Determinants of bank deposits in Morocco

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Abstract : This paper aims to define the determinants of bank deposits in Morocco for the period 2003-2014 using panel data regression. Thus, we used deposits in Moroccan banks as dependent variables and twelve explanatory variables (banks' size, logarithm of banks' total assets ; bank's capital to total assets ratio; external funding to total liabilities ratio; equity to total assets ratio; unemployment rate; inflation rate; growth rate of gross domestic product; foreign direct investment and financial crisis. Results obtained show that deposits are positively correlated with banks size, with both internal and external funding, with interest rate on deposits and with unemployment rate.

Keywords: Deposits, Morocco, banks, panel data, bank-specific determinants, macroeconomic determinants

JEL Classification: G17, G21, G32

INTRODUCTION

Deposits are the part of income placed in banks and are the main source of bank's liquidity. MISHRA[1] distinguishes three types of deposits : demand deposits which can be withdrawn at any time and on which no interest is paid ; time deposits which can be withdrawn after a fixed period of time and on which a higher rate of interest is paid ; and saving deposits which can be withdrawn to the limited extent in a given period and on which some interest is paid. According to the permanent income hypothesis (FRIENDMAN[2], 1975), deposits (or savings) depend on the permanent income while life-cycle hypothesis (ANDO and MODIGLIANI[3], 1963) suppose that individual's age is the main determinant of deposits in banks.

ATHUKORALA and SEN[4] examine determinants of savings in India between 1954 and 1998. They found that found that rate of growth, real interest rate on bank deposits, spread of banking facilities and inflation were positively correlated with savings. FINGER and HESSE[5] examines banks deposits' demand in Lebanon for the period 1993-2008. Results obtained show that at the macro level, economic activity, prices and exchange rate and financial conditions explain the deposit demand while perceived riskiness of individual banks, their liquidity buffers, loan exposure and interest margins explain the deposit demand at the micro level. KANJ and EL KHOURY[6] investigates the main determinants of non-residents deposits in Lebanese commercial banks using monthly time series data covering January 2002 to January 2013. They found that non-residents' deposits are shaped differently between domestic and foreign currency. For instance, bank assets, interest rates, and some adverse political situations affect non-resident deposits in all its measures. FERROUHI and LEHADIRI[7] apply JOHANSEN-JUSELIUS cointegration test to define determinants of Moroccan banks' savings and long run relationship between these determinants and savings between 2001 and 2012. Results obtained show the existence of long run equilibrium between banks' size, external funding to total liabilities, equity to total assets; growth rate of gross domestic product; Foreign Direct Investment and savings.

This paper aims to define the determinants of bank deposits in Morocco for the period 2003-2014 using panel data regression. Thus, after the presentation of literature review in the first section,

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[1] Mishra S., *Engineering Economics and Costing*, PHI Learning Pvt. Ltd., New Delhi, 2009, 303 pages

[2] Friedman M., *A Theory of the Consumption Function*, PRINCETON UNIVERSITY PRESS, New Jersey, 1957, 259 pages

3 ANDO A. et MODIGLIANI F., "The Life-Cycle Hypothesis of Savings : Aggregate Implications and Tests", *American Economic Review*, vol. 53, n°1, 1963, pp. 55-84

[4] Athukorala, P. C., & Sen, K. (2004). The determinants of private saving in India. *World Development*, *32*(3), 491-503.

[5] Finger, H., & Hesse, H. (2009). Lebanon-determinants of commercial bank deposits in a regional financial center.

[6] Kanj, O., & El Khoury, R. (2013). Determinants of Non-Resident Deposits in Commercial Banks: Empirical Evidence from Lebanon. *International Journal of Economics and Finance*, *5*(12), 135.

[7] Ferrouhi, E. M., & Lehadiri, A. (2014). Savings Determinants of Moroccan banks: A cointegration modeling approach. *International Journal of Innovation and Applied Studies*, 9(2), 6.

we present methodology used in this paper in section 2. Results obtained are presented in section 3. Section 4 is dedicated to discussion. Finally, section 5 offers conclusions.

METHODOLOGY

As this paper aims to define the determinants of banks deposits in Morocco, we use as a dependent variable deposits in Moroccan banks (composed from demand and time deposits) while we use ten explanatory variables : five bank-specific variables (banks' size measured using total banks' assets logarithm LAGA, logarithm of banks' total assets squared LAGA2 to capture non-linear relationships ; internal funding CTA ; external funding to total liabilities ratio EFL ; equity to total assets ratio ETA) ; and five macroeconomic variables (unemployment rate UNE ; inflation rate INF ; growth rate of gross domestic product GDP ; foreign direct investment FDI and a variable that we simulated for detecting the realization of the financial crisis FIC. The value of this variable is 1 for the years 2008, 2009 and 2010 and 0 for the other years).

To test our panel data stationarity, we used three tests : Levin, Lin and Chu test, Breitung test and Im, Pesaran and Shin test. The null hypothesis of nonstationairy is rejected at the 5% level. Hausman test allows us to reject null hypothesis of random effects and to use a panel data regression with fixed effects.

The simplified model presentation is as follows :

$$\text{Deposits} = \alpha_0 + \alpha_1 \text{LAGA} + \alpha_2 \text{LAGA}^2 + \alpha_3 \text{CTA} + \alpha_4 \text{EFL} + \alpha_5 \text{TID} + \alpha_6 \text{UNE} + \alpha_7 \text{INF} + \alpha_8 \text{GPIB} + \alpha_9 \text{IDE} + \alpha_{10} \text{AEN} + \alpha_{11} \text{DP} + \alpha_{12} \text{FIC} + \varepsilon_{it}$$

Regarding data, the present paper concern the seven major banks in Morocco for the period 2003-2014. These banks are ATTIJARIWAFA BANK (AWB), BANQUE CENTRALE POPULAIRE (BCP), BANQUE MAROCAINE DU COMMERCE EXTERIEUR (BMCE BANK), BANQUE MAROCAINE POUR LE COMMERCE ET L'INDUSTRIE (BMCI), CREDIT AGRICOLE DU MAROC (CAM), CREDIT DU MAROC (CDM), CREDIT IMMOBILIER ET HOTELIER (CIH). Data used is obtained from banks' annual reports and financial statements and databases of the World Bank, the International Monetary Fund and the Moroccan High Commission for Planning.

RESULTS

The application of panel data regression with fixed effects allows, after gradual elimination of non-significant variables, to define the optimal model. Thus we obtain the following model (Results obtained are presented in table 1) :

$$\text{Deposits } = \alpha_0 + \alpha_1 \mathbf{LAGA} + \alpha_2 \mathbf{CTA} + \alpha_3 \mathbf{EFL} + \alpha_4 \mathbf{TID} + \alpha_5 \mathbf{UNE} + \varepsilon_{it}$$

Results obtained are presented in the following table 1.

Table 1 : Deposits determinants for the period 2003-2014

Variable	Coefficient	Std. Error
C	6,34276*	0,02344
LAGA	1,89834*	1,87453
CTA	2,354687***	0.624373
EFL	23.14870*	1,313210
TID	-0.247845**	1,968566
UNE	8.223312*	6.024618
R-squared	0,872538	
Adjusted R-squared	0,857282	

Variables statistically representative at à * 1%, ** 5% et *** 10% level

We remark that the explanatory power of the model is strong (0,872538). We also note that deposits are positively correlated with banks size LAGA, with external funding to total liabilities ratio EFL and with unemployment rate at the 1% level. The positive correlation relationship also exists between customer deposits and the interest rate on deposits TID at the 5% level and internal funding CTA at the 10% level.

The first interpretation of these results is that large banks collect more deposits than small banks. Results obtained show also that the impact of bank funding, whether internal or external, impacts positively depositors behavior. However, deposits rate, has a contradictory effect to that expected. Indeed, as they increase, deposits decrease. Finally, deposits grow as unemployment rates grow.

Thus, these results show that Moroccan banks' deposits are explained by four banks specific determinants (Banks size, internal funding, external funding and interest rate on deposits) and one macroeconomic variable (unemployment). These results confirm precedent study results on determinants of savings in Morocco in term of bank-specific determinants of deposits (FERROUHI and LEHADIRI, 2014).

We can then conclude that customer deposits are generally determined by bank-specific variables.

CONCLUSION

The present paper aims to define determinants of Moroccan banks deposits for the period 2003-2014 using panel data regression. Thus, we used deposits in Moroccan banks as dependent variables and twelve explanatory variables (banks' size, logarithm of banks' total assets ; bank's

capital to total assets ratio; external funding to total liabilities ratio; equity to total assets ratio; unemployment rate; inflation rate; growth rate of gross domestic product; foreign direct investment and financial crisis.

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