Financial Liberalization and Banking Profitability: A Panel Data Analysis for Tunisian Banks

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ABSTRACT

The financial liberalization policy was implemented in several countries in order to have a modern and a dynamic financial sector and to boost economic growth. However, the consequences of this program diverge from one country to another one. In this paper, we focus our attention to the Tunisian case study. To this end, we collected data from 9 banks over the period 1980-2006, and we employed the panel data analysis. The results of our study show a negative and significant relationship between financial liberalization and banking profitability. This shows that liberalization has harmed the domestic banking system.

JEL Classification : E44, G21, L51, N24

Key Words : Financial liberlization, banking profitability,empirical study, panel data, Tunisia

1. Introduction

Following the recommendations of the authors of financial repression school, several countries undertook programs of financial liberalization. These actions are in waiting to modernize and instigate financial system. Several theoretical and empirical studies were centered on the relation financial liberalization and financial instability, banking crises or bankruptcies. Whereas the relation between financial liberalization and banking profitability were timidly studied.

The relation between financial liberalization and banking profitability present a paradoxical aspect owing to the fact that there are two antagonistic currents of them. The first one is articulated around the school of financial repression and which admits the founded good of financial liberalization. Another finds its roots in work of the authors of neostructuralist school underlining the harmful effect of financial liberalization.

The absence of a consensus with regard to the effect of financial liberalization on the banking profitability encourages us to check this relation in a Tunisian context. With this intention, our objective is to study the effect of financial liberalization on the profitability of the Tunisian banks. In other words, financial liberalization supported the profitability of the Tunisian banks or quite to the contrary it is at the origin of its deterioration. The articulation of this paper will be as follows: we will briefly present a review of the literature based on this subject in the first part. The second will be devoted to study the theoretical base of financial liberalization and its implications. The theoretical framework, followed methodology as well as the results of our study appears in the third part. In the last part we concluded.

2. Literature review

The study financial liberalization effect on banking profitability was often included in the relation financial liberalization brittleness or banking crisis. This inclusion goes up with the importance of the profitability of the banks like indicator of brittleness. Some studies which studied exclusively this relation. Fisher. K and Chenard. M [1997] showed that financial liberalization decreases banking profitability. In this direction, and by the liberalization of the credit rates, it results a financial increase in the financial expenses banking (interests poured with the customers). What involves a reduction in banking profitability as measured by the report of the margin of intermediation on total assets. In the same way the lifting of framing of credit (liberalization of the debtor rates, liberalization of the credit) encouraged the banks to take more risk while seeking to be more profitable. This taking risk is often rewarded by an increase in default risk.

Barajas, Steiner and Salazar [1999], in their study relating to the case of Colombia showed that financial liberalization affects the banking margin of intermediation. If this margin were not reduced, it knew a deterioration of the quality of the credit distributed. In other words, it results an increase in the banking profitability which is the resultant of the liberalization of the debtor rates. However, this margin will be affected negatively by the bad quality of credit.

Demerguç-Kunt and Huizingha [2001] studied the impact of the financial development on the banking profitability. By using banking data relating to developed countries and others in the process of development over the period 1990-1997, showed that the financial development exerts a significant effect on the banking performance. They also led so that a high level of banking development affects negatively the banking performance. This result is explained by the fact that this development will accentuate the banking competition which decreases the performance of the banks. These authors concluded that the development of the financial market and that of the banking structure are proportional so that it has a complementarity between the two.

Other authors centered their studies on other determinants which can influence profitability. Into this direction, macro-economic variables are introduced with the modeling of the profitability of the banks. Among those macroeconomic we can notes the interest rate, the inflation rate and the gross domestic product (GDP) [Okpara. G.C(2010)]. With regard to the banking variables most significant we find the liquidity, the size of the bank, the level of risk, the adequacy in capital...

Afanasieff et al. [2001], by using the technique of the panel data for the case of Brazil concluded that the macro-economic variables have a significant effect on banking profitability. Guru et al. [2002], while being based on data relating to 17 Malaysian trade banks over the period 1986-1995, stressed the importance of the bank deposits like determinant of the performance of these institutions. Demirguç-Kunt. A and Huizingha [2001], while serving as the banking data relating to 80 countries over the period 1988-1995, examined the determinants of banking profitability. The variables introduced into their modelling concern the banking characters, the macro-economic conditions and the financial structure.

Other authors showed that financial liberalization exerted harmful effects on the banking structure. They affirm that the financial opening accentuated financial instability, the banking brittleness and bankruptcies as well as the decline of the economic growth. At this level, Demirguç-Kunt. A and Detragiache.E [1998], Fisher. K and Chenard. M [1997], highlight the existence of a relation between financial liberalization and banking brittleness.

After having briefly passed by the literature concerning the relationship between financial liberalization and banking profitability, we will try in the second part to present the theoretical base of financial liberalization and his implications.

3. Financial liberalization and its implications

By admitting the harmful effect of financial repression on the development and the economic growth, several developed countries and under development adopted policies of liberalization of their financial systems following the recommendations of the authors of the financial repression school.

3.1 The financial repression school

The financial liberalization literature emanated towards the beginning of the Seventies at the time of the construction of financial repression school by works precursors of Mc Kinnon. RI [1973] and Shaw. E [1973]. According to these two authors, financial liberalization is the only effective means to develop banking intermediation, to start again the capital accumulation and to promote the economic growth in the countries. These authors come to present the misdeeds of financial repression and to defend the founded good of financial liberalization.

The approach of Mc Kinnon. RI (1973) and Shaw. E (1973) was well accommodated by other partisans who come to share the same point of view of these authors with regard to the beneficial effect of financial liberalization. Among these authors: Kapur [1976], which was one of the first to supplement the analysis of these two authors by integrating it in a dynamic model. This reveals that it is preferable to rather increase the nominal rate been useful on the deposits than to reduce the rate of growth of the money supply. Indeed, the first sequence makes it possible to achieve two objectives simultaneously: on the one hand, it allows the reduction of inflation thanks to a reduction in the request for currency; in addition, it is at the origin of a direct stimulation of the saving.

Galbis [1977] is considered one of the partisans of the school of financial repression. It built a model with two sectors: a traditional sector where the output of the capital is constant and weak and a modern sector where the output of the capital is also constant but higher. The first sector proves to be able to finance its investments completely, whereas the second ensures the financing of his investments by his saving and by the bank loans. Indeed, financial liberalization impelled by the rise of the real rates of deposits leads to an increase in the average productivity of the investment, insofar as it allows a displacement of the saving of the traditional sector towards the modern sector.

Lastly, from the recent models come to enrich the initial approach by Mc Kinnon (1973) and Shaw. E (1973). It is the case, in particular, of work of Roubini and Martin [1992]. Their model aims to study the consequences of the exogenic distortions on the financial markets on the long term growth. Like the approach of Mc Kinnon. RI [1973] and Shaw. E [1973] well was answered and accommodated by several authors, others come to criticize it by admitting the direct effect of financial liberalization on financial instability, the deterioration of the banking financial state, brittleness, the crises and the banking bankruptcies. This new current is articulated around the authors of the school neostructuralist.

3.2. The neostructuralist school

The Neostructuralist School is articulated around work which comes to dispute the approach of Mc Kinnon. RI [1973] and Shaw. E [1973]. They affirm that the financial liberalization accentuated financial instabilities, banking brittleness and bankruptcies as well as the decline of the economic growth. At this level, Demirguç-Kunt. A and Detragiache. E [1998], Fisher. K and Chenard. M [1997], highlight the existence of a relation between financial liberalization and banking brittleness. Aljandro. C Diaz [1985] in its famous article “Goodbye financial repression, hello financial crash” showed that the passage from a situation of financial repression to another of financial liberalization accentuated the financial instability and crises.

Indeed, although the approach of Mc Kinnon. RI [1973] and Shaw. E [1973] was accommodated and enriched well by several authors that does not prevent from announcing that it noted a certain number of problem. Initially, the theory of financial liberalization supposes an increasing relation between the real interest rate and the saving. This assumption does not take account of the substitution effect and the returned effect. On the contrary, the theory of financial repression supposes a decreasing relation between saving and interest rate. Second, the approach of Mc Kinnon. RI [1973] and Shaw. E [1973] is founded on the implicit assumption that financial market is perfect, whereas Stieglitz and Weiss [1981] showed that the credit markets suffer from an imperfection of information. This informational imperfection can lead to processes of anti-selection. A third problem is opposed to the Mc Kinnon and Shaw approach which comes to relate to the difference between the expiries from the assets and engagements.

Lastly, the sequence of Mc Kinnon and Shaw suppose the existence of a relationship between the informal financial sector and financial repression. On the contrary Jensen [1989] stresses that the existence of an informal financial market is not forcing the proof necessary of financial repression but rather the demonstration of a particular organization of the production and marketing.

3.3 Implications of financial liberalization

The majority of the theoretical studies which covered the subject of financial liberalization announced the harmful effects of this phenomenon more than on these beneficial effects. But we should not be naive by studying the implications of financial liberalization, but rather we will take a nuance of the effects. It is true that financial liberalization was on several parts "culprit" but one should not omit that it was beneficial on other parts with knowing the saving and the investment.

3.3.1 Beneficial effects of LF

According to Venet.B [1994], financial liberalization was beneficial only on the saving and the investment. With the liberalization of credit rates, it results an increase in the financial saving in waiting in a strong remuneration of deposits. This increase can only stimulate the investment.

Effects on the saving and the investment

According to Mc Kinnon. RI [1973] and Shaw. E [1973], financial liberalization ensures a better mobilization of capital. In particular, allowing a better adequacy between the investment and the saving, and an acceleration of the process of economic growth. In a study relating to seven Asian countries, Fry [1978] led so that the real credit interest rate affects positively the national saving. Diery and Yasim [1993] concluded that the real credit interest rate acts positively in the constitution of the saving in nine countries of Africa. In the same way, Bandiera et ali. [2000], analyzing the impact of financial liberalization on the mobilization of the saving, they found that financial liberalization has a positive and significant direct impact on the saving. By liberalization of the credit rates, and while believing in a strong remuneration, the depositors will resort to save their capital. It results an accumulation of capital what makes it possible the bank to hold a strong financial intensity.

Once the saving is favoured (financial saving), the bank can meet all the needs for these customers in term of financing. The investment will be thus favoured and each investor finds the optimal financing of his project. If the saving and the investment were the beneficial effect of financial liberalization what it does prevent the economic growth of Mc Kinnon [1973] and Shaw [1973]? According to these two authors, the policy of financial liberalization is work to involve an increase in saving, a stimulation of the investment and thus an economic growth. What escapes from their equation it is the reciprocal behaviour of the two institutions (banks/firms). In other term, by it rationality and prudence the bank will finance the investments of the companies, on the one hand? And in addition how the company it will react with the received initial credit? And how will it maintain the determinants of a good future banking relationships? The relation saves, investment and economic growth is a relation of long term. Once one of those components is not respected, this relation will never be checked.

3.3.2 Harmful effects of LF

The emergence of new banking behaviours

The changes which the banking environment following the adoption of financial liberalization policy are at the origin of the birth of new banking behaviours. It is in particular about the taking risk and the speculative behaviour. A great responsibility for propagation of these two behaviours goes up with the phenomenon of hazard moral.

- **The excessive risk taking**

Several recent analyses sought to study why certain banks remain failing while others prove to be healthy following the process of financial liberalization. The results of these analyses have leaded to the same conclusion so that the failing banks took more risk, which justifies the higher level of profitability recorded with before of the failures and the banking crises

[Miotti. L and Plihon. D (2001)]. Now let us try to clarify the concept of risk taking as well as the explanatory factors. The risk taking consists with an orientation towards the selection and the financing of the risky projects which require high yields. To search more profitability, banks distribute bad credits which require high yields but also to strong probability of defect. The explanation of the risk taking is as follows, by giving to the banks a great liberty of action, financial liberalization increases the opportunity of risk taking. In fear to see their profits lowered and to support possible losses, following the rise of competition, banks are encouraged to finance bad customers. This behavior would be supported by the public mechanism of protection (PDR). An excess of risk taking, is likely to involve a banking fragility often followed by banking failures and crises. In addition to, the risk taking supported by the financial liberalization and which is likely to involve banking crises, the banks developed a speculative behaviour.

- **The speculative behaviour**

The concept of speculation consists with a detention of a good (purchase or sale) with an intension of resale on a later date and not the intention of later use. The speculative behaviour was justified by the policy of financial liberalization as by the financial innovations which facilitated the entry of new national or foreign speakers on the financial market. At this level, the banks undergo the competition of direct finance. The access of the borrowers to a direct financing decreases the profitability of the traditional banking operations. Confronted with a potential reduction of their operations and their returned, the banks are encouraged to react by raising the mean level of risk of their operations by developing operations of speculative nature. The emergence of new banking behaviours, namely the risk taking and the speculative behaviour goes up with the problem of moral hazard induced by the policy of financial liberalization.

The stressing of banking and financial risks

The vast program of financial liberalization undertaken within the framework of the emergent countries was followed by an evolution of the banking and financials risks. In this part we will show the transmission channels between financial liberalization and the principal banking and financial risks with knowing the credit risk, liquidity risk, exchange rate and interest rate risk.

The easing of banking activity through the lifting of framing of credit gave a great action as regards fixing of interest rates and the distribution of credit. Indeed, the banks sought to be more profitable what makes an excess of distributions of credit in spite of the quality of those credit “good or bad”. The “bad” credit distributed will be rewarded by diversions for the fact of the incapacity for the borrowers to honour their engagements what involves a stressing of credit risk.

With regard to the liquidity risk, the reform of liberalization of deposit interest rates made involve an increase in banking liquidity which remains less significant to the quantities of credit distributed, on the one hand, and dependent on the depositor’s decisions which can constantly to withdraw their capital in an unforeseen and massive way, on the other hand. What involves an increase in liquidity risk?

Following the financial liberalization policy, it results an increase in interest rate risk. The explanation is as follows: the easing of the restrictions concerning the mobility of the capital within the framework of the programs of financial liberalization, made the financial institutions and non-financial more sensitive to the interest rate risk. Indeed, a lender at a variable rate undergoes the risk to see its incomes decreased if the rates drop. Also, if the interest rate is fixed, in the event of rise of rate, this lender undergoes an opportunity cost to see his incomes decreased. On the contrary, a borrower at a variable rate court the risk to see its financial expenses increased if the rates go up. If the rate is fixed, this borrower undergoes the risk if the rates decrease. At this level, a definition of the position of the rates is necessary. The position of the rates measures the exposure of the company to the risk of rate; it gathers all engagements and the assets of the company, current, future or conditional, at fixed and fluctuating rate.

In connection with the direct effect of the financial liberalization on the risk of rate of exchange, Kaminsky G and Reinhart C [1999], find that 56% of the banking crises, which are due to the policy of financial liberalization as being the central cause, were followed by crises of exchange. The exchange rate risk within the framework of a policy of financial liberalization can be summarized simply as follows: The financial opening resulted in the massive entry of the capital like by a level of very high debt on behalf of the poorest countries into those richest. The exchange rate risk is resulted when the national currency (the borrower country) is depreciated compared to the foreign currency (lender country). Or an appreciation of the foreign currency compared to the local currency. Considering the financial dependence of the poor countries as regards liquidity towards the countries with excess of liquidity (massive debt, placement from abroad), the borrower countries will undergo the difference between the two rates of exchange.

Banking fragility

The policy of financial liberalization was adopted by several emergent countries in order to modernize and instigate the financial system in general and the banking system in particular. This liberalization, according to waiting’s' of the developing countries and developed, should support the growth and the economic development such as is the recommendations of the authors of the financial repression school.

The observation of the facts suggests that the financial liberalization is beneficial only on the saving and the investment, following the liberalization of the credit rates and the liberalization of the capital account. It results from it indeed, an increase in liquidity what will stimulate the investment. This positive effect is only at a short-term and uncertain; the explanation is as follows: an uncertain positive effect owing to the fact that the investors can constantly and in an unforeseen way to withdraw their capital by seeking other refuges generating a higher output. Positive effects in the short term since the banks become increasingly speculative in the absence of a control and sufficient supervision.

The banks start the excessive risk taking by financing projects of bad qualities and which require high yields. This will be reflected negatively on the quality of investment of the companies on the one hand, and on the solvency of these last towards the banks on the other hand. From where a deterioration of the financial situation of these institutions. It is on this level that several authors centred their research. As an example, Demirguç Kunt. A and Detragiache. E [1998], Klaus. F P and Chenard. M [1997], Hermosillo.G. B; Pazarbasioglu.C [1997]. These authors come to underline the harmful effect of financial liberalization like a source of banking fragility.

Banking crises

Several theoretical and empirical studies showed the central role of financial liberalization in the occurrence of the banking crises. The literature of the banking crises developed with the courses of second half of the 90 years, following the propagation of the banking bankruptcies and financials difficulties in the world. The successes experiments of financial liberalization are very rare and in the general case, liberalization causes banking and financial crisis accompanied by a brutal fall of the growth and a contraction by the GDP. According to Sandretto. R [1994]: "the financial crises are not a new phenomenon, since during twenty last years 125 countries were confronted with this problem whose half of the crises affecting the countries in process of development".

In this direction, several developed and under countries have undergoes the weight of the banking crises after having liberalized their financial systems. The countries of the south are Asian (Thailand and Korea de Sud) and of Latin America (Chile and Argentina) are the more touched. Let us take the example of the Asian country and more precisely Thailand which was the first touched by the banking crises. Indeed, the consequences of financial liberalization inform to an inadequacy between the banking system and the measurements of opening, owing to the fact that this last was not well equipped to accommodate profound and radical changes. The competition between the financial institutions induced by the high number of the speakers led to the abolition of the dominant position of the banks.

Following the policy of financial liberalization, the economic actors find a great action; the banks can freely allocate the capital. Banks adopt a new speculative and opportunist behaviour and an excessive risk taking owing to the fact that the risky projects require high yields. These radical modifications are at the origin of the stressing of asymmetry of information what make difficult the role of the supervisors. This imperfection of information combined with the weak monitoring, will support moreover the excessive risk taking.

Indeed, the most general explanation of the excessive risk taking rests a great part on the responsibility for the financial liberalization. All these failures and banking fragility combined with an unfavourable institutional macroeconomic context are at the origin of an effective banking crisis in 1983. In the case of South Korea, the financial crisis was actually started when the government decided in 1997 to not support Chæbols in financial difficulty. Chæbols is an industrial conglomerate largely turned towards export. To finance their investments, they have recourse to a financing by a debt towards the domestic banking and financial system. Consequently, banks would be dependent on the health of Chæbols because of their significant credits held on the latter. During the years which preceded the crisis, Chæbols tried to increase their shares of market, with this intention they have resorts to a debt from the international markets. Because of the surplus capacities of overproduction, Chæbols are found in financial difficulty marked by a reduction of their profits and an unbalance between their debts and their assets which are not of the same maturity. This situation will lead the foreign creditors to reduce their exposure to the Korean risk and to cut the credit line, from where an effective crisis in 1997.

For the case of the countries of Latin America, and more precisely the Chilie, Diaz Aljandro [1985] finds that, the results of Chileans financial liberalization were catastrophic. As of the first months, the banking bankruptcies are with repetition. Following the serious difficulties known by the most significant banks of the country (Banco or sono) during the year 1997, the government reconsiders its declarations, and decides to support this in fear of the bankruptcy. In their study, Brukett and Dot [1991] show that the process of financial liberalization undertaken in Chilie did not allow neither the development, nor the economic growth.

As for the liberalization of the domestic capital market to the foreign capital, it resulted, according to MC Kinnon, in an appreciation of the rate of exchange which it comes to cancel the few rare beneficial effects of the financial liberalization policy. In the case of Argentina, Miotti.L and Plihon.D [2001], thus go up the occurrence of banking crises to the unfavourable macroeconomic context of the country and the speculative behaviour of the banks adopted following the financial liberalization.

The macroeconomic situation resulted in a brutal deceleration of inflation, a very fast resumption of the credits and a growth economic. In the same way, financial liberalization involved a strong entry of capital of short term which will be placed in speculative activities. This macroeconomic environment characterized by favorable anticipations of growth, an increase in liquidity and a strong banking competition is at the origin of speculative bubbles. The speculative attacks and the massive withdrawals of the capital will be translated quickly into banking bankruptcies. The closed or merged institutions are 20 during first half of the year of 1995, 28 during second half of the year and 8 during first half of the year of 1996 until reaching 86 in 1999.

In addition to the macroeconomic context, it is extremely useful to study the banks behaviour. At the beginning of the process of financial liberalization, it results from it an increase competition to increase the shares of market. The Argentinean banking system, is thus with a keen competition, high profitability and fragility of the portfolios. This was explained by the development of speculative operations.

4. The impact of financial liberalization on banking profitability

4.1 Financial liberalization and banking profitability: Theoretical framework

On the short term, and after the programs of financial liberalization, it results a higher level of banking profitability. The explanation is as follows: the financial opening was followed by an accumulation of liquidity. This financial intensity goes up with the liberalization of the capital account and the credit rates. While having a strong liquidity, the investment will be favoured; from where an optimal allowance of the resources.

In absence of control and sufficient supervision, banks start to finance risky projects which require high yields. Indeed, banking profitability is seen increased. The great liberty of action given to the banks, and impelled by financial liberalization, made increase the opportunity of risk taking. The banks continue to be directed moreover towards the financing of the high-risk activities. These financed projects are often with strong probability of defect. The borrowers remain unable to honour their engagements. Indeed, it results from it a deterioration of the financial situation of banks which resulted in a weakness and even negative of banking profitability. This low profitability combined with a speculative behaviour, an asymmetry of information and an unfavourable institutional macroeconomic context, constitute a source of banking fragility. It is followed for then by banking bankruptcies and crises.

Let us take the case of Argentina, and according witch studied by Miotti.L and Plihon.D [2001], they prove that financial liberalization affects negatively banking profitability. According to these authors, before falling in bankruptcy, banks obtain higher profitability than the healthy banks. This differential of profitability comes from what the failing banks sought to develop speculative activities. As the strategy of risk taking increases, banking profitability is seen deteriorated and the banks become more fragile.

In conclusion, financial liberalization in the emergent countries was accompanied by a high profitability of the banks. This profitability is explained by the insufficiency of supervision and control, which leaded to the stressing of the opportunity of risk taking. An excess of risk taking, a deterioration of the quality of investment and a bad allowance of the resources are at of the origin of a deterioration of the banking profitability which constitutes one of the sources of banking fragility.

4.2 Financial liberalization and banking profitability: Empirical application

Tunisia, as several countries in the process of development engaged in a program of reform of the financial sector during the two last decades. These reforms are generally started after the process of financial liberalization in the South Asian and Latin America countries. Towards the end of the 80 year, the Tunisian financial system knew several reforms aiming to more dynamization and modernization. In what follows we will try to check the impact of financial liberalization on the Tunisian banking profitability.

4.2.1 Methodology

Several theoretical and empirical studies showed the effect of financial liberalization is ambiguous. On the one hand, most studies come to defend the beneficial effects of financial liberalization; in addition, other work underlines the harmful effects on banking profitability. With this intention, we propose to study in a Tunisian context, the impact of financial liberalization on banking profitability. In other term, financial liberalization exerts a negative effect on the profitability of the banks, or, on the contrary, the financial opening in Tunisia improves banking profitability. It is taking into account these problems that we will put the following assumptions:

- Basic assumptions

H 1 Financial liberalization deteriorates banking profitability.

H 2 Financial liberalization improves banking profitability

- The Sample

Our sample of test acts of the deposit banks in Tunisia (9 banks) over the period 1980 – 2006. It is in particular about: Agricultural national bank (BNA), Tunisian Company of Bank (STB), Tunisian bank (BT), Attijari Bank (ATJB), international Arab Tunisian bank (BIAT), Amen Bank (AB), Union of Commercial and Industry banks (UBCI), Union International of the Banks (UIB) and Arab Tunsian Bank (ATB). Our data base is obtained starting from the financial statistics of the central bank of Tunisia (various numbers) or starting from the trade association of the banks in Tunisia over the period of study (1980-2006).

- *The model*

To test the relation between financial liberalization and banking profitability in a Tunisian context, we were used the following model. We will use the method of the data of panel and the method of estimate is that of least square ordinary (MCO). The econometric model can be written following form:

$$PROF_{i,t} = \alpha_0 + \beta_1 LIB_{i,t} + \beta_2 RISK_{i,t} + \beta_3 LIQ_{i,t} + \beta_4 \ CONTR_{i,t} + \varepsilon_{i,t}$$

With:

PROF = measurement of profitability

LIB = an index of financial liberalization

RISK = measurement of risk (Credit risk).

LIQ = measurement of liquidity

CONTR i = variable of control

α = constant

β_i = coefficients to be estimated

ε_i = Error term

Definitions and measurements of variables

<u>The variable of financial liberalization:</u>

Several work completed by economists belonging to the World Bank and the IMF showed the direct effect of financial liberalization on the financial system instability. Others confirmed that the phenomenon of financial liberalization constitutes the central cause of the banking crises. The introduction of this variable into the modelling of the performance, fragility or the crises banking proves to be a complex practice. With this intention, several economists regarded as variable dummy by allotting a value of 1 for the period post-liberalization, 0 for the period pre-liberalization. Others constituted an index of liberalization. In this context, Leaven [2001], to check the effect of financial liberalization on the banking crises used an index made up of six variables. Each variable takes value 0 or 1 and the index of liberalization will have a value ranging between 0 and 6. The six variables are as follows:

1. Deregulation of the interest rates
2. Reduction of the barriers to entry
3. Reduction of the obligatory reserves
4. Reduction of the credit control
5. Privatization
6. Prudential Regulation

Maher and Willianson [1998] developed a rather significant data base concerning financial liberalization in 34 industrialized countries for the period 1973-1976. The two authors explained the evolution of financial liberalization through six indicators with knowing:

1. the elimination of credit market control
2. the deregulation of the interest rates
3. the elimination of the barriers to entry
4. banking autonomy
5. the role of private banking sector
6. Liberalization of the capital account

To study the impact of financial liberalization on banking profitability in Tunisia we will try to build with a synthetic index of financial liberalization starting from the reforms of financial liberalization. The reforms which we retained are as follows:

Suppression of the institutional rates of liquidity (**STI)** 1989: constitute the first reforms of banking system. Indeed, this reform aims the generalization of the credits to all sectors contrary to the period of financial repression when the priority and public sectors were privileged.

The liberalization of the deposit interest rates ***(LTC) 1994:*** allows to instigate the saving and to stimulate the investment. However this strong financial intensity available to the banks remains dependent on the decisions of the depositors.

Lifting of framing of credit ***(LEC) 1996:*** allows to banks a great margin to operate as regards distribution of credit like to the fixing of the debtor interest rates on the market.

The privatization of the public banks ***(PRIV) 1997*** allows increasing the level of competition between the banks. What affects their profitability. Banks will seek more share of market, new markets of credit from where the costs of appropriations can be reduced and consequently, banking profitability will be influenced.

A better prudential regulation ***(REG) 1992*** it makes it possible to reduce the behaviours of the risk takings on behalf of the banks which sometimes prefer to finance projects at the high risk and with weak probability of success. Consequently the credit risk will be decreased.

The creation of the investment companies ***(CSI) 1988*** in addition to competition inter-banks like significant determining profitability of the banks, it was creates in 1988 an investment companies. From where the banks become more encouraged to provide a good service and favourable conditions to maintain their share of market and their level of profitability.

A justification of choice of these reforms can be presented. The most general forms of financial repression are the framing interest rates of credit into the public sector and the priority activities. To check the impact of the financial liberalization on the banking profitability we choice the most remarkable reforms and which can be regarded as a contradictory situation with that known by a repressed financial system. (For more detail concerning the constitution of the financial liberalization index, see appendix 1).

Variables of profitability: (PROF)

The variable of profitability constitutes in our model the explained variable. Like profitability measures, we will use the following ratio as used by Demirgüç-Kunt .A and Huizinga. H. [1999]: *PROF* = (received interest –expensive interest) / Total assets.

Variable of risk: (RISK)

To introduce a variable of risk into the model, often we refer to precise measurements. For example, the standard deviation of the benefit, the report of the ROA to the standard deviation of the ROA as used by Goyeau.D and Tarazi.A [1992]. In this present work we will be useful of credit risk owing to the fact that it is the most significant risk in Tunisia. The risk of credit is measured by the following ratio *RISK* = Total credit / total assets.

Variable of liquidity: (LIQ)

The variable of liquidity constitutes a significant indicator of banking profitability. It makes it possible to inform about the level of financial intensity for each bank. It also makes it possible to evaluate the function of intermediation banking (collection of deposits and distribution of credit). Indeed, this variable allows deciding the level of funds for the banks. In other words, financial liberalization involved a surplus of funds or, on the contrary, it leads to the risk of sufficiency of liquidity which is at the origin of a deterioration of banking profitability. Like measures liquidity, we will use the following ratio: LIQ = total credit / total deposit.

Control variables:

As variables of control we used the banking intermediation, the banking concentration by the means of index of concentration IHH. These variables were introduced by Klaus.F and Chenard. M (1997). Other macroeconomic indicators were been useful in this modelling. It is about the growth rate of the GDP per capita and the rate of inflation. The introduction of these variables goes up with work of Ben Naceur.S and Goaeid M (2001).

4.3 Results and interpretations

Before carrying out the regression of our model, it is extremely useful to specify the estimations if they are of fixed effects or of random effects. So the test of specification of Hausman is essential. The results of our test are given by the table 2.

Table 1 Haussman test result

Model	**K**	$\chi^2(K)$ **à 95 %**	**Hausman (H)**	**Fixed Effect fixes (FE) Or Random effect (R E)**
Model (1)	7	14.06	0.481 (0.786)*	R E

Being given that the model tested comprises 7 explanatory variables (K = 7), these statistics follow Chi two to (7) degrees of freedom. The tests of specification of Hausman show that our regression is random effect.

Table 2. Result of regression random effect: dependent variable (profitability)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
c	0.119525	0.012637	9.458691	0.0000
LIB	-0.001472	0.000787	-1.871013	0.0626***
RISK	0.015104	0.006242	2.419633	0.0163**
LIQ	0.002094	0.002753	0.760723	0.4476
ITR	-0.082305	0.004386	-18.76496	0.0000*
IC	-0.307390	0.074914	-4.103240	0.0001*
GDP	-0.012740	0.003461	-3.680716	0.0003*
INF	-0.008325	0.004442	-1.874109	0.0622***
Nbre of observation		243		
R2		0.7599		
D-W		1.661		

*sig at 1% **sig at 5% ***sig at de10%

Statistically, the degree of significativity of our model is 75, 99%. In other term the explanatory and those of control variables allow to explain the dependent variable at the level of 75.99%. The test of Durbin-Watson indicates a coefficient of 1.664 what indicates a weak autocorrelation of the errors. The variables of financial liberalization (LIB), degree of concentration (IC), of intermediation (ITR), inflation (INF) and GDP (growth rate of GDP per capita) are correlated negatively and significantly with the dependent variable profitability (PROF). That of the variable of credit risk (RISK) is correlated positively and significantly. The variable of liquidity (LIQ) is correlated positively and not significantly.

Starting with interpreting the variables which are correlated positively with the dependent variable. The variable credit risk (RISK), proves correlated positively and significantly with the banking profitability. This relation is checked only in the short term, since an excess of credit risk leads to the banking fragility and prepare their bankruptcies. As the banks finance risky projects or distribute bad credits, they require higher interest rates. These projects are with high yield but also with weak probability of success. It is for that which the relation credits risk/ banking profitability is positive only that in the short run. The liquidity variable (LIQ) constitutes a significant indicator of profitability. In the same way, the liquidity is the principal pillar on which is based the function of intermediation. Indeed, a bank having a strong financial intensity can meet the needs for their customers that it is depositor or a borrower. The distribution of “good” credit to “good” borrowers affects positively the banking profitability. On the contrary, the banks having a weak liquidity are obliged to resort to the financial markets financings. This recourse makes increase the financial expenses of the bank what is likely to involve a reduction in its profitability.

Now let us try to study the variables which act negatively on banking profitability. The variables of financial liberalization, intermediation, concentration, the growth rate of GDP per capita and inflation exert a negative effect on the banking profitability. The variable financial liberalization (LIB) presents a negative effect on the dependent variable (PROF). To explain this relation we will check the direct effect of the principal reforms of liberalization in Tunisia and which were used for to build the index of liberalization. It is in particular the liberalization of interest rates, the lifting of credit control and the prudential regulation.

The liberalization of the creditor interest rates results in a strong remuneration of the deposits. From where we are waiting for a reduction in banking profitability. In the same way, the banks following the liberalization of the creditor interest rates have a strong financial intensity. However, this intensity remains uncertain and dependent on the decisions of depositors. A massive and unforeseen withdrawal of the capital is likely to support the risk of insufficiency of liquidity which affects negatively the level of profitability of the banks. By the liberalization of the debtor interest rates and the lifting of framing of credit, the banking profitability is seen deteriorating. This liberalization encourages banks to take more risk by requiring rates raised on riskier projects. However, this strong profitability is random and it is associated with a weak probability of success. What decreases the profitability of the banks? In the same way, the lifting of framing of credit deteriorates the banking profitability. Indeed, the credits distributed to “bad” borrowers make support banks the costs of adjustments. The latter affect negatively the banking profitability.

An insufficient and ineffective prudential regulation tends to support for the banks the speculative behaviour and the risk takings what often involves a reduction in their profitability.

In conclusion, and while combining the direct effect of these three principal reforms on the banking profitability, financial liberalization in Tunisia comes to exert a harmful effect on banking profitability.

The variable of banking concentration is correlated negatively and significantly with banking profitability. The low number of Tunisian banks is an indicator of a weak banking competition. Weak competition between the banks results in a weak profitability and it is not always the case. A strong competition encourages the banks to take more risk by the financing of the risked projects with strong level yield and weak probability of success. This risk taking decreases the profitability of the banks. The banking intermediation constitutes the traditional raison of the banks. So, it constitutes a significant indicator of profitability. In our modelling this variable is correlated negatively and significantly with the dependent variable. Indeed, a reduction in the received interests (risk of credit) or reciprocally an increase in the paid interests (remuneration of the deposits), is likely to decrease the profitability of the banks. It should be noted that an increase in the credit rates must be less proportional to a reduction in the debtor rates. In other term, the credit distributed must exceed the collected deposits in order to more profit for banks. However, banks should not adopt an excessive policy of distribution of credit.

The variable growth of GDP per capita affect positively the banking profitability following the literature based on the relation economic growth and the financial performance. However, in our study this relation is negative. Former studies assembled a positive association between the inflation and the banking profitability. A high rate of inflation is generally associated by a high interest rate and consequently a significant income of banks. Our results show that inflation acts negatively on the profitability of the banks. The explanation is as follows: if inflation is not anticipated and the banks do not adjust their interest rates, it is possible that the banking costs can exceed the products what affects negatively their profitability.

5. Conclusion

Financial liberalization in Tunisia is differed from the other experiments on several plans. It takes a gradual and not radical rhythm. Thus it is characterized by no occurrence of the crises and the banking bankruptcies as the examples of the South East Asian and of Latin America. However, and according to the results of our study, the effect of financial liberalization on the banking profitability proves to be similar to results carried out on other countries. Financial liberalization decreased the profitability of the Tunisian banks. Like explanation of these results, the risk taking supported by the liberalization of the debtor rates and the lifting of framing of credit as well as the low financial intensity prove to be responsible.

In a Tunisian context, we cannot confirm the risk taking on behalf of the banks but we cannot hide the problems of liquidity which suffer the Tunisian banking system. The banking intermediation form in Tunisia is still more or less traditional in spite of the development of several financial products. The Tunisian banks continue to count on the capital of depositors like a financial intensity and do not take the initiative to constitute their own capital. In the same way, the contribution of financial liberalization to the dynamization of banking competition remains little far from waiting's. Let us recall that a high level of competition can reduce the banking profitability.

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Appendix 01 : Financial Liberalization index[1]

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**

CSI : creation of investment firm **STI** : suppression of institutional rate o liquidity **REG** : prudentielle reglementation.	**LTC** : Liberalization of credito rate **LEC** : levée credit encadrement **PRIV** : Banking privatisation

[1] This index summarizes the degree of financial liberalization in Tunisia. It takes a maximum value equal to 6 which translates a total liberalization by holding account the selected reforms and a minimal value equal to 0. The principle of constitution of this index is as follows. The year which follows the reform takes the value of 1 that which proceeds takes 0. For the year which follows the second reform we not attribute the value of 1 but rather 2 and so on for the third we attribute 3 until the sixth reform we attribute 6. We did not proceed by method AFC or that ACP, owing to the fact that the reforms are dispersed in terms of year.