



Capital Adequacy & Banking Distress: A Case Study of Commercial Banks in Pakistan

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Abstract

This study attempts to investigate the prediction power of capital adequacy ratios about banking distress. Taking commercial banks from Pakistan as a study sample for a period from 2011 to 2020, this study highlights the role and importance of the capital adequacy ratio in the prediction of banking distress. The research findings conclude that capital adequacy ratios are the sources that signal the banking soundness in emerging economies and financial distress in banking can be predicted by alternative capital ratios. The study recommends that commercial banks must have to develop and adopt regulatory and reporting structures on capital adequacy to safeguard themselves from the unexpected risk of default. Further, banking officials are also advised to maintain a steady capital ratio to avoid potential losses from insufficient liquidity capital.

Keywords: *Capital Adequacy, Distress, Soundness, Banks*

Introduction

Capital adequacy ratios (CAR here onwards) denote the risk cushion available within the banks to safeguard them from unexpected losses (Chiaromonte & Casu, 2017; Rahman & Kaium Masud, 2021). These ratios normally define the solvency and liquidity positions of banking institutions. Theoretically, a bank with a good capital ratio is considered well to absorb potential risks. Thus, maintenance of good and high capital ratios enables banks to ensure financial stability and is likely to meet their due obligations (Halteh, Kumar & Gepp, 2018). Banking regulators have special consideration for capital ratios because their mandate is to prevent the bank from possible insolvency and distress (Aziz & Dar, 2006). Financial distress is the probability that banks will not be able to pay their obligations when required (Amalia et al., 2020). The concept of financial distress also denotes the decline in the financial efficiency of banking institutions where insufficient liquidity can cause banks to come to solvency (Roman & Şargu, 2013). The banks which took a high proportion of debt into their financing need are more prone to distress situations as a high proportion of debt intensifies the risk of financial distress, which is unfavorable for banking stakeholders (Toby & Danjuma, 2021). In

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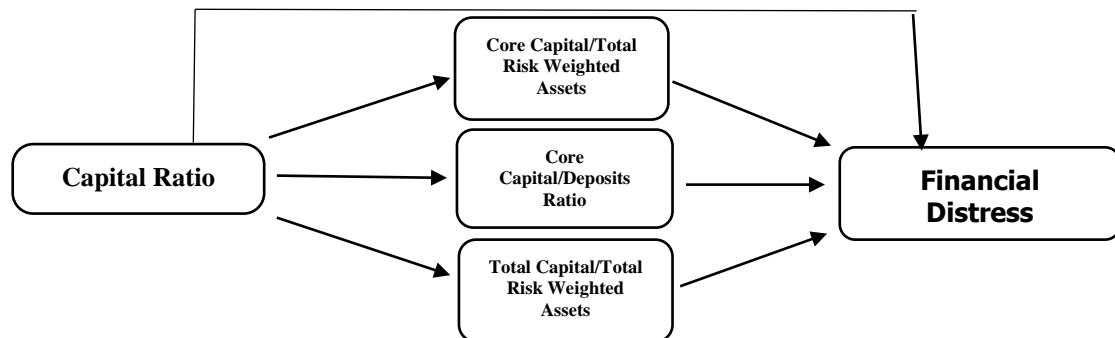
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literature, the dangerous situation of financial distress is considered insolvency which may lead a bank to default. The role of commercial banks in shaping economic growth cannot be ignored therefore the banking distress may lead to panic in the national economy. In this sense, banks having high capital cushions are better able to safeguard the interests of their depositors. Many studies conducted in the past to explore the influence of capital ratios on the probability of financial stability mainly within the financial institutions (Salehi & Abedini, 2009; Pathan & Faff, 2013; Buchdadi et al., 2020; Hersugondo, et al., 2021). Like further financial institutions, commercial banks are also financed by a combination of both equity as well as debt. So, to comprehend the effects of capital ratios on the banking financial stability and distress would be motivated to explore. So, the objective of this research is to inspect the usefulness of the capital ratios as interpreters of the financial distress in conventional commercial banks in Pakistan.

Conceptual Framework

The conceptual framework (figure-1) of this paper is based on the work of Karugu et al., (2018) who also explored the effectiveness of the capital ratio in the determination of banking distress. The dependent variable of the study is taken as Z-Score which is widely used as an indicator of distress in past literature (Betz et al., 2014; Rosa & Gartner, 2017; Roman & Şargu, 2013). While, three key capital ratios namely, core capital scaled by risk-weighted assets, core capital scaled by total deposits, and capital scaled by risk-weighted assets have been taken as independent variables. The conceptual framework for this research proposes that the core capital ratios act as a predictor to estimate the financial distress in the banking institutions of Pakistan.

Fig. 1: Conceptual Framework



The current research is explanatory and the purpose of the study is to determine the causal effect because the researcher aims to find the causal relationship between the study variables. The current research is quantitative because the selected variables and their association with the dependent variable are constructed based on financial measurement. The secondary data sources are used for measuring the selected variables of the present research. The annual financial data is taken from published financial reports of the individual banking firms for a period from 2011 to 2020. The nature of data is panel because data entry is done by the cross-section versus period method. The study sample consists of 23 conventional banks listed on the stock exchange of Pakistan. The data analysis is conducted using e-views software and logistic regression is applied to perform the empirical analysis.

**Variables and their Measures**

It is evident that distress in one banking institution may lead to the distress of the overall financial system and can cause economic panic. Therefore, it is necessary to estimate the impact of change in capital ratio on banking distress and suggest some remedial measures so that future adverse events can be avoided. Past studies have used the quantity of banking distress using the Z-score indicator (Gamaginta, 2015). This study also attempts to incorporate the same distress variable developed by Altman in 1968 as the dependent variable. Altman used financial ratios to develop a prediction model for banking insolvency. The outlay of the model is as follows:

$$ZS = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.9X_5$$

Where, X_1 (Liquidity) = Working Capital/Total assets

X_2 (Profitability) = Retained Earnings/Total Assets

X_3 (Operating Efficiency) = EBIT/Total Assets

X_4 (Market to Book) = Market Value of Equity/Book Value of Total Liabilities, and;

X_5 (Total Asset Turnover) = Sales/Total Assets

The level of banking distress based on obtained ZS values is categorized as follows:

If the value of ZS > 2.99, it means the bank is safe

If the value of ZS is between 1.81 and 2.99, it means the bank is in the grey zone

If the value of ZS < 1.81, it means the bank is financially distressed. So, for the current study, the banks having a ZS value below 1.81 are put under the category of distressed banks otherwise safe.

The independent variables of the study are three capital ratios which are measured as follows:

Table 1: Study Variables

Variable	Sign	Measurement	Proxy for
Capital Ratio	Cap_1	Core Capital/Total Risk-Weighted Assets	Capital Adequacy
Capital to Deposit Ratio	Cap_2	Core Capital/Total Deposits	
Total Capital Ratio	Cap_3	Total Capital/Total Risk-Weighted Assets	

Empirical Analysis

Empirical estimations of the model have been illustrated in this section.

Summary Statistics

Table 2 points to the results obtained from the summary statistics table that the average value of capital to risk-weighted assets ratio (Cap_1) is 13.93% which is higher than the regulatory capital requirement e.g. 8%. The core capital to deposits ratio (Cap_2) is 15.72%. The total capital to total risks ratio (Cap_3) is 16.43% compared to the regulatory capital requirement e.g. 12%. These average values indicate that banks in Pakistan have maintained a sufficient amount of capital buffer which also signals the relative stability of the banking industry. The high industry average values of capital ratio further indicate that the banking industry is sufficiently capitalized to meet the unexpected losses and risks.

**Table 2:** Descriptive Statistics

	Mean	SD
Cap_1	13.93	11.93
Cap_2	15.72	15.71
Cap_3	16.43	22.17

Source: author's calculation

Independent Sample t-test

Independent sample t-tests are conducted in which banking distress is used as the grouping variable. The results from the independent sample t-test are as given in table-3. It is evident from the values obtained in table-3 that Cap_1 has a mean of 8.84% in distressed banks while the mean value of Cap_1 stands at 13.45% in the case of non-distressed banks. The obtained values of corresponding standard deviations for each group are 5.32% and 10.23% respectively. These findings suggest that there exists a strong substantial difference in the capital to risk-weighted assets ratio for both distressed as well as non-distressed banks. It can be concluded from the obtained results that Cap_1 is an important determinant of the distress in the banks of Pakistan.

The obtained value in table-3 for capital to deposits ratio (Cap_2) has a mean of 10.52% for distressed banks while it stands at 15.92% in the case of non-distressed banks. The obtained values of corresponding standard deviations for Cap_2 for each group are shown as 7.82% and 12.32% respectively. These findings also suggest the existence of a strong significant difference in the Cap_2 for both distressed and non-distressed commercial banks. Based on obtained findings, it can be established that Cap_2 is an important determinant of the financial distress in the case of Pakistani commercial banks.

Table 3: Independent Sample t-test

	Distress	Obs.	Average	St. Dev.	St. Error
Cap_1	1	20	8.84	5.32	0.352
	2	210	13.45	10.23	0.458
Cap_2	1	20	10.52	7.82	2.365
	2	210	15.92	12.32	0.652
Cap_3	1	20	13.39	10.52	3.396
	2	210	21.82	22.36	0.645

As far as the findings of total capital to total risk ratio (Cap_3) is concerned, the results are not much different from the results obtained in the cases of Cap_1 and Cap_2. The mean value for distressed commercial banks is 13.39% while their standard deviation stood at 3.39%. The obtained values of mean and standard deviation for non-distressed firms are 21.82% & 22.36%. These differences in the mean values of both groups although not very large but could be considered significant to decide that Cap_3 is a strong predictor in the determination of the financial distress within commercial banks in Pakistan. The results of the independent sample t-test confirm the strong predictive power of selected capital ratios in defining the distress level of commercial banks in Pakistan. Based on the above discussions, it can be concluded that the CAR is a strong indicator in assessing the financial distress level of commercial banks. Maintenance of the regulatory and adequate level of capital ratios might help safeguard banks from unexpected losses. Additionally, capital ratios are directly



related to the liquidity level like cash flows which are considered the biggest source of financial distress within commercial banks.

Empirical Analysis

The proposed logistic model to determine the prediction power of capital adequacy on banking financial distress is as follows:

$$P_i(ZS_i) = 1/(1 + \exp\{-(\alpha + \beta_1 Cap_1_i + \beta_2 Cap_2_i + \beta_3 Cap_2_i)\})$$

Model Summary

Table 4 reports the findings of the model summary. The model summary explains the value obtained for -2 log-likelihood (-2LL) and pseudo-R² for the given model. The value for -2LL for this model is found to be 105.32 stating that the applied model is significantly better.

Table 4: Model Summary

	-2 Log-Likelihood	Cox & Snell R²	Nagelkerke R²
1.	105.32	0.198	0.232

The values of R² given in Table 4 indicate the level of variations in the financial distress (explanatory variable) explained by the capital ratios (explained variable). The model variations for the applied model range between 0.198 (when Nagelkerke R² is used) and 0.232 (when Cox & Snell R² is used). These findings suggest that the model explains 19.8% of the variations in the outcome when Nagelkerke R² is used as a determinant of R-square. While the same model explains 23.2% of the variations in the outcome when Cox & Snell R² is used as a determinant of R-square.

Regression Coefficients Estimates

The table reports the coefficient estimates obtained from regression analysis. The table also shows the obtained values of standard error, Wald test. The beta (β) coefficients of the model, P-value, and Wald test provides the important information indicated by the importance of the relation between the explanatory and explained variables.

Cap_1 has a direct linkage with financial distress prediction among commercial banks in Pakistan. The coefficient value of Cap_1 is 0.36 which is also found to be significant at the 5% level. The value of standard error for the estimate appears to be 0.153 while the Wald test stands at 4.56. Accordingly, from the obtained values, the study discovers the direct influence of Cap_1 on the prediction determination of the financial distress among commercial banks of Pakistan. So, it can be concluded that Cap_1 proves to play a vital role in the prediction of financial distress since it uncovers a statistically significant relation in the model.

Table 5: Regression Estimates

Step 1	Variables	B	S.E	Wald test	df	Sig.
	Constant	12.34	8.43	3.35	1	0.235
	Cap_1	0.36	0.153	4.56	1	0.005
	Cap_2	0.32	0.146	7.39	1	0.042
	Cap_3	0.42	0.156	6.56	1	0.023



The capital to deposits ratio (Cap₂) was also found to have a significant direct association with the prediction determination of the financial distress of commercial banks. The value of the β coefficient of the stated measure is 0.32 with an S.E of 0.146 and a Wald test of 7.39. This infers that the association between Cap₂ with the prediction determination of the financial distress is significant at the 5% level. This designates that the financial distress prediction among commercial banks is improved mainly by the inclusion of Cap₂. Subsequently, the capital to deposits ratio (Cap₂) would be incorporated into the prediction model due to its significance.

The ratio of total capital to risk-weighted assets (Cap₃) has shared a direct linkage with the prediction determination of the financial distress. The β value is 0.42 with an S.E of 0.156 while the Wald test value of 6.56 is found to be significant at a 5% level. Therefore, the study suggests that Cap₃ is interrelated to the prediction determination of the financial distress positively. The ratio is incorporated into the prediction model as it appears to have a statistically significant relation.

The findings of the study suggest that the ratio of capital adequacy as acknowledged by the guidelines given in Basel-III and the regulations of the state bank of Pakistan (SBP) is perilous in determining the financial distress prediction among commercial banks in Pakistan. The obtained relation was found to be significant between the capital ratios (explanatory variables) and financial distress (explained variable) for the three employed variables and hence play a crucial role in the prediction of the financial distress.

Discussions and Conclusion

The importance of CAR cannot be ignored in the financial industry as they provide a base to handle unexpected shocks. Capital adequacy ratios (CAR) are considered key to predicting financial distress so, they are considered important for the prediction of financial distress within financial business. To be safe and sound, a financial firm must have to be capitalized adequately. In previous literature, several measures are taken to explain the financial distress among commercial banks, while the current study employed the ratio of core capital adequacy to determine the sustainability of the commercial banks. Core capital ratios are found to have a positive association with the financial distress prediction. Subsequently, this study comes to the opinion that the CAR has a statistically significant linkage with financial distress prediction in Pakistani commercial banks. So, it can be concluded that the maintenance of higher capital adequacy ratios (CAR) significantly lowers the probability of financial distress prediction. Further, these ratios are considered important to determine annual financial performance and the perception of the managers about the possible role of the explained variable in the prediction of the explanatory variables in commercial banks. Based on the obtained results, the current study suggests that all employed CAR are positively and significantly related to the prediction determination of the financial distress in the banking industry of Pakistan. The findings from the current study also corroborate the rules laid down by Basel-III on the maintenance of the CAR to observe financial distress. The findings from the current study also motivate the strong ratification of the maintenance of high capital requirements in banking.

Based on obtained results, the study recommends that banking regulators should take a keen interest in maintaining the sustainability of the banking business. This can be done by highlighting important factors that threaten the banking industry. In this regard, the capital adequacy ratio plays an important role as it is considered to have a significant impact on the prediction of financial distress. Moreover, the employment of CAR as financial distress prediction tool can help financial managers to predict, diagnose, identify and put in corrective actions to handle financial distress among commercial banks. So, as per the conventional



wisdom, high capital ratios provide a cushion against the banking distress, therefore any imbalances arising due to unexpected situations can be handled by maintaining high capital ratios as per BASEL capital requirement for the banking firms in Pakistan. This study endorses that banking officials should adopt an automated system that may track and report the level of capital adequacy in commercial banks.

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