



# **DETERMINANTS OF BANKS PROFITABILITY, ANALYZING THE ROLE OF REMITTANCE: EVIDENCE FROM LEBANON**

**Jumana Mohammad Toufaily**

Cyprus International University, Cyprus

[jomana\\_tofayli@hotmail.com](mailto:jomana_tofayli@hotmail.com)

## **Abstract**

*This paper empirically examines the influence of bank internal and external determinants factors of bank profitability in Lebanon with a panel data. 13 Lebanon commercial banks were sampled and internal factors such as capital adequacy, credit risk, liquidity risk, and bank size as well as macroeconomic variables such as inflation, and interest rate together with remittance are analyzed to determine their impact on bank profitability. Fixed and random-effect panel data analysis for the period spans from 2005Q1 to 2017Q4 was employed. Result reveals that bank specific variables such as liquidity risk, bank size, credit risk, and capital adequacy were found to be significant to the bank profitability in Lebanon. Meanwhile, only inflation and remittance was found to be significant out of the three macroeconomic variables included in the study.*

*Keywords: Remittance, Bank profitability, Fixed and Random- effect panel model, Lebanon*

## **INTRODUCTION**

In the last two decades, the banking has witnessed significant changes across the world, owing to the influence of technological development, deregulation, and globalization. Several factors which could be internal or external has one way or the other impact on the structure and functioning of banking industry in many countries. Even in the presence of increasing trend in the direction of bank disintermediation that is being witnessed in many countries around the world, the function of banking industry in any country is very significant in providing finances for the economic activities of such country in general and for different sector of the economy.

The ability of any bank not to be affected by the negative shock and still provide contribution to the financial sector of the country lies solely on the efficient and profitability of the banking industry. Thus, the contributions to the bank performance have been an interesting areas to researchers, regulators, bankers and analyst, and policy makers. Literature on the bank performance has been prolific (Ally, 2014; Goddard et al. 2004; Islam et al, 2017).

The Lebanon banking system is occupying a significant position in Lebanon financial system which is anchored on the global banking framework that authorized legally the commercial banks to provide various services in the financial markets. The banking sector acts essentially as a life blood of modern and economic development. It provides businesses and consumers with access to capital and investment that are vital to a healthy and growing economy.

The banking sector is the backbone of Lebanon's financial system and acts as financial intermediaries in the economic growth processes, channeling funds from lenders (savers) to borrowers for investment. As financial intermediaries, banks are the key providers of funds and their financial stability is paramount importance to the financial system and for the economy. Such an understanding and studying the determinants of their profitability and the factors of bank profitability is essential and crucial for the stability of the economy. This paper seeks to identify the determinants of Lebanese bank's profitability analyzing the role of remittance by examining the bank specific industry and macroeconomic variables and remittance.

The drivers of bank's profitability that are considered in this paper are in two parts, internal and external drivers in addition to remittance. Internal drivers can be defined as those factors that are affected by a bank's management decisions and objectives, while external drivers are those factors that cannot be controlled by bank's management. They represent events outside the influence of the bank. However, the management can expect changes in the external environment and try to position the institutions to take advantage of anticipated development.

The importance of migrants' remittance in the bank's profitability cannot be over-emphasized. It has remained a significant and growing source of funds from abroad for many developing countries among which is Lebanon. The inflow of the remittance has continue increasing over the years and form a large source of foreign earnings in comparison to other financial flows.

In reference to World Bank (2018), the global remittances reached \$613 Billion, and out of this figure, payments to low and middle income countries stood at \$466 Billion. This figure rose up with about 8.5% from the \$429 billion for the year 2017. The average annual growth of remittance to Lebanon over the period 2003 – 2017 was around 13%, and the figure is higher

than the average rate for Arab region (10.1%) over the same period (World Bank, 2018). This is an indication that despite the ups and downs the country experienced during the observed period, it still stands out as a major beneficiary of remittance. According to World Bank (2018), the remittance share of Lebanon GDP was put at 14.5%.

The flow of remittance is a major source of foreign currency for achieving the stability in Lebanon current account balance, especially in country facing a structural trade deficit. Moreover, remittance to Lebanon like any other developing countries, nourishes the country economy and it was one of its main components of survival during tough times. The link between remittance, bank's profitability and growth is an important issue for Lebanon. Remittance is transferred through banks as a channel. Recipient families transfer a portion of this remittance in a saving accounts and this helps increase the liquidity of a bank and enables bank to provide businesses and consumers with loans. Moreover, this loan is used in investment that leads to economic growth.

Therefore, this study is aimed to examine the determinants of bank profitability in Lebanon, including remittance by employing the data of 13 banks over the period 2005 – 2017.

The rest of the paper is structured as follows: relevant literature were reviewed in the next section; the data and methods used was discussed in section 3; while empirical findings and discussion, and conclusion is presented in section 4 and 5 respectively.

## LITERATURE REVIEW

Various previous scholarly articles abounds on the determinants of bank profitability. In the literature, the determinants have been examined from two categories of bank determinants, namely the internal and external factors. Internal factors are those affected by banks' management decisions such as those used in this study capital adequacy, credit risk, liquidity risk, and bank size (Gungor, 2007), while external factors are those that can't be controlled by banks' management, but they influenced its operation and performance. External factors used in this study are inflation, interest rate, and remittance.

Staikouras and Wood (2003) examined the performance of European bank by applying time series and cross -sectional analysis for the period 1994-1998. The result of this study shows that the profitability of the European bank is affected by macroeconomic factors and management decision factors. Flamini et al. (2009) in their study argued that aside credit risk, there is also a relationship between return on assets (ROA) and bank size. The study stated that that the higher the bank size, the higher the ROA. The study corroborated the study of Pasiouras and Kosmidou (2007) who found a positive and significant relationship between bank profitability and the size. Similar study was conducted by Khrawish (2011), and the study found

a significant and positive relationship between return on assets (ROA) and bank size. Meanwhile, Samad (2015) could not established influence of bank size on profitability in their study.

Recently, Ally (2014) investigates the influence of internal and external factors on the bank profitability in Tanzania, employed a panel data of 23 banks from 2009 to 2013. The study found that internal factors are the major determinants of banks profitability in Tanzania, and found the macroeconomic factors influence on the bank profitability to be insignificant.

In the study of Naceur (2003) that investigates the influence of banks characteristics and macroeconomics factors on bank net interest margin (NIM), and capital adequacy. Naceur (2003) was corroborated by Dietrich and Wanzenried (2009) who conducted similar study in Switzerland and concluded that a significant positive relationship exist between bank profitability and capital adequacy. The result is similar to Sayilgan and Yildirim (2009), who established similar result in Turkey. Javid, Anwar & Gafoor (2011) examined the determinants of bank profitability in Pakistan for the period 2004-2008 by applying pooled ordinary least squares (POLS). The result shows that banks with high level of capital appear to have more security and to achieve more profits. The also further shows that bank size has a direct association with bank profitability. As they argued that the higher the size, the higher the bank profitability. In a similar study in Jordan, Ramadan, Kilam, and Kaddumi (2011) explored factors that determined bank profitability in the country. Their study revealed that capital adequacy is highly related to bank profitability, while their study found no significant effect of bank size on the profitability of banks in Jordan.

In a recent study, Lee and Hsieh (2012) investigated the relationship between capital and profitability by applying panel data Generalized Method for 42 Asian countries over the period 1994-2008. The result shows that capital has a positive significant impact on bank profitability in addition he proposed that these countries have to promote their financial efficiency by developing its banking system. Tariq et al. (2014) conducted a study on Pakistan commercial banks' profitability, the results shows that capital adequacy is significantly related to banks profitability. The study also found that bank size has a direct association with bank profitability. As they argued that the higher the size, the higher the bank profitability.

Credit risk as a determinant of banks profitability was examined by Bashir (2003), the study investigates the inverse association between credit risk and bank profitability, and found that high loans bring high risk and create problem in the bank profitability. This study was in consistent with Duca and McLaughlin (1999) who did similar study and earlier found that the problems in the bank profitability is highly correlated with difference in credit risk. And argued that, an exposure to credit risk will result to decline in the bank profitability. Bessis (2011)

argued that credit risk is significant in the bank profitability, as only minimum sizable number of customers failed to repay the loan and this could not pose a major threat to the bank profitability.

Regarding the same topic Rjoub (2013) suggested that low level of liquidity is the main reason behind every bank failure. Gunes (2014) proposed that reducing the level of risk and having a stable control over credit risk will increase the profitability of the bank. Taha (2013) concluded that credit risk causes a decrease in the return on assets ratio of bank profitability.

Tariq et al. (2014) opined on the influence of liquidity risk to bank profitability that it is actually an internal factor that is directly related to bank risk administration. The study suggested that a little level of liquidity is dangerous to banking profitability and this is the reason why it is of much concern to scholar in identifying how much of a threat is it to bank profitability. Recently, Rahman, Hamid, and Khan (2015) investigate determinants of bank profitability using the three measures of bank profitability (ROA, ROE, and NIM) using Bangladesh banks. The results show that there is non-uniformity in the results in reference to the different measures of profitability. In the study, credit risk is found to be a determinant for NIM, bank size was found to have positive and significant influence on ROA, while inflation was found to have negative and significant on both ROA and ROE. Moreover, Islam et al. (2017) explored the determinants of bank profitability in Bangladesh. The study found credit risk to be negative and significantly related to bank profitability. The study concluded that, the higher the credit risk assumed by a bank, the more the number of defaulted loans. In other words, the more the number of loan defaulters, the greater the negative consequence on bank profitability (Islam et al. 2017).

Guru, Staunton, and Balashanmugam (2002) explored an inverse association between liquidity risk and profitability. The study found a mixed result. It found that liquidity is a consequence of variation between the maturity period of assets and liabilities sizes. It was inferred from the study that the present value of the assets is not adequate to fulfil the present responsibilities (Joel, 2002; Bessis. 2002).

Inflation is a significant determinant of bank profitability (Tariq et al, 2014). As examined by Guru et al. (2002), the study established that when inflation increases, it has a positive and significant association with bank profitability. The study was in line with Abreu and Mendes (2001) who found an inverse relationship between inflation and bank profitability in European banks. Meanwhile Sharma and Mani (2012) argued in their study that the influence of inflation on bank profitability is non-significant. However, Zeitin (2012) who did a panel study of Gulf Cooperation Council countries, found that inflation is negatively related with bank profitability.

In a country where their capital market and banking sector is well established and the profit making is associated with the GDP growth rate, such country bank interest rate is related

to the bank profitability (Tariq et al, 2014). This suggestion was in line with Staikouras & Wood (2003) who found that direct and significant association between bank profitability and interest rate.

Meanwhile, several studies abound on the remittance and economic growth. It is believed that economic growth is a determinant of bank profitability (Ally, 2014), and evidence has shown that remittance contributes to economic growth of remittance origin country (Fayissa et al, 2012; Nazam, Mubeen, & Akram, 2016; Shazad, Adnan, & Raza, 2014). It is therefore necessary to explore the possibility of remittance contribution to bank profitability.

Fayissa and Nsiah (2008) examined that in countries where financial system is not strong, remittance acts as an alternative source for financing investment which improves economic growth. Moreover, Hobeika (2009) found that remittance to Lebanon improves the liquidity of the Lebanese banks. Giuliano & Ruiz-Arranz (2009) investigated the relationship between remittances, financial development and growth for 100 developing countries. The result shows that remittance affects positively the growth in countries where financial development is not very strong.

Oke et al. (2011) examined the relationship between remittances and financial sector development by applying Ordinary Least Squares and Generalized method of Moments for the period 1977 to 2009. The result shows that remittances effect positively the financial sector development except the ratio of private credit to GDP.

Fayissa et.al (2012) investigated the relationship between remittances and financial sector development for the period 1985 to 2007 by using 44 countries 25 for Africa and 15 for America. The results show that remittances have positive significant on exchange rate stability and financial sector development. Shazad, Adnan, Raza (2014) investigated the impact of remittances on financial development in South Asia for the period 1989 to 2011. The result shows that remittances have positive significant on the financial sector development.

Sibindi (2014) examined the relationship between remittances, financial development and economic growth in Lesotho. The result shows that remittances have positive impact on financial development and growth. Javid, Qayyam and Arif (2014) examined the relationship between remittance, poverty reduction and economic growth by using Autoregressive Distributed Lag (ARDL) and the result shows that remittance has positive significant on economic growth and impact on poverty reduction.

Nazam, Mubeen, Akram (2016) examined the impact of foreign remittances on financial development of Pakistan by using multiple regression model. The result shows that remittances effect positively the economic growth of Pakistan, but it has no significant relationship with exchange rate and inflation.

Meyer and Shera (2017) examined the impact of remittances on economic growth by applying panel data model of six high remittance receiving countries during the period 1993-2013. The results indicate that remittances have a positive significant on the economic growth. Similar study was conducted by Gabriela, et al. (2017), the study investigated the impact of remittances on financial development and economic growth. The result shows that remittances have positive impact on credit market development and bank deposits.

Though literature abounds on the banks profitability and its determinants for both developed and developing countries, but empirical research on the Lebanon banks profitability are scant. Most especially in examining the role of remittance in the Lebanon bank profitability. Thus, this study seeks to fill these significant gap in the existing literature and enhance the understanding of Lebanon banks profitability determinants and the contribution of remittance.

## RESEARCH METHODOLOGY

### Data source and Description

This paper probes into influence of remittance on Bank profitability in Lebanon. Additionally, 13 banks were selected, and their financial data were retrieved from 2005 to 2017 as the research sample. The variables are structured as follows, with their description presented in table 1.

Table 1. Definition and description of the variables

Symbol	Variables	Proxy	Expected Relation	Source of data
<b>Dependent Variables</b>				
ROA	Return on Average Assets	Net Income/Average Asset (%)		Bank scope
ROE	Return on Average Equity	Net Income/Average Common Stock Equity (%)		Bank scope
NIM	Net Interest margin	Difference between interest income and interest expense/Total assets of the bank (%)		Bank scope
Bsize	Bank size	Logarithm of total assets	+/-	Bank scope
Adequacy	Capital Adequacy	Equity/Total Assets (%)	+/-	Bank scope
Lrisk	Liquidity Risk	Loans/customer deposits (%0	-	Bank scope
Crisk	Credit Risk	Impaired Loans(NPLs)/Gross Loans (%)	-	Bank scope
INF	Inflation	Annual %	+	World Bank
INT	Interest Rate	Annual %	+/-	World Bank
REM	Remittance	Billion Dollar	+	World Bank

The data utilized in the study consist of return of average assets (ROA), return on average equity (ROE), net interest margin (NIM) as dependent variables; while, inflation, interest rate, bank size, liquidity risk, credit risk, remittance, and capital adequacy are independent variables. The bank specific-data were extracted from Bank scope of the Lebanese bank, while the data for Inflation, Interest rate and Remittances are obtained from the World Bank for the same period.

**Returns of average assets (ROA).** Is the ratio of net profit over total assets. It measures the profit earned per dollar of assets and reflects how well bank management uses the bank's investment resources to generate profits (Flamini et al, 2009; Khrawish, 2011).

**Returns on average equity (ROE).** Measures the rate of returns on the ownership interest (Shareholders' Equity) of the common stock owners. It measures a firm's efficiency at generating profits from every unit of shareholders equity. Returns on equity is the ratio of net income to total equity (Fraker, 2006).

**Net interest margin (NIM).** The NIM variable is defined as net interest income divided by total assets. It represents the profit earned by banks on interest activities (Berger, 1995; Naceur and Goaid 2001).

**Inflation (INF):** affects the banks pricing behavior, and hence if banks expect general inflation to be higher in the future, they may believe that they can increase their prices without experiencing a decline in the demand for their output (Driver and Windram, 2007).

**Interest Rate (INT):** It is the rate a bank or other lender charges to borrow its money, or the rate a bank pays its savers for keeping money in an account.

**Bank size (BS):** is measured by the logarithm of total assets (Log A). The banks size affects the profitability and normally considered positive (Naceur & Goaid, 2008; Dietrich & Wanzenrid, 2009)

**Liquidity risk (LR):** It is measured by loans to deposit ratio

**Credit risk (CR):** The ratio of provision for loan losses to total loan.

**Remittance (REM):** It is defined as money transferred by foreign workers from foreign countries to their home countries (Beck and Peria, 2011)

**Capital adequacy (CAL):** It is measured by the ratio of equity to total assets. It is used as one of the determinants of bank profitability since it indicates the financial strength of bank (Athanasoglo et al, 2005)

## Research Design

The Panel data analysis is an increasingly popular form of longitudinal data analysis among social and behavioral science researchers. It is a cross-section or group of people who are

surveyed periodically over a given time span. Panel data analysis is being considered appropriate in this study since it involves 13 banks with a time span from 2005 to 2017. Given that the phenomenon researched is described numerically and not in a narrative fashion, I have chosen to use a quantitative approach. The quantitative study consists of quarterly observations of 13 banks gathered between the years 2005 and 2017. By using quarterly instead of yearly data, more variation in the time series can be observed. However, since some financial variables are only available on an annual basis, we employed quadratic method in Eviews to transform the data into quarterly data. With a time, series structured into quarters both periods of deep recession and high economic growth are covered. The method enables adjustment for seasonal variations in the data when the data are transformed from low frequency into high frequency by decreasing the point-to-point data variations (Shahbaz et al, 2017).

### The Panel Data Analysis Equation

The panel data for a regression analysis is expressed as follows:

$$Y_{it} = \alpha_i + \beta_1 X_{it} + \beta_2 X_{2it} + \dots + e_{it} \dots \dots \dots \text{(equ. 1)}$$

Where,  $Y_{it}$  is the value of dependent variable for country  $i$  in the period  $t$ .  $\alpha_i$  is the parameter of equation for country  $i$ .  $X_{it}$  is the vector of independent variables,  $\beta$  Vector of coefficients that are common among the countries and  $e$  is error term for country  $i$  in the period  $t$ .

However, the panel data equations for this study are:

$$ROA = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 CAL_{it} + \alpha_3 CR_{it} + \alpha_4 LR_{it} + \alpha_5 INF_{it} + \alpha_6 INT_{it} + \alpha_7 REM_{it} + \mu_{it} \dots \dots \text{(equ. 2)}$$

$$ROE = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 CAL_{it} + \alpha_3 CR_{it} + \alpha_4 LR_{it} + \alpha_5 INF_{it} + \alpha_6 INT_{it} + \alpha_7 REM_{it} + \mu_{it} \dots \dots \text{(equ. 3)}$$

$$NIM = \alpha_0 + \alpha_1 BS_{it} + \alpha_2 CAL_{it} + \alpha_3 CR_{it} + \alpha_4 LR_{it} + \alpha_5 INF_{it} + \alpha_6 INT_{it} + \alpha_7 REM_{it} + \mu_{it} \dots \dots \text{(equ. 4)}$$

In equation 2, 3, & 4 respectively, ROA = the return on average assets, ROE = return in average equity, NIM = net interest margin, BS = bank size, LR = Liquidity risk, CR = credit risk, INF = inflation, REM = remittance, CAL = capital adequacy, and INT = interest rate. Also  $i$  is the banks in the panel data set, while  $t$  is the period 2005 to 2017.

### The Constant Coefficients Model

One type of panel data model has constant coefficients, referring to both intercepts and slopes. In the event that there is neither significant country nor significant temporal effects, we could pool all of the data and run an ordinary least squares regression model. Although most of the times there are either country or temporal effects, there are occasions when neither of these is statistically significant. This model is sometimes called the pooled regression model. The major problem with the pooled regression is that, it does not distinguish between the various units that

we have in the panel. In other words, by combining all the units in the panel, we deny the heterogeneity or individuality that may exist among the sections.

### The Fixed Effects Model

Another type of panel data model would have constant slopes but intercepts that differ according to the cross-sectional (group) unit - for example, the banks as in the case of this study. Although there are no significant temporal effects, there are significant differences among the sections in this type of model. While the intercept is cross-sectional (group) specific and in this case differs from unit to unit, it may or may not differ over time. These models are called fixed effects models. In fixed effect model, there are two ways to do estimations which are within effect and between effect estimation. The estimators produce identical slope of non-dummy independent variables but they produce different parameter estimates (Wooldridge, 2012). Fixed effect models treat differences of individual specific effect,  $\mu_i$  in intercepts and it assume same slope and constant variances across cross sectionals. Since individual specific effect is time invariant,  $\mu_i$  are allowed to be correlated with other independent variables (Wooldridge, 2009). The fixed effect model is thus presented as follows:

$$Y_{it} = (\alpha + \mu_i) + X_{it}\beta + V_{it} \dots\dots\dots (\text{equ. 5})$$

Where:

$Y_{it}$  = Dependent variable

$X_{it}$  = Independent variables

$V_{it}$  = Zero mean random disturbance with variance

$\mu_i$  = an unobserved individual specific effect

$\beta$  = model coefficient

### The Random Effects Model

The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrected with the predictor or independent variables included in the model. Random effects model studies how cross section and/or time series affect the error variance. An advantage of random effects is that we can include time invariant variables. In the fixed effects model these variables are absorbed by the intercept. The model is thus presented as follows:

$$Y_{it} = \beta X_{it} + \alpha + \mu_{it} + \varepsilon_{it} \dots\dots\dots (\text{equ. 6})$$

Where,

$\varepsilon_{it}$  = within-entity error

$\mu_{it}$  = between-entity error

Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. In random effects we need to specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that some variables may not be available leading to omitted variable bias in the model. Random effects allow generalizing the inferences beyond the sample used in the model.

### **Random Effects or Fixed Effects Model (Hausman Test)**

To decide between fixed or random effects we can run a Hausman test, where the preferred model for the analysis is chosen. Random effects vs. Hausman test is based on relation or in-relation between estimated regression errors and direct variable of model (Bole & Rebec, 2013). If we had relationship, our model has random effect and if we do not have this relationship, our model has fixed effect (Greene, 2008). In order to make a decision after conducting Hausman test, the null hypothesis states that random effect model is appropriate, while alternative hypothesis considered fixed effect model to be appropriate.

If the two variables are significantly different,  $H_0$  is rejected, implying that the fixed effects model should be used, and vice versa. The Hausman tests in this study, conducted prior to running the regressions, all suggest the use of random effects models.

## **EMPIRICAL FINDINGS AND DISCUSSIONS**

There are 3 models to be discussed with each of the dependent variable and the seven independent variables form a model. The first model concerns the effects of bank size, liquidity risk, credit risk, inflation, remittance, capital adequacy and interest rate on return on average assets. The second model is the influence of the independent variables (bank size, liquidity risk, credit risk, inflation, remittance, capital adequacy) as it impact return on average equity. Similarly, the effect of bank size, liquidity risk, credit risk, inflation, remittance, capital adequacy on the net interest margin is examined in the third model. The three models were analyzed using three estimators (pooled regression, fixed effect model and random effect model). The comparisons of the results were made and Hausman test was employed to determine an appropriate model for the study between fixed and random effect model.

The Hausman test for all model shows this study failed to reject null hypothesis and considered random effect model to be appropriate. Therefore, the interpretation and discussion is based on random-effect model results.

## Descriptive analysis of variables

Table 2. Descriptive Statistics

Variables	ROA	ROE	NIM	LR	REM	BS	INT	INF	CR	CAL
Mean	13.21	1.01	1.79	38.87	9.83	22.35	6.69	3.31	6.18	13.86
Maximum	38.55	1.85	3.40	95.32	9.90	30.38	8.11	10.76	35.77	36.35
Minimum	1.52	0.37	0.52	3.61	9.69	8.92	5.78	-3.75	0.21	4.96
Std. Dev.	5.03	0.29	0.47	21.93	0.06	6.08	0.91	3.60	6.91	5.56
Skewness	1.19	0.26	-0.20	1.36	-1.10	-0.73	0.46	-0.05	2.82	1.51
Kurtosis	6.62	2.73	3.24	3.94	2.87	2.59	1.48	2.89	10.98	6.14
Observations	676	676	676	676	676	676	676	676	672	676

Note: ROA: Return on average assets, ROE: Return on average equity, NIM: Net interest margin, LR: Liquidity ratio, REM: Remittance, BS: Bank size, INT: Interest rate, INF: Inflation, CR: Credit risk, CAL: Capital adequacy.

As shown in table 1, all the variables has 676 observation after structured into a quarterly data, while only credit risk (CR) has 672 observation which could be as a result of missing value. While almost all the variables shows a considerate standard deviation from their mean value, the mean and standard deviation for liquidity risk (LR) across the banks are slightly higher, this could be as a result of the economic volatility of Lebanon.

## Correlation analysis

Table 3. Correlation Analysis

	LR	LogREM	LogBS	Int	Inf	CR	CAL
LR	1						
LogREM	.09	1					
LogBS	.30	.025	1				
Int	-0.07	-0.68	-0.08	1			
Inf	-0.01	-0.0004	.002	.19	1		
CR	-0.27	-0.0034	-0.24	.001	-0.02	1	
CAL	-0.07	-0.19	-0.45	.17	-0.13	.15	1

The Pearson correlation matrix is provided in table 2 in order to check the problem of multicollinearity. The result is encouraging as there appears to be no serious collinearity problem among the regressors.

## Model Estimation

Table 3. Estimation results

Independent Variables	Dependent variables		
	ROA	ROE	NIM
LR	-0.02 (0.03)	-0.01***(0.001)	0.01**(0.003)
LogREM	-3.22***(2.86)	1.27***(0.17)	0.07 (0.28)
LogBS	0.07 (0.06)	0.004(0.003)	-0.01**(0.01)
INT	0.25 (0.20)	0.02 (0.01)	0.01 (0.02)
INF	0.11***(0.04)	0.01***(0.002)	0.02***(0.004)
CR	-0.17***(0.04)	-0.02***(0.002)	0.01 (0.004)
CAL	-0.22***(0.03_)	0.003 (0.002)	-0.01***(0.003)
C	144.36***(28.98)	-11.49***(1.67)	1.11 (2.80)
R-squared	0.19	0.19	0.10
F-statistics	21.67	22.49	10.14
Prob.	0.00	0.00	0.00

Note: \*\*\* indicates 1% level of significance

\*\* indicates 5% level of significance. Figures in parentheses are standard error value

From table 3, remittance (REM) is found to have a negative influence on the return on average assets (ROA). The impact is also established to be statistically significant at 1% confidence level. It could be infer from this result that a change in remittance will impact negatively on return on average assets. Inflation (INF) is found to have positive influence on ROA, while credit risk (CR) and capital adequacy (CAL) were found to have negative impact and all the three variables were statistically significant at 1% confidence level, while the model shows a joint influence of liquidity risk (LR), remittance (REM), bank size (BS), interest rate (INT), inflation (INF), credit risk (CR) and capital adequacy (CAL) on ROA. The analysis result suggests that the variables puts together could provide about 19% explainable variations on the factors influencing return on average assets. Much could not be discussed on the bank size and liquidity risk because the slope coefficient of these variables are not statistically significant. However, with the f-statistic of 21.67 and p-value of 0.00, which is less than 0.05, the model is established to be fit for the prediction.

As for the measure of profitability using ROE, the result as shown in table 3, liquidity risk is found to have negative significant influence on ROE. The influence is also significant as 1% confidence level. Similarly, credit risk (CR) and intercept (constant) is found to have significant negative influence on ROE. However, remittance and inflation are found to have positive

influence on ROE respectively. The influence is also statistically significant at 1% confidence level. The model R-square is 0.19, which implies that about 19% of the explainable variations in the factors influencing return on average equity could be explain by the combination of LR, REM, BS, INT, INF, CR and CAL. The model returns an f-value of 22.49 and a p-value of 0.00, which indicate that the model is fit for the prediction.

The third measure of profitability as adopted in this study which is Net interest margin (NIM), have the results also presented in table 3. From table 3, liquidity risk is found to have a positive influence on net interest margin (NIM). The influence is statistically significant at 5% confidence level. Bank size has negative influence and significant at 5% confidence level. Inflation (INF) has positive influence and significant at 1% confidence level, while capital adequacy has negative influence and statistically significant at 1% confidence level. Much could not be said on remittance, interest rate and credit risk because their slope coefficient is not significant.

Moreover, the model has an R-squared value of 0.10, which implies that about 10% of the explanation variation in factors that impact on net interest margin (NIM) could be provided by the seven variables in the model. Worthy to note also that, the model has an f-value of 10.14 and p-value (0.00) that is far less than 1%, thus implies that the model is fit for predicting net interest margin (NIM).

## CONCLUSION

According to the empirical findings for this study, credit risk has a negative impact on profitability, the result is in consistent with previous studies (Bashir, 2003; Duca and Mclaughlin, 1999; Islam et al, 2017; Rahman, Hamid, & Khan, 2015). The result reflects that the default risk has affected the Lebanese bank. Moreover it detects that the quality of credit is a momentous for achieving a higher profitability level for Lebanese banks. However, the result is in contrast to the work of Bessis (2011) who argued in his study that the few defaulter could not pose a threat to the bank profitability. Capital adequacy ratio has a negative impact on ROA and NIM. The result is not in line with the studies of Dietrich & Wanzeried (2009); Naceur, (2003); Sayilgan & Yildirim, 2009. The result of our findings shows that in Lebanon, the bank is in normal financial position because of alternative cost of capital. This impact suggests that Lebanese banking sector has insufficient capital and its dependence on external financing

Regarding the inflation that shows a positive impact on ROA, ROE and NIM. The result is in agreement with some previous studies (Abreu & Mendes, 2001; Guru et al, 2002; Pasiouras & Kosmidou, 2007). In reference to Lebanon, the result implies that Lebanese bank managers accurately predicted the future increase in inflation. However, Rahman, Hamid &

Khan (2015); Zeitun (2012) found negative influence of inflation on bank profitability in their studies.

Liquidity Risk which is measured by loan to customer deposit, and it is one of the key factors of banks's profitability. Most studies suggest that the lower the loan to deposit ratio indicates that the bank has excess liquidity. The negative impact of liquidity risk on bank profitability as revealed by our findings in agreement with previous studies (Ally, 2014; Islam et al, 2017; Ramadan, Kilam & Kaddumi, 2011; Tariq et al, 2014).The negative significant impact of this ratio on profitability reflects that deposits are not ultimately converted into loans. In addition it may reflect that bank uses minimal deposits to generate loans or give more loans without rising deposit. The negative influence of liquidity risk ROE, implies that banks are in excess of liquidity and it also indicates that banks haven't use their deposit to grant loans. On the other hand this study shows a positive impact of loans to customer deposit on NIM which implies that bank uses their deposit to grant loans moreover it suggest the higher the liquidity ratio the higher the profitability of the bank. This significant impact detects the dependence of Lebanese banks on using deposits to generate loans and generate profit.

While remittance has a negative impact on ROA, though the result is in contrast to Rahman & Hossam (2018), our result may suggest that the portion of remittances that are transferred to bank saving accounts has not been used by banks to generate loans, it also suggests that remittance which acts as an alternative source of financing for Lebanon tend to decrease the percentage of bank loans leading to decrease in ROA ratio of the Lebanese bank. On the other hand the result of this study shows that remittances have no significant impact on NIM. Meanwhile, where the study shows that remittance has a positive significant impact on ROE, it implies that higher amount of remittances provide a higher amount of deposits, and this deposits are used by Lebanese banks to grant loans leading to higher liquidity and higher profitability.

In conclusion, a strong, healthy and organized financial system is the base for long run economic growth of any country. Therefore, a stable and profitable banking sector can fight negative shocks and engage in the stability of financial system. Consequently, identifying the determinants of banks' profitability and role of remittances becomes an essential in the financial development prospects. Because of this, this study investigated the determinants of banks' profitability that are operating in Lebanon and its relationship with remittances, by applying panel data technique for the period 2005 to 2017.The result shows that remittance has a positive significant impact on return on equity (ROE) , credit risk has a negative impact on ROA and ROE regarding the macroeconomic determinant inflation has a positive impact on ROE, ROA and NIM while interest rate has no significant on profitability.. On the other hand bank size

has a negative impact on NIM while remittance and credit risk, has no significant impact on NIM.

These findings are essential in many aspects .First it concludes that credit risk, liquidity risk bank size and capital adequacy required a better monitoring. Moreover this study sheds the light on the role of remittances as an external source of financing for Lebanon and its important role on increasing the liquidity and the profitability of the Lebanese banks.

In as much this paper found an evidence that supports the influence of remittance flow on the bank profitability in Lebanon, there is need for further study on the channels through which the influence go through. This is presently beyond the scope of this work and shall be taken up in the subsequent research. Moreover, literature suggest an influence of remittance on financial development, this shall be interesting to know if remittance contributes to the Lebanon financial development and its concomitant effect on the economic growth as a whole.

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