

BANK'S PERFORMANCE AND ITS DETERMINANTS – EVIDENCE FROM MIDDLE EAST, INDIAN SUB-CONTINENT AND AFRICAN BANKS

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Abstract: This study is driven by a motivation to examine the key determinants of bank's performance as proxied by bank's liquidity (LR), non-performing loans (NPL), capital adequacy ratio (CAR), loan growth (FEXP) and default risk premium (FQL) within the framework of credit creation theory of banking. Using random effect model as an estimation tool on 93 banks in Middle East, Africa and Indian subcontinent over study period from 2009 through 2016, the findings reveal that there are significant relationships between bank's performance and its loan growth. Both ROA and FEXP are also found to be positively correlated. In contrast, the NPL and CAR are found to be negatively correlated with ROA. As a whole, it is evident that loan growth plays a very important role in supporting bank's long term performance.

Key words: bank's liquidity, return on assets, capital adequacy ratio, non-performing loans, loan growth, static panel data, random effect model, credit creation theory of banking

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Introduction

It is generally known that a banking business is associated with high level of risk with great possibility of insolvency. As such, many agree that banking is one of the most regulated industries in the world (Chortareas et al., 2012). The 2008 global financial crisis has resulted in significant reforms in banking regulation and today's banking supervision plays an even more important role on the stability of the banking system than before. One must also note that the Asian Financial Crisis in July 1997 not only exerted tremendous impact on the financial well-being of Asian financial institutions, but also on large multinational companies partly owned by governments such as Maybank, Samsung and Hyundai.

To begin with, it is essential to give a clear definition of what regulation and supervision mean. The term regulation refers to the setting of the particular principles that firms or banks need to comply to. These might be a set of laws, rules or legislation stipulated by the appropriate regulatory agency. On the other hand, supervision involves the monitoring of the behavior of financial institutions and banks (Casu et al., 2004). This means that the main difference between banking

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regulation and supervision is that the former focuses on the stipulated rules while the latter involves actual implementation of those rules and regulations. Nevertheless, the study of Demirguc-Kunt and Detragiache (2011) on bank performance in 86 countries fail to find a significant relationship between bank supervision and bank soundness as measured by a system-wide Z-score.

A myriad of studies on banking soundness have been focusing more on developed countries rather than developing countries and Sub-Saharan Africa (SSA) is no exception. Most of the empirical evidences are derived from cases in United States and Europe. There is, therefore, a lack of sufficient information on determinants of bank performance in Africa and middle-east which warrant further investigation (Short, 1979; Bourke, 1989; Molyneux and Thornton, 1992; Demirguc-Kunt and Huizinga, 2001). Interestingly, there have been no serious problems reported on those banks in Middle East, Africa and Indian subcontinent after the 2008 global financial crisis. This paper attempts to provide useful insights on the soundness of the banking system in this region.

Despite significant reforms made in the financial sector in Sub-Saharan Africa during 1980s and 1990, the size of banks in this sub-region is relatively low and has not been increasing for many years. Poor performance of banks are attributed to low levels of quality landings, high spread between lending and deposit rates, high loan default rates, poor asset quality and lack of operational efficiencies (Panayiotis et al., 2005). In the context of bank competition in developing economies, the study of Ariss (2010) indicates an increase in the degree of market power leads to greater bank stability and enhanced profit efficiency. Beck et al. (2013) reveal that an increase in bank competition will have a larger impact on banks' fragility in countries with stricter activity restrictions, better developed stock exchanges and more effective systems of credit information sharing.

For every bank, its strength and resilience may come from within or outside the bank itself. Milton Cornett et al. (2002), Toddard et al. (2004) and Panayiotis et al. (2005) argue that bank's profitability is subject to internal and external factors. Internal factors involve bank-specific variables; while external factors encompass both industry-specific and macroeconomic variables. Literature suggests that there are six standard key bank-specific indicators which are commonly used to investigate bank soundness: profitability, capital adequacy, asset quality, operational efficiency, and asset growth (Kamarudin, 2018). Meanwhile, industry-specific factors comprise of ownership, bank concentration index. Lastly, the macroeconomic variables consider interest rate, interest rate spread, inflation rate and the rate of economic growth as measured by annual GDP.

As the motivation of this paper is to examine bank's long-term sustainability, it is very important to have a specific measurement of the bank's soundness and robustness. The liquidity coverage ratio (LCR) is an important part of the Basel Accords, as they dictate the amount of liquid assets required to be retained by financial institutions. As banks are required to hold a certain level of highly liquid assets, they are less likely to be able to provide short-term lending (Francis, 2013).

This study is narrowed down towards a number of pertinent issues within Basel risk management framework. Liquidity ratio (LR), capital adequacy ratio (CAR), non-performing loans (NPL) and default risk premium (FQL) are used as proxies for bank's soundness, while loan growth (FEXP) is a measure for bank's robustness. Subsequently, the following research questions are studied and analyzed: (a) Did LR and CAR really exert significant influence on bank's profitability? (b) Is there any significant relationship between loan growth (FEXP) and bank's profitability? (c) Is there a strong correlation between loan growth (FEXP) and bank's NPL?

The World Bank (2006) acknowledges that the positive signs of sustainable growth from both public and financial sectors are still far-fetched. The report has called for more comprehensive reforms not only in the financial sector but also in the public services. Bank is one of the key players in the financial system and therefore it must operate at the optimal level of efficiency in the banking sector. Bank efficiency results in growth in quality assets that this is the key enabler that supports growth in economic activities.

Data and Methodology

Data

This study attempts to uncover the theoretical link between bank's profitability and its asset classes (liquid assets and new loans). The study also looks into the effect of poor asset quality (NPL and default loans) on bank's long-run profitability. Analysing the yearly data from year 2009 through 2016, the study examines financial data from 93 banks across Middle East, Africa and Indian subcontinent. All secondary data are obtained from World Bank database. The bank-specific factors are expressed as follows:

- LR=Liquidity Coverage Ratio=Total of Highly Liquid Assets/Total Assets (in %)
- FQL=Default Risk Premium=Total Amount of Default Loans/Total Loans (in %)
- FEXP=Loan Growth %=New Loan Created/Total Assets (in %)
- NPL=Amount of Non-Performing Loans/Total Loans (in %)
- CAR=Capital Adequacy Ratio=Total Paid-up Capital/Total Loans (in %)
- ROA=Net Profits/Total Assets (in %)

Theoretical Framework

In developing bank's profitability model, this study replicates the work of by Naceur et al. (2003) and Panayiotis et al. (2005) on Tunisian banks and Greece banks respectively. The bank's profit efficiency model is derived from the reduced form of cost efficiency function, which is adapted from Cobb-Douglas production function. Ultimately, the estimation model is expressed as follows:

$$\Pi_{it} = \alpha + \alpha_i \sum \Pi_{t-i} + \beta_i X_{it} + u_{it} \quad (1)$$

where Π_i is the profitability variable and X_i = bank-specific factors or profitability determinants, and uit is group specific variation that is time invariant. Based on literature, ROA is the most common variable in measuring bank's profitability.

Model Specification and Variables

The estimation model and its variables are specified according to the work of Naceur et al. (2003) and Panayiotis et al. (2005) but with some adjustments. Since this study falls into static panel framework, the pooled OLS regression is employed as a base-line analysis. This study also reduces the number of explanatory variables by incorporating only six factors into the equation: bank's profitability; capital adequacy that measures the bank ability to meet regulated capital standards; default risk premium that measures changes in the bank loan quality and risk; loan growth that measures the bank ability to generate revenue; liquidity ratio that measures the changes in the bank cash position; and non-performing loan that measures the bank's potential liability. Based on these six factors, a regression analysis to estimate bank's profitability model is developed. Deploying the bank's profitability model, the following specification is postulated:

$$\Pi_{it} = c + \beta_1 FEXP_{it} + \beta_2 CAR_{it} + \beta_3 LR_{it} + \beta_4 FQL_{it} + \beta_5 NPL_{it} + \varepsilon_{it} \quad (2)$$

where Π_{it} is profitability variable represented by ROA , $FEXP$ is bank's loan growth, CAR is bank's total equity to its total assets, LR is bank's liquidity ratio, FQL is bank's default risk premium and finally NPL is the proxy for bank's non-performing loans.

Table 1 shows the determinants of bank's profitability and their anticipated impacts as demonstrated by earlier researchers (Anthanasoglou et al., 2006) on their studies in developed economies.

Table 1. Determinants of Bank's Profitability

Explanatory variable	Anticipated Impact
Growth in total assets - ($FEXP$)	Positive
Capital adequacy ratio - (CAR)	Positive
Liquidity ratio - (LR)	Negative
Default risk premium - (FQL)	Negative
Non-Performing Loans- (NPL)	Positive

Empirical Findings

To demonstrate the impact of changes in bank-specific factors on bank's profitability, the empirical results are presented in Table 2, Table 3 and Table 4 respectively. As explained earlier, the pooled OLS procedure is used as an estimation model for this static panel data framework. To begin with, the descriptive statistics and correlation analysis are presented in the following paragraph. From Table 2, it is evident that the mean ROA for all 93 banks is moderately low at 1.8 percent coupled with bank liquidity ratio of 36 percent.

On the back of robust loan growth of almost 63 percent (mean growth rate), the mean percentage of non-performing loans is successfully kept below 6%. The default risk premium is also observed settling at low level of mean 2 percent. It is interesting to highlight that the average capital adequacy ratio stands at relatively high level of almost 19 percent, providing solid buffer for bank's entire asset portfolios. These preliminary findings seem credible to support bank soundness in the observed region over 8 years study period. In terms of riskiness, (looking at the degree of dispersion from the mean line), loan growth slightly has lower standard deviation as compared to bank's liquidity ratio.

Table 2. Descriptive Statistics of Bank-Specific Factors

Variable	Label	N	Mean	Standard Dev	Minimum	Maximum
ROA	return on assets	744	0.0179167	0.020891	0	0.21
NPL	non-performing loans	744	0.0554973	0.0735105	0	0.6
CAR	capital adequacy ratio	744	0.1882796	0.1043624	0.07	1.83
LR	liquidity ratio	744	0.3601613	0.2144779	0	0.94
FQL	financial quality	744	0.0206048	0.0352348	0	0.51
FEXP	financial expansion	744	0.6264785	0.2015077	0.01	3.46

Table 3 shows the results from Pearson correlation analysis. A hypothesis testing is carried out to determine the significance level of the correlation coefficients. P-values are reported, indicating the level of significance. From the statistical output, FEXP has the highest positive correlation (14%) with ROA followed by LR (-9.7%) and both variables are significant at 5% level. On contrary, CAR registered the lowest correlation (-0.9%) with ROA but it is not statistically significant.

Table 3. Correlation Analysis of Bank-Specific Factors

Pearson Correlation Coefficients, N = 744						
Prob > r under H0: Rho=0						
	ROA	NPL	CAR	LR	FQL	FEXP
ROA	1	-0.0488	-0.00967	-0.09767	0.07375	0.13902
return on assets		0.1837	0.7923	0.0077	0.0443	0.0001
NPL	-0.0488	1	0.00262	-0.04586	-0.0242	0.00174
non-performing loans	0.1837		0.9431	0.2115	0.5098	0.9621
CAR	-0.0097	0.00262	1	-0.05486	-0.02644	-0.17062
capital adequacy ratio	0.7923	0.9431		0.1349	0.4715	<.0001

LR	-0.0977	-0.04586	-0.05486	1	0.00444	-0.09189
liquidity ratio	0.0077	0.2115	0.1349		0.9038	0.0122
FQL	0.07375	-0.0242	-0.02644	0.00444	1	0.04568
financial quality	0.0443	0.5098	0.4715	0.9038		0.2133
FEXP	0.13902	0.00174	-0.17062	-0.09189	0.04568	1
financial expansion	0.0001	0.9621	<.0001	0.0122	0.2133	

The empirical results from pooled OLS regression in Table 4 indicate an acceptance of alternative hypothesis for two bank-specific variables - LR and FEXP. This finding implies that there are statistically significant relationship between them and bank's profitability as measured by ROA. Consistent with the findings of earlier studies (refer Table 1) both LR and ROA have a significant negative relationship. As for FEXP, its relationship with ROA is found to be significantly positive. Looking at the fit statistics in Table 5, the low R² of 3.4% does not warrant a desirable goodness of fit for this estimated model. In view of this, a more robust static panel data modeling, namely random effects and DaSilva are considered for further analysis.

H₀: Absence of significant relationship between Profitability and Bank-Specific
H₁: Existence of significant relationship between Profitability and Bank-Specific

Table 4. Pooled OLS Analysis

Parameter Estimates						
Variable	DF	Estimate	Standard Error	t Value	Pr > t	Label
Intercept	1	0.012214	0.00353	3.46	0.0006	Intercept
NPL	1	-0.01462	0.0103	-1.42	0.156	non-performing loan
CAR	1	0.001908	0.00737	0.26	0.7958	capital adequacy ratio
LR	1	-0.00856	0.00355	-2.41	0.0162*	liquidity ratio
FQL	1	0.039862	0.0215	1.86	0.0639	financial quality
FEXP	1	0.013435	0.00383	3.51	0.0005*	financial expansion

Table 5. Fit Statistics of Pooled OLS Model

Fit Statistics			
SSE	0.3133	DFE	738
MSE	0.0004	Root MSE	0.0206
R-Square	0.034		

Looking at the p-values of Hausman and Breusch Pagan tests in Table 6, it is justifiable for this study to employ panel random effects as the estimation model. The null hypothesis of Hausman test cannot be rejected as its p-value is greater than α of 5 percent. As for the Breusch Pagan test, the acceptance of the alternative hypothesis indicates that estimating using random effects is warranted.

Table 6. Diagnostics Tests via Hausman and Breusch Pagan

Hausman Test for Random Effects (H ₀ : Random Effect)			Breusch Pagan Test for Random Effects (H ₀ : Pooled Effect)		
DF	m Value	Pr > m	DF	m Value	Pr > m
5	7.87	0.1638	2	908.48	<.0001

From the p-values presented in Table 7 and Table 8 below, financial expansion or percentage loan growth poses a significant influence on bank's profitability in both estimation models.

Table 7. Parameter Estimates of Random Two Model

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Pr > t
Intercept	1	0.01179	0.00372	3.17	0.0016
LR	1	-0.00375	0.00553	-0.68	0.4984
NPL	1	-0.00867	0.0106	-0.82	0.4142
CAR	1	0.00523	0.00668	0.78	0.4336
FQL	1	-0.02178	0.016	-1.36	0.1752
FEXP	1	0.01185	0.00327	3.63	0.0003

Table 8. Parameter Estimates from DaSilva Model

Parameter Estimates					
Variable	DF	Estimate	Standard Error	t Value	Pr > t
Intercept	1	0.01271	0.00343	3.7	0.0002
LR	1	0.00043	0.00546	0.08	0.9374
NPL	1	-0.017	0.0111	-1.53	0.1263
CAR	1	0.00465	0.00616	0.75	0.4511
FQL	1	-0.0281	0.0131	-2.14	0.0327
FEXP	1	0.00909	0.00276	3.29	0.001

This result conforms to the earlier finding in the pooled OLS. Meanwhile, financial quality is found to be credible only in the Da Silva model. The remaining independent variables in both models seem insignificant in relation to bank's profitability. As anticipated, there is a positive direct relationship between loan growth and bank's profitability but financial quality appears to be otherwise.

With respect to the fit statistics (refer Table 9), low R^2 values are reported from both models. However, this limitation is not a major concern as the diagnostics results remain intact.

Table 9. Fit Statistics of Random Two and DaSilva Models

Estimation Method: Random T (Fit Statistics, CS=93, TS=8)				Estimation Method: DaSilva (Fit Statistics, CS=93, TS=8)			
SSE	0.1244	DFE	738	SSE	945.59	DFE	738
MSE	0.0002	Root MSE	0.013	MSE	1.2813	Root MSE	1.1319
R-Square	0.0221			R-Square	0.0182		

Conclusion

From the empirical results of pooled OLS and random effect models, there is a statistically significant relationship between bank's profitability and its loan growth. As such, it is worth noting that growth in bank asset classes significantly influence bank's profitability and therefore any change in central bank's policy that promotes reduction in bank's liquidity requirement is seen timely and favorable to the bank management. This finding is consistent with the earlier study by Goddard et al. (2004) that postulate profit is an important prerequisite for future growth among banks in European Union. Doumpos et al. (2015) find that central bank independence also exerts a positive impact on bank soundness, particularly during crisis. Effective liquidity risk management not only helps ensure a bank's ability to meet cash flow obligations, but also enable this excess liquidity to be channeled into short-term borrowings. As anticipated, liquidity ratio is found to be negatively correlated with bank's profitability, while loan growth and bank's profitability are positively correlated. This study also reveals that both NPL and CAR are negatively correlated with ROA, suggesting that any percentage increase in these two variables will exert some detrimental effect on bank's long-run profitability. However, these two variables do not have statistically significant relationship with ROA. It is hoped that the bank's top management would understand the important interactions between bank's profitability and its specific factors, particularly liquidity management and loan growth (Francis, 2013). No doubt that every manager works to maximize shareholders' wealth but ultimately one must strike the balance between bank soundness and its sustainability in the long-run.

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WYDAJNOŚĆ BANKU I JEJ DETERMINANTY - PRZYKŁAD BLISKIEGO WSCHODU, INDYJSKICH PODWYKONAWCZYCH ORAZ AFRYKAŃSKICH BANKÓW

Streszczenie: Celem badania jest przeanalizowanie kluczowych czynników determinujących wyniki banku w zależności od jego płynności (LR), zagrożonych kredytów (NPL), współczynnika wypłacalności (CAR), wzrostu kredytów (FEXP) i premii za ryzyko niewypłacalności (FQL) w ramach teorii bankowej dotyczącej działalności kredytowej. Jako narzędzie oceny, w 93 bankach na Bliskim Wschodzie, w Afryce i na

subkontynencie indyjskim, w okresie od 2009 r. do 2016 r. wykorzystano model efektu losowego. Wyniki pokazują, że istnieją istotne zależności między wydajnością banku a zwiększeniem aktywności kredytowej. Na podstawie przeprowadzonych badań stwierdzono, że zarówno ROA, jak i FEXP są skorelowane dodatnio, natomiast NPL i CAR są skorelowane ujemnie z ROA. Reasumując, należy stwierdzić, że zwiększenie aktywności kredytowej odgrywa bardzo ważną rolę we wspieraniu długoterminowej wydajności banku.
Słowa kluczowe: płynność banku, zwrot z aktywów, współczynnik adekwatności kapitałowej, niespłacone pożyczki, wzrost pożyczek, statyczne dane panelowe, model losowego efektu, działalność kredytowa

银行业绩及其决定因素 - 来自中东，印度次大陆和非洲银行的证据

摘要：本研究的动机是研究以银行流动性（LR），不良贷款（NPL），资本充足率（CAR），贷款增长（FEXP）和违约风险溢价为代表的银行业绩关键决定因素（FQL）在银行信贷创造理论框架内。对2009年至2016年在中东，非洲和印度次大陆的93家银行的研究使用随机效应模型作为估算工具，研究结果显示银行业绩与贷款增长之间存在显著关系。ROA和FEXP也被认为是正相关的。相反，不良贷款和CAR与ROA呈负相关。总体而言，贷款增长显然对支持银行的长期业绩起着非常重要的作用。

关键词：银行流动性，资产收益率，资本充足率，不良贷款，贷款增长，静态面板数据，随机效应模型和银行信贷创造理论。