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THE IMPACT OF MACROECONOMIC VARIABLES ON THE PROFITABILITY OF LISTED COMMERCIAL BANKS IN PAKISTAN

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ABSTRACT

Based on vital contribution of the commercial banks to economic progress of Pakistan, this study investigates the impact of macroeconomic variables on profitability of public limited commercial banks in Pakistan for years 2001-2011. Pooled Ordinary Least Square (POLS) method is used to examine the effect of 3 major external factors; inflation rate, real gross domestic product (GDP) and real interest rate on profitability indicators; return on assets (ROA), return on equity (ROE) and equity multiplier (EM) ratios in 3 separate models. The empirical findings indicate a strong positive relationship of real interest rate with ROA, ROE and EM. Secondly, real GDP is found to have an insignificant positive effect on ROA, but an insignificant negative impact on ROE and EM. Inflation rate on the other hand, has a negative link with all 3 profitability measures. Overall, the selected macroeconomic factors are found to have a negligible impact on earnings of commercial banks.

INTRODUCTION:

Role of the financial institutions cannot be understated, financial sector is as crucial as any other development sector in Pakistan. They act as intermediaries between investors and end users of deposits and facilitate in numerous business activities. According to Pakistan 10 year strategy paper for the banking sector reforms (n.d.); banking sector represents the core of the financial sector in Pakistan with 88 % share. Currently, there are 34 commercial and 4 specialized banks in Pakistan (Anwar, 2011). Commercial banks include 29 conventional and 5 Islamic banks (SBP, 2012). Out of these only 23 banks are listed at stock exchanges (ISE, 2012; KSE, 2012; LSE, 2012).

The banking sector of Pakistan has been constantly under structural changes and development phase since independence. Till 1970, commercial banks showed remarkable growth. 1974 onwards 14 commercial banks were nationalized and merged into five banks. In 1980s and 1990s, almost 90 % of the total assets of banking industry were owned by financially unproductive public banks. The profits declined and consequently, banking sector reforms were initiated to address issues like privatization, lending rates, etc. (Anwar, 2011). Enlisting of banks with stock exchanges and with the advent of Islamic banking, in the year 2002, banks started earning profits and continued to perform very well even in late 2008-2009 global financial crises. Stress test report, June 2008 pointed out that the banks larger in size are relatively robust to external factors (Economy of Pakistan, 2012). According to Rousseau and Sylla (2001), well performing securities markets encourage economic growth. Recent banking sector performance highlighted by Anwar (2011) shows same progressive trend with total assets of Rs. 7.7 trillion, deposits of Rs. 6.0 trillion, advances of Rs. 3.8 trillion, investments consisting of Rs. 2.6 trillion, before -tax profit for first six months accounting for Rs. 77 billion and Rs. 722 billion invested as equity. Contribution of Islamic banks in total banking assets is Rs.560. billion which accounts for 7.3% of total assets. However, this past decade growth in financial assets is in nominal terms and is not in relation to real economy, which is measured by GDP.

Profitability as defined by Rose (1999) is the net after-tax income of banks commonly measured by return on assets and return on equity ratios. Numerous external factors that affect these ratios include; inflation rate, real interest rate, real gross domestic product, imports and exports of a country, etc. In Pakistan, commercial banks have been playing an important role in the economic development (Khan, 2012) and they are also affected by the macroeconomic conditions. Over the past decade, Pakistani banks have faced financial stability challenges due to changes in economic indicators. A lot of work has been done in foreign literature, Staikouras and Wood (2004) and Kosmidou, Tanna, and Pasiouras (2005) give evidence of significant contribution of external factors towards earnings of banks, but in Pakistan only Ali, Akhtar, and Ahmed (2011) and Gul, Irshad, and Zaman (2011**)** have done research into this topic covering only up to five-year time period.

As Pakistan is dominated by Commercial Banks (SBP, 2012)**,** it is of vital concern to associate their profitability with country's progress, and hence, a study to identify the cumulative impact of macroeconomic variables on the profitability of commercial banks would add to the strategies devised in interest of the institutions' development. Purpose of this research is to study the relationship between macroeconomic variables and profitability of listed commercial banks in Pakistan. The remaining paper is segregated as follows. Section 2 provides the review of related articles. Section 3 defines the data, methodology and develops hypotheses. Section 4 presents the findings and interpretation. Finally, Section 5 summarizes empirical results and gives suggestions for future work.

LITERATURE REVIEW:

There are mixed studies on profitability of banks based on the number of countries and types of banks included in the study sample. ROA and ROE have been widely considered as profitability measures (Delis & Staikouras, 2006; Hassan & Bashir, 2003), while resreachers have also included EM (Almazari, 2012; (Naïmy, 2005).

Demirgüç-Kunt and Detragiache (1998) analyzed 45-65 developed and developing countries. Applying a multivariate logit model for period 1980-94, results suggested a significant contribution of external factors towards banking sector crises. Demirguc-Kunt and Huizinga (1999) used linear regression on commercial bank data for 80 countries. Empirical findings pointed out positive but insignificant impact of macroeconomic factors on profitability of banks. Naceur (2003) looked into the profitability of the Tunisian banking sector. Balanced panel data of ten major deposit banks was sampled for 1980 -2000 period. Results indicated no or insignificant impact of annual growth rate and inflation rate on Tunisian banks. Mamatzakis and Remoundos (2003) sampled 17 Greek commercial banks and used and structure-conduct-performance framework to derive results of 1989-2000-year bank level data. Their findings indicate no considerable link of CPI and Real interest rate with ROA and ROE of banks. Followed by this, Athanasoglou, Brissimis, and Delis (2005) used GMM estimator approach that revealed a significant positive effect of inflation and real interest rate on profitability of Greek banks.

Bashir (2003) evaluated data of 14 Islamic banks earning profits across 8 Middle Eastern countries during years 1993 to 1998. Linear estimation proved strong positive impact of variables involved. Hassan and Bashir (2003) pooled 8 years financial data of 43 Islamic banks and proved significant positive impact on profitability ratios. Haron and Azmi (2004) statistically proved direct relationship of inflation rate and indirect relationship of real interest rate on ROA of 5 major Islamic banks over a period of 1984-2002. Staikouras and Wood (2004) reviewed the performance of European Banking industry for years 1994-1998. Using ordinary least square method and fixed effects model they concluded that interest rate has a significant positive but growth of GDP exerts significant negative impact on ROA. Goddard, Molyneux, and Wilson (2004) also estimated the profitability of 583 European Union domestic banks where cross sectional regression showed a significant positive effect of GDP on profits.

Kosmidou, Tanna, and Pasiouras (2005) focused on profitability of domestic U.K commercial banks. The outcome shows a strong positive relationship of all factors. Athanasoglou, Delis, and Staikouras (2006) appraised year 1998-2002 unbalanced panel of 71-132 South-Eastern European banks by linear regression. The result shows high earnings during peak inflation periods and no noticeable effect of GDP. Later on, Havrylchyk and Jurzyk (2006) proved similar result for Eastern and Central European banks. Wong, Wong, Fong, and Choi (2006) used feasible generalized least square (FGLS) method to estimate results and proved that GDP and inflation have a significant impact on asset returns. Focusing on Indonesian banking industry Anwar and Herwany (2006) found out significant relation of economic growth, inflation rate and real interest rate with ROA at 1% level but not with ROE. Consistent relationship was estimated by Sufian and Habibullah (2010).

Further, Pasiouras & Kosmidou (2007) examined domestic and foreign commercial banks in 15 European Union countries. Estimates show significance of macroeconomic conditions to ROAA. Ghazali (2008) considered six years data of 60 Islamic banks operating in 18 countries Results ascertain that GDP and inflation positively influence the revenue of banks. Aburime (2008) scoped out the profitability of Nigerian banks concluded that both real interest rate and inflation have a considerable link with ROA and positively affect bank profitability. Sufian and Chong (2008) worked on the banks in Philippines. Findings of linear regression showed evidence of insignificant positive impact of GDP and market capitalization on ROA but, negative impact of inflation.

Vong and Chan (2009) take balanced panel data of five large banks of Macao. Linear model shows strong influence of inflation on ROA, GDP and interest rate show no effect. Flamini, McDonald, and Schumacher (2009) utilized annual data of 389 banks operating in 41countries of Sub-Saharan Africa for period 1998-2006. Linear regression model estimated positive contribution of GDP growth and CPI on asset returns, whereas using random effects estimation, Francis (2011) indicated negative relationship of inflation. Mercia, Evren, and Hassan (2002), and Panayiotis, Anthanasoglou, Brissimis, and Mathaios (2005) also worked on such large samples to study profitability of banks in developed and developing economies**.** Ramlall (2009) studied Taiwanese banking firms. Quarterly categorized financial data of 31 local commercial banks reflect negative impact of GDP and real interest rate. Rasiah (2010) used pooled regression methods and estimated positive impact of determinants of Malaysian commercial banks. Al-Tamimi (2010) focused on banks of UAE functioning between 1996 and 2008. A simple regression model assessed positive relationship between GDP and revenue.

Scott and Arias (2011) studied performance of five largest banks in United States. They proved that GDP did not directly affect the profit level of U.S banking sector. Hoffmann (2011) used GMM and pooled OLS estimation approach to study US banks. The final result of both regression models indicates no considerable relationship. Sufian (2011) analyzed 11-29 Korean commercial banks during year 1992-2003. Linear regression results reveal negative impact of GDP on ROA, but positive impact of inflation. An empirical study by Damena (2011), on the profitability determinants of Ethiopian commercial banks uses 10 years balance sheet data of 7 leading banks confirms positive affect of GDP, inflation and interest rate. Likewise, Davydenko (2011) used fixed effects estimation technique and proved that both GDP and Inflation have a positive relationship with ROA of Ukrainian banks.

Saksonova and Solovjova (2011) performed comparative analysis of five largest Latvian commercial banks during period of economic crises. GDP growth had positive contribution to profits, and inflation negatively affected ROA. Few scholars have also provided qualitative proofs of variables affecting the banks' income. Shaher, Kasawneh, and Salem (2011) distributed 320 questionnaires among bank-related individuals and response proved important association of GDP with earnings. Khrawish (2011) determined the macroeconomic indicators affecting the listed Jordanian banks. Result demonstrated negative impact of GDP and inflation with ROA and ROE. Alper and Anbar (2011) observed the returns of Turkish banks and inferred that GDP growth, real interest rate and inflation rate least effect banks' assets and equity returns.

In a recent study, Sharma and Mani (2012) measured the impact on Indian commercial banks for time period 2006-2011. They report that the effect of GDP and inflation on ROA was negligible. Zeitun (2012) investigated macroeconomic influential factors for banks of Gulf Cooperation Council countries. Cross sectional time series panel data gave proof that GDP is positively related but inflation is negatively related with ROA and ROE ratios.

In latest studies of the banking sector in Pakistan, Ali, Akhtar, and Ahmed (2011) uses data of 22 banks for years 2006-2009 and point out significant positive relationship of growth rate and CPI with assets and equity return ratios. Moreover, Gul, Irshad, and Zaman (2011) examined the profitability of top 15 Pakistani commercial banks for years 2005 – 2009. Using POLS regression, Gul et al. (2011) investigated strong relationship between the external variables and bank performance indicators.

DATA AND METHODOLOGY:

Commercial banks listed on Karachi Stock Exchange are employed in the sample of this study because KSE has the greatest number of commercial banks registered with it. 18 out of 23 banks have been included in the sample. 5 excluded banks are either newly established (not operational before 2005) or their data is not retrievable. List of banks which have been considered for study is provided in the appendix respectively. Secondary annual balanced panel data of selected banks for 10 years (2002-2011) is used in this study.

Macroeconomic data has been taken from World Bank Publication (WDI, 2012), and Economic Survey of Pakistan (2003-2004). Data for financial ratios is obtained from unconsolidated annual financial statements banks through; concerned websites, direct visits, KSE website and from Lahore Stock Exchange. Consolidated financial statements have been used where stand alone statements were unavailable. All bank level financial data (In thousands and Rupees) is converted to Pakistani Rs. (Millions) for accurate and standardized estimation.

Present study employs technique of Descriptive statistics, Pearson Correlation and Pooled Ordinary Least Squares (POLS) Regression. POLS method is used because literature suggests that it is a valid method where variables show stable relationship across the banks (Gul, Irshad, & Zaman, 2011). Table 1 gives the details of dependent variables and Table 2 shows the details of independent variables respectively.

Table 1. Dependent Variables and Their Assessment

Variable	Variable Name	Assessment
ROA	Return on Assets	Net Income/Total Assets
ROE	Return on Equity	Net Income/ Shareholder's Equity
EM	Equity Multiplier	Total Assets/ Shareholder's Equity

** After-Tax Net Income is used to calculate ROA and ROE ratio*

** (Tier-1 Capital) Shareholder's Equity before adding surplus on revaluation, is used to calculate ROE and EM.*

ROA measures the profit earned per Rupee of assets and reflects the efficiency of banks' management to earn profits using financial and real resources **(**Alkassim, 2005; Naceur, 2003). ROE ratio reflects the effectiveness of bank's management to transform every unit of shareholder's equity into profit (Samad, 1999; Tarawneh, 2006). Equity multiplier measures the amount of assets in Rupees that an institution supports with one Rupee of shareholders' equity (Accounting dictionary, 2012). It is considered a measure of profitability as it has a multiplier effect on ROA to determine the bank's ROE (Grier, 2007). It measures financial leverage. It can increase the shareholders' return if earnings are positive (Financial leverage, 2012; Stock research pro, 2009). In Pakistan, this study uses EM as a profit measure for first time. However, (Almazari, 2012; (Naïmy, 2005) have used equity multiplier by applying DuPont system of financial analysis to banks' data.

Table 2. Independent Variables and Their Assessment

Variable	Variables Name	Assessment	Hypothesized relationship with profitability
INF	Inflation Rate	Annual % change in consumer price	+/-
GDP	Real Gross Domestic Product	Annual growth rate of economy	+/-
INT	Real Interest Rate	Lending rate adjusted to inflation	+

**Inflation rate, Real interest rate and Real GDP are taken in percent form.*

**Real interest rate for years 2001, 2002 and 2003 were calculated using average lending rate for a year adjusted with inflation*

Pooled Ordinary least squares (POLS) regression equation used for empirical analysis is as follows:

$$Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + € \text{ ---------- 1}$$

Where;

Y_{it} = ROA, ROE and EM, $X1_{it}$ = Inflation Rate, $X2_{it}$ = Real Interest Rate, $X3_{it}$ = Real Gross Domestic Product, β_0 = Value of x-intercept which is constant, β_1, β_2 & β_3 = Proportionate change in dependent variable due to independent variables, i = 1 to 18 Banks, t = 2002 -2011, € = Error term.

Hypotheses:

For any country, Inflation rate and GDP growth rate affects the bank profitability according to the economic conditions prevailing in that country (Alexiou & Sofoklis, 2009). They may induce a positive effect in countries where financial markets are well-developed and economies are in boom but negative effect in developing countries.

Perry (1992) suggests that inflation can positively or negatively impact profits depending upon if it is anticipated or unanticipated. Bashir (2003) indicates that when inflation is anticipated, banks generate profits using high rates on loans in times of the high inflation rate and if it is unanticipated, banks would not adjust rates timely and overhead costs would rise quicker than inflation resulting in poor profits. Demirguc-Kunt and Huizinga (1999) also observe a similar scenario for developing countries. In case of Pakistan, inflation rate shows unanticipated values so, hypothesis will be:

H1: Inflation rate is negatively associated with bank profitability.

Secondly, GDP is expected to have a direct influence on the supply of deposits and customer's demand for bank loans that in turn impacts the generation of cash flows and profitability. According to Sufian and Habibullah (2010), favorable conditions in an economy will positively impact the level of financial transactions, and well managed banks will earn from loans and sale of securities. Also fast economic growth enhances bank profitability (Demirguc-Kunt & Huizinga, 1999).

H2: Gross domestic product has positive significant relationship with profitability.

Thirdly, by the rule of borrow short and lend long, banks may increase the lending rate as compared to the deposit rate and earn more profit over time. Hypothesis 2 is proposed as follows:

H3: Real interest rate is positively related to bank profitability.

DATA ANALYSIS AND ITS INTERPRETATION:

Descriptive statistics of data accumulated for this study is given in table 3 where as table 4 presents the result of Pearson correlation between all the dependent and explanatory variables. Summary statistics has been computed using the Excel data analysis tool.

Table 3. Descriptive Statistics for Variables Included in Study

Variable	Mean	Standard deviation	Sample variance	Range	Minimum	Maximum	Sum
ROA	0.70	2.31	5.36	22.27	-7.73	14.53	127.49
ROE	22.61	326.46	106582.07	5560.59	-1473.09	4087.5	4071.35
EM	24.35	90.36	8166.13	1176.87	0	1176.87	4383.60
INF	9.79	5.01	25.15	17.37	2.91	20.28	1763.35
GDP	4.66	1.95	3.81	6.07	1.59	7.66	839.87
INT	0.98	3.94	15.53	13.39	-4.48	8.91	177.49

According to table 3, on average the total return on assets of listed banks for past decade was 0.7% where as the ROE was 22.6%. ROE between 15% -20% is considered favorable (Fraker, 2006). Also the banks selected in this study vary due to their size and level of establishment. The average EM ratio of banks was about 24% for years under study. Table also depicts that Pakistan's average consumer price inflation rate has been 9% during this time. As far as real interest rate is concerned, in 10 years, banks have been charging around 10% rate of real interest. And on average the growth rate of Pakistan's economy is 4.6% during 2002-2011.

Table 4. Pearson Correlation

	ROA %	ROE%	EM	INF%	GDP %	INT %
ROA %	1					
ROE%	0.222	1				
EM	0.0262	0.7950	1			
INF %	-0.2303	-0.1372	-0.0918	1		
GDP%	0.1156	-0.0154	-0.0587	-0.50150	1	
INT %	0.1656	0.18885	0.1300	-0.7423	0.24054	1

As per statistics in table 4, most of the variables are weakly or negatively correlated with coefficients of correlation less than 0.55, but among dependent variables, ROE and EM are strongly correlated with value 0.795. And also the correlation between macroeconomic factors; inflation and real interest rate is noticeable and highly negative with value above 0.70. Addressing the issue of multicollinearity, Kennedy (2008), states that correlation is high when its value is above 0.80 or 0.90. Bryman and Cramer (2001) view that

multicollinearity is when correlation exceeds 0.80 whereas, Anderson, Sweeney and Williams (1990) use 0.70 as standard point indicating. By considering the third viewpoint there exist multicollinearity between two of the dependent and independent variables which may alter the results. To get accurate output, 3 separate models and step-wise regression (Fattah, 2012**;** Motulsky, 2012) is used to re-relate the variables by eliminating one of the two highly correlated variables. Regression was also performed prior to the elimination of multicollinearity but the results are not reported here due to their no practical importance. However, are available if required.

Results of Model 1

Below is the regression equation for first model, which shows the three external factors influencing ROA. Table 5 gives the details of empirical results of model 1.

$ROA = B_{0+} \ B_1INF \ + B_2 \ GDP + B_3 \ INT + €$ ---------- 2

Table 5. Empirical Findings Where Dependent Variable: ROA

External factors	**Regression Step-1**		**Regression Step-2**	
	Coefficients	**P-value**	**Coefficients**	**P-value**
INF %	_	_	-0.10	0.007*
GDP %	0.09	0.29 (NS)	0.0003	0.99 (NS)
INT%	0.08	0.05**	_	_
R Square	0.033		0.053	

* Significant at 1% level, ** Significant at 5% level and (NS) = Not significant

The R^2 value of regression step-1 in table 5 reflects 3.35% contribution of macroeconomic variables (Real interest rate and real GDP) towards the profitability of listed commercial banks and remaining 96.65% variation in ROA is because of other influencing factors, **most likely internal factors**. Similarly, the contribution of Inflation in regression step-2 is only 5%.

Furthermore, inflation rate is proved to have negative influence on ROA at 1% level of significance. Both step-1 and step-2 regression analyses show positive but insignificant affect of GDP on ROA with p-value>0.05. And as hypothesized interest rate has a significant and positive impact on the ROA at 5% level of significance, so by keeping all other factors constant, one percent change in real interest rate will lead to 8.5 % increase in ROA.

Results of Model 2

The regression results of second model which computes the affect of independent variables on ROE are given in Table 6.

$ROE = B_{0+} \ B_1INF \ + B_2 \ GDP + B_3 \ INT + €$ ---------- 3

Table 6. Empirical Findings Where Dependent Variable: ROE

External factors	Regression Step-1		Regression Step-2	
	Coefficients	**P-value**	**Coefficients**	**P-value**
INF%	_	_	-12.61	0.02**
GDP %	-10.79	0.39(NS)	-18.82	0.19(NS)
INT%	16.92	0.007*	_	_
R Square	0.039		0.028	

* Significant at 1% level, ** Significant at 5% level and (NS) = Not significant

According to table 6 the value of R^2 in both steps is around 3% showing very less contribution of selected macroeconomic variables towards ROE. Inflation rate exerts a negative impact on ROE ratio with p-value<0.05 indicating its significance at 5% level. GDP in both cases remains an insignificant factor affecting ROE of banks but it has affected ROE negatively, whereas interest rate is observed to have a strong positive relationship with ROE at 1% level of significance.

Results of Model 3

The regression results of third model incorporating EM are reported in table 7. The regression equation for third model is given as follows.

$EM= B_{0+} \ B_1INF \ + B_2 \ GDP + B_3 \ INT + €$ ---------- 4

Table 7. Empirical Findings Where Dependent Variable: EM

External factors	Regression Step-1		Regression Step-2	
	Coefficients	**P-value**	**Coefficients**	**P-value**
INF %	_	_	-2.92	0.06(NS)
GDP %	-4.42	0.21(NS)	-6.47	0.10(NS)
INT%	3.50	0.04**	_	_
R Square	0.025		0.023	

* Significant at 1% level, ** Significant at 5% level and (NS) = Not significant

In table 7, the rise in inflation rate and GDP growth of Pakistan has confirmed the decrease in EM of banks but the variables are proved insignificant in the respective steps of regression analysis. The p-value of interest rate evidences the positive and significant influence of interest rate on EM at 5% significance level. And overall, the three external factors only contribute about 2% to EM.

Empirical analysis of the POLS regression in all three developed models is mostly consistent with the theory and literature. The negative relationship of inflation with macroeconomic variables is in accordance with studies of (Francis, 2012; Khrawish, 2011; Saksonova & Solovjova, 2011; Sufian & Chong, 2008; Zeitun, 2012), and insignificance of inflation is in accordance with studies of (Alper & Anbar, 2011; Demirguc-Kunt & Huizinga, 1999; Havrylchyk & Jurzyk, 2006; Mamatzakis & Remoundos, 2003; Naceur, 2003; Sharma & Mani, 2012). Banks have a very low or no impact from inflation if the benefit of increased interest rate gets equalized when the cost of operating the banking business is increased simultaneously.

Insignificant positive effect of GDP is supported by researches of (Alper & Anbar, 2011; Athanasoglou & Staikouras, 2006; Demirguc-Kunt & Huizinga, 1999, Flamini, McDonald & Schumacher, 2009; Naceur, 2003; Sufian & Chong, 2008; Vong & Chan, 2009), and insignificant negative effect of GDP is supported by (Khrawish, 2011; Sharma & Mani, 2012; Sufian, 2011). Whereas, insignificant negative relationship of GDP is in contradiction to theory which asserts that economic growth enhances profits and downturn adversely affects the interest income. This opposite result may be due to other reasons which include the customer's preference or choice of depositing excess funds and taking loans and informational asymmetry of customer; lack of information regarding economic changes in the country.

The significant positive relationship of interest rate with ROA and ROE is in line with previous studies such as (Aburime, 2008; Athanasoglou, Brissimis, & Delis, 2005; Anwar & Herwany, 2006; Demirgüç-Kunt & Detragiache, 1998; Demirguc-Kunt & Huizinga, 1999; Staikouras & Wood, 2004).

CONCLUSION:

There are numerous internal and external factors which influence the profitability of public limited commercial banks in Pakistan, but this study employs only three external factors; inflation rate, GDP and interest rate, and investigates their impact on earnings of financial institutions. Three major macroeconomic variables have been incorporated because quantified data of these variables is easily available from secondary resources and in past, these variables have been analyzed most, hence the cumulative study would help in getting a clear picture. ROA, ROE and EM ratios are used as proxies for profitability. After analyzing the 10 years (2002-2011) data of 18 listed commercial banks with total 180observations, using POLS regression, it is verified that in general, the selected macroeconomic factors do not contribute noticeably to the profits of sampled banks, so in order to maximize the risk-adjusted returns banks have to focus more on other external factors or devise policies to improve the internal factors.

For future research, this study can be extended to cover longer time periods. Unbalanced panel data can be used to incorporate the banks which are recently established. Quarterly data can be analyzed to reveal more precise results. Other econometric techniques can be applied to verify the relationship. More macroeconomic factors such as exchange rate, imports, exports, tax rates and income level can be focused on. In addition to domestic banks, foreign banks may be included in the sample. Furthermore, listed banks in different countries or a group of countries can be evaluated.

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Appendix

List of Commercial Banks Included in Study

No.	Acronym	Commercial Bank Name	Website
1	ABL	Allied Bank Ltd.	www.abl.com
2	AKBL	Askari Bank Ltd.	www.askaribank.com.pk
3	BAFL	Bank Al-Falah Ltd.	www.bankalfalah.com
4	BAHL	Bank AL-Habib	www.bankalhabib.com
5	FABL	Faysal Bank	www.faysalbank.com
6	HBL	Habib Bank Ltd.	www.hbl.com
7	HMB	Habib Metropolitan Bank	www.habibmetro.com
8	KASBB	KASB Bank Ltd.	www.kasbbank.com
9	MCB	Muslim Commercial Bank Ltd.	www.mcb.com.pk
10	MEBL	Meezan Bank Ltd.	www.meezanbank.com
11	NBP	National Bank Of Pakistan	www.nbp.com.pk
12	NIB	NIB Bank Ltd.	www.nibpk.com
13	SBL	Samba Bank	www.pak.samba.com
14	SILK	SilkBank Ltd.	www.silkbank.com.pk
15	SCBPL	Standard Chartered Bank Limited	www.standardchartered.com.pk
16	SNBL	Soneri Bank Ltd.	www.soneribank.com
17	BOP	The Bank Of Punjab	www.bop.com.pk
18	UBL	United Bank Ltd.	www.ubl.com.pk

Source: Karachi Stock Exchange

**SAMBA bank Ltd was formerly Crescent Commercial Bank Ltd. Financial data for year 2002-2007 has been collected from the annual reports of Crescent Commercial Bank.*

**In 2001, Prudential Bank was acquired by Saudi-Pak Bank and in 2008 it was named as Silk Bank. Financial statements for years 2002-2007 have been taken from reports of Saudi-Pak Bank and of years 2008-2011 have been retrieved from Silk bank.*