

THE IMPACT OF LIQUIDITY ON BANK PROFITABILITY: CASE OF TUNISIA

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ABSTRACT: *Liquidity and profitability are two important variables in the banking industry. In this article, we studied. The impact of liquidity on bank profitability in the Tunisian context. We used a sample of 18 banks over the period (2000...2017). We employ 2 models of panel static in the empirical research. We found that (liquid assets / total assets) and (total credits / total deposits) have a positive and significant impact on return on assets (ROA) whereas (current assets / current liabilities) have not significant impact on ROA. Also, we found that (liquid assets / total assets), and (total credits / total deposits) have a negative and significant impact on ROE (return on equity). Whereas (current assets / current liabilities) have not significant impact on ROE.*

KEYWORDS: liquidity, profitability, bank, panel

1-INTRODUCTION

Liquidity creation is the primary function of bank but also a major source of vulnerability. The vulnerability from their primary function requires deliberate policies and actions by the bank to mitigate against such risks (Dybvig (1983) , Bryant (1980)).A bank is liquid when it is capable of meeting its own obligation when they become due , repay deposit and to make such payment on customer order (Lartey and al (2013) , BIS (2009)).Liquidity can be defined as the assets or securities which can be easily convertible into cash . Liquidity refers to the short term assets (Cash , short term , advances , and balance with other bank) and short term liabilities (short term borrowing , account payable , lending to financial institutions , and short term deposit) (Achraf and al 2017).Liquidity management is essential for bank effectiveness and profitability . On the other hand , profitability means a situation where revenues exceeds expenses and which allow bank to generate profits (Bawacha (2018)) .It is important to determine the relationship between liquidity and profitability (Sile and al (2019) , Ibrahim (2017) , Ferrouhi (2014) , Shachera (2012) , Awlo and al (2019) ,Mazrova (2015).Indeed , we attempt to study the impact of liquidity on bank profitability in Tunisian context. We will use approach that consists of 3 sections. First, we will show the literature review, and then we will analyze the empirical study. At the end, we will make the conclusion.

LITERATURE REVIEW

Liquidity

A-Concept of bank liquidity

Bank liquidity means the ability of the bank to maintain sufficient funds to pay for its maturing obligations .Nwaezecku (2008) defined liquidity as the degree of convertibility to cash or the ease which any asset be converted to cash hold at a fair market price . A bank is

liquid when it is capable of meeting its own obligations when they become due, repay deposits and to make such payment based on customer order (Lartey and al 2013; BIS 2009) Alshatti(2015) argues that liquidity is the ability of banks to meet the financial needs of their increased assets and meeting ability as when they fall due without the occurrence of unforeseen losses. For commercial banks ,Adalestinsson (2014) points out the liquidity can be achieved through 3 different ways , the first are is the sale of assets , the second way is to borrow money from credits in financial markets , and the third way is relied on the repayment of debts from debtors .

B-Anticipated income theory

According to Sobyibo(2014) , the anticipated theory of liquidity particularly focuses on long term advances . According to this theory , regardless of the nature and character of a borrower's business , the bank plan the liquidation of the term loan from the anticipated income of the borrower . A term loan is for a period exceeding one year and extending to less than 5 years .

C-Shiftability theory

In accordance to Alshatti(2016) , the shiftability theory is a process by which bank interchange or exchange its assets for the extreme liquid when there is pancity of liquidity . Shiftability is an approach to keep bank liquidity supporting the shiftability of assets. When a bank is short of ready money, it is able to sale or repo its assets to be a more liquid bank.

D-Commercial loan theory

This theory states that whenever commercial banks make short term self-liquidating productive loans , the central bank should lend to the banks on the security of such short term loans .

E-The trade-off theory

This states that there is opportunity cost for a bank either pursuing to be liquid or profitable. Under this theory, banks that choose to be liquid will not be profitable and vice versa . As the tow fundamental goals cannot be achieved together, for banks to be solvent and maintain to institute an efficient financial management practices that will balance the liquidity and profitability trade-off so that banks can be optimally liquid and profitable. The major argument against this theory isthat is based on banks' ability to make profit on granting substantial part of its liquid resources as loan from which it can earn interest income . (Kajola and al (2019) .

F-liquidity regulation

Liquidity plays a significant role in the sustainable development of bank and the stability of financial system , strict liquidity regulation are supposed to put forward to guard against problems due to the lack of liquidity (Bawacha (2018)).

Rochet (2008) indicates 2 reasons for liquidity regulation , from micro-point of view , liquidity regulation from prevent bankruptcy and damage of depositors interest by regulation liquidity buffers of banks , from macro-point of view , liquidity regulation help maintenance of financial system ability .

The 2008 global financial crisis reminded financial institutions to that of liquidity risk on financial system .

Basel III focused on liquidity by introducing liquidity coverage ratio and net stable funding (LCR), ratio (NSFR).

LCR= high quality assets / 30 days net cash outflows

NSFR= Available stable funding / required stable funding

NSFR(net stable funding ratio) measures the bank ability to get access to stable funding , this ratio comes out to make sure banks have available the stable funding with 1 year period . (Bawacha (2018)).

Bank profitability

Like all business, bank profit by earning more money than what they pay in expenses, the major position of a bank profit comes from fees that it charges for its services and the interest that it earns on its assets.

Profitability maximization is the ultimate goal for banks because of their for profit essence. Two aspects are concerned with profitability, the revenues generated and the cost. Thus, the way of improving, profitability includes enhancing revenues and minimizing costs.

The profitability of banking sector is important with to aim to estimate the constancy and reliability of the financial and banking industry (Albertazzi and Gambacorta 2009). The profitability is represented by 3 alternatives variables (Kabejeh and al 2012) . First, most important profitability ratio is ROA, also ROE . The next is the return on investment (ROI) , it measures the bank's efficiency by using invested capital. Earnings per share serve as a pointer of bank's profitability (Pearce and al 1987).

The relationship between bank liquidity and bank profitability

There are many researches that studies the relationship between bank liquidity and bank profitability. Shachera(2012) studied listed banks in Iran for the period (2002...2009) . He found that liquidity has significant impact on bank profitability . Warrad and al (2015) studied 15 Jordanian banks listed at Amman Stock exchange (ASE) . They found significant impact of liquidity (quickratio) on ROA (Return on assets) . Nishanthini and Merrajancy(2015) studied a sample of banks in Sirilanka over the period (2008...2012) . We found that liquidity have not significant impact on bank profitability.

Vodova(2016) studied the impact of liquidity on profitability of the polish banking industry over the period (2007...2013) . He found that liquidity has a negative impact on bank profitability . Also Abulaila , Alhathlool (2016) studied banks in Saudia . They found no significant relationship between liquidity and bank profitability . Salim and Bilal (2016) studied 4 commercial banks in Oman for the period (2010...2014) . They found significant relationship between bank liquidity and bank profitability. Moreover , Mebounon and al (2016) examined 38 banks in WAEMU region for the period (2001...2011). They found a non linear relationship between bank liquidity and bank profitability . Also Achraf and al (2017) studied 10 banks in Pakistan for the period (2006...2015) . They found that quick ratio has a negative impact on bank profitability , whereas cash and current ratio has a positive impact on bank profitability .

Also Ibrahim (2017) examined the influence of liquidity on the profitability of Iraqi banks over the period (2005...2013) . He found a significant impact of liquidity on bank profitability.

Hakimi and Zaghdoudi(2017) studied a sample of 10 Tunisian banks over the period (1990...2013) . They found that liquidity (measured by total credits / total deposits) has a negative effect on bank profitability (NIM) .Munithi and Waweru (2017) studied 41 commercial of banks in Kenya . They measured liquidity by liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) while profitability is measured by ROE (return on equity) . Panel data techniques of random effect estimation and generalized method of moments were used to purge time invariant observed specific effect and to mitigate potential endogeneityproblems. Findings indicate that NSFR is negatively associated with bank profitability both in long run and short run while LCR does not significantly influence the profitability of commercial banks in long run and short run .

Charmler and al (2018) studied a sample of 21 banks in Ghana over the period (2007...2016). They found that liquidity is positively associated with bank profitability .Moreover, Lucy and al (2018) studied a 5 banks in Nigeria for the period (2007...2016) . They found that liquidity has positive and significant effect on bank profitability .On the other hand,Bawacha(2018) studied a sample of 50 banks in Asia , Europe , North America . The findings of this study that only DAR (deposit to assets ratio) significantly impact on profitability (Return on equity) .

Moreover Mohanty and Mehrota (2018) studied 27 public sector banks and 20 private sector banks in India for the period (2011-2012) and (2015-2016) .They found that there is a negative effect of cash deposit ratio and investment deposit ratio on ROA . But there is no significant effect of liquidity on ROE .Ghurtskaia and Lemonjava (2018) indicated that the relationship is positive between liquidity and bank profitability in the Georgian context.

Also Awlo and al (2019) studied the impact of liquidity on bank profitability in Ethiopia over the period (1986...2017) . Autoregressive distributed lag model (ARDL) is used to investigate the short run and long run effect of liquidity on profitability .Current ratio and loan to deposit ratio of the bank were used to measure liquidity while ROA is dependent variable (measure of profitability) . They found that loan to deposit ratio negatively affect return on assets in the long run , while current ratio significantly and positively affects ROA in the long run .Sahyouni and wang (2019) estimated the amount liquidity created by Syrian banks between (2004---2010) and further investigates the effect of liquidity creation on bank performance , controlling for set a bank level , industry level , and macroeconomic variables .The findings show that bank liquidity creation improved during the prewar period and showed positive figure , but started to decline sharply during wartime .Besides Sile and al (2019) studied 43 commercial banks in Kenya over the period (2012...2016) . They found that there is a negative relationship between liquidity and profitability .

Empirical study

The relationship between bank liquidity and bank profitability has been the object of several studies prompting us to study this problematic in the Tunisian context .

Under this section , we will identify the sample at the beginning and then we specify the variables and the model .

After we carry out the necessary econometric tests . Finally we show the estimation results of the model and their interpretations .

Sample

We will use 11 banks (BIAT, STB, BNA, BH, ATB, Amen Bank, BH, BTEI, BT, Attijari bank, UBCI) that belong to professional association of banks in Tunisia over the period (2000---2017). Financial data are collected through the annual reports of banks existed in the web site of the professional association of banks in Tunisia over the period (2000----2017).

Estimation method

We will utilize panel static because it controls :

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

Specification of variables

We will estimate the following models :

ROA $i,t = b_0 + b_1 \text{Size}_{i,t} + b_2 \text{CAPI}_{i,t} + b_3 \text{TLAI}_{i,t} + b_4 \text{CEAI}_{i,t} + b_5 \text{CFCi}_{i,t} + b_6 \text{Tdepositi}_{i,t}$

$+ b_7 \text{CEAI}_{i,t} + b_8 \text{CFCi}_{i,t} + b_9 \text{Tdepositi}_{i,t} + b_{10} \text{TPiBi}_{i,t} + b_{11} \text{TINFi}_{i,t} + E_{i,t}$

ROE $i,t = b_0 + b_1 \text{Size}_{i,t} + b_2 \text{CAPI}_{i,t} + b_3 \text{TLAI}_{i,t} + b_4 \text{ALAI}_{i,t} + b_5 \text{CDi}_{i,t} + b_6 \text{CRI}_{i,t} + b_7 \text{CEAI}_{i,t} + b_8 \text{CFCi}_{i,t} + b_9 \text{Tdepositi}_{i,t} + b_{10} \text{TPiBi}_{i,t} + b_{11} \text{TINFi}_{i,t} + E_{i,t}$

Where :

i= bank

t= time

b₀= constant

b₁, b₂, b₃, b₄, b₅, b₆, b₇, b₈, b₉, b₁₀, b₁₁:Parameters to be estimated

ROA = return on assets = net income / total assets

ROA shows how to generate income from the assets of the bank (Chin 2011). It measures the profit earned per dollars of assets and reflect how well bank management uses the bank's investment resources to generate profits (Naceur 2003). ROA is considered as the best proxy of profit (Flamini and al (2009), Samad (2005)).

ROE = return on equity = net income / total equity

ROE reflects the ability of bank to use its own funds to generate profits (Yilmaz 2013)

This ratio shows the profit earned per 1 dinar of investment. This is an indicator of how well bank uses investor's money or generate profits. (Chouikh, Blagui (2017)).

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, Runkhale (1993)).

ALA = liquid assets / total assets

ALA depicts the bank's ability to absorb the liquidity shocks. In theory the higher liquidity ratio indicates that the bank is better position to meet its stochastic withdrawals (Chagwiza (2014)).

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 expense due to loan made in the money market and the capital market by banks. CFC shows the share of financial expenses in relation to total credits

T deposit = total deposits / total assets

Deposit include demands deposits and term deposits. T deposit show the share of deposits compared to total assets. The more the deposits a bank collect, the more the loan opportunities, it will be able to generate further profit (Mencucci , Paolucci (2016)).

CD= total credits / total deposits

It is the ratio that describes how allocation of funds in term de deposits, comparing to a number of funds which is obtained from saving (Widyastuti and al (2017)). When this ratio is higher , it show more risky conditions because the funds from deposits have been collected in more of credit .Conversely the lower ratio indicate effective banks in lending decisions .

TPIB = Growth rate of gross domestic product

TPIB show the growth in the economy activity in the country .Ayadi ,Boujelbene (2012) , Asarkaya , Ozcan (2007) pointed out the when economic growth increase , the banks make more profit .

CR= current assets / current liabilities

This is the proportion of bank's current assets to its current liabilities . It shows the strength of the bank in meeting the short term maturing obligations to the claimant of those obligations .(Kajola and al (2019).

TLA = total credits / total assets

Bank loans are the main course of return and are anticipated to impact positively the profits (Menicucci , Paolucci (2016))

CAP = total equity / total assets

The capital strength of bank indicates its capacity to meet deposit demand and sends signals to bank customers about its stability and ability to protect their savings especially during periods of uncertainty such as the financial crisis (Ghosh 2016; Berger (1995).It is largely assumed that well capitalized banks challenge lower probable cost of financial distress and such circumstances will then be turned into high profitability (Abreu , Mendes (2002).

TINF = rate of inflation

TINF shows the rate of increase in the price index. Inflation is generally the persistence increase of price level of goods and services .

We test the following hypotheses :

H1: (Liquid assets / total assets) have a positive impact on ROA

H2: (Total credits/ total deposits) have a positive and significant impact on ROA

H3 (Liquid assets / total assets) have a negative and significant impact on ROE

H4: (Total credits / total deposits) have a negative and significant impact on ROE

H5: (Current assets / current liabilities) have a significant impact on ROA

H6: (Current assets / Current liabilities) have a significant impact on ROE

Analysis of descriptive statistics

Table 1 :Descriptive statistics

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
ROA	198	0.011424	0.01439	0	0.1291
ROE	198	0.08746	0.088	0	0.9572
CAP	198	0.1626	0.1705	0	0.97724
Size	198	14.058	1.329	10.19	16.46
TLA	198	0.7165	0.1910	0.024	0.97
ALA	198	0.037	0.04055	0.0033	0.44
CEA	198	0.026	0.02132	0.0023	0.3614
CFC	198	0.0324	0.0206	0.001788	0.3179
Tdeposit	198	0.6545	0.2626	0.0066	0.9813
TPIB	198	0.03295	0.0405	-0.015	0.0611
TINF	198	0.041	0.0089	0.03	0.0715
CD	198	3.57	9.50	0.16	86.032
CR	198	1.11	1.51	0.074	20.20

198= 11*18 = total number of observations

18= Number of years (2000...2017)

11= Number of banks

ROA (mean = 0.0114) . The net income represent on average 1.14% of total assets

ROE (mean = 0.087) . The net income represent on average 8.7% of total equity

Size (mean = 14.058) . Most banks have a small and medium size . There is no large variation in size of banks

CAP (mean = 0.1626) . The equity represent on average 16.26% of total assets .

But there is a large variation in capital between banks . Standard deviation = 17.05%

TLA (mean = 71.65%) . Total credit represent on average 71.65% of total assets . The standard deviation is high (19.210)

ALA (mean = 0.037) . Liquid assets represent on average 3.7% of total assets

The standard deviation is low= 0.04

CEA (mean = 0.026) . Operating expenses represent on average 2.6% of total assets . Standard deviation is low (0.021)

CFC(mean = 0.0324) . Financial expenses represent on average 3.24% of total credits . Standard deviation is low = 2.6%

There isn't a big difference between banks in term of financial expenses .

T deposit (mean = 0.6545) . Total deposit represent on average 65.45% of total assets . The standard deviation is high 26% . There is a big difference between banks in term of deposits .

TPIB (mean = 3.29%) . The economic growth is not good . It is negative in 2011 because of revolution .

TINF (mean = 4.1%) . The rate of inflation is acceptable . Standard deviation is not high . There is not big difference between years but after revolution of 2011 this rate will be high .

CD (mean = 3.75) In average , total credits represent 3.75 of total deposit , it is a great standard deviation between banks .

CR (mean = 1.11) . In average , current assets represent 1.11 current liabilities .

The difference is big in term of CR between banks .(Standard deviation = 20.20) is high .

Econometric tests

A-Mutlicolineraity test

Table 2 Correlation between variables

	ROA	ROE	Size	CAP	TLA	CEA
ROA	1.000					
ROE	0.2220	1.000				
Size	-0.0874	0.3293	1.000			
CAP	0.4551	-0.1262	-0.4699	1.000		
TLA	-0.1706	-0.0100	0.2604	-0.0917	1.000	
CEA	-0.0289	0.0674	0.1122	-0.0612	-0.07	1.000
CFC	-0.0911	0.0589	0.0369	-0.0848	-0.1739	0.2536
Tdeposit	-0.02323	0.2107	0.4532	-0.56	-0.0841	0.1771
ALA	0.0256	-0.1174	-0.1656	0.1179	-0.057	-0.0716
CD	0.0359	-0.1540	-0.2526	0.1069	0.1123	-0.22
CR	-0.0617	-0.1461	-0.26	0.1134	-0.0725	-0.0526
TPIB	0.1370	-0.1069	-0.2207	0.1836	-0.23	-0.068
TINF	-0.1149	0.0963	0.24	-0.242	0.1986	-0.0792

Table 3 Suite of correlation between variables

	CFC	T deposit	ALA	CD	CR	TPIB	TINF
CFC	1.000						
Tdeposit	0.2661	1.000					
ALA	-0.0031	-0.24	1.000				
CD	-0.2912	-0.6041	0.0942	1.000			
CR	0.0111	-0.2749	0.187	0.2281	1.000		
TPIB	0.0161	-0.12	0.15561	0.0955	0.1367	1.000	
TINF	-0.06	0.1958	-0.1743	-0.0433	-0.15	0.0090	1.000

There is no problem of multicollinearity because all coefficients are inferior to 80%

Table3 :VIF values

Variable	VIF
Size	1.58
T deposit	2.97
CAP	1.94
ROA	0.59
ROE	0.63
CEA	1.12
CFC	1.19
ALA	1.24
CD	1.94
CR	1.28
TPIB	1.14
TLA	1.22
TINF	1.17

VIF is defined as the factor by which the variance of estimator is inflated in the presence of vary high multicollinearity (Masiero , Nicolan (2012)) . If the VIF value of independent variable is greater than 10 , that variable should be excluded in order to overcome multicollinearity (Shah (2011)) .

B-Hausman test

Hausman test determines if the individual effects are fixed or random . It determines if the coefficient Beta are fixed or random effect are not statistically different . Under the null hypothesis of independence between errors and explanatory variables , both estimators are unbiased . So the estimated become somewhatdifferent .

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

According to Wooldridge (2009) , if the prob value of Hausman is statistically significant (p inferior to 0.05) . Fixed effect will be better ,other wise random effect

In our research , p value of model 1= 0.9732 , P value of model 2= 0.3498

P value is superior to 10% , we choose random effect for regression of 2 models because it is more pertinent .

C-Breush Pagan test

It has been assumed that the variance of the error is constant . This is known as the assumption of homoscedasticity . If the errors not have a constant variance , they are said to be heterosedastic (Amene , Alenu (2019)) . The test statistic is X^2 with the degree of freedom . It tests the null hypothesis of homoscedasticity . If the chi squared value is significant with p value below an appropriate p inferior to 0.05 . Then the null hypothesis of homoscedasticity is rejected and heteroscedasticity is assumed .

Results of estimations and interpretations**Table 3: Results of estimation of model 1**

ROA	Coefficient	Z	P value	Standard error
Size	0.0019	1.83	0.067	0.0019
CAP	0.0375	5.31**	0.000	0.0307
TLA	-0.0081	-2.03**	0.043	-0.0081
CEA	-0.032	-1.03	0.304	-0.032
CFC	-0.062	-1.82	0.069	-0.062
Tdeposit	-0.0053	-1.05	0.294	-0.0053
ALA	0.0047	2.26**	0.0597	0.0057
CD	0.0000743	2.77***	0.0139	0.096
CR	-0.0006673	-1.39	0.165	0.0075
TPIB	0.0631	2.54***	0.0106	0.084
TINF	-0.074	-2.91***	0.0143	0.0925
Cons	-0.0071	-0.48	0.629	0.0149

The relationship between ROA and size is positive (if size increase by 1% , ROA will be increase by 0.0019%) . The increase of size has a positive effect on return on assets . This result is similar to be found by (Serwadda(2018) , Jasnad , Lahsan (2018) , Menicucci , Paolucci(2016), Secrezi (2015), Sahyouni and Wang (2019)) , but contrary to found by (Pasiouras , Kosmidou (2007) , Athansoglou and al (2008) , Shah and Khan (2017)).

Large banks can benefit from economies of scale enable cost reduction (Molyneux , Thornton (1992) , Bikker , Hu(2002) , Goddard and al (2004)). Larger banks might also benefit from economies of scope economies (reduced risks and product diversification) , by accessing to markets in which small banks cannot enter (Menicucci , Paolucci (2016).

Also , the relationship between ROA and CAP is positive (if CAP increase by 1% , ROA will be increase by 0.0375%) . The increase of capital has a positive effect on return on assets . This result is similar to found by (JaraBartin at al (2014) , Acaravci , Claim (2013) , Kosmidou , Pasiouras (2005) , Abel , LaRose (2016) , Sarwadda (2018) , Trujillo , Ponce (2013) , Clamentina , Isu (2013) , Menicucci , Paolucci (2016) , Widyastuti and al (2017),Dhouibi(2017), Amen , Alemu (2019). But contrary to found by (Secrezi 2015) , Lwa and Zogli (2017).

A high volume of equity will reduce the cost of capital , causing a positive effect on profitability Furthermore , it is estimated that banks with higher capital ratio are less dependent on external funding , with a positive impact on bank profit . Therefore, well capitalized banks achieve greater profitability because lower risk raises bank's worthiness and reduces the cost of funding (Menicucci and Paolucci 2016).

The relationship between ROA and TLA is negative (if TLA increase by 1% , ROA will be increase by 0.0081%) . The increase of total credits in term of total assets has a negative effect on return on assets . This relationship is significant at 1%. This result is similar to found by (Hassan , Bashir (2005) , Staikouras and Wood (2004)) but contrary to found by (Menicucci , Paloucci (2016) . The increase of loan volume along with lower margins, it could be presumed a negative effect on bank profitability. Moreover, the relationship between CEA and ROA is negative (if CEA increase by 1% , ROA will be increased by 0.032%) . The increase

of operational costs has a negative effect on return on assets. This result is similar to found by (Serwadda (2018) , Athansoglou and al (2008) , Kosmidou and al (2005) , Purkuoko , Sudiyatno (2013). The negative effect of cost means that there is a lack of competence in expense management since banks pass part of increased costs to customer and the remaining part to profits , possibly due to the fact that competition does not allow them to overcharge (Athansoglou and al (2008)) .The relationship between CFC and ROA is negative (if CFC increase by 1% , ROA will be decrease by 0.062%) . The increase of financial expenses has a negative effect on return on assets.

Also the relationship between T deposit and ROA is negative (if T deposit increase by 1% , ROA will be decrease by 0.053%) . The increase of T deposits in term of assets has a negative effect on return on assets . This result is similar to found by (Shah , Khan (2017)).The relationship between ALA and ROA is positive (if ALA increase by 1% , ROA will be increase by 0.0047%) . The increase of liquid assets has a positive effect on return on assets .

This result is similar to found by (Abel , Le Rouse (2016)) , Jawad , Lahsen (2018),Charmler and al (2018). A good liquidity ratio reduces the risk of failure that may lower the financing cost and hence increases profitability (Alexiou , Sofoklis (2009)) . On the other hand , the relationship between CD and ROA is positive (if CA increase by 1% , ROA will be increase by 0.00000743%) . The increase of total credits in term of total deposits has a positive effect on return on assets .

It is similar to result found by (Hassan , Bashir (2003) , Sufian , Habibullah (2009) , Margareth , Zein (2013),Ibrahim (2017), Bawacha (2018)) but contrary to result found by (Sabir , and al (2012) , Purwoko , Sudyatno (2013) , Aini (2013).The relationship between CR and ROA is negative (if CR increase by 1% , ROA will be decrease by 0.000673%) . The increase of (current assets / current liabilities) has a negative effect on return on assets . This result is contrary to found by (Waleed and al (2016) , Ashraf and al (2017), Ibrahim and Aqeel (2017)) .

Besides, the relationship between TPIB and ROA is positive (if TPIB increase by 1% , ROA will be increase by 0.0031%) . The increase of economic growth has a positive effect on return on assets . This result is similar to found by (Turjillo –Ponce (2013) , Dietrich , Wanzenried (2011) , Jawad , Lahsan (2018) , Calza et al (2006) , Sahyouni and Wang (2019) , but contrary to result found by (Blagui ,Chouikh (2017) , Dhouibi (2015) , Lwa , Zogli (2017) , Amene , Alemu (2019).

The relationship between TINF and ROA is negative (if TINF increase by 1% , ROA will be decrease by 0.074%) . The increase of inflation has a negative effect on return on assets .This result is similar to found by (Ben Naceur (2003) , Ghazouani (2005) , Umar and al (2014) , Boyd and al (2000) , Garcia Herrero and al (2009) , Izhar (2007), Amene , Alemu (2009) but contrary to found by (Turjillo Ponce (2013) , Clementina and al (2014) , Chouikh, Blaghui (2017), Dhouibi (2015).

Table4 Results of estimation of model 2

ROE	Coefficient	Z	Pvalue	Standard error
Size	0.02326	3.26***	0.001	0.0071
CAP	0.03343	0.83	0.406	0.040
TLA	-0.0199	-0.71	0.477	0.027
CEA	-0.0206	-0.09	0.925	0.22
CFC	0.098	0.41	0.682	0.24
Tdeposit	-0.042	-1.21	0.228	0.035
ALA	-0.022	-2.17*	0.1173	0.014
CD	-0.0002868	-2.43**	0.0668	0.00068
CR	-0.0007973	-0.24	0.812	0.036
TPIB	0.3181	-2.12	0.425	0.29
TINF	0.5796	1.03	0.303	0.56
Cons	-0.21	-2.14	0.032	0.10

(****) significant at 1%

(**) significant at 5%

(*) significant at 10%

-There is a positive relationship between ROE and size (if size increase by 1%, ROE will be increase by 0.02326%). This relationship is significant at 1%. The increase of size has a positive effect on return on assets. This result is similar to found by (Topak and al (2011), Abobaker (2018), Ashraf and al (2017), Charmler and al (2018), Bogale (2019)). The increase of size can increase bank profitability due to economies of scale. Moreover there is a positive relationship between CAP and ROE (if CAP increase by 1%, ROE will be increase by 0.033%). The increase of CAP has a positive effect on bank return on equity. This result is similar to found by (Abobaker (2018), Athansoglou and al (2008), Ben Naceur (2003), Charmler and al (2018)). Banks with a high capital ratio are considered to be insured against bankruptcy, to have access to cheap funds, to be more flexible in pursuing business opportunities and to have the ability to absorb any unexpected loans (Al Harbi (2019)).

Garcia Herrero and al (2009) suggested that the degree of capitalization could affect the profitability of bank through 4 main channels. Firstly, high levels of capital may raise profitability through an increase in the share of loans. Secondly, high capitalization positively influences credit worthiness. Thirdly, a well capitalized bank will reduce their cost of funding through a reduction in borrowing. Lastly, banks with a greater value of franchise value will have adequate capital.

Besides, there is a negative relationship between TLA and ROE (if TLA increase by 1%, ROE will be decrease by 0.0199%). The increase of total credit in total assets has a negative effect on bank return on equity. This result is similar to result found by (Anarfi and al (2018), Yukel and al (2018)). Therefore, higher level of loans means a possible deterioration of the bank asset quality with a negative effect on bank profitability (Alper, Anbar (2011)). On the other hand, there is a negative relationship between CEA and ROE (if CEA increase by 1%, ROE will be decrease by 0.0206%). The increase of operating costs has a negative impact on bank return on equity. Also there is a positive relationship between CFC and ROE (if CFC increase by 1%, ROE will be increase by 0.098%).

The increase of financial expenses has a positive effect on bank return on equity .There is a negative relationship between ALA and ROE (if ALA increase by 1% , ROE will be decrease by 0.022%) . The increase of liquid assets has a negative effect on return on equity . This result is similar to found by Sile and al (2019) but contrary to result found by Charmler and al (2018) .There is a negative relationship between CD and ROE (if CD increase by 1% , ROE will be decrease by 0.0002868%) . The increase of (total credits / total deposits) has a negative effect on return on equity . This result is contrary to found by Bawacha(2018) , Tamunoski (2017) .

There is a negative relationship between CR and ROE (if CR increase by 1% , ROE will be decrease by 0.0007979%) . The increase of(current assets / current liabilities) has a negative effect on return on equity . This result is similar to found by Ashraf and al (2017) but contrary to found by Waleed and al (2016) , Ibrahim and Aqeel (2017),Akinuwum and al (2017) .Moreover the relationship between TPIB and ROE is positive (if TPIB increase by 1% , ROE will be increase by 0.3181%) . The increase of economic growth has a positive effect on bank return on equity . This relationship is statistically significant at 1% .

This result is similar to found by Zampara and al (2018) . According to Staikouras , Wood (2003) , Alexiou , Voyozas (2009) , Grow and al (2014) , Dietrich , Wanzenried (2011) , a higher GDP growth rate result in higher demand for bank services , on the one hand and lower loan default probability in the other hand .Whereas banks can also impose higher fees and interest for their services resulting in higher profitability (Zampara and al (2018)) . Besides , Karinzadek and al (2013) , Said , Tumim (2011) argue that GDP growth has a positive effect on the expectation of both the bank and the customers , implying hence that during economic booms not only customers demand for new loans and financial crises but simultaneously banks are also more eager to increase loan supply .

There is a positive relationship between TINF and ROE (if TINF increase by 1% , ROE will be increase by 0.5796%) . The increase of inflation has a positive effect on return on equity . This result is similar to result found by (Rani , Zergaw (2017) , Naceur , Abdollah (2015) , Tan , Floros (2012) , Flamini and al (2009) , Gul and al (2011) , Sufian , Habibullah (2009) , Hasanov and al (2018) , Ben Moussa , Hdidar (2019) .But contrary to opinions to result found by Sfyari (2012) , Boyd and Champ (2003) . Inflation affect bank performance as it transfers money from services and investors to debtors. Therefore the opportunity cost of holding currency in the future may discourage savings that will in turn affect the performance of bank .

CONCLUSION

Profitability and liquidity are powerful tools that are useful for efficient and effective financial intermediation as the two variables depict the strength of the banking sector (kajola at al 2019). Also Liquidity means the ability to finance the increase in assets and meet liabilities when they due fall without any unexpected losses , and so the efficient management of liquidity in the bank helps to make sure that the bank is able to make sure that the bank is able to meet the incurred cash , which are usually uncertain and subject to external factors and to the behavior of other agents . The liquidity management is a key factor in business operations

. It is vital for the survival of business , the firm should have sufficient of liquidity .(Malik and Aqeel 2017) .

In this article , we studied the impact of liquidity on bank profitability in Tunisian context . We choose 18 banks for the period (2000...2017) . By estimating 2 models of panel static , we found that(liquid assets / total assets) , (total credit / total deposits) have significant and positive impact on ROA (return on assets) whereas (currents assets / currents liabilities)have not significant impact on ROA . Also (liquid assets / total assets) ,(total credits / total deposits)have negative and significant impact on ROE(return on equity) whereas (current assets / current liabilities)have not significant impact on ROE .

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