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Did financial liberalization lead to bank fragility?
Evidence from Tunisia

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Abstract

The debate on the effects of financial liberalization on banking sector is far from being conclusive. In fact, financial liberalization is recommended by some scholars on the one hand and it is not supported by some others in the other hand. In this confused situation, it is so interesting to study the consequences of the introduction of financial liberalization program on the Tunisian banking sector in order to evaluate the country's experience. To reach this goal, we collected date related to 9 banks observed for the period of 1980-2009. By using a Seemingly Unrelated Regression (SUR), our estimation shows that financial liberalization affected negatively the profitability of Tunisian banks and increased the degree of credit risk. Empirical results show, however, that financial liberalization increased significantly the liquidity of banks, tanks to liberalization of deposit interest rates and the accumulation of capital inflows from international companies.

Keywords*:* Financial Liberalization, Bank Fragility, Profitability, Risk-Taking, Tunisian Banks, Sur Regression.

JEL classification*:* E44, G21, L51, N24

1. Introduction

Banks have a very important role in our modern economy. They are a vital part of the society because they provide an important channel through which many businesses obtain their financial support. Banks are also the most important channel of money circulation between households, firms and financial markets; they become the hub of the economic development.

Since many decades ago, banks have received a particular attention by scholars. For example, Bagehot in «Lombard Street: a Description of the Money Market », published in 1873, argued that banks have played a major role for the industrial revolution of the United Kingdom in the beginning of the 19th century. Schumpeter (1912/1934), in "The Theory of Economic Development" argued that banks play a major role in the economy through the allocation of capital and the creation of wealth. More recently, Merton (1993, 20) states that «a well developed smoothly functioning financial system facilitates the efficient life-cycle allocation of household consumption and the efficient allocation of physical capital to its most productive use in the business sector»[1]. Nowadays, banks became such as the dynamo of the economy and their role became more and more important.

In the past two decades, financial markets have emerged spectacularly and financial innovations have been developed at a stunning rate. In a more advanced financial services economies, banks have modernized their role and have changed their strategies. Nowadays, banks exercise an extensive variety of business than before. In some developing countries, however, banking sector is still archaic and it suffers from some anomalies. One of the solutions adopted by some countries to improve the financial sector's architecture is the liberalization process. Liberalization refers to a basket of policy frameworks to measures directed at diluting or dismantling regulatory control over the institutional structures, instruments and activities of agents in different segments of the financial sector (Ghosh J 2005). Liberalization policy suggests an independent central bank with a strong position in the financial and money market, it also requires the necessity of mitigating financial repression by releasing interest rates, promoting financial innovation, reducing directed and subsidized credit and allowing greater freedom in terms of external flows of capital in diverse forms. These suggestions were strongly recommended by the so called the "Financial

[1] Merton R C (1993), Operation and Regulation in Financial Intermediation: A functional Perspective. In Operation and regulation of financial Markets, ed P. Englund. Stockholm: Economic Council. Cited by Freixas and Rochet (2008)

Repression School", notably by McKinnon (1973) and Shaw (1973). The authors demonstrated that financial liberalization is the key of rapid economic growth of Less Developed Economies (LDEs). However, these recommendations were criticized by the so called the "Neo-Structualist School", which argued that liberalization of financial markets might have adverse effects on growth if curb markets are more and more effective than official money market in financing investment (Loizoz, 2006). Furthermore, the problem became serious when the organization and the structure of financial sector became inefficient to control the globalized world economy. Whose is right and who is wrong? What should LDEs do?

Since the eighties, many LDCs have adopted the financial liberalization policy. In Tunisia, during 1986-1987, the government adopted an extensive program of financial market reforms in order to prepare the implementation of the liberalization frameworks. In this paper, we will determine the consequences of financial liberalization for Tunisian banks. Has financial liberalization affected the solidity of Tunisian banks or increased their profits? To respond to this question we collected data relative to 9 Tunisians banks for the period of 1980-2009. We used a Seemingly Unrelated Regression (SUR) to test the consequences of financial liberalization on the solidity of Tunisians banks. This paper is organized in three sections. The first one gives a review of literature on financial liberalization process by explaining its advantages according to Financial Repression School and its drawbacks according to Neo-Structualist School. In the second section we develop an empirical study to test the consequences of the adoption of financial liberalization on Tunisian banks. The third section concludes.

2. Financial Liberalization And Bank Fragility: A Theoretical Review

The financial liberalization policy has been adopted by several less developed countries as a strategy to accelerate the economic development and increase the economic growth through the adoption of some reforms for the financial sector. According to recommendations of the financial repression school, financial liberalization promotes growth and economic prosperity. Following the liberalization of interest rates and capital account, financial openness becomes beneficial on savings and investment because it allows an increase in liquidity which will stimulate investment. However, this statement is viewed by some

scholars[2] as uncertain and only with short-term positive effect. They argued that investors can at any time and in an unexpected reason withdraw their capital and seek to invest in new activities with higher returns. In addition, with the deregulation and the absence of control and adequate supervision, banks are becoming more oriented towards more speculative operations. Banks take excessive risks by funding projects with poor quality and require high rates of return. This environment will negatively affect the quality of corporate investment on the one hand, and the solvency of these banks to the other hand. This may deteriorate the financial situation of banks. Many analysts have focused their research on this concern and they emphasized the serious effects of the financial liberalization as source of banking fragility.

To study and evaluate the relationship between financial liberalization and bank fragility for the Tunisian context, we will use three main indicators[3] of solidity of banks: profitability, credit risk and liquidity.

2.1. Impact of Financial liberalization of bank profitability

Authors of the financial repression school (McKinnon 1973and Shaw, 1973) underlined the advantageous of financial liberalization. They insist on the fact that financial liberalization is the most effective way to develop banking intermediation, raise capital accumulation and promote economic growth in less developed countries. Following McKinnon (1973) and Shaw (1973) argument, several studies[4] were developed and were arrived to the same conclusion which is: the financial system should be liberalized to ensure its proper functioning, increase financial savings, promote productive investment in technological innovation and sustaining economic growth. Chari and Henry (2002) argued that in short term, and just after the introduction of liberalization programs, banks know a high profitability. They argued that the globalization of finance and the disappearance of the

[2] Demirguç Kunt and Detragiache. E (1998), Klaus. F, Gurey J.P. e and Ortigz (1997), Fisher Klaus P and Chénard. M (1998), Hermosillo. G. B; C. Pazarbasioglu (1997).

[3] Profitability it is the goal any financial institution to ensure its existence and to avoid external pressure. The level of risk is the second key indicator because credit risk is a threat to the health of the banking system, where a special attention was given to the prevention and management of risk. The third indicator is liquidity which is a necessary pillar for the well functioning of bank intermediation (collection of deposit and lending).

[4] Galbis (1977), Vogel and Buser (1976), Chari and Henry (2002)

national borders were followed by an accumulation of liquidity which promoted investment and accelerate economic development and prosperity.

Financial liberalization is broadly characterized by deregulation and the disappearance of some *old* rules imposed to banks and other financial institutions. This new environment has given more flexibility to banks to enlarge their expertise and to diversify their activities. Thus, some banks exploit this opportunities for taking new sophisticated risks uncontrollable with the available regulations. In fact, with the absence of adequate control and supervision, banks started to invest in risky projects with high rates of return. Banks were moving closer to funding high-risk activities with a high probability of default. Consequently, high profits are seen quickly for some banks but, for some other, many borrowers were unable to meet their commitments. This caused a deterioration of banks profitability and weakens the position of many institutions. The speculative behavior of banks combined with information asymmetry, adverse selection and uncertainty have increased the fragility of banks and increased bankruptcies and banking crises notably systemic risk.

2.2. Impact of Financial liberalization on bank liquidity

The liberalization of capital account leads to massive capital inflows, especially for LDCs. The decline in restrictions on capital flows has facilitated the transfer and movement of funds from the richest countries to LDCs. Consequently, liquidity of banks has increased drastically. In their paper, Mongrué and Robert (2005) have shown that capital inflows in the countries of Southeast Asia have risen sharply between 1990 and 1996, from $ 9 billion (or 3 % of regional GDP) to over 80 billion (14% of regional GDP). Thailand and Malaysia, in particular, have received annual flows of more than 10% of their GDP. These capital inflows have contributed to the overheating of the economy and put pressure on speculative asset markets (real estate).

Capital inflows are major factors for prosperity; nevertheless amounts of flows are not durable: they are cyclical and uncertain. Investors may at any time and unexpectedly withdraw their capital in case of a major problem: negative macroeconomic shock, political event or also in case of natural disasters. Investors are always looking for safer places with more productive yields.

The unexpected withdrawal of capital (outflows) is the source of the great difficulties for local countries because they find themselves with insufficient capital to finance the economy.

In this context, capital accumulation results in a financial imbalance: exchange rate (currency assets/liabilities in foreign currency) and maturity (having long term / short term commitment). During the nineties, financial liberalization has destroyed economies of Southeast Asia and Latin America through capital outflows.

2.3. Impact of financial liberalization on credit risk

Financial liberalization gave banks some flexibility and it has also declined some constraints imposed to these financial institutions. However, some banks, for reasons other than profitability, have adopted a speculative behavior, especially in Latin America and Southeast Asia. Several theoretical and empirical studies found that financial liberalization has increased the level of risk exposure for banks and thus, has increased the level of risk-taking in many ways. First, within the deregulation of interest rates, the level of market risk has increased because of the fluctuation of interest rates. The cost of "money" became uncertain and could affect the cycle of economic activities notably when banks, firms and households need urgent financing. In this situation, economic agents will be obliged to find another source of finance costly and inefficient. Second, liberalization of finance and deregulation have lead to a high competitive banking market (Hamdi and Sbia, 2008). Nowadays, a wide range of new types of enterprises have started to supply traditional banking services: transactions deposits, savings accounts and a variety of loans. Such enterprises include supermarkets, utility companies, insurance companies, mutual funds and even a car manufacturer. Consequently, banks have lost their traditional monopoly advantage such as their monopoly in the payments system (Hamdi 2009). This new environment forced banks to diversify their activities and to exercise new non-banking activities (insurance, telecommunication, and industry). However, some banks found the diversification as an interesting way to get profit easily and without any control and supervision. As a result, they started the financing of risky projects that requires a high rate of return but a low probability of success. Generally the financing of such type of projects increases the credit risk. This is what happened with Japanese banks and this is the main reason behind the Japanese banking crisis.

Third, financial liberalization has increased the liquidity risk due to an unexpected withdrawal of capital (outflows). All these risks have increased the vulnerability of banks and

lead in most cases to deterioration of the banking systems. This weakening was often followed by crisis and bank failures[5].

3. Financial Liberalization And Bank Fragility: An Empirical Study

3.1. Methodology: assumptions and data

According to literature cited above, the debate on the effect of financial liberalization on banking sector is far from being conclusive. As we saw in the theoretical background, financial liberalization is recommended by some scholars on the one hand, and it is not supported by some analysts in the other hand. In this confused condition, it is so interesting to study the consequences of the introduction of financial liberalization program on the Tunisian banking sector in order to evaluate the country's experience. To test empirically whether financial liberalization makes Tunisian banks fragile, our analysis will be based in two assumptions:

H_1: Financial liberalization reduces bank fragility.

H_2: Financial liberalization increases the fragility of banks.

In this paper we will separately analyze the link between financial liberalization and bank profitability, then financial liberalization with bank liquidity and finally financial liberalization and the level of risk.

Based on the theoretical study above, the expected signs of the different variables are summarized in the table below.

Table1. Effects of financial liberalization

Variables	expected Signs	expected Signs
Profitability	-	+
Liquidity	-	+
Credit Risk	+	-
Results	Increasing the Banking Fragility	Decreasing the Banking Fragility

Our sample is made up of 9 Tunisian banks observed for the period 1980-2009. The model used in this paper is similar to Klaus and Chenard (1998) model; it is written as follows:

[5] Klaus.F and Chénard.M (1998), Hermosillo.GB; Pazarbasioglu.C (1997), William C. Gurben, Jahyeong Moore.R and Koo (2004)

$$PROF_v = \alpha_1 + \beta_{11}LIBFIN + \beta_{21}RISK_v + \beta_{31}LIQ_v + \sum \beta_{i1}CONTR_{vi} + \varepsilon_1$$

$$RISK_v = \alpha_2 + \beta_{21}LIBFIN + \beta_{22}PROF_v + \beta_{32}LIQ_v + \sum \beta_{i2}CONTR_{vi} + \varepsilon_2$$

$$LIQ_v = \alpha_3 + \beta_{31}LIBFIN + \beta_{32}RISK_v + \beta_{33}PROF_v + \sum \beta_{i3}CONTR_{vj} + \varepsilon_3$$

(PROF) measures the profitability[6]; *(RISK)* measures the credit risk[7], *(LIQ)* measure de liquidity[8], *(LIBFIN)* financial liberalization index[9], *(CONTR)* is the control variables[10].

3.2. Results and discussion

The results of the effects of financial liberalization on bank fragility will be obtained through the estimation of our model with three equations: profitability, liquidity and credit risk.

Firstly, we start the estimation of the first equation, then the second one and finally the third one.

Table 2. Effect of financial liberalization on Bank profitability

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.139899	0.008847	15.81389	0.0000
LIB	-0.003778	0.000405	-9.320704	0.0000*
LIQ	0.022262	0.002188	10.17372	0.0000*
RISK	-0.006431	0.000662	-9.714205	0.0000*
ITR	-0.079586	0.001945	-40.91048	0.0000*
IC	-0.502210	0.057454	-8.741106	0.0000*
G	0.002866	0.001152	2.488721	0.0134**
Log likelihood	1119.630			
R-squared	0.709452	Mean dependent var		0.029518
Adjusted R-squared	0.702824	S.D. dependent var		0.013083
S.E. of regression	0.007132	Sum squared resid		0.013378
Durbin-Watson stat	1.986937			

** sig at 1%, ** sig at 5%,*

[6] Profitability is measured as the Net Interest Margin, which is: the interest income/Total Assets.
[7] Credit risk is measured by Total Loans / Total Assets (Goyeau. et Tarazi , 1992)

[8] Liquidity is measured by Total Loans/Total Deposits
[9] See annex 1.
[10] Control variables are ITR, IC and G. ITR refers to Banking Intermediation measured by the value of Deposit Interest Rates/Value Lending interest rates, IC is the concentration index measured by the IHH index $IC = \sum_{i=1}^{n} S_i^2$ and G is the growth rate of Assets = (Total Assets $_t$ – Total Assets $_{t-1}$) / Total Assets $_{t-1}$

In Tunisia, liberalization is measured by an index obtained from the major banking and financial reforms. Table 2 above shows that profitability of banks is negatively correlated with financial liberalization. This indirectly explains the consequences of reforms on the wealth of Tunisian banks. Among the major reforms, there is the liberalization of deposit interest rates which encourage households and some firms to save their funds instead of invest it. In this situation, banks were forced to pay high deposit interest rate than before. In addition, despite an accumulation of funds, banks cannot rely on this liquidity for investments in some projects because it is considered as short term saving. Therefore, banks were scared of a massive unexpected withdrawal of funds which will deteriorate their balance sheet and thus their profitability. Another reform that affected the profitability of Tunisian banks is the decline of the supervision on credit. In fact, banks were in the obligation to facilitate the condition of lending to households and enterprises. However, in many occasions customers were unable to reimburse their credits because they did not have enough guaranties to have credits. This situation has negatively affected the return on equity and returns on assets and increased the non-performing loan. Due to this new environment, banks started to take sophisticated risks through the adoption new activities based on financial innovations to minimize the added costs of interest paid and the cost of customers' non-reimbursements. This behavior has damaged the profitability of many banks. In conclusion and following this interpretation, we can conclude that financial liberalization leads to a deterioration in profitability of banks. This confirms our basic assumption.

Table 2 shows that bank liquidity is positively correlated with the dependent variable. In the Tunisian context, the money market is known as liquid because of the nature of the economy of Tunisia which is very diversified (agriculture, tourism, industry and manufactory) and dynamic. During the last decade, the growth rate of Tunisia was between 5% and 7%, banks were obliged to manage their liquidity to satisfy demand of investors and to boost the economy of the country. So liquidity contributes positively to the profit of banks.

The table also illustrates that bank profitability decreases with a high degree of credit risk. Credit risk results when borrowers are unable to honor their commitments. Non reimbursement is equivalent to a loss, which incontestably reduces profitability.

Regarding the consequences of financial liberalization on credit risk, table below illustrates the main results of the estimation of the equation 2.

Table 3. Effects of financial liberalization on the level of credit risk

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	0.752732	0.468699	1.606004	0.1095
LIB	0.507324	0.202362	2.303545	0.0023**
LIQ	1.542510	0.091549	16.84902	0.0000*
PROF	-0.716219	1.408184	-0.508611	0.0000*
ITR	-0.408473	0.130222	-3.136745	0.0019**
IC	-0.726329	2.875060	-0.252631	0.8008
G	0.052000	0.047886	1.085916	0.2785
Log likelihood	118.6588			
R-squared	0.463725	Mean dependent var		1.092765
Adjusted R-squared	0.451491	S.D. dependent var		0.406706
S.E. of regression	0.301212	Sum squared resid		23.86163
Durbin-Watson stat	1.975951			

**sig at 1%, **sig at 5%*

There is a negative relationship between financial liberalization and credit risk. Liberalization has exposed banks to more credit risk due to reforms of the credit conditions and liberalization of lending rates. Eliminating some constraints on access to loans has encouraged households to borrow and consequently increased the degree of default risk and the level of non-performing loans. Facilitating credits for households and some sectors is dramatic in some cases if it is accorded without enough guaranties[11]. In fact, when an event occurs, the probability of default risk increases significantly. Households became unable to reimburse their debts. The recent events in Tunisia are a perfect witness of our argument. The so called “Jasmine Revolution” has affected the tourism sector, industry and manufactory alike because of the strike and the instability of the post-events period. Consequently, investors, entrepreneurs and households were incapable to pay their debts. Therefore, financial situations of Tunisians banks will be aggravated.

[11] The recent subprime crisis witnesses this statement

In conclusion, through the effect of these three reforms, financial liberalization over expose banks to credit risk. This result confirms our assumption admitting the negative impact of financial openness on the degree of risk exposure.

The profitability of banks is negatively and not significantly correlated with the level of credit risk. Banks with a certain level of profitability have no incentive to finance risky activities that require a significant rate of return. In contrast, the less profitable banks are more encouraged to engage in speculative operations which expose them to more credit risk.

Table 4. Effects of financial liberalization on liquidity of banks

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.156546	0.124689	1.255494	0.2104
LIB	0.032698	0.004739	6.900058	0.0000*
RISK	0.139917	0.008936	15.65823	0.0000*
PROF	2.955233	0.512921	5.761573	0.0000*
ITR	0.312381	0.045205	6.910257	0.0000*
IC	-0.512662	0.686698	-0.746562	0.4560
G	0.030606	0.019572	1.563791	0.1191
Log likelihood	396.3079			
R-squared	0.685790	Mean dependent var		0.605161
Adjusted R-squared	0.678622	S.D. dependent var		0.155390
S.E. of regression	0.088091	Sum squared resid		2.040874
Durbin-Watson stat	1.980339			

**sig at 1%*

Financial liberalization act positively and significantly on liquidity of banks, contrarily to what we expected in table 1. In fact, following the reforms of the liberalization of interest rates, depositors have moved their money to their saving account to benefit from an attractive interest rate and to enjoy strong earnings. Consequently banks have seen their liquidity increase significantly. Table 4 shows that bank liquidity is positively correlated with profitability; the level of profitability can be considered an important indicator of power. This vision will be viewed positively by customers who are increasingly confident vis-à-vis their banks. Similarly, customers who received good credits can be in turn the future depositors. Bank liquidity is positively correlated with risk. In fact, despite the availability of funds, banks were obliged to invest in short term project because the available liquidity is unfortunately short term. This dilemma forced banks to take risk in high return investments

with high probability defaults risk because liberalization of interest rates has increased the interest rate on deposit which is considered as an added charge imposed to banks.

To summarize the main finding of this paper, our study shows that financial liberalization negatively affects the profitability of Tunisian banks; increase to level of credit risk and increase the bank liquidity. So, we can conclude that financial liberalization increases the fragility of the banks in Tunisia. Our results are similar to those found by Fisher and Chenard (1997) and Plihon and Miotti (2001).

4. Conclusion

Financial liberalization is considered as an optimal policy to improve the economic infrastructure of LDCs. Many studies strongly recommend the adoption of financial reforms and the need for an open financial system. For example, McKinnon (1973) and Shaw (1973) argued that financial liberalization is the best way allowing economic growth through an increasing in savings and investment. However, this optimistic vision is not accepted by scholars of the Neo-structualist school. For them, financial openness put pressure on banks through competition and encourages banks to take high risks. By developing many empirical studies for some countries, especially South-Asian and Latin American countries, they conclude that financial liberalization has deepened and intensified the gap between rich and poor countries.

We understand that Tunisia has undertaken many reforms (Adjustment Structural Program in 1987) during the eighties and nineties; so that, our goal was to test empirically the consequences of the adoption of liberalization policy on the solidity of Tunisian banks (9 banks). The impact of liberalization on banking fragility was pulled from the direct effect on profitability, credit risk and liquidity. According to results of our model, we concluded that financial openness has eroded the profitability of banks because it reduces the margin of intermediation through the liberalization of interest income. Flexibility and the decrease of constraints on credits have encouraged households and enterprises to borrow with insufficient guaranties; consequently non-performing loan ratio has increased drastically because many borrowers were incapable to reimburse their debts. This situation makes some banks on difficulty and pushes them to take sophisticated risks to compensate their credits losses. In Tunisia financial liberalization increased the liquidity in banks, which is a good point,

because of the liberalization of interest rate which increased the deposit interest rates. Households prefer saving their money rather than invest it. However, saving was not for long period, the reason by which banks were unable to implement large investments. This means that liquidity was available but for short period only.

All these statements show that financial liberalization has had negative consequences on Tunisian banks. Our results are similar to those found by other previous studies but we should not conclude that financial liberalization is the only guilty of this fragility. In fact, liberalization allowed international companies to invest in Tunisia and to create employment. In addition salaries increased significantly due to the need for workforces. Corporate management and governance may have an impact on the fragility of Tunisian banks because as Schumpeter claimed hundred years ago, when a bank fail, this happen because of the management quality of its entrepreneur. Is corporate governance in Tunisia efficient? A further study is needed to answer to this question and to conclude the link between financial liberalization and fragility of banks.

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ANNEXE1: Index of Financial Liberalization[12]

Année	CSI	STI	REG	LTC	LEC	PRIV	LIB
1980	0	0	0	0	0	0	**0**
1981	0	0	0	0	0	0	**0**
1982	0	0	0	0	0	0	**0**
1983	0	0	0	0	0	0	**0**
1984	0	0	0	0	0	0	**0**
1985	0	0	0	0	0	0	**0**
1986	0	0	0	0	0	0	**0**
1987	0	0	0	0	0	0	**0**
1988	0	0	0	0	0	0	**0**
1989	1	0	0	0	0	0	**1**
1990	1	1	0	0	0	0	**2**
1991	1	1	0	0	0	0	**2**
1992	1	1	0	0	0	0	**2**
1993	1	1	1	0	0	0	**3**
1994	1	1	1	0	0	0	**3**
1995	1	1	1	1	0	0	**4**
1996	1	1	1	1	0	0	**4**
1997	1	1	1	1	1	0	**5**
1998	1	1	1	1	1	1	**6**
1999	1	1	1	1	1	1	**6**
2000	1	1	1	1	1	1	**6**
2001	1	1	1	1	1	1	**6**
2002	1	1	1	1	1	1	**6**
2003	1	1	1	1	1	1	**6**
2004	1	1	1	1	1	1	**6**
2005	1	1	1	1	1	1	**6**
2006	1	1	1	1	1	1	**6**
2007	1	1	1	1	1	1	**6**
2008	1	1	1	1	1	1	**6**
2009	1	1	1	1	1	1	**6**

[12] This index refers to the degree of financial openness in Tunisia. The minimum value of this index is 0 (no reforms yet) and its maximum value is 6 (equivalent to 6 reforms). The principle of the construction of this index is as follows. The year after the reform takes the value 1, the above is 0. For the second year of the reform the value become 2 and so on until the sixth years.

List of acronymes of reforms

CSI : Creation of Investment Firms **STI** : Removal of institutional rates of de liquidity **REG**: prudential Regulation	**LTC** : liberalization of deposit interest rates **LEC** : Decline of Credit barriers **PRIV** : privatization of public banks