




“Bank-specific vs. macro-economic factors: what drives profitability of commercial banks in Saudi Arabia”

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# BANK-SPECIFIC VS. MACRO-ECONOMIC FACTORS: WHAT DRIVES PROFITABILITY OF COMMERCIAL BANKS IN SAUDI ARABIA

## Abstract

The goal of this study is to determine the elements that contribute to the profitability of commercial banks in Saudi Arabia. The study is important due to the fact that Saudi vision 2030 foresees Saudi Arabia as a global investment powerhouse and fulfilling this objective requires a profitable banking sector. The method chosen for the study is multiple regression analysis. The sample data is taken for the period ranging 2009 and 2015 for the 12 local banks. The research concludes that bank's internal factors specifically, bank size, liquidity, credit risk and operational efficiency are significantly determining the profitability in the banks as compared to the economy's macro-economic variables.

## Keywords

banking, commercial banks, profitability, Saudi Arabia, GCC

## JEL Classification

G21, L25, C3

## INTRODUCTION

The financial intermediation functions of the banks is one of the most important factor to grow economies (Elsas et al., 2010). However, banks need to stay stable in order to continue performing such functions. Moreover, failures in the banking sector can lead to severe shocks to the economy as was apparent during the financing crisis of 2008.

Profitability is one of the enabling factors in the stability of banks. Banks cannot suffer losses for a long period of time and stay in business. More than that, profits retained in the business are the purest form of capital for a bank and source of its growth in capital, which will lead to its expansion. Therefore, regulators are very interested in the determinants of profitability to shape their regulatory policies and regulations. Many studies such as Maudos and Guevara (2004), Hirose et al. (2004), Kohler (2013), Saunders and Schumacher (2000) emphasize that more profitable bank or financial institution means more wealth transfer to the economy than a poorly managed bank.

The GDP of Saudi Arabia currently stands at 646.44 billion US dollars, with annual growth rate of 1.7% and GDP per capita of \$21,847 (Statista, 2017). The petroleum sector is the largest contributor to the economy; and it is mostly controlled by the government, as it accounts for 55% of GDP, 92% of the budget revenue, and 90% of total export. The government is encouraging the private sector growth through diversification of the economy, which contributes about 40% to Saudi Arabia's GDP.

Saudi financial sector includes 24 commercial banking institutions (24%), credit institutions (19%), pension funds (26%), investment funds (2%), and insurance firms (2%). According to Saudi Arabia Monetary Agency (SAMA), by 2016 the financial sector had about USD 1.2 trillion in assets which translated into 186% of the country's GDP. There are 12 domestic banks and 12 foreign banks. The National Commercial Bank is the biggest bank in Saudi Arabia with at least 20.1% market share, closely followed by Al Rajhi Bank with 15.3% market share, Samba with 10.8% market share, and Riyadh Bank with 9.8% market share (Al Jazira Capital, 2017).

Four of the 12 domestic banks (Al Jazira, Albilad, Alinma, and Al Rajhi) are majorly owned by pension funds of government agencies and represent approximately 97% of total assets of the banking system. These banks are Sharia-compliant, however, SAMA does not classify banks as Islamic or conventional. SAMA's financial stability report in 2016 indicated a continued growth of Saudi banking sector. The asset base of the banking sector had increased by 3.6% in 2015 (SAMA, 2016). The private sector has claims of 62.1% of the banks' assets in Saudi Arabia. The ratio of total bank assets to GDP reached 91.2% in 2015.

Saudi Arabian banks have well-developed strategies that determine their performance. The firms have grown in size and established their regional branches all over the country. The branched network operations though expensive (Shamim et al., 2017) allow the financial institutions such as banks to attract and retain more customers rather than depending on their primary wing for conducting financial services (Wasiuzzaman & Tarmizi, 2010). As a result of improved client base, the size has grown over the years. Furthermore, financial institutions have diversified their products and banking services based on the Sharia compliance legislation that allows for asset co-ownership. According to Rahman and Banna (2016), the increased profit sharing, Takaful Insurance, and other Sharia compliance legislations have helped in cost reduction for the banks.

The study is very relevant especially due to the fact that Saudi vision 2030 foresees Saudi Arabia as a global investment powerhouse and fulfilling this objective requires a stable and growing banking sector.

Studying the factors that impact profitability of banks can lead to improving the operation of the banking sector. By researching on these factors, the policymakers may have an insight on how to improve corporate policies. In addition, the banking sector acts as a key source of economic growth in any economy. It is imperative for the government to adopt the policies that support the growth and survival of the financial market or other sectors that reinforce such capital transfers. The relevant profitability determinant parameters influence the businesses to exclusively determine the appropriate loan or credit period to advance the facility.

Research has shown that profitability determinants can be harmonized into two indicators. A framework can either be bank-specific or external (Wasiuzzaman & Tarmizi, 2010; Masood et al., 2015). The current study is conducted to identify factors, which determine the profitability specifically, and to interrogate whether bank-specific characteristics such as size, capital adequacy, liquidity, credit risk and operational efficiency and macro-economic conditions such as economic growth and inflation are important determinants of profitability in the Saudi Arabian banks. The explanatory variables chosen for this study and their expected effects on the banks profitability are explained in the section below.

The study is structured as follows. First, a brief introduction and the importance of studying the profitability of banks are presented. Then, the variables are described followed by a research methodology. The empirical analysis is presented in the next section. The last section concludes.

## 1. DESCRIPTION OF VARIABLES AND DATA

The determination of profitability is based on the context of accounting profitability which exists when the real revenue exceeds the costs incurred to generate such revenue (Maudos & Guevara, 2004). According to Zarrouk (2012), profitability level is an indicator of the financial performance of the bank. The investors and financial analysts use the ratios to appraise the bank's capability and compare it to the rivals and other key industry actors.

In this study return on assets (ROA) is used to represent profitability of banks. It is a widely used ratio in the banking industry, as it reflects on the capability of the bank to make profits from its existing assets. The factors that influence profitability can either be internal (bank's own) or external ones (macro-economic). The internal factors can be controlled and managed by the bank management. The macro-economic factors affect all the banks equally and it is beyond the management's control to mitigate them. According to Bashir (2003), the internal factors can be classified as the bank's size, management of expenses, capital, and credit risk. Macro-economic factors include inflation expectations, interest rates, the growth of the market, structure of the market, changes in government legislations, and changes in business cycles (Kosmidou, 2008). Discussing these specific factors in detail can help to understand their effect on the profitability of banking institutions (Athanasoglou et al., 2008).

The overhead ratios, compared to the overall assets, are viewed as the only determinant for a negative profitability (Athanasoglou et al., 2008). It is, therefore, believed that rationing of these overheads would improve the operational efficiency and hence profitability. This probable deleterious link applies wholly to the banks in Saudi Arabia, where labor overheads are impaired by comparatively little output and the extra scope for the government controlled financial institutions. Bonin et al. (2005), Giustiniani and Ross (2008), and Kosak and Cok (2008) found that profitability level is affected by the management of expenses. Ahmed et al. (2011), Eljelly (2013), Masood and Ashraf (2013), and Claessens et al. (2001) found that operating ef-

iciency results in higher ROE and ROA. However, some existing studies, such as Chowdhury (2015), have found negative association between ROA and operating efficiency. According to Goddard et al. (2004) and Roodman (2009), low inefficiencies versus high production costs in the Saudi Arabia banking sector can be detrimental to the profitability. For the purpose of this study the researchers expect that operational efficiency will be positively related to profitability as better management of expenses directly impacts profits.

Furthermore, any effective management policy of banks should address the issue of the size that can successfully optimize its profitability (Zarrouk, 2012; Kundid et al., 2011). Generally, a bigger bank is expected to be more profitable, but the banks that have continued to grow and increase in size, eventually could be undesirable owing to bureaucracy among other issues. Therefore, the profitability level and size connection may be believed to be non-linearly correlated (Lepetit et al., 2008). Abdullah et al. (2014) in Bangladesh, Dietrich and Wanzenried (2014) across 118 countries, Ibrahim (2016) in Qatar and Muda et al. (2013) found that the size of the bank has the greatest influence on profitability level with positive correlation. For the purpose of this study, the researchers expect that bank size will be positively related to profitability of Saudi banks.

Capital is the accumulated wealth of any financial institution. In determining the accumulated wealth of a bank, equity multiplier (equity-to-assets) can be adopted and the return on total assets ratio determines profitability level (Fernandez et al., 2005). Capital adequacy measures the spread or financial leverage. Ibrahim (2016) found that capital adequacy significantly affected the profitability level of both conventional and Islamic banks. According to Berger et al. (2010), decreasing the ideal speculation of capital market permits can greatly enhance capital accumulation while increasing the expected revenue streams. The constructive outcome might be due to the fact that capital or wealth is internally generated and readily reinvested in the internal operation of the banking institution. Therefore, capital acts as a loss absorbency buffer against future uncertainties. Abdullah et al. (2014) found that capital contributes positively to the level of profitability

in the context of Bangladeshi banks. The capital-assets ratio is positively related to profitability level according to Goddard et al. (2004). However, other studies, such as Ahmed et al. (2011), found that high capitalization results in lower profitability level in both ROE and ROA models. For the purpose of this study, capital adequacy is expected to negatively related to profitability as capital is the most expensive source of funding for any company; therefore, banks with high amounts of capital cannot benefit as much from the leverage of deposits.

Credit risk is the risk of loss for the lender or lending institution. The lender risks the loss of interests and principal amount and this can have a negative effect on cash flows of the banking institution. Customers can fail to pay amount due on line of credit, credit card, and mortgage. Abdullah et al. (2014), Ahmed et al. (2011) and Karim et al. (2010) argued that credit risk negatively affects the profitability performance of banks. Banks can adopt policies for monitoring and improving the level of credit risk to increase its profitability performance, hence credit risk is supposed to be modelled as a predetermined factor or variable. Banks tend to improve their revenues and hence by validating and appraising the credit risk environment. The procedures and strategies involve projecting the expected unforeseen risks (Fernandez et al., 2005). The Central banks also enforce policies aimed at protecting and defending the commercial banks against the adverse effects of the credit risks. The country's banking sector is compelled to adopt the policies that are formulated and enforced by the central banks (Kosak & Cok, 2008). Therefore, the credit risk policy can be modelled as per the prearranged parameter. The researchers expect that credit risk will be negatively related to profitability in banks as a riskier bank is exposed to more losses due to provisions and impairment of assets.

Liquidity is the amount of current assets that is available for managing short-term obligations. Ibrahim (2016), Chowdhury (2015) and Karim et al. (2010) found that the liquidity level negatively affects return on assets ratio in the sense that when less money is tied up in liquid assets, a higher profitability level is expected. However, Eljelly (2013) found that liquidity positively affects return on assets. The researchers also expect that liquidity will

be negatively related to profitability as highly liquid assets generally do not provide high returns.

Macro-economic factors include those that signify the industry or the sector in which the firm operates and external facets. Research on factors affecting the profitability of the banks, previous research, such as Pervan et al. (2010), and Kosak and Cok (2008) studied factors such as market structure in which the bank operates and the financial sector reforms with special focus to banks. Other factors, such as the gross domestic product or the economic growth, rate of interest and the nature of the financial system are key parameters that are used to define the macro-economic environments (Berger et al., 2010).

Increase in *GDP* growth has a linear effect on the profitability level of the banks, suggesting higher demands for loans from the financial institutions during the cyclical upswings (Flamini et al., 2009). The researchers expect that *GDP* (log of *GDP*) should be positively related to the profitability of banks.

There is ambiguity associated with the implications of inflation rate on profitability. Aslam et al. (2016) and Abdullah et al. (2014) found that *ROA* is negatively related to *GDP* growth and inflation rate. However, Chowdhury (2015) confirms that inflation affects *ROA* in the long term. Inflation is expected to negatively affect profitability for the purpose of this study.

In terms of data, this research is built on a model of 12 locally incorporated banks in the Kingdom of Saudi Arabia. The data taken was from 2009 to 2015, using annual audited figures. The source of the data is Thomson Reuters. It is important to note that since the drop in oil prices which significantly effects the Saudi economy in 2016 and 2017, the data chosen did not include 2016 figures in order to remove any effects of the oil prices from the data.

The banking size is one of the factors affecting bank's financial profitability. The size (*S*) can be measured by log of all assets. Total assets to total liabilities ratio (*CR*) is the bank's liquidity indicator (similar to loans to deposits). Another key variable is the credit risk (*DTIR*), which is the ratio



between total debts to income. The final variable is the operational efficiency (*OE*), which is expressed as the operating expenses over total revenues. The descriptive statistics of all the variables are provided in Table 1. In order to provide a better overview of the data, descriptive statistics (means) by year and by each bank were also performed and are provided in Tables 2 and 3.

**Table 1.** Descriptive statistics

Variables	Mean	Std. dev	Min	Max
ROA	0.01776	0.0079	−0.0143	0.03964
S	5.04306	0.34089	4.2382	5.65258
CA	0.15953	0.10535	0.09253	0.90171
CR	1.29614	0.99282	1.10196	10.174
DTIR	29.2964	5.95748	1.79185	37.7621
OE	0.30449	0.14601	0.004	0.81497
GDP	4.1207	3.3467	−2.059	9.997
I	3.926	1.3591	2.185	5.824

Table 1 indicates that the mean value of *ROA* is 0.0178 or 1.78% with the standard deviation of 0.0079. The low average value of *ROA* indicates that the selected Saudi banks had low profitability in the last seven years. The small value of standard deviation implies that there are fewer dispersion in the value of *ROA* with the maximum value of 0.0396 reported by Al-Rajhi Bank in 2009, and the minimum value of −0.0143 reported by Al-Bilad Bank in 2009. However, an improvement in the value of *ROA* can be observed over the years.

Table 1 also indicates that the mean value of *S* is 5.0431 with the standard deviation of 0.3409. The high value of standard deviation implies that there is a large dispersion in the values of *S*. Moreover,

an improvement in the value of *S* can be observed over the years. The mean value of *CA* is 0.1595 with the standard deviation of 0.1054. The high value of standard deviation implies that there is a large dispersion in the values of *CA* (Weinberg & Abramowitz, 2016). However, a decline in the value of *CA* can be observed over the years for most of the banks included in the sample. The mean value of *CR* is 1.2961 with the standard deviation of 0.9928. The high value of standard deviation implies that there is a large dispersion in the values of *CR* of Saudi banks. Moreover, an increasing trend has been observed in the value of *CR* over the last seven years. The mean value of *DTIR* is 29.2964 with the standard deviation of 5.9574. The high value of the standard deviation implies that there is a large dispersion in the value of *DTIR*. However, an increase in the value of *DTIR* is observed over the years. The mean value of *OE* is 0.3045 with the standard deviation of 0.14560. The high value of standard deviation value implies that there is a large dispersion in the values of *OE*. However, a decline in the value of *OE* can be observed over the last seven years. The macroeconomic factors including *GDP* and inflation indicate that their mean value was 4.12% and 3.93% respective with high standard deviation. Moreover, it could be indicated that maximum values of both variables were recorded in 2011. The country experienced negative *GDP* growth in 2009.

## 2. RESEARCH METHODOLOGY

This research investigates how the internal factors, i.e. capital adequacy, size, liquidity level, credit risks, and operational efficiency, and macro-economic factors (*GDP* and inflation), affect the profitability of the banks in Saudi Arabia.

**Table 2.** Year-wise descriptive statistics

Variables	2015	2014	2013	2012	2011	2010	2009
ROA	0.01865	0.018482	0.018628	0.019678	0.018346	0.015951	0.014103
S	5.175414	5.158666	5.101301	5.049293	4.982839	4.932828	4.901056
CA	0.143407	0.139234	0.144315	0.150723	0.162899	0.176774	0.199371
CR	1.168553	1.163631	1.171792	1.182534	1.211098	1.266317	1.909083
DTIR	31.3929	32.76193	31.36326	30.93747	29.60121	27.28408	21.73383
OE	0.232987	0.249066	0.274298	0.296977	0.257158	0.364246	0.456675
GDP	4.106	3.652	2.699	5.411	9.997	5.039	−2.059
I	2.185	2.671	3.506	2.886	5.824	5.343	5.067

**Table 3.** Descriptive statistics (means) by banks

Banks	OE	DTIR	CR	CA	S	ROA
Alimna	0.1387	20.0228	2.8135	0.4174	4.6594	0.0158
Al Rajhi	0.2431	21.5517	1.1751	0.1489	5.3863	0.0291
Al Jazira	0.4351	31.528	1.1319	0.1161	4.6702	0.0085
ANB	0.291	30.2106	1.1524	0.1322	5.1287	0.0181
Albilad	0.2904	31.5467	1.1643	0.1408	4.4868	0.0126
BSF	0.2764	31.9922	1.1641	0.141	5.184	0.0197
NCB	0.3022	26.3614	1.1255	0.1114	5.5352	0.0189
Riyad	0.3152	29.9051	1.1981	0.1654	5.2879	0.0181
Sabb	0.324	32.351	1.1466	0.1277	5.1906	0.02
Saib	0.46	30.9711	1.1692	0.1444	4.821	0.0133
Samba	0.1806	33.3956	1.183	0.1543	5.3066	0.0228
Alawwal	0.3972	31.7205	1.1299	0.1148	4.8601	0.0155

The study used both the fixed and random effect regression methods to determine coefficient values of variables and test their significance for profitability in banks. This procedure will also highlight whether a particular parameter positively or negatively affects the profitability. In panel data analysis the Hausman test can help to choose between a fixed effects model or a random effects model.

Furthermore, before the regression analysis is done, the study tested the data to see if it is robust or not. The Levin-Lin-Chu unit-root test and Variance Inflation Factor (*VIF*) were used to test the stationarity and to detect multicollinearity of the data.

The following regression model was used to determine the relationship between profitability level and its predictors or determinants.

$$ROA = \beta_0 + \beta_1(S) + \beta_2(CA) + \beta_3(CR) + \beta_4(DTIR) + \beta_5(OE) + \beta_6(I) + \beta_7(GDP) + \varepsilon,$$

where *ROA* – return on assets; *S* – bank size, *CA* – capital adequacy, *CR* – current ratio, *DTIR* – credit risk, *OE* – operational efficiency, *I* – inflation rate, *GDP* – gross domestic product, and  $\varepsilon$  – probable error.

The study also reported r-squared and the value of F-test in order to determine the explanatory power of the above regression model.

### 3. EMPIRICAL ANALYSIS

This section provides findings of different statistical tests that are performed to test the stationarity of the panel data of 12 banks incorporated in Saudi Arabia. Furthermore, these statistical procedures include fixed and random effect regression analysis, Hausman test, and Wald Chi-Square Test along with the summary of results of each test. The variables included in this study are reiterated including the dependent variable, i.e., Return on Assets (*ROA*), and independent variables including Size (*S*), Capital Adequacy (*CA*), Liquidity (*CR*), Credit Risk (*DTIR*), and Operating Efficiency (*OE*) to allow the reader to easily follow the results provided.

Levin-Lin-Chu Unit-Root Test rejects the hypothesis at 5% level of significance<sup>1</sup>. Therefore, it could be inferred that both fixed and random effect regressions are suitable for the data. Furthermore, it could be noted from Table 4 that the *VIF* value of *CA* is greater than the benchmark of 5. It implies that there is high multicollinearity of this variable with other variables. Therefore, when the variable of *CA* is excluded from the model, it reduces the value of *VIF*, which implies that this variable should not be included in the regression model.

The results of the fixed effect and random effect regression are provided in Table 5. Table 5 summarizes the results of the fixed and random effect regression performed by using the data of 12 Saudi

<sup>1</sup> For brevity reasons, the test results are not reported in the paper.

**Table 4.** Variance inflation factor

Variables	VIF	VIF excluding CA
CA	6.75	–
CR	4.23	2.01
DTIR	2.63	2.05
OE	2.26	1.79
S	1.72	1.35
GDP	1.68	1.66
Inflation	1.70	1.69
Mean VIF	2.99	1.76

banks. The study performs Hausman test to test the validity of the null hypothesis, which states that the random effect regression is suitable for the panel data (Henderson & Parmeter, 2015). The value of  $P > c^2$  is more than the confidence level of 5%. Therefore, it could be stated that the null hypothesis cannot be rejected and for this study, the results of the random effect regression including the coefficients of relationships between dependent and independent variables are considered for interpretation (Wooldridge, 2015).

The goodness of fit is assessed by the value of R-square that is 0.5795, which implies that the fixed effect regression model implemented in this study is sufficiently explanatory as it explains 57.95% of the variations recorded in the panel data of 12 Saudi banks. However, it should be indicated that a significant proportion of variations remain unexplained by the model implemented in

this study (Bartolucci et al., 2016). Therefore, it could affect the generalizability of results, and it may suggest weaknesses of the data and incompleteness of variables that affect the profitability of banks operating in Saudi Arabia. Furthermore, the p-value of 0.00 is less than the confidence level, which implies that the results generated by the coefficients of variables by using fixed effect regression are not nil that supports the validity of findings presented in this report.

The coefficient of constant in this model is .0015156, which represents the proportion of unexplained variations and changes in the mean value of ROA that is not explained by the model. The coefficient of Size has a positive value of .0085851 that indicates it has a direct relationship with ROA. The estimated value of ROA is predicted to increase when the size of the bank increases. This relationship is found to be significant at the

**Table 5.** Regression analysis

Variables	(a) CA not included		(b) CA included	
	Fixed effect	Random effect	Fixed effect	Random effect
Intercept	-.0147597	.0015156	0.0450486	0.0015156
Size	.0146859	.0085851*	0.0039295	0.0055474
Liquidity	-.0009394*	-.0005198*	-.0009444*	-.0006879*
Capital adequacy			-0.0280321	-.0342906*
Credit risk	-.0020339*	-.0017241*	-0.0007491	0.0001603
Operating efficiency	-.0371915*	-.031664*	-.0408628*	-.0370109*
GDP growth	.0001816	-.0000558	0.000201	0.0001064
Inflation	-.0002238	-0.0012	-0.0006236	-0.0001666
Wald c2		85.24		95.66
F-statistic	11.87		10.42	
P-value	0.00	0.00	0	0
R-square	0.5538	0.5795	0.5579	0.6142
Hausman test	$\chi^2(4) = 8.47$		$\chi^2(4) = 4.72$	
	$P > c^2 = 0.2056$		$P > c^2 = 0.6944$	

Note: \* significant at the confidence level of 5%.



level of 5% error (Mehmetoglu & Jakobsen, 2017). Therefore, the null hypothesis that states that there is no significant relationship between size and *ROA* is rejected. The coefficient of Liquidity has a negative value of  $-0.0005198$  that indicates it has an inverse relationship with *ROA*. The estimated value of *ROA* is predicted to increase when the liquidity value decreases. This relationship is found to be significant at the level of 5% error. Therefore, the null hypothesis that states there is no significant relationship between Liquidity and *ROA* is rejected. The coefficient of Credit Risk has a negative value of  $-0.0017241$  that indicates it has an indirect relationship with *ROA*. The estimated value of *ROA* is predicted to increase when Credit Risk value of the bank decreases. This relationship is found to be significant at the level of 5% error. Therefore, the alternative hypothesis that states that there is a significant relationship between Credit Risk and *ROA* is accepted. The coefficient of Operating Efficiency has a negative value of  $-0.031664$  that indicates it has an inverse relationship with *ROA*. The estimated value of *ROA* is predicted to increase when the operating efficiency of the bank decreases. This relationship is found to be significant at the level of 5% error. Therefore, the null hypothesis that states there

is no significant relationship between Operating Efficiency and *ROA* is rejected. The coefficients of *GDP* and inflation have negative values of  $-0.0000558$  and  $-0.0012$  that indicate they have an inverse relationship with *ROA*. The estimated value of *ROA* is predicted to increase when the *GDP* and inflation of Saudi Arabia decreases. This relationship is found to be insignificant at the level of 5% error. Therefore, the null hypothesis that states there is no significant relationship between *GDP*, Inflation and *ROA* is accepted.

In order to compare and check the robustness of the data, another regression was run with capital adequacy included in the model. Results are presented in Table 5 (b). As expected the results have been altered due to the inclusion of *CA* which has high multicollinearity. The major differences include the bank size and credit risk not being significant variables in determining profitability and the changes in signs wherein credit risk is positively related to profitability of banks. The capital adequacy variable in this regression model is significant in determining profitability of banks and it is negatively related to the dependent variable. This indicates that banks that have high capital will have relatively lower profits.

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## CONCLUSION

This study examined profitability determinants in Saudi Arabia banking industry. The profitability model was applied in the financial period beginning 2009, and ending 2015. The method used to identify the relationships between the dependent variable, i.e. the profitability of banks, and internal independent variables, i.e. bank size, capital adequacy, liquidity, credit risk and operational efficiency and macro-economic independent variables, i.e. *GDP* growth and inflation rate, is multiple regression analysis. The study also used stationarity tests to identify any non-stationary variables, which may require further statistical analysis/modifications to be used in a time-series analysis. The study also used *VIF* to ensure no multicollinearity exists between the independent variables.

The overall results indicate that all five internal variables are significant factors in determining the profitability of banks while the macro-economic variables are not significant factors for profitability of banks in Saudi Arabia. The results of the study were in accordance with the expectations of the researches in this aspect in line with previous studies such as Abdullah et al. (2014).

The results show that the bigger the bank, the more profitable it will be. Furthermore, liquidity is negatively related to profitability in the banks. This indicates that banks that have liquidity did not put a sufficient number of their resources in profitable venues and, therefore, showed relatively lower profits. Credit risk was found to have a negative relationship with profitability. This suggests that banks with higher credit risk are seen as risky from certain high profile and high profit customers.

Operational Efficiency showed a negative relationship with bank profitability in the regression results. The result is in line with previous studies such as Chowdhury (2015), however, contradicts with Bonin et al. (2005), Eljelly (2013) and Claessens et al. (2001).

With respect to the macro-economic variables, the results showed in both regression analyses conducted that GDP growth and inflation were not significant in impacting the profitability of banks in Saudi Arabia. The study in effect shows that internal factors are very important for profitability but the external factors as long as they were tested in a stable period were not significant. Therefore, the regulatory authorities should focus on developing regulations and supervisory methods that improve profitability in the banks.

Future research could benefit from adding more explanatory variables in the analysis and comparing the study with data based on pre-financial crisis of 2008 period.

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