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639

The Role of Financial Risk Management in Predicting Financial Performance: A Case Study of Commercial Banks in Pakistan

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Abstract

The study aims to examine the role of financial risk management in predicting the financial performance of commercial banks in Pakistan over the period of 2006–2017. For this purpose, risk management is measured through credit risk, interest rate risk, and liquidity risk, while financial performance is measured through ROA, ROE, and ROI. For this purpose, the dynamic panel model and two step GMM panel estimators are used to test the hypothesis empirically. The annual secondary data has been taken from the published financial reports of commercial banks of Pakistan. The results show that financial risk management significantly decreases the financial performance of commercial banks in Pakistan. Overall, the results are conclusive across the alternative measures of financial risk management in predicting the financial performance of the banking sector in Pakistan. The study suggested that managers should adopt risk management and risk hedging strategies to manage commercial banks' financial risks in Pakistan. They should hold extra cash while using the trade credit facilities. Previous studies mostly used a static model, but this study used a dynamic panel model. This study is among the first that focused on the various factors affecting the banks' performance in Pakistan.

Keywords: Credit Risk, Interest Rate Risk, Liquidity Risk, Financial Performance

JEL Classification Code: G32, L25

1. Introduction

Risk management is of great importance because balancing the risk leads to effective management of any organization in this challenging world. Commercial banks play a vital role in boosting the economy's performance through their financial activities by accepting deposits and lending money (Din et al., 2020; Zulfiqar et al., 2020). The banking sector of both developed and developing economies of the world is affected by risk (Ekpo, 2012). To deal with the monetary crisis in developing countries, the banks should focus on the soundness of the banking system by managing various types of risks. Risk management is strategic because an organization's success and value largely depend upon strategically dealing with those risk factors (Suranarayana, 2003). It has been developed as an important area in accounting and corporate finance (Dechow et al., 2012). The uncertainty of risk is unmeasured, and it adversely affects the quality of financial accounting information (Gaio, 2010).

Effective and professional risk management can bring managers to increase their organization's assets efficiency and to maximize the banking sector's value (Gupta et al., 2009). Risk management arises due to uncertainty concerning outcomes of future decisions. Risk management helps banks to manage and forecast the risk. It also improvises for problems solving and decision-making processes. Moreover, it reduces the costs, improves both business continuity, compares results, and competitive advantage (Degraeve et al., 2004; Williams, 1998; Fadun, 2013). Therefore, it is obligatory for the management team of financial institutions to seriously recognize, control, and manage their risks, especially the financial and monetary risks that might incur.

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640

Zeeshan AHMED, Zain SHAKOOR, Mubashir Ali KHAN, Waseem ULLAH /
Journal of Asian Finance, Economics and Business Vol 8 No 5 (2021) 0639–0648

The financial performance of banks is influenced by the various types of risks like interest-rate risk, credit risk, and liquidity risk. Risk is a vulnerable factor for the financial performance of any organization. The poor management of credit risk adversely affects profitability and the quality of assets. It may increase non-performing loans, which may lead to financial distress. State Bank of Pakistan Quarterly Review Report, 2015, shows that the Pakistani banking sector's asset quality is declining. Their non-performing loans have increased by 1.6 percent during Jun-2015. Due to the intense competition in the market and deregulation, there is high volatility in the interest rates in a dynamic way which may affect the earnings and costs and leads to the interest rate risk in the risk. The inadequacies in the capital funds mix and mismatching in the maturities of assets and liabilities give rise to the liquidity risk, which adversely impacts banks' financial performance. The banks become unable to liquidate a position timely (Arif & Anees, 2012).

Due to the unstable economic situation of Pakistan, it becomes more favorable for the Pakistani banking sector to pay a significant focus on risk management. It may directly or indirectly affect the financial performance (profitability) of any organization (Mohammed & Knapkova, 2016). Due to the adverse risk management practices and improper internal control practices in the banking sector, banks' performance is not up-to mark (Njuguna, 2016). Moreover, due to ineffective risk management practices and non-compliance to the rules, the financial performance of banks is adversely affected. However, to improve the financial performance, the Pakistani banking sector has introduced modern ways (internet banking) to run their financial activities, which has great exposure to default credit risk and risk of losing customers (Ongore & Kusa, 2013). Due to a lack of financial risk management formalization and a lack of utilization of financial risk management tools, responsibility for the financial resources is still lacking.

This study aims to identify the role of financial risk management in predicting the financial performance of commercial banks in Pakistan. A closer look at the literature reveals several gaps and shortcomings. The study has additionally reinforced homogeneity assumptions of risk management theory on commercial banks in Pakistan. The study contributes to prior empirical evidence through different risk management measures, and financial performance of commercial banks in developing countries like Pakistan as limited studies are available in this scope. First, the various financial risk management tools like credit risk, interest rate risk, and liquidity are used to identify their impact on the financial performance of banks in Pakistan. Secondly, a dynamic panel is applied to test the mentioned relationship where a two-step system GMM estimator is applied. Financial risk management is crucial to Pakistan's banking sector because it leads to an increase in corporate value. So, the risk management practices should be focused on, especially in the banking sector, because it improves their financial performance (Tursoy & Faisal, 2018). To tackle the major challenges faced by the Pakistani banking sector, they have to pay proper attention to operationalize and implement the proper financial risk management practices.

2. Literature Review

The financial risk management profile of commercial banks plays a significant role in fluctuating their financial performance. Banks face credit risk due to bank loans and many other sources. To deal with this type of risk, the Basel 1 committee has established effective measures where the board of directors reviews the credit risk management strategies (BCBS, 1999). The credit risk leads to the possible bankruptcy of banks (Muhammed, 2012). Credit risk measured by capital adequacy had a strong negative and significant relationship with the financial performance of banks (Muhammad & Bilal, 2014; Anila, 2015). However, these results contradict other studies which found a positive relationship between capital adequacy and performance (Frederic, 2014). Muhammed (2012) investigated and established an inverse relationship between credit risk and the performance of Nigerian banks. Nevertheless, Kolapo et al. (2012) found a positive and direct relationship between these two variables. They suggested that proper management of risk could improve the banks' efficiency. Harison and Joseph (2012) found an insignificant relationship between credit risk proxies: capital adequacy and non-performing loans and banks performance. To measure the performance (profitability) of commercial banks in Europe, it has been found that the effect of non-performing loans on financial performance is significant, but CAR is insignificant (Zou & Li, 2014). Non-performing loans and provisions are the significant factors that decrease the banks' performance (Sujeewa, 2015). It showed that the performance of banks had been adversely affected by credit loss. But the credit risk positively impacts the financial performance of the banking sector (Imamul & Arif, 2015).

A rise in the rate of interest boosts banks' performance (Khawaja & Musleh, 2007). Other researchers found a significant negative and indirect relationship between the rate of interest and financial performance of five major commercial banks in Pakistan (Waseem & Abdul, 2014). The banks' financial performance is inversely correlated to the interest rate risk (Zagonov et al., 2009). It was acknowledged that failure to manage or evade the interest rate risk would adversely affect the banks' performance (Matthias, 2012). However, the risk profile of Islamic banks positively contributes towards their performance (Zainol & Kassim, 2010). A rise in interest rate would be a rise in banks' performance by charging a high interest rate to

the borrowers. On the other hand, there is an insignificant effect of interest rate on the banks' performance (Kolapo & Dapo, 2015).

Besides the credit risk and interest rate risk, many researchers and authors have investigated banks' exposure to liquidity risk. Banks may face liquidity risk when they grant loans for the long-term from their short-term deposits (BCBS, 2008). Norazwa et al. (2015) have examined the impact of liquidity risk on the performance of Bahrain and Malaysian banks and used various measures of liquidity risk. They found that deposit volatility and liquidity risk are significantly negatively correlated with each other. However, they found a significant and positive link between bank capitalization and liquidity risk. A study has been conducted to analyze the performance of commercial banks in Pakistan has also found a significant negative correlation between liquidity risk measures and performance. It has been justified that liquidity risk had a bad impact on banks' performance. Moreover, an increase in NPLs ratio leads to a decrease in banks' performance (Ahmed & Ahmed, 2012). Liquidity risk measured by net stable funding ratio tends to decrease the financial performance, but liquidity coverage ratio has no significant impact on financial performance (Murithi & Waweru, 2017). The more the net stable funding ratio, the more the liquidity but performance may be influenced negatively.

3. Methodology

The rational and logical way the research process is planned and elements of the study are analyzed for data interpretation is research methodology (Upagade & Shende, 2012). To examine the empirical impact of financial risk management on the financial performance of commercial banks in Pakistan, a quantitative research design and deductive research approach were used (see Table 1). The sample data was collected for 28 commercial banks licensed by the State bank of Pakistan over the 12 years period, i.e., 2006–2017. For data analysis, secondary data was collected from audited and published financial statements of commercial banks in Pakistan.

3.1. Data Estimation Method

For empirical analysis and testing the hypotheses, a dynamic panel model has been used. Dynamic panel information describes the case wherever a lag of the variable is employed as a regressor. The presence of the lagged variable violates strict exogeneity, that is, endogeneity could occur. The endogeneity issue usually originates from the existence of omitted variables, measurement errors of the variables incorporated in the model. Theoretically, endogeneity occurs when a predictor variable in a regression model is correlated

with the error term (e) in the model. Endogeneity occurs when a variable, observed or unobserved, is not included in our models, is related to a variable we used in our model. Endogeneity issues might arise when specific firm variables are used and are one cause of potential error estimation. A potential endogenous problem can also come about when variables are based on accounting values (Gaud et al., 2005). The presence of endogeneity in firm-specific variables (Malik et al., 2021). Therefore, to deal with endogeneity issues, the Generalized Methods of Moments (GMM) is the better option. The generalized method of moments produces excellent results in dealing drastically with heteroskedasticity and autocorrelation issues (Baum, Schaffer & Stillman, 2003; Antoniou et al., 2006). The study adopted the dynamic panel model for empirical testing of the hypothesis and removed the heterogeneity from the data. The model caters to the heterogeneity among the institutions, allowing them to possess their own intercept, i.e., time-invariant. Moreover, the model's appropriateness is based on a presumption about population.

The dynamic panel estimator generalized methods of moments (GMM) eliminates the unobserved heterogeneity and unobserved firm-specific effects. Two-step System GMM is applied that control the correlation of error over time and heteroskedasticity across the firms. This helps to control the measurement errors and simultaneity bias due to orthogonal conditions in the variance-covariance matrix that leads to downward bias. Xtabond2 command is used for two-step System GMM (Roodman, 2009) because it lowers the standard errors quite accurately, and estimation seems to be superior. Two-step System GMM performs better than one step System GMM in estimating the coefficient with lower bias and standard errors.

3.2. Econometric Model

This research study has employed the economic model to relate the dependent and explanatory variables. This model elaborates on how financial risk management is related to the financial performance of commercial banks. This study has taken on the dynamic panel model for the empirical testing of the hypothesis. To remove the endogeneity and heteroskedasticity problems and while concluding results about population, this model is suitable for this study (Na Sun, 2019). Keeping in view the above discussion, we developed the following model

$$PF_{it} = \beta_1 FP_{i,t-1} + \beta_2 CR_{it} + \beta_3 IRR_{it} + \beta_4 LR_{it} + \beta_5 Size_{it} + \beta_6 Lev_{it} + \varepsilon_{it}$$

In the above model, FP_{it} is the financial performance which is measured as Return on Assets (ROA) (Malik et al., 2021), Return on Equity (ROE), and Return on Investment (ROI)

642

Zeeshan AHMED, Zain SHAKOOR, Mubashir Ali KHAN, Waseem ULLAH /
Journal of Asian Finance, Economics and Business Vol 8 No 5 (2021) 0639–0648

Table 1: Variables Measurement

Variables	Proxies	Measurement	Evidences
Dependent Variables			
Financial Performance (FP)	1. Return on Equity (ROE)	• Net profit to Total equity	Mubin et al. (2014)
	2. Return on Assets (ROA)	• Net profit to Total assets	Khadafi et al. (2014)
	3. Return on Investment (ROI)	• Net profit to Cost of investment	
Independent Variables			
• Credit Risk (CR)	• Capital Adequacy	• Higher the ratio, higher the risk	Mingdong (2012)
	• Total loans to Total assets		Parlakkaya et al., 2020)
	• Non-performing loans to Gross advances		Balasubramaniam (2012)
• Interest-Rate Risk (IRR)	• Net loans to Total assets ratio	• Higher the ratio, higher the risk	Macit (2012)
	• Interest income to Total assets		Bolt et al. (2012)
• Liquidity Risk (LR)	• Liquid assets to Total assets • Total assets to Total deposits	• Higher the ratio, lower the risk	Wolff (2013) Yuksel et al. (2015)
Control Variables			
Bank Size	Total Assets	Natural Log	Pais (2013)
Leverage	Debt-to-Equity ratio	Higher ratio, lower risk	Forbes et al. (2012)

(Mubin et al., 2014), while risk management is measured through three different factors named as Credit risk (CR), Interest rate risk (IRR) and Liquidity risk (LR). Credit risk is measured by capital adequacy, total loans to total assets, and non-performing loans to gross advances (Mingdong, 2012; Parlakkaya et al., 2020). Interest rate risk is measured by Net loans to total assets ratio and Interest income to total assets (Macit, 2012; Bolt et al., 2012). Liquidity risk is calculated as liquid assets to total assets and total assets to total deposits ratio (Pisani et al., 2013). Additionally, control variables are also included in the model as bank size measured by taking the natural log of total assets (Pais & Stork, 2013) and leverage calculated through debt-to-equity ratio (Obediat et al., 2021; Forbes et al., 2012).

4. Results and Discussion

4.1. Descriptive Statistics

Descriptive statistics show the distribution and normality of data used in this study. It defines the specific characteristic of a part of the total population. Table 2 given below presents the descriptive statistics figures about all variables used in this study. The average ROA of the banking sector of Pakistan is 0.09, the average value of ROE is 0.10, and ROI is 0.36. While the dispersion measured by the standard deviation of ROA, ROE, and ROI is 0.35, 0.33, and 0.57, respectively. The measures of credit risk: capital adequacy (CA), total loans to total assets (T. Loan), and non-performing loans to gross advances (NPL) show the mean value of 1.34, 0.43, and 0.33 while their standard deviation is 1.93, 0.17, and 0.31 respectively. The average value of net loans to total assets ratio (N. Loan) is 0.83, while the average mean value of interest income to total assets (INTT) is 0.09. The results show that the net loans ratio has a high standard deviation that is 0.19, than the interest income ratio. The liquidity risk measured by liquid assets to total assets (LIQ) and total assets to total deposits (TA) indicates the average value of 0.51 and 0.58, while their standard deviations are 0.29 and 0.22, respectively.

4.2. Correlation Analysis

Correlation analysis shows the strength and direction of the relationship between the variables. There may be perfect positive, perfect negative, partial correlation, or no correlation between the variables, which lies between +1 and −1. The correlation matrix does not show an accurate picture of the results. All the variables in the study are

Table 2: Descriptive Statistics

Variables	St. Deviation	Mean	Minimum	Maximum	Observations
ROE	0.33	0.10	−0.99	0.99	336
ROA	0.35	0.09	−1	1.6	336
ROI	0.57	0.36	−1.29	3.07	336
CA	1.93	1.34	−0.46	6.76	336
T. Loan	0.17	0.43	0	1.17	336
NPL	0.31	0.33	−0.12	1.34	336
N. Loan	0.19	0.83	0.07	0.99	336
Intt	0.02	0.09	0	0.17	336
Liq	0.29	0.51	0.03	0.99	336
TA	0.22	0.58	0	1.02	336
BS	1.33	19.0	14.71	21.7	336
Lev	0.97	2.14	0.11	5.04	336

Note: The above table represents the descriptive statistics with and standard deviation of the variables of study. The variables are ROA: Return on Assets; ROE: Return on Equity; ROI: Return on Investment; CA: Capital Adequacy ratio; T. Loans: Total loans to total assets; NPL: Non-Performing Loans to gross advances; N. Loans: Net loans to total assets; Intt: Interest income to total assets; Liq: Liquid assets to total assets; TA: Total assets to total deposits; BS: Bank Size; LEV: Debt to equity ratio.

Table 3: Correlation Analysis

Variables	ROE	ROA	ROI	CA	T. Loan	NPL	N. Loans	Intt	Liq	TA	BS	Lev
ROE	1.000											
ROA	0.1760	1.000										
ROI	0.0795	−0.4186	1.000									
CA	−0.0232	0.0689	0.0085	1.000								
T. Loan	0.1793	−0.0766	−0.2171	−0.1903	1.000							
NPL	0.0879	−0.0845	0.2404	0.1638	−0.0551	1.000						
N. Loans	0.3507	−0.1691	0.0504	−0.2111	0.3391	−0.0081	1.000					
Intt	0.2224	0.0467	−0.3783	−0.0614	0.4760	−0.0781	0.3385	1.000				
Liq	0.0482	0.0228	0.0249	0.2048	−0.0715	0.1333	−0.0107	0.0315	1.000			
TA	0.1499	0.1175	−0.0353	−0.1205	0.0227	−0.1728	0.2415	0.2840	−0.0700	1.000		
BS	0.2130	0.1896	0.0288	0.0086	−0.0456	−0.0219	0.2264	0.0441	−0.0042	0.4058	1.000	
Lev	−0.1743	−0.1438	0.0571	0.1067	−0.1142	0.1471	−0.1598	−0.0823	0.0532	−0.1807	0.0151	1.000

Note: This table shows the correlation/direction between the variables of study. The correlation is among the ROA: Return on Assets; ROE: Return on Equity; ROI: Return on Investment; CA: Capital Adequacy ratio; T. Loans: Total loans to total assets; NPL: Non–Performing Loans to gross advances; N. Loans: Net loans to total assets; Intt: Interest income to total assets; Liq: Liquid assets to total assets; TA: Total assets to total deposits; BS: Bank Size; LEV: Debt to equity ratio.

not highly correlated with each other but are partially correlated with each other; therefore, no multicollinearity problem exists in the model. The results of the correlation analysis of variables used in this study are shown in Table 3.

4.3. Credit Risk and Financial Performance

This section shows the relationship between credit risk and the financial performance of the banking sector in Pakistan. The results related to this particular relationship

644

Zeeshan AHMED, Zain SHAKOOR, Mubashir Ali KHAN, Waseem ULLAH /
Journal of Asian Finance, Economics and Business Vol 8 No 5 (2021) 0639–0648

Table 4: Estimation Results Between Financial Performance and Credit Risk

Financial Performance is the Dependent Variable in all the Columns						
Variables	**ROE**		**ROA**		**ROI**	
Perf $_{(t-1)}$	0.5371*** (0.345)	0.4135*** (0.079)	0.5493*** (0.071)	0.6568*** (0.036)	0.9177*** (0.005)	0.4239*** (0.060)
CA	−0.0208*** (0.007)	−0.0434*** (0.063)	−0.101*** (0.013)	−0.0334*** (0.007)	−0.0360*** (0.002)	−0.0196* (0.010)
T. Loans	−0.4128*** (0.076)	−0.0633 (0.111)	−0.4990*** (0.140)	−0.4555*** (0.109)	−0.3076*** (0.0428)	−0.7037*** (0.171)
NPL	−0.2465*** (0.020)	−0.1238*** (0.029)	−0.0940* (0.100)	−0.2102*** (0.041)	−0.1781*** (0.0262)	−0.1566*** (0.057)
BS		−0.0365** (0.0175)		−0.1184*** (0.025)		−0.0582** (0.020)
Lev		−0.1479*** (0.0448)		−0.0529*** (0.0145)		−0.0237 (0.0298)
AR (1)	0.001	0.000	0.023	−2.446	0.036	0.040
AR (2)	0.055	0.068	0.401	0.495	0.406	0.344
Sargan	0.928	0.897	0.110	0.727	0.609	0.753
Hansen	0.480	1.000	0.390	0.636	0.429	0.925
Instruments	27	25	25	23	21	27
No. of Groups	28	28	28	28	28	28

Note: This table reports the results related to two–step system GMM in dynamic panel model. Financial performance is the dependent variable in all the columns, and results are reported in columns 2 to 7. ROE: Return on Equity; ROA: Return on Assets; ROI: Return on Investment; CA: Capital Adequacy ratio; T. Loans: Total loans to total assets; NPL: Non–Performing Loans to gross advances; BS: Bank Size; LEV: Debt to equity ratio. AR (1) is significantly indicating first order serial correlation, but the insignificance of AR (2) specifies no second order serial correlation among error term. Sargan / Hansen test is insignificant, specifying the instrument's validity with no over identification. All these identifications prove that GMM is accurately specified with no identification issues. Standard errors are shown in parentheses (); ***, ** and * show the 1%, 5%, and 10% significance levels, respectively.

are presented in Table 4. The lagged dependent variable is a noteworthy feature of the dynamic panel model, and its significance confirms the dynamic panel model. This shows that firm performance is based on last year's performance. Credit risk is measured in three different ways like capital adequacy, total assets to total loans, and non-performing loans. The coefficient of capital adequacy (CA) shows a significant negative relationship with the overall financial performance of banks in Pakistan, which is consistent with (Anila, 2015; Muhammed, 2012; Hamid et al., 2013). The coefficient of total loans to total assets (T. Loans) and non-performing loans (NPL) also indicate a significant negative relationship with the overall performance of the banking sector in Pakistan, which supports the results of (Muhammed, 2012; Hamid et al., 2013; Sujeewa, 2015). This negative relation indicates that an increase in credit risk leads to a decrease in future earnings growth and investment potential of banks, an increase in bankruptcy, and failure to meet the obligations. Additionally, borrowers' capacity to repay the

loan reduces, that results in an increase in default chances. According to Hamid et al. (2013), shareholders' value decreases due to increased credit risk and vice versa. In such a situation, commercial banks suffer severe consequences that adversely affect banks' financial performance. These negative and significant results are in contradicted with the studies (Frederic, 2014, Kolapo et al., 2012; Zou & Li, 2014; Imamul & Arif, 2015) who found a significant and positive relationship, and some found an insignificant association between credit risk and financial performance of banks.

4.4. Interest Rate Risk and Financial Performance

This section shows the relationship between interest rate risk and the financial performance of the banking sector in Pakistan. The results related to this particular relationship are presented in Table 5. The lagged dependent variable is significant in all the columns, which shows that model is dynamic in nature. Interest rate risk is measured in two

Table 5: Performance and Interest Rate Risk

	Performance is the Dependent Variable in all the Columns					
Variables	**ROE**		**ROA**		**ROI**	
Perf$_{(t-1)}$	0.3462*** (0.025)	0.5030*** (0.098)	0.5560*** (0.018)	0.5143*** (0.027)	0.6669*** (0.006)	0.6702*** (0.029)
N. Loans	−0.3471*** (0.058)	−0.3499*** (0.147)	−0.4840*** (0.033)	−0.8923*** (0.076)	−0.3835*** (0.036)	−0.4678*** (0.087)
Intt	−1.3956*** (0.116)	−1.1652*** (0.471)	−1.1028*** (0.231)	−2.9573*** (0.567)	−0.466*** (0.087)	−1.601*** (0.596)
BS		−0.0506*** (0.019)		−0.1792*** (0.020)		−0.030** (0.006)
Lev		−0.0502*** (0.018)		−0.0646*** (0.0104)		−0.0699** (0.032)
AR (1)	0.001	0.001	0.012	0.007	0.039	0.039
AR (2)	0.09	0.60	0.311	0.271	0.488	0.560
Sargan	0.912	0.982	0.259	0.119	0.134	0.027
Hansen	0.302	0.435	0.974	0.624	0.353	0.822
Instruments	25	25	21	23	21	27
No.of groups	28	28	28	28	28	28

Note: This table reports the results related to two–step system GMM dynamic panel model. Financial performance is the dependent variable in all the columns, and results are reported in columns 2 to 7. ROE: Return on equity; ROA: Return on assets; ROI: Return on investment; N. Loans: Net loans to total assets, Intt: Interest income to total assets, BS: Bank Size, LEV: Debt to equity ratio. AR (1) is significantly indicating first order serial correlation, but the insignificance of AR(2) specifies no second order serial correlation among error term. Sargan / Hansen test overid is insignificant, specifying the instrument's validity with no over identification. All these identifications proves that GMM is accurately specified with no identification issues. Standard errors are shown in parentheses (); ***, ** and * show the 1%, 5%, and 10% significance levels, respectively.

ways, like N. Loans and INTT. The coefficient of net loans to total assets (N.loans) shows a significant opposite relationship with the overall financial performance (ROE, ROA, and ROI) of banks in Pakistan. The coefficient of interest income to total assets (INTT) also indicates a notable inverse relationship with the overall financial performance of commercial banks in Pakistan. These findings suggested that an increase in interest rate risk would decrease the financial performance of the financial sector (Khan & Sattar 2014; Zagonov et al., 2009; Matthias, 2012). This negative relationship between interest rate risk and performance is justified when interest rate risk rises; there is a decrease in the banks' investments. It also discourages the depositors because banks charge higher rates from borrowers and pay a lower rate to the depositors. It indicates poor management of interest rate risk by banks. Moreover, a high level of interest rate risk leads to a reduction in banks' acquaintance with the leverage risk. In contrast, some authors indicated a rise in interest rate risk leads to increased performance (Khawaja & Musleh, 2007; Zairy & Salina, 2010).

4.5. Liquidity Risk and Financial Performance

The results related to the relationship between liquidity risk and financial performance of the banking sector in Pakistan are presented in this particular section. Table 6 empirically represents the relationship between liquidity risk and the financial performance of commercial banks. The lagged dependent variable is significant in all the columns, which shows that model is dynamic in nature. Liquidity risk is measured in two various ways like liquid assets (Liq) and total assets (TA). The results explored that liquidity risk significantly decreases the financial sector's performance in Pakistan. A high level of liquidity risk declines the financial performance of banks (Norazwa et al., 2015; Arif & Anees, 2012; Murithi & Waweru, 2017). The higher the fluctuations in the bank's deposits tend to higher the liquidity risk. The negative relationship indicates that when liquidity risk increases due to the insufficient cash balance and marketable securities, banks' performance decreases. Moreover, when the level of long-term loans increases, then liquidity risk

Table 6: Estimation Results Between Financial Performance and Liquidity Risk

Performance is the Dependent Variable in all the Columns					
Variables	ROE		ROA		ROI	
$Perf_{(t-1)}$	0.2679*** (0.018)	0.2361*** (0.090)	0.6794*** (0.025)	0.5828*** (0.046)	0.9173*** (0.007)	0.8079*** (0.028)
Liq	−0.1919*** (0.036)	−0.1548*** (0.029)	−0.1655*** (0.021)	−0.1564*** (0.018)	−0.195*** (0.014)	−0.079 (0.039)
TA	−0.1557*** (0.026)	−0.5270*** (0.090)	−0.184*** (0.023)	−0.147* (0.059)	−0.1530*** (0.032)	−0.133*** (0.039)
BS		−0.055*** (0.012)		−0.0822*** (0.019)		−0.046*** (0.005)
Lev		−0.069*** (0.016)		−0.041*** (0.010)		−0.018 (0.0146)
AR (1)	0.001	0.002	0.025	0.024	0.034	0.034
AR (2)	0.128	0.278	0.450	0.446	0.328	0.338
Sargan	0.651	0.562	0.077	0.182	0.310	0.441
Hansen	0.237	0.999	0.900	0.991	0.342	0.991
Instruments	25	49	41	41	25	49
No. of Groups	28	28	28	28	28	28

Note: This table reports the results related to two–step system GMM in a dynamic panel model. Financial performance is the dependent variable in all the columns, and results are reported in columns 2 to 7. ROE: Return on equity; ROA: Return on assets; ROI: Return on investment; Liq: Liquid assets to total assets; TA: Total assets to total deposits; BS: Bank Size; LEV: Debt to equity ratio. AR (1) is significantly indicating first order serial correlation, but the insignificance of AR (2) specifies no second order serial correlation among error term. Sargan / Hansen test overid is insignificant, specifying the instrument's validity with no over identification. All these identifications proves that GMM is accurately specified with no identification issues. Standard errors are shown in parentheses (); ***, ** and * show the 1%, 5%, and 10% significance levels, respectively.

arises, due to which banks' performance suffer adversely (BCBS, 2008).

5. Conclusion

The study aims to examine the role of financial risk management practices in the financial performance of commercial banks in Pakistan over the period of 2006-2017. The secondary data is collected from annual published financial reports of commercial banks. The dynamic panel model was developed due to endogeneity issues, and a two-step system GMM panel estimator is applied to control the potential endogeneity. Financial risk management is measured through credit risk, interest rate risk, and liquidity risk, while financial performance is measured through return on assets, return on equity and return on investment. The study concluded that financial risk management is a significant factor that decreases commercial banks' financial performance. Credit risk, interest rate risk, and liquidity risk are important factors of financial risk management that are likely to decrease the

financial sector's performance. All these factors negatively impact the performance of the banking sector. The study suggested that managers should adopt risk management and risk hedging strategies to manage the financial risks faced by commercial banks. Moreover, bank managers should maintain sufficient cash balance, marketable securities, and greater availability of funding for committed credit facilities so that liquidity risk could be tackled efficiently. Further study can investigate various factors like bank-specific factors, market structure factors, macro-economic factors to conclude an in-depth insight about the impact of financial risk on performance. Moreover, non-financial factors could also be taken into account, like possession structure, physical locations, variety of consumers, etc., to see their likely effects on the performance of commercial banks in Pakistan.

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648

Zeeshan AHMED, Zain SHAKOOR, Mubashir Ali KHAN, Waseem ULLAH /
Journal of Asian Finance, Economics and Business Vol 8 No 5 (2021) 0639–0648

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