

The impact of financial crises in Asean countries: A Structural Var model

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Abstract

This article focuses on the reaction of the Asean economies to international financial shocks. The crises in emerging markets at the end of the last century underlined the significant vulnerability of the Asean emerging economies to international financial fluctuations and a lack of sustainability in their exchange rate regime. A Structural VAR model is used to analyze the efficiency of the measures adopted by these countries after this episode of crisis in order to protect their economies against speculative attacks. The results reveal that the impact of the recent subprime crisis on emerging Asean countries is less significant than that observed in industrialized ones.

JEL Classification: C32, F42, G15.

Keywords: Asean countries, contemporaneous restrictions, emerging and industrialized economies, international financial crises, Structural VAR Model.

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1. Introduction

The last decade has been characterized by the development of many trade areas in Europe (EMU, EU, Cefta), Latin America (Mercosur) and Asia (Asean). More precisely, during this period, many emerging countries have opened their economy to international trade in order to benefit from the growth opportunities due to economic integration. Then, different economic blocks appeared during the nineties. Today, they have reinforced their commercial and financial links to form common markets, which correspond to the third stage of the Balassa (1961) classification, and they seek to adopt a common currency to form a monetary union. The main problem linked to this type of monetary integration is due to external asymmetric shocks whereas the countries have left their national interest rate and exchange rate as instruments of adjustment in case of shocks (Flood, 1979). This problem is particularly significant in emerging markets (Edwards, 2006). The main condition to adopt a sustainable monetary union is the ability of the countries to resist these shocks. The respect of the traditional criteria of the Optimal Currency Areas theory (Mundell, 1961, McKinnon, 1963, Kenen, 1969) is not sufficient today to protect the countries against exogenous fluctuations. It is important to consider the international changes that have taken place since this period. More precisely, the recent crises in emerging markets have underlined the fact that it is important to enlarge the concept of sustainability. In addition to the lasting stability of economic fundamentals, it is essential to consider the strength of the banking and financial sectors of the country and the risk of illiquidity in a context of information asymmetry. That would help to avoid speculative attacks and the spread of financial shocks between countries in a same block in period of international crisis (Corsetti *and al.*, 1999, Chang *and al.*, 2000, Gimet, 2007). But the several financial crises that occurred in emerging markets at the end of the last century - in Asia in 1998-1997, in Latin America in 1994, 1999, 2001 and in Eastern Europe in 1998 and 2001 - have highlighted the inability of these countries to adopt this common exchange rate solution. In general, the crisis had harmful effects on all the countries of the region where it occurred and sometimes infected more distant regions. For example, a “fast and furious” episode of contagion followed the Thai crisis (Kaminsky *and al.*, 2003). Most emerging countries that adopted a fixed or quasi-fixed exchange rate have been forced to let their currency float.

But, today, it seems that emerging markets have drawn some lessons from these crises and have reinforced their structures to protect their banking and financial sectors from international fluctuations and speculative attacks. In fact, the subprime crisis, which was born in the United States in July 2007, seems to have spillover effects on the banking and financial sectors of Western European countries and Japan and less significant impact on emerging markets. Therefore, it is extremely interesting to analyze the different effects of these crises on countries into a same commercial area according to their economic characteristics (industrialized or emerging) and during different episodes of crises. More precisely, the purpose of this article is to underline the progress of the emerging countries since the nineties crises episode and their ability to resist the subprime crisis and to draw some conclusions concerning their ability to adopt, in the future, a monetary union. The study is concentrated on the case of the Asean (Association of Southeast Asian Nations) +3 countries¹. Two reasons justify this choice. First, this is one of the regions which was the most hit by financial crises at the end of the last decade; it is interesting to analyze the evolution of the different countries in

¹ Brunei Darussalam (1984), Cambodia (1999), Indonesia (1967), Laos (1997), Malaysia (1967), Myanmar (1997), Philippines (1967), Singapore (1967), Thailand (1967), Vietnam (1995) + China, Japan and South Korea (1997).

their ability to stabilize their banking and financial sectors, in order to guarantee the confidence of international lenders. Second, this commercial block is constituted by industrialized and emerging economies; therefore it is important to compare the fullness and the duration of the shock due to different crises episodes according to the economic characteristics of these countries.

Many econometric instruments can be used to measure the vulnerability of countries to an external shock; in particular the Vector Auto-Regression (VAR) models (Calvo *and al.*, 2000; Bordo *and al.*, 2006). But the Structural Auto-Regression methodology (SVAR) seems to be more precise because it allows imposing identifying restrictions on relationships between the variables of the model, in reference to the economic theory; it allows to include real and nominal variables and ensures a better interpretation of the results.

A second section deals with the choice of the method, sample and variables used in our analysis. In a third section, the results obtained are analyzed before concluding.

2. An empirical analysis

The structural VAR model

The representation of the reduced form of the vector auto-regression model VAR(q) is:

$$\Delta Y_t = \sum_{i=1}^q A_i \Delta Y_{t-i} + e_t \quad (1)$$

Where q is the number of lags, e_t is a white noise.

L is the lag operator which corresponds to $L\Delta Y_t = \Delta Y_{t-1}$. Then, the VAR(q) model can be written as:

$$A(L)\Delta Y_t = e_t \quad (2)$$

In order to obtain the shock response functions and the forecast error variance decomposition, it is necessary to write the process on the Moving Average infinite structural form. An intermediate step consists in “reversing” the canonical VAR model according to the Wold Theorem in order to obtain its moving average form:

$$\Delta Y_t = \sum_{j=0}^{\infty} C_j e_{t-j} = C(L)e_t \quad (3)$$

where e_t represents the vector of canonical innovations.

Then, the structural Moving Average representation is:

$$\Delta Y_t = \sum_{j=0}^{\infty} \Theta_j \varepsilon_{t-j} = \Theta(L)\varepsilon_t \quad (4)$$

$$\text{with} \quad e_t = P\varepsilon_t \quad (5)$$

where P is a invertible matrix $n \times n$ which have to be estimated in order to identify the structural shocks. The short-run constraints are imposed directly on P and correspond to some elements of the matrix set to zero. The Θ_j matrix represents the response functions to shocks ε_t of the elements of ΔY_t . The different structural shocks are supposed to be non-correlated and to have a unitary variance:

$$E(\varepsilon_t, \varepsilon_t^T) = I_n \quad (6)$$

Ω is the variance-covariance matrix of the canonical innovations e_t , then :

$$E(e_t, e_t^T) = PE(\varepsilon_t, \varepsilon_t^T)P^T = PP^T = \Omega \quad (7)$$

The no long-run response of certain variables ΔY_t to the shocks ε corresponds to dynamic long run multiplier set to zero.

The choice of variable

Our study is based on Asean+3 countries² on the period 1990M1-2008M5. This one is divided into two sub-periods³ which correspond to the two different episodes of crisis that hit the Asean countries: the Thai crisis in 1997-1998 and the subprime crisis in 2007-2009. For each crisis episode the purpose is to measure the reaction of Asean countries to this international disturbance and to make comparisons between the periods and the countries.

The variables are selected in order to see the impact of the financial international shock on the economic, monetary and financial sectors of the countries. If it hits only the financial sphere and involves only a small outflow of capital, we can conclude that the harmful consequences of the international disturbance are limited. But, if the shock is propagated into the real sector and induces a reaction of the monetary authorities in order to stabilize the economies, all the sectors are weakened and the time necessary to eliminate the negative impact of the crisis is going to be long.

In our model, each Asean economy is described by the following vector of endogenous variables:

$$Y = \begin{pmatrix} \text{external} \\ y \\ \text{ner} \\ \text{fa} \\ r \end{pmatrix}$$

² Because of the availability of data our sample is only constituted by 8 countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, China, Japan, South Korea.

³ 1990M1-1999M12 and 2000M1-2008M5.

The external disturbances (*external*) retained in order to represent the different crisis episodes are a positive shock of the composite stock exchange index of emerging markets (*MSCI*)⁴ in the first part of the analysis, and a positive shock of the variation of the stock exchange index of the United States (*SP*)⁵ in the second part of the study. The purpose of the paper is to study the impact of the international crisis revealed by extreme fluctuations on financial markets. Consequently, the volatility of these indexes has to be measured. We used a GARCH model that gives the conditional variance of these variables from which the standard deviation is deduced. y is industrial production, ner is the nominal exchange rate (units of foreign currency for one unit of US Dollar)⁶, fa is the share of foreign assets held by the central bank and r is the nominal interest rate. The succession of the variables has been chosen in order to make possible the introduction of the restrictions.

The variables are used in logarithm, except the interest rate. They are seasonally adjusted. It is not necessary to test the stationnarity and the cointegration of the variables of the model, in following the postulate of Sims (1988), Sims *and al.* (1991) because a Bayesian inference is used and then the model is not affected by the presence of a unit roots.

The variables chosen are traditionally used in the literature on structural VAR in order to simplify the identification of the model with the inclusion of restrictions generally employed in SVAR reference studies. However, some of them have been inspired by the recent financial crisis theory. Then, the variables y , ner and r can be found in the studies concerning the impact of monetary fluctuations on economic cycles that underline the role of the exchange rate in the spread of the shock (Cushman *and al.*, 1997, Kim *and al.*, 2000, Canova, 2005, Mackowiak, 2007). The decomposition between supply and demand shocks follows the postulate of Gali (1992), Cushman *and al.* (1997) which is based on an ISLM model. Besides, the literature on “third generation of crisis” has recently underlined the necessity to consider the illiquidity risk of the country in the spread of the crisis and then, the role of international reserves in a national economy (Corsetti *and al.*, 1999, Chang *and al.*, 2000). Finally, the importance of taking into account the vulnerability of emerging markets to international fluctuations has been demonstrated by Canova (2005), Mackowiak (2007).

The main contribution in this analysis is the inclusion of the two variables of stock exchange volatility. This choice is inspired by the recent mechanism of financial contagion during crisis episodes in economies whose banking system is vulnerable, and illiquidity risk is significant. In fact, the loss of confidence of international lenders after a crisis in a country can generate a portfolio reallocation of these investors in order to limit their exposition to the risk. This situation is at the origin of an important outflow of capital from economies which have the same characteristics as the first country hit by the crisis (Calvo, 1999, Kaminsky *and al.*, 1999, Kodres *and al.*, 2002). The international reserves decrease and the monetary authority can increase the interest rate which can create a reduction in the economic growth.

Consequently the structural disturbances vector linked to each variable is:

⁴ The MSCI emerging markets index is drawn from *Morgan Stanley Capital International database*. It is composed by 24 emerging market country indices. It is a float-adjusted market capitalization index. It allows measuring the equity market performance of emerging markets.

⁵ The S&P500 index includes 500 largest US industrial companies quoted. It covers more than 75% of the US equity market.

⁶ We can notice that we use a Bayesian inference. So, in that case, it is not necessary to test the stationnarity and the cointegration of the variables of the model, in following the postulate of Sims (1988), Sims *and al.* (1991) because a Bayesian inference is used and then the model is not affected by the presence of a unit roots.

$$\boldsymbol{\varepsilon}_t = \begin{pmatrix} \boldsymbol{\varepsilon}_{ext} \\ \boldsymbol{\varepsilon}_s \\ \boldsymbol{\varepsilon}_{fi} \\ \boldsymbol{\varepsilon}_{ner} \\ \boldsymbol{\varepsilon}_{ms} \end{pmatrix}$$

Where $\boldsymbol{\varepsilon}_{ext}$, $\boldsymbol{\varepsilon}_s$, $\boldsymbol{\varepsilon}_{fi}$, $\boldsymbol{\varepsilon}_{ner}$, $\boldsymbol{\varepsilon}_{ms}$ represent respectively the external shock, that is to say a crisis in emerging markets or a crisis in the United States economy, a real supply shock, a shock in the nominal exchange rate, a financial shock, and a monetary supply shock.

The contemporaneous restrictions

The purpose of the study is to analyze the response of the economies to financial shocks in the short term. So, the period of analysis concerning the impact of the disturbances is reduced to 12 months. Then, we impose only contemporaneous restrictions in our model and we use the Bayesian procedure proposed by Sims *and al.* (1995, 1999)⁷.

Our objective is to identify the n^2 elements of the P matrix. The Ω matrix is symmetric, then $n(n+1)/2$ orthogonalization constraints are already imposed. It is necessary to determine the $n(n-1)/2$ remaining constraints; 10 in our model.

We have chosen to impose 11 short term restrictions in reference to the economic literature. Then the model is over-identified.

First, we consider that the external variables (*MSCI* and *SP*) are exogenous (Cushman *and al.*, 1997, Mackowiak, 2007). Secondly, we follow the postulate of the authors who considered that the function of reaction of the monetary authority, that is to say the interest rate, does not react immediately to a shock in price and production. Then, we suppose that the response of the monetary policy to these shocks and to financial disturbances⁸ is postponed to a month because of information delays (Sims *and al.*, 1995, 1999, Kim *and al.*, 2000). Finally, the hypothesis of a lag in the response of the economic activity to international and national financial disturbances and to monetary shock is retained (Kim *and al.*, 2000).

Then:

$$P_{12} = P_{13} = P_{14} = P_{15} = 0$$

$$P_{21} = P_{23} = P_{24} = P_{25} = 0$$

$$P_{51} = P_{52} = P_{54} = 0$$

⁷ We used MONTEZHA.PRG Rats procedure that corresponds to Sims-Zha's approach for overidentified structural VAR.

⁸ National and international.

Following the information criteria of Schwartz, Akaike and Hannan-Quinn, four lags have been retained for all models. Although, complementary tests underlined the absence of autocorrelation in the residuals⁹

The model is now identified. We can report, in the following section, the empirical results.

3. The results

The exchange rate regime of the countries is an important parameter to take into consideration as it influences the orientation of the economic policies and then their responses to a common shock. Over the periods of analysis, according to a *de facto* classification¹⁰, China is the only country that maintained a perfect fixed exchange rate with a peg to US \$ until 2005 and then adopted a crawling peg. Some countries of the region knew an intermediate regime before 1997 (Indonesia, Malaysia and Thailand) but they, except for Malaysia, decided to let their currency float after the Asian crisis. The other countries of the region have chosen either independently or managed floating regimes since 1990 (Japan, Korea, Philippines and Singapore). However, it is important to note that during the second period of analysis, Japan and Singapore are the only countries of the sample that have not used inflation or monetary target.

We can suppose that the responses of the economies to a common financial shock would be divergent in the first period of analysis; many economic differences existed between developed and emerging countries and they had diverse exchange rate regimes. But after the Asian crisis, we can expect a better convergence in the reaction of countries for three main reasons: first, most of them have adopted a floating regime; second, most of them have been hurt by the Asian crisis and they have taken different measures to protect their economy against short term capital flows; finally, all of them have decided to cooperate in order to reduce the risk of financial crisis with the implementation of the Chang Mai Initiative¹¹. The main objective is to reinforce regional financial surveillance, and to develop some mechanisms of assistance in case of financial difficulties and lack of liquidities in a country of the region (development of bilateral swaps and repurchase agreement facilities in addition to expansion of ASEAN regional Swap Arrangement). Moreover, the financial integration of the Asean+3 countries was strengthened in 2003 with the Asian Bond Market Initiative which aims to develop regional liquid bond markets.

The graphics, in appendix A, show the reaction of domestic variables after a one-standard-deviation positive variation of the external variable. They reveal the significance level of the results.

The vulnerability of the Asean economies at the end of the last century

First of all, we concentrate on the period 1990M1-1999M12 and we study the responses of Asean economies to a shock of volatility on composite stock exchange index of emerging markets (*MSCI*) (Appendix A, figures 1 to 8). This shock generates an immediate loss in

⁹ Complete and detailed information concerning the tests and their results is available on request.

¹⁰ Bubula, A., Ötker-Robe, I., 2002, "The evolution of Exchange Rate Regimes since 1990: Evidence from De Facto Policies", IMF Working Paper, 155.

IMF, *Annual Report on Exchange Arrangements and Exchange Restrictions, 1990-2008*.

¹¹ May 6, 2000, Chiang Mai, Thailand.

international investors' confidence, particularly significant in Thailand, in Indonesia and in Malaysia which known a significant capital outflow (fa). In the developed countries the situation is opposite because, in the nineties, they were the principal creditors of the Asean developing economies; in order to limit their exposition to the risk on international markets, they massively removed their investments in short-term capitals from these countries. Consequently, after a few months, their reserves increased. The impact on China's capital flows is not significant, because during the nineties, the financial openness of the country is limited and the outflow of capitals is controlled. This phenomenon is at the origin of a depreciation of the nominal exchange rate in the short term in all emerging countries of the region (ner), except China which exchange rate stayed peg to the US\$. We can notice a small devaluation in the medium term in Singapore, which can be explained by an intervention of the Monetary Authority in this sense. Moreover, in the short term Japan which exported 40% of its products to Asean countries knew a short decrease in its growth rate and a temporary depreciation of its money. But it was one of the world's largest holders of currency reserves at the time and the situation was reestablished quickly. In order to limit the negative effects of this shock, the central bank of all countries of the region increased the nominal interest rate during the first months following the crisis (r). On that point a small difference exists between countries with fixed and floating exchange rate. The countries that were dependant to the monetary policy of United States knew a less pronounced variation of their interest rate. They were influenced by the decrease in the US interest rate which aimed to stimulate the domestic economic growth. Finally, the increase in the interest rate level and/or the decrease of international reserves in the countries were at the origin of a decline in production in the entire region, more pronoune in emerging markets (y).

During this period, a shock of volatility of the composite emerging market index explains more than 10% of the variation of the interest rate in the year following the shock. Moreover, it was at the origin of nearly 10% of variation of the production in most countries of the region (appendix B, tables 1 and 2). However, even though the magnitude of the macroeconomics fluctuations were less significant in countries with fixed exchange rate, because of their dependence to the monetary policy of the United States, all the emerging countries of the region were hit by the shock. Moreover, it spread from the financial to the real sector of the economy. This allowed underlining of the sensitivity of the emerging Asean countries to international fluctuations during the nineties and their incapacity to limit their negative consequences. This situation was due to their early capital account openness, at the beginning of the century, followed by an excessive risk-taking, which is shown by the banking and financial indicators' deterioration during the four years preceding the Thai crisis. More precisely, the situation of the banking and financial sectors in the Asean countries worsened after 1994 because of a large decrease in banking liquidities and a rise in short-term debt, increasing the total amount of external debt which was responsible for international lenders loss of confidence (Corsetti *and al.*, 1999, Chang *and al.*, 2000, Gimet, 2007). Our results show the spread of the crisis in all emerging countries of the region that corresponds to the "Fast and Furious" episode of contagion defined by (Kaminsky *and al.*, 2003).

The impact of the subprime crisis in the Asean countries

Second, we analyze the impact of the subprime crisis in the same economies (Appendix A, figures 9 to 16). A shock of United States stock exchange volatility seems to have many different effects on these economies. These divergences cannot be explained by the exchange rate regime, because, all countries except China had a free or managed floating exchange rate.

The countries that knew more important inflows of capitals were the developed ones (*fa*). Similarly, China experienced a significant volatility of capital flows due to the progressive deregulation of its financial markets. The Philippines and Indonesia saw their international reserves decreased but only in the short run. Consequently, the impact on the other macroeconomics and financial variables was reduced in comparison to the last crisis episode in all emerging countries: The nominal exchange rate did not vary significantly (*ner*) and the impact on production is limited or no significant (*y*). Then, the monetary policy didn't react massively. On the contrary, we can note an action of the central banks of Singapore, China and the Philippines on the interest rate (*r*) and a decrease in production pronounced in Japan and Singapore. Finally, the crisis is at the origin of a more significant volatility of the exchange rate in these countries except in China which maintained its crawling peg.

When we compare these results with those of the previous period of analysis, we underline many differences. They can be explained by several factors. First, the situation changed at an international level. In the recent years the international reserves were concentrated in emerging countries which became the new international lenders (in particular in China and OPEC countries). Moreover, the emerging Asean countries which knew the very negative impacts of their last crisis decided to adopt prudential measures in order to protect their economies against speculative attacks. More precisely, they limited the short-term capital inflows and consolidated their banking sector. Our analysis reveals the efficiency of these measures. The lowest magnitude of the responses of these economies underlines less sensitivity of the emerging Asean economies to international financial shocks.

4. Conclusion

Our results highlight the negative impact of the financial crisis in the emerging Asean economies at the end of the last century. They were very vulnerable to international financial fluctuations because their growth depended mainly on the confidence of international lenders that invested an important amount of short term capital in these economies. Then, when a crisis occurred in an emerging country, the volatility of the emerging markets stock exchange index increased and international investors reallocated their assets portfolio to reduce their exposure to the risk. In order to limit the loss of capital, investors sold their assets on markets likely to be affected by the crisis. This phenomenon is at the origin of a massive capital outflow which had negative consequences on the whole economy. This situation reveals the inability of the Asean emerging countries to prevent and reabsorb these types of shocks during this period. The fact that all the emerging economies of the region were hit by the crisis shows that the exchange rate regimes in place during this period were not sustainable.

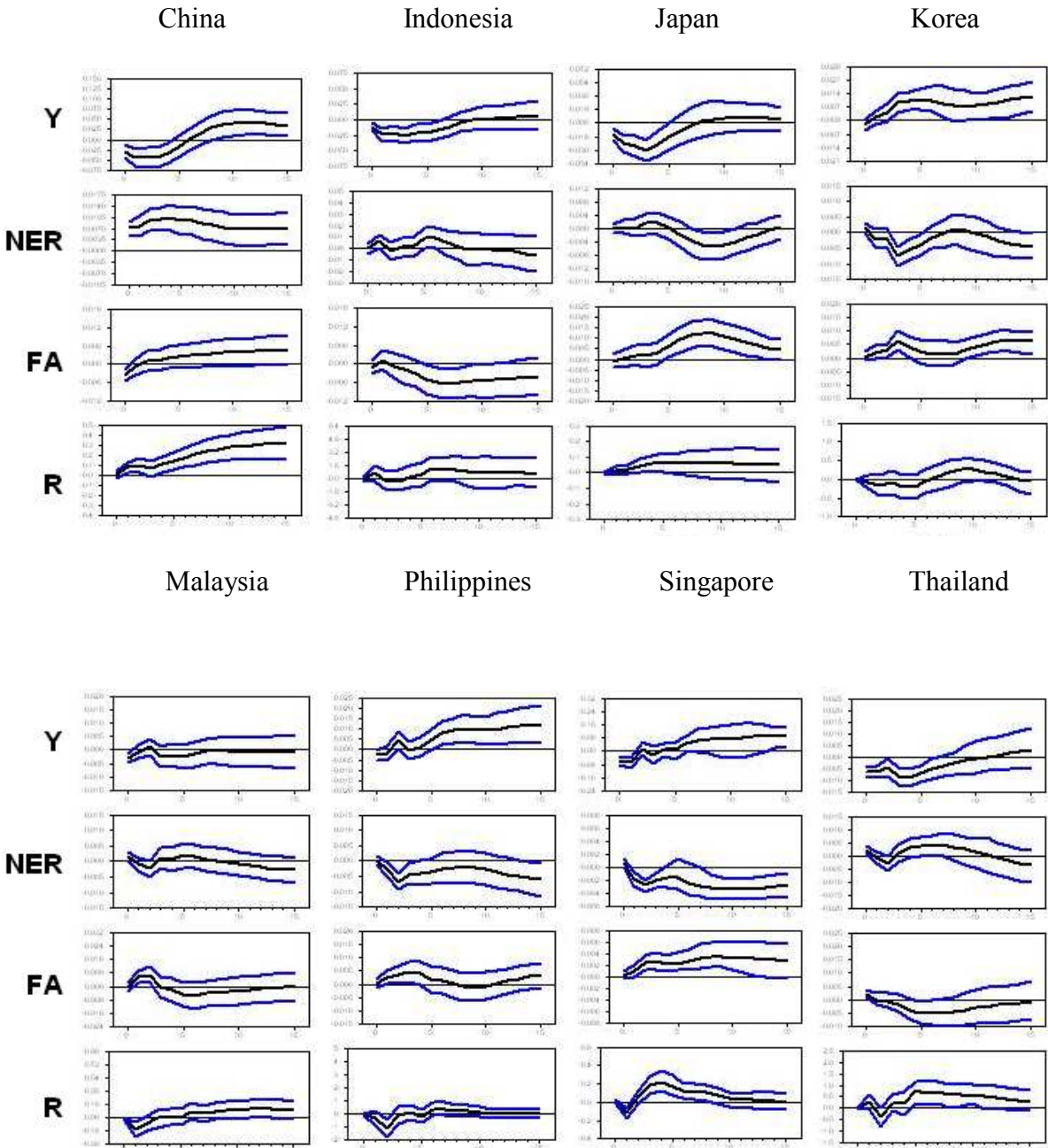
But, the comparison of these results with those from the second period of analysis allows for observation of several significant differences. Actually, the impact of the recent subprime crisis seems to have limited impacts on these emerging countries. On the contrary, the negative effects are more significant in industrialized ones, including China. We can conclude that the measures adopted by the emerging Asean economies at the beginning of this decade are very efficient. They decided to limit their dependence on short-term capital flows, the risk of illiquidity of their economy and to consolidate their banking sector. These actions have allowed, to a certain extent, maintaining the international lenders confidence in period of international fluctuations and then limiting capital outflows. Today, a group of emerging market constituted by Malaysia, Phillipines and Korea and, to a certain extent, Thailand, has made significant progress in the sense of a better capacity to prevent and reabsorb speculative

attacks. Moreover, the similarities in their responses to a common shock highlight a better structural financial convergence between them and toward a sustainable level.

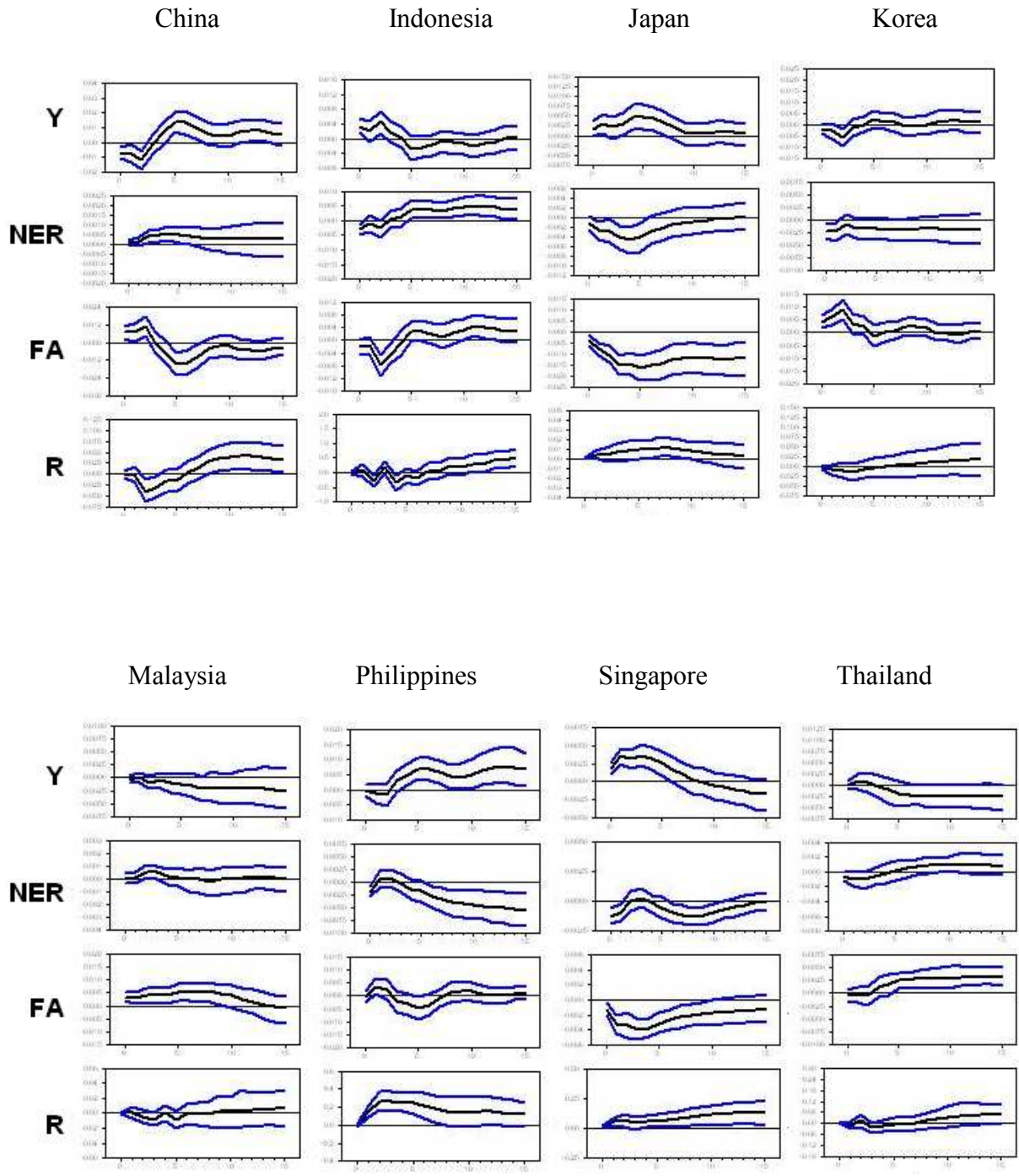
We can conclude that the actual financial crisis spreads in the most advanced countries directly by the financial channel which includes both banking exchanges between the countries, and the variations in financial assets. The crisis extends from the financial to the real sector in these countries. Then, the fundamental contagion of the crisis in emerging markets will be indirect by the way of the real channel through trade links between them and industrialized ones.

Appendix A. Asean countries responses to a *MSCI* and a *SP* shock

Figures 1 to 8. Asean countries responses to a MSCI shock



Figures 9 to 16. Asean countries responses to a SP shock



Appendix B. Forecast error variance decomposition further to a *MSCI* and a *SP* shock

Tables 1 & 2. Forecast error variance decomposition further to a MSCI shock

Country	period	y	ner	fa	r
China	1	3.573	12.561	3.524	0.113
	2	6.562	14.890	2.303	1.788
	3	8.934	20.930	1.482	3.193
	6	9.409	33.148	1.256	5.809
	9	7.705	38.367	3.889	11.218
	12	9.820	38.960	9.330	21.460
Indonesia	1	2.911	0.001	0.629	0.644
	2	16.561	6.596	0.647	0.426
	3	11.199	4.673	0.735	1.806
	6	8.626	2.752	1.358	3.846
	9	6.465	3.890	3.956	4.909
	12	6.680	9.643	10.725	9.651
Japan	1	3.775	0.037	0.132	0.260
	2	5.023	0.021	0.053	3.229
	3	5.821	0.388	0.357	6.988
	6	6.877	3.603	5.459	15.734
	9	4.986	10.811	20.157	17.753
	12	3.884	9.876	31.635	16.925
Korea	1	0.376	0.112	0.296	0.800
	2	1.301	1.203	2.549	1.092
	3	2.154	1.244	1.594	2.238
	6	12.429	7.978	3.180	1.254
	9	11.746	5.233	3.707	0.897
	12	9.755	4.006	8.750	0.960

Country	period	y	ner	fa	r
Malaysia	1	2.086	1.124	0.024	0.009
	2	1.362	1.874	2.700	3.890
	3	1.457	2.630	4.136	4.559
	6	1.143	2.431	1.785	3.983
	9	1.519	2.100	1.549	3.682
	12	1.278	1.850	1.393	3.650
Philippines	1	1.135	0.000	0.032	0.624
	2	1.814	1.322	0.515	0.669
	3	1.197	4.091	1.871	6.409
	6	2.118	5.067	1.838	5.332
	9	8.116	3.981	1.667	7.886
	12	13.166	3.867	1.514	8.457
Singapore	1	3.199	1.076	0.015	3.041
	2	10.051	0.465	0.072	2.933
	3	9.226	1.431	0.097	5.925
	6	6.963	1.832	1.176	13.045
	9	4.022	3.796	4.856	12.716
	12	3.280	9.417	7.466	12.206
Thailand	1	8.196	1.840	3.130	1.282
	2	4.680	2.635	2.111	1.280
	3	3.051	7.343	1.551	2.331
	6	6.509	6.889	3.564	4.868
	9	6.100	4.975	3.438	6.395
	12	6.050	5.056	2.759	7.019

Tables 3 & 4. Forecast error variance decomposition further to a SP shock

Country	period	y	ner	fa	r
China	1	1.980	0.070	2.105	0.004
	2	1.715	0.924	2.314	5.737
	3	3.691	0.520	4.901	6.612
	6	2.444	5.178	3.339	6.385
	9	3.648	15.473	4.857	6.361
	12	5.106	21.272	6.308	7.160
Indonesia	1	0.331	0.153	0.363	0.146
	2	0.608	0.095	1.863	0.138
	3	4.334	1.733	5.399	0.133
	6	6.100	3.089	12.197	13.623
	9	8.732	14.158	9.122	19.642
	12	17.599	33.174	9.945	18.074
Japan	1	0.000	0.041	5.112	3.605
	2	0.372	0.077	6.269	4.493
	3	1.319	2.075	10.550	5.834
	6	0.628	0.958	18.030	7.721
	9	0.948	1.203	24.441	5.717
	12	1.692	2.153	25.986	8.511
Korea	1	2.926	0.297	3.255	3.432
	2	1.758	0.171	1.755	3.627
	3	1.066	1.968	1.154	2.981
	6	3.143	1.297	1.885	8.722
	9	2.844	1.175	2.556	11.312
	12	3.544	1.170	3.227	10.208

Country	period	<i>y</i>	<i>ner</i>	<i>fa</i>	<i>r</i>
Malaysia	1	1.500	0.000	2.634	5.174
	2	2.581	0.125	3.186	8.177
	3	8.822	0.787	5.770	10.929
	6	28.900	11.353	9.302	22.287
	9	25.665	19.661	7.526	25.637
	12	20.924	21.891	7.183	25.810
Philippines	1	2.100	0.090	1.111	0.153
	2	11.353	4.778	10.215	0.068
	3	16.639	5.718	18.001	0.663
	6	10.565	4.115	9.418	1.520
	9	9.939	2.852	10.686	6.286
	12	9.183	2.209	11.281	9.016
Singapore	1	0.183	9.346	0.023	2.280
	2	2.291	6.895	0.049	0.957
	3	3.187	6.754	5.067	1.172
	6	1.788	4.525	5.668	2.813
	9	1.884	4.946	8.310	12.264
	12	2.281	6.430	6.962	22.444
Thailand	1	0.133	0.693	3.824	0.131
	2	0.059	0.487	2.644	0.754
	3	0.232	1.370	1.495	0.918
	6	3.362	3.104	3.839	4.430
	9	3.035	6.614	4.558	5.978
	12	2.715	6.190	4.964	5.886

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