

The Dynamics of International Liberalization Reforms and Regional Financial Stability: Some Guidelines for Policymakers

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Abstract:

This paper applies a new procedure that enlightens some issues regarding the relationship between the dynamic of deregulation of finance relatively to commerce and financial stability in some areas (Latin America, South East Asia and Europe) during the period (1971-2008). More precisely, we investigated the impact of “financial liberalization first” strategies on the vulnerability of a country to currency crisis. This analysis is related to debate on the adequate sequence of reforms. We analyzed the correlation between financial liberalization and exchange crisis through dynamic panel data models using the GMM methodology. The results suggest the nonlinearity of the effect of financial liberalization on exchange pressures. Moreover, we proved that the positive effect of financial liberalization on the speculative pressures becomes appreciable once the rate of financial integration exceeds some threshold. We use the threshold regression techniques of Hansen (1999). A threshold effect is then identified referring to some structural changes between financial liberalization and exchange market pressures. Our estimations indicated also that the impact of financial integration depends on the order of deregulation of real and financial spheres. In fact, undertaken a bad sequencing considering “financial liberalization first” had led to an increase of the vulnerability to exchange crisis since the first stages of liberalization.

Keywords: sequencing of liberalization, regional financial integration, dynamic panel data, threshold effect

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Introduction

This analysis cast some light on the relationship between sequencing of liberalization reforms and speculative pressures. An empirical finding is reported to be the origin of this recent interest. This latter was the asymmetrical character of the spillover effects through countries. In fact, the crises tend to spread more and more conditionally to a “sunspot” variable determining the reaction of international investors to the occurrence of a crisis in a given country. The literature of speculative pressures and contagion has puzzled at length over the mysterious phenomenon proving every time how unexpected could be the intensity and the direction of financial contamination. A strand of empirical literature of contagion sustains that commercial and financial linkages are the principal channels of propagation of some regional contagions (Latin America (1994) and South East Asia (1997)).

The way in which the new wave of crisis (United States (2007)) was widespread suggests that the modern crises tend to be more and more global rather than regional. Some researches prove that the countries contaminated are characterized by a higher trade and financial integration³.

Most of empirical investigations have supposed homogeneity of the process of international liberalization through the countries. However, economies had undertaken different strategies of international liberalization. Edwards (2008) argue that the order of deregulating financial sphere relatively to commercial one governs the effect “crisis” of the process of financial integration. Basing on the optimal sequence theory⁴, Edwards (2008) proves that “financial liberalization first “policies increase the level of financial vulnerability of a country. Edwards (1984) advocates that freeing up capital flows prematurely before domestic and trade liberalization may cause economic instability. McKinnon (1993) argues that a rapid inflow of capital in the beginning of the process of liberalization will appreciate the exchange rate, making it difficult for domestic tradable producers “to adjust for the removal of protection”. Consequently, the inflows of

³ Glick and Rose, 1999

⁴ Mckinnon ,1973,1991 ; Edwards ,1984 ; Funk, 1993 and Stiglitz , 2002

capital will deteriorate international competitiveness which declines the profitability of the sectors of export and could even generate a credit boom.

Edwards (2008) considers the financial liberalization as a binary process omitting the sequential nature of the process of liberalization. Additionally, Edwards (2008) does not investigate the importance of threshold effect. In fact, the negative impact of financial liberalization on financial stability of an economy does not appear immediately but during the liberalization process. In this furrows of ideas, we investigate the linkage between undertaking a bad order of deregulation and the contagion effect of the latest waves of crisis. We make the assumption that the occurrence of crisis is a logical consequence of a bad governance of international financial liberalization. Consequently, the purpose of our analysis is to test the following hypotheses:

1. The effect of financial liberalization on speculative pressures is non linear.
2. Once the financial liberalization exceeds a “threshold” level, the effect of an additional increase depends on the sequence of international liberalization undertaken by the country.

In this paper, we use a large panel country data set to investigate whether the policy of the international liberalization of a country can explain its financial instability. We tend also to identify a level of financial integration from which the speculative pressures increase conditionally to the strategy of liberalization undertaken by a country. To this end, we use the threshold econometric procedure of Hansen (1999). A threshold effect in the relation (financial liberalization / speculative pressure) is identified for each strategy of liberalization. Then, by using a dynamic panel threshold models, we analyze the dynamic effect of financial liberalization on the severity of currency crises. The rest of the paper is organized as follows: In section 1, we briefly review the financial and trade liberalization policies in some areas (Latin America, South East Asia and Europe) in

relation with their financial stability during the period (1970-2008). In section 2, we expose the axioms of optimal liberalization sequence theory. In section 3, we describe data, definition of the variables and the econometric modeling. We present the empirical results of regressions for each area. By the same way, we assess the ability of the “optimal sequence “theory to explain some recent crises. Finally, we conclude.

1. Dynamics of Financial and trade liberalization and financial instability:

The analysis of the path of international liberalization in relation with financial instability enables the identification of "bad" scenarios of international integration. Latin America, South East Asia and Europe had been at a certain moment during the period (1971-2008) respectively contaminated by the Mexican “Tequila effect” (1994), the Thai “Asian flu” (1997) and the American “subprime crisis” (2007). On the basis of a sample of countries belonging to each of that regions, we investigate first the process of financial integration (legal and effective) then the interaction between the commercial opening and financial liberalization in relation with financial instability.

1.1 Legal and effective financial liberalization

Since the Eighties, the most regions had undertaken an unprecedented move toward full financial liberalization. The legal (de jure) and effective (de facto) liberalization are approached using the index of official liberalization (de jure) of Chinn and Ito (2006) and the index of liberalization of foreign flows of capital (de facto) of Lane and Mielsi-Feretti (2006). The first assesses the severity of controls of capital while the second synthesizes the extent of dependency on external financial flows. An original remark is that the three regions had maintained a high level of financial integration during the period (1970-2007) which is surprising in consideration of the date of liberalization of capital flows in Europe and South-east Asia (1970) and in Latin America region (1980).

Since 1990s and during the early 2000s, European countries have reimposed the capital control. This change in international finance policies could be explained by the potential risk of financial contagion during that period⁵. Nevertheless, the averaged share of financial exchanges in percentage of GDP continued to multiply by 3 (2000) and by 2 (2007). The inspection of the dynamics of financial integration in South-East Asia area reveals that those countries use the controls of capital as an instrument to stabilize their economy. In fact, during the period of our analysis, the index of legal capital control in SEA had decreased 4 times. The movement of capital does remain free of control only in the nineties.

In fact, during 1990s, the IMF and the American Treasury encouraged those nations to liberalize their capital account⁶. As a result, the volume of financial exchange had doubled in 1990 and tripled in 2000 comparing to 1980s. This high level of financial integration could explain why the Thai crisis (1997) had infected most economies of that region. With regard to Latin America area, the sequence of financial liberalization was been a component of structural reform packages. Indeed, economies of that region adhered since the end of the seventies to reforms suggested by IMF which planned their financial deregulation. Consequently, the volume of financials exchanges as a percentage of GDP had more than doubled during the periods (1970-1980) and (1980-1990). This area was shook by several crises during the last decades.⁷

1.2 Commercial openness, Financial liberalization and Financial stability :

The international liberalization is a dynamic process involving the transition of economies toward global environment. At the country level, this market regulation implies a movement toward full

⁵ European Monetary System currency crisis (1992.), Mexican debt crisis (1994), Thai Banking crisis (1997)...

⁶ FMI (1995)

⁷ Debt crisis (1980), Abrupt of flows of capital (Mid 1990s)...

liberalization of commercial and financial spheres. This review of the processes of trade and financial liberalization is based on both legal and effective opening indexes. As a measure of severity of commercial and financial restrictions, we consider two indexes published by Fraser Institute which are respectively the mean tariffs on imports and the financial openness index during the period (1985-2007)⁸. In order to make this table instructive, Edwards (2008) suggests considering two reference values which are a mean tariff of 10% from which the current account is considered legally opened and a note of 6 from which the capital account is judged liberalized⁹.

Table 2 Evolution of Legal International Liberalization

	Mean tariff (%)				Financial openness index			
	1985	1995	2004	2007	1985	1995	2004	2007
Latin America	39.892	12.467	8.883	9.133	2.889	6.530	6.287	6.229
Asian South-East	29.422	20.600	8.237	9.385	2.000	5.317	4.814	4.616
Europe	8.073	6.990	3.002	4.638	4.381	7.218	7.203	6.502

Source : Institut Fraser et calcul personnel

This dynamic representation of the legal evolution of the process of liberalization in its double dimension (commercial and financial) reveals that regions move steadily towards more commercial opening. However, the emergent regions deregulate more carefully their finances.

According to those indexes, official financial deregulation had preceded the commerce one in Latin America. The economies of that region have evolved during the period (1985-1995) with an “ex-liberalization” of capital relatively to commerce openness. Taking into

⁸ Table 2

⁹ The values 6 and 10% correspond respectively to the 25th percentile of the distribution of the index of financial opening and indices “mean tariff on the imports for 130 countries over the period (1970-2008).

account the waves of crises which shook this area in the Eighties and in the middle of the Nineties, we suggest that such sequence “evolving at a certain time with a liberalized capital account and a closed commercial one” constitutes a bad dynamic of liberalization and makes economy financially instable.

Similarly, the sequence of liberalization of the SEA area had proved generator of financial instability in the end of Nineties. It’s clear that during the first period (1985-1995), the mean tariffs had decreased by 30 % while the financial openness index had more than doubled. The regional effect of contagion of the Thai crisis (1997) suggests that the strategy of integration which consists in opening capital and current accounts in a not synchronized way could have returned, at a certain moment, the countries of SEA more vulnerable to the threats of financial contamination.

Lastly, the analysis of international deregulation in Europe is proving as interesting as their predecessors. The capital account has been deregulated since the late 90s. Despite the fact that the restrictions on the current account have also been lifted by that date, the mean tariffs on imports have been applied again between 2004 and 2007. This change in the direction of deregulation could ventilate a “bad” dynamic of liberalization. The Europe was the first region which was shook by the contagion effect of subprime crisis of United States (2007). This bad dynamic seems to explain even partially the direction of financial contagion of this last crisis.

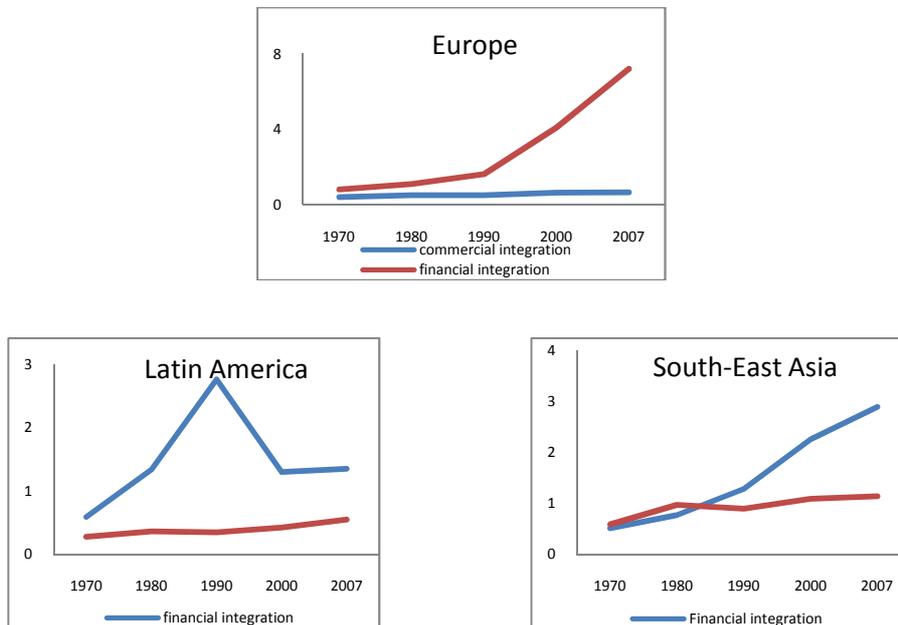
The second part of this analysis of international liberalization is based on effective indicators of commercial and financial integration. We retain the indices “commercial liberalization” (commercial exchanges / GDP) and “financial liberalization” (financial exchanges / GDP)” as indicators of the effective integration. The respective values of 0.53 and 1.06 indicate the levels from which the current and capital & financial accounts are considered open. The juxtaposition of curves enables synthesizing the dynamics of the processes of commercial opening and financial liberalization in terms of flows effectively received by each region during the period of analysis.

The preliminary assumptions concerning the path of international integration in Latin America and South-East Asia are confirmed. As could be seen, the process of liberalization in Latin America area is

characterized by a premature and important deregulation of the financial account comparing to effective commercial opening. Especially, financial liberalization has preceded the opening of trade. For the South-East Asia area, the trade opening was realized before the financial liberalization. However, the South-East Asia area exhibits a simultaneous deregulation of the two dimensions of liberalization process (commerce and finance). In fact, during the first stages of liberalization the two processes commoved.

In the case of Europe, the effective indicators of liberalization suggest that finance liberalization was in 1977 while the commercial one was reached in 1984. By the same way, the index of financial integration had exposed its highest peak in 2007. In fact, this index increased by 43% in 2007. Since the beginning of the Twenties, financial liberalization had preceded widely commercial opening.

Graph 1 Evolution of the process of Effective International Liberalization in Area



Personal calculation

In consideration of the evidences suggested by this preliminary analysis, we propose to identify the stages of a sound dynamic of international integration. That dynamic will enable a country to overcome any potential risk of financial contamination.

2. The theory of optimal liberalization sequence and role of the sequencing

The regional effect of contagion of the last currency crises in a context of movement toward financial liberalization reflects the inefficiency of the national and international processes of financial deregulation. Nobel laureate Stiglitz (2002) remarks that liberalization's reforms were undertaken rapidly according to a wrong order. This section discusses in one hand the axioms of the theory of optimal sequence of Liberalization. On the other hand, we propose to investigate the existence of regional heterogeneity at the level of liberalization sequence. Indeed, the contamination of some economies while others remain intact can be explained by the establishment of different policies of international deregulation.

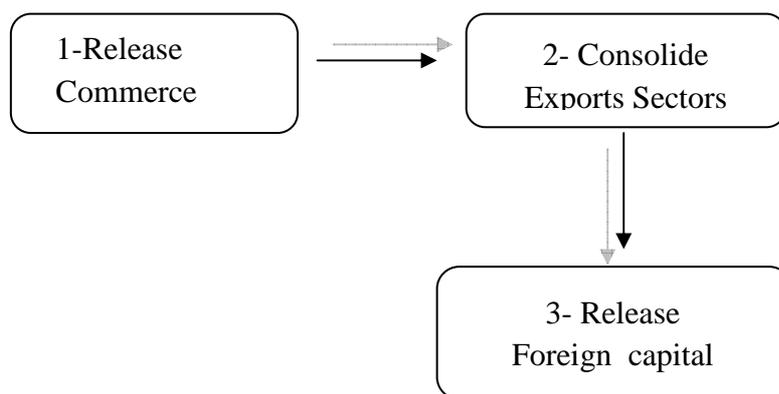
2.1 Theory of optimal sequence of Liberalization:

The international integration has spouted out a whole theory on “the optimal liberalization sequence”. In fact, this theory has been for a long period devoted to emerging economies as a code of good conduct of their policy of international liberalization. The dynamic nature of the process of liberalization previously illustrated may assign to this theory a universal character and an undeniable political importance.

The literature of “optimal sequencing” of international liberalization has been widely investigated by the works of McKinnon (1973, 1991) and Edwards (1984). According to those authors, the decontrol of the capital account must be postponed to the end of liberalization's reforms, especially after the bank sector consolidation and the commercial liberalization. McKinnon (1973, 1991) and Edwards (1984, 2008) recommend the launching a commercial liberalization before opening the capital account as an optimal dynamic of

international integration¹⁰. The financial liberalization should be achieved at the last stages of integration, and only when the economy consolidates its sector of export in other words after the completion of the commercial opening.

Graph 2: An Optimal Dynamic of International Integration:



The countries which liberalized their capital and financial accounts in concerto or after pre-consolidation of the current account do not risk a premature and important exposure to reversals of financial flows. This could be due to the possibility of compensation between the commercial and financial balances. It's the existence of an interaction at the short term between the two accounts which insure the possibility of compensation in the case of deterioration of external returns. There is no question that, evolving according to an optimal dynamic of liberalization, trade could provide a stabilizing force to the economy. Thus, the commercial opening appears as a prerequisite to the deregulation of capital and finances.

However, undertaking a bad order in other words launching a premature “financial liberalization” will make the economy more vulnerable to the fluctuations of international financial returns. Stiglitz (2002) criticized this sequence” to undertake an early financial

¹⁰ Graph 2

integration at the first stages of liberalization process”, basing on the fact that a premature mobility of capital will encourage the speculation and increases the possibility of exchange crisis. In fact, the reception of a massive inflow of capital at the beginning of the process of integration increases the imports in an abnormal way while decreasing the exports. In a similar vein, Edwards (2008) proves that a premature opening of the capital and financial accounts could increase the degree of vulnerability to exchange crises in view of the potential risk of commercial imbalance. In fact, the increase of flows of capital is transitory and implies that at a certain time the investors are likely to withdraw country inducing a crisis. In such a case, the country must be able to compensate for the contraction of capital flows. Indeed, evolving with a “bad dynamic” of the liberalization do not enable the establishment of a strategic compensation between the two accounts and increases the financial vulnerability of a country to a crisis of exchange.

This theory had already established a universally applicable code on how to govern the process of country's liberalization. It provides a theoretic optimal dynamic of governance of the liberalization reforms enabling the decision makers to monitor their financial stability via a good monitoring of their process of financial liberalization.

2.2 Regional heterogeneity of liberalization sequences:

The section 1 suggests that some regional international liberalization strategies came so close to reaching a dynamic which deviates from the theoretical recommendations. This evidence in itself provides an interesting cautionary signal. We propose to investigate the presence of heterogeneity at the level of the sequence of liberalization engaged in some regions (Latin America, South East Asia and Europe).

We distinguish for each region two groups of countries undertaking respectively the “good” (opening the current account before the deregulation of the capital and financial account) and “the bad”

sequence (a premature deregulation of capital and financial account) of liberalization reforms. This identification was based on the indicators of commercial and financial integration previously exposed¹¹. As legal respective indexes of deregulation of current and capital & financial accounts, we use the tariff average on the imports and the index of mobility of the capital. We retain the value of 10% and the note of 6 as commercial and financial respective threshold of deregulation. The indicators of effective commercial and financial integration are (commercial exchanges/GDP¹²) and (financial exchanges/GDP)¹³. The respective values of 0.53 and 1.06 indicate the levels from which the current and capital & financial accounts are considered open.

The good sequence group respects these conditions: the average of tariffs in a country was $\leq 10\%$ before having an index of financial openness ≥ 6 . Moreover, during the two last decades, this group of country exposes an index of effective commercial liberalization ≥ 0.53 before liberalizing finances (having an index ≥ 1.06). Intuitively, the bad sequence group was found with an open capital account (an index of international control of the capital ≥ 6) before having an average tariff $\leq 10\%$ (an open current account) during the period (1971-2007). By analogy, this group had, at a certain moment, a commercial account relatively closed (the share of the commercial exchanges in GDP < 0.53 and a relatively open financial account (the share of the financial exchanges in GDP is ≥ 1.06).

As expected, heterogeneity is detected for each region. In fact, even within the areas, each country had chose its own order of international deregulation

An examination of commercial and financial dimensions of the process of financial integration through the sequences for each region enables us to draw the following remarks. The good sequence groups had initially conferred an importance to commercial integration. However, the group of countries defying the theory of sequencing exhibits a prevalence of the financial sphere and it is clear that the opening of the capital & financial account is more important than the

¹¹ Section 1, 1.2

¹²Gross Domestic Product

¹³Lane. P and Mielsi-Feretti. G (2006).

current one. An analysis of the Index of Speculative Pressure (SPI¹⁴) of the diverse groups reveals that the SPI of the groups which undertook a "bad" sequencing of liberalization reforms were more volatile comparing to the SPI of "good" sequence group. For example, in Europe, the variance of the indicator of foreign exchange market disequilibrium during (1969-2008) was of 0.0012 for good sequence and 0.037 for bad one. Similarly in SEA, SPI good sequence was of 0.028 while SPI bad sequence was 0.016.

In consideration of the evidence suggested by this analysis, it would be an instructive exercise to investigate the dynamic of liberalization in relation with financial instability. It seems an opportune time to review the evidence concerning the effects of sequencing of liberalization reforms on countries' financial stability.

3. Impact of the sequence of Liberalization on the country's financial vulnerability: an empirical investigation

In the light of the theoretical assumptions, we suppose that the divergence from optimal dynamic of liberalization had made nations more financially vulnerable to contagion effect and / or to exchange crises. Similarly, the evidences suggest that it would be an instructive exercise to investigate the dynamic of liberalization in relation with financial instability. This section investigates the impact of the sequencing of liberalization reforms on the severity of speculative pressures. Particularly, we investigate the effects of undertaking a bad order of deregulation on countries' vulnerability to speculative attacks.

¹⁴ Similarly to Girton and Roper (1977), exchange market pressure is a weighted average of exchange rate changes, international reserve changes, and interest rate changes.

3.1 Data Description and Definition of Variables

We define a “currency crisis” episode as Girton and Roper (1977), using a synthetic index of speculative pressures as a measurement of crisis. The endogenous variable SPI_{it} translates the intensity of the tensions on the exchange markets undergone by a country during the period (1971-2007). This index is a weighted average of the variation of exchange rate, changes of interest rate and of the negative of the variation of monetary reserves so as to smooth the differences in volatility among these series. The negative sign allotted to the average annually variation of monetary reserves, makes it possible to obtain an index all the more high as the crisis is close. This index catches the instances of successful attacks as well as of unsuccessful attacks. The reason is that the central banks tend to thwart the speculative pressure by allowing the currency to depreciate or, exhausting gradually their international reserves or, by increasing the interest rates. The exchange market pressure for country i at time t is computed as:

$$SPI_{it} = [\alpha (\% \Delta e_{it}) + \gamma \Delta (i_{it} - i_{ct}) - \delta (\% \Delta r_{it} - \% \Delta r_{ct})]$$

with e : the price of the center /reference country’s currency in terms of country i ’s currency¹⁵, i_{it} (i_{ct}) is the nominal interest rate of country i (center country) and r is the ratio of reserve to M1. Germany is taken as the center of reference for our OECD samples while US is taken as center for emerging market economies. α , γ and δ are weights¹⁶.

We retain in our model a certain number of macroeconomic variables (table 4). The choice was done in the light of the theoretical and empirical literature of financial crises and subject to the availability of the data¹⁷.

¹⁵ We consider US as the reference country for the variable e because of the availability of the data.

¹⁶ The weights are computed based on Sachs, Tornell and Velasco (1996)

¹⁷Source international Financial Statistics (IFS), Fonds monétaire international(IMF), Reserves (1L.d), exchange rate (line rf), interest rate (60B...ZF otherwise 60...ZF), M1 (line 34); M2 (line 35+M1) commercial balance = (Exports- Imports)/GDP ; commercial opening = (Exports +Imports)/GDP ; Exports (line 70..ZF), Imports (line 71... ZF); Data base of Lane. P and Mielsi-Feretti. G (2006): FDI (Foreign Direct Investment) , PI (Portfolio Investmen)

Table 4 Indicators of vulnerability to the crises

Category	Concept	Measure
Macroeconomic indicators	Commercial imbalance	Commercial balance/ GDP
	Monetary disequilibrium	M2/Reserve
	Fundamentals	Inflation, growth rate of GDP
	foreign indebtedness	debt/total_eng , total_engagement/ reserves
	International shock	Oil price
Common shock	Sensitivity to the fluctuations in EU	bta_ 10 ans
Policy of integration	Commercial links	commercial opening/GDP
	Financial links	Financial exchanges/GDP,

Our analysis is related to a sample of 47 countries from three regions (Europe, Latin America and SEA) during the period (1971-2008). I investigate the econometric modeling for each sequence of liberalization¹⁸. Each region was divided in two groups which synthesize both the "good" and "bad" sequencing of liberalization reforms.

3.2 Econometric Modeling

3.2.1 Specification

Our empirical investigation uses a panel data specification which explains speculative pressures in the exchange market:

$$SPI_{it} = \eta_i + \gamma \text{integ}_{fin_{it-1}} + \beta' X_{it-1} + e_{it}$$

$$i = 1, \dots, n \quad t = 1, \dots, T_i \quad (1)$$

Financial exchanges= FDI+PI+DEBTS, GDP;
<http://www.ssc.wisc.edu/~mchinn/research.html> (KOPEN) and the return the American Treasury Bond of 10 years , BIS « International Bank of Settlement »
<http://www.economagic.com/em-cgi/data.exe/fedbog/day-tcm10y>

¹⁸ See Annex

SPI_{it} is an index of speculative pressure in country i for the period t , $integ_fin_{it-1}$ constitutes the delayed measure of financial integration (threshold variable), X_{it-1} represents the delayed vector of the variables of control, η_i synthesizes an effect not observed specific to the country and e_{it} is the term of error for each observation.

In order to avoid the causality problem, we use delayed values of variables. Otherwise, we will not be able to know any more if it is the deterioration of fundamental which causes the crisis, or it is the crisis which causes the degradation of the economy.

The lack of complete sets for each variable during the period of analysis supports the use of incomplete panels. Similarly, the recourse to differentiation of equation (1) requires models of dynamic panel. For such models, the GMM technique¹⁹ provides more consistent and efficient estimators. This methods based on the instrumental variables principles, insures the convergence of estimators. In a similar vein, GMM procedure overcomes the problem of endogeneity bias. This problem arises from the correlation between the lagged dependent variable, SPI_{it-1} and the error term e_{it} as well as between some explanatory variables and the unobserved country specific term η_i . The model (1) becomes:

$$(SPI_{it} - SPI_{it-1}) = \gamma (integ_fin_{it-1} - integ_fin_{it-2}) + \beta' (X_{it-1} - X_{it-2}) + (e_{it} - e_{it-1}) \quad (2)$$

$$i = 1, \dots, n \quad t = 2, \dots, T_i$$

The differentiation of first order eliminates the specific country and omitted variable bias invariant over time. However, the correlation between $(SPI_{it-1} - SPI_{it-2})$ and the differenced error term $(e_{it} - e_{it-1})$ arises a new kind of bias. In order to overcome this econometric externality, the GMM estimation of equation (2) is based on a set of orthogonality conditions between the error terms and some instrumental variables.

¹⁹ Arellano and Bond (1991)

The orthogonality conditions of Arellano and Bond (1991) are defined as follows:

$$E(\text{libfin}_{it-1-s}(e_{it} - e_{it-1})) = 0 \text{ pour } s \geq 2 ; t = 3, \dots, T_i \quad (3)$$

$$E(X_{it-1-s}(e_{it} - e_{it-1})) = 0 \text{ pour } s \geq 2 ; t = 3, \dots, T_i \quad (4)$$

This technique enables to palliate to the over-fitting risk by reducing the dimensionality of the instruments while taking into account the presence of heteroskedastic consistent standard errors. The difference estimator is found after a two steps procedure. In the first stage, the retained residuals are used to provide a consistent estimate for the variance – covariance matrix of errors. The error terms are supposed to be independent and homoskedastic over time and across countries. Therefore, the difference estimator is asymptotically more efficient than the first step estimator. Secondly, the presence of a second-order serial correlation on the level of the error terms of the first-differenced equation given by expression (2) must be tested to validate the consistence of GMM estimator. This is due to the fact that the coherence of the GMM estimator depends on the following assumption: $E(\varepsilon_{it} \varepsilon_{it-2}) = 0$. The statistic of the test is asymptotically standard normal under the null hypothesis and is given by $N = \frac{\Delta \hat{\varepsilon}_{-2} \Delta \hat{\varepsilon}_*}{\sqrt{\Delta \hat{\varepsilon}}}$

with $\hat{\varepsilon}_{-2}$: the vector of residuals lagged twice and $\hat{\varepsilon}_*$ is a vector of trimmed $\hat{\varepsilon}$ to match $\hat{\varepsilon}_{-2}$.

The test of overidentifying restrictions of Sargan is performed. Under the null hypothesis, the Sargan statistic is asymptotically distributed as X^2 with $p-k$ degrees of freedom and is written as:

$$S = \Delta \hat{\varepsilon}' \left(\sum_{i=1}^n W_i' \Delta \hat{\varepsilon}_i \Delta \hat{\varepsilon}_* W_i \right)^{-1} W' \Delta \hat{\varepsilon} \quad (5)$$

Where; W: matrix of instruments, p: the number of columns in W, and k: the number of estimated parameters.

3.2.2 Identification of the threshold effect strategy

Taking into account the sequential nature of the process of integration, we suppose that the change on the impact's direction of financial integration on speculative pressure occurs only when the financial liberalization exceeds a certain threshold value. In order to estimate the threshold value, we recourse to threshold models which allow for a super-consistent threshold estimates. In a first stage, we determine a threshold level using the procedure of "trimming" which consists to sweep all the values of the series after eliminating 10% of the extreme values from each side of the distribution of the threshold variable. This technique leads to an equal partition of regimes, leaving at each regime sufficient observations to estimate the parameters of the model. At the same time, such methodology eliminates the tail's observations which is a reasonable procedure because finding a point of rupture close to the tails of threshold distribution is often caused by a problem of skews and do not reflect necessarily a structural rupture. The model of Hansen (1999) is written down as:

$$\begin{aligned}
 SPI_{it} = & \mu_i + \alpha x_{it-1} + \beta'_1 integ_fin_{it} I(integ_fin_{it-1} \leq \gamma) \\
 & + \beta'_2 integ_fin_{it} I(integ_fin_{it-1} > \gamma) \\
 & + e_{it} \quad (6)
 \end{aligned}$$

$I(.)$ is a dummy which considers two cases according to whether the level of financial liberalization $integ_fin_{it-1}$ is higher (1) or lower (0) relatively to an estimated threshold ($\hat{\delta}$).

Indeed, once the level of financial liberalization is below this threshold value, ($I(.)=0$ and $\theta=0$) and the relation (financial integration /speculative pressure) is rather linear. Otherwise, if the level of liberalization of the financial account is higher than $\hat{\delta}$, ($I(.)=1$) and the coefficient of the liberalization of finances is (θ).

The effect of the threshold would be verified, if the coefficient of financial liberalization moves from γ to $\gamma + \theta$. For this, the Wald test

is used to test the null hypothesis ($\gamma - \theta = 0$). When Wald test rejects the constancy of the coefficients, the level of financial liberalization of the countries for which this one exceeds “the threshold” (θ) explains more pertinently the marginal effect of financial integration on the speculative tensions. This specification enables us to evaluate the impact of the sequence of financial integration on the risk of speculative pressures in order to appreciate its effectiveness for each of the sequences of liberalization reforms. β'_1 and β'_2 are the marginal effects of the process of financial integration according to the value of threshold, μ_i = the specific effects “country “ and e_{it} is supposed *iid* of average 0 and variance σ^2 .

The identification of the different coefficients of regression coefficients supposes that integ_fin_{it-1} does not vary through time.

Least squares estimation of the threshold and regression slopes is proposed using fixed-effects transformations. $\hat{\gamma}$ is the value of γ which minimizes the sum of the squares of the residues for the interval of trimming : $\hat{\gamma} = \text{argmin}_{\gamma} S(\gamma)$ with $S(\gamma) = \hat{e}(\gamma)' \hat{e}(\gamma)$.

Hansen (1999) proposes to build a confidence interval on the basis of ratio of maximum of likelihood calculated for any value in order to establish an interval of no rejection of the significance of the threshold: $LR(\gamma) = \frac{(S(\gamma) - S(\hat{\gamma}))}{\hat{\sigma}^2}$. For the threshold value identified $\gamma = \hat{\gamma}$, the ratio of maximum of likelihood (LR) is null and tends towards a random variable whose function of distribution is: $P(\varepsilon \leq x) = ((1 - \exp(-\frac{x}{2}))^2)$. In presence of homoscedasticity of errors, we can generate p-values for the observed test statistics. Namely, $p = 1 - (1 - \exp(-\frac{1}{2} LR(\gamma)^2))^2$ is the asymptotic p-value for the likelihood test. The critical values can be calculated by inversion of this distribution function. Thus the test of presence of threshold is rejected at the asymptotic level of a if $LR(\hat{\gamma})$ exceeds $c_\alpha(1 - a)$ where $c_\alpha(\alpha) = -2 \log(1 - \sqrt{1 - \alpha})$. Selected critical values are reported in Table 5.

Moreover, the confidence interval corresponds for a threshold of risk α to the values of γ such as $LR(\gamma) \leq c(\alpha)$.

Table 5 Asymptotic critical values

	0,8	0,85	0,9	0,925	0,95	0,975	0,99
$P(\xi \leq x)$	4,5	5,1	5,94	6,53	7,35	8,75	10,59

Once threshold is founded, the following model is finally estimated by *GMM* in ought to incorporate the threshold effects:

$$\begin{aligned}
 SPI_{it} = & \mu_i + \alpha x_{it-1} + \beta'_1 integ_fin_{it} I(integ_fin_{it-1} \leq \hat{\gamma}) \\
 & + \beta'_2 integ_fin_{it} I(integ_fin_{it-1} > \hat{\gamma}) \\
 & + e_{it} \quad (7)
 \end{aligned}$$

3.3 Empirical Results

The results of the estimation of the dynamic panel models using the econometric methodology previously exposed for Europe, South-east Asia and Latin America are displayed respectively in table 6, 7 and 8. A battery of control variables was used in the various specifications. At the bottom of each column, we report the critical values for the test of significance of Ficher, threshold estimations and the Sargan's test. As may be seen, the effect of financial integration on the speculative pressures undergone by exchange markets differs widely through groups for each region. The sequencing of reforms seems to exert a significant impact on the financial vulnerability of countries to exchange crisis. In fact, the estimation of the threshold based on the procedure of Hansen (1999) reveals that the level from which a structural change in the relation "Financial Liberalization / Speculative Pressure" occurs was reached earlier for the group which undertakes a bad sequencing "open capital and financial accounts before achievement of commercial opening". This inversion in the direction of the impact suggests that the sequencing of liberalization reforms constitutes a significant determinant of financial stability. For example, European countries which proceeded to an early opening of

their capital and financial account had perceived a threshold level in the relation (speculative pressure/ financial liberalization) when the volume of their financial exchanges exceeds 80 % of their GDP. Such a result suggests that an additional integration of finances of 1% beyond 80 % was assorted by an increase of 4 % of the exchange tensions. Similarly, the South-east Asian “bad sequence” groups had undergone an increase of 0.0014 % of speculative pressure for every rise of financial liberalization of 1 %. Regarding to Latin America group the threshold was of 103 % with an increase of 0.004 %. However, the good sequence groups don't expose a similar direction after reaching the threshold level. In fact, the groups of Europe and Latin America record a respective decrease of 0.93 % and 0.05 % of the exchange tensions in response to an increase of financial integration of 1 %. The good sequence in South-east Asia exhibits a rise of speculative pressure of 0.0012%. The idea that emerges is that the close commoves between the processes of commercial and financial liberalization during a long period had generated a bad dynamics of the process of globalization in South-East Asia. The theory states that if a country is evolving in a "bad dynamic" of liberalization, the interaction between real and financial spheres do not operate which eliminates any possibility of compensation between trade and finance balances in case of financial disequilibrium. Interestingly, the level of financial integration was at around 80 % during the 80s for the two groups of countries. This observation suggested that the contamination of the most economies of South East Asia may be explained by the bad sequencing of liberalization reforms.

In fact, the trade balance in percentage of GDP decreases significantly the speculative pressures in South-East Asia for good sequence group. However an unexpected effect is recorded for the European “good sequence” group. In fact, the trade balance raises the tensions of exchanges. Such a result could be due to the commercials deficits exhibit by the majority of countries of that group.

Regarding to the other control variables, the exchange markets of the South East Asia countries (GS and BS) had undergone the fluctuations of the US economy. A rise of 1% of the returns of the American Treasury Bond raises significantly the tensions on the exchange markets. For the countries of South-east Asia, the ratio M2/reserves

lowers significantly the speculative pressure which reduces the capacity of the South-east Asian central banks to halt a decline in reserves in case of panic. Concerning the impact of oil price, the effects differ through regions and groups. This could be explained by the length of the period and the inclusion of oil exporter's countries.

The objective of this study is to enlighten some unexplored aspect of the process of international liberalization.

These results must be interpreted cautionary regarding to the consideration of annual series. Annual data may do not catch efficiently the changes of indicators during a same year.

Table 6 Results of regression for Europe Area

Variables	GMM regression with threshold (Good sequence group)	GMM regression with threshold (Bad sequence group)
m2_res	- 0.314 (-0.51)	-0.00001 (-0.01)
eng_res	0.052 (1.17)	-0.216 (-1.44)
finance_integ	0.841* (1.66)	-4.492* (-1.65)
I (finance_integ > $\hat{\gamma}$)	- 0.609 (-0.76)	1.339 (0.61)
finance_integ* I (finance_integ > $\hat{\gamma}$)	- 0.937* (-1.91)	4.583* (1.75)
cominteg_gdp	0.008 (0.70)	-0.679 (-0.44)
oil_price	- 0.899** (-1.99)	-0.054 (-0.04)
bta_10_years	-1.809 (-0.31)	17.007 (0.93)
growth rate of gdp	1.175 (1.45)	-0.337 (-0.25)
debt_total eng	- 0.136 (-0.21)	-6.955** (-2.53)
tradebalance_gdp	0.08351*** (4.03)	-0.23018 (-1.27)
Observation number	261	349
Threshold (Method of Hansen)	200%	80%
Test of significativity of Ficher (p_value)	0.0040	0.0001
Sargan test (S statistics)	0.4966	0.2709

« * » p<0.1, « ** » p<0.05, « *** » p<0.01

Table 7 Results of regression for South East Asia

Variables	GMM regression with threshold (Good sequence group)	GMM regression with threshold (Bad sequence group)
m2_res	-3.79e-07*** (-2.98)	-0.006*** (-7.83)
eng_res	0.010 (0.34)	-0.004*** (-3.18)
finance_integ	-0.0013** (-2.32)	-0.0013*** (-4.08)
I (finance_integ > $\hat{\gamma}$)	-0.046 (-0.50)	0.041 (1.15)
finance_integ* I (finance_integ > $\hat{\gamma}$)	0.0012** (2.14)	0.0014*** (4.28)
cominteg_gdp	-0.0002* (-1.79)	-0.0002 (-0.88)
oil_price	0.0003* (1.93)	-0.0001 (-0.81)
bta_10_years	0.005* (1.71)	0.014*** (4.74)
growth rate of gdp	-0.0007 (-0.63)	0.0005 (0.63)
debt_total eng	-0.021 (-0.11)	0.125*** (3.18)
tradebalance_gdp	-0.003* (-1.14)	0.0003 (0.69)
Observation number	216	108
Threshold (Method of Hansen)	85%	80%
Test of significativity of Ficher (p_value)	0.0000	0.0012
Sargan test (S statistics)	0.3567	0.3064

« * » p<0.1, « ** » p<0.05, « *** » p<0.01

Table 8 Results of regression for Latin America

Variables	GMM regression with threshold (Good sequence group)	GMM regression with threshold (Bad sequence group)
m2_res	-0.00001 (-1.41)	-2.21e-08*** (-3.11)
finance_integ	0.051* (1.66)	-0.004*** (-2.59)
I (finance_integ > $\hat{\gamma}$)	1.714* (1.65)	-0.672*** (-2.59)
finance_integ* I (finance_integ > $\hat{\gamma}$)	-0.050* (-1.65)	0.003** (2.06)
oil_price	0.002* (1.75)	0.002* (1.85)
bta_10_years	0.011 (0.73)	0.018 (0.93)
growth rate of gdp	0.0001*** (10.24)	-0.0002 (-0.98)
debt_export	0.003 (0.78)	-0.0008 (-0.30)
tradebalance_gdp	0.0088 (1.23)	0.0007*** (2.63)
Observation number	142	403
Threshold (Method of Hansen)	48%	103%
Test of significativity of Ficher (p_value)	0.0000	0.0000
Sargan test (S statistics)	0.0806	0.0727

« * » p<0.1, « ** » p<0.05, « *** » p<0.01

Concluding remarks

This research sheds some light on the relationship between sequencing of liberalization reforms and financial stability. We used a dynamic panel data specification to investigate whether the impact of financial integration on financial vulnerability to the exchange crises of a country differs according to the policy of liberalization undertaken by that country. We were particularly interested in proving that the manner of deregulation of capital and financial accounts governed the effect “crisis” of the process of financial integration. The investigation of international deregulation in the areas (Latin America, South East Asia and Europe) enables us to identify the “bad” dynamics that had made at some time those areas financially unstable. The central assumption of this article is that the effect “exchange pressures” of a policy of integration depends widely on the sequence of liberalization. In the light of the results, the premature deregulation of financial markets constitutes one of the major factors of global instability. The theory of optimal sequence of liberalization could explain the contamination of some countries while others remain intact. In fact, the divergence of international strategies of liberalization from the “good” path of deregulation provided had caused severe financial crises. Contrary to conventional wisdom, countries could govern their financial vulnerability by evolving, simply according to a good dynamic of liberalization. A possible manner to avoid a global financial instability consists on the establishment of a re-regulation of the dynamics of international liberalization for countries which had diverged from the “optimal” dynamic of liberalization. Also, we prove that allowing for nonlinearities in the specifications provides an answer to the following question: why different studies failed to catch the real effect of financial integration on speculative pressures? The most telling report is that even within those regions, countries were not contaminated similarly. This finding is of particular importance in consideration to the global character of modern crises.

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APENDIX

Table 1: Legal financial integration

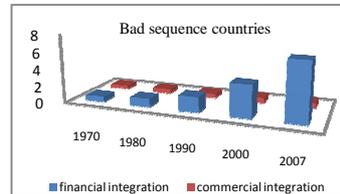
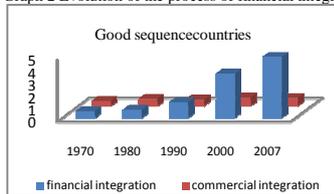
		legal finance integration	effective finance integration
EUROPE	1970	1.002809	0.822805
	1980	1.001964	1.099997
	1990	0.995784	1.632966
	2000	0.990880	4.089525
	2007	0.985508	7.191796
SEA	1970	1.003821	0.509929
	1980	0.996863	0.769524
	1990	0.993321	1.283397
	2000	0.993781	2.255097
	2007	0.995716	2.893158
Latin America	1970	0.997947	0.586365
	1980	0.999920	1.941278
	1990	1.008355	2.763163
	2000	0.988705	1.299306
	2007	0.984173	1.348743

Table 3: The countries of each sequence by area

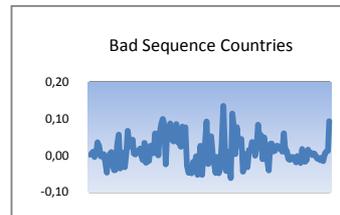
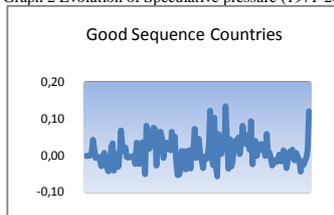
	Good Sequence	Bad Sequence
Europe	Cyprus,Finland,Ireland,Netherlands, Romania, Norway, Turkey, Sweden	Austria, Belgium , Denmark, Spain, France, Greece, Iceland, Switzerland, United Kingdom, Portugal, Italy
South East asia	China, Korea, India, Indonesia, Malaysia,Sri Lanka, Thailand,	Japan, Philippines, Singapore
Latin America	Brazil, Colombia, Costa Rica, Guatemala, Nicaragua,	Argentina, Bolivia, Chile, Dominican Republic, Ecuador, Peru, Paraguay,Panama, Mexico, Jamaica, Uruguay, Venezuela, Rep. Bol.

Descriptive analysis²⁰: - Europe

Graph 2 Evolution of the process of financial integration of the sequences

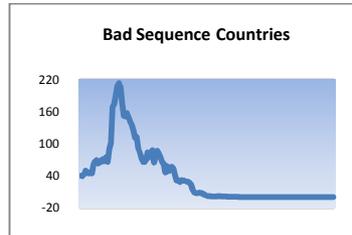
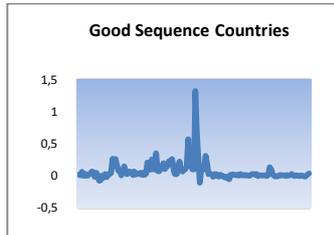
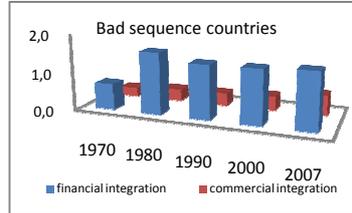
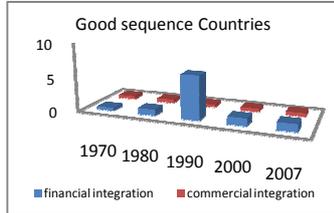


Graph 2 Evolution of Speculative pressure (1971-2005)

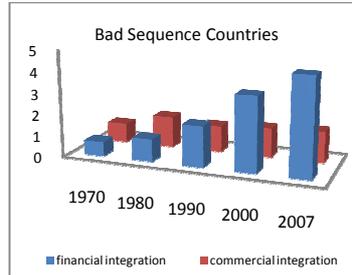
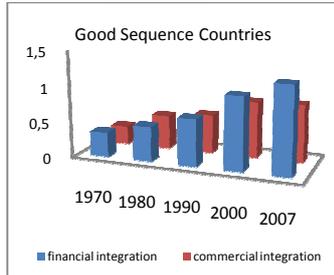


²⁰ Personal calculation

- Latin America



- South East Asia



Graph 2 Evolution of Speculative pressure (1971-2005)

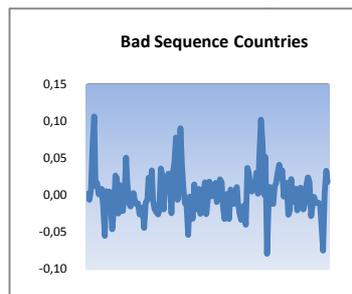
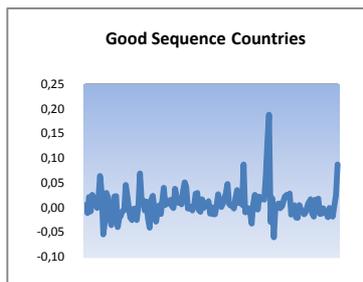


Table 9 and 10 Regressions for Europe Area

Good sequence Variables	GMM regression without threshold		GMM regression with threshold
	m2_res	- 0.161 (-2.32)	-0.404 (-0.64)
eng_res	0.070 (1.61)	0.041 (1.16)	0.052 (1.17)
sqrtfinance_integ		-0.760** (-2.26)	
finance_integ	- 0.161** (-2.32)		0.841* (1.66)
I (finance_integ > $\hat{\gamma}$)			- 0.609 (-0.76)
finance_integ* I (finance_integ > $\hat{\gamma}$)			- 0.937* (-1.91)
cominteg_gdp	0.010 (0.90)	0.008 (0.70)	0.008 (0.70)
oil_price	-0.672* (-1.77)	-0.492 (-1.20)	- 0.899** (-1.99)
bta_10_years	-1.826 (-0.34)	-3.645 (-0.64)	-1.809 (-0.31)
growth rate of gdp	0.961 (1.18)	0.845 (1.04)	1.175 (1.45)
debt_total eng	-0.503 (-0.75)	- 0.612 (-0.93)	- 0.136 (-0.21)
tradebalance_gdp	0.076*** (3.61)	0.072*** (3.52)	0.083*** (4.03)
Observation number	261	261	261
Test of significance of Ficher (p_value)	0.0309	0.0345	0.0040
Sargan test (S statistics)	0.5902	0.6063	0.4966

Bad sequence Variables	GMM regression without threshold		GMM regression with threshold
	m2_res	0.001 (0.38)	0.001 (0.38)
eng_res	-0.172 (-0.64)	-0.175 (-0.65)	-0.216 (-1.44)
sqrtfinance_integ		-6.856 (0.68)	
finance_integ	0.070 (0.31)		-4.492* (-1.65)
I (finance_integ > $\hat{\gamma}$)			1.339 (0.61)
finance_integ* I (finance_integ > $\hat{\gamma}$)			4.583* (1.75)
cominteg_gdp	-0.186 (-0.07)	-0.358 (-0.13)	-0.679 (-0.44)
oil_price	0.234 (0.28)	-0.114 (-0.11)	-0.054 (-0.04)
bta_10_years	9.73 (1.00)	12.611 (1.18)	17.007 (0.93)
growth rate of gdp	-0.771 (-0.48)	-0.766 (-0.48)	-0.337 (-0.25)
debt_total eng	- 5.429*** (-2.71)	-5.693*** (-2.78)	-6.955** (-2.53)
tradebalance_gdp	-0.214** (-2.47)	-0.209** (-2.42)	-0.230 (-1.27)
Observation number	349	349	349
Test of significance of Ficher (p_value)	0.1784	0.1650	0.0001
Sargan test (S statistics)	0.3077	0.3081	0.2709

Table 11 and 12 Results of regression for South East Asia

Good sequence Variables	GMM regression without threshold		GMM regression with threshold
	m2_res	-2.93e-07 *** (-5.67)	-2.88e-07*** (-5.26)
eng_res	0.013 (0.42)	0.013 (0.41)	0.010 (0.34)
sqrtfinance_integ		-0.006 (-1.06)	
finance_integ	-0.0001 (-0.35)		-0.001** (-2.32)
I (finance_integ > $\hat{\gamma}$)			-0.046 (-0.50)
finance_integ* I (finance_integ > $\hat{\gamma}$)			0.0012** (2.14)
cominteg_gdp	-0.002 (-1.03)	0.0001 (0.64)	-0.0002* (-1.79)
oil_price	0.0001 (0.77)	0.0002 (1.09)	0.0003* (1.93)
bta_10_years	0.006* (1.91)	0.005* (1.70)	0.005* (1.71)
growth rate of gdp	-0.001 (-0.81)	-0.001 (-0.92)	-0.0007 (-0.63)
debt_total eng	-0.065 (-0.34)	-0.062 (-0.33)	-0.021 (-0.11)
tradebalance_gdp	-0.002 (-1.03)	-0.003 (-1.11)	-0.003* (-1.14)
Observation number	216	216	216
Test of significance of Ficher (p_value)	0.0000	0.0000	0.0000
Sargan test (S statistics)	0.3899	0.3851	0.3567

Bad sequence Variables	GMM regression without threshold		GMM regression with threshold
	m2_res	-0.005*** (-3.25)	-0.006*** (-3.39)
eng_res	-0.004*** (-4.81)	-0.004*** (-3.73)	-0.004*** (-3.18)
logtfinance_integ		-0.011** (-2.04)	
finance_integ	0.00008* (1.87)		-0.001*** (-4.08)
I (finance_integ > $\hat{\gamma}$)			0.041 (1.15)
finance_integ* I (finance_integ > $\hat{\gamma}$)			0.001*** (4.28)
cominteg_gdp	-0.00009 (-0.26)	-0.00006 (-0.19)	-0.0002 (-0.88)
oil_price	0.0001 (1.03)	0.0002* (1.86)	-0.0001 (-0.81)
bta_10_years	0.004*** (5.77)	0.003*** (5.92)	0.014*** (4.74)
growth rate of gdp	0.0001 (0.22)	-0.00007 (-0.09)	0.0005 (0.63)
debt_total eng	0.240*** (3.23)	0.247*** (3.14)	0.125*** (3.18)
tradebalance_gdp	-0.0012** (-2.19)	-0.0004 (-1.62)	0.0003 (0.69)
Observation number	108	108	108
Test of significance of Ficher (p_value)	0.2649	0.0048	0.0012
Sargan test (S statistics)	0.0041	0.2516	0.3064

Table 13 and 14 Results of regression for Latin America

Good Sequence				Bad Sequence			
Variables	GMM regression without threshold		GMM regression with threshold	Variables	GMM regression without threshold		GMM regression with threshold
m2_res	-0.00002 (-0.66)	-0.00001 (-0.52)	-0.00001 (-1.41)	m2_res	-3.59e-09 (-0.51)	-2.11e-08*** (-2.97)	-2.21e-08*** (-3.11)
invsqrtfinance_integ		0.033 (0.85)		logfinance_integ		-0.004*** (-4.95)	
finance_integ	-0.0008 (-0.39)		0.051* (1.66)	finance_integ	-0.001 (-1.31)		-0.004*** (-2.59)
I (finance_integ > ?)			1.714* (1.65)	I (finance_integ > ?)			-0.672*** (-2.59)
finance_integ * I (finance_integ > ?)			-0.050* (-1.65)	finance_integ * I (finance_integ > ?)			0.003** (2.06)
oil_price	0.0031 (1.64)	0.003* (1.80)	0.002* (1.75)	oil_price	0.0004 (0.29)	0.003** (2.06)	0.002* (1.85)
bta_10_years	0.022 (0.79)	0.024 (0.85)	0.011 (0.73)	bta_10_years	0.027 (1.18)	0.025 (1.08)	0.018 (0.93)
growth rate of gdp	0.0002 (1.31)	0.0002 (1.16)	0.0001*** (10.24)	growth rate of gdp	-0.0002 (-0.83)	-0.0001 (-0.83)	-0.0002 (-0.98)
debt_export	0.003 (0.33)	0.003 (0.29)	0.003 (0.78)	debt_export	0.003 (1.32)	-0.004 (-1.03)	-0.0008 (-0.30)
tradebalance_gdp	0.0129 (0.99)	0.012 (1.03)	0.0088 (1.23)	tradebalance_gdp	0.0008*** (3.09)	0.0009*** (2.98)	0.0007*** (2.63)
Observation number	142	142	142	Observation number	403	403	403
Test of significativity of Ficher (p_value)	0.9072	0.8760	0.0000	Test of significativity of Ficher (p_value)	0.0000	0.0000	0.0000
Sargan test (S statistics)	0.1270	0.1313	0.0806	Sargan test (S statistics)	0.0766	0.0753	0.0727