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The Determinants of Bank Liquidity: Case of Tunisia

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ABSTRACT: Liquidity is an important variable for the bank and the banking system components. So it is interesting to show its determinants. Thus, we used a sample of 18 banks in Tunisia in for 2000-2010period. We estimated two measures of liquidity (liquid assets / total assets; total loans / total deposits). Through the method of static panel and method of panel dynamic, we found that (financial performance, capital / total assets, operating costs/ total assets, growth rate of GDP, inflation rate, delayed liquidity) have significant impact on bank liquidity while (size, total loans / total assets, financial costs/ total credits, total deposits / total assets) does not have a significant impact on bank liquidity.

Keywords: bank; bank liquidity; static panel; Tunisia; dynamic panel
JEL Classifications: C5; G2; G21

1. Introduction

Liquidity is the ability of the bank to fund asset growth and meet its obligations as they fall due without incurring acceptable losses (BIS (2008)). Indeed, the Basel Committee (2009) explained that the viability of commercial banks depends on the liquidity position of the bank. Diamond and Dybvig (1983) were the first to provide the evidence on the importance of role of the bank in the creation of liquidity. In addition, the optimal level of liquidity is strongly linked to effective banking operations if liquidity is not generated properly, which can lead to insolvency (in case of low liquidity) and low profitability (in the case of high liquidity) and finally destroyed shareholders value and may be harmful to other banks and because of the contagion effect.

As liquidity problems of some banks during global financial crisis showed, liquidity is very important for functioning of financial market and the banking sector (Vodova, 2013). Therefore there is interesting to examine the determinants of bank liquidity. This article aims to identify the factors that influence bank liquidity in Tunisian context in period (2000-2010).We will use 3 sections. The first section is devoted to the literature review; the second section is about the empirical study. Finally, we will make a conclusion.

2. Literature Review

There are several studies on bank liquidity. Adrian and Shin (2008) showed that in chaotic economic times, the liquidity position is important changes in it can change the whole bank reserves. Indeed, Aikaeli (2006) said the determinants of excess bank liquidity. He noted that the credit risk, the right level of funding, preference of cash, the volatility of deposits is fundamental determinants of excess liquidity.

On the other hand, the Basel committee (2009) explained that the viability of commercial banks depends on the position of the liquidity. Valla and SaerEscorbia (2006) studied the liquidity measures for banks in England. They found that profitability, Growth in the credit, GDP, monetary policy, interest rates have a negative impact on bank liquidity.

In addition, Vodova (2011) showed that bank specific and macroeconomic variables determine significantly the bank liquidity. After the global financial crisis, banks have began to examine the problems of liquidity and its importance to the overall performance of the banking sector and financial markets. Moreover, Rauch et al.(2010) studied the determinants of bank liquidity. They found that the size of bank, profitability, and the interest rate of monetary policy are negatively associated with bank liquidity, while the value of delayed liquidity is positively associated with bank liquidity.

On the other hand, Saxegard (2006) studied the pattern of excess liquidity in the African countries of sub-sahrienne using SVAR (structure of VaR), this result shows that excess liquidity alter transmission monetary policy so that the monetary authority could not control the demand for the currency. Gauley (2004) showed that the absorption of liquidity by monetary and authority encouraged to use the tools of monetary instruments such as the title of the central bank that have a major interest. This leads to inefficient transmission of monetary policy.

Brio (1997, 2001) argued that the balance of exante liquidity before the intervention of the central bank should be different from the expost liquidity on the balance after the intervenance of central bank. Edlin and Jaffee (2009) claimed that the excess liquidity is due to credit crunch and banks are reluctant to allocate credits. Lei and Song (2013) showed that the performance of bank and the creation of liquidity are negatively related to the on large banks in China, while they are positively related to small banks. Chen and Phuong (2013) showed that securitization and synergy credits, deposits reduce the incentives for the bank to have liquid assets in its balance sheet. Monetary policy has a negative effect on excess liquidity.

On the other hand, they showed that the decrease in the flow of money in proportion to deposits of the banking sector lead to decrease of the ratio (loans / deposits). Kamau et al. (2013) showed that 42.2% of the variation in the liquidity of 27 commercial banks in Kenya is explained by the change of several factors (profitability, obligation, policy management, credit rating, monetary policy), 57.8% is explained by others factors.

Choon et al. (2013) studied the determinants of liquidity of 15 commercial banks in Malaysia in period (2003-2012). They used specific factors (size of bank, capital adequacy, profitability, credit), macroeconomic factors (GDP, interbank rate, financial crisis). They used panel data (fixed effect model with annual data). The empirical results show that all factors included are significant except interbank rate.

Factors that positively influence bank liquidity are (non performing loans, profitability, GDP). Others factors negatively affecting the liquidity (bank size, capital adequacy, financial crisis). Hovarth et al. (2012) studied a sample of Czech banks between 2000 and 2010. They observed a negative relationship between the creation of liquidity and bank capital. This shows that Basel III reduces liquidity creation, but the creation of high liquidity can reduce bank solvency. Indeed, Berger and Bouwman (2009) showed 2 assumptions related to the motivation of the bank's capital to create liquidity. The idea of creating liquidity of the bank predicts that the capital increase improves the ability of the bank to create liquidity. But the hypothesis of financial fragility predicted that the increase in capital reduces liquidity creation (Diamond and Rajan, 2001). On the other hand, Lartey et al. (2013) have shown positive relationship between liquidity and profitability of listed banks in Ghana. Shachera (2012) studied the relationship between liquidity and profitability of banks in Iran over the period (2002-2009), he found a non linear relationship between profitability and possession of liquid assets.

Then, we study 2 hypotheses:

H1: The determinants internals and externals have significant impact on bank liquidity

H2: The determinants internals and externals not have significant impact on bank liquidity

3. Empirical Study

The determinants of bank liquidity has been the object of several studies (Rafik, 2013; Vodova, 2011) prompting us to study this problem in the Tunisian context. Under this section, we will identify the sample at the beginning, then, we specify the variables and models. On the other hand, we carry out the necessary econometric tests. Finally, we show the estimation results of the model and their interpretations.

3.1. Sample

We will use 18 banks (Table 1) that belong to professional association of banks in Tunisia over the period (2000-2010). Financial data are collected through the web sites of the professional association of banks in Tunisia over the period (2000-2010). Macroeconomic data are collected from site of central bank of Tunisia and national statistic institution.

Table 1. Specification of sample

Index of bank	Name of bank
AB	AMEN BANK
ABC	ARAB BANKING CORPORATION
ATB	ARAB TUNISIAN BANKING
Attijari bank	ATTIJARI BANK OF TUNISIA
BH	BANK OF HOUSING
BT	BANK OF TUNISIA
BTE	TUNISIA AND EMIRATE BANK OF TUNISIA
BIAT	ARAB INTERNATIONAL BANK OF TUNISIA
BNA	NATIONAL AGRICULTURE BANK
BTS	TUNISIAN SOLIDARITY BANK
BTL	TUNISO LYBIAN BANK
CB	CITI BANK
STB	TUNISIAN BANKING COMPANY
SB	STUSID BANK
TQB	TUNISO QATRI BANK
UBCI	BANKING UNION OF TRADE AND INDUSTRY
UIB	INTERNATIONAL BANKING UNION
BTK	TUNISO KUWAIT LYBIAN

3.2. Estimation method

We will utilize panel static and panel dynamic.

3.2.1. Panel static

We will use the static panel because it can control:

-The time and individual variation in the observable behavior or cross sectional time series aggregated.

-The observed or unobserved individual heterogeneity.

-The hierarchical structure

3.2.2. Panel dynamic

The presence of lagged variables makes conventional techniques to estimate panel data inappropriate. Thus, the use of panel data with fixed effect or random effect does not solve the problems inherent in dynamic econometric models.

This is due to the correlation between the endogenous and the residuals of the regression (ai+Uit).

To overcome this difficulty, we must rewrite the dynamic model in first differences to eliminate specific effects (ai).

$Riski,t=b1.Riskit-1+…Ui,t'$(1-2)

$Riski,t'=Riski,t-1-Riski,t-2$ (1-3)

$Ui,t=Riski,t-Riski,t-1$ (1-4)

There is another problem concerning the correlation between Riski,t and Ui,t.

This necessitates a set up a method using instrumental variables for estimation of equation (2). That is why in a second step, the technique is for 2< T to use the lagged endogenous variables in levels as instruments to estimate the baseline equation in difference. If this technique on The GMM difference equation provides more accurate than conventional techniques, the use of lagged variables as instruments in estimates is not always adequate.

Indeed, Blundell and Bond (1998) showed in the small samples, the coefficients can be seriously not significant when the explanatory variables have a high level of autocorrelation. In addition, the changes in differences prohibits the introduction of invariant variables over time, it is necessary to develop a second method, that of GMM system, developed by Arellano and Bond (1995), Blundell and Bond (1998).

3.3. Specification of variables

We will estimate 4 models:

$ALAi,t=b0+b1.ROAi,t+b2.ROEi,t+b3.NIMi,t+b4.Sizei,t+b5.CAPi,t+b6.TLAi,t+b7.CEAi,t+b8.CFCi,t+b9.Tdepositi,t+b10.TINFi,t+b11.TPIBi,t+Ei,t$ (1)

$CDi,t=b0+b1.ROAi,t+b2.ROEi,t+b3.NIMi,t+b4.Sizei,t+b5.CAPi,t+b6.TLAi,t+b7.CEAi,t+b8.CFCi,t+$

b9.Tdeposit i,t+b10.TINFi,t+b11.TPIBi,t+Ei,t (2)

ALAi,t=b0+b1.ALAi,t-1+b2.ROAi,t+b3.ROEi,t+b4.NIMi,t+b5.Sizei,t+b6.CAPi,t+b7.TLAi,t+b8.CEAi,t+ b9.CFCi,t+b10.Tdepositi,t+b11.TINFi,t+b12.TPIBi,t+Ei,t (3)

CDi,t=b0+b1.CDi,t-1+b2.ROAi,t+b3.ROEi,t+b4.NIMi,t+b5.Sizei,t+b6.CAPi,t+b7.TLAi,t+b8.CEAi,t+ b9.CFCi,t+b10.Tdepositi,t+b11.TINFi,t+b12.TPIBi,t+Ei,t (4)

ROA= net income/total assets

ROA = return on assets

ROA show how to generate income from the assets of the bankan (Chin, 2011). This ratio is used in several articles to compare the financial performance of banks. Use ROA as dependent variable also provides to convince to compare the results to other findings in this literature. It reflects the ability of the banks to use the financial data and real estate resources to generate profits (Naceur, 2003; Khrawish, 2011; Ongore and Kusa, 2013).

ROE= return on equity = net profit / equity

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

NIM= interests receivables –interest incurred / total assets

Interests receivables (by borrowers)

Interests incurred (paid by the bank to the creditors and depositors)

NIM indicates the efficiency of financial intermediation (Hamadi and Awdeh, 2012).

NIM indicates the efficiency of financial intermediation.

ALA= total liquid assets / total asset

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

TLA= total loans / total assets

TLA shows the percentage of loans in relation to total assets

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 loans made in the money market and the capital market by banks. CFC shows the share of financial expenses in relation to total loans.

Size = size of the bank = natural logarithme 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 and Runkhle, 1993).

T deposit = total deposits / total assets

Deposits include demand deposit and term deposits. T deposits show the share of deposits compared to total assets.

CAP= equity / total assets

CAP show the strength of bank capital against the vagaries of economic and financial environment. Generally, the capital is positively related to the financial performance of banks (Gul, 2011).

CD= total loans / total deposits

CD shows the degree of conversion of deposits in credits (Dogan, 2013).

CD is generally greater than 1 which shows the lending capacity of bank.

TPIB=growth rate of gross domestic product.

TPIB shows the growth of economic activity in the country (Ayadi and Boujelbène, 2012).

TINF = rate of inflation

TINF shows the increase in the price index.

3.4. Analysis of descriptive statistics

Table 2. Descriptive statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
ALA	198	0.0559812	0.1242289	0.0045356	0.1452
CD	198	4.263173	10.57702	0.07916	79.154
ROA	198	0.0135572	0.0223216	0	0.2124
ROE	198	0.0801206	0.0948191	0	0.9572
NIM	198	0.0307891	0.0294613	0	0.2193
Size	198	13.68314	1.310985	10.19	15.7258
CAP	198	0.2023391	0.2054597	0	0.97249
TLA	198	0.6658789	0.202334	0.057649	0.95824
CEA	198	0.0262949	0.0098981	0.0002371	0.051585
CFC	198	0.0349709	0.0292976	0.002377	0.3179
Tdeposit	198	0.6108761	0.2857199	0.06616	0.956
TPIB	198	0.0440636	0.0283145	0.02	0.041
TINF	198	0.0388182	0.0075244	0.03	0.056

-198=total number of observations = 11*18
11= number of years between (2000-2010)
18=number of banks in the sample studied.
-ALA (mean = 5.59%). The liquid assets represent 5.59% of total assets. But there is high standard deviation (12.42%).
-CD (mean = 4.26). The credits represent 4.26 of deposits. This is the sign of efficacy of financial intermediation. But there is a high standard deviation (10.57).
-ROA(mean = 1.35%).The return represents 1.35% of total assets. So, the average return on assets of bank is low. But there is a standard deviation of 2.23%.
-ROE (mean =8%). The net profit represent on average 8% of equity. This is acceptable.
-NIM (mean =3.07%). The interest margin represents 3.07% of total assets. The standard deviation is low (2%).
-CEA (mean = 2.62%). Operating expenses represent 2.62% of average total assets. So, there is an efficiency at banking. There is a slight variation of CEA between banks.
-CFC (mean = 3.49%). Financial expenses represent on average 3.49% of total assets. So, there is an effective management of financial expenses on banks. There is a large variation in CFC between banks (standard deviation = 2.92%).
-Size (mean = 13.68).Most of banks are small and medium in size. There is no much variation in size between banks.
-T deposit (mean = 0.61). Deposit represent on average 61% of total assets. Which show high ability to attract the deposits. The deposits are important in the banking. But there is a large variation in deposits between banks (standard deviation = 0.285).
-TLA (mean = 66%). The loans represent on average 66% of total assets. Which show the importance of intermediation of banks. But there is a large variation in loans between banks (standard deviation = 0.2023).
-CAP (mean = 0.2023).The capital represent on average 20.23% of total assets. It is acceptable to face the vagaries of the banking environment. But there is a great variation in CAP between banks (standard deviation = 0.2054).
-TPIB(mean = 0.04). The growth of GDP (gross domestic product) is on average 4% over the period of (2000-2010).Standard deviation is low. There is not much variation in TPIB between the years of sample.
-TINF (mean = 0.038). TINF represent on average 3.8% between2000-2010. The standard deviation is low. There is not much difference in TINF between the years of sample.

3.5. Test of multi-collinearity

Table 3. Correlations between variables

	ALA	CD	ROA	ROE	NIM	Size	CAP
ALA	1.0000						
CD	0.0070	1.000					
ROA	0.0330	-0.0445	1.000				
ROE	0.0374	-0.1558	0.1147	1.000			
NIM	0.0356	-0.0219	0.0671	-0.0663	1.000		
Size	-0.0323	-0.2121	-0.0699	0.3032	0.0498	1.000	
CAP	-0.0013	0.0982	0.3011	-0.1289	0.1262	-0.4556	1.000
TLA	-0.0042	0.2001	-0.0848	-0.0672	0.1950	0.2694	0.0134
CEA	-0.0626	-0.5223	-0.1575	0.1250	-0.1055	0.1118	-0.2270
CFC	-0.0389	0.2493	-0.0887	0.0587	0.0373	0.0230	-0.1317
Tdeposit	-0.0672	-0.5825	-0.1877	0.1750	-0.0934	0.4867	-0.6305
TPIB	-0.0155	0.0155	0.1626	-0.0148	0.0459	-0.0614	-0.0471
TINF	-0.1377	0.0462	-0.0637	0.0582	-0.0278	0.1986	-0.1637

Table 4. Suite of correlation between variables

	TLA	CEA	CFC	Tdeposit	TPIB	TINF
TLA	1.000					
CEA	-0.1818	1.000				
CFC	-0.1452	0.4063	1.000			
Tdeposit	-0.1411	0.4733	0.2863	1.000		
TPIB	-0.0200	-0.1543	-0.0994	-0.1142	1.000	
TINF	0.1214	-0.1870	0.0208	0.1529	0.0631	1.000

The all coefficients are inferior to 80%, there is no problem of multi-collinearity (Kennedy, 1985).

Table 5. VIF

Variable	VIF	1/VIF
Tdeposit	3.65	0.2733
CAP	2.36	0.4246
CD	2.24	0.4465
ALA	3.5	0.28
CEA	1.85	0.541
tiSIZE	1.83	0.545
TLA	1.32	0.760
CFC	1.26	0.793
ROA	1.22	0.820
TINF	1.17	0.852
ROE	1.17	0.853
TPIB	1.13	0.883
NIM	1.10	0.906

VIF of the variables is inferior to 5; there is no problem of multi-collinearity (Gujarati, 2005).

3.6. Test of Hausman

It determines if the individual effects are fixed or random. It determines if the coefficients (beta) and 2 fixed or random estimates are not statistically different. Under the null hypothesis of independence between errors and explanatory variables, both estimators are unbiased, so the estimated coefficient becomes somewhat different. The fixed effect model assumes that the influence of explanatory variables on the dependent variable is the same for the all invidious, and that whatever the period (Sevestre, 2002).

The random effect model assumes that the relationship between the dependent variable and the explanatory variable is not fixed, but random, the individual effect is not fixed parameter but a random variable (Bourbonnais, 2009).
The null hypothesis of the test is following:
H0: the presence of random effect
Chi (2) = (b-B) '(V_B-V_B)'(-1) (b-B)
The hausman test blends in Pv= Chi2<Prob
If Pv<5%, we accept H0 (presence of random effect)
If not, we accept H1 (presence of fixed effect)
The model 1, model 3, model 4 are fixed. The model 2 is random.

Table 6. Results of Hausman test

Models	Pv
Model (1)	0.9874
Model (2)	0.000
Model (3)	1.000
Model (4)	1.000

3.7. Estimations Results and interpretations of models

Table 7. Estimations results of models (1) and (3)

	Model (1)	**Model (3)**
Dependent variable ALAi,t		
Independent variables		
ALAi,t-1	-	0.0121011
ROAi,t	-0.0158129 (2.23)**	-0.1590472 (2.63)***
ROEi,t	0.0510617 (2.32)***	0.0082906 (2.44)***
NIMi,t	-0.1531476 (2.08)*	-0.0825812 (1.98)*
Sizei,t	-0.0248459 (-0.93)	-0.0002184 (-0.85)
CAPi,t	-0.0503254 (2.54)***	0.0048155 (2.48)***
TLAi,t	-0.0624989 (-1.02)	-0.0611138 (-1.15)
CEAi,t	-1.559202 (2.56)***	-0.7507737 (2.36)***
CFCi,t	-0.01632630 (-0.056)	0.016876 (-0.042)
Tdepositi,t	0.06511818 (0.79)	-0.0348021 (0.63)
TPIBi,t	0.05087 (2.15)**	0.0148741 (1.98)*
TINFi,t	-2.239542 (3.06)***	-0.804928 (2.81)***
Constante	0.5395587 (0.85)	0.1609407 (0.63)
AR(1)	-	-
Sargan test	-	-
Chi2(44)	-	6.900
Chi2<P	-	1.000

(***) significant at 1%, (**) significant at 5%, (*) significant at 10%

There is a negative relationship between ROA and ALA (if ROA increases by 1%, ALA decreases by 1.58%, 15.9% respectively in model (1) and model (3).The increase of return on assets has a negative impact on bank liquidity. This relationship is statistically significant at 5%. On the other hand, there is a positive relationship between ALA and ROE (if ROE increases by 1%, ALA increases by 0.051%, 0.0082% respectively in model (1) and model (3). This relationship is statistically significant at 1%. The increase of return on equity has a positive effect on bank liquidity. This is similar to the result found by (Lartey et al., 2013; Shahchera, 2012; Malik and Rafique, 2013). There is a negative relationship between NIM and bank liquidity (if NIM increases by 1%, bank liquidity decreases by 0.153% and 0.082% respectively in model (1) and model (3). This relationship is statistically significant. Increase in interest margins stimulates bank to focus more on lending activity and as a result, the share of liquid assets is decreasing (Vodova, 2013).

There is a negative relationship between size and bank liquidity (if size increases by 1%, liquidity decreases by 0.024%, 0.006218% respectively in model (1) and model (3).The increase of size has a negative impact on bank liquidity. This relationship is not statistically significant. This is contrary to result found by Malik and Rafique (2013). Kashyap et al. (2002) find a strong effect of bank size on holding of liquid assets, with smaller banks being more liquid as they face constraints in accessing capital markets. On the other hand, there is a negative relationship between CAP and ALA (if ALA increase by 1%, CAP decreases by 0.050% in model (1), if ALA increases by 1%, CAP increases by 0.0048% in model (3). This relationship is statistically significant at 1%.There is 2 assumptions related to motivation of the bank capital to create liquidity (Berger and Bouwman, 2009). The idea of creating liquidity of the bank predicts that the capital increase improves the ability of the bank to create liquidity but the hypothesis of financial fragility predicted that the increase of capital reduces liquidity creation (Diamond and Rajan, 2001).

There is a negative relationship between TLA and ALA (if TLA increase by 1%, ALA decrease by 0.062% respectively in model (1) and model (3)).The increase of credits has a negative impact on bank liquidity. This relationship is not statistically significant. Besides, there is a negative relationship between CEA and ALA (if CEA increase by 1%, ALA decrease by 1.55%, 0.75% respectively in model (1) and model (3)).The increase of operating expenses has a negative impact on bank liquidity. This relationship is statistically significant at 1%.

There is a negative relationship between CFC and ALA (if CFC increase by 1%, ALA decrease by 0.016% in model (1), if CFC increase by 1%, ALA increase by 0.016% in model (3)). This relationship is not statistically significant.

There is a positive relationship between ALA and tdeposit (if t deposit increase by 1%, ALA increase by 0.065% in model (1), ALA decrease by 0.0348% in model (3)). This relationship is not statistically significant.

There is a negative relationship between tpib and ALA (if tpib increase by 1%, ALA increase by 0.05% and 1.48% respectively in model (1) and model (3)).The increase of growth of GDP has a negative impact on bank liquidity. This is similar a result found by Valla and Saer-Escorbiac (2006), Vodova (2011).There is a negative relationship between TINF and ALA (if TINF increase by 1%, ALA decrease by 2.23% and 0.80% in model (1) and model (3)).This is contrary a result found by Raeisi et al. (2014) but similar a result found by Bunda and Desquilbet (2008), Malik and Rafique (2013). Inflation rate significantly determine bank liquidity (Heffernan, 2005; Bessis, 2009).

There is positive relationship between CD and CD-1 (if CD-1 increase by 1%, CD increase by 0.63%). This relationship is statistically significant at 10%. This is similar a result found by Rauch et al. (2010). On the other hand, there is a negative relationship between ROA and CD in model (2) (if ROA increase by 1%, CD decrease by 17.55%).This relationship is statistically at 1%.This result is similar to result found by Owolabi et al. (2011); Bordeleau and Graham (2010). But there is a positive relationship between ROA and CD in model (4) (if ROA increase by 1%, CD increase by 19.42%).This is similar a result found by Bourke (1989). Therefore, banks should always strike a balance between liquidity and profitability to satisfy shareholders wealth b as well as regulatory environments.

There is a negative relationship between ROE and CD in model (2) (if ROE increase by 1%, CD decrease by 2.134%). The increase of return on assets has a negative impact on bank liquidity. This relationship is statistically at 5%. But there is a positive relationship between ROE and CD in model (4) (if ROE increase by 1%, CD increase by 3.16%).There is a negative relationship between

NIM and CD in model 2 and model 4 (if NIM increase by 1%, CD decrease by 14% and 18.31% respectively in model 2 and model 4). The increase of interest margin has a negative impact on bank liquidity. This relationship is statistically significant at 1%.

Table 8. Estimation results of model (2) and model (4)

	Model (2)	Model (4)
Variable independent CD	-	
Variables dependents		
CD-1	-	0.63992 (2.16)**
ROA	-17.55368 (2.12)**	19.42784 (2.31)**
ROE	-2.134753 (2.38)***	0.031692 (2.15)**
NIM	-14.00193 (2.51)***	-18.31941 (2.41***
Size	-0.093491 (0.58)	0.3490888 (0.23)
CAP	-11.42739 (2.05)**	-2.940867 (2.26)**
TLA	5.82522 (2.54)***	0.6507144 (3.51)***
CEA	-228.5078 (3.25)***	-5.752506 (2.75)***
CFC	3.025343 (0.78)	4.667838 (0.91)
Tdeposit	-21.99374 (1.54)	-3.048534 (1.15)
TPIB	-28.80526 (2.16)**	-1.153161 (2.22)**
TINF	72.8109 (3.76)***	80.7421 (4.15)***
CONS	22.59641	-4.125359
AR(1)	-	
Sargan test	-	
Chi2(44)		6.38
Chi2<Prob	-	1.000

There is a negative relationship between Size and CD in model 2 (if Size increase by 1%, CD decrease by 0.093%).This relationship is not statistically significant. This is similar a result found by Chagwiza (2014).But there is a positive relationship between Size and CD in model 4 (if size increase by 1%, CD increase by 0.34%).There is a negative relationship between CAP and CD (if CAP increase by 1%, CD decrease by 11.42%, 2.94% respectively in model 2 and model 4.) This relationship is statistically significant at 5%.This is contrary a result found by Chagwiza (2014).On the other hand, there is a positive relationship between TLA and CD (if TLA increase by 1%, CD increase by 5.82% ; 0.65%).

There is a negative relationship between CEA and CD (if CEA increase by 1%, CD decrease by 228%, 5.28% respectively in models 2 and 4).This relationship is statistically significant at 1%.
-There is a positive relationship between CFC and CD (if CFC increase by 1%, CD increase by 3.02%, 4.66% in model 2 and model 4).This relationship is not statistically significant. On the other hand, there is a negative relationship between T deposit and CD (if Tdeposit increase by 1%, CD decrease by 21.99%, 3.048% respectively in model 2 and model 4.This relationship is not statistically significant.

There is a negative relationship between TPIB and CD (if TPIB increase by 1%, CD decrease by 28.80%, 1.15% respectively in model 2 and model 4 respectively).This relationship is statistically significant at 5%.This is similar a result found by Painceira (2010), Vall and SaesEscorbia (2006). Where, banks confidently expect to profit by expanding loanable funds to sustain economic boom, while restrict loanable funds during economic downturn to prioritize liquidity. To sum up, banks prefer high liquidity due to lower confidence in repaying profits during economic downturn. Alper et al. (2012) exemplified that during economic expansion banks would issue more loans and run down their liquidity buffers. Moreover, it's harder for banks to attract deposits during economic expansion, consequently increasing their financing gap.

There is a positive relationship between TINF and CD (if TINF increase by 1%, CD increase by 72.81%, 80.74%).This relationship is statistically significant at 1%. This is similar result found by Vodova (2013).

4. Conclusion

Liquidity is necessary for the good functioning of the banking system. It is useful for the bank to meet its obligations to creditors and depositors and fund investments. So, it's interesting to study its determinants. In the context of this article, we found after a study of 18 banks in Tunisia over the period (2000-2010) that (financial performance, capital, loans / total assets, operating expenses / total assets, growth rate of GDP, inflation rate) have a significant impact on bank liquidity, however (size, total deposits/total assets, financial expenses / total loans) does not have significant impact on bank liquidity.

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