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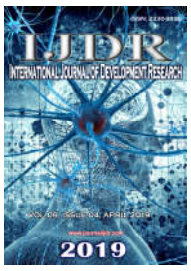

RESEARCH ARTICLE OPEN ACCESS

DETERMINANTS OF PROFITABILITY IN LEBANESE COMMERCIAL BANKS

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ABSTRACT

This study derives an empirical model for studying micro and macro-economic factors that affect the profits of Lebanese commercial banks represented by return of assets (ROA).The sample covers thirteen banks spanning the period 2007-2016. The panel least square is taken as the estimation procedure. Results are based on the cross section fixed effects model. Regression results shows that the whole model is significant, where capital adequacy ratio and total loans to total assets ratio have high negative significance in determining the bank's profitability. Deposits to total assets ratio, bank size represented by ln (assets), and interest rate appears to have a positive impact, and GDP appeared to have a negative impact on profitability.

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INTRODUCTION

Profitability is considered the backbone of the banks and managers in order to satisfy shareholders. It is important to examine its determinants due to the fact that many countries including Lebanon base their financial scheme on banking system. This requires an understanding to these determinants. Taking the return on assets (ROA) as a proxy for measuring banks profitability is the most commonly used variable in previous studies. Several studies on the determinants of bank's profitability have been made by (Abiodun, 2012); (Adeusi, et al., 2014); (Akinkunmi, 2017); (Alexioul & Sofoklis, 2009); (Ally, 2014); (Azar, et al., 2016); (Alper & Anbar, 2011) (Capraru & Ihnatov, 2015); (Rachdi, 2013), that focused on different countries, time periods, databases, regulations, and used different variables like capital adequacy ratio, loans, deposits, credit risk, liquid assets, bank size, cost to income ratio and many other variables affect bank's profitability. The implication of banking profitability can be determined by both micro and macroeconomic indicators. (Ali, *et al*., 2011). Microeconomic factors are internal to a bank and can be controlled by the management, while macroeconomic factors are beyond management's control and hard to anticipate its influence.

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Research problem

There are uncountable scholarly articles on determinants of banks profitability. On the other hand, there is little evidence on the determinants of banks profitability in Lebanon. Studies about the determinants of bank's profitability in Lebanon are limited and still in debate. This raises the necessity of examining and studying some important factors contributing to Lebanese banking profitability researches. When several empirical evidences are made on this issue, banks become more aware of factors that mainly and directly affect Lebanese bank's profitability either negatively or positively.

Research Objectives

This study is conducted in order to satisfy the below objectives:

RO1) Determine the effect of total loans to total assets ratio on bank profitability in Lebanon.
RO2) Determine the effect of deposits to total assets ratio on bank profitability inLebanon.
RO3) Determine the effect of bank size on bank profitability in Lebanon.
RO4) Determine the effect of capital adequacy ratio on bank profitability in Lebanon.

RO5) Determine the effect of interest rate on bank profitability in Lebanon.
RO6) Determine the effect of economic growth (GDP) on bank profitability in Lebanon.
RO7) Creating a model that helps in forecasting and enhancing profitability.
RO8) Enhancing bank's profitability by controlling the determinants.

Hypotheses

The study teststhe below hypotheses:

H1: Total loans to total assets ratio affects bank profitability in Lebanon.
H2: deposits to total assets ratio affects bank profitability in Lebanon.
H3: bank size affects bank profitability in Lebanon.
H4: capital adequacy ratio affects banks profitability in Lebanon.
H5: interest rate affects bank profitability in Lebanon.
H6: economic growth (GDP) affects bank profitability in Lebanon.

Research Structure

The study starts with a literature about determinants of bank profitability. After which it presents variables, data collection method, sample, and empirical model. In the empirical part, data analysis method and fact finding results are presented, where regression analysis for 6 independent variables on ROA is conducted and a model is extracted in order to help in forecasting profitability. The last part presents the study limitations, conclusion and recommendations of the study.

Overview of the Banking Sector in Lebanon

Governments are striving to maintain a stable financial system since it is becoming the pillar of all economies worldwide. Globalization gives the financial system more opportunity for improvements, evolutions, and change. Factors that affect banks' profitability are changeable between countries and banks, due to different regulations, different management strategies and plans, different levels in risk taking, and different levels of capital. The regulatory environment requests the Lebanese banks to sustain a high capital adequacy ratio of 15%, at the end of 2018, while Basel Settlement asks them to maintain a minimum capital adequacy ratio of around 8%. The Lebanese banking control commission and the central bank of Lebanon doesn't impose restrictions on banks on their outflows and inflows, thus allowing them to undertake lending activities contingent to their level of capital.

Literature Review

Several empirical studies have been made on banking profitability to determine the factors affecting it. These factors are defined as Internal and external factors. Unlike external factors, internal factors are those that can be controlled by the bank. A study made by (Pilloff, 2002) found that bank size and profitability are positively correlated. (Ramlall, 2009) Discussed the relationship of both operational efficiency and credit risk with bank profitability, shows that they are positively and negatively correlated respectively. (Naceur, 2001), (Athanasoglou, 2008) Shows that capital for banks has a strong effect on their profitability. An empirical study made by (Kunt, 1998) found that economic recession and high inflation rates are caused by weak macroeconomic atmosphere in which it disables economies of scale. Whereas, efficient asset management and economic growth, credit risk and capital are negatively related to profitability. (Ali, et al., 2011). (Jahangir, *et al*., 2007) State that there exist a strong and positive relation of ROE and market size. (Staikouras & Wood, n.d.) In studying the EU banks covering the period from 1994 till 1998, found that both micro and macro-economic factors affect the profitability of banks.(Capraru & Ihnatov, 2015) Examines factors affecting profitability of 15 European countries during 2001-2011 using ROAA as a measure of profitability; found that bank size, and market concentration has an inverse relation with banks profitability, While macroeconomic variables like inflation and GDP, resulted in a direct relation with banks profitability. (Căpraru & Ihnatov, 2014) Analyze the determinants of banks profitability in five central and eastern European countries covering 143 banks, explored in 2004-2011. ROAA, ROAE, and net interest marginare used as a proxy for profitability. All profitability ratios are negatively influenced by bank size and positively influenced by capital adequacy growth and management efficiency. Credit risk and inflation found to have significant effect on ROAA and ROAE (Dabiri, et al., 2017).

Examines the effect of Islamic banks liquidity on profitability using a sample consists of five Islamic banks operating in the United Kingdom spanning the period 2005-2016. The results show that liquidity negatively affects profitability with a significant effect, as measured by ROA. (Alexioul & Sofoklis, 2009)Studies the micro and macro-economic factors that affect profitability in six Greek banks where most of micro economic factors appeared to have significant effect on profitability. Inflation appeared to have a positive but weak relation with bank profitability, this correlation may appear when Interest rates on loans decrease at a lower rate than those on deposits. GDP is found to have an insignificant relation with banks profitability. (Scott & Arias, 2011) Develop an econometric model that shows the determinants of profitability in the five best banks in the United States. The results support the positive relation between capital to asset ratio and ROE. During economic recessions, bank size has the great impact to compete in the market; however, these top five banks faced an increase in ROAA in the face of a decrease in GDP. (Bordeleau & Graham, 2010) Investigate the effect of liquid assets on profitability (ROE) of large banks in Canada and United States. Results show that banks profitability is enriched when it embraces liquid assets until certain level in which banks profitability starts to decrease. Together, when the economy face bad conditions and worsens, increasing the probability of illiquidity, the profit from liquid assets decrease. Unemployment found to have a negative effect on banks profitability. Inflation resulted in a negative and significant relation with banks profitability. Net interest margin and return on equity symbolize profitability. Net interest margin, which is derived from investments and loans, is a creditworthy measure for a bank's performance (Reda, et al., 2016). The analysis of performance of banks pointed that NIM, deposits, earnings, bank size, expenses, and number of employees are all factors that cause a decrease in banks profitability. Capital ratio is a vital measurement tool, where well capitalized banks have greater opportunity to achieve favorable results. Inflation, economic growth, and interest rates stimulate default risk because they interrupt the reimbursement of the borrower. (Tariq, *et al*., 2014). (Abdul-Jalil, n.d.) Study empirically the profitability of conventional banks and Islamic banks in Qatar

covering the period from 2010 till 2014, with a total of 8 banks; found that banks' size and liquidity have positive significant effects of both types of banks. (Francis, 2013)Investigate the elements that determine profitability of banks in Sub-Saharan Africa. The sample included 216 banks selected from forty two countries spanning the period from 1999-2006; Found that bank deposits, and capital adequacy ratio are significantly and positively related to banks profitability. Banks have more ability in increasing profits and controlling credit risk problems when there is high margin of interest rates. Loans to total assets ratio (liquidity), and cost to income ratio are found to have a negative but significant effect on banks profitability. On the other hand, economic growth GDP and inflation show significant and negative effect on profitability (Saad & El-Moussawi, 2012). Examine the determinants of banks profitability, measured through net interest margin, in Lebanon selecting thirty nine banks spanning the period from 2000-2010. Results of study support the positive relationship between capital and Lebanese banks profitability. Market concentration shows a significant and positive relation with net interest margin. Efficiency in costs widens market share and increases profitability. Credit risk found to negatively and significantly affects net interest margin. High credit risk means higher costs of bad debts and non-performing loans thus less returns and profitability. Inflation appeared to have an insignificant effect on net interest margin due to management control over it. GDP found to have a positive and significant impact on NIM.(Azar, *et al*., 2016) Compared the effect of some external variables on banks profitability, measured through (ROAA), in Lebanon. The results are based on thirty nine selected banks explored 2003-2014. It was found that non-interest income, net interest margin, and cost to income ratio al affect significantly and positively banks profitability, whereas, capital adequacy ratio is negatively and significantly related to banks profitability.(Hamadi & Awdeh, 2012)Analyze the variables that determine bank's net interest margin in the Lebanese banking sector; Show that bank size, liquidity and capital adequacy ratio significantly but negatively influences net interest margin. Deposits, lending, inflation, central bank discount rate, national saving, domestic investment were found to positively and significantly affect net interest margin. (Reda, *et al.*, 2016) Examine several internal factors that affect profitability measured by net interest margin. The sample of study composed of 24 Lebanese banks and investigation span the period 2000-2015. Loans and loans to deposits ratio are found to significantly but negatively affects net interest margin. Equity to assets and equity to liabilities ratios, used as measures of capital adequacy tend to strongly affect NIM positively. Lower interest rates on deposits also have positive effect on banks profitability.

Data Collection Method: The purpose of this study is to examine the determinants of banking profitability in Lebanon and how they affect it with return on assets in focus. The study uses bank-specific and macroeconomic variables to analyze their effect on profitability of a group of selected banks in Lebanon. Thus, data collected is a secondary data based on numbers and statistics originated from the annual consolidated financial statements of selected banks. Data collection results in identifying statistical relationships between specified variables, while the final statistical report results in correlations, regression analysis, and normality test to determine type of relationship between the dependent variable and other independent variables, and their level of significance. The research method used in this study is the quantitative method.

Sample

The sample of study incorporated 13 banks in Lebanon namely, Byblos bank, BBAC bank, BLC bank, Bank Audi, Bank of Beirut, BLOM bank, Fenicia bank, First national bank, IBL bank, Credit bank, Credit Lebanese Bank, Jammal Trust Bank, and BSL bank. The sample of this study is an unbalanced panel dataset observed over a 10 years period from 2007-2016.The data of this study is collected from the published annual reports of these selected banks, extracted from their websites. For data analysis, regression, correlation analysis, normalityand other tests were prepared. In order to investigate the determinants of bank profitability, the study includes 7 variables, one of them is the dependent variable and the others are independent variables. The independent variables compromise internal bank-specific and macroeconomic variables that determine the bank profitability.

Dependent Variables: Previous studies have used different measures of bank profitability including return on assets (ROA), net interest margin (NIM), and return on equity (ROE). (Samad, 2008) Define ROA as earnings per unit of asset and the ability to alter this asset into earnings. It is expressed in percentage (%). A high ROA ratio indicates a high profitability and efficient use of assets. Many financial regulators believe that ROA is the best indicator for bank performance and profitability (Abdul-Jalil, n.d.). In this study, following (Azar, *et al.*, 2016), (Rachdi, 2013), (Alshatti, 2015), (Al-Qudah & Jaradat, 2013), (Simiyu & Ngile, 2015), (Akinkunmi, 2017), (Rahman, *et al*., 2015) ROA is used as a measure of bank profitability.

Independent Variables: (Qin & Pastory, 2012),(Gul, *et al*., 2011),(Nimer, *et al*., 2015), (Saad & El-Moussawi, 2012) and others support the idea that both macroeconomic and bank-specific variables are significantly important for banks profitability. High profitability may be achieved by different ratios of equity, deposits, loans, economic growth, and market concentration.

Bank-Specific or Internal Independent Variables: Internal variables are determined and controlled by the management's decision making process. The study uses the following 4 bank-specific variables as determinants of bank profitability:

- **Loans**: loans are considered as the bank's market product. They take money from depositors and then lend the money to customers. The profits spread here is between interest paid by banks to depositors and the rate obtained from customers on loans. Loans are represented as (total loans to total assets ratio, LTOA).
- **Deposits**: deposits are considered the core source of funds characterized with low costs.Deposits are represented as (deposits to total assets ratio, DTOA).
- **Bank size**: most of previous studies use total assets as a measure of bank size. In this study, bank size is represented as (LnAssets).
- **Capital adequacy**:capital adequacy represents bank's capital strength. Well capitalized banks have lower chances of becoming bankrupt. It is represented as CAPADEQ.

Macroeconomic or External Independent Variables: Profitability of banks is affected by the macroeconomic

factors. In this study, 2 macroeconomic variables are used: GDP and real interest rates.

- **Annual real GDP:** it is represented as the sum of all economic activities in the country. It is anticipated to have an effect on the supply and demand of bank loans and deposits.
- **Real interest rate:** Affects the willingness of consumers and businesses to take loans or put deposits.

Data Analysis Method: The study aim is to obtain accurate results and statistics, so used tools include correlation, regression analysis, residual graphs, and normality tests. Correlation is used to know the type of relationship, positive or negative, between each independent variable and the dependent variable. The regression method used is the panel least square regression using fixed effects. It is applied before and after removing outliers. Analysis helps us in determining the significance (p-value) of each independent variable and the extent to which all these variables can influence the dependent variable (R squared).Moreover, it can obtain the P-value of the F statistic which is important to determine the overall significance of the model, and the Durbin Watson stat which predicts weather there's autocorrelation or not. Lastly and more importantly, it determines the overall design of the model and its coefficients.

Estimated equation: $ROA_{it} = \beta_0 + \beta_{1LTOAit} + \beta_{2LNAit} + \beta_{3INTRit} + \beta_{4DTOAit} + \beta_{5GDPit} + \beta_{6CAPit}$

FINDINGS AND RESULTS

This section includes the results of the study which includes regression analysis, correlations, residuals and normality tests.

Correlation Results: Correlation results between ROA and the selected independent variables are showed in Table 1.

Regarding the bank specific microeconomic variables, the results of the correlation indicate that total loans to total assets ratio (LTOA) have a negative and weak correlation with the dependent variable ROAA. This is consistent with the study of (Staikouras & Wood, n.d.). Ln (assets) appeared to be positively correlated with ROAA, where total assets represent the bank size. This positive relationship indicates that the bank size have a positive impact on profitability. It reveals that larger banks may achieve higher ROAA. This is consistent with the study of (Guillen, et al., 2014). Total deposits to total assets ratio (DTOA) appeared to be negatively correlated with bank profitability. Therefore, it reveals that deposits have a negative effect on banking profitability, and that banks that consider deposits as a source of funds, will achieve lower ROAA. Capital adequacy ratio shows a positive correlation with ROA. This means that banks that are well capitalized achieve higher returns on assets. This is consistent with the study of (Al-Qudah & Jaradat, 2013). Regarding the external factors to the bank or the macroeconomic variables, the results of the correlation indicate that GDP and interest rate correlate negatively with ROA. This is consistent with the studies of (Scott & Arias, 2011) and (Simiyu & Ngile, 2015).

REGRESSION RESULTS

Here we examine the effect and the significance of each independent variable on ROA, residual graphs, and normality tests. The above figure shows, there isn't so many gaps between the actual and fitted Y. Test of normality, figure 2, is prepared to make sure that the distribution is normal. Kurtosis shows the degree of flatness of the curve. Results show a kurtosis of 2.96 which is reasonably good for a normal distribution. So it is not concentrated towards a single value. The curve appeared to be symmetrical, and skewness of 0.36 which indicates that there's no skewness.

Table 1. Correlation Matrix

	ROA	LTOA	LNA	INT. RATES	DTOA	GDP	CAPADEQ
ROAA	1.000						
LTOA	-0.079	1.000					
LNA	0.314	0.240	1.000				
INTERESTRATE	-0.019	0.043	0.053	1.000			
DTOA	-0.001	-0.216	-0.167	-0.109	1.000		
GDP	-0.167	0.262	0.126	0.172	0.072	1.000	
CAPADEQ	0.057	-0.186	0.273	0.214	-0.105	0.072	1.000

Prepared By Author

Table 2. Panel least squares results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTOA	-0.014	0.005	-2.826	0.005
LNA	0.008	0.092	0.085	0.932
INTERESTRATE	0.006	0.005	1.079	0.283
DTOA	0.006	0.007	0.878	0.382
GDP	-0.001	0.001	-0.987	0.326
CAPADEQ	-0.024	0.006	-3.647	0.001
C	1.175	0.892	1.317	0.191
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.746	Mean dependent var		1.019
Adjusted R-squared	0.70	S.D. dependent var		0.312
S.E. of regression	0.171	Akaike info criterion		-0.547
Sum squared resid	2.896	Schwarz criterion		-0.101
Log likelihood	51.28	Hannan-Quinn criter.		-0.366
F-statistic	16.22	Durbin-Watson stat		1.615
Prob(F-statistic)	0.000			

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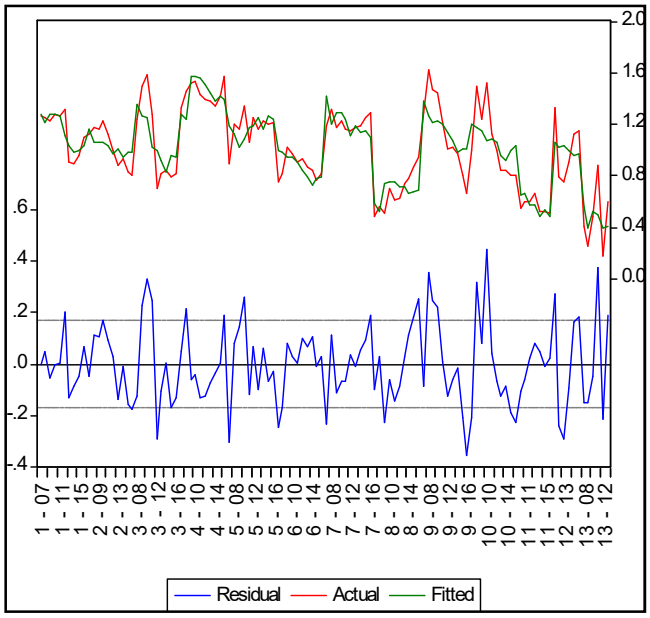

Prepared by Author

Figure 1. Actual Versus Fitted Residuals

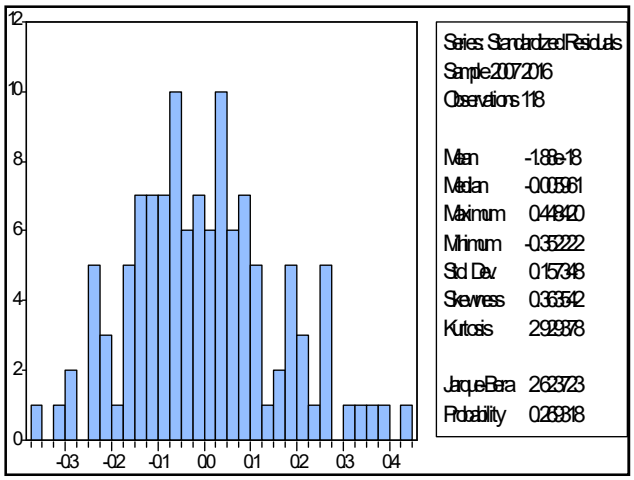

Figure 2. Normality Test Plot

Regression Analysis

Regression results for the whole model are represented in Table 2. The value of the R-squared obtained with this model is 0.74 which means that 74% of the variation in ROA (dependent variable) is explained by LTOA, LNA, INTERESTRATE, DTOA, GDP, and CAPADEQ (independent variables). This high obtained value (74%) of R squared means that the model is nicely fitted. Compared to other studies, this value of R squared is considered good and high. The remainder 26% variation in ROA, the dependent variable, can be explained by other factors or variables that are not included in our model. Moreover, as we can see that adjusted R squared is %70 which is not far from the R squared %74, which is a good sign for data fitness. The probability of the F-statistic is 0.000 which means that the whole model and its variable's coefficients arestatistically significant to ROA; this is a good sign. Durbin-Watson stat is 1.61 indicating that there is no auto correlation between errors. Results obtained from regression show that total loans to total assets ratio have a negative and significant impact on ROA with a coefficient of -0.0142. So any increases in this ratio leads to decrease in profitability mainly ROA. Bank size measured by Ln (assets) appeared to have a positive and insignificant effect on ROA with a coefficient of 0.00792, Thusas total assets of a bank increases by 1 unit, then ROA increases by 0.00792 units. Deposits to total assets ratio appeared to positively but insignificantly affect ROA with a coefficient of 0.006496, therefore the more the deposits of 1 unit the higher the profitability of 0.006496 units. Capital adequacy ratio appeared to negatively and significantly affect ROA with a coefficient of -0.024647. Thus, capital adequacy ratio does determine ROA. As capital adequacy ratio increase by 1 unit, then the bank will achieve lower returns on assets by 0.024647 units. Macro-economic factors show insignificant relation with profitability. Interest rate found to have a positive effect on ROA with a coefficient of 0.006043. Any increases in levels of interest rates by 1 unit cause an increase in ROA by 0.006043 units. GDP is found to have a negative effect on ROA with a coefficient of -0.001746, thus an increase in GDP by 1 unit, results in a decrease in ROA by 0.001746 units.

After regression results, we can write the model of the study as follows:

ROA = 1.175540 – 0.014273 LTOA + 0.007922 LNA + 0.006043 INTERESTRATE + 0.006496 DTOA – 0.001746 GDP – 0.024647 CAPADEQ.

Conclusion

Bank managers are responsible of internal decision making and they have to understand the major bank characteristics that are related to bank profitability. Moreover, anticipating changes in external environment is also a necessity for sustainable growth. This study has determined some internal and external factors, or macroeconomic factors that affect banking profitability in Lebanon. The sample consisted of 13 Lebanese banks studied over the period 2007-2016. Panel least squares was used for the estimation of results for correlation and regression. In this study, six variables are considered which are loans, deposits, bank size, capital adequacy ratio, interest rate, and GDP were examined for banks profitability. First, correlation results of this study suggested that total loans to total assets ratio and deposits to total assets ratio have a negative effect on return on assets (ROA). Secondly, results showed that capital adequacy ratio positively affects ROA. This may be due to bank's strength and so increase in their equities, while the number of shareholders remains unchanged, due to the fact that most of banks in Lebanon are private. Third, correlation results suggested that total assets which are a measure of bank size have a positive effect on banks profitability measured as ROA. Regarding the macroeconomic variables, the study did not find a significant relation with profitability, even though interest rate and GDP are negatively related to ROA.

Regression analysis results showed that the whole model is significant. Specifically, it showed that capital adequacy ratio and total loans to total assets are the 2 variables that are highly significant and can highly determine the profitability of the bank measures as return on assets (ROA). As for the empirical model, the independent variables deposits to total assets ratio, bank size measured as Ln (total assets), and interest rate appeared to have a positive impact on return on assets (ROA). Whereas, total loans to total assets ratio, capital adequacy ratio, and GDP appeared to have a negative impact on return on assets (ROA).

Study Limitations and Recommendations: During the research we have faced several limitations. First, some banks publish only the annual reports of the last 5 years, and there is nosufficient data on quarterly basis on their websites. This forced us to study the variables annually. If we were to make the study on quarterly basis, we would obtain more observations and so bigger sample and more accurate results.

The study highlighted some important issues and topics that need further research. We recommend investigating the effect using quarterly data. Further research may look for a bigger sample and more observations. Other areas require depth investigation on the determinants of bank profitability in Lebanon, including effect of increased liquid assets, provisions on loan losses, operating costs and taxes. We recommend the use of more than one measure of profitability in the same study so researchers can compare the effect of all selected independent variables on profitability from different proxies like net interest margin (NIM) and return on equity (ROE). Moreover, we recommend expanding the study to the MENA region. We also recommend using other regression methods to study the effect in a different way. This would result in a better impression of the whole model presentation and performance, and allow comparison between results obtained with the methods used.

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