Liberalization of Financial Services and Performance of Commercial Banks in Algeria: An Empirical Study (1998 – 2012)

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ABSTRACT

The banking system is facing deep and varied challenges due to financial openness and bank liberalization (LIB) which both call for the removal of all restrictions and barriers on banking activities, as well as for a competition between foreign and local banks, which has increased in recent years. The aim of this paper is to investigate the impact of financial LIB on banking efficiency in Algeria. Using three varieties of a panel data regression model on a sample of 10 Algerian commercial banks (public and private) for the period during 1998-2012. Our results show a negative and significant impact of financial LIB on Algerian banking performance during the period studied.

Keywords: Financial Liberalization, Performance, Commercial Banks, Algerian, Panel Data
JEL Classifications: G21, G23, L25

1. INTRODUCTION

Recently, the global financial sector has gone through a number of significant radical transformations which emerged from the financial globalization. These transformations called for the need to stay updated and adequately adapted to new situations, because they have significant effects on the financial and banking sectors, particularly on the liberalization (LIB) of trade in financial and banking services, technological developments, implementation of economic reform programs, banking conglomerates, as well as on the acute competitive pressures between actors in the banking market. This would lead to a variety of high quality and low cost banking services.

Mc Kinnon (1973) and Shaw (1973) noted that financial repressions have repercussions that push the government to intervene energetically in the economic and financial sectors. This intervention appears in the legislation and laws related to banking which aim at limiting the freedom of the banking system. According to Kinget and Levine (1993), the financial repression leads to the reduction or scaling of the financial services offered by the financial system to savers, contractors, producers, beside

new restrictions on economic activities and slower growth rates Gheris (2005). However, Chatelain and Amable (1995) concluded that the financial repression is a policy that aims to keep the interest rates below the balance levels specified by the supply and demand law Boujelbene et Chtioui (2006).

Due to the negative results arising from this policy, many economists in developing countries advised to follow are form policy based on an increasingly limited intervention of the government in the financial activity, as well as freeing this activity from all restrictions imposed on it, i.e., following a financial liberalization (LIB) policy in order to stimulate savings and improve the distribution of loans in the economy and raise the pace of economic growth.

Mc Kinnon (1973) suggested to some countries to liberalize their financial systems in order to get rid of the negative effects generated by the financial repression which is seen in the scarcity of the financial resources required for investment. This is mainly due to the weak interest rates that discourage savings as well as to the ineffectiveness of the financial intermediation as a result of the massive intervention of the government, the poor distribution

of the financial savings in the economy (loans), on account of the policy of directing loans by the monetary authorities. All these facts led to weak growth rates in these countries. Several studies have contributed to the promotion of the policy of financial LIB Bouzid (2003). In his work, Kapur (1976) supported the view of Mc Kinnon and Shaw, but showed a preference for raising the nominal interest rates on deposits as a solution to reduce the inflation rate, rather than cutting the money supply. He considers that raising the nominal interest rate al lows stimulating the savings and, at the same time, reducing the inflation rate.

As for Vogel and Buser (1976), they both support the idea of complementary currency and capital; they are in favor of finished and semi-finished goods which are considered a refuge against inflation Venet (1994). The pair (return/risk) is a new dimension in financial LIB. Galbis (1977) added a new point to the financial LIB model. Indeed, he considered that the economy is divided into two sectors: A traditional sector based on self-financing for the completion of projects, and a modern sector that depends on self-financing in addition to bank loans to realize new projects.

Furthermore, he considers that increasing the interest rate on deposits allows for increased productivity, and helps transferring savings from the traditional sector to the modern sector. Fry (1977) studied the relationship between the real interest rate and savings, in a number of developing countries. He found that there is a strong positive relationship between these two variables (Ary, 2002). Mathieson (1979) expressed the necessity to reduce the money supply during the application of the financial LIB policy. He justifies that by the fact that high nominal interest rates lead to increased funding from abroad under an open economy, and the high borrowing costs from the inside pushes the local institutions to borrow from countries where these costs are lower Venet (1993). Such a situation allows for significant financial flows into the economy, causing high inflation rate.

Likewise, Moubini and Sala-i-Martin in 1992 showed the existence of a strong and positive relationship between the real interest rate and the savings rate (Ary, 2002). Similarly, both Boujelbene and et Chtioui (2006) supported the firm and positive relationship between the real interest rate and savings rate in nine African countries. Finally, Arestis and Demetriades (1999) investigated the impact of financial LIB on the gross domestic product (GDP) in South Korea and concluded that a strong positive relationship exists between these two factors Donadieu (2004).

One of the objectives of the financial LIB program is to make commercial banks more efficient by creating a flexible banking and financial sector, capable to compete. In such a program, the banks must have more control over the use of their own resources; they ought to determine the financial services required by the public. These services are established on the basis of efficiency and competitive prices. Therefore, by the late eighties and early nineties, Algeria and many other developing countries started adopting a package of reforms to keep pace with the global trend. So, the Algerian economy witnessed a transitional phase from a socialist planned economy to a liberal economy based on the foundations and principles of the market economy. This occurred after the 1986

crisis, which clearly showed he fragility of the economic structure in Algeria. This situation required, at first, to carry out some self-reforms without resorting to foreign parties, such as the International Monetary institutions for example. However, self-reliance may result in worse monetary, economic and even social situations.

Considering the sensitive position the banking system occupies in the economic life, every state has to take care of its own system which has a significant impact on the development of the economy. The Algerian banking system, just like other banking systems, has seen several reforms which began in 1971. Their objectives were to conduct and monitor the financial operations of public institutions (banks), and impose strict control on cash flows. However, a radical reform was introduced on the banking function on August 19, 1986 (Act 86-12), to establish the general principles of public banks and unify the legal framework which runs the banking institutions. Act 01-88, issued on December 1, 1988, aimed at guiding the public institutions; the banks became more independent in managing their financial resources and granting loans. Therefore, banks turned into economic institutions whose objective is to make profit and profitability. Other financial reforms came later. The most important one was issued on February 14, 1990 (Act 90-10), and it represented the turning point in the Algerian banking system; it included new ideas related to the performance of banks, i.e., liberalizing banks from the restrictions imposed on them, limiting the monetary authority to one party which is the Central Bank and the Council of Money and Credit, all owing the establishment of private banks, and encouraging the entry of foreign banks.

The banking system is facing deep and varied challenges due to financial openness and bank LIB which both call for the removal of all restrictions and barriers on banking activities, as well as for a competition between foreign and local banks, which has increased in recent years. So the banking variables made it extremely necessary for the Algerian banking administration to adopt suitable strategies to face these challenges in order to ensure their survival and growth in the banking market.

On this basis, the present research paper seeks to clarify that the LIB of financial services allows commercial banks to expand and improve performance. The first part of this study concerns the foundations of financial LIB and a reform to the banking system in Algeria, as required by the financial globalization. The second part deals with the most important studies which involved both bank performance and LIB of banking services. Finally, an empirical study on all Algerian banks (private and public) for the period extending from 1998 to 2012, using the panel regression technique to show the resulting effects of applying LIB on the performance of the Algerian banking system.

2. PREVIOUS STUDIES

The services sector has not received any interest worth mentioning from the early economists, like Adam Smith and David Ricardo, who considered that the services sector is a non-productive sector. During the last two decades (in the twentieth century), trade in services has gained increasing importance in the economies of the countries, and especially the developed ones, which led to put trade

in services on the agenda of the Uruguay roundtable, in September 20, 1986. An independent agreement on liberalizing trade in services was later reached and signed. Developed countries, and particularly the United States, pushed in the direction of liberalizing trade in services and included them in the multilateral negotiations, because this is growing-fast sector which plays an important role in the world economy as well as in the development of international trade in the sector of services. Banking services are among the most important services that have been liberalized. Therefore, the banking field has become so important that it is now required to assess the banking system's performance in order to determine the impacts of financial LIB.

A number of studies have analyzed the impacts and the relationship between the financial LIB of services and the performance of the banking system: Cevdet (2007) demonstrated the performance of banks before and after LIB, using the data envelopment analysis (DEA) on Turkish banks. It appeared that the macroeconomic instability led to the reduction of the Turkish banking system performance. Lensink et al. (2008) used the DEA technique in 26 developing countries, and confirmed that financial LIB had a positive impact on the banking performance, for the period 1991-2000, in the short term. Abid (2008) worked on a sample of 93 developing countries, between 1988 and 2006, using panel data and found that foreign banks have a positive impact on local banks, from a competitive point of view. However, Al-Fayoumi and Abuzayed (2009) found that foreign banks have a negative short-term effect on local banks, unlike the long-term, we used the Camels and Swot techniques to analyze six Jordanian banks; they found out that LIB of financial services had various effects on the performance of every Jordanian bank in the year 2007.

Hakkimi (2011) studied nine Tunisian banks, during the period 1980-2009. He used the Panel technique and found a negative relationship between financial LIB and the profitability of banks. But in 2012, Capraru (2012) carried out studies on 17 countries in Central and Eastern Europe, for the period 2004-2008, and found out that financial LIB and financial openness have a positive effect on the performance of banks in European Union member states, according to the performance indicators and the determinants of bank performance. Onu (2013) presented a research paper to evaluate the performance of 24 Nigerian Banks, for the period from 2001 to 2010. He showed that the comprehensiveness of banks affects the banking performance. On the other side, Rekiba (2014) focused on the reforms undertaken by Algeria to keep pace with the financial LIB. The emergence of private banks, such as Khalifa Bank, had a negative impact on public banks, such as the Algerian Popular Credit Bank. This showed that the experience of failure of Khalifa Bank urged the banking system authorities to think about reformulating the banking reforms. Khalifa crisis that contributed to the growth of the banking panic in Algeria according the study of Bendob (2015) on profitability of commercial banks in Algeria.

3. RESEARCH METHODOLOGY

Several theoretical and experimental studies have highlighted the impact of financial LIB on the performance of the banking system. Some of them confirmed the existence of a positive relationship between financial LIB and the performance of banks, but others developed some justifications for the existence of a negative effect of the financial LIB on the profitability of commercial banks. We therefore proposed the following hypotheses:

H0: The existence of a statistically significant positive relationship between the LIB of financial services and the performance of commercial banks.

H1: The existence of a statistically significant negative relationship between the LIB of financial services and the performance of commercial banks.

In light of this study, we used the Bank Scope database. The budgets, reports and accounts of 10 Algerian commercial banks were used, for the period from 1998 to 2012, (Table 1). Besides, some statistical variables specific to the macroeconomics of the financial statements of the International Monetary Fund could be obtained.

3.1. Model
To test the relationship between financial LIB and the performance of banks in Algeria, the unbalanced panel data analysis (Bendob, 2015) was used to study the multiple linear regression model, based on the least squares method.

$$Perf\ i, t = \alpha_0 + \beta_1\ LIB_i, t + \beta_2\ RISK_i, t + \beta_3\ LIQ\ i, t + \beta_4\ GDP\ t + \beta_4\ IFL\ t + \varepsilon\ i, t \qquad (1)$$

PERF = banking performance measure
LIB = financial LIB measure
RISK = risk measure (loans)
LIQ = liquidity measure
GDP = cross domestic product (annual growth rate)
IFL = inflation rate
A = constant
B_1 = coefficient of estimation
$\varepsilon i, t$ = error.

3.2. Interpretation of Variables
3.2.1. The financial LIB variable
Introducing this variable in the bank's performance modeling is of great importance. It takes the value 0 before LIB and the value

Table 1: List of Algerian commercial banks studied

Name of bank	Nature
BEA	Public
BNA	Public
CPA	Public
BADR	Public
BDL	Public
BNP	Private
SGA	Private
BMAIC	private
TBA	Private
BARAKA	Private

BARAKA: Algerian Al Baraka Bank, TBA: Trust Bank Algeria, BMAIC: Maghreb Bank for Investment and Foreign Trade, SGA: Société Générale Algeria, BNP: BNP Paribas Algeria, BDL: Bank of Local Development, BADR: Bank of Agriculture and Rural Development, CPA: Algerian Popular Credit, BNA: Algerian National Bank, BEA: Algerian Foreign Bank

1 during the period that follows the application of the financial LIB policy. This variable involves a set of indicators (Fray, 1997), as follows:

- LIB of interest rates
- Reduction of restrictions and barriers to foreign investment
- Reduction of compulsory reserve requirements
- Reduction of control on loans
- Privatization
- Rules of caution and care.

To study the effects of financial LIB on the profitability of commercial banks in Algeria, we tried to build a financial LIB index on the basis of the reforms implemented for openness on foreign financial exchanges. Each variable takes a value between 0 and 3 to create the ultimate indicator, representative of the financial LIB, knowing that0indicates the total financial repression, 1 the partial financial repression, 2 the partial financial LIB, and 3 the total financial LIB. They are as follows[1]:

- Credit LIB and reduction of compulsory reserve requirements
- LIB of interest rates
- LIB of the banking sector
- LIB of capital
- Monitoring and supervision of the banking sector.

3.2.2. Performance variable

This factor represents the dependent variable (the interpreter) in the study model; it includes a set of indicators such as return on assets, return on average assets (ROA or ROAA) (Demirgüç-Knut and Huizinga, 1999).

We used the average return on assets to mitigate the changes in assets during the year. We also used return on equity, return on average equity (ROE or ROAE) to carry out aempirical study to mitigate the urgency on equity changes during the year. They can be calculated as follows:

Net interest margin (NIM) = (Interest obtained - interest granted by the Bank)/total assets
ROA = Net profit/Total assets
ROE = Net profit/Total net capital

3.2.3. The risk variable

This variable represents one the most important supports in the study of our standard model. This variable can be measured as follows:

Risk index = Total loans/Total assets (Bourke, 1989).

3.2.4. The liquidity variable

This has a statistical significance with the banks' profitability. It determines the level of capital funds, and indicates the existence of surplus funds from financial LIB that leads to the risk of insufficient liquidity. It is measured as follows:

Liquidity index (LIQ) = Total loans/Total deposits' (Liu and Wilson, 2010).

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1 Financial sectors reforms in Algeria, Morocco and Tunisia: A preliminary Assessment, Middle East department; IMF, 2004, p26.

3.2.5. Summary of independent variables used in the model

ETA capital	Equity/total assets
LLPNI asset quality	Loan loss provision/net int rev
NIRAA administration performance	Net intrev/avgassets
LATDB Liquidity	Liquid assets/totdep and bor

Source: Ben Naceur and Goaied (2001)

3.2.6. External factors

There is an interdependent relationship between the internal and external factors for the banking sector. The most important are the GDP and the inflation index. They both show a significant impact on the performance of commercial banks, particularly the banking services (Molyneux and Thornton, 1992).

4. RESULTS AND COMMENTS

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

Credit control: This variable measures the liberation of all: The level of interest rates, statutory reserve and bank competition. The higher reserve requirement ratio fell and dropped restrictions on loans and banking generally increased the value of this variable.

Int rate control: This variable degree of LIB of interest rates on loans and deposit rates, the more have been abandoned to direct loans and roofing for certain sectors of interest rate policies increased the value of this variable.

Entry barriers: This variable abolition of barriers and constraints to create a new, whether domestic or foreign, and open the banking sector to private investors in the banking sector banks. And the greater openness of the financial sector increased the value of this variable.

Intl capital: This variable eshml abolition of all restrictions on foreign financial exchanges, any LIB of capital movement and the abolition of censorship applied to the current account and the capital account exchange rate.

Security market: This variable creation of financial markets, and policies that help the development of these markets, and the openness of domestic financial markets to foreign investors, like the abolition of the restrictions that prevent foreigners from acquiring shares issued by local institutions.

Banking superv: This variable is based on the extent of the application of one of the Basel Convention, which recommends banks to respect the proportion Cook, also measures the extent of the independence of the central bank this variable and provided oversight of government interference.

In the Table 2 we present the index of financial LIB in Algeria based on the reforms applied to the Algerian financial sector.

Table 3 highlights the results of estimation of the regression equation, using the pooled ordinary least squares (POLS) method,

Table 2: Extension represent show LIB of financial services index account

Years	Crédit control	Intrate control	Entry barriers	Intlcapital	Sécurity market	Banking superv	Index of financial "LIB"
1998	2.25	3	3	1	1	0	10.25
1999	2.25	3	3	1	1	1	11.25
2000	2.25	3	3	1	1	1	11.25
2001	2.25	3	3	1	1	1	11.25
2002	2.25	3	3	1	1	1	11.25
2003	2.25	3	3	1	1	1	11.25
2004	2.25	3	3	1	1	1	11.25
2005	2.25	3	3	1	1	1	11.25
2006	2.25	3	3	1	1	1	11.25
2007	2.25	3	3	1	1	1	11.25
2008	2.25	3	3	1	1	1	11.25
2009	1.5	3	1	1	1	1	8.5
2010	1.5	3	1	1	1	1	8.5
2011	1.5	3	1	1	1	1	8.5
2012	0.75	3	1	1	1	1	7.75

Source: Abiad, et al. (2008) with new database of financial reforms in Algeria

Table 3: Estimated regression equation using data panel study the model on pooled least squares

Dependent variable	NIM?		ROAA?		ROAE?	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	−1.427724[NS]	−1.519534	−0.058225[NS]	−0.059016	13.77934[NS]	1.267874
ETA?	0.023516***	1.923681	0.053251*	2.686992	−0.432710*	−4.513817
LLPNI?	−0.000189[NS]	−0.511751	−0.000948[NS]	−1.592794	0.012585[NS]	1.328147
NIRAA?	1.532350*	27.26297	0.509507*	7.038243	3.865974*	5.371110
LATDB?	0.002943[NS]	1.031016	0.009899**	2.181057	0.125808*	2.845403
GDP	0.091405***	1.887573	0.069013[NS]	1.236597	0.310863[NS]	0.488301
INF	−0.058063[NS]	−1.129346	−0.038755[NS]	−0.671750	−0.554477[NS]	−0.912117
LIB	0.065668[NS]	0.831493	−0.101186[NS]	−1.196888	−0.957936[NS]	−1.103956
R^2	0.937014		0.609695		0.243424	
F-statistic	180.6445		18.96834		3.906899	
Akaike infocriterion	2.068947		2.771450		7.586081	
Schwarz criterion	2.286805		2.989308		7.803939	
Hannan-Quinn criter	2.156912		2.859415		7.674046	

Source: Authors, *Significant at 1% level, **Significant at 5% level, ***Significant at 10% level. NS: Not Significant, LIB: Liberalization

where it appears that the Fisher statistics is randomly different from zero for the level of 1% of the studied models. This means that this is a statistically acceptable model. The explanatory power reached the highest value with the model NIM, where $R^2 = 94\%$. This rate of changes in the profitability of banks, expressed by NIM, is explained by the selected variables. The remaining 6% reflect the errors and other factors, while the explanatory power of the two models ROAA and ROAE appeared to be 61%. The first model NIM, with 24%, remains the best, as it recorded the lowest value for both AKAIKE and SHWARTZ information criteria.

It is also easily noted, from the results in the Table 4, that there is a direct correlation, with a statistical significance, between NIM and each one of ETA (risk) and NIRAA (management efficiency) and GDP (gross domestic product) at the levels of 10%, 1% and 5%, respectively, where the flexibility of NIM is very high compared to NIRAA whose coefficient is1.53. Furthermore, the variable related to financial LIB has a positive relationship with a statistical significance with NIM. Therefore, hypothesis H0 can be accepted, as it is in favor of the idea of the positive effects with statistical significance on the profitability of banks NIM, using the pooled least squares technique.

The use of this method means ignoring the characteristics of banks and considering them completely similar. The question remains as to whether the results obtained change if the characteristics of each bank are taken into consideration. This is going to be discussed in the next stage.

Table 3 highlights the results of estimation of the regression equation, using the POLS as well as the fixed effects (FE); it appears that the Fisher statistics F is randomly different from zero at the level of 1% for the studied models. This means that the model is statistically acceptable. We also added the dummy variable (0.1) to each bank in order to know the effect of the different characteristics of each bank. The explanatory power reached the highest value for the model NIM where $R^2 = 96\%$. This ratio of changes in the profitability of banks is represented by NIM, and is explained by the selected variables. The remaining 4% are explained by the errors and other factors. However, the explanatory power of the two models ROAA and ROAE appeared to be 70% and 37%, respectively. This leaves the first model NIM to be the best, as it recorded the lowest value for the AKAIKE and SCHWARZ information criteria.

Under the FE model, it appears that the variables NIM and ROAE are distinguished by the presence of one independent variable with a statistical significance. These are the liquidity (LATDB) in ROAE and the administration performance (NIRAA) in NIM. It is easy to note that the ROAA model is better, as it includes three

Table 4: Estimated regression equation using data panel study the model on pooled least squares and fixed effects (cross)

Dependent variable	NIM?		ROAA?		ROAE?	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	0.776498[NS]	0.813754	1.621080[NS]	1.045165	15.79190[NS]	1.101645
ETA?	−0.035299[NS]	−1.393169	0.026151[NS]	0.515479	−0.254630[NS]	−0.861723
LLPNI?	−0.000160[NS]	−0.549906	−0.000914[NS]	−1.373152	0.012993[NS]	1.287384
NIRAA?	1.361142*	15.96662	0.298706**	2.423379	1.627789[NS]	1.539571
LATDB?	0.005354[NS]	1.651790	0.011376**	2.420193	1.168968*	2.888870
GDP	0.035334[NS]	0.825397	0.021360[NS]	0.319998	−0.148315[NS]	−0.212108
INF	−0.055451[NS]	−1.341117	−0.020340[NS]	−0.344805	−0.522777[NS]	−0.826653
LIB	−0.035617[NS]	−0.534903	−0.178774***	−1.749428	−0.794656[NS]	−0.742695
Fixed effects (cross)						
BEA-C	−0.688215		−0.351653		−2.698333	
BNA-C	−0.553191		−0.128535		6.290358	
CPA-C	−0.464156		−0.233833		−4.003432	
BADR-C	−0.322175		−0.692268		−5.446082	
BDL-C	−0.351647		−0.416472		−1.419313	
BNP-C	0.348365		1.016883		7.883896	
SGA-C	0.176494		−0.176553		0.323114	
BMAIC-C	−0.072754		−1.015705		−17.83753	
TBA-C	2.126875		1.334384		0.262521	
BARAKA-C	0.565207		0.469504		4 .871580	
R²	0.957821		0.703009		0.366185	
F-statistic	107.8649		11.24377		2.744301	
Akaike infocriterion	1.861513		2.691770		7.602584	
Schwarz criterion	2.324461		3.154719		8.065532	
Hannan–Quinn criter	2.048438		2.878695		7.789509	

Source: Authors, *Significant at 1% level, **Significant at 5% level, ***Significant at 10% level, NS: Not Significant, LIB: Liberalization

independent variables with a statistical significance, though it has a lower explanatory power compared to that of the model NIM.

Therefore, a positive relationship with a statistical significance appears between ROAA and both of LATDB and NIRAA at the level of 5%, as well as a negative relationship with a statistical significance between the same dependent variable and the variable related to financial LIB at the level of 10%. Based on that, hypothesis H1 which supports the negative relationship with the existence of a statistical significance between the financial LIB and the performance of commercial banks, using the FE, is accepted.

The use of FE takes into account the characteristics of each bank; it gave results different from those reported in Table 2. Therefore, the following question is asked: Would the results be different in the case where the random effects are used? This will be dealt with in the following table.

Table 5 displays the results of estimating the regression equation using the POLS and the random effects, where it appears that the Fisher statistics F is randomly different from zero at the level of 1% of the models studied. This means that the model is statistically acceptable. The explanatory power reached the highest value with the model NIM, as R² = 87%. This ratio of changes in the profitability of banks is represented by NIM, and is explained by the selected variables. The remaining 13% are due to error sand other factors. However, the explanatory power of the two models ROAA and ROAE appeared to be 42% and 23%, respectively. Therefore, the model NIM turns out to be the best.

Under the random effects model "RE," the NIM model shows a positive relationship with a statistical significance with NIRAA

(management efficiency) at a level of 1%, unlike ROAA which has a positive relationship with a statistical significance with NIRAA and ETA at the level 1% and with LATDB (liquidity) at 10%. As for the model ROAE, the results indicate that there is a positive relationship with a statistical significance between it and the same independent variables which are related to ROAA at the level of 1%.

To choose the best method to be used to interpret the study model, we applied Hausman test, where the results showed that the probability has no statistical significance under the model "RE." Hence, the best technique in POLS is the FE model which aims at explaining the relationship between the financial LIB of banking services and the performance (profitability) of banks, while diagnosing each bank separately, according to its characteristics in the studied sample.

5. CONCLUSION

The past years have witnessed a significant increase in the number of studies to analyze the relationship between the banking sector performance and the LIB of financial services. These studies gave different views about the subject. However, our study was able to support the results of the most common investigations. The present research paper included the effects of financial openness on the performance of the banking sector, using internal and external variables on a sample of 10 Algerian public and private commercial banks, during the period from 1998 to 2012.

Indicators representing the performance of banks and the financial LIB variable showed that the Algerian banking sector displays negative effects as a result of its entry in the financial openness

Table 5: Estimated regression equation using data panel study the model on pooled least squares and random effects (cross)

Dependent variable	NIM?		ROAA?		ROAE?	
Variable	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
C	−0.477445[NS]	−0.560347	0.473062[NS]	0.389487	13.96598[NS]	1.041592
ETA?	0.000380[NS]	0.030140	0.048353*	3.140892	−0.425506*	−3.134371
LLPNI?	−0.000151[NS]	−0.274258	−0.000989[NS]	−1.206292	0.012335[NS]	1.341198
NIRAA?	1.448967*	23.02671	0.441018*	5.110835	3.745668*	4.450433
LATDB?	0.004726[NS]	1.470735	0.008864***	1.977814	0.124130*	2.709596
GDP	0.062881[NS]	1.493938	0.055587[NS]	0.884091	0.286318[NS]	0.398921
INF	−0.059395[NS]	−1.424242	−0.23869[NS]	−0.379723	−0.530576[NS]	−0.729668
LIB	0.023223[NS]	0.356709	−0.127859[NS]	−1.324818	−0.948948[NS]	−0.866649
Random effects (cross)						
BEA-C	−0.350558		−0.021471		−0.161138	
BNA-C	−0.409236		−0.101131		0.613884	
CPA-C	−0.300139		−0.048866		−0.315973	
BADR-C	−0.026401		−0.258659		−0.507255	
BDL-C	−0.079998		−0.116069		−0.117938	
BNP-C	0.253432		0.671589		0.988884	
SGA-C	0.045974		−0.225040		−0.361012	
BMAIC-C	−0.347639		−0.383425		−0.319552	
TBA-C	0.891527		0.342584		0.040159	
BARAKA-C	0.323038		0.139488		0.139941	
SD	0.460941	0.565500	0.409956	0.856487	1.298945	9.979078
Rho	0.3992	0.6008	0.1864	0.8136	0.0167	0.9833
R²	0.870454		0.424086		0.226782	
F-statistic	81.59086		8.941656		3.561457	
Hausman test						
Chi-square statistic	11.301105		9.121083		11.370967	
Probility	0.1260		0.2441		0.1232	

Source: Authors, *Significant at 1% level, **Significant at 5% level, ***Significant at10% level, NS: Not significant, ROAE: Return on average equity, ROAA: Return on average assets, NIM: Net interest margin

loop. The performance of the banking sector will still deteriorate because Algeria has liberalized the financial and banking services, as the profitability of local banks cannot compete with foreign banks. Therefore, the problem of stability and survival of the Algerian local banks is urgent, despite the implementation of reforms imposed by the Code of Money and Loan 90-10. Hence, it is vital to reschedule and restructure the banking sector in order to cope efficiently with the LIB policy in all areas, including the banking services.

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