Factors Affecting Bank Performance: Empirical Evidence from Morocco

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Abstract

This study empirically examines the effects of bank-specific characteristics, bank governance, financial market structure, and macroeconomic conditions on Moroccan banks' performance. Moroccan banks' performance is measured by return on assets (ROA) and return on equity (ROE). For this aim, panel data method (fixed effects model) is applied to data which is obtained from a sample of 6 Moroccan banks' financial statements during the period 2010-2016. The findings show that only operating management efficiency represented by the cost-to-income ratio (COST) is highly significant and negatively related to bank's performance. Also, the results indicate that bank size (SIZE) is positively related to ROA and statistically significant. Nevertheless, the effects of the other variables are statistically insignificant. The findings suggest that future studies could be include more dependent and independent variables to explain Moroccan banks' performance.

Keywords: Bank Performance, Bank-specific Variables, Corporate Governance, Macroeconomic Conditions, Moroccan Banking.

Introduction

The stability and solidity of the Moroccan banking system are appreciated by several international financial institutions. Since the global financial crisis of 2007-2009, Moroccan banks have expanded both domestically and regionally in terms of bank penetration and bank density. Although banks are adequately capitalized and profitable, with stable funding, they are vulnerable to large corporate defaults and deposit withdrawals (IMF, 2016).

In this context, and according to the Moroccan Central Bank, the sound foundations of the banking sector were broadly confirmed by the findings of stress tests, which underlined the ability of banks to withstand plausible macroeconomic shocks.

Morocco represents an attractive opportunity to study bank performance with the financial system being dominated by the commercial banks. The number of banks operating in Morocco was 19 at the end of December 2017.

The aim of this article is to extend earlier work on the determinants of performance of Moroccan banks and examine the effect of bank-specific, industry-specific and macroeconomic determinants of bank profitability. Following the literature and taking into account the country's particular characteristics, we use a variety of internal and external banking characteristics over the period 2010-2016.

The rest of the paper is organized in the following manner: Section 2 reviews the existing literature, relating bank profitability to its determinants. Section 3 describes research methodology, variables, data and research method. Section 4 presents and analyses the empirical results. Finally, Section 5 concludes the study.

1. Literature Review

There is a rich literature on the determinants of bank performance. The summary of previous research studies shows that bank profitability is usually expressed through internal and external variables. Internal determinants can be defined as those factors that are specific to each bank, while external variables include factors relating profitability to the industry structure, and to the macroeconomic environment that affects the operation and performance of the banking system. A non-exhaustive listing of these studies that related to measurement of financial performance is discussed below:

Bourke (1989) examined the performance of banks in twelve countries in Europe, North America and Australia during the period 1972-1981. He found that concentration, liquidity, inflation and size affect the bank performance and profitability positively. The study of Molyneux and Thornton (1992) reproduces the methodology of Bourke (1989). They studied the determinants of banking performance in eighteen European countries between 1986 and 1989. The results confirmed Bourke's findings.

Using return on average assets (ROAA) to evaluate bank's performance, Pasiouras and Kosmidou (2007) examined the profitability of 584 commercial domestic and foreign banks operating in the 15 European Union countries over the period 1995-2001. Results obtained show that profitability of both domestic and foreign banks in the European Union is affected by the bank's specific characteristics (size, capital adequacy,

efficiency of the management), financial market structure (concentration), and macroeconomic conditions (inflation and the real gross domestic product [GDP] growth).

Moreover, Athanasoglou and al. (2008) performed a study to examine the effect of bank-specific, industry-specific and macroeconomic determinants of Greek banks' profitability, covering the period from 1985 to 2001. The estimation results indicated that, with the exception of bank size, all bank-specific determinants significantly affected bank profitability. The results also reported that the impact of concentration and ownership on bank profitability is insignificantly related.

Trujillo-Ponce (2013) analysed the factors that determine the profitability of Spanish banks for the period of 1999–2009. Firstly, the empirical finding reveals differences in the performance of commercial and savings banks. Secondly, the results indicated a strong positive relationship of asset quality, capitalization, concentration, inflation, economic growth and real interest rate with ROA and ROE. Finally, concerning the effect of bank size on profitability, the results showed an insignificant impact of size on the two profitability indicators.

Studies on the impact of corporate governance on bank performance were documented by various authors. Liang and al. (2013) analysed board characteristic impacts on bank performance and bank asset quality in China. Using a panel data of 50 largest Chinese banks during the period of 2003–2010, they found that the board size has a significantly negative impact on bank performance while the proportion of independent directors and the number of board meetings have significantly positive impact on both bank performance and asset quality.

De Andres and Vallelado (2008) used a sample of 69 boards of large commercial banks from Canada, France, the UK, Italy, Spain, and the US from 1995 to 2005. They found that bank performance has a significantly positive relation with board meetings and an inverted U-shaped relation with board size and the proportion of outside directors.

Staikouras and al. (2007) examined the relationship between two of the most pertinent corporate governance factors –that is, the size of the board of directors and the proportion of non-executive directors– and firm performance on a sample of 58 large European banks over the period 2002-2004. The results reveal that bank profitability is negatively related to the size of the board of directors, while the impact of board composition, although positive in all models, is, in most cases, insignificant.

Literature exists on studies on determinants of banks' profitability in Morocco. Mansouri and Afroukh (2009) examined the banking profitability determinants in Morocco for the period between 1993 and 2006. The empirical results of the study showed that, except the volume of loans distributed that

affect positively the return on assets, all other managerial determinants have a significant and negative impact on commercial banks' profitability in Morocco. The other significant determinants are macro-financial conditions (banking industry concentration and development of the capital market) and macroeconomic conditions (inflation and GDP per capita growth), both of which positively impact on bank profits.

In line with this study, Bahyaoui (2017) underwent a research to identify the idiosyncratic determinants of banking performance in Morocco for the period between 2004 and 2015. The author used the Global Banking Margin (GBM) a ratio that is adopted by Moroccan central bank and is very similar to NIM, as an independent variable measuring profitability. The findings indicate that banks with a majority of private capital (whether Moroccan or foreign) and unlisted banks are banks that perform well. The estimated results indicated that most bank-specific determinants (capitalization, financing costs, operational efficiency, and credit quality) significantly affected bank profitability. This research conducted by Bahyaoui confirmed that the bank size impacted on profitability negatively.

Also Ferrouhi (2017) conducted a study to analyze the long-term determinants of performance of eight biggest Moroccan commercial banks, for the period 2005-2015, using the Johansen cointegration test. Three measures of performance were used in this study. These were: the net non-interest margin (NIM), returns on assets (ROA), and returns on equity (ROE). The results indicated that the significance of bank specific variables (size of the bank, short-term, long-term and funding liquidity, deposits, and foreign direct investments) are long-term determinants of the performance of Moroccan commercial banks.

Concerning the impact of corporate governance structure on the performance of Moroccan banks, Sbai and Meghouar (2017) used data from 6 Moroccan commercial banks listed on Casablanca Stock Exchange for a period of 7 years from 2009 to 2015. The empirical results of this study indicated that the presence of a nomination and remuneration committee has a positive impact on the performance of Moroccan banks. The size of the board of directors and the presence of foreign administrators positively influence bank performance.

To sum up, the findings of the several studies tackled above are considerably different. These differences are due to the variation of the macroeconomic and legal environment, and data included in the analysis. However, there are common factors influencing profitability as identified by various researchers.

2. Research methodology

a. Determinants and variables selection

In the literature of bank performance, the most common variables used to measure the performance of banks are the profitability ratios. This study uses return on assets (ROA) and return on equity (ROE) as the dependent variables to evaluate bank's performance. ROA is defined as the ability of a bank's management to generate profits from the bank's assets. The second measure ROE reflects the return to shareholders on their equity.

The independent variables, used in this research, are to be classified into four sub-categories as bank-specific, bank governance, market structure and macroeconomic determinants of bank profitability. Table 1 provides the definitions of the dependent and independent variables used in this study. The notations used and the expected effect of each determinant are also given.

Table 1 Variables measurement and expected effect

	Category	Variables	Measures	Notation	Expected effect
Dependent variables	Profitability	Return on Assets	Net Profit/Total Assets	ROA	+/-
		Return on Equity	Net Profit/Equity	ROE	
Independent variables	Bank-specific determinants	Bank's Size	Natural(normal) logarithm of total asset of the bank	SIZE	+
		Capital Adequacy	Equity to total assets	CA	+/-
		Liquidity	Net loans to total assets	LIQ	-
		Operating Management Efficiency	Cost to income ratio	COST	-
	Market structure	Concentration	The C5 concentration measure calculated by dividing the assets of the five largest banks with the assets of all banks operating in the country	CONC	-
	Bank governance	Board Size	The number of members in the board	BS	+/-
		Board Meetings	The number of board meetings	MEET	+
		Duality	A dummy that takes the value of 1 if the CEO chairs the board as well, and 0 otherwise	DUA	+/-
		Independent Directors	The percentage of independent directors	IND	+/-
	Macroeconomic determinants	GDP per capita growth	Annual percentage growth rate of GDP per capita based on constant local currency	GDP	+
		Inflation	Annual Inflation Rate (Consumer Price Index,CPI)	INF	+

b. Data and research method

The study covers six selected commercial banking institutions that operated in Morocco, over the period 2010–2016, consisting of 42 observations. The bank-specific variables used in this paper are obtained from Fractal Markets database. Bank governance determinants are derived from the annual reports of the Moroccan commercial banks. With regard to the macroeconomic variables, the data of economic growth and inflation rate are obtained from databases of the World Bank, the International Monetary Fund and the Moroccan High Commission for Planning.

In order to examine the internal and external factors that affect the profitability of banks in Morocco, the study used panel data regression techniques for conducting the econometric modeling. The following linear regression model was developed:

$$\mathbf{Yit} = \boldsymbol{\alpha}\mathbf{it} + \boldsymbol{\beta}\mathbf{itXit} + \boldsymbol{\varepsilon}\mathbf{it} \qquad (1)$$

Where :

- **Yit** is the performance of Bank *i* at time *t* as expressed by ROA and ROE.
- **i** refers to an individual bank, **t** refers to year
- **αit** is a constant
- **Xit** is the independent variables (control variables that comprise of external variables described earlier)
- **εi** is an Error term

By extending equation (1) to reflect the variables, as described in table 1, the baseline model is formulated as follows:

$$\begin{aligned}\mathbf{ROAit} = {} & \boldsymbol{\alpha}\mathbf{it} + \boldsymbol{\beta}\mathbf{itLIQit} + \boldsymbol{\beta}\mathbf{itCAit} + \boldsymbol{\beta}\mathbf{itCOSTit} + \boldsymbol{\beta}\mathbf{itSIZEit} \\ & + \boldsymbol{\beta}\mathbf{itCONCit} + \boldsymbol{\beta}\mathbf{itBSit} + \boldsymbol{\beta}\mathbf{itMEETit} + \boldsymbol{\beta}\mathbf{itDUAit} \\ & + \boldsymbol{\beta}\mathbf{itCOEAGEit} + \boldsymbol{\beta}\mathbf{itINDit} + \boldsymbol{\beta}\mathbf{itGDPit} + \boldsymbol{\beta}\mathbf{itINFit} + \boldsymbol{\varepsilon}\mathbf{it}\end{aligned}$$

$$\begin{aligned}\mathbf{ROEit} = {} & \boldsymbol{\alpha}\mathbf{it} + \boldsymbol{\beta}\mathbf{itLIQit} + \boldsymbol{\beta}\mathbf{itCAit} + \boldsymbol{\beta}\mathbf{itCOSTit} + \boldsymbol{\beta}\mathbf{itSIZEit} \\ & + \boldsymbol{\beta}\mathbf{itCONCit} + \boldsymbol{\beta}\mathbf{itBSit} + \boldsymbol{\beta}\mathbf{itMEETit} + \boldsymbol{\beta}\mathbf{itDUAit} \\ & + \boldsymbol{\beta}\mathbf{itCOEAGEit} + \boldsymbol{\beta}\mathbf{itINDit} + \boldsymbol{\beta}\mathbf{itGDPit} + \boldsymbol{\beta}\mathbf{itINFit} + \boldsymbol{\varepsilon}\mathbf{it}\end{aligned}$$

3. Empirical results

a. Descriptive statistics

Table 2 reports the descriptive statistics for the dependent and independent variables. For each variable, descriptive analysis includes mean, median, maximum, minimum, and standard deviation. The average value of ROA is 0.84% with a standard deviation of 0.288%, the minimum and maximum values are 0.144% and 1.33%, respectively. When the mean ROE is 9.083%, minimum value is 1.73% and maximum value is 17.1%. Average of capital adequacy ratio (CA) and liquidity ratio (LIQ) are approximately 10% and 74%, respectively. The cost to income ratio (COST) amounts to

69.14% on average. Market structure, represented by the C5 concentration measure, has shown the value of mean equal to 79.5% for the study period.

The means of corporate governance variables over the year 2010 through 2016 are: 10.61 for board size (BS), 4.40 for board meetings (MEET), 61.90 % for duality (DUA), and 0.047% for independent directors (IND).

Concerning macroeconomic variables, when the average growth rate of real GDP is approximately 3.5% (minimum 1.1% and maximum 5.24%), inflation rate has a 0.601% mean value over the 2010-2016 period.

Table 2 Summary of descriptive statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
ROA	42	0.008407	0.007779	0.0028873	0.0014423	0.0133782
ROE	42	0.0908378	0.086129	0.0318628	0.0173003	0.1711623
SIZE	42	11.08623	11.06416	0.4003822	10.48327	11.63222
CA	42	0.1007728	0.103582	0.0179197	0.068587	0.1385268
LIQ	42	0.7418681	0.767263	0.1254672	0.0515222	0.8744851
COST	42	0.6914787	0.698203	0.0860095	0.518923	0.9382658
CONC	42	0.795	0.795	0.0026504	0.791	0.798
BS	42	10.61905	11	1.695797	7	14
MEET	42	4.404762	4	1.326273	2	8
DUA	42	0.6190476	1	0.4915074	0	1
IND	42	0.0004781	0	0.0009573	0	0.0041667
GDP	42	0.0353805	0.038157	0.0133215	0.011	0.052457
INF	42	0.0060174	0.003693	0.0075856	-0.0069098	0.0174892

Table 3 and Table 4 present the correlation matrix for the several variables. The results show that there is a positive correlation of ROA and ROE with bank's size (BS), board meetings (MEET), duality (DUA), and the average growth rate of real GDP. When the dependent variables are negatively correlated to liquidity (LIQ), cost to income ratio (COST), concentration (CONC), independent directors (IND), and inflation rate (INF). Also capital adequacy (CA) is positively correlated to ROA and negatively correlated to ROE, and vice versa for board size (BS).

Table 3 Correlations between ROA and independent variables

	ROA	SIZE	CA	LIQ	COST	CONC	BS	MEET	DUA	IND	GDP	INF
ROA	1.0000											
SIZE	0.0293	1.0000										
CA	0.3838	-0.2393	1.0000									
LIQ	-0.0933	-0.6133	0.1257	1.0000								
COST	-0.7309	-0.1960	-0.3208	0.0513	1.0000							
CONC	-0.1588	0.1015	0.1851	-0.2761	0.3433	1.0000						
BS	-0.1385	0.5667	-0.1433	-0.2250	-0.1027	0.0163	1.0000					
MEET	0.3293	0.3321	0.0641	-0.2981	-0.1256	0.0208	-0.1467	1.0000				
DUA	0.4756	0.0991	0.0793	-0.1878	-0.2425	-0.1123	-0.2076	-0.0196	1.0000			
IND	-0.1627	0.1707	0.1263	-0.0727	0.1628	0.4692	0.4022	0.1567	-0.2103	1.0000		
GDP	0.0797	-0.0555	-0.0836	0.0045	-0.1798	-0.3363	-0.0986	-0.1431	0.0547	-0.5724	1.0000	
INF	-0.0741	0.0194	0.0646	-0.2080	0.2102	0.4538	0.0286	-0.0754	-0.0482	-0.0545	0.1629	1.0000

Table 4 Correlations between ROE and independent variables

	ROE	SIZE	CA	LIQ	COST	CONC	BS	MEET	DUA	IND	GDP	INF
ROE	1.0000											
SIZE	0.3197	1.0000										
CA	-0.2193	-0.2393	1.0000									
LIQ	-0.2110	-0.6133	0.1257	1.0000								
COST	-0.5126	-0.1960	-0.3208	0.0513	1.0000							
CONC	-0.2388	0.1015	0.1851	-0.2761	0.3433	1.0000						
BS	0.0473	0.5667	-0.1433	-0.2250	-0.1027	0.0163	1.0000					
MEET	0.3620	0.3321	0.0641	-0.2981	-0.1256	0.0208	-0.1467	1.0000				
DUA	0.4977	0.0991	0.0793	-0.1878	-0.2425	-0.1123	-0.2076	-0.0196	1.0000			
IND	-0.1340	0.1707	0.1263	-0.0727	0.1628	0.4692	0.4022	0.1567	-0.2103	1.0000		
GDP	0.0644	-0.0555	-0.0836	0.0045	-0.1798	-0.3363	-0.0986	-0.1431	0.0547	-0.5724	1.0000	
INF	-0.1343	0.0194	0.0646	-0.2080	0.2102	0.4538	0.0286	-0.0754	-0.0482	-0.0545	0.1629	1.0000

a. Empirical results from panel data analysis

Panel data analysis is done to ensure that the data suits the basic assumptions of classical linear regression model. The model was tested on checking for normality (Jarqur Bara test), Multicolinearity (Variance Inflation Factor [VIF] test), and Heteroscedasticity (Breush Pagan test or White test). After conducting the Hausman test, the empirical analysis is based on panel data fixed effects model taking each bank's ROA and ROE as the dependent variable respectively. The various tests performed on the data as well as the different regressions are performed on the STATA software. Table 5 shows the results of the regressions.

Table 5 Panel regression results (Fixed effects regression model)

	Dependent variable : ROA				Dependent variable : ROE			
	Coef.	Std. Err.	t	P>t	Coef.	Std. Err.	t	P>t
SIZE	0.0163661	0.0083187	1.97	0.060**	0.1569347	0.1226713	1.28	0.213
CA	0.0403356	0.0393612	1.02	0.315	-0.5883888	0.5804389	-1.01	0.32
LIQ	0.0009288	0.0017531	0.53	0.601	0.0350581	0.0258516	1.36	0.187
COST	-0.0194751	0.002903	-6.71	0.000*	-0.1954363	0.0428086	-4.57	0.000*
CONC	-0.3194384	0.1992379	-1.6	0.121	-2.854733	2.938057	-0.97	0.341
BS	0.0002856	0.0002306	1.24	0.227	0.0047566	0.0034011	1.4	0.174
MEET	-0.0000222	0.0002477	-0.09	0.929	0.0014189	0.0036531	0.39	0.701
DUA	-0.0006707	0.0012491	-0.54	0.596	-0.0147478	0.0184192	-0.8	0.431
IND	0.1177127	0.3365415	0.35	0.729	1.569984	4.962801	0.32	0.754
GDP	0.0106157	0.0159676	0.66	0.512	0.0733731	0.2354661	0.31	0.758
INF	0.0426879	0.0296279	1.44	0.162	0.3361146	0.436907	0.77	0.449
Cons	0.0864262	0.0910156	0.95	0.351	0.7359607	1.34216	0.55	0.588
*and **indicate significance level of 1% and 10% respectively.								

The empirical results indicate that only operating management efficiency represented by the cost-to-income ratio (COST) is highly significant and negatively related to bank's performance. This negative relationship shows that an increase (decrease) in these expenses reduces (increases) the profits of Moroccan banks to a large extent. These findings are consistent with previous studies (Kosmidou and al., 2005; Athanasoglou and al., 2008; Trujillo-Ponce, 2013).

The negative effect of the COST variable means that there is a lack of competence in expenses management since banks pass part of increased cost to customers and the remaining part to profits, possibly due to the fact that competition does not allow them to "overcharge" (Athanasoglou and al., 2008).

The bank size (SIZE) is positively related to ROA, and is statistically significant. This is consistent with previous studies (Haslem, 1968; Short, 1979; Smirlock, 1985; Akhavein and al., 1997; Goddard and al., 2004; Bonin and al., 2005; Pasiouras and Kosmidou, 2007; Anbar and Alper, 2011) and implies that the size of the bank has significant positive impact on profitability. In the case of ROE, this variable is statistically insignificant.

The other bank specific determinants are statistically insignificant. Capital adequacy (CA) is positively related to ROA and negatively related to ROE, while liquidity ratio (LIQ) is positively related to both dependent variables (ROA and ROE).

Concerning market structure represented by concentration ratio is negatively related to bank performance but statistically insignificant. The bank governance indicators, board size (BS) and independent directors (IND) are positively related to ROA and ROE, when board meetings (MEET) and duality (DUA) are negatively related to dependent variables, but all these variables are statistically insignificant.

The impact of macroeconomic conditions on bank performance is insignificant in all cases. It indicates that no relationships were found between dependent variables and real GDP growth rate and inflation. However, inflation (INF) and GDP are positively related to both measures of profitability.

Conclusion

This paper is a modest contribution to the ongoing discussions about banking performance. The study investigates the impact of bank-specific characteristics, bank governance, financial market structure, and macroeconomic conditions on Moroccan bank's performance, measured by return on assets (ROA) and return on equity (ROE). For this aim, panel data method (fixed effects model) is applied to data obtained from six Moroccan banks' financial statements during the period 2010 -2016.

The empirical results indicated that all the independent variables are statistically insignificant, with the exception of operating management efficiency, represented by the cost-to-income ratio (COST), and bank size (BS). This research confirms previous findings showing that cost decisions of bank management are instrumental in influencing bank performance. In line with these prior studies, cost to income ratio (COST) is highly significant and negatively related to bank's performance. Moreover, this study found a positive and significant relationship between the total assets of the banks and profitability measured by ROA.

The remaining bank specific factors (capital adequacy and liquidity), market structure (concentration), bank governance (board size, board meetings, duality, and independent directors), and macroeconomic factors (real GDP growth rate and inflation rate) do not have a significant effect on the Moroccan banks' performance.

Finally, any limitation of the current research may be considered as a call for future research. Future studies could include more dependent variables such as economic measures of performance like the economic value added (EVA), or price-earnings ratio (P/E) as a measure of the market-based performance. Concerning the independent variables, more variables could be incorporated to explain bank performance such as credit risk, service quality, and customer satisfaction.

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