

RESEARCH ARTICLE

Nexus Between Diversification and Banking Efficiency in Developing Economies

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Abstract: Banking efficiency is becoming more vital in a world where international marketplaces are becoming increasingly competitive. This premise lays the groundwork for achieving the study's goal. The major goal of this research is to look at the link between Pakistan's Revenue Diversification and banking efficiency over the period 2008 to 2019. Their banking efficiency is poor in comparison to other nations; hence there is a need to improve it. In this regard, this research first examines the technical BE using a modified version of Aparico et al., (2015) by using the Data Envelopment Analysis. To accomplish so, the researchers used a Directional Distance Function model, which offers estimates of efficiency, with an emphasis on Non-Performing Loans as an undesirable output. This research uses quantile regression to assess the influence of diversification on banking efficiency in the second portion of the investigation. As a consequence, the findings revealed that it has a significant influence on bank technical efficiency. Other efficiency drivers have a significant impact on the bank's performance as well. These findings have significant strategic implications for bank executives, regulators, and policymakers who all want to improve bank efficiency and stability.

Keywords: Bank efficiency; data envelopment analysis; revenue diversification; quantile regression; non-performing loans.

JEL Classification Codes: G21

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1 Introduction

Banking system remains the main form of financial intermediation in the world, and it is the major network for activating national and foreign savings. A healthy banking structure is very important, especially in developing economies to obtain supportable financial development and optimal efficiency. Efficiency is an assessment of the maximum output that can be produced by a certain level of input. Bank Efficiency (BE) deals with improving the bank performance according to international standards. This thing also indicates that efficiency plays an important part in country's economy consisting of efficiency inputs and outputs. Estimating the efficiency is quite easy in the case of only one input and output while on the other side when there are multiple inputs and outputs then this estimation process becomes difficult. Several studies (Hou et al., 2019; Aparico et al., 2015; Ruggiero 2007) have been conducted to provide sufficient measures that increase the BE of the banking system. Among many, the BE can be measured through Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) as renowned measurement techniques. The supremacy of one approach over the other has long been debated. For example, Ruggiero (2007) postulated that DEA gives us better results than the SFA. This could be said that DEA is an effective method that measures the efficiency of the banks.

An efficient bank has many capabilities, i.e., they mobilize the funds to promote the process of lending and borrowing and encourage the investment. In this case, the developed countries started to work towards the financial markets and reformed the banking sector. Because this is not only compulsory to the banks stakeholder but this has a significant contribution towards the financial condition of the country. This is possible through diversifying the efforts towards different revenue-enhancing opportunities.

The studies (Laeven & Levine, 2007) discussed that either bank should operate exclusively or they should diversify their business across the different products and services. Two views of diversification hold in this case. First, through diversification, they can get maximum economies of scope and reduce the chances of bank default (Berger et al., 2010). Second, the diversification process increases the agency problems between the shareholders and management in this way conflict of interest rises (Laeven & Levine, 2007). The main purpose is to reduce the confusion and fill out the gap in the previous studies (Liu et al., 2020; Nguyen 2020). Therefore, this is imperative to understand the significance of Bank Diversification (BD).

The theme of diversity has continually been a central discussion in strategic management analysis. Ansoff (1957) outlined diversification as a special modification within the structure of an organization's product market and believed that diversification is way harder than different ways. Diversification could need new skills, new technologies, and structural changes within the company structure. Aaker (2010) defines diversification as a product market entry strategy that is different from the market the company is currently engaged in. Diversification and its impact on company worth are the most arguable ideas that have recently attracted investors and researchers. Therefore, an open question is raised to prove that diversification methods are superior to alternative methods. This can be because of the very fact that the importance of selecting between the two methods greatly affects the company's business and monetary management, as it may affect its performance and charter value.

Diversification is a vital methodology utilized by firms to keep up coordination and enhance profitability. Firms ask for diversification ways to attain price creation through

economies of scope and economic processes (Barney, 1991). On the other hand, diversification may increase prices that will lead to difficulties associated with coordination with the headquarters of multi-departmental firms, department managers, and incentive imbalances (Denis et al., 2002). The link between BD and profitability has invariably been the main target of in-depth analysis within the corporate finance literature. Most of the past studies were targeted at the developed market firms (Amihud & Bulgarian, 1981).

The banking literature said that banks should be as diverse as possible. Some people believe that by diversifying business activities in different products, services, and economic surroundings, banks can mitigate the chances of bankruptcy (Boot & Schmeits, 2000). This is beneficial for the development of the banks. Boyd and Graham (1988) found that the bankruptcy risk of banks that merged with insurance companies was reduced. Berger et al. (1999) found that the merging of the monetary and economic sector is aligned with larger risk that is emerging due to diversification. The diversified companies can benefit from the leverage of product management skills, capabilities and from the diversified organizations (Iskandar-Datta & McLaughlin, 2007). Therefore, the above background literature shows the confusion about diversifying their business. Hence the present study removes that confusion and fills out the gap finding out the relationship between the BD and BE.

Many reasons support the diversification process. Firstly, Froot et al. (1993) inferred that diversification is a border against bankruptcy risk, which mitigates financial disturbance. Secondly, diversification is that method that enhances the banking performance and capability, especially when different units of operations are expanded (Landskroner et al., 2005). Third, Revenue Diversification (RD) strengthens the functions of banking supervisors, thereby enhancing the number of intermediaries. Hence banks can promote the provision of other financial services by using important information, thereby limiting the asymmetry of information (Baele et al., 2007).

Several reasons set the grounds for the current study. First, for example, the literature provides the mixed results about the relationship between RD and BE. Some studies (Sanya & Wolfe, 2011) find the positive while some studies (Berger et al., 2010) report the negative association between BD and performance. Contrarily, Lee et al. (2014) postulated that BD has no effect on performance. Secondly, few empirical studies (Elekdag et al., 2020) have been done on the advanced countries, very little research has been found on the developing markets. They ignored the RD, BE and NPLs in case of study context.

The decline in bank gain is sometimes linked with maximum amount of NPLs on the bank's record. Banks typically eliminate loans and realize new business scopes, like ever-changing operations and investment in management securities. From the attitude of managers and policy makers, the advent of a general banking model that enables banks to mix numerous money activities is a perfect structure for banking establishments. Modern operations are believed to assist cut back the danger of insolvency as a result of they are going to diversify the financial gain produced by the bank, which can have a positive impact on the worth of the firm. The world has started to diversify its income from interest to NII sources to survive in this competitive era. Hence the overall background indicates that banking efficiency of Pakistan is low because there is a lack of diversification system. On the basis of that knowledge, following are the research objectives that need to be investigated:

- To investigate the impact of diversification on BE in Pakistani banking sector.
- To investigate the impact of macroeconomic variables (Liquidity Risk, Capitalization, Net Interest Margin, Net Non-interest Income Margin, Size, GDP and Inflation) on BE in Pakistani banking sector.

The contribution of the study is that this study considers the influence of undesirable output in the DEA method. Secondly this sheds the light on the relationship between BD and BE in the developing economies like Pakistan so this is addition in the literature also. This study is significant in the sense that it provides useful deep insights to the strategy makers and practitioners in developing markets. The results of the study provide the guidelines for the banks regarding the RD. This study not only provides a comprehensive picture of RD but also sheds light on the relationship between RD, BE, efficiency determinants, and NPLs. The findings lead to a road map and guidelines for the bank managers to boost the profitability of the banking system in Pakistan. Hence, pragmatic research on the concerned topic is highly appreciated from both decision-maker and regulatory viewpoints.

2 Literature Review

Theoretically, diversification has positive as well as negative effects on business performance and value (Dastidar, 2009). After the seminal work in the modern finance theory, the portfolio theory has gained a lot of significance in international business. This theory also supports the process of diversification. The greater geographical scope provides the basis for risk diversification and increases their business performance. This theory argues that diversified banks may boost bank performance by enhancing the economies of scope and minimizing the possibilities of bank default. Banks provide the services to their customers; get the information from them and reuse that information again and again. They have the capability to a main long-term relationship with their customers. In the loan-making process, banks are desired to attain information from both borrowers and lenders. By expanding their products and services, they get more ideas for innovation. The diversified banks may get the maximum profit by utilization the business activities, enhancing their managerial capabilities and skills. When banks diversify their income, in this regard the maximum range of economies of scope is acquiring (Klein & Saldenberg, 1997).

Banks tend to disregard redundant processes and use acquired customer information once process loans to facilitate the supply of different monetary services, thereby increasing the gain. The view is that RD or conversion from interest financial gain to non-interest gain ought to cut back the risk. Operations that generate the NII, are negatively related to activities that generate interest financial gain, thereby helpful profits are acquired. Additionally, it is believed that the shift to non-interest financial gain will cut back the alternate changes in bank profits whereas being less captivated with overall business conditions (Stiroh, 2004).

Modern portfolio theory is extensively chosen theory to clarify the diversification of banks. It shows that enhancing the margin of NII can reduce possible risks. Modern portfolio theory shows that focused income streams will harm banks' income volatility (Tong, 2012). Therefore, banks should diversify their investment portfolios to improve their stability and diversify idiosyncratic risks. This theory shows that bank can generate a common market investment portfolio, so that bank contributes its risk investment portfolio to the total and recovers its relative share. In the presence of various risk categories, various unique risks under a single investment portfolio will be eliminated.

Maudos (2017) conducted a study to investigate whether the income system has an impact on the performance of European banks. To achieve this goal, the researcher used a set of European bank data to estimate the income structure for the period 2002-2012 and

used the quantile regression and fixed effect model. The main objective is to find out that whether there is a difference between investment-oriented banks and banks that focus on financial intermediation. The results showed that the growth in the margin of non-interest financial gain harms profitability, although this impact is only obvious at a certain point. Nevertheless, analyzing the effect of banking corporate distinctly, the impact on interest rate banks is negative and significant, but for banks with more varied business zone, the impact is not significant. It was said that a boost in the margin of NII would enhance the risk which would ultimately decrease the BE.

On the other hand, Bapat and Sagar (2015) studied the relationship between ID, asset quality, and bank profitability. They used data from 46 public and private sector banks in India from 2006 to 2013. When comparing both types of banks, they found significant differences in diversification measures. Determine the negative correlation between non-performing assets and asset returns. It is also found that diversification is positively correlated with the return on assets (ROA) leading towards better bank performance by using the regression technique.

Carlson (2004) explained that when the researcher tested the effects of geographic diversification on banking performance in the period of financial distress. The results suggest that banks with geographic diversification were less likely to survive by using the survival analysis. It means this is not appropriate for the banks. In addition, Morgan and Samolyk (2003) studied the geographic diversification among U.S. bank holding companies from 1994 to 2001. They had used the regression technique and found similar negative results, which means that diversification has nothing to do with higher returns or reduced risks. Consistent with these results, Kim and Mathur (2008) used a sample of 28,050 global companies observed from 1990 to 1998. They used the multivariate regression model in their study. Their research showed that industrial and geographic diversification is related to the decline in corporate value. Deng et al. (2007) examined the connection between the diversification of assets and the cost of debt from 1994 to 1998 by using the multiple regression technique. The results showed that, while controlling the endogeneity of diversification decision-making, diversification reduces the cost of debt to a certain limit.

Sawada (2011) used Japanese data from 1983 to 2007 to study the effect of ID and loan diversification on banking performance by using the regression technique and HHI. The results confirmed that loan diversification improved the performance of banks and reduced risks. On the other hand, ID did not affect bank performance. Berger et al. (2010) assessed the empirical relationship between the diversification strategy and the risk-return trade-offs of the Russian banking industry from 1997 to 2006. The researchers used the regression model and found that the performance of banks is often independent of their diversification strategy. Moreover, it is found that the concentration strategy is related to increasing profits and reducing risks to a certain threshold.

Otieno and Moronge (2014) studied the impact of product diversification on the financial condition of Kenyan banks. The aim of the study was to check the effect of product diversification on the performance of Kenyan banks. The aim was to find out how information flow, new markets, creativity, and technology affect its performance financially. The results showed that creativity, new markets, information flow, and technology have an impact on financial performance by using the regression technique.

Another research by Adesina (2021) had been done on the African countries over the period 2005-2015. This research studied the relationship between diversification and banking performance with moderating effect of human capital. The sample was 400 commer-

cial banks collected from 34 African countries to investigate the relationship by using the Pearson correlation. The findings suggested that diversification has major role towards the banking performance and stability and human capital also influences this relationship. This research provided the helpful insights towards the banking activities.

Early studies (Umar et al., 2021; Kolia et al., 2021; Dietrich & Wanzenried, 2011; Iqbal et al., 2017) on bank financial performance indicated that bank-related antecedents (such as board size, bank size, diversification, bank age, and capitalization) are the main antecedents that control the company's financial status. Similarly, the subsequent studies (Rachdi, 2013; Iqbal et al., 2013; Iqbal et al., 2014) examined the impact of industry-related and macroeconomic aspects on bank's performance. It has been observed that the main factors of a bank's financial performance change with samples and periods. The nature of the association between bank samples and performance is different in each sample. It is understood that the structure of the banking industry varies from country to country. Based on literature reviewed above; following hypotheses are generated in the present study.

Hypotheses of the Study

H1: There is a positive relationship between RD and BE.

H2: There is a positive relationship between Macroeconomic variables (Liquidity Risk, Capitalization, Net interest Margin, Net non-interest Margin, Size, GDP and Inflation) and BE.

3 Methodology

3.1 Data Description

This section describes the study sample, data collection sources and econometric techniques to answer the research questions. The study sample consists of data on banks of Pakistan (35) over the period 2008-2019. The data about the bank specific variables have been collected from Bankscope, which is a global database. The macroeconomic data like GDP and inflation of the countries has been collected from World Development Indicators (WDI).

3.2 Research Tool/ Technique

Efficiency measurement can be performed by parametric (SFA) and non-parametric methods (DEA). Parametric methods are related to production or cost function libraries. All decision-making units (DMUs) are functioning effectively, they are used to estimate the characteristics of functions and measure economies of scale. Charnes et al. (1978) considered the DEA using DMU efficiency boundaries to construct efficiency measures. This approach considers the extent to which the overall efficiency of the banks can be enhanced and ranks the DMU's efficiency score. This metric is derived by analyzing the observations obtained from the DMU that are used to describe the production units in which multiple inputs and outputs are considered. The most common measure of efficiency is the DEA (Charnes et al., 1978). DEA approach is a mathematical programming model providing the empirical estimate of the relationship. Hence this is indicated that DEA gives the better re-

sults as compared to SFA that's why the present study uses the DEA method and one most important consideration here is including the undesirable output which has been ignored in the literature.

Non-performing loan is the loan that is in default or close to being in default. The quality of bank assets is a significant measure of a bank default that can affect efficiency and bank stability. Berger et al. (2010) discussed the importance of NPLs and found that NPLs affect the efficiency and stability of banks. NPLs are classified as control variables or non-performing output. The main disadvantage behind the literature is that they consider the impact of NPLs as a control variable rather than undesirable output, which badly influences on the production process.

3.2.1 Data Envelopment Analysis (DEA)

In order to estimate the production boundary, this study uses the non-parametric method DEA approach to measure the efficiency. In this technique, there is no need to impose any assumptions on the functional form of the production function, and this makes the analysis more flexible. This method was first introduced by Charnes et al. (1978). In this model, inefficiency is defined as any deviation from the defined boundary. When there are multiple inputs and outputs, DEA can also calculate efficiency metrics without any requirements, such as establishing pre-specified weights for each variable. The efficiency of the decision-making unit (DMU) in this model is calculated based on the assumption that all these units are located below or above the boundary line. Obviously, all DMUs on the boundary line are regarded as effective units, and any deviation from this line indicates low efficiency. DEA accepts input X , output Y , and undesired output Y^u .

This study uses DEA approach introduced by Aparico et al. (2015). This version offers a new directional distance function which measures the bank efficiency, at the same time as considering the undesirable outputs. This becomes very tough to estimate the efficiency in case of undesirable output. This study considers many inputs and outputs followed by Partovi and Matousek (2019). Capital and deposits are the two main inputs used to calculate the BE. Accordingly, the ideal output would be total loans and receivables, total securities, and total non-interest income. NPLs are undesirable output in DEA method. This DEA analysis has been done through MATLAB and value of technical efficiency has been driven out. Efficiency can be achieved by the following:

$$D(X, Y^d, Y^u; g) = \max \rho \quad (1)$$

This is directional distance approach in which X shows the inputs, Y^d shows the desirable outputs, Y^u reports the undesirable output and g is the number of DMUs. On the other side, ρ estimates the maximum possible increase of desirable outputs/inputs from the maximum possible decrease of undesirable outputs/inputs in order to accurately measure technical inefficiency in DMUs.

3.2.2 Quantile Regression

In addition to examine the impact of RD on the BE of Pakistan, this study takes the bank specific and macroeconomic variables which are considered as efficiency determinants. The bank specific determinants include the RD, Liquidity Risk, Capitalization, net interest margin (NIM), net non-interest income margin (NNIM), and size of the banks while GDP and

inflation are the macroeconomic variables of this study.

This is type of regression analysis which estimates the quantile of the response variable. In the second part of the analysis, the quantile regression has been computed through Eviews and SPSS on the following equation.

$$\theta_{(i,t)} = \beta_0 + \beta_1 RevDiv_{(i,t)} + \beta_2 LR_{(i,t)} + \beta_3 Cap_{(i,t)} + \beta_4 NIM_{(i,t)} + \beta_5 NNIM_{(i,t)} + \beta_6 Size_{(i,t)} + \beta_7 GDP_{(i,t)} + \beta_8 Inf_{(i,t)} + e \quad (2)$$

θ shows the technical efficiency of the banks which is dependent variable in our study. DEA estimates the value of technical efficiency. β are the coefficients of the efficiency determinants. In the set of independent variables, the term "RevDiv" is used for Revenue diversification that is measured through non-interest income/operating revenue (Tan and Floros, 2012). LR is the liquidity risk which is measured through liquid assets/total assets. Cap shows the capitalization of the banks which has been measured through capital to assets ratio. Along with, the NIM is measured as net interest income to total deposits while NNIM is calculated as net non-interest income to total assets. These two variables NIM and NNIM shows the management quality. Bank's size has been measured through natural log of the total assets. GDP and inflation are the macroeconomic variables of the country and e is the random error. The specific bank that operates in specific year can be described by the subscripts i and t respectively.

When there is a lot of heterogeneity in the data, then the Quantile Regression is a more suitable technique in efficiency-related studies. By using this tool, the considerable variations can get by making the different quantile in the regarding research. The adoption of quantile regression on the other techniques is that it gives a more precise picture of efficiency dispersion across the banks at different times.

4 Data Analysis and Results

Data analysis has been done in the form of descriptive and inferential statistics that are given below in the tables.

Table 1: Descriptive Statistics

	TE	RD	LR	Cap	NIM	NNIM	Size	GDP	Inf
Mean	0.703	29.306	38.950	15.830	7.028	-4.392	3.344	3.675	9.115
Median	0.763	26.918	39.329	14.895	3.879	-2.171	3.590	3.951	8.687
Maximum	0.999	145.247	93.455	43.920	144.724	2.267	4.387	5.836	20.286
Minimum	0.000	-188.207	0.168	1.080	-1.991	-49.375	0.269	0.988	2.529
Std. Dev.	0.218	23.979	15.046	5.843	12.605	7.463	0.811	1.615	4.918
Skewness	-1.557	-0.102	-0.4	1.895	6.472	-3.481	-1.378	-0.232	0.650
Kurtosis	5.303	22.834	3.507	9.675	56.664	15.543	4.402	1.662	2.847
Jarque-Bera	262.763	6885.425	15.707	1031.243	53330.24	3602.213	167.401	35.060	30.068
Probability	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs.	420	420	420	420	420	420	420	420	420

Note: This table shows the summary details of all study variables in the context of Pakistan.

The above table shows the summary statistics of the study variables like mean median, maximum, minimum, SD, p value and number of observations are presented in the above table. The mean value of TE is 0.703 while its median value is 0.763. Its p value is significant and number of observations is 420.

Table 2: Correlation Coefficients

	TE	RD	LR	Cap	NIM	NNIM	Size	GDP	Inf
TE	1								
RD	0.076**	1							
LR	-0.625**	0.293	1						
Cap	0.321**	-0.111*	0.298	1					
NIM	-0.194**	-0.276	-0.384*	-0.08	1				
NNIM	0.493**	0.382*	0.553	0.114	-0.771	1			
Size	0.394**	0.198	0.393*	-0.039	-0.522*	-0.719*	1		
GDP	0.047**	-0.005	0.096	0.037*	-0.033	-0.003	-0.088*	1	
Inf	-0.086**	0.001	-0.131	-0.062	0.05	0	-0.116	-0.824	1

Note: This table showed the correlation coefficient values of the study variables, ** Correlation is significant at the level 0.01, * correlation is significant at the 0.05 level.

The table 2 results show that correlation coefficient between RD and TE is 0.076** that is positively significant. In case of LR, this is negatively significant with the value of -0.625**. This coefficient is also negative in NIM and inflation with the values of -0.194** and -0.086** respectively.

Table 3: Results of Quantile Regression

Model	OLS	Q.25	Q.50	Q.75	Q.95
DV	TE	TE	TE	TE	TE
RD	0.001*** (0.000)	-0.001*** (0.000)	-0.002*** (0.000)	0.002** (0.000)	0.001 (0.001)
LR	-0.006*** (0.000)	0.006*** (0.001)	0.006*** (0.000)	-0.003*** (0.000)	-0.005 (0.000)
Cap	0.005*** (0.001)	0.008*** (0.002)	0.008*** (0.001)	0.006*** (0.001)	6.48E-06 (0.001)
NIM	-0.007*** (0.000)	-0.008*** (0.001)	-0.007*** (0.000)	-0.005 (0.023)	0.004 (0.011)
NNIM	0.016*** (0.002)	0.019*** (0.004)	0.020*** (0.002)	0.01 (0.01)	0.002 (0.016)
Size	0.016 (0.013)	-0.079** (0.034)	0.032** (0.016)	0.01 (0.017)	0.037 (0.023)
GDP	0.007 (0.008)	-0.006 (0.006)	-0.004 (0.006)	0.004 (0.009)	0.006 (0.006)
Inf	-0.003 (0.002)	0.002 (0.002)	-0.002 (0.002)	-0.001 (0.003)	-0.003 (0.002)
Constant	0.433	0.042	0.353	0.642	1.083
R sq	0.54	0.432	0.543	0.61	0.453
P value	0	0	0	0	0

Note: This table reports the results of the Quantile Model examining the impact of RD and other efficiency determinants on TE. The beta coefficients are given here while standard errors are in parentheses, ***p < 0.001, **p < 0.05, *p < 0.1.

Table 3 showed the Pakistan bank results. Mostly the results have been found to be significant in all the variables except the GDP and inflation. The OLS result shows that RD has positive significant impact on TE of the banks. The first two quantile results show that it has negative significant while last two quantile 0.75 and 0.95 show that it has positive significant impact on TE of the banks. This thing shows that RD has a significant role in boosting the bank performance. Hence if the banks of Pakistan wanted to enhance their profitability, they should mainly focus on diversifying their revenue. The LR is negatively significantly correlated with TE of the banks; it means both are inversely proportional to each other. While in the starting quantiles its value is positive and gradually moving to last quantile it becomes negative. In case of capitalization of the Pakistanis banks, all values have found positive significant with the efficiency of the banks. In case of NIM, the results show that NIM has negative most significant impact on TE of the banks with value of -0.007***. NNIM and TE of the banks have positive relationship with each other with the value of 0.016***. In first quantiles, the size of bank has negative significant impact while in further quantiles the positive significant impact on TE of the banks has found. GDP has mixed results positive as well as negative while inflation has negative insignificant impact on TE has found. It means both variables are going in the opposite direction.

5 Discussion

For this research, Aparico et al. (2015)'s DEA model is used to produce each bank's TE score, which includes NPL as an undesirable output, and compare these scores at various quantiles. These quantiles were regressed in order to include as many as possible in the final results of the analysis. Readers will discover three noteworthy insights in the overall analysis of the data. To begin, there are large disparities in these quantiles. It's also important to note that the conditional mean point estimation of efficiency (quantile 0.5) is considerably different from the estimation of TE across quantiles. Thus, quantile regression analysis provides higher TE-inequality estimates in the fundamental range than OLS.

In the first two quantiles, RD has a negative influence on Pakistani banks' total equity (TE), but the final two quantiles indicate a positive impact. This is the initial hypothesis, and the OLS results support it. When the quantile is 0.75, the p-value is 0.002, which is significantly different from zero. For Pakistani banks as well, the most significant LR/TE association was discovered. As can be seen from the OLS results, the value of -0.006^{***} is the most significant, and the quantile regression also reveals the significance of each individual quantile. The result is -0.005 with a p-value of 0.95, which is a somewhat negative number.

There is a considerable positive influence on the TE of the Pakistani banks' capitalization in OLS with a value of 0.05^{***} . There is a substantial positive correlation between the relevant variables in all of the quantile sections as well. Their association is further strengthened when they are at the half-way point, with a correlation coefficient of 0.08. Using OLS and quantile regression, all findings were determined to be statistically significant except for the final one. In both the OLS and quantile 0.5, a -0.007^{***} value is found, indicating that NIM has a significant negative influence on Pakistani banks' total equity (TE). According to the OLS analysis, there is a statistically significant positive impact of NNIM on Pakistani banks' TTE with a value of 0.016^{***} . A beneficial influence on TE can be seen in the first two quantiles, where values are less than 0.019^{***} in the first one. OLS and quantile 0.95 reveal positive but negligible values for bank size of 0.016 and 0.037. Quantile 0.5, on the other hand, represents the value between bank size and TE (0.032^{**}). Except for the first two quantiles, Pakistan's GDP figures are positive. In this case, all of the values were judged to be inconsequential. However, it differs from Berger et al. (2010) and Umar et al. (2021) and agrees with Laeven and Levine and Kolia et al (2021).

5.1 Conclusion

After the financial crisis triggered major macroeconomic turmoil in the 1990s, the organization of the banking industry in the financial market has undergone a period of revolution. Since then, global financial institutions have rapidly developed in the direction of diversification of products and services. Since the recent financial crisis caused unparalleled large-scale bank failures on a worldwide scale, the issue of banks' optimum diversification policy has attracted improved attention from legislators, regulators, practitioners, and scholars. However, the current study on BD tends to simplify the analysis by assuming a linear relationship between BD and performance. In addition, a lot of old researches tend to concentrate on large and difficult banks in developed countries, while ignoring banks in emerging markets to a great extent.

Managers must be in a position to generate the company's suitable RD structure and attain

the non-interest operating BE so that NII activities can be more cost-effective and benefit from the ID itself. If banks only focus on interest income, it will raise the company's risk. Taking into account the benefits of the diversification approach found in this study, policymakers must also formulate regulations to encourage banking companies to implement provable policies, particularly in RD strategies.

5.2 Policy Implications

Therefore, banks will engage in a wide range of economic activities and ultimately improve business performance. Diversification deals with ambiguity and improves the bank's future performance (Elsas et al., 2010). RD infers to all those operating activities of the banks that are outside the range of a single financial product line. ID in emerging countries depicts that banks can participate in various NII activities, such as securities underwriting, insurance, and real estate investment. This analysis provides appropriate guidance for supervisors and policymakers to assess the economic steadiness of banks. If the bank's investment portfolio has a higher risk and a higher level of NPLs, it may reduce the efficiency of the entire banking system. In this case, policy makers need to administer and control the risk level of banks wisely. In addition, the research results indicate that strict supervisory actions should be applied to sustain and recover banks' economic strength, reduce their default risks and improve their performance. Given the openness of the Asian banking system to modern banks, the study also gives significant information for policymakers. This result helps the government and bank supervisory departments to formulate applicable strategies to boost up the BE.

5.3 Limitations and Future Research Directions

Time and unavailability of the data are the limitations of this research. This research uses the current data but over time data also changes. Further research using different methods will help cross-validate the conclusions of this study. Other research is possible by making the comparison by including the different countries.

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