countries in order to rebalance their portfolios. A more complex transmission mechanism arises when fund managers hedge risks using countries whose returns are correlated with those that are being hedged.

(iii) If an emerging market financial claims are illiquid and bad news from a particular country, measured by a lower probability of repayment, generates a higher probability of a run against other emerging markets and, therefore, a lower probability of repayment in these other countries. Other theories include the behavior of open-end mutual funds and hedge funds, which after suffering a shock sell off securities in other countries in order to raise funds to finance redemptions by investors who decide to withdraw from the fund.

(iv) Particularly, after a crisis, fund managers need to sell securities to finance possible redemptions by investors. However, in the process of selling ''good'' countries, the market penalizes them because of the well-known ''lemon problem.'' Herd behavior, in turn, can be explained by the practice that fund managers' performance is compared to market performance and, therefore, it is very risky for them to deviate from what other managers do, even if the latter follow wrong investment strategies.

2.3. Asymmetric Information Channel

Another cause of contagion relates to imperfect information and differences in investor expectations. In the absence of better information, investors may believe that a financial crisis in one country could lead to similar crises in other countries. A crisis in one country may then induce an attack on the currencies of other countries in which conditions are similar (Dornbush, Park & Cleassens, 2000, p.184). In particular, it is assumed that agents have complete information about their environment. Incomplete information may create another channel for contagion. If a shock in one region serves as a signal predicting a shock in another region, then a crisis in one region may create a self-fulfilling

expectation of a crisis in another region (Franklin & Gale, 2000, p.2)

First of all, contagion would appear as countries with bad fundamentals are suffering from common negative shocks. Secondly, because of incomplete information, investors suppose that all countries are in same situation as infected country. Thus due to an information spillover against countries in a similar situation, investors may draw back their investments from those countries expecting that the same problem will arise there as well (Hernandez & Valde, 2001, p. 205).

More transparency may worsen contagion from A to B; when A suffers from a fundamentals driven crisis. On the other hand, it makes beliefs driven crises less contagious (Changa&Majnonib, 2002, p. 808). Consequently because of the skepticism of the investors more transparency will not eliminate contagion. Rather, it changes the way contagion takes place, making some kinds of crises more contagious than others.

3. Empirical Survay

In a study Mina, McDonald and Chounga (2003) investigated the capital market risk among six Asian countries, utilizing time-varying conditional variances, to test the direction of contagion from one country to another. They also verified bidirectional causality by using multivariate Granger-causality tests. They found the significance probability of multiple Granger-causality tests of capital market risk among six Asian countries. They demonstrated that Korea, Malaysia and Indonesia all experienced a sudden increase in capital-market risk in 1997 with little volatility during the previous period. The resulting hypothesis—that these countries might have been affected by Thailand's capital-market risk—is confirmed by the multiple Granger-causality test results. However capital-market risk of Thailand is Granger-caused by the capital-market risk of Korea and Indonesia. The capital-market risk of Indonesia transmitted from Thailand Granger-caused to the capital-market risk of Malaysia and Korea. There is also evidence of bi-directional Granger causality for Indonesia and Korea as well as for Malaysia and Korea. These estimation results are also consistent with the chronology of the Asian crisis (Mina, Mc Donald and Chounga, 2003, p.180-1).

In order to analyze the relationship between exchange rates and stock price indices, Nagayasu (2001) focused on causality among these variables using the method developed by Granger. Also the robustness of his findings from this test is examined using the threshold auto-regression. Under the fixed exchange rate regime, the causality analysis may not provide accurate information but the existence of fluctuation in the currencies, although to a limited degree, provides some justification for conducting the causality test in a pre-crisis period.

In addition, the causality between the Philippines' currency, the peso, the Thai benchmark stock price indices, and the Thai sectoral stock price indices analyzed. There was no clear evidence of trading sector variables Granger-causing the peso. This may be consistent partly with the fact that Thailand is not a major trading partner of the Philippines and thus deterioration in the Thai trading sector may not have affected directly its counterpart in the Philippines. The results of this analysis, therefore, raise some evidence that Thai financial problems seem to have transmitted to the Philippines via the financial market linkages. The robustness of these findings is also examined using the threshold auto-regressive model that accounts for the heterogeneous effects of stock prices on the exchange rate movements. For the Philippines, the Thai banking stock is also found to be statistically significant. In all cases, the current and lagged exchange rates are found to be highly correlated. However, all other variables such as those related to the trading sector, are not found to be statistically significant and are not included in the final estimations (Nagayasu, 2001, p.537).

In contrast with the study described above, Khalid and Masahiro (2003) did not find any evidence for the Thailand baht to be affected by other regional currencies. Similarly, the data does not support that the Thailand baht influenced other regional currencies. These results provided only a weak support to the much talked about currency contagion in the Asian market as the main source of spread of crisis from the Thai baht to other currencies. Contrarily, these results do not provide any empirical support that the Thai baht was the source of crisis for any currency in the region. This off-course is a very strong result. The results for the stock market and for the interest rate market are not different and they only provide a weak support for regional contagion (Khalid & Kavai, 2003, p. 143). However Khalid and Masahiro (2003) do not reject contagion altogether as a source of turmoil in the regional markets altogether. These results suggest only a weak support for contagion. They extend this research by incorporating, exchange rates, stock price indices and interest rates, using daily observations to study the financial contagion. They used Vector Autoregression method and impulse response analysis to identify both the

cross-country, cross-market and cross-country–cross-market contagion during the crises period to further investigate the issue of contagion. Unfortunatelly the results did not provide a strong support for a contagion case (Khalid & Kavai, 2003, p.131).

Chen, Firth and Rui (2002) investigated the dynamic interdependence of the major stock markets in Latin America. Using data from 1995 to 2000, the stock market prices of Argentina, Brazil, Chile, Colombia, Mexico and Venezuela are examined. The index level series were non-stationary and so cointegration analysis and error correction vector autoregressions (VAR) techniques are employed in order to model the interdependencies. Fluctuations in market prices in Mexico explain movements in all other markets except Colombia. Decomposition of the forecast error variances shows that for Argentina, Chile and Mexico, a large proportion of the stock market index variance is attributable to shocks from foreign stock markets within Latin America. Results of this study suggest that the potential for diversifying risk by investing in different Latin American markets is limited (Chen, Firth and Rui, 2002, p.1113).

Edwards and Susmel (2001) used weekly stock market data for a group of Latin American and Asian countries to analyze the behavior of volatility through time. They are particularly interested in understanding whether periods of high volatility are correlated across countries by employing both on univariate and bivariate switching volatility models. Their analysis departs from other works in the area in that they also use a multivariate extension of the SWARCH model to explore whether there are co-movements in stock market volatility across countries. Results do not rely on the correlation coefficients, but on the codependence of volatility regimes. The results indicate that high-volatility episodes are, in general, shortlived, lasting from two to twelve weeks. They find strong evidence of volatility co-movements across countries, especially among the Mercosur countries (Edwards & Susmel, 2001, p.1).

Bekaert, Harvey and Ng (2003) present a two-factor asset pricing model and define contagion as correlation among the model residuals. Their research takes, as a starting point, a two factor model with time-varying betas that accommodates various degrees of market integration between different markets. This model is applied to stock returns in three different regions: Europe, South-East Asia, and Latin America. In addition to providing new insights on contagion during crisis periods, they document patterns through time in world and regional market integration and measure the proportion of volatility driven by global, regional, and local factors. Econometric results showed that there is no evidence of additional contagion caused by Mexican crisis. However findings were econometrically significant for Asian countries during the crisis (Bekaert, Harvey and Ng, 2003, p.17).

Hashimoto and Ito (2002), using daily data during the period of Asian Currency Crises, examined highfrequency contagion effects among Asian six countries. By identifying the "origin" (of exchange rate depreciation, or decline in stock prices) and the "affected" (currencies, or stock prices) in spillover relationship, Indonesia and Korea are found to be the two main origin countries, affecting exchange rates and stock prices of other countries. Evidence of high-frequency crisis spillover from Thailand to other countries was weak at best. A positive relationship between trade link indices and the contagion coefficients is found, implying that the bilateral trade linkage is an important factor for currency market participants to expect which currency should be affected within days of an original a shock in the exchange rate of a particular country. As a result they find evidence of statistically significant high-frequency contagion among Asian countries in both the exchange rate and the stock prices. In addition the spillover effect in stock markets has been intensified after the crisis in most of the Asian countries (Hashimoto and Ito 2002, p.2). High-frequency spillover effect is tied to the international trade channel. This implies that the bilateral trade linkage is an important variable in transmitting financial pressures across international borders.

4. Conclusion

After the experiences of the 1996 Asian financial crises the contagious financial crises became one of the main research areas for financial economists. Seeing that the financial crisis beginning from Thailand spread to all other South Asian countries economists realized the importance of financial contagion. In our opinion growing international financial integration, trade liberalization and regional economic integarions in general economic globalization during last decades is the main reason of the appearance of contagious effects of financial crises.

Although economists put different importances on the different contagion channels and financial crises are observed in many different forms of changes in values of financial variables such as exchange rates, stock prices and interest rates, economists have reached consensus on that the trade channel, financial linkages,

economic integration and assyimetric information channel are the main channels of contagion.

Contagious effects of financial crises are examined also in the empirical sense within quite large amount of studies. Although many different econometric techniques are used in these researches, findings were quite commonly supporting the contagious effects of financial crises.

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