Profitability of Saudi Commercial Banks: A Comparative Evaluation between Domestic and Foreign Banks using Capital Adequacy, Asset Quality, Management Quality, Earning Ability and Liquidity Parameters

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ABSTRACT

Recent banking reforms in Saudi Arabia fostered the entry of foreign banks to increase competition and improve the financial stability of the Saudi banking sector. There is, however, no comprehensive econometric study which has analyzed the profitability of domestic and foreign banks on a standalone and comparative basis. Present paper fills in this gap and assesses the profitability of Saudi banks using the parameters of the Capital Adequacy, Asset Quality, Management Quality, Earning Ability and Liquidity framework over the period 2000-2014 using pooled ordinary least square and fixed effect model. Our results indicate that domestic banks are more profitable than foreign banks. We also find that both foreign and domestic banks with higher capital are more profitable. Banks with a higher non-performing loan are less profitable: Foreign banks carry more credit risk in their portfolio. In contrast to domestic banks, operating expenses to total income for foreign banks is significant but negatively related to profitability, indicating that cost management inefficiency adversely affect the profitability of this group. Our results also indicate that banks with larger size are less profitable. We also find that steep rise in lending activities lead to increase in the profitability of domestic banks but has adversely affected the profitability of foreign banks in the country. The findings of the study have many policy implications.

Keywords: Profitability, Foreign Banks, Domestic Banks, Capital Adequacy; Asset Quality; Management Quality; Earning Ability; Liquidity Model, Saudi Arabia
JEL Classifications: G20, G21, G01, G24, C23, L25, E40, O16

1. INTRODUCTION

Commercial banking is one of the most important segments in the financial services sector in a nation's economy. Banks provide a safe linkage between the savers and the borrowers. Therefore, government and the central bank of any country in always concerned to ensure continuing strength and stability of the country's banking and financial system for capital formation, innovation, the creation of job opportunities. There are five key elements in the financial climate of any economy viz., money; financial institutions; financial tools; and system and rules (Karim and Alam, 2013). Efficiency in the financial performance of banks is, therefore, the key to ensuring economic growth and

development. Analysis and evaluation of bank performance can identify the inherent strengths and also weaknesses in the financial position of banks. Evaluation of bank performance is important to all its direct and indirect stakeholders: Bank managers, borrowers, depositors, investors, and regulators.

Kumbirai and Webb (2010) have highlighted that banks are closely interconnected due to their common functions and their linkage through the payment system. Hence, the failure of one bank does not only impact the bank's owner and investors, but also all other banks and other businesses interconnected with that bank. This is stated to be one of the important reasons which lead to the global financial crisis that originated in the US in 2008 (Ongore and Kusa, 2013).

Demirguc-Kunt and Huizinga (1999) posit that the most important indicators of financial crises are the index of a bank's profitability. Banking sector plays a pivotal role in any economy and the banking sector in Saudi Arabia is not an exception. According to the 2014 economic report, a balanced monetary policy by the Saudi Arabian Monetary Agency's (SAMA) has contributed to strengthening the stability of the national economy during the phase of global stress and turbulence. As a result, the credit rating of the Kingdom of Saudi Arabia has been upgraded: Fitch upgraded the Kingdom's sovereign credit rating to AA from AA- with a stable outlook in the said year. Banking services witnessed further expansion throughout the Kingdom. A total number of commercial banks' branches increased by 53.8% to 1862 at the end of July 2014, compared to 1211 at the end of July 2004. Although there is an extensive body of literature on the assessment of banks profitability using Capital Adequacy, Asset Quality, Management Quality, Earning Ability and Liquidity (CAMELs) framework, the evidence is mixed and not entirely conclusive. Most of these studies have addressed the said issue either in the developed economies or the east European economies that have undergone a wave of privatization. However, little or no work has been reported in the literature addressing the said issue in the Middle-Eastern markets.

Barker and Holdsworth (1993) suggest that the CAMELs system is robust, even after controlling for a broad range of available information in the market on the bank's performance. The CAMEL framework has been widely used both for an off-site and on-site investigation to make reliable estimations about the conditions of banks. The framework aims to provide a consistent and accurate estimation of the financial health of banks regarding the capital, asset quality, management, earning ability and liquidity. The value of the CAMEL parameters help banks address the supervisory concern and it also facilitates appropriate supervisory response to reduce the adverse effects on banks arising out of adverse conditions in the market (Dang, 2011).

The studies by Akhtar (2010), Almumani (2013; 2014), Almazari (2013), and Abraham (2013) are the ones that have focused on the Saudi commercial banks. Yet, only Abraham (2013) has examined the effect of listed foreign ownership on bank performance metrics in Saudi Arabia during the period 2008-2009. Moreover, none of these studies have made a comprehensive evaluation of the profitability of Saudi commercial banks using CAMEL framework as is done in this study. This study fills important gaps in the literature by looking at the profitability of both domestic and foreign bank on a comprehensive basis and includes both the listed as well as unlisted banks over the period 2000-2014. Hence represents an important contribution relevant to all concerned.

Moreover, this study identifies whether CAMEL parameters have statistically significant impact on Saudi banks' profitability measured by return on assets (ROA), return on equity (ROE), and net interest margin (NIM). The remainder of the paper is structured as follows. Section 2 highlights the relevant literature and overview of the Saudi Arabian banking industry. Section 3 explains the data and methods used. Section 4 displays the findings, and Section 5 concludes.

2. LITERATURE REVIEW

2.1. Related Literature

Kumbirai and Webb (2010) evaluate the financial performance of five largest commercial banks in South Africa for the period 2005-2009 by using financial ratio analysis. The study also examines whether performance in 2005 and 2006 is significantly different from the performance in 2008 and 2009 by applying the t-test. The findings show that the banks' performance improved in the first 2 years (2005 and 2006). There is a significant change in the trend because of the financial crisis in 2007 reaching its peak in 2008 and 2009. This led to low liquidity; fall in profitability, and failing credit quality in the banking industry of South Africa. Karim and Alam (2013) analyze the financial performance of private commercial banks in Bangladesh from 2008 to 2012 using financial ratios. Using multiple regression analysis, their findings show that credit risk and bank size are significant and negatively related to ROA and Tobin's Q. It also indicates that the increase in bank's assets decreases bank performance.

Alkhatib and Harsheh (2012) study the financial performance of five Palestine commercial banks for the period 2005-2010 using multiple regression analysis. The results show that credit risk, asset management, bank size and operational efficiency have a positive association with bank performance. Haque (2013) indicates that there is no significant relationship between the bank's performance and their driver variables in Bangladesh. Bank's performance relies more on the ability of the management in formulating and implementing strategic plans. Ongore and Kusa (2013) use CAMEL model and find that bank profitability in Kenya is significantly related to capital adequacy, asset quality, and management efficiency, however, the relationship with ownership is not significant.

In India, Haque (2014) shows that there is no significant difference in the profitability of banks in terms of NIM and ROA, but have significant differences in terms of ROE. Using fixed effect model, Said and Tumin (2011) analyze the financial performance of commercial banks in China and Malaysia from 2001 to 2007 and find that banks profitability in China is influenced by operating ratios, but there is no influence on Malaysian banks irrespective of the measure of performance. Doğan (2013) compares the financial performance of foreign and domestic banks in Turkey for the period 2005-2011 using financial ratios. The findings indicate that management effectiveness, total assets, ROE and asset quality of domestic banks are better than that of foreign banks. However, foreign banks have higher capital adequacy ratio than domestic banks.

In Saudi Arabia, Almumani (2014) finds that the ROA and ROE have a negative relationship with total assets, the cost to income ratio and operating expenses during the period of 2007-2011. However, there is a positive relationship between operating income with ROA and ROE. Saudi joint banks are more profitable, are dominant in terms of ROE and in the absorption of loan losses. Using multiple regression models during the period of 2007-2011, Almazari (2013) shows that the association of capital adequacy and cost efficiency with ROA and ROE is negative. Almumani

(2013a) compares the liquidity risk between Saudi and Jordanian listed banks during the period of 2007-2011. Their results show that liquidity risk of Saudi banks is lower than that of Jordanian banks. ROA and ROE for Saudi banks are better than the Jordanian banks. Using t-test over the period 2008-2009, Abraham (2013) finds that listed foreign ownership are more aggressive than listed domestic banks through decreased capital adequacy, increased the financial leverage, higher loan to total assets, higher ROE and Tobin's Q. Using data envelopment analysis, Almumani (2013b) and Akhtar (2010) find that Saudi banks have more efficiency in resources and less risky due to the higher capital adequacy ratio.

On an overall basis, previous literature on the association between profitability and bank-specific CAMELs in the emerging and developed economies provided mixed results. However, there is a broad consensus that the global financial crisis has adversely affected the profitability of banks, forced them to reduce their size of the loan, and have forced then to strengthen their capital ratios.

2.2. Overview of Saudi Arabian Banking Industry

The Saudi banking system includes SAMA Commercial banks, Islamic banks, and Investment banks. SAMA, the central bank of the Kingdom of Saudi Arabia, was established in 1952. It has been entrusted with many functions pursuant to several laws and regulations. The most important functions are the following: To deal with the banking affairs of the government; promote the growth of the financial system and ensure its soundness; supervise commercial banks and exchange dealers; and monitor credit information companies (SAMA, 2013).

There are 12 domestic commercial banks presently in Saudi Arabia including Alinma Bank. In addition, there are 12 foreign banks including the Industrial and Commercial Bank of China, Deutsche Bank, BNP Paribus and JP Morgan including some regional banks (SAMA Report, Q1, 2014). SAMA expects all banks to provide more competitive and improved service quality and augmented the level of service.

Over the past decade, the Saudi banking sector has significantly expanded its services to include murabaha, speculation, participation, forward contracts and securitization. Banks have also made significant strides in providing asset management services, such as portfolios investment accounts and investment funds that target stocks and bonds of local, regional and international markets, money market instruments, and real estate investment. During the past decade, assets management in Saudi banks has increased by more than 10 times, from 21 billion SAR to 100 billion SAR. Currently, banks put more than 120 investment funds (SAMA Report, Q1, 2014).

Over the past 10 years, the Saudi banking sector witnessed significant developments, both quantitatively and qualitatively. Money supply (M3) rose by 270% to SAR 1669.3 billion at the end of July 2014 against an increase of SAR 451.3 billion at the end of July 2004. Total deposits of banks also went up by 284.5% to SAR 1520.6 billion in the same period. Total commercial banks' claims on the private and public sectors grew by 193.3% to SAR 1314.4 billion at the end of July 2014 compared to SAR

447.8 billion at the end of July 2004. All these developments contributed to the growth of the Kingdom's economy and enhanced the stability of its financial sector (SAMA Report, Q2, 2014).

Capital adequacy ratio (Basel standard) of domestic and foreign banks stood at 17.8% and 16.2% respectively, at the end of the second quarter of 2014, exceeding the prescribed minimum rate of 8%. In addition, stress tests conducted periodically by SAMA on commercial banks showed good results. SAMA fostered the introduction of latest banking technology in Saudi commercial banks. The value of transactions carried out through the Saudi Arabian Riyal Interbank Express system picked up to SAR 54.6 trillion in 2013 from SAR 8.1 trillion in 2004.

The total number of transactions executed through ATMs went up to SAR 1,335.5 million in 2013 from SAR 412.1 million in 2004. During the same period, the total number of transactions carried out through the point of sales terminals increased to SAR 294.1 million with a total value of SAR 144.3 billion from SAR 52.1 million with a total value of SAR 23.9 billion. The number of bills paid through Saudi Arabia payment system (SADAD) increased to SAR 160.8 million with a value of SAR 176.6 billion in 2013 from 43.5 million with a value of SAR 22.0 billion in 2007. As a result of these huge developments in the banking sector, several important international institutions strongly endorsed the Saudi banking system and practices. Also, according to SAMA's expectation, the commercial banks' branches will increase to 57% at the end of 2016.

3. DATA AND METHODOLOGY

3.1. Sample Design and Data Collection

The sample of this study covers 20 of the 24 listed and unlisted banks in the Kingdom of Saudi Arabian stock exchange, including foreign-owned banks and local banks. Four banks were excluded due to non-availability of relevant data. The banks are chosen to fulfill the main purpose of this study which is to examine the relationship between the profitability of Saudi banks and CAMELs model. In this study, the final sample comprises 20 commercial banks, i.e., 8 foreign banks and 12 domestic banks for the period 2000-2014.

Data of 11 listed domestic banks on the Saudi Arabia stock exchange are retrieved from Bureau Van Dijk's Bankscope database provided by the library of Universiti Teknologi MARA, while data for the remaining one and eight foreign banks are obtained from their respective financial statements. The entire analysis is carried out in three stages. In the first two stages, the analyses of domestic and foreign banks are carried out as independent groups. In the third stage, a comparative evaluation between the domestic and foreign banking groups is conducted.

3.2. Model Specification

The traditional estimators of panel data which are the pooled ordinary least square (OLS) and random effects or fixed effects, following Mercieca et al. (2007) and Pasiouras and Kosmidou (2007), are used in our study. In order to address the endogeneity problem that can occur due to the bank fixed effects, we employ

fixed effects model or random effects model, after its validation through the Hausman test. The main indicators (dependent variables) used as a proxy to the profitability for commercial banks are ROA, ROE, and NIM. The determinants (independent variables) are CAR, AQ, OE, SIZE, LIQR1 and LIQR2. In this study, the regression model used is estimated is as follows:

$$\Pi_{ij,t} = \beta_{0_{it}} + \beta_{1_{it}} CAR_{it} + \beta_{2_{it}} AQ_{it} + \beta_{3_{it}} OE_{it} + \beta_{4_{it}} SIZE_{it}$$
$$+ \beta_{5_{it}} LIQR1_{it} + \beta_{6_{it}} LIQR2_{it} + \varepsilon_{it} \dots \quad (1)$$

Where, $\pi_{i,t}$ is the performance of bank i at time t as expressed by ROA, ROE and NIM. CAR is the capital adequacy ratio, AQ is assets quality, OE is operational efficiency, SIZE is bank size, LIQR1 net loan to total deposits, LIQR2 liquid asset to total assets, and ε is an error term. Table 1 shows the measurements which are used to run the study.

4. FINDINGS AND DISCUSSION

4.1. Descriptive Statistics
Table 2 presents a summary of the descriptive statistics for the dependent and independent variables for both Saudi domestic and foreign banks. Note that the mean of ROA, ROE, and NIM for the domestic banks and the foreign banks are 2.7, 18.95 and 3.30, and 1.23, 12.94 and 2.50 respectively. Therefore, it is apparent that domestic banks on average are more profitable than foreign banks.

Domestic banks exhibit a higher CAR (20.47%) and LIQR1 (83.18%) compared to foreign banks. This reflects that CAR of both foreign and domestic banks more than double the 8% statutory requirement set by SAMA, according to the requirement

of Basel Standard II but the domestic banks are more capitalization than foreign banks. At the same time, the domestic banks depend more on the customers' deposit to operate the banking business compared to foreign banks. However, foreign banks show a higher value of AQ of 4.10% implying lower asset quality, OE (168.09%), SIZE (18.29%) and LIQR2 (11.91%). These indicate that foreign banks have more credit risk; foreign banks are more depend in higher operating expenses (traditional function) to generate the income (NIM). Moreover, foreign banks are larger in size and have higher liquidity.

4.2. Correlation Analysis
This section shows the correlation between the variables used in the study. As presented in Table 3, all the correlation between the independent variables is <0.90, indicating the absence of the problem of multicollinearity.

4.3. Empirical Results
This section presents the results of regression analysis for both foreign and domestic banks in the Kingdom of Saudi Arabia which identifies the relationship between the profitability of commercial banks (ROA, ROE, and NIM) and CAMELs parameters: Capital adequacy, asset quality, operational efficiency, net loan to total deposits, liquid assets to total assets, and bank size.

4.3.1. Domestic banks
Table 4 presents the regression results of pooled regression (columns 1, 3, and 5) and fixed effect panel data (columns 2, 4, and 6). Hausman test (P = 0.0000 <5%) indicates that for the present analysis fixed effect model is more appropriate for analysis. It is also found that the F values for the three profitability measures

Table 1: Variables definitions

Symbol	Variable	Measurements	Expected sign
Dependent variable			
ROA	Return on assets	Net income/total assets	
ROE	Return on equity	Net income/common equity	
NIM	Net interest margin	Net interest income/average earning assets	
Independent variables			
CAR	Capital adequacy ratio	(Tire 1 capital+Tire 2 capital)/risk weighted assets	+/-
AQ	Assets quality	Non-performing loan/total loan	-
OE	Operational efficiency	Total operating expenses/total income	-/+
SIZE	Bank size	Logarithm of total assets	-/+
LIQR1	Liquidity risk 1	Net loans/total deposits	+
LIQR2	Liquidity risk 2	Liquid assets/total assets	+

Table 2: Descriptive statistics

Variables	Domestic banks (N=1-180)				Foreign banks (N=1-120)			
	Mean	Min	Max	Standard deviation	Mean	Min	Max	Standard deviation
ROA	2.71	−1.48	13.21	1.89	1.23	−2.53	3.99	1.00
ROE	18.95	−7.99	57.52	11.77	12.94	−34.18	41.63	9.32
NIM	3.30	2.12	7.79	1.05	2.50	0.55	6.68	1.41
CAR	20.47	11.24	183.00	17.58	16.19	10.06	32.70	4.76
AQ	1.98	0.03	6.39	1.34	4.10	0.00	25.16	4.91
OE	125.32	44.54	277.71	49.28	168.09	46.20	579.08	98.38
SIZE	18.08	15.78	19.45	0.79	18.29	9.62	23.78	3.97
LIQR1	83.18	3.18	202.43	22.62	71.29	24.29	139.82	23.84
LIQR2	10.17	0.82	40.08	9.20	11.91	0.46	44.56	11.43

ROA: Return on assets, ROE: Return on equity, NIM: Net interest margin, CAR: Capital adequacy ratio, AQ: Assets quality, OE: Operational efficiency, SIZE: Bank size, LIQR1: Liquidity risk 1

Table 3: Correlations analysis

	ROA	ROE	NIM	CAR	AQ	OE	SIZE	LIQR1	LIQR2
ROA	1								
ROE	0.849**	1							
NIM	0.527**	0.484**	1						
CAR	0.291**	0.062	0.279**	1					
AQ	−0.127	−0.003	0.270**	0.006	1				
OE	−0.105	0.013	−0.041	−0.167*	0.176**	1			
SIZE	−0.016	0.147*	0.111	−0.148*	0.235**	0.388**	1		
LIQR1	0.272**	−0.002	0.372**	0.487**	−0.069	−0.017	−0.146*	1	
LIQR2	0.088	0.319**	0.472**	−0.017	0.368**	0.215**	0.291**	−0.008	1

**Correlation is significant at the 0.01 level and *Correlation is significant at the 0.05 level. ROA: Return on assets, ROE: Return on equity, NIM: Net interest margin, CAR: Capital adequacy ratio, AQ: Assets quality, OE: Operational efficiency, SIZE: Bank size, LIQR1: Liquidity risk 1

Table 4: Regression results for Saudi domestic banks

Variables	ROA		ROE		NIM	
	1	2	3	4	5	6
	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect
CAR	0.171***	2.044**	0.189	0.339	0.017	0.016
	(−3.373)	(1.05)	(0.675)	(1.57)	(0.671)	(1.13)
AQ	−0.352*	−0.435**	−3.528***	−3.394***	−0.029	−0.0098
	(−1.991)	(−2.50)	(−4.117)	(−4.70)	(−0.384)	(−0.25)
OE	0.003	0.001	0.004	0.0009	0.003	0.0011
	(0.431)	(0.13)	(−0.108)	(0.04)	(−0.889)	(−0.680)
SIZE	−0.305**	−1.992***	−0.971**	−17.69***	−0.177**	−1.331***
	−(0.683)	(−3.08)	(−0.411)	(−5.55)	(−0.855)	(−7.51)
LIQRI	2.021*	0.061**	0.178	0.0815	0.039***	0.015**
	(1.117)	(2.47)	(1.623)	(0.700)	(−3.157)	(2.36)
LIQR2	−0.033	−0.029	−0.414***	−0.305**	−0.025***	−0.014*
	(1.349)	(0.990)	(−3.087)	(−2.16)	(−2.108)	(−0.180)
Constant	−4.241	33.468**	51.21***	342.52***	−2.793	26.62***
	(−0.450)	(2.67)	(1.019)	(5.54)	(−0.632)	(7.70)
Observation	159	159	159	159	159	159
R²	0.268	0.492	0.272	0.522	0.276	0.5523
F	4.02	9.37	5.228	13.81	5.343	15.42
Significant F value	0.002	0.000	0.000	0.0000	0.000	0.000
Durbin–Watson	1.968		1.523		1.687	
Hausman test P value		0.0000		0.0000		0.0000

The figures in parentheses are t-statistics. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. ROA: Return on assets, ROE: Return on equity, NIM: Net interest margin, CAR: Capital adequacy ratio, AQ: Assets quality, OE: Operational efficiency, SIZE: Bank size, LIQR1: Liquidity risk 1

ROA, ROE and NIM are statistically significant in both OLS and fixed effect models at a level of 1%. This reflects that differences of profitability of Saudi domestic banks using ROA, ROE, and NIM are significantly explained by the determinants of bank performance. In general, the results of the variable are similar in the both pooled and fixed effect regression models.

It is noted that the relationship of CAR for domestic banks with ROA is positive and significant, indicating thereby that higher capital ratio results in better profitability of domestic banks. However, there is a positive but insignificant relationship with ROE and NIM, suggesting that banks with higher capital are more profitability. AQ measured by nonperforming to total loans has a negative and significant effect on bank profitability ROA, ROE, indicating higher non-performing loans results in decrease in profitability of banks. For operational efficiency (OE) measured by total operating expenses to total income, has a positive association with ROA, ROE, and NIM but insignificant, suggesting that the efficient cost management does not result in better in the profitability of Saudi domestic banks.

Bank size (SIZE) has a negative and significant effect on ROA, ROE, and NIM, suggesting that the larger the bank, the lower is the profitability, indicating that the domestic banks suffer from diseconomies of scale. For liquidity risk, loan to total deposit (LIQR1) has a positive and significant impact on ROA and NIM. However, liquid assets to total assets ratio (LIQR2) has a negative impact on ROE and NIM, indicating that strained liquidity drains the profitability of domestic banks.

4.3.2. Foreign banks
As can be observed from Table 5, the F values for the three models is also statistically significant at 1% level, which means that the variance of foreign banks' profitability in Saudi Arabia is significantly explained by ROA, ROE, and NIM. The fixed effect model is found to be more appropriate as through Hausman test (P = 0.0000 <5%).

Table 5 shows that CAR for foreign banks has a positive and significant relationship with ROA and NIM, confirming that more capital ratio increases the profitability of banks. AQ or non-

performing loans to total loan ratio has a negative and significant effect on bank profitability, confirming that more non-performing loans erode the profitability of foreign banks. Operating expenses to total income (OE) has a negative and significant impact on ROA and NIM of foreign banks in Saudi Arabia.

The relationship between SIZE and foreign banks' profitability ROA, ROE, and NIM is negative and significant, indicating that the smaller the banks the higher the profitability. This also confirms that the hypothesis of economies of scale and scope that argue that the argument that larger banks are more profitable is not supported in the Saudi Arabia banking sector. The loan to total

deposit (LIQR1) and liquid assets to total assets ratio (LIQR2) have a negative and significant association with ROA, ROE, and NIM. These suggest that foreign banks in Saudi Arabia with less liquidity (higher value of loans to deposits) are less profitable.

4.3.3. Discussion on the empirical results for domestic and foreign banks

Based on Table 6, CAR in both foreign and domestic banks has positive and significant relationship with ROA; positive but insignificant relationship with ROE. The relationship with NIM is positive and significant with foreign banks while insignificant with domestic banks. Overall, this reflects that the higher the

Table 5: Regression results for foreign banks in Saudi Arabia

Variables	ROA		ROE		NIM	
	1	2	3	4	5	6
	OLS	Fixed effect	OLS	Fixed effect	OLS	Fixed effect
CAR	0.065***	0.058**	0.267	0.323	0.027**	0.032**
	(2.654)	(1.73)	(1.27)	(0.93)	(1.124)	(1.98)
AQ	−0.020**	−0.161**	−0.212**	−0.912**	−0.072***	−0.012**
	(−0.490)	(−2.34)	(−0.896)	(−2.60)	(−2.814)	(−0.110)
OE	−0.002*	−0.0011*	−0.012	−0.0003	−0.001**	−0.003**
	(−1.748)	(−0.78)	(−1.228)	(−0.031)	(−0.625)	(−6.38)
SIZE	−0.004***	−0.540***	−0.276*	−6.874***	−0.005**	−0.227**
	(−0.157)	(−2.65)	(−0.403)	(−3.37)	(−0.206)	(−2.42)
LIQRI	−0.013**	−0.013**	−0.007***	−0.1683***	0.017***	−0.005***
	(2.478)	(−2.23)	(−0.185)	(−2.85)	(4.191)	(−1.31)
LIQR2	−0.012*	−0.028**	−0.303***	−0.035**	−0.075***	−0.024**
	(−1.043)	(−0.750)	(−3.188)	(−0.100)	(−7.292)	(−1.49)
Constant	−1.193*	11.3***	−2.506	146.5***	−0.093	6.275***
	(−1.765)	(3.00)	(1.137)	(4.01)	(−0.138)	(3.73)
Observation	100	100	100	100	100	100
R^2	0.307	0.211	0.212	0.248	0.636	0.4133
F	5.768	3.04	4.169	4.56	27.028	9.75
Significant F value	0.000	0.010	0.001	0.000	0.000	0.000
Durbin–Watson	2.003		1.716		2.399	
Hausman test P value		0.0000		0.0000		0.0000

The figures in parentheses are t-statistics. ***Significant at the 1% level, **Significant at the 5% level, *Significant at the 10% level. ROA: Return on assets, ROE: Return on equity, NIM: Net interest margin, CAR: Capital adequacy ratio, AQ: Assets quality, OE: Operational efficiency, SIZE: Bank size, LIQR1: Liquidity risk 1

Table 6: Summary of results for profitability measures for both domestic and foreign banks in Saudi Arabia

Variables	Domestic banks								
	ROA			ROE			NIM		
	+ Significant	− Significant	Insignificant	+ Significant	− Significant	Insignificant	+ Significant	− Significant	Insignificant
CAR	✓					✓			✓
AQ		✓			✓				✓
OE			✓			✓			✓
SIZE		✓			✓			✓	
LIQRI	✓					✓	✓		
LIQR2			✓		✓			✓	
	Foreign banks								
CAR	✓					✓	✓		
AQ		✓			✓			✓	
OE		✓				✓		✓	
SIZE		✓			✓			✓	
LIQRI		✓			✓			✓	
LIQR2		✓			✓			✓	

"+Significant" represents that the variable is significantly and positively affect the bank profitability; "−Significant" indicates that the variable is significantly and negatively affect the bank profitability; "insignificant" means that the variable is not significantly related to bank profitability. ROA: Return on assets, ROE: Return on equity, NIM: Net interest margin, CAR: Capital adequacy ratio, AQ: Assets quality, OE: Operational efficiency, SIZE: Bank size, LIQR1: Liquidity risk 1

CAR, the higher is the profitability of Saudi banks (ROA, ROE, and NIM).

The relationship of AQ measured by non-performing loans to total loans is negatively related to ROA and ROE for both domestic as well as foreign banks, while it has only negative and significant effect on NIM for foreign banks. These indicate that increased non-performing loans have a detrimental effect on the profitability of domestic banks and foreign banks in Saudi Arabia.

Another determinant for profitability, OE measured by total operating expenses to net interest income has a positive but insignificant relationship with ROA, ROE, and NIM for domestic banks. However, OE for foreign banks is negatively and significantly associated with ROA and ROE. This indicates that though profitability of domestic banks has no significant relationship, cost inefficiency in foreign banks has a negative effect on their profitability. The SIZE of both domestic banks and foreign banks are negatively and significantly related to ROA, ROE, and NIM, confirming that the smaller banks are more profitable than larger banks in Saudi Arabia. These findings indicate that both foreign and domestic banks suffer from diseconomies of scale.

Finally, the relationship of total loan to total deposit (LIQR1) for domestic banks has a positive and significant relationship with ROA and NIM; whereas it has a positive but insignificant relationship with ROE. However, in foreign banks, the relationship is negative and significant with all bank profitability measures ROA, ROE, and NIM. In both foreign and domestic banks, liquid assets to total assets ratio (LIQR2) shows a negative and significant association with ROE and NIM. However, it is only negative and significant related to ROA for foreign banks. These suggest that massive loans lead to increase the profitability of domestic banks and decrease the profitability for foreign banks. In other words, this indicates that the domestic Saudi banks have good administrations and high capacities to assess, monitor and control the loans compared with foreign banks.

5. CONCLUSION

The overall aim of our paper is to analyze and compare the impact of CAMEL model on the profitability for both domestic and foreign commercial banks during the period 2000-2014. To achieve that, we have estimated 15 years panel data for 20 commercial banks using both pooled OLS as well as fixed effect model. In this paper, the relationship of the specific factors on banks' profitability as determined by ROA, ROE, and NIM is evaluated. This study is considered as the first study that has conducted on the profitability of commercial banks in the Kingdom of Saudi Arabia to examine differences in the profitability metrics of domestic versus foreign-owned banks. Among the three models used in the study, R^2 of the driver variables is highest with NIM as dependent variable explaining the variation of 28% and 64% in the dependent variable.

Our findings indicate that domestic banks in Saudi Arabia are more profitable than foreign banks. We find that both foreign and domestic banks with higher capital are more profitable. In opposite, we find that banks with a higher non-performing loan to total loan are less profitable; however, foreign banks are riskier in terms of their credit portfolio. In contrast to domestic banks, operating expenses to total income for foreign banks is significant but negative related to profitability, indicating that the cost managements for foreign banks are not efficient to generate more profits. Our results also indicate that banks with larger size are less profitable. We also find that massive loans lead to increase the profitability of domestic banks and decrease the profitability for foreign banks. Furthermore, we find that foreign banks are more liquid and less profitable than domestic banks.

The findings have numerous policy implications: The diseconomies of scale in Saudi commercial banking are an issue which should draw the close attention of both the policy planners and the top management of banks in the country. Though the findings that higher volume of lending activities have a positive effect on the profitability of domestic banks, there is a need for the regulator to impress upon the domestic banks about the importance of monitoring the health of their loans book. Foreign banks should explore ways and means to control their operating expenses and strengthen their system of assessment and monitoring of their loans book. Future research can examine the effect of the various macroeconomic and industry factors on bank profitability. It also can analyze and compare between the profitability of private and public banks in Saudi Arabia.

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