

# DETERMINANTS OF BANK PERFORMANCE IN A DEVELOPING COUNTRY: EVIDENCE FROM MOROCCO

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**Abstract.** *This paper aims to define long-term determinants of Moroccan commercial banks performance, for the period 2005-2015, using the Johansen cointegration test. For this purpose, we use bank performance ratios (ROA, ROE and NIM) as dependent variables, and deposits, liquidity ratios, bank-specific and macroeconomic variables as explicative variables. Results obtained show that long-term performance of Moroccan commercial banks depends on deposits, short-term, long-term and funding liquidity, the size of the bank and its square, internal and external funding, deposits interest rates and foreign direct investments. These results show the significance of bank-specific variables as long-term determinants of the performance of Moroccan commercial banks.*

**Key words:** *bank performance, bank-specific variables, macroeconomic variables, Johansen cointegration test, Morocco*

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## 1. Introduction

Bank performance plays an important role in the global financial system. Indeed, bank performance reflects the banks' financial health and is a key element in the prosperity of the banks. Regarding performance, it incorporates, according to Dayan *et al.* (1999), the concepts of efficiency, productivity and growth and is defined as the ability to create wealth (Ensley, 2014). However, during the last decade, bank performance was strongly impacted mainly as a result of the financial crisis that affected banks and financial systems. Indeed, this financial crisis was not only limited to bank bankruptcies but caused quasi-bankruptcies, nationalizations and a decline in financial performance of large financial institutions.

In Africa, we remark that during the last decade, Moroccan banks have become an important actor in African financial scene that plays an important role in Africa. According to the African Bank of Development, Moroccan banks are one of the banks' best performing portfolios in Africa and the first African banks investing in Africa (Ghozali, 2016). Likewise, the eight biggest Moroccan banks (used in the present study) figure

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in the top banks in Africa (according to rebanks ranking) and are all in the top 15 of best performing banks in francophone Africa. Moroccan banks have also the largest networks in Africa, ahead of Nigerian, South African, Kenyan and Gabonese banks (Wilson, 2015).

This paper aims to define long-term determinants of Moroccan banks performance, for the period 2005-2015, using the Johansen cointegration test. For this purpose, we use bank performance ratios (ROA, ROE and NIM) as dependent variables and deposits, liquidity ratios, bank-specific and macroeconomic variables as explicative variables. The definition of bank performance determinants allows both researchers and bank managers to identify the most important elements for the survival and prosperity of banks. Banks used in the present paper are all coted in the Moroccan Stock Exchange, also known as Casablanca Stock Exchange (CSE), which is considered as one of the most dynamic stock markets in Middle East and North Africa region (MENA) and part of the MSCI Emerging Markets indices (Ferrouhi & Ezzahid, 2013).

For this purpose, we use the Johansen cointegration test. We use the three main performance ratios (return on assets, return on equity and net interest margins) as independent variables and liquidity ratios (short term liquidity, long-term liquidity and funding liquidity), bank deposits, bank specific (bank size and its square, internal funding, external funding and deposit interest rate) and macroeconomic variables (foreign direct investment, unemployment rate, growth rate of gross domestic product) as explicative variables.

The paper is organized as follows. Section 2 is reserved to the literature review. Variables and data used are presented in Section 3, while Section 4 is reserved to the presentation of research methodology. Results obtained are presented in Section 5. Finally, Section 6 offers conclusions.

## **2. Literature review**

Bank performance has always attracted the interest of researchers and bankers and plays an important role in the global financial system. This role was greatly displayed by the fall of large banks in 2007-2008, which resulted in a global financial crisis.

Theoretical analysis of bank performance determinants identifies two main theories: the Market Power Theory that relates bank performance to external factors and the Efficiency Structure Theory that explains banking performance using internal factors. Each of these theories can be split into two models. Thus, according to the Market Power Theory, bank performance is determined by the behavior of agents on the market and by its structure (Structure-Conduct-Performance model) or by the market shares (Relative Market Power model). As for the Efficiency Structure Theory, the X-Efficiency model postulates that the best performing banks are those with lower costs while the Scale Efficiency Hypothesis states that banks achieving high scale economies are the best performers.

Empirically, bank performance is usually expressed in terms of internal and external variables. Internal or specific variables characterize each bank independently of its environment while external or macroeconomic variables are related to the macroeconomic environment of banks. Various authors studied the determinants of bank performance. Thus, Hester & Zoellner (1966) were the first to define bank performance determinants from the balance sheet. The authors found that assets elements were positively correlated with bank performance and conversely to liabilities. Other authors studied the relationship between bank performance and internal determinants (Haslem, 1968; Short, 1979; Smirlock, 1985; Akhavein et al., 1997; Bikker & Hu, 2002, and Goddard et al., 2004) and found that there was a positive correlation between a bank's performance and its size.

Regarding external determinants of bank performance, Revell (1979) was the first to investigate the relationship between bank performance and inflation. Perry (1992) argues that the influence of inflation on bank performance depends on inflation expectations. Athanasoglou et al. (2006) analyzed a panel data of credit institutions in seven Southeast European countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia, Romania, and Serbia and Montenegro) during the period 1998-2002. Results show that both bank specific and macroeconomic variables significantly affect bank performance. Thus, the concentration in the market and inflation are positively correlated with performance while GDP fluctuations have no impact on performance. Kakilli and Çalim (2013) analyzed bank specific and macroeconomic determinants that affect Turkish commercial banks' performance during the period 2008-2011. Results show that bank specific variables have more effect on bank performance than macroeconomic variables. Thus, liquidity, gross domestic product, capital adequacy and asset quality have an effect - positive or negative - on bank performance. Deposits and real exchange rates affect positively or have no effect on bank performance, unlike fees and commissions revenue effect, which is negative or insignificant. Molyneux and Thornton (1992) try to define performance determinants of 671 European banks (from 18 countries: Austria, Belgium, Denmark, Finland, France, Greece, Germany, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Turkey and United Kingdom) between 1986 and 1989. Results show that liquidity is weakly and negatively correlated to bank performance measured by ROA. Kosmidou (2005) analyzed the performance of the UK banks during the period 1995-2002. The author found that liquidity is positively correlated to return on assets average ROAA and negatively correlated to net interest margins NIM. Pasiouras and Kosmidou (2007) examined European Union bank performance from 1995 to 2001. Results show that liquidity is positively correlated to national banks' performance and negatively correlated to foreign banks' performance. Chen (2009) analyzed bank performance determinants in 12 countries (Australia, Canada, France, Germany, Italy, Japan, Luxembourg, Netherlands, Switzerland, Taiwan, United Kingdom and United States of America) for the period 1994-2006 and concluded that liquidity risk is related to bank performance.

### 3. Variables and data

As the aim of this paper is to define long-term determinants of Moroccan bank performance for the period 2005-2015 using the Johansen cointegration test, we first define variables and data used in this paper, then we present the model used.

Thus, in the present paper, bank performance ratios are used as dependent variables, and liquidity ratios, deposits, specific variables and macroeconomic variables as explicative variables. As the European Central Bank ECB defined three traditional performance measures, *i.e.* Return on Assets, Return on Equity and Net Interest Margin (European Central Bank, 2010), we use these three ratios as measures of bank performance. These ratios are defined as follows:

- $ROA = \frac{\text{Net income}}{\text{Total assets}} \times 100$  measures a bank's profitability relative to its assets and thus the bank's overall performance;
- $ROE = \frac{\text{Net income}}{\text{Shareholder equity}} \times 100$  measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested;
- $NIM = \frac{\text{Total interest income} - \text{Total interest expense}}{\text{Total earning assets}} \times 100$  measures the gap between what the bank pays savers and what the bank receives from borrowers.

Regarding explicative ratios, we use short term liquidity ( $SL = \frac{\text{Liqud assets}}{\text{Short term liabilities}}$ ), long-term liquidity ( $LL = \frac{\text{Liqud assets}}{\text{Deposits}}$ ), funding liquidity ratio ( $FL = \frac{\text{Loan}}{\text{Total assets}}$ ) and banks' deposits.

Other explicative ratios used are banks' specific variables (the size of banks calculated using logarithm of the total assets of the bank SIZE; logarithm of the total assets squared SIZE<sup>2</sup> that captures the non-linear relationship; internal funding IF; external funding EF and deposit interest rates DIR), and macroeconomic variables (foreign direct investment FDI, unemployment rate UNE and growth rate of gross domestic product GGDG).

Data used in the present paper were obtained from Moroccan banks' annual reports and from databases of the World Bank, the International Monetary Fund and the Moroccan High Commission for Planning for the period 2005-2015.

As our study concerns Moroccan banks, listed existing banks are presented in Table 1.

TABLE 1: List of Moroccan banks for the period 2005–2015

	Ticker	Top African banks ranking
ATI'JARIWABA BANK (AWB)	AWB	6
BANQUE CENTRALE POPULAIRE (BCP)	BCP	10
BANQUE MAROCAINE DU COMMERCE EXTERIEUR (BMCE)	BMCE	11
BANQUE MAROCAINE POUR LE COMMERCE ET L'INDUSTRIE (BMCI)	BMCI	31
CREDIT AGRICOLE DU MAROC (CAM)	CAM	67
CREDIT DU MAROC (CDM)	CDM	52
CREDIT IMMOBILIER ET HOTELIER (CIH)	CIH	65
SOCIETE GENERALE MAROCAINE DE BANQUES (SGMB)	SGMB	28
Number of banks	8	

#### 4. Research methodology

The existence of a cointegration relation between two or more variables means that these variables are long term correlated, even if they are not stationary (variables should be stationary at the same level). Thus, cointegration demonstrates the stable long-term equilibrium relations between integrated variables in the same order. There are two main methods for examining the cointegration relationships, namely Engle and Granger test and the Johansen cointegration test. Whereas the first method allows detecting only one cointegration relation, the Johansen cointegration test allows detecting several types of cointegration. Thus, we apply the Johansen cointegration test.

To define long-term determinants of Moroccan banks' performance, our methodology consists on the application of the Johansen cointegration test that requires, as a *sine qua none* condition, the integration of the studied variables in the same order.

Thus, the first step of our methodology consists o the application of unit root tests (Augmented Dickey Fuller, 1981 and Phillips Perron, 1988) to determine the order of integration. We then apply the Johansen cointegration test (Johansen, 1988), which is a multivariate cointegration test that allows the detection of multiple cointegrating vectors and tests the following equation:

$$\Delta Z_t = \Pi Z_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta_{t-i} + \mu_0 + \mu_1 t + v_t$$

where  $Z_t$  is the column vector of p-variables,  $\Gamma$  and  $\Pi$  are coefficients matrices to test,  $\mu_0$  and  $\mu_1$  are column vectors of constant terms and trend coefficients,  $\Delta$  is the difference operator, and  $v_t$  the Gaussian error of dimension p. The coefficient matrix  $\Pi$ , also called impact matrix, is equal to the number of cointegrated independent vectors and indicates the rank of the matrix and contains information relating to long-term relationships (Awokuse, 2003).

Three cointegration models are defined (according to Table 2):

- ROA =  $\int$  (DEPOSITS, SL, LL, FL, SIZE, SIZE<sup>2</sup>, IF, EF, DIR, FDI, UNE, GGDP)
- ROE =  $\int$  (DEPOSITS, SL, LL, FL, SIZE, SIZE<sup>2</sup>, IF, EF, DIR, FDI, UNE, GGDP)
- NIM =  $\int$  (DEPOSITS, SL, LL, FL, SIZE, SIZE<sup>2</sup>, IF, EF, DIR, FDI, UNE, GGDP)

TABLE 2. Augmented Dickey Fuller and Phillips-Perron Unit root tests

Model 1 : ROA

Variables	ADF						PP					
	At level			1 <sup>st</sup> difference			At level			1 <sup>st</sup> difference		
	Model 3	Model 2	Model 1	Model 3	Model 2	Model 1	Model 3	Model 2	Model 1	Model 3	Model 2	Model 1
<b>Performance ratios</b>												
ROA	0.9611	0.9130	0.2824	0.0000*	0.0000*	0.0212**	0.4563	0.0452	0.3253	0.0000*	0.0000*	0.0212**
ROE	0.0003	0.0001	0.1422	0.0000*	0.0000*	0.0000*	0.0023	0.0003	0.1531	0.0000*	0.0001*	0.0000*
NIM	0.0301	0.0115	0.3854	0.0000*	0.0001*	0.0000*	0.0000	0.0000	0.2024	0.0001*	0.0001*	0.0000*
<b>Liquidity ratios</b>												
SL	0.0001	0.0000	0.1184	0.0000*	0.0001*	0.0000*	0.0001	0.0000	0.1128	0.0000*	0.0001*	0.0000*
LL	0.0001	0.0000	0.5794	0.0000*	0.0000*	0.0000*	0.0000	0.0000	0.6563	0.0000*	0.0001*	0.0000*
FL	0.0001	0.0000	0.3625	0.0000*	0.0000*	0.0000*	0.0000	0.0000	0.6710	0.0000*	0.0001*	0.0000*
<b>Banks' deposits</b>												
DEPOSITS	0.4212	0.0323	0.0023	0.0537**	0.0187**	0.0470**	0.0473	0.1676**	0.6560**	0.0000*	0.0000*	0.0000*
<b>Banks' specific variables</b>												
SIZE	0.7076	0.3844	0.0584	0.0000*	0.0001*	0.0000*	0.1240	0.0488	0.6899	0.0000*	0.0000*	0.0000*
SIZE <sup>2</sup>	0.6994	0.3757	0.0564	0.0000*	0.0001*	0.0000*	0.1244	0.0540	0.6666	0.0000*	0.0000*	0.0000*
IF	0.0010	0.0003	0.2302	0.0000*	0.0001*	0.0000*	0.0012	0.0003	0.2506	0.0000*	0.0001*	0.0000*
EF	0.1345	0.1738	0.0773	0.0000*	0.0000*	0.0000*	0.1289	0.1774	0.0773	0.0000*	0.0000*	0.0000*
DIR	0.0000*	0.0000*	0.6586	0.0000*	0.0000*	0.0000*	0.0000	0.0000	0.5369	0.0001*	0.0001*	0.0000*
<b>Macroeconomic variables</b>												
UNE	0.0208	0.1376	0.0207	0.0000*	0.0001*	0.0000*	0.0004	0.0001	0.3211	0.0000*	0.0001*	0.0000*
GGDP	0.9993	0.9864	0.3045	0.0001*	0.0001*	0.0000*	0.0004	0.0001	0.3280	0.0000*	0.0001*	0.0000*
FDI	0.4759	0.6162	0.8637	0.0000*	0.0000*	0.0000*	0.0000	0.0000	0.2581	0.0000*	0.0001*	0.0000*

Variables statistically significant at \*1% ; \*\* 5% ; \*\*\* 10%

## 5. Results

Unit root tests results for the period 2005-2015 show that performance ratios (return on assets ROA, return on equity ROE and net interest margins NIM), liquidity ratios (short-term liquidity SL, long-term LL and funding liquidity FL), banks' deposits (DEPOSITS), bank's specific ratios (banks' size SIZE, square of banks' size SIZE<sup>2</sup>, internal funding IF, external funding EF and deposit interest rate DIR) and macroeconomic ratios (foreign direct investment FDI, unemployment rate UNE, growth rate of gross domestic product GGDP) are integrated in the first order. Indeed, results obtained using ADF and PP unit root tests show that all the variables studied are integrated in the first order. These results indicate that the Johansen cointegration test can be applied to these variables.

However, since the Johansen cointegration test is sensitive to lag structure of VAR model, the optimal length of the offset must be determined before applying the test.

To determine the lag order of the VAR, Akaike Information Criterion AIC and the Schwarz Criterion SC are used. Based on Schwarz criterion, the optimal lag length proposed is 1 (Kasri & Kassim, 2009).

Tables 3 and 4 present results of the Johansen cointegration test for Model 1:

$$ROA = \int (\text{DEPOSITS, SL, LL, FL, SIZE, SIZE}^2, \text{IF, EF, DIR, UNE, GGDP, FDI})$$

We remark that the null hypothesis ( $H_0: r = 0$ ) for this model is rejected at 5% significance level while assumptions  $r = <1$ ;  $r = <2$ ;  $r = <3$  are not rejected. Thus, Table 1 shows the existence of a cointegration vector in “Trace Statistic”, as the 897.3518 value exceeds the critical value 752.6548 at 5%. Similarly, we note the existence of a cointegration vector in “Max-Eigen Statistic”, as the 294.4035 value exceeds the critical value at 5% values 130.5684. These results thus indicate the existence of a single balance and one cointegrating equation.

TABLE 3. JOHANSEN cointegration Test-Model 1 (Trace statistic)

Hypothesized N, of CE(s)	Eigenvalue	Trace statistic	005 critical value	Prob**
None*	0.972410	897.3518	752.6548	0.0000
At most 1	0.912582	334.9837	602.9483	0.3232
At most 2	0.638972	285.1425	403.1099	0.4397
At most 3	0.607447	239.2354	319.5684	0.4568

TABLE 4. JOHANSEN cointegration Test-Model 1 (Max Eigen Statistic)

Hypothesized N, of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 critical value	Prob**
None*	0.972410	294.4035	130.5684	0.0021
At most 1	0,912582	76.57843	199.8384	0.3458
At most 2	0.638972	70,.53513	83.54154	0.4578
At most 3	0.607447	64.50472	76.67688	0.4987

The variables ROA, DEPOSITS, SL, LL, SIZE, SIZE2, IF, EF, DIR and FDI are cointegrated and long-term coefficients of the variables DEPOSITS, SL, LL, SIZE, SIZE2 and FDI are significantly positive while those of specific variables IF, EF and DIR are significantly negative. However, liquidity ratio FL and macroeconomic variables, UNE and GGDP, are insignificant.

Tables 6 and 7 show the results of the Johansen cointegration test for Model 2 (performance ratio ROE):

$$ROE = \int (\text{DEPOSITS, SL, LL, FL, SIZE, SIZE}^2, \text{IF, EF, DIR, UNE, GGDP, FDI})$$

We remark that the null hypothesis ( $H_0: r = 0$ ) for this model is rejected at significance level 5% while alternative hypotheses  $r = <1$ ;  $r = <2$ ;  $r = <3$  are not rejected. Thus, the table shows the existence of a cointegration vector in “Trace Statistic”, as the

TABLE 5. Long-term coefficients estimated – Model 1

Model 2 : ROE

	ROA	DEPOSITS	IF	EF	GGDP	FDI	SL	LL	UNE	DIR	SIZE2	SIZE	FL
	1.000	-1.038	0.306	-0.148	-0.224	0.708	-0.104	0.219	1.936	-2.519	1.745	-0.270	-0.210
E.S		0.398	0.144	0.082	0.230	1.809	0.108	0.111	1.435	0.731	0.735	1.127	0.061
T-stat		2.546	-2.876	-5.214	-0.574	1.456	2.797	1.654	0.765	-5.655	3.864	2.449	0.026

TABLE 6. JOHANSEN cointegration Test - Model 2 (Trace statistic)

Hypothesized N. of CE(s)	Eigenvalue	Trace statistic	0.05 critical value	Prob**
None*	0.972266	875.6676	456.4868	0.0000
At most 1	0.912063	334.9837	581.6906	0.2548
At most 2	0.635583	285.1425	382.3378	0.3298
At most 3	0.558998	239.2354	299.5623	0.3987

TABLE 7. JOHANSEN cointegration Test - Model 2 (Max Eigen Statistic)

Hypothesized N. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 critical value	Prob**
None	0.972266	293.9770	125.416	0.0275
At most 1 *	0.912063	76.57843	199.3528	0.1247
At most 2 *	0.635583	70.53513	82.77551	0.2454
At most 3 *	0.558998	64.50472	67.13383	0.2846

875.6676 value exceeds the critical value 456.4868 at 5%. Similarly, we note the existence of a cointegration vector in “Max-Eigen Statistic”, as the 293.9770 value exceeds the critical value 125.416 at 5%. These results thus indicate the existence of a single cointegration equation. The results for this model show that ROE, DEPOSITS, SL, FL, SIZE, SIZE2, IF, EF, DIR and FDI are cointegrated. Thus, the variables DEPOSITS variables, SL, FL, SIZE and FDI are significantly positive, while SIZE2 variables, DIR, EF and IF are significantly negative. As for LL variables, UNE and GGDP, they are not significant.

Tables 9 and 10 show results of the application of the Johansen cointegration test to Model 3 (performance ratio NIM):

$$NIM = \int (DEPOSITS, SL, LL, FL, SIZE, SIZE^2, IF, EF, DIR, UNE, GGDP, FDI)$$

We remark that the null hypothesis ( $H_0: r = 0$ ) for this model is rejected at significance level 5%, while alternative hypotheses  $r = <1$ ;  $r = <2$ ;  $r = <3$  are not rejected on the same threshold. Thus, the table shows the existence of a cointegration vector in “Trace Statistic”, as the 925.7361 value exceeds the critical value 507.8793 at 5%. Similarly, we note the existence of a cointegration vector in “Max-Eigen Statistic”, as the 320.2091 value exceeds the critical value 150.5152 at 5%. These results thus indicate the existence of a single cointegration equation.

TABLE 8. Long-term coefficients estimated – Model 2

Model 3 : NIM

	ROE	DEPOSITS	IF	EF	GGDP	FDI	SL	LL	UNE	DIR	SIZE2	SIZE	FL
	1.000	-1.036	0.482	-0.350	-0.679	1.826	-1.979	0.558	-0.697	0.555	4.714	-0.720	-4.286
E.S		1.006	0.383	0.220	0.706	0.408	0.285	3.049	1.986	0.392	1.961	3.011	1.642
t-stat		4.521	-4.963	-1.656	0.987	3.971	4.321	0.157	0.006	-1.215	-1.245	2.334	3.521

TABLE 9. JOHANSEN cointegration Test - Model 3 (Trace statistic)

Hypothesized N, of CE(s)	Eigenvalue	Trace statistic	0.05 critical value	Prob,**
None	0.979859	925.7361	507.8793	0.0121
At most 1 *	0.919869	334.9837	605.5270	0.2154
At most 2 *	0.649907	285.1425	398.5515	0.3659
At most 3 *	0.599133	239.2354	312.4878	0.4869

TABLE 10. JOHANSEN cointegration Test - Model 3 (Max Eigen Statistic)

Hypothesized N, of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 critical value	Prob,**
None	0.979859	320.2091	150.5152	NA
At most 1 *	0.919869	76.57843	206.9755	0.0000
At most 2 *	0.649907	70.53513	86.06374	0.0011
At most 3 *	0.599133	64.50472	74.95834	0.0038

TABLE 11. Long-term coefficients estimated – Model 3

	NIM	DEPOSITS	IF	EF	GGDP	FDI	SL	LL	UNE	DIR	SIZE2	SIZE	FL
	1.000	0.293	-1.660	-0.402	-1.300	0.281	-0.414	0.431	-0.430	-7.393	0.493	-0.675	1.019
E.S		0.520	1.307	0.296	0.836	6.309	0.386	0.406	0.222	3.978	0.258	2.707	5.223
T-stat		-2.231	1.334	-1.294	0.3218	0.997	1.948	2.798	-0.364	-3.973	2.133	3.599	-2.132

TABLE 12. Comparison of Cointegration results

	Model 1	Model 2	Model 3	Consolidated results
DEPOSITS	+	+	-	+/-
SL	+	+	+	+
LL	+		+	+
FL		+	-	+/-
SIZE	+	+	+	+
SIZE2	+	-	+	+/-
IF	-	-	+	+/-
EF	-	-	-	-
DIR	-	-	-	-
FDI	+	+		+
UNE				
GGDP				

We note that the variables SL, LL, SIZE, SIZE2 and IF are significantly positive, while the variables DEPOSITS, FL, EF and DIR are negative. However, the effects of macroeconomic variables FDI, UNE and GGDP are insignificant. The variables NIM, DEPOSITS, SL, LL, FL, SIZE, SIZE2, IF, EF and DIR are thus cointegrated.

The existence of cointegration between these variables implies the existence of a long-term equilibrium which governs relations between these variables (Tables 5, 8 and 11).

Thus, as the purpose of our study is to define long-term determinants of Moroccan banks performance and relationship between specific variables, macroeconomic variables and Moroccan banks performance between 2005 and 2015, results obtained show that:

- Deposits have a significant and positive impact on the overall banking performance measured by ROA. Indeed, deposits are generally reinvested by the bank, which allows them to achieve a higher profit. A similar result is obtained for profitability as measured by ROE. However, the relationship between deposits and bank performance measured using NIM is significant and negative;
- Short-term liquidity SL significantly and positively impacts bank performance measured for the three models. Thus, when short term liquidity increases, bank performance increases;
- Long-term liquidity LL has a significant and positive impact on bank performance for Models 1 and 3. However, the impact of long-term liquidity is not significant for Model 2;
- Funding liquidity FL has a significant and positive impact on bank performance for Model 2 and negative one for Model 3. However, results for Model 1 show that the impact of funding liquidity on bank performance is insignificant;
- Bank size (SIZE) measured by the logarithm of the total banks assets has a significant and positive impact for the three models. Thus, the larger the bank is, the higher its performance is;
- The square of the natural logarithm of total assets (SIZE<sup>2</sup>) has a significant and positive impact for Models 1 and 3. However, this relationship is negative for Model 2;
- Internal financing IF has a significant and negative impact for Models 1 and 2. The impact of internal funding is positive for Model 3;
- External financing EF has a significant and negative impact for the three models. Thus, when banks rely on external funding sources, they are less efficient;
- The deposit interest rate DIR defined as the interest rate paid to depositors as payment of their deposits has a significant and negative impact on commercial banks' performance in Morocco. This result seems reasonable since it means that when the bank pays more interest on deposits, its performance decreases;
- Regarding the macroeconomic variables, one variable only has a significant impact on bank performance, *i.e.* foreign direct investment FDI. Indeed, the relationship between bank performance measured by performance ratios ROA and ROE and foreign direct investment is significant and positive for Models 1 and 2. The impact of foreign direct investment for Model 3 is insignificant;

- Finally, the relationship between unemployment UNE and gross domestic product growth is insignificant for the three models.

Results obtained show that deposits are generally reinvested by the bank, which allows them to achieve a higher profit, short and long term liquidity increases banks' performance and foreign direct investment in Morocco increases Moroccan banks' performance. Bank size is considered as a long-term determinant of Moroccan commercial bank performance in so far as the larger the bank is, the higher its performance is. Our findings also show that banks that rely on external funding sources are less efficient and that when bank pays more interest on deposits, its performance decreases. However, results relating to deposits, the funding liquidity, and internal funding depend on performance ratio used.

Thus, long-term performance of Moroccan commercial banks depends on deposits, short-term, long-term and funding liquidity, the size of the bank and its square, internal and external funding, deposits interest rates and foreign direct investments. These results show the significance of bank-specific variables as long-term determinants of Moroccan commercial banks' performance.

## 6. Conclusion

This paper aims to define long-term determinants of Moroccan banks' performance for the period 2005-2015 using the Johansen cointegration test. For this purpose, we use three bank performance ratios as dependent variables, and deposits, liquidity ratios, bank-specific and macroeconomic variables as explicative variables. Results for Models 1 and 2 show the existence of a cointegration relationship between bank performance, deposits, liquidity ratios, specific bank ratios and foreign direct investment, while results for Model 3 show the existence of a long-term relationship between bank performance, deposits, liquidity ratios and bank specific variables.

Our findings show that deposits are generally reinvested by the bank, which allows them to achieve a higher profit; short and long term liquidity increases bank performance, and foreign direct investment in Morocco increases Moroccan banks' performance. Bank size is considered as a long-term determinant of Moroccan commercial banks' performance in so far as the larger the bank is, the higher its performance is. Our findings also show that banks that rely on external funding sources are less efficient and that when bank pays more interest on deposits, its performance decreases. However, results relating to deposits, the funding liquidity, and internal funding depend on performance ratio used.

Thus, we conclude that long-term performance of Moroccan commercial banks depends on deposits, short-term, long-term and funding liquidity, the size of the bank and its square, internal and external funding, deposits interest rates and foreign direct investments. These results show the significance of specific variables as long-term determinants of Moroccan commercial banks' performance.

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