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Financial Liberalization and Banking Crisis in Emerging Countries

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ABSTRACT

From the 1970s, emerging countries embarked on financial liberalization policies with a view to promoting growth. However, these policies can have adverse effects on the stability of banking systems. The central hypothesis of this article is that their impact on the stability of the banking system largely depends on the modalities of liberalization. The analysis focuses on a sample of seventeen emerging countries over the period 1990-2012. The interest of this period is that it allows not only to analyze the causes of these crisis but also to integrate new banking crisis such as those of South-East Asia (1997), Argentina (2001) and Turkey (2001) while most of the studies analyzed in the literature are limited to crisis that occurred before 1995. Then, using the logit method, we found that financial liberalization played an important role in explaining banking crisis and that economic growth reduces the probability of suffering a crisis. In addition, at the level of institutional variables, the more contracts are honored, the more the probability of suffering a banking crisis decreases.

Keywords: Financial liberalization, banking crisis, emerging countries, logit.

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Introduction

The rise in financial instability is one of the highlights of recent times. Banking crisis are the most spectacular form of this instability. The banking systems of two-thirds of IMF member countries and most emerging countries have experienced serious dysfunctions that have resulted in losses equivalent to $250 billion over the past two decades.

The emerging countries of Latin America and Asia have been particularly affected by these banking crisis, the cost of which has often been considerable. Restructuring costs were very high, around 55% of GDP in Indonesia and Argentina, 42% in Chile, 34% in Thailand, 30% in Turkey, 28% in Korea and 19% in Mexico (Caprio and Klingebiel, 1996).

In recent years, important advances in the understanding of these crisis have been made thanks to well-documented empirical work, some of which has been carried out by IMF economists. This work shows in particular the existence of a relationship between banking and financial crisis and the policies of financial liberalization, often radical, carried out in emerging countries. They also show that bank failures are at the center of recent economic and financial crisis in emerging countries. Most of these analyses, which are mainly macroeconomic in nature, put forward two series of explanations for banking crisis: on the one hand, financial liberalization makes banks more vulnerable to macroeconomic shocks and, on the other hand, the financial fragility of the latter would be aggravated by the unsuitability of public policies and by the insufficiency of supervision mechanisms, which are particularly evident in emerging countries. It appears, however, that these explanations, if they are not debatable, do not nevertheless make it possible to fully elucidate the reasons which lead banks to take excessive risks and to constitute a major factor of instability.

In this article, we will analyze the effects of financial liberalization on banking crisis in emerging countries, which have a more vulnerable and fragile banking system than that of developed countries. We will study the effects of financial liberalization over a period from 1990 to 2012 during which the most important banking crisis occurred. The interest of this period is that it allows not only to analyze the causes of these crisis but also to integrate new banking crisis such as those of South-East Asia (1997), Argentina (2001) and Turkey (2001) while most of the studies analyzed in the literature are limited to crisis that occurred before 1995. It is interesting in our research to introduce recent banking crisis.

The first part offers a review of recent literature on the explanation of banking crisis in these countries. The second and third parts respectively present the methodology and the main empirical results.

1- Banks at the center of financial instability in emerging countries: review of recent literature

The banking crisis in emerging countries have given rise to numerous studies. Two main results emerge from these analyses. First, it is clear that the process of financial liberalization, carried out in almost all countries for the past twenty years, is

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the common cause of most banking and financial crisis. Second, banking crisis are closely linked to financial and currency crisis, particularly in emerging countries. These two results, which are now the subject of a broad consensus in the community of economists, show the central role of banks in the process of financial instability in emerging countries over the last decade.

There have been different approaches to explaining the causes of banking crisis. The first approach concerns studies that have analyzed a few episodes of banking crisis. Despite the fact that these studies provided detailed knowledge of the causes, they did not, however, make it possible to identify the causes of banking crisis for a set of countries. Among the authors who have adopted this approach, we find Sachs, Tornell and Velasco (1996), Glick and Rose (1998), Blanco and Garber (1986).

The second approach concerns studies on the "signal theory" developed by Kaminsky and Reinhart (1996) who analyzed the indicators that make it possible to identify banking crisis. The two authors determine for each indicator a threshold to minimize the risks of a false alarm and the risk of non-anticipation, with the aim of minimizing the risks of errors (type I error and type II error).

Kaminsky and Reinhart (1999) used signaling theory to determine the cause of monetary and banking crisis in twenty countries between 1970-1995 (5 developed countries and 15 emerging countries). If an indicator exceeds the threshold, then the model predicts a crisis within 24 months. In this study, the two authors find that the indicators that best explain the emergence of crisis are the decline in exports, the decline in the real exchange rate and the deterioration of the M2 / international reserves ratio.

The advantage of signal theories is that they make it possible to determine the effects of each indicator on crisis, the models used are often Logit or Probit models, with a binary variable which takes the value 1 if there is a crisis and 0 otherwise. The limits of this model lie in the determination of a threshold for each indicator, however this does not explain the banking crisis that appeared without signaling.

The third approach analyzes the effects of several economic and financial variables on crisis. Eichengreen Rose and Wyplosz (1996) analyzed between 1959-1993 the causes of banking and monetary crisis in emerging countries by showing the contagion effect. On the other hand, Frankel and Rose (1996) used a Probit model to determine the causes of banking crisis in 105 countries between 1971-1992, they found that the probabilities of banking crisis increase when the external interest rate is high and that domestic loans are more important. Eichengreen and Rose (1998) find that a high external interest rate and a deterioration in economic growth increase the likelihood of crisis. On the other hand, Hardy and Pazarbasioglu (1998) find that the banking sector crisis increases with the decline in the growth rate, unstable inflation, a domestic interest rate and high capital inflows.

One of the important contributions of the literature is that of Kaminsky and Reinhart (1999) who conclude that banking crisis contribute to monetary crisis and that financial liberalization contributes to increasing the probability of crisis.

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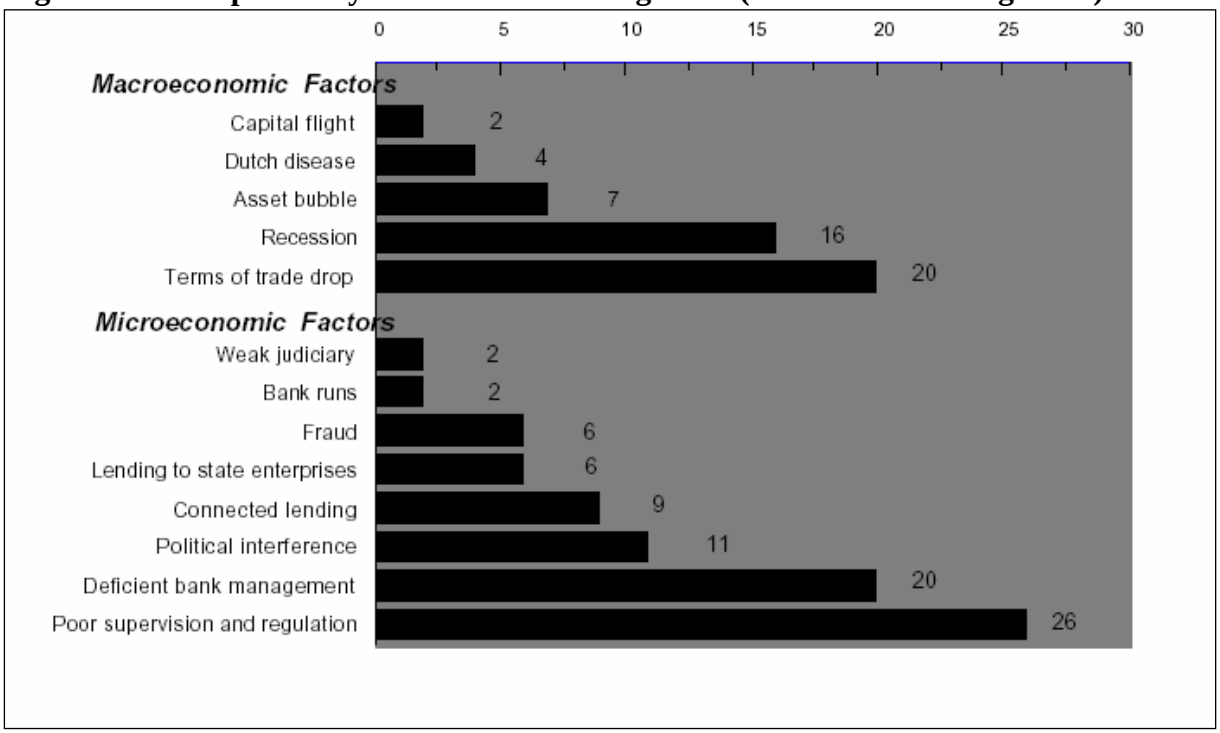
Demirgüç-Kunt and Detragiache (1997,1998) analyzed through a multivariate logit model the causes of banking crisis and the effects of a policy of financial liberalization for 53 developed and emerging countries between 1980-1995. These authors found that a real interest rate, a high M2/reserves ratio and the existence of a deposit insurance system increase the probability of banking crisis. On the other hand, the two authors have shown that financial liberalization has played an important role in the emergence of crisis. Caprio (1999) found that rapid financial liberalization can be the main cause of financial crisis.

Hellman, Murdock and Stiglitz (2000) showed how in a framework of financial liberalization, an increase in banking crisis can have negative effects on the rent of the banking sector. This loss of rent encourages banks to adopt a riskier policy by taking advantage of the support of the authorities in the event of a problem or major risks.

Caprio and Klingebiel (1996) introduced a database of banking crisis between 1970-1998 and made an important distinction between systemic and non-systemic crisis. These authors analyzed the causes of banking crisis in 29 cases and show that the fall in the terms of trade explains about twenty crisis and that a weak supervision and regulation framework explains 26 banking crisis out of 29 cases (Figure 1).

Figure 1: The explanatory variables of banking crisis (29 cases of banking crisis)



Source: Caprio and Klingebiel (1996)

According to Demirgüç-Kunt and Detragiache (1998) one of the reasons explaining that financial liberalization implies an increase in the fragility of the banking sector is that the elimination of entry barriers and the elimination of capping

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interest rates lowers the rents of banks that exercised their powers in a regime of financial repression.

Caprio and Summers (1993) as well as Hellmann, Murdock and Stiglitz (1998) have shown that restrictions on the entry of foreign banks promote the appearance of a rent, but the disappearance of this rent implies that the banks begin to adopt speculative policy and excessive risk-taking.

2- General model specification and variables definition

In this part, we will analyze the effects of financial liberalization on banking crisis in 17 emerging and developing countries in Latin America, Asia, Mediterranean and African countries for the period 1990-2012[1]. The interest of the choice of the period is that it represents all the banking crisis that have affected emerging countries. It is interesting despite the geographic, economic, institutional and regulatory diversity to know the explanatory variables of banking crisis.

We took into account data from the IFS (International Financial Statistics, an institution of the International Monetary Fund) for macroeconomic variables and development indicators for all of these countries between the period 1990 and 2012 as well as data from the database Chelem for data on the banking market.

In our study, we took into account the logit model to analyze the probability of banking crisis. The variable explained in our model is the banking crisis, it is a binary variable which takes the value of 1 if there is a banking crisis and the value 0 if there are no crisis.

$$(1)\ Y_{it} = F\left(\alpha_0 + \alpha_1 Macro_{it} + \alpha_2 FD_{it} + \varepsilon_{it}\right)$$

i: country
t: period
Macro: it represents all macroeconomic variables.
DF: It represents all the variables of financial development.
If the country experienced a banking crisis on date (t) then Yit = 1 Else Yit=0

In this model, we have introduced macroeconomic variables and microeconomic variables to identify the variables that most influence banking crisis in emerging countries between 1990-2012.

2.1- The choice of variables

Many of the variables have been analyzed in the literature, particularly that of Demirgüç-Kunt and Detragiache (1998) as well as Kaminsky and Reinhart (1999). Demirgüç–Kunt and Detragiache (1998) showed the effects of macroeconomic variables on the performance of the banking sector. Among the variables, they found that the GDP growth rate, the terms of trade, the inflation rate, the "spread" and the variation in the real exchange rate had an influence on the banking sector. The two authors analyzed the characteristics of the banking system such as liquidity, vulnerability to capital movements (measured by the M2/external reserve ratio)

[1] 8 Latin American countries: Argentina, Brazil, Chile, Colombia, Jamaica, Mexico, Peru, Venezuela, 5 Asian countries: Korea, Indonesia, Malaysia, Philippines, Thailand and 4 Mediterranean and African countries South Africa, Egypt, Morocco, Jordan.

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suggested by Calvo (1996) and private sector risk (all credits private sector compared to total credit).

2.2- Definition of a banking crisis

One of the important assumptions in our study is the definition of the period of banking crisis for the period between 1990 and 2012. What is interesting is that this period contains the largest part of the crisis that occurred in developed countries but also in emerging countries. However, it is essential in this case to make an important distinction between a period of financial fragility and a period of banking crisis. Also, to make a distinction between period of systemic and non-systemic crisis. Several authors have identified the periods of banking crisis, Caprio and Klingebiel (1995), Kaminsky and Reinhart (1996,1999) from which we drew inspiration. In this part, we will consider the approach of Demirgüç-Kunt and Detragiache (1996) to identify banking crisis from the following conditions:

• the panic of the banks,
• major financial support programs (the cost of rescue operations exceeds 2% of GDP) or the widespread nationalization of banks,
• the freezing of deposits, a prolonged increase in holidays at the level of banks,
• the generalization of State guarantees following the banking crisis,
• doubtful debts exceeding 10% of bank loans.

From these criteria, we can identify periods of crisis compared to periods of bank fragility. It is enough to find one of the following conditions to set a date for banking crisis. This approach by Dimirgüç-Kunt and Detragiache (1998) is interesting because it makes it easy to identify periods of crisis.

3- Econometric results

In this part, we have analyzed five different models, each time introducing a variable representing the characteristics of the financial market, namely concentration, interest rate margin and operating costs.

Table 5: Results of the global Logit model

Variables	1	2	3	4	5
Constant	-0,36 -0,31	0 ,45 0 ,32	0,853 0,61	0,72 0,21	-0,97 -0,26
LF5	5,09*** 8,40	5,40*** 8,33	5,23*** 8,49	5,22*** 8,30	5,95*** 8,40
T^xGDP	-0,14*** -3,27	-0,09** -2,05	-0,15*** -3,54	-0,13*** -3,24	-0,10** -2,22
I.real	0,032 1,30	0,037 1,52	0,028 1,47	0,024 1,14	0,036* 1,68
T^xINFL	-0,0002 -0,49	-0,009 -1,35	-0,0001 -0,29	-0,0003 0,474	-0,0009 -1,38
M2RC	0,022 0,65	0,031 0,86	0,013 0,37	0,009 0,24	0,0297 0,71
ΔT^xchange	-0,0003* -1,66	-0,0004* 0,073	-,0004* -1,92	-0,0003 -1,48	-0,0006** -2,42
Spread	-0,026 -0,81	-0,049 -1,53	-0,009 -0,41	-0,035 -1,05	-0,01 -0,59

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Dep/Actif	-3,02*	-2,799	-3,067*	-2,84*	-2,89
	-1,90	-1,59	-1,91	-1,77	-1,49
Dep/GDP	-3,57	-2,77	-5,51	-2,70	-7,74
	-0,97	-0,70	-1,45	-0,72	-1,80
Liq/GDP	-0,34	-0,016	-0,45	-1,39	0,40
	-0,15	-0,01	-0,20	-0,60	0,15
TCRPV	1,049	1,061	1,637	-0,303	3,17
	0,28	0,27	0,44	-0,08	0,72
CRPV/GDP	4,45**	4,67**	4,78**	5,55**	5,14**
	2,25	2,31	2,41	2,52	2,21
Cost/Asset		25,02***			36,9***
		3,44			4,02
M/Asset			-15,8		-42,11**
			-1,59		-2,78
Conc				1,472	-0,37
				1,18	0,26
Number of Obs	391	391	391	391	391
Pseudo R^2	0,4468	0,4791	0,4545	0,4507	0,5088
LR Global test (χ^2)	162,43	174,15	165,24	163,84	184,97
Probability (LR statistic)	0,0000	0,0000	0,0000	0,0000	0,0000

***: significant variable at 1%
**: significant variable at 5%
*: significant variable at 10%

● For the first logit model, we introduced macroeconomic variables as well as financial development variables to explain the causes of banking crisis in emerging countries, without taking into account the variables representing the characteristics of the banking market. Of the twelve explanatory variables, we found five significant variables that have effects on banking crisis. First of all to determine the effects on banking crisis, we followed the approach of Kaufman (1998) by considering whether a country had experienced a crisis during the five years following the liberalization if this is the case this variable 'LF5' takes the value of 1, otherwise 0. We have assumed that 5 years are largely sufficient for the effects of a financial liberalization policy to have an effect on the banking sector.

We notice that the financial liberalization variable is significant at 1% in the five models and it has a positive effect on the explained variable banking crisis. The likelihood of banking crisis increases during the first five years after the introduction of financial liberalization reforms. Financial liberalization increases the likelihood of banking crisis in emerging countries. This result corresponds well to what has been developed in the economic literature with the work of Demirgüç-Kunt and Detregiache (1998a, 1998b, 1999), Kaminsky and Reinhart (1999), Kaufmann (1998)….

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In addition, the economic growth variable has a negative effect on banking crisis, an increase in economic growth reduces the probability of banking crisis, this corresponds to what has been developed in the literature, in the first model this variable is significant at 1%.

We also notice that the rise in the exchange rate has a negative effect on banking crisis, it is significant at 1%, an appreciation of the exchange rate reduces the probability of suffering a banking crisis. Another interesting result is that the increase in deposits reduces the probability of crisis, this variable is significant at 10%. Indeed, the more the percentage of deposits increases, the more the problems of liquidity in the banking sector will decrease and the more the probabilities of crisis decrease.

On the other hand, the higher the percentage of loans distributed by banks and financial institutions to the private sector, the higher the probability of banking crisis will increase, this variable is significant at 5%. These results confirm the empirical results of various authors such as Demirgüç-Kunt and Detragiache (1998) Kaminsky and Reinhart (1999) who have shown that significant economic growth can encourage banks to grant loans to increasingly risky without taking the necessary precautions in the event of force majeure. This is particularly the case of Asian banks which believed in the economic miracles of Asia and which engaged in an unprecedented race to grant credit without taking into consideration the measures necessary to protect themselves in the event of a problem. It appeared that the banks financed very risky short-term oriented projects in the hope of maximizing the gains, the Asian banks encouraged the development of real estate development, speculation on movable assets….by the effect of "collective myopia". Believing in an economic miracle, banks and borrowers embarked on the financing and realization of very risky projects, credits to the private sector increased considerably between 1990 and 1996, which can only increase the probability of suffering a major banking crisis.

● In the second model, we are going to introduce the operating cost variable of the banking sector which represents the competitiveness for each country. What is interesting in this approach is the fact that this variable is significant at 1%, it has a positive effect on the probability of banking crisis. Indeed, the higher the operating cost in relation to the assets, the higher the probability of crisis, this variable plays a very important role in explaining crisis. Indeed, the higher this variable, the more this is synonymous with poor management of banking institutions and a problem of governance.

On the other hand, the variable deposits and credits to the private sector are no longer significant in the second model, we also found the same explanatory variables compared to the second model, the existence of financial liberalization considerably increases the probability banking crisis, it is significant at 1%.

An increase in economic growth makes it possible to reduce the probability of crisis and it is significant at 5%. An appreciation of the exchange rate has a negative effect on crisis, an appreciation of the exchange rate reduces the probability of suffering a crisis.

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● In the third model, we introduced the variable margin of the banking sector relative to total assets and we found that this variable is not significant in this model. The variables that influence the probability of banking crisis are the same as in the first model, an increase in private credit and the implementation of financial liberalization considerably increase the probability of experiencing banking crisis. On the other hand, economic growth, an increase in deposits and an appreciation of the exchange rate have negative effects on the variable explained the crisis, because they reduce the probability of crisis.

● In the fourth model, we introduced the concentration variable to analyze the effects on banking crisis. To our surprise, this variable is not significant, what is interesting in this model is that the exchange rate variable is no longer significant. Only four variables are significant. We first found that financial liberalization has a positive effect on banking crisis, the variable increased credit to the private sector also increases the probability of suffering a crisis while economic growth lowers the probability of going bankrupt. We can explain this by the fact that prosperity contributes to reducing the number of bad debts and reducing the insolvency of creditors in the banking sector. In addition, we found that an increase in deposits helps to improve the banking situation, it lowers the probability of bankruptcy.

● In the last model, we introduced the three variables that characterize the banking market, namely the degree of concentration (this variable measures the degree of concentration in the five largest banks), the operating cost in relation to total assets as well as the margin in relation to the total assets. We found some very interesting results. There are seven significant variables in this model, the financial liberalization variable confirms the results found in the previous models by the fact that it increases the probability of banking crisis (it is significant at 10%). The economic growth variable has negative effects on the banking sector (it is significant at 5%). Like the previous models, an appreciation of the exchange rate lowers the probability of crisis (it is significant at 5%). The increase in loans to the banking sector contributes positively to the increase in the probability of crisis. The “deposits” variable is no longer significant in this model. What is interesting, on the other hand, is that the real interest rate variable "I.real" becomes significant at 10%, the more the real interest rate increases the more the probability of banking crisis increases, which confirms the effects of financial liberalization on the banking sector which leads to a considerable increase in the real interest rate. In addition, we found that the operating cost variable in the banking sector is significant at 1% and it contributes to the increase in crisis.

The higher the operating cost, the more vulnerable the banks are and the probability of suffering a crisis increases. In addition, we found that the variable margin relative to total assets is significant at 5% and that it has a negative effect on the probability of crisis, the more the margin on interest rates increases the more the probability of a crisis bank drops.

We found several interesting results namely that the effect of financial liberalization increases the probability of banking crisis and economic growth has a

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negative effect on crisis. We also notice that the increase in the interest rate margin has a negative effect on crisis while the increase in the cost of operation in the banking sector considerably increases the probabilities of banking crisis.

For most emerging countries, it is interesting to analyze the effects of institutional variables on banking crisis.

3.1- Financial liberalization, institutional context and banking crisis

In this section, we have taken the same macroeconomic variables as well as the indicators of financial development and we have added the institutional variables (Source ICRG: International country risk guide (4 variables: laws, contract, corruption, bureaucracy).

We took the value of the average between 1982-1995 (data available for the four variables and we assumed that the average of each variable between 1990-2012 is the same as that of 1982-1995. This is the limits of our approach because there is no data available.

We will introduce for each model an institutional variable to analyze the effects on banking crisis. In the fifth model we introduce the four institutional variables (compliance with contracts, compliance with laws, corruption and bureaucracy).

Table 6: Logit model of banking crisis with institutional variables

Variables	1	2	3	4	5
Constante	2,041 0,409	-0,52 0,807	-0,87 0,644	-0,40 0,829	2,78 0,40
LF5	5,85*** 0,000	5,84*** 0,000	5,79*** 0,000	5,85*** 0,000	5,94*** 0,000
T^xGDP	-0,089** 0,050	-0,092** 0,044	-0,0915** 0,046	-0,089* 0,053	-0,086* 0,058
I.real	0,048** 0,039	0,038 0,115	0,0421* 0,064	0,0452** 0,046	0,0527** 0,045
T^xINFL	-0,00078 0,221	-0,0008 0,190	-0,0008 0,197	-0,0008 0,214	-0,00007 0,246
M2RC	0,032 0,450	0,0308 0,462	0,03957 0,462	0,0463 0,462	0,038 0,396
ΔT^xchange	-0,0011** 0,023	-0,0008* 0,023	-0,0011** 0,023	-0,0011** 0,027	-0,0011** 0,044
Spread	-0,025 0,362	-0,018 0,535	-0,018 0,441	-0,021 0,435	-0,025 0,390
Dep/Asset	-2,64 0,189	-3,04 0,129	-2,064 0,332	-2,464 0,212	-3,33 0,187
Dep/GDP	-8,13* 0,060	-7,44* 0,083	-6,763 0,119	-7,73* 0,070	-9,63** 0,38
Liq/GDP	-0,52 0,837	0,357 0,897	-0,229 0,933	-1,125 0,690	-1,58 0,567
TCRPV	4, 26 0,322	-7,44 0,445	2,8911 0,508	2,98 0,489	4,64 0,297
CRPV/GDP	5, 90** 0,014	5,141** 0,030	5,84** 0,018	6,69** 0,012	6,84** 0,011
Coût/Asset	0,92	-0,34	0,28	0,37	1,03

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	0,556	0,811	0,857	0,807	0,51
M/Asset	34,19*** 0,000	35,27*** 0,000	35,76*** 0,000	32,97*** 0,000	30,74*** 0,003
Conc	-46,75*** 0,008	-42,3** 0,016	-40,69** 0,018	-41,5** 0,017	47,97** 0,010
contr	-1,90* 0,077				-1,92 0,151
Laws		-0,06 0,857			0,151 -0,029
Corrup			-0, 38 0,290		0,94 0,49
Bureau				-0,40 0,164	-0,47 0,313
Number of Obs	391	391	391	391	391
Pseudo R^2	0,4953	0,48	0,475	0,4914	0,4984
LR Global test (χ^2)	169,08	165,77	166,2	167,74	170,13
Probability (LR statistic)	0,0000	0,0000	0,0000	0,0000	0,0000

***: significant variable at 1%
**: significant variable at 5%
*: significant variable at 10%

● In the first model, we added the variable 'Contract' which corresponds to the respect of contracts to the macroeconomic and financial development variables. Of the sixteen explanatory variables, we found nine significant variables. The financial liberalization variable and the rise in the real interest rate increase the probability of crisis (they are significant at 1%), while economic growth and the appreciation of the exchange rate on the contrary reduce the probability of banking crisis. We also found that the variable bank deposits relative to GDP is significant at 10% and it has a negative effect on banking crisis. Indeed, an increase in deposits relative to GDP decreases the probability of suffering a crisis. Moreover, an increase in credit to the private sector considerably increases the likelihood of crisis. As for the cost and profitability variables, they are both significant at 1%. The first operating cost variable has a positive effect on crisis, the more the interest rate margin increases the more the probability of suffering a crisis increases. What is interesting in the first model is that the institutional variable "Contract" that we have introduced is significant at 10% and it has a negative effect on banking crisis, countries that undertake to respect the clauses of contracts and to honor them are those that will experience very low probabilities of crisis. Indeed, this variable has a negative effect on banking crisis. This result is very interesting because it shows us the important role of regulations concerning the application of commitments and clauses in contracts.

● Subsequently, in the second model, we introduced the institutional variable 'laws', this variable measures the degree of application of the laws for each emerging country, the higher this index, the higher the respect for the laws and their degree of app is important. To our surprise, this variable is not significant. We found seven

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المجلة الدولية للعلوم الإنسانية والاجتماعية
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Volume (39) November 2022
IJOHSS

significant variables, financial liberalization which is significant at 1% increases the probability of banking crisis. Economic growth, the appreciation of the exchange rate, the increase in deposits relative to GDP reduce the probability of banking crisis. In addition, a decline in the interest rate margin and an increase in the cost of operation considerably increase the likelihood of crisis.

- In the third model, we introduced the corruption index, the higher this index, the higher the corruption in the country. This variable is not significant, we found the same explanatory variables with the exception of the variable deposits in relation to GDP which is no longer significant.
- We have introduced the variable that measures the degree of bureaucracy, the higher this index, the higher the level of bureaucracy in the country. This variable does not play an important role in explaining banking crisis since this variable is not significant. We found the same explanatory variables for banking crisis as in the second model. In addition, we found that the increase in the real interest rate and financial liberalization considerably increase the probability of banking crisis.
- In the last model, we introduced the four institutional variables, contract enforcement index, law enforcement index, level of corruption and bureaucracy. To our surprise, there is no variable that has an influence on banking crisis since none of these institutional variables is significant. An increase in the interest rate and the establishment of a policy of financial liberalization and an increase in private sector financing considerably increase the likelihood of crisis, while an increase in economic growth, an appreciation of the exchange rate, an increase in the ratio of deposits to GDP lowers the probability of suffering a banking crisis. In addition, an increase in the cost of operation in the banking sector and a decline in the margin on interest rates only increase the probability of banking crisis.

We can say that financial liberalization has a strong effect on increasing the probability of banking crisis. Regarding the institutional variables, we found only the respect of the commitments in the contracts which has a negative effect on the banking crisis. The more commitments are honored, the lower the probability of suffering a crisis.

In addition, an increase in the cost of operation and a decrease in the margin on interest rates only increase the probability of banking crisis.

3.2- Financial liberalization and banking crisis

The different econometric results show us the important role played by financial liberalization in emerging countries, it is interesting to study the effects of the implementation of a policy of financial liberalization on banking crisis. A gradual liberalization policy does not have an immediate effect on the financial and banking sector, but it is after a few years that the effects begin to be felt.

This leads us in this part to analyze the effects of financial liberalization on the banking sector by distinguishing the different periods. First, we started by determining the first year of financial liberalization based on the data of Mahar and Williamson (1998) and those of other authors such as Demirgüç-Kunt and

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Volume (39) November 2022
IJOHSS

Detragiache (1998), Lindgren, Saal and Garcia (1996), Kaminsky and Reinhart (1996).

Table 7: Logit model of crisis according to the period of liberalization

Variables	1	2	3	4
Constant	-1,77 -1,51	-0,64 -0,45	-1,52 -1,06	
T^{x}GDP	-0,07** -2,33	-0,08** -2,33	-0,06** -1,94	-0,06* -1,93
M2RC	0,02 0,80	0,037 1,04	0,029 0,79	0,17*** 2,98
I.real	0,01 1,50	0,011 1,04	0,016* 1,71	0,01 1,12
Dep/Asset	-0,14 -0,13	0,10 0,08	-0,48 -0,34	-0,98 -0,63
Liq/GDP	3,51** 2,06	3,13 1,48	4,01* 1,86	5,75** 2,21
Dep/GDP	-2,66 -0,98	-7,74** -2,34	-6,10* -1,72	-5,98 -1,46
CRPV/GDP	5,61* 1,76	7,40** 2,11	3,34 0,82	11,31** 2,38
TCRPV	-1,33 -0,82	-0,65 -0,35	1,52 0,78	-3,32* -1,72
Conc	-1,61* -1,86	-3,40*** -3,17	-1,13 -1,08	-2,30* -1,61
Coût/Asset	15,80*** 2,63	21,25*** 2,77	23,17*** 3,14	15,30** 2,20
M/Asset	-6,24 -0,99	-23,02** 0,015	-23,21** -2,46	-4,61 -0,61
LF0	0,17 0,45			
LF3		3,64*** 8,12		
LF5			4,03*** 8,19	
LF.Leaven				-0,004 -0,04
Number of Obs	391	391	391	391
Pseudo R^{2}	0,084	0,32	0,34	0,118
LR Global test (χ^{2})	30,63	117,71	124,20	33,34
Probability (LR statistic)	0,000	0,000	0,000	0,000

***: significant variable at 1%
**: significant variable at 5%
*: significant variable at 10%

- We took into consideration a variable “LF0” which takes the value of 1 if the country adopts financial liberalization and 0 during the phase of financial repression, we tested the effects of the probability of crisis in the first model.

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العدد (39) نوفمبر 2022
Volume (39) November 2022
IJOHSS

● We have analyzed the effects of liberalization over 3 years, if the country experienced a banking crisis after 3 years, then this variable takes the value of 1 otherwise 0.

● Similarly, we wanted to test the effects of financial liberalization over 5 years in the third model, if the country experienced a banking crisis during the 5 years of financial liberalization then the variable "LF5" takes the value of 1 otherwise 0 .

● In the last model, we constructed a new index based on Laeven's approach and applied it to all emerging countries. The financial liberalization index takes the value from 0 to 6. A high rate is synonymous with total liberalization and major financial liberalization reforms, while a low index is synonymous with partial liberalization, so there remains a lot of important reforms to be made for full liberalization.

In the first model, we wanted to analyze the effects of financial liberalization on crisis through the variable "LF0". This variable takes the value of 1 as soon as a policy of financial liberalization is introduced, otherwise zero for the period of financial repression.

What is surprising in our result is that the financial liberalization variable is not significant in our model. We found in this model five significant variables: economic growth has negative effects on banking crisis, growth leads to a decrease in the probability of crisis. An increase in credit to the private sector and an increase in the level of liquidity in the banking sector increase the likelihood of crisis. On the other hand, the higher the level of concentration, the more the probability of suffering a crisis decreases. In addition, the higher the operating cost in the banking sector, the more the probability of suffering a crisis increases.

In the second model, we wanted to analyze the effects of financial liberalization over three years, by introducing the variable “LF3”, if the country experienced a banking crisis during the three years of financial liberalization then this variable takes the value of 1 otherwise zero. This variable plays an important role in the explanation of seizures, it is significant at 1% and it considerably increases the probability of seizures. Economic growth together with an increase in deposits greatly increases the likelihood of crisis. On the other hand, an increase in credit to the private sector increases the likelihood of crisis. An increase in margin and concentration lowers the likelihood of banking crisis. In terms of operating cost, the higher this rate, the greater the probability of crisis.

In the third model, we introduced the variable "LF5", if the country experienced a crisis during the five years following financial liberalization then this variable takes the value of 1 otherwise zero. We find that the liberalization variable is significant at 1% and it increases the probability of banking crisis. The real interest variable becomes significant in this model at 1% and it has a positive effect on banking crisis. In addition, we found that an increase in the ratio of liquidity to GDP and the cost of operation significantly increase banking crisis. While an increase in the level of deposits and the interest rate margin decreases the probability of having a banking crisis. In the last model (column 4), we introduced the Leaven liberalization

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Volume (39) November 2022
IJOHSS

index and we determined the value of this index for most emerging countries. This index takes the value from 0 to 6 (0: indicates the application of financial repression, 6: indicates total liberalization). To our surprise, the Leaven liberalization index is not significant.

We find that financial liberalization considerably increases the probability of banking crisis not in the first year but from the third year (3 years). Indeed, the consequences of financial liberalization are not felt the first year but rather from the third year. On the other hand, we found that the economic growth variable is significant in all four models. It contributes to reducing the probabilities of banking crisis, which shows us the important role of economic policies in reducing the probabilities of crisis.

Conclusion

In this article, we wanted to show the effects of financial liberalization on banking crisis by introducing macroeconomic and financial development variables based on 17 emerging countries in Asia, South America, Africa and the Middle – East. We tried through a logit model to determine the variables that most influence banking crisis. We found some very interesting results. First, financial liberalization increases the likelihood of banking crisis. This result confirms the contributions of Demirgüç-Kunt and Detregiache (1998), Kaminsky and Reinhart (1999)…who showed the significant effects of financial liberalization on banking crisis. Furthermore, we have found that economic growth decreases banking crisis, indeed, in times of economic prosperity, bad debts decrease considerably and the banking sector becomes more efficient. In addition, an increase in the cost of operation and a decrease in the margin in relation to the interest rate increase the probability of crisis.

Second, we introduced institutional variables (compliance with contracts, compliance with laws, corruption index and bureaucracy index) to determine their effects on banking crisis. We only found that the respect of contracts and commitments variable is significant at 10%, the more the commitments are respected and the contracts are honored the lower the probability of suffering a banking crisis. This result seems very interesting to us and shows the important role of the regulatory framework in strengthening the banking sector.

Thirdly, the effect of the implementation of a financial liberalization reform does not have an immediate effect on the crisis, it is from 3 and 5 years that the effects begin to be felt on the banking crisis, which confirms the contributions of Kaufmann (1998).

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