

Impact of Ownership Structure on Financial Performance of Banks: Case of Tunisia

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Abstract

The ownership structure and financial performance are two important variables in the banking sector . Indeed , shareholders have the incentive of control and discipline of managerial decisions .

It seems to us interesting to study the impact of ownership structure on financial performance of banks .We used a sample of 19 banks belong the professional association of banks in Tunisia over the period (2000-2010).

With a measure of financial performance (ROA) , and 4 types of ownership (ownership concentration , public ownership , private ownership ,foreign ownership) , we have shown by the method of static panel that there was no impact of ownership structure to the financial performance of banks in the Tunisian context .

JEL classification numbers: G21, G320, G39, C34

Keywords : Ownership structure, ROA, ROE, Tunisia, Static panel, banks

1 Introduction

The influence of ownership structure on financial performance is important in banking. Indeed , shareholders have an incentive to monitor managerial decisions and return on their invested funds .

But different types of shareholders have different reaction face a managerial decisions, that influence the financial performance of banks . As a result , we will focus on the impact of (concentration ownership , public ownership , private ownership , foreign ownership) on the financial performance of banks .

We will adopt a methodology composed of 3 sections . The first section is devoted to the literature review . In the second section , we will make an empirical study in the Tunisian context . After , we make a conclusion .

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2 Literature Review

2.1 Impact of Ownership Concentration on Financial Performance of Banks

There are several studies that show the influence of majority shareholders (who own a large part of bank's capital) on the financial performance of banks . Indeed , Busta (2007) examined the effect of majority ownership on financial performance and the role of the legal family in the development of this relationship using a GMM estimation of a dynamic panel on a sample of European banks over the period (1993-2005)).

He found that for level of ownership from 50% , increased competition may be beneficial in banks (which belong to the French legal family and the Scandinavian legal family) while the concentration of ownership may have a negative effects on bank (which belong to the German legal family and the English legal family) .

The results confirm the existence of difference in effect of ownership concentration on financial performance of banks following different institutional context .

The author had assumed that after the legal protection afforded to minority shareholders , an important element to better interpret these results can be found in the identity of controlling shareholders .

Indeed , the academic literature has extensively debate (the benefits of large shareholders as a way to reduce the problem of governance , and the possibility that they make wrong (when they are rooted and appropriate the wealth of minority shareholders (Shorte (1994)).

Demestez and Lehn (1985) showed the endogeneity of the ownership structure . Bebchuk et Roe (1999) said that the structure of current ownership of firms don't need to efficiencies because it is determined by the structure of firm and regulation and not entirely designed for the objective of maximizing profit .

At the same time , the tradition of " Law and Finance " , initiated by Laporta et al (1998,1999,2000), introduced the legal origin as an additional element explaining the differences in ownership structure across countries .

In addition , there is the possibility that large shareholders , are noted in their positions and resources expropriation of minority shareholders which is known as the assumption of enracinement (Fama et Jensen (1983) , Morck et al (1988) , Demestez et Lehan (1985), Shleifer et Vishny (1997) , Demestez (1983)).

They indicated that the ownership structure of the company is the result of a profit maximization decision of investors (when buying or selling shares in the market) .

Moreover , Belkhir (2006) used simultaneous equations on a sample of US banks . He didn't find a significant effect of dominant ownership in bank performance (Q of Tobbin) On the other hand , Hanafi et al (2010) found from a sample of 54 commercial banks in Indonesia through the period (2002-2008) that the concentration ownership has a negative impact on bank performance .

Riewsthiratorn et al (2011) showed that the concentration of ownership is associated with more operating costs which reduces the performance of bank . Wen (2010) showed a positive relationship between ownership concentration and bank performance in China .

We will test the first hypothesis :

H1: The ownership concentration has a positive impact on the financial performance of banks .

2.2 The Influence of Public Ownership and Private Ownership on the Financial Performance of Banks

Bonin and al (2005) found that public banks are more efficient than private banks in term of return of equity . But , Clark and al (2005) showed that bank performance will be improved after privatization .

Besides , Altnubas et al (2001) found that German commercial private banks are more beneficial and efficient than public banks and investment banks .

Micco et al (2004) showed that public banks in developing countries are less profitable than private banks .

In addition , Omran (2007) studied a sample of 12 banks from Egypt between (1996-1999) during which time the ownership is transferred from public sector to private sector . After privatization , the results show that some coefficients in profitability and liquidity for bank privatized decreased significantly but other performance measure remain unchanged .

But the change of performance of private banks is better than public banks . So , the private banks are more efficient than public banks . Also , Iannotta and al (2007) compared the performance of 181 banks in 15 countries over the period (1994-2004) . After the control of bank characteristics , countries , effect of time, they showed that public banks have less performance than private banks .

On the other hand , Loukil and Chaabane (2005) studied the banking sector in Tunisia and found that public banks have good performance despite the social objectives that they follow . This is due to the social benefits that they receive compared to private banks . Domestic banks are more profitable than foreign banks .

On the one hand , it should be noted that the effect of ownership structure on performance is mainly due to the frame (principal –agent) and the theory of capital markets (Altunbas, Evans , Molyneux (2011)).

For example , one of the main proportion of the theory of public choice is that public companies have less performance than private firms(This is due to political influences) .

However , managers of private firms have more incentive to pursue the objectives of shareholders that managers of public companies because the market surveillance of private capital is higher than the government (Figuerio and al (2009)).

In addition , Cornett and al (2009) studied the influence of public ownership on the performance of banks around the period (1989-2004).

They analyzed the changes in performance between public banks and private banks around the Asian financial crisis (1997)).

They found that public banks are less profitable , have less capital and credit risk than private banks before 2001. The performance differences are more significant in countries with high involvement and political corruption in the banking system .

In the period of few years after the onset of the Asian financial crisis , declining years , capital credit quality of public banks was significantly greater than enjoyed by private banks especially for countries that are hardest hit by the Asian crisis . However , public banks have no difference with private banks at yield cash-flow , capital , non performing loans over the period (2001-2004).

Indeed , state ownership of banks has been associated with low performance and poor economic performance . Several studies have shown that public banks are less profitable , have more costs , less asset quality compared to private banks (Berger and al (2004,2005)).

In addition , the strong presence of public banks in the banking sector has been associated with lower financial development (Laporta and al (2002) , Barth et al (2004)).

In addition , Gosh (2010) examined the responses of banks for privatization using data on all public banks in India over the period (1990-2006) . The results show that banks owned totally by state are less profitable than private banks .

Improvements in the performance of partially privatized banks are supported after privatization. In addition , the analysis shows that privatization improves profitability , efficiency and improves the strength of the banking system .

In same time , it reduces the bank risk .

So , we will test the following hypothesis :

H2: Public ownership has a negative impact on the financial performance of banks .

H3: Private ownership has a negative impact on the financial performance of banks .

2.3 Influence of Foreign Ownership on Financial Performance of Banks

There are several studies that have shown the importance of foreign ownership and its effect on the financial performance of banks . Moreover , Havrylek (2006) used data for 265 banks in Eastern and Central Europe for the period (1995-2003) .She analyzed the differences in profitability between domestic and foreign banks . She found that foreign banks earn higher profits than domestic banks .

In addition , she studied the benefits and costs of foreign ownership by analyzing the determinants of profitability for domestic banks . Indeed , the profits of foreign banks , are less affected by macroeconomic conditions of the host country . Also , it should be noted that it is assumed for a long time that foreign banks in the developed countries have less profits than domestic banks (the inverse case in developing countries) .

Indeed , Demircuc-Kunt and Huizinga (2001) showed that there is a low return on assets for foreign banks in (USA , Canada , France , Netherlands) . De Young and Noll (1996) analyzed this phenomenon in the US market and found that foreign banks sacrifice profits in exchange for large share of the market .

On the other hand , Galac and Craft (2000) said that foreign banks are more efficient than national banks through several competitive advantages . First , these banks have funding sources cheaper than domestic banks . This is because they rely heavily on their equity / a high ratio of capital / deposits) .

The second reason is the reputation of these banks in international markets . The third reason is that all these foreign banks are allowed to borrow from their parent banks .

Then , foreign banks attract a work force by offering higher wages or better working conditions . Since these banks have low nominal rates of credits . In addition , they are well informed about the customers in Croatia .

In the end , Galac and Craft (2000) argued that foreign banks in Croatia do not suffer from internal problems , since the widespread use of English in the field of finance in general. Also , Berger and al (2001) found that foreign banks located in the region of South America tend to grant loans in certain classes with small business in Argentina than those located in outside area .

In addition , Kobeissi (2004) noted that cultural connection can affect the ability of foreign banks to take advantage of local opportunities . She stressed that foreign banks with offices in countries very far with different environment , market , language , culture and regulatory structure can encounter several problems that limit their performance against national banks .

On the other hand, Claessens and al (2001) studied the relationship between foreign bank entry and performance of domestic banks in 80 countries. They used panel data with 7900 observations banks over the period (1988-1995).

The main result of this study is that foreign banks tend to have higher profits than domestic banks in developing countries, as in developed countries, foreign banks are less profitable than domestic banks.

In addition, Corrao (2008) found that in developed countries, the performance of foreign banks is higher when the home country and host country share the same language, the performance decreases when the legal system is similar.

On the other hand, Marcia and al (2009) studied the difference between the performance of domestic banks and that of foreign banks in many countries between (1996-2006). They found that the answer depends on the number of factors.

Specifically, foreign banks tend to be more successful in countries with large GDP and when competition in the receiving country is limited. Foreign banks are more efficient when they are larger and rely more on deposit for investment.

Foreign banks improve their performance over time, probably because they adapt to the local institutional environment. Foreign banks from home countries whose geographical or cultural characteristics are similar to those of host country are more profitable than foreign banks from home countries whose characteristics are far from those of host countries.

Moreover, the differences in performance between domestic and foreign banks is related to several factors. Foreign banks may have a number of advantages compared to domestic banks. By maintaining active customers in more than one country, they can achieve efficiencies.

In addition, foreign banks can realize the benefits of better policies and procedures propagation practices in more of one country. Further, they can better diversify risk to undertake bigger risk, but also for higher return of investments.

For example, foreign banks may have advantages as more diversified investment base, including have access to external liquidity relative to their bank parent which may reduce their investment costs.

Being larger, foreign banks can afford to develop more sophisticated models giving them top quality risk management. Moreover, Chung and al (2009) assumed that foreign banks from high income countries are healthier than local banks in low income countries because they are equipped with modern technology and operations.

In reality, this assumption is not entirely true but it is unlikely to be vary from reality. They hypothesized under which foreign shares from low income countries can not provide benefits to local banks in rich countries.

The effect of foreign equities from high income countries on local banks in high income countries is unknown. Moreover, most previous studies on the role of foreign equities playing in the banking sector has focused on the microeconomic approach.

Chen and al (2009) adopted a macroeconomic approach. They divided the countries (low income countries and high income countries). They found that foreign shares from high income countries have no impact on the net interest margins.

It increased the return on assets and overheads, but decreased the number of non performing loans and provisions for doubtful accounts. If the return on assets and non performing loans indicate profitability and bank risk respectively, while foreign shares from high income countries increase performance or decrease the risk of local banks.

Yet, we must not forget that foreign shares from low income countries have no impact on the bank's interest margins. They have no effect on the return on assets and the number of non performing loans and overheads.

Only foreign securities from high income countries are beneficial for local banks. Then, Chung and al (2009) divided the home countries in low income countries and countries with great income.

This gives 4 combinations, each of which has its own impact on bank performance. Firstly, foreign shares from high income countries have a certain effect on the high income countries. But with this combination, foreign shares do not appear to increase the net interest margin of banks and have no effect on the return of assets, total expenses, and non performing loans provisions for loan losses.

Local banks in high income countries are likely equipped with modern operation technology. Therefore, the financial performance of local banks in high income countries is not affected by foreign equities from other high income countries.

The second combination is foreign shares from high income countries that have an impact on banks in low income countries. So, foreign banks increase the profit margins of local banks but they do not reduce their overheads and the number of impaired loans.

They do not have an effect on the performance of assets or provisions for loan losses. The financial performance of local banks in low income countries improves significantly with foreign shares in high income countries with their modern operating technology.

Rokhim and Susanto (2011) studied the impact of foreign ownership on the short term performance in the Indonesian banking performance. They used the financial statements of commercial banks over the period of (2005-2010). They found foreign banks are more profitable than domestic banks.

In addition, Azzam and Siddiqui (2012) studied and compared the profitability of domestic banks and foreign banks over the period (2004-2010). They found that foreign banks are more profitable than domestic banks.

The empirical results show that foreign banks are less affected by macroeconomic factors of host countries compared to domestic banks. They have a higher profitability in Pakistan. So, foreign ownership has a significant impact on performance of banks.

We will test the following hypothesis:

H4: Foreign ownership has a significant impact on the financial performance of banks.

3 Empirical Study

The empirical impact of ownership structure on the financial performance of banks has been the subject of several studies (Fadzalan (2010), Kobeissi(2004,2010), Dogan (2013)).

Prompting us to study this problem in the Tunisian context. Under this section, we will identify the sample at the beginning, then, we specify the variables and models.

After, we analyze the descriptive statistics. On the other hand, we carry out the necessary econometric tests. Finally, we show the estimation results of the model and their interpretations.

3.1 Sample

We will use 19 banks that belong to professional association of banks in Tunisia over the period (2000-2010) .

Table 1: Specification of sample

Index of Bank	Name of Bank
AB	AMEN BANK
ABC	ARAB BANKING CORPORATION
ATB	ARAB TUNISIAN BANKING
Attijari Bank	Attijari Bank of Tunisia
BH	Bank of Housing
BT	Bank of Tunisia
BTE	Tunisia and Emirate Bank
BFT	Franco Tunisian bank
BIAT	Arab International Bank of Tunisia
BNA	National agriculture Bank
BTS	Tunisian Solidarity Bank
BTL	Tuniso Lybian Bank
CB	CITI Bank
STB	Tunisian banking company
SB	STUSID BANK
TQB	Tuniso Quatari Bank
UBCI	Banking Union of trade and industry
UIB	International banking union
BTK	Tuniso Kwait Lybian

Financial data are collected through the websites of the professional association of banks in Tunisia over the period (2000-2010).

Macroeconomic data are collected from site of central bank of Tunisia and national statistic institution . The period (2000-2010) is chosen because it comes the adoption of new accounting system (1997) and before the Tunisian revolution (2011) .

3.2 Method of Estimation

We will use the static panel because it can control :

- The time and individual variation in the observable behavior or cross sectional times series aggregated .
- The observed or unobserved individual heterogeneity .
- The hierarchical structure .

3.3 Specification of Variables

We will estimate 4 models :

$$ROAi, t = b_0 + b_1.TLAI, t + b_2.CEAI, t + b_3.CFCi, t + b_4.Sizei, t + b_5.Tdeposi, t + b_6.CAPi, t + b_7.Foreigni, t + b_8.CDi, t + b_9.TPIBi, t + b_{10}.TINFi, t + Ei, t \quad (1)$$

$$ROAi, t = b0 + b1.TLAI, t + b2.CEAI, t + b3.CFCi, t + b4.Sizei, t + b5.Tdepositi, t + b6.CAPi, t + b7.Pubi, t + b8.CDi, t + b9.TPIBi, t + b10.TINFi, t + Ei, t \quad (2)$$

$$ROAi, t = b0 + b1.TLAI, t + b2.CEAI, t + b3.CFCi, t + b4.Sizei, t + b5.Tdepositi, t + b6.CAPi, t + b7.Privi, t + b8.CDi, t + b9.TPIBi, t + b10.TINFi, t + Ei, t \quad (3)$$

$$ROAi, t = b0 + b1.TLAI, t + b2.CEAI, t + b3.CFCi, t + b4.Sizei, t + b5.Tdepositi, t + b6.CAPi, t + b7.OCi, t + b8.CDi, t + b9.TPIBi, t + b10.TINFi, t + Ei, t \quad (4)$$

ROA= net income / total assets

ROA=return on assets

ROA show how to generate income form the assets of the bank (Chin.L(2011)). This ratio is used in several articles to compare the financial performance of banks .

Use ROA as dependent variable also provides to convince to compare the results to other findings in this literature . ROA shows the profit per dollar of assets . It reflects the ability of the banks to use the financial data and real estate resources to generate profits (Naceur (2003) , Karawesh (2011) , Ongore and Kusa (2013).

If ROA increases , therefore , the bank is more effective (Wen (2010)).

TLA = total loans / total assets

TLA shows the percentage of loans in relation to total assets .

CEA= operating expenses/total assets

Operating expenses including personal expenses and other expenses . CEA shows the weight of operating expenses compared to total assets .

CFC = financial expenses / total credits

Financial expenses include interest expenses due to loans made in the money market and and the capital market by banks . CFC shows the share of financial expenses in relation to total loans .

Size = size of the bank = natural logarithm of total assets .

Size can show the economies of scale .

The large banks benefit from economies of scale which reduces the cost of production and information gathering (Boyd and Runkhle (1993)).

T deposit = total deposits / total assets

Deposits include demand deposit and term deposits . T deposits show the share of deposits compared to total assets .

CAP = equity / total assets

CAP show the strength of bank capital against the vagaries of economic and financial environment . Generally , the capital is positively related to the financial performance of banks (Gull (2011)).

Pub = binary variable that takes 1 if the bank is public , 0 otherwise .

The bank is public if more than 50% of the bank's share are owned by the state (Leaven et al (2002).

Priv = binary variable that takes 1 if the bank is private , 0 otherwise .

The bank is private if more than 50% of their shares are owned by private investors (Fazdalan(2010)).

Foreign = binary variable that takes 1 if the bank is foreign , 0 otherwise .

The bank is foreign if the foreign investors owned more than 50% of bank (Kobeissi (2010)).

OC = binary variable that takes 1 if the majority shareholders owned more than 20% of capital of bank, 0 otherwise (Caprio and al (2007)).

CD= total credits / total deposits

CD shows the degree of conversion of deposits into loans (Dogan (2013).

CD is generally greater than 1 which shows the lending capacity of the bank.

CD is assumed positively related to the financial performance of banks .

TPIB = growth rate of GDP (Gross domestic product).

TPIB show the growth of economic activity in the country (Ayadi and Boujelbène (2012)).

TINF= rate of inflation

TINF shows the rate of increase in the price index.

3.4 Analysis of Descriptive Statistics

Table 2: Descriptive statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
ROA	209	0.0146827	0.040152	0	0.54
CEA	209	0.0267549	0.0100226	0.0002371	0.05526
CFC	209	0.0360495	0.033472	0.002371	0.351
SIZE	209	13.60692	1.325026	10.19	15.72
Tdeposit	209	0.632719	0.2898864	0.0066	1.49368
TLA	209	0.6754984	0.1971867	0.025	0.95824
CAP	209	0.1895372	0.1975422	0.017	0.97249
CD	209	4.104515	10.34688	0.070919	79.514
Foreign	209	0.5263158	0.5005058	0	1
Pub	209	0.239324	0.4276404	0	1
Priv	209	0.234498	0.4246716	0	1
OC	209	0.923445	0.2665225	0	1
TPIB	209	0.0422861	0.0108197	0.02	0.0611
TINF	209	0.0388182	0.0075234	0.03	0.056

209=total number of observations = 11*19

11= Number of years between (2000-2010).

19= Number of banks in the sample studied .

ROA (mean = 1.46%) .

The result represents on average 1.46% of total assets . So , the average return on assets of bank is low . But there is a wide variation in return of assets between banks (standard deviation= 4%) .

CEA (mean = 2.67%) . Operating expenses represent 2.67% of average total assets . So , there is an efficiency at banking . There is a slight variation of CEA between banks (standard deviation = 1%) .

-CFC (mean = 3.6%) . Financial expenses represent on average 3.6% of total assets .So , there is an effective management of financial burden on banks . There is a large variation in CFC between banks (standard deviation = 3.34%) .

-Size (mean = 13.60) . Most of banks are small and medium in size . There is no much variation in size between banks .

-T deposit (mean =63.27%) . Deposit represent on average 63.27% of total assets . Which show high ability to attract the deposits . The deposits are important in the banking . But there is a large variation in deposits between banks (standard deviation = 28.98%) .

-TLA (mean =67.54%) . The loans represent on average 67.54% of total assets . Which show the importance of intermediation of banks . But there is a large variation in loans between banks (standard deviation = 19.7%) .

-CAP (mean = 18.95%) .The equity represent on average 18.95% of total assets . It is acceptable to face the vagaries of the banking environment . But there is a great variation in CAP between banks (standard deviation = 19.75%) .

-CD (mean = 4.10) . The loans represent on average 40% of deposits . Which show the efficiencies of financial intermediation of banks . But there is a great variation in CD between banks (standard deviation = 10.34) .

-Foreign (mean = 53.63%) .

The foreign ownership represent on average 52.63% of total ownership . But there is a great difference between banks (standard deviation = 0.5) .

-Pub (mean = 23.92%)

The public ownership represent on average 23.92% of total ownership . Public ownership not widespread in the banks . There is a great variation in Pub between banks (standard deviation = 0.427).

-Priv (mean = 23.44%)

The private ownership represent on average 23.44%of total ownership . The private ownership have an acceptable part in banks . But , there is a great variation in private ownership between banks (standard deviation = 0.4246).

OC (mean = 92.34%)

Large shareholders own more than 20% of bank capital represent 92.34% of total shareholders of banks . Indeed , the banks are characterized by high ownership concentration.

There is a small change in OC between banks (standard deviation = 0.2665) .

TPIB (mean = 4.22%)

The growth of GDP (gross domestic product) is on average 4.22% over the period (2000-2010). Standard deviation is low . There is not much variation in TPIB between the years of sample .

TINF (mean = 0.038)

TINF represent on average 3.8% between (2000-2010) . The standard deviation is low . There is not much variation in TINF between the years of sample.

3.6 Econometric Tests

We will focus on several tests such as (multicollinearity test , Hausman test , test of heteroskedasticity) .

3.6.1 Multi-collinearity test

Multi-collinearity appears when 2 or more explanatory variables are correlated and positive similar informative . In this situation , the coefficient estimates may change erratically in response to small change in the model or data .

The consequence of high multicollinearity are (increase of the standard error of β s, reduce reliability) , the results are often confusing and misleading . Collinearity detection is done by calculating the correlation between the variables .

If some correlations are close to -1 or 1 (to delete one of 2 variables) . Also by calculating VIF (variance inflation of factor) .

$$VIF = 1 / (1 - R^2_j)$$

R^2 = the coefficient of determination of model

If $10 < VIF$, there is a problem of multicollinearity (Gujarati (2005)).

Table 3: Correlation between variables

	ROA	CEA	CFC
ROA	1.000		
CEA	0.1158	1.000	
CFC	0.0687	0.4219	1.000
Tdeposit	0.1127	0.5086	0.2709
Size	-0.0787	0.0790	-0.0067
TLA	-0.0620	-0.1619	-0.1710
CAP	0.0812	-0.2390	-0.1189
CD	-0.0408	-0.5140	-0.2205
Foreign	0.1046	0.088	0.1400
Pub	-0.1155	-0.1916	-0.1294
Priv	-0.0070	0.0882	-0.0348
OC	-0.2183	-0.1705	-0.0320
TPIB	0.1353	-0.0536	0.0052
TINF	0.1388	-0.1581	0.0066

Table 4: other correlation between variables

	T deposit	Size
Tdeposit	1.000	
Size	0.3976	1.000
TLA	-0.0754	0.2204
CAP	-0.6335	-0.3750
CD	-0.5805	-0.1868
Foreign	-0.1164	-0.6931
Pub	-0.1573	0.3845
Priv	0.2956	0.4297
OC	-0.1066	0.2328
TPIB	0.0257	0.0469
TINF	0.1927	0.2060

Table 5: Other correlation between variables

	TLA	CAP	CD	Foreign	Pub	Priv	OC	TPIB	TINF
TLA	1.000								
CAP	-0.009	1.000							
CD	0.1846	0.1044	1.000						
Foreign	-0.257	0.3033	-0.124	1.000					
Pub	0.2645	-0.127	0.3104	-0.591	1.000				
Priv	0.03070	0.2295	-0.165	-0.583	-0.31	1.000			
OC	-0.084	0.0082	0.0707	-0.273	0.1615	0.159	1.000		
TPIB	0.0515	-0.013	-0.001	0.0076	-0.019	0.0104	0.05	1.000	
TINF	0.1572	-0.165	0.0433	0.000	-0.037	0.0315	-0.0	0.18	1.000

3.6.2 Test of Heteroscedasticity

We talk about heteroscedasticity, if error variance are different.

$V(E_i) = \sigma^2$ whatever i , there is an homoscedasticity. The detection of heteroscedasticity is done by several tests (test of Goldfeld and Quandt (1965), test of White (1980), test of Breush Pagan).

We use test of Breush-Pagan. It is based on the type model $62i$ for the variance of the observations which $Z_i = (1, Z_{2i}, \dots, Z_{pi})$ explains the differences in their variances.

The null hypothesis is equivalent to $p-1 = 0$

$Y_2 = \dots = Y_p = 0$

The Lagrange multiplier test (LP) follow the test of Breush-Pagan.

It currently consists of three steps:

First step: application of MCO

Second step: Make the auxiliary test

$e_i^2 = Y_1 + Y_2 Z_{2i} + \dots + Y_p Z_{pi} + E_i$

Third step: the test statistic is the result of determination auxiliary regression with the second stage sample size

$LM = n \cdot R^2$

This test is asymptotically distributed according $\chi^2(p-1)$ under the null hypothesis of homoscedasticity.

In the case of our model, $p < 10\%$, there is no problem of heteroscedasticity.

3.6.3 Hausman test

It determines if the individual effects are fixed or random. It determines if the coefficients (β) and 2 fixed or random estimates are not statistically different.

Under the null hypothesis of independence between errors and explanatory variables, both estimators are unbiased, so the estimated coefficients become somewhat different.

The fixed effect model assumes that the influence of explanatory variables on the dependent variable is the same for the all individuals, and that whatever the period (Sevestre (2002)).

The random effect model assumes that the relationship between the dependent variable and the explanatory variables is not fixed, but random, the individual effect is not a fixed parameter but a random variable (Bourbonnais (2009)).

The null hypothesis of the test is following:

H_0 : the presence of random effect

The result of this test:

$\chi^2(2) = (b-B)'(V_B - V_{B'})^{-1}(b-B)$

The Hausman test blends in $Pv = Chi2 < Prob$

If $Pv < 5\%$, we accepte H_0 : (presence of random effect)

If not , we accepte H_1 (presence of fixed effect)

Table 6: Result of Hausman test

Models	Pv
Model (1)	0.8525
Model (2)	0.8797
Model (3)	0.8951
Model (4)	0.8507

Indeed , the 4 models are random .

3.7 Results and Interpretations of Models

Table 7: estimation results of models of ROA

	Model (1)	Model(2)	Model(3)	Model(4)
Dependent variable				
ROA	-	-	-	-
Independent variables				
CEA	0.571785 (1.58)	0.5658582 (1.57)	0.5670497 (1.57)	0.43728331 (1.22)
CFC	-0.0215396 (-0.24)	-0.0253644 (-0.28)	-0.0232423 (-0.26)	-0.0116 (-0.13)
Tdeposit	0.0491548 (2.84)***	0.0490806 (2.79)***	0.0480566 (2.76)***	0.043563 (2.54)***
Size	-0.0043311 (-1.31)	-0.0033867 (-1.28)	-0.0034515 (-1.38)	-0.0012486 (-0.51)
TLA	-0.0113894 (-0.78)	-0.0109945 (-0.75)	-0.010 (-0.72)	-0.0172143 (-1.18)
CAP	0.0625821 (3.16)***	0.0615429 (3.10)***	0.061 (3.12)***	0.0598626 (3.10)***
CD	0.0006726 (1.77)*	0.0007002 (1.84)*	0.000713 (1.91)*	0.0006979 (1.90)*
Foreign	-0.004037 (-0.48)	-	-	-
Pub	-	0.00112 (0.14)	-	-
Priv	-	-	0.0019668 (0.28)	-
OC	-	-	-	-0.0261652 (-2.43)***
TPIB	0.443773 (1.76)*	0.442377 (1.75)*	0.4412435 (1.75)*	0.4476352 (1.80)*
TINF	0.8131069 (2.00)**	0.7732632 (1.94)*	0.7726616 (1.95)*	0.6796383 (1.74)*
Constant	-0.0271368 (-0.56)	-0.0406133 (-1.05)	-0.0395724 (-1.03)	-0.0309157 (-0.84)
Number of observations	209	209	209	209
R ²	0.34	0.35	0.37	0.38

-There is a positive relationship between ROA and CEA (if CEA increases by 1% , ROA will increase by (0.57% , 0.56% , 0.567% , 0.437%) respectively in models ((1), (2),(3),

(4)). This relationship is not statistically significant. The increase in operating expenses has a positive effect on return of assets is similar to the result found by (Ben Naceur and Goaid (2008) , Yilmaz(2013)). But contrary to the result found by (Demirguc Kunt and Huizinga (1999) , Bourke (1989)).

The increase in operating expenses is due essentially to the increase in personal expenses and expenses related to market transactions and credits. These expenses may be related to the restructuring program or to increase the market share which increases the return on assets.

A large expenditure can increase productivity and increase bank profitability (Molyneux and Thornton (1992)). The positive impact of operating costs on return of assets should mean a more motivate staff (well paid) contributes to the profitability of the bank (mainly by wages)(Ben Naceur and Goaid (2008)).

On the other hand , there is a negative relationship between CFC and ROA (if CFC increases by 1% , ROA decreases by (0.021% , 0.0253% , 0.023% , 0.011%) respectively in the models ((1) ,(2) ,(3) ,(4)). The increase in financial expenses has a negative effect on the return of assets .

This relationship is not statistically significant. The increase in financial expenses lead to higher costs and additional liabilities lead to higher costs and additional liabilities for the bank which reduces profitability and thereafter there is a negative effect on the return of assets (Pasiouras and Kosmidou (2006)).

In addition , thee is a positive relationship between ROA and Tdeposits (if Tdeposit increases by 1%) , ROA will increase by (0.049% , 0.049% , 0.048% , 0.043%) respectively in models ((1) ,(2) ,(3) ,(4)).

This relationship is statistically significant at 1% which is consistent with results found by (Javid et al (2011) , Alkassimi (2005) , Ayadi et Boujelbène (2012) , Riaz (2013)).

The increase in deposits resulted in increase of availability of liquidity of the bank which increases the ability to provide credit which improves profitability and a positive effect on return on assets . On the other hand , there is a positive relationship between ROA and Size (if Size increases by 1% , ROA will decrease by (0.0043% , 0.0033% , 0.0034% , 0.0012%) respectively in models ((1) ,(2) ,(3) ,(4)).

-The increase in Size has a negative effect on the return of assets . This relationship is not statistically significant. The increase in Size does not necessary lead to higher profits due to diseconomies of scale (Ani and al (2012) , Panayiotis and al (2006)). But there is contrary to result found by (Yilmaz (2013) , Riaz (2012) , Alper and Anbar (2011) , Fadzalan (2011) , Denis and Taisier (2010)).

-There is a negative relationship between ROA and TLA (if TLA increases by 1% , ROA will decrease by (0.011% , 0.010% , 0.011% , 0.0172%) respectively in models ((1),(2),(3),(4)).

The increase in loans has a negative effect on the return on assets . This relationship is not statistically significant. The increase in loans may caused increase proportion of non performing loans (NPL) which reduces bank profitability and having a negative effect on ROA(Ayadi and Boujelbène (2012)).

-Moreover , the influence of CAP on ROA is positive . If CAP increase by 1% , ROA will increase by (0.062% , 0.061% , 0.061% , 0.059%) respectively in models ((1) , (2) ,(3) ,(4)). The increase of capital has a positive effect on return on assets . This relationship is statistically significant at 1% .

This is similar to result found by (Javid and al (2011) , Imad and al (2011) , Scott and Arias (2011) , Hong and John (2010) , Fadzalan and Muzzafar (2009) , Ben Naceur and Goaid (2008) , Yilmaz (2013)).

The increase of capital leads to a reduction of external financing requirement which increases the bank performance (Berger (1995)).

The increase in capital increases the capability of the bank to cope with potential shocks and improve its financial strength .The over capitalized banks have less cost of bankruptcy to their accounts and their customers which reduces their cost of capital .

-There is a positive relationship between CD and ROA (if CD increases by 1% , ROA will increase by (0.00067% , 0.0007% , 0.0007% , 0.00069%) respectively in models (1) ,(2) ,(3) ,(4)). The increase in credits relative to deposits has a positive effect on return of assets . This relationship is statistically significant at 1% .

-The influence of foreign ownership on ROA is negative (if Foreign increases by 1% , ROA will decrease by 0.00403%) . The increase in foreign ownership has a negative effect on return of assets of bank .

This relationship is not statistically significant . This result is similar to result found by (Demircuc Kunt and Huizinga (2001) , De Young and Noll (1996) , Berger and al (2001) , Kobeissi (2004) , Lensink and Hermes (2004) , Zajc (2003) , Yinsill and al (2009) , Miller and Parkhe (2009) , Correra (2008) , Berger and al (2002) , Rokhim and Sustano (2008)).

But , this is contrary to result found by (Xing Xu (2010) , Sheng et Lin(2010) , Olena (2006) , Galace and Kraft (2000) , Claessens and al (2001) , Cull and Soledad (2010) , Cheng and al (2009) , Buch and Golder (2001) , Song (2004) , Taboda (2007) , Shafer and Okdra (2004) , Azzam and Siddiqui (2012) , Kirwi and Oklakou (2013)).

Indeed , foreign banks scarify profitability to increase their market share . In addition , the distance between the host country and the home country , difference in culture , management practices may adversely affect the profitability of foreign banks . Foreign banks with offices in countries faraway with very different market environment, language, culture and regulatory structure , may encounter several problems limiting their performance against national banks (Kobeissi (2004)).

Foreign banks react with overhead cost because they want to maintain their images and technological bases for computing on the market (Zajc (2002)) . In addition , foreign banks may have less information about business in the host country , permitting them at unfavorable position .

-There is a positive relationship between public ownership and ROA (if Pub increases by 1% ,ROA will increase by 0.00112%) . The increase of public ownership has a positive effect on return of assets of bank .

This relationship is not statistically significant . This result is similar to result found by (Loukil and Chaabane (2005) , Sathye (2003)). But this is contrary to result found by (Bonin and al (2005) , Micco and al (2004) , Omrane (2007) , Iannotta and al (2007) , Marcia and al (2009) , Megginson (2005) , Barth and al (2000) , Gosh and Saibal (2010) , Mian (2006) , Sinha (2008) , Kirwi and Oklakou(2013)).

Public banks have the support of the government and they have more credits transactions and investments in different regions which can increase their return on assets (Loukil and Chaabane (2005)).

-There is a positive relationship between private ownership and ROA (if Priv increases by 1% , ROA will increase by 0.0019668%) . The increase of private ownership has a positive effect on return of assets . This relationship is not statistically significant .

This result is similar to result found by (Bonina and al (2005) , Micco and al (2004) , Omrane (2007) , Iannotta and al (2007) , Marcia and al (2007) , Megginson (2005) , Barth and al (2000) , Gosh (2010) , Mian (2006) , Sinha (2008) , Beck and al (2005) , Lang and So (2002) , Carene and al (2004) , Kobeissi and Xian (2010) , Kirwi and Oklakou (2013)).

But this is contrary to result found by (Chen and al (2005) , Chaabane and Loukil (2005), Bonacrossi and al (2005) , Sathye (2003)).

Private investors seeking to maximize profits , increase in deposits , look for profitable investments opportunities , a reliable credit selection with increases the return on assets of bank .

On the other hand , the influence of concentration ownership is negative on ROA (if OC increase by 1% , ROA will decrease by 0.0261652%) . The increase of concentration ownership has a negative impact on return of assets . This relationship is statistically significant at 1% .

This result is similar to result found by (Busta (2007) , Thomsen and al (2006) , Hanafi and al (2012) , Kirwi and Oklakou (2013) , Riewstathirathorn and al (2011)).

This is contrary to result found by (Demestez and Lehn (1985) , Prowse (1995) , Faccio and Lang (2002) , Caprio and al (2004)).

Indeed , controlling shareholders can expropriate minority shareholders (Shleifer and Vishny (1986) , Facarie and Stolin (2006)) , creating agency conflicts which reduce bank performance.

Stulz (1988) questioned the benefit of large shareholders since they can expropriate the welfare of outside investors . There are other potentials costs of the high concentration of ownership , such as excessive surveillance , that increasing the cost of care .

There are other potential costs of the high concentration of ownership such as excessive surveillance that increasing the cost of care .

-There is a positive relationship between growth of PIB and ROA (if TPIB increases by 1% , ROA will increase by (0.0443% ; 0.042% , 0.441% ; 0.447%) respectively in models ((1),(2) ,(3) ,(4)).

This relationship is statistically significant at 10% .

GDP growth is the measure of economic activity that has an impact on the supply and demand of deposits and credits (Ayadi and Boujelbène (2012),Fadzalan (2010)).

This is contrary to results found by result (Yilmaz (2013) , Ben Naceur and Goaid (2008) , The GDP growth has a positive relationship with bank profitability (Kosmidou and al (2005) , Ayadi and Boujelbène (2012)).

-There is a positive relationship between the rate of inflation and ROA (if TINF increase by 1% , ROA will increase by (0.813% , 0.773% , 0.772% , 0.679%) respectively in models ((1) ,(2) ,(3) ,(4)).

The increase of inflation has a positive effect on return of assets of bank . This relationship is statistically significant at 5% in model (1) , but is statistically significant at 10% in models ((2) ,(3) ,(4)).

With inflation , bank returns increase more than their costs .This is similar to result found by (Demirguc Kunt and Huizinga (1999) , Kaya (2002) , , Abreu and Mendes (2002)), Fadzalan (2010) , Yilmaz (2013) , Astoy (2007)).

Inflation leads to a price increase which affects the service and product offered by the bank , which increases bank profitability . The result is contrary to found by Ayadi and Boujelbène (2012) .

The 4 models of ROA are overall significatifs .

4 Conclusion

The ownership structure and financial performance are 2 important variables in the banking sector . Shareholders have the incentive to monitor managerial decisions and increase the financial performance of banks .

In the context of the article , we studied a sample of 19 banks included in professional association of banks of Tunis over the period (2000-2010) . We found that return on assets (ROA) has a negative relationship with foreign ownership and concentration ownership . While ROA has a positive relationship with public ownership and private ownership . But overall , the impact of ownership structure on financial performance of banks is insignificant.

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