

Comparison of Bank Profitability: Evidence from Morocco and Tunisia

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Abstract

The banking sector in African countries is attracting more interest among practitioners and researchers. In this paper, we compare the profitability of banks in Morocco and Tunisia, in which authorities are making great efforts to improve the financial sector using different tools. Our study is an attempt to compare the financial systems of both nations. Using panel data analysis, we have studied the banking profitability in both countries from 2009 to 2018. This paper presents a quantitative study using the Generalized Least Squares (GLS) regression method with the software "STATA". Two models with fixed and random effects were studied. A Hausman test was performed to account for potential endogeneity in the collected data. The obtained results show that Tunisian and Moroccan banks operate efficiently. Hence, the capital adequacy ratio is directly related to banking profitability for Tunisian and Moroccan banks. In terms of the ratio of net interest revenue to total assets, Tunisian banks have the best results.

JEL Classifications: G10

Keywords: Banks, Profitability, Panel, Tunisia, Morocco

1. Introduction

Tunisia and Morocco provide an interesting context for the analysis of banking profitability as their banking sector went through similar transition processes. The execution of substantial economic reforms was a challenge for each country. Therefore, liberalization, consolidation, and privatization processes occurred when governments revised their previous policies. Moreover, the question of what factors affect banking profitability is especially pertinent. In this study, we try to define important factors affecting the profitability of Tunisian and Moroccan banks.

The four fundamental pillars of banking management [1] are: (a) ensuring permanent solvency when withdrawing deposits by maintaining a sufficient liquidity reserve (liquidity management); (b) developing a risk-minimized portfolio based on diversified asset positions; (c) acquiring sufficient deposit volumes at the lowest possible financing costs, and (d) optimizing and appropriate procurement of the necessary amount (equity management). However, the individual components of banking management are sometimes in competition with one another, and the respective measures to achieve the goals described are not risk-free.

Article history:

Received (August 1, 2022), Review Result (September 5, 2022), Accepted (October 10, 2022)

In Morocco, the objective of the reforms is to align Moroccan financial legislation with international standards and supervisory standards in most fields. Following the global financial crisis of 2007-09, international norms have dramatically changed. This required the Moroccan Central Bank to update its financial legislation as well.

The revision of the legal framework for banks was particularly important given the dominance of banks in the financial sector. The new banking law adopted in 2014 aligned the legislative requirements to the Basel standards. This includes, among others, the supervision of systemically important banks, a resolution mechanism for distressed banks, and enhanced coordination among supervisors [2]. The legislative requirements for Moroccan banks are, in most cases, above the minimum levels embedded in international standards.

The high exposure requirement, for example, is decreased to 20% of capital rather than 25%, while the minimum capital requirement is cut to 10% rather than 8%. The Central Bank has classified the country's three largest banks as systemically important. Scale, interconnectedness, and cross-border activities are the most important systemic elements.

Since the regulatory standards for systemically important banks are stricter, politicians need to prepare their resolution plan and be subject to a capital surcharge [3]. There are no provisions for the resolution of the financial market infrastructure and insurance companies [3].

Moreover, the new banking law that was published in Morocco in 2015 also included provisions for cross-border coordination of banking supervision. The new banking law enabled the Central Bank of Morocco, Bank Al-Maghrib (BAM) to conclude agreements in a coordinated action of banking supervisory authorities in other countries. In addition to standard information sharing and supervisory board agreements with Central Banks, BAM has several agreements with Central Banks in the field of risk management [4]. On the other, in Tunisia, the financial sector is dominated by banks, with assets representing 115% of the GDP.

This sector is highly fragmented, and conferring to the IMF, potential risks and vulnerabilities in the banking sector are probable to be much higher compared to what is declared in some officially reported data. A substantial portion of the nonperforming loan (NPL) has been rescheduled, about 5 percent of the overall NPL ratio, which is around 13, 3% in 2011 of their debts. It is also necessary to note that public banks hold the bulk of this NPL compared to private banks. Aware of this fact, the Moroccan government has begun reforming to renovate and reinforce these banks, issuing a full audit before advancing with their recapitalization [5].

The jurisdictions are also working on the legal framework to deal with the weak bankruptcy law and a deficient judicial system that does not grant banks to rapidly use collateral to regain their losses from unpaid loans, which makes them object to lending. Therefore, this study proposes an observation between Tunisian and Moroccan banks to simplify the sources of profitability and to produce strategic decisions.

This article is structured as follows. Section 2 describes the literature review. Then, section 3, gives a summary of the user database. Section 4 is devoted to the methodology. Our results will be presented and discussed in section 5, and finally, section 6 concludes the paper.

2. Literature review

Some studies focus on one country, while others cover groups of countries. In this vein, Horobet et al [6] noted that there is a positive correlation between personnel expenses and return on equity, which can be explained by a higher qualification of the staff and

productivity of the work and thus a higher quality of the banking services, which have a positive effect on profitability. A higher use of human resources in concentrated markets, which is expressed in the personnel expenses, is not to be equated with inefficiency, but can also be due to a higher quality of the service provided, which is justified by the profit advantages.

For their part, Muhammad and Meleml [7] found a positive correlation between the equity-asset ratio variable that approximates the chosen capital structure and the net interest margin as a measure of banking profitability. The authors argue that better-capitalized banks face lower expected costs of insolvency for both the bank and its customers, which lowers the bank's funding cost and widens the spread between interest income and interest expense and increases the net interest margin.

The profitability of a bank represents its ability to generate sufficient earnings from its operations, and this is after the deduction of the necessary costs for the operation to sustainably pursue its activity. There are several ways to assess bank profitability.

For this part, Oino [8] found a positive impact of the equity-asset ratio variable on three profitability indicators in a sample of sub-Saharan African banks: ROA, ROE, and NIM.

Staikouras and Wood [9], found a positive impact of the equity-asset ratio variable on the ROA and the ROE in a sample of selected European banks. They explain the results of the capital structure theory, which assumes that increased debt (capital) financing in the interval of the target capital structure decreases (increases) the bank's cost of capital. Therefore, a positive (negative) sign of the coefficient in front of the variable of the ratio of equity and wealth indicates efficient (inefficient) management of the capital structure.

On the other hand, Dhoubi and Mamoghli [10] found that Tunisian banks are insufficiently capitalized and overwhelmed by high and non-performing loans and register the lowest profitability.

In this context, Ferrouhi [11] noticed that banking profitability is positively affected by the banks' size, foreign direct investments, and the recognition of financial distress, while it is negatively impacted by the external part of total liabilities and unemployment rate.

In another study. In another, Mirzaei et al [11] showed that loan growth is supposed to be linked to higher profitability. Therefore, larger banks can benefit from economies of scale and income diversification. Furthermore, Osuagwu [13] found a positive influence of the capital adequacy ratio on ROA and NIM in a sample of banks in Nigeria.

Islam and Nishiyama [14] found a positive and negative impact of the equity-asset ratio variable on the ROA and the ROE, respectively, in a sample of South Asian banks. The authors demonstrate the negative effect of the variable on the equity-to-asset ratio on the ROE using the traditional risk-return hypothesis, which states that the achieved return on invested funds is higher if the probability of losing invested funds is higher. Therefore, banks with a higher value of capitalization indicators are safer, so they expect a lower ROE. Then, the authors explained the positive impact of the variable on the ratio of equity to assets on the ROA by the capacity of better-capitalized banks to transform their creditworthiness into lower financing costs. The provision of the information function is, in the broadest sense, about reducing the information asymmetries both before the conclusion of the contract (“hidden information”, adverse selection) and afterward (“hidden action”, moral hazard) [15]. Then, the exercise of the information function consequently forms the basis for the strategically important customer proximity and thus a decisive element of the competitive position of credit institutions.

Over the years, people have been able to agree fairly quickly that the capital adequacy of the various banks must be significantly improved. An increased capital base can act as a

buffer of safety in the event of a default and stabilize the affected bank and make the banking system as a whole less susceptible to contagion effects. Supervisory regulations in force to date could not prevent financial sector upheavals during and after the financial crisis, as evidenced by the numerous campaigns of State support for banks threatened by insolvency. From the start, renowned scientists called for a rapid and radical increase in the responsible capital of banks [16].

The most specific question of the new and more efficient balance to be struck between the condition of financial leverage and that of capital adequacy is a topic of relevant topicality.

In the same vein, Dufrenot and Jawadi [17] have reported after the most recent financial crisis that when several operators, characterized by high financial leverage, failed to cope with the losses recorded in their portfolios, resulting in a significant reduction in capitalization and thus potential conditions for system instability, which required massive recapitalization measures from different countries [18][19]. On the other hand, the Basel Committee on Banking Supervision published in December 2010 a set of fully amended rules aimed at improving the resilience of individual banks and the financial system as a whole (Basel III). Banks' primary responsibility is to efficiently allocate capital so that they can have access to capital markets, and have the right to exist only if they cause lower costs in the course of financial intermediation than a direct financial relationship through the capital market. As a result, banks must ensure that their products and services are developed cost-effectively. According to some studies, the most important variable influencing banking profitability is the capital ratios of banks. Profitability and capital ratio have a positive relationship, which means that a bank with a healthy capital structure will have a higher win rate. Because a well-capitalized bank can provide more profitable financing, the risk of insolvency is low. A bank with a low capital ratio will present a high risk because its debt is high. As a result, financing costs increase and profits decrease.

One of the most important determinants of a bank's profitability is operational efficiency, also known as cost management [20][21]. In a concentrated banking system, higher interest rates due to market power may increase the borrower's risk due to higher costs [22]. Lending may also be less restrictive, which creates a greater risk of loss and bankruptcy for the banks [23].

There is also abundant literature dealing with the relationship between capital and profitability. Recently, Altunbaş et al [24] have discovered that more capitalized banks are more profitable as they have more creditworthiness, are more prudent in lending, and borrow less, which decreases their costs and boosts their profitability. In the more recent literature, liquidity is no longer explicitly interpreted as an independent goal, but as a fundamental, necessary secondary condition for the achievement of other goals. Simultaneously, the liquidity target is directly related to risk (security). On the one hand, liquidity is intended to minimize the likelihood of insolvency and to this extent, it is one dimension of an overarching risk target. On the other hand, a lack of liquidity does not lead directly to over-indebtedness but merely forces a bank to finance itself on the interbank market. Because interbank interest rates are usually higher than the deposit rates offered by banks, a lack of liquidity reduces performance [25]. Thus, liquidity and success risks are to a certain extent interdependent.

Using the same methodology, our article aims at comparing the Moroccan and Tunisian banks' profitability. To the best of our knowledge, studies focusing on this subject are scarce, despite the current political and financial developments in both countries.

3. Data

Our data is collected over time and across banks, and then a regression is run across these two dimensions. We use data on an annual basis from 2009 to 2018. We retrieved the data from Decypha Database. The used variables are presented in the table below:

Table 1. Variables details

Variables	Designation
Total grossloans (LNLOANS)	The total amount of issued credits during the period
Total Assets (BSZ)	It is the size of the bank measured by natural logarithm of Banks Total Assets
Capital Adequacy Ratio(CAR)	CAR (%) is measured as the ratio of the quotient of total banks capital with total assets.
Return on assets (ROA)	ROA (%) is a profitability ratio that measures how well a company generates profit from its total assets
Cost-to-Income Ratio (CI)	CI (%) is a ratio calculated by dividing the operatingcostsby the operating income of each bank
Total interestincome/asset (NIM)	NIM is a ratio that indicates whether the bank is earning a high-interest income as compared to the assets
Non-interestincome/assets (NONIM)	NONIM is a ratio that indicates whether the bank is earning a non-interest income (from fees, including deposit and transaction fees) as compared to the assets

Our sample comprises the greatestvital banks in Morocco and Tunisia, namely, 6 Moroccan banks were considered:

- Attijariwafa Bank (AWB)
- Banque Marocaine du Commerce Extérieur (BMCE)
- Banque marocaine pour le commerce et l'industrie (BMCI)
- Banque Centrale Populaire (BCP)
- Crédit du Maroc (CDM)
- Crédit Immobilier et Hôtelier (CIH)

11 Tunisian Banks were considered in our sample:

- Amen Bank (AB)
- Arab Tunisian Bank (ATB)
- Banque de l'Habitat (BH)
- Banque Internationale Arabe de Tunisie (BIAT)
- Banque Nationale Agricole (BNA)
- Banque de Tunisie (BT)
- Banque de Tunisie et des Emirats (BTE)
- Société Tunisienne de Banque (STB)

- Banque Attijari de Tunisie (BAT)
- Union Bancaire pour le Commerce et l'Industrie (UBCI)
- Union Internationale de Banque (UIB)

4. Methodology

4.1. The justification for the use of panel analysis as an econometric approach

An econometric approach is a robust tool since it enables empirical testing of theoretical perceptions and a better explanation of the attained results. In our study, and to take advantage of the multidimensional advantages of the Econometrics of panel data, we opted for such an econometric tool. One of the advantageous characteristics of panel data is their double dimension (individual and temporal). This dual dimension brands it probable to simultaneously train the dynamics and heterogeneity of individuals (commercial banks). According to Hsiao [26], the panel data methodology controls individual heterogeneity and reduces the problems associated with multi-collinearity and estimation bias. Panel data, by the greater amount of information it contains, also helps to better estimate structural relationships.

In addition, in the empirical literature, the econometrics of panel data has been used in numerous studies that focus on the profitability of commercial banks. The studies focused, for example, on the profitability of European banks [27] MENA banks [28] of South Asian Banks [14]. On the other hand, [20] provided evidence from Switzerland Banks, the main UK banks [29], and Tunisian banks [30].

4.2. Presentation of the used econometric model

In general, a simple econometric panel data model is a double index model (individual exponent i and time exponent t). This model is written as follows if we consider N individuals observed over T periods and m explanatory variables:

$$y_{it} = \sum_{k=1}^m \alpha_{ki} x_{kit} + \beta_{0i} + \varepsilon_{it},$$

where:

- y_{it} is the dependent variable observed for the individual I at time t
- x_{kit} is the k^{th} explanatory variable observed for the individual I at period t
- $i = 1, 2, \dots, N$ (N is the number of people), $t = 1, 2, \dots, T$ (T is the number of periods).
- α_{ki} denotes the unknown parameters related to the explanatory variables.
- m represents the number of explanatory variables.
- β_{0i} represents the error term for the individual I at time t .

- \mathcal{E}_{it} is the error term for individual I at period t

In the case of our empirical investigation, we use the dependent variable $y_{it} = ROA_{it}$ and six selected explanatory variables:

$$x_{1it} = LNLOANS_{it}, x_{2it} = BSZ_{it}, x_{3it} = CAR_{it}, x_{4it} = CI_{it}, x_{5it} = (NIM)_{it}, x_{6it} = (NONIM)_{it}$$

Where LNLOANS is the Total Gross Loans, BSZ is the Total Assets, ROE is the Return On Equity, CI is the Cost-to-Income Ratio, NIM is the Total Interest Income, BSZ is the assets, NONIM is the Non-Interest Income.

As a result, the general theoretical model is written as follows:

$$ROA_{it} = \beta_i + \alpha_{1i}(LNLOANS)_{it} + \alpha_{2i}(BSZ)_{it} + \alpha_{3i}CAR_{it} + \alpha_{4i}CI_{it} + \alpha_{5i}(NIM)_{it} + \alpha_{6i}(NONIM)_{it} + \varepsilon_{it}$$

To take into account the heterogeneity, this model is supposed to differ for all individuals (commercial banks) at the level of the constants. It is therefore appropriate, in what follows, to estimate a fixed-effects model and a random-effects model and choose the most suitable among them. In practice, this decision is primarily based on Hausman's test.

The fixed-effects model

Individual fixed effects models assume that the relationship between the dependent variable and the independent variables is the same for all individuals (that is, the coefficients associated with the independent variable are constant regardless of the individual i). This theoretical model is written based on the chosen determinants:

$$ROA_{it} = \beta_i + \alpha_1(LNLOANS)_{it} + \alpha_2(BSZ)_{it} + \alpha_3CAR_{it} + \alpha_4CI_{it} + \alpha_5(NIM)_{it} + \alpha_6(NONIM)_{it} + \varepsilon_{it}$$

The random-effects model

This model assumes that the links between the dependent variable and the explanatory variables are no longer fixed, but random and that the individual effect is a random parameter rather than a fixed one (β_i is a random variable)

- Hausman's test is a specification test that determines whether the coefficients of the two estimators (fixed and random) are statistically different. It is a test that enables the user to choose between two hypotheses (H_0 and H_1):
 - H_0 : The Random-effects model is more suitable (P-value greater than 5%)
 - H_1 : The fixed effects model is more suitable (P-value less than 5%)

5. Results and discussion

5.1. Compare Banking Loans and Asset Growth Rates

From 2009 to 2018, the table below summarizes the growth rate of banking loans and assets in Morocco and Tunisia.

Table 2. Total Banking Loans and Assets in 2009–2018

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Morocco										
Total assets (M MAD)	710 413	850 521	941 221	1 028 245	1 071 286	1 117 192	1 178 119	1 250 341	1 344 402	1 392 223
Growth rate (%)	-	19,72 %	10,66 %	9,25%	4,19%	4,29%	5,45%	6,13%	7,52%	3,56%
Total loans (M MAD)	501 358	625 434	697 516	746 880	773 987	791 547	825 822	850 630	905 039	915 466
Growth rate (%)	-	24,75 %	11,53 %	7,08%	3,63%	2,27%	4,33%	3,00%	6,40%	1,15%
Tunisia										
Total assets (M TND)	37 635	41 862	45 173	49 614	51 631	54 646	58 377	64 629	73 960	81 649
Growth rate (%)	-	11,23 %	7,91%	9,83%	4,07%	5,84%	6,83%	10,71%	14,44%	10,40%
Total loans (M TND)	28 797	32 648	35 318	38 493	40 357	41 644	44 046	47 221	54 571	60 092
Growth rate (%)	-	13,37 %	8,18%	8,99%	4,84%	3,19%	5,77%	7,21%	15,57%	10,12%

Sources: Decypha Database

The analysis of the total gross loans shows that Moroccan Banks provide more gross loans than their Tunisian counterparts; this is due to the Moroccan banking system's advanced banking practices. Six Moroccan banks are listed on the Casablanca Stock exchange and some of them are acquiring units abroad (even in Tunisia). When we consider the growth rate, we see a positive trend in both markets, an important evolution in Moroccan loans in 2010 and 2011. From 2012 to 2018, there was a rapid expansion of total loans provided by Tunisian Banks. The same pattern can be seen when comparing total assets. The size of Moroccan banks is more important than the Tunisian ones, which are known for their tight liquidity. Only in 2010 and 2011, the rate of asset growth was important for Moroccan banks. However, from 2012 to 2018, the growth rate of banks' total assets was more important in Tunisian banks. This could be explained by the Moroccan banking system becoming saturated.

5.2. Banking profitability as determined by panel data analysis

To study the determinants of the profitability of the assets of Moroccan and Tunisian banks (ROA), we opted for econometric modeling based on panel data. Using such a tool enables us to study the heterogeneity between the different banks (Moroccan and Tunisian) and to consider the dynamic nature of the variables' relationships. Before presenting the results of our modeling equations, we first carry out a descriptive analysis of the studied variables

Table3. Descriptive statistics

Country	Morocco	Tunisia	All
Mean	0.879828	0.842222	0.858645

Std. Dev.	0.296732	0.847335	0.664017
Obs.	69	89	158

Using Hausman's test enables us to choose between FEM (fixed-effect model) and REM (random-effect model). Moreover, this specification enables us to check whether the coefficients of the two models are statistically different or not.

Table 4. Hausman's test

The Hausman Test for Correlated Random Effects			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Tunisianbanks	4.574068	6	0.5995
Moroccanbanks	92.667954	6	0.0000
Allbanks	12.327002	6	0.0551

The previous test shows the presence of a fixed effect for the whole sample and Moroccan banks (Khi Sq statistics are above theoretical values). We are going to use Fixed Effect Model for Moroccan banks and Random Effects Model for Tunisian banks. The table below summarizes the results:

Table 5. Estimation Results of banking profitability with fixed effects and random effects model

Variables	(I) ALLbanks Fixed effects	(II) Moroccanbank Fixed effect	(III) Tunisianbanks Random effects
CI	-0,026***	-0,003*	-0,029***
NIM	6,382	3,637	16,841**
BSZ	0,106	0,183	0,161
LNLOANS	0,065	-0,016	-0,204
CAR	0,016***	0,061***	0,014***
NONIM	18,97***	-2,728	0,039
C	0,13	-1,52*	2,216***
R ²	0,903316	0,91568	0,930016
adjusted R ²	0,88756	0,89761	0,915635
Durbin-Watson	1,416741	0,99896	1,303482
F-Statistic	57,33197	50,6761	131,0184
Nb. Obs.	158	69	89

Note: ***, **, and * denote statistical significance at 1, 5, and 10 percent levels, respectively.

The results of this paper, which are presented in Table 4, relate a negative relationship between operating efficiency (CI) and banking profitability, and that banking profitability is statistically significant at a 10% significant level in Moroccan banks and 1% in Tunisian banks, this relationship implies that highly efficient and profitable banks have greater operational efficiencies compared to less profitable banks.

This result is in conformity with that of Feng and Wang [31], who found that the ratio of cost-effectiveness has a significantly positive linear effect on the profitability of banks. For instance, in [Table 4], the (CAR) was originally statistically significant at a 5% level, this coefficient is positively associated with banking profitability for Tunisian and Moroccan banks, implying that the higher the level of capital, the stronger the protection of depositors and creditors against losses. This capitalization then takes on all its importance, raising its flexible lines in the face of negative shocks [32] and reducing the problems of over-indebtedness [33].

This means that better cost management leads to better profitability in Tunisian and Moroccan banks. The NIM reflects the bank's management ability to manage productive assets to generate net interest income.

Banks face some difficulties with liquidity when they have a positive spread in the net interest. This indicates that the bank receives more interest income than it pays interest expenses. The larger NIM represents the bank's better performance. Based on data analysis, the NIM has a significant level, so it can be stated that there is a positive significant impact of the NIM on profitability for Tunisian banks, but it is not significant for Moroccan banks.

6. Conclusion

Tunisia and Morocco have undergone notable financial reforms. However, empirical data on the Maghreb countries are relatively scarce. Using unbalanced panel data at the banking level, this study seeks to examine the profitability of 17 Moroccan and Tunisian banks, covering the years 2009 to 2018 by monitoring a wide range of financial and banking characteristics. We found that the level of capital adequacy is positively related to the profitability of the bank. The study also reports a statistically significant relationship between banking profitability and operating efficiency for banking in Tunisia and Morocco, the net interest margin has a positive significant impact on profitability for Tunisian banks, but not for Moroccan ones.

Finally, we can argue that profitable banks accumulate more capital and become more resilient. To this end, the role of technological progress is particularly important for banks that could improve their profit efficiency levels and provide an additional advantage over their counterparts. However, research is limited by the small size of the used sample, and the absence of characteristics relating to governance that could prove useful. Therefore, future research will focus on the interrelationships of complex and bidirectional causality while taking into account the endogeneity of the variables by a system of simultaneous equations and the exploration of the homogeneity of profitability with different measures, which are based on a metric definition classifying profitable banks under different categories; light, medium and high profitability, thus, an understanding of the causes will be more complete according to an analysis of the information asymmetry, risk management, lending policies and the effect of the regulatory framework.

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