

## Accounting Discretion, Loan Loss Provision in Financial Distress: Evidence from Commercial Banks

*Amina Malik*<sup>\*</sup>  
*Shahab Ud Din*<sup>\*\*</sup>  
*Khuram Shafi*<sup>\*\*\*</sup>  
*Babar Zaheer Butt*<sup>\*\*\*\*</sup>  
*Haroon Aziz*<sup>\*\*\*\*\*</sup>

**Abstract:** *This study explores the association between earning management practices and financial distress in commercial banks. Earning management is measured through discretionary loan loss provisions and non-discretionary loan loss provisions. Modified Altman’s Z-score has been used as a proxy for financial distress. Panel regression with fixed and random effect has been employed for empirical analysis. The study finds a significant positive association between DLLP, NDLLP and financial distress in terms of the Altman Z-score. In the case of NDLLP, liquidity reduces the probability of financial distress. Whereas, a bank’s SIZE, LEVG and AQ enhance the likelihood of financial distress. The robustness tests were applied to find the association between NDLLP and FD using logistic regression to validate baseline estimates results of the random effect model. The findings of this study have implications for the policymakers, regulators and internal stakeholders to devise effective regulatory measures for well-informed investment decisions.*

**Keywords:** Financial distress; Z-Score; Discretionary loan loss provisions and Non-discretionary loan loss provisions

**JEL Classification:** G11, G21, G28

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<sup>\*</sup> Amina Malik, PhD Scholar, National Defence University, Islamabad, Pakistan. E-mail [amina\\_malik\\_2000@yahoo.com](mailto:amina_malik_2000@yahoo.com)

<sup>\*\*</sup> Shahab ud Din, Associate Professor, Management Sciences, Karakoram International University, Ghizer campus, Gilgit Baltistan, Pakistan. E-mail [shahabuddin@kiu.edu.pk](mailto:shahabuddin@kiu.edu.pk)

<sup>\*\*\*</sup> Khuram Shafi, Associate Professor, Management Sciences, COMSATS University Islamabad, Pakistan E-mail: [HYPERLINK “mailto:shafikhuram@yahoo.com” shafikhuram@yahoo.com](mailto:HYPERLINKmailto:shafikhuram@yahoo.com)

<sup>\*\*\*\*</sup> Babar Zaheer Butt is Post Doctorate Research Fellow, Tohoku University of Community Service & Science, Japan. E-mail: [babarzb@gmail.com](mailto:babarzb@gmail.com)

<sup>\*\*\*\*\*</sup> Haroon Aziz is Senior Accounts Officer, All Pakistan Textile Mills Association. E-mail: [haroon-pvma@gmail.com](mailto:haroon-pvma@gmail.com)

## Introduction

Banks perform mobilization functions by the collection of deposits and provision of loans to their customers. This function exposes banks to credit risk, which sometimes increases financial distress that affects stakeholders (Liberty & Zimmerman, 1986). Sometimes financial distress forces bank manager's to take manipulative steps by concealing actual performance, which affects the quality of financial statements. On the other side, reliable financial statements are expected by the stakeholders. Therefore, any doubt in the quality of financial reports negatively affects their reputation (Barro & McCleary, 2003, Callen & Fang, 2015). Managers use loan loss provisions (LLPs) as a major accrual tool for the manipulation of earnings (Altamuro & Beatty, 2010). LLPs also portray the prediction of management regarding expected losses in bad loans (Cohen, Cornett, Marcus, & Tehranian, 2014). Loan loss provisions offer a signal to users of financial statements about the state of loans and their significant negative impact on net income (Desta, 2017). In this context, agency theory also postulates that everyone is influenced by self-interest, which leads to a conflict of interest between the principal and the agent regarding their interests (Scott, 2012). Likewise, earning management is also affected in the time of financial distress (Rudiawarni & Budianto, 2022).

Pakistani banks play an important role in economic development (Aurangzeb, 2012). The Pakistani banking sector has a blend of foreign as well as local banks. To study the relationship between discretion used by managers through loan loss provisions (LLPs) and financial distress (FD) in commercial banks listed on the Pakistan Stock Exchange (PSX), a sample of twenty commercial banks has been selected from the year 2010 to 2018. Further, earning management practices have been segmented into discretionary and non-discretionary provisioning. Altman Z-score has been used as a proxy for financial distress in the banks. The control variables used in this study include SIZE in terms of total assets, profitability (PROF), leverage (LEV), liquidity (LIQ) and asset quality (AQ). The literature shows that Pakistani banks use NDLLP and DLLP segments to manage their earnings, which means that they address their credit problems early, by setting aside a reserve for unexpected future losses and also for achieving management objectives like capital management, smoothening and signaling.

The objective of this study is to assess the impact of discretionary and non-discretionary aspects of earnings management and financial distress in the Pakistani Commercial banking sector landscape, which is quite untapped as per earlier research studies. This paper contributes to the literature in several ways. First, this study explores the linkage between financial distress and earning management by segmenting manipulation practices into discretionary loan loss provisions and non-discretionary loan loss provisions. Specific segmentation provides better and specific results. Secondly, to the best of our knowledge, this study is a unique effort at examining the

association of non-discretionary and discretionary loan loss provisions with financial distress with important control variables.

This study provides important and useful insights for internal stakeholders of banks as it informs management about the impact of discretionary as well as non-discretionary earnings management and its particular influence on financial distress in terms of Z-score, which assist them in formulating policies and strategies to handle going concern issues. Furthermore, this research study also provides useful insights for external stakeholders like investors and creditors to assess the influence of provisioning practices on bankruptcy and the customization of their strategies and investment decisions.

The rest of the paper is arranged as follows. Section 2 describes the literature review and hypothesis development. Section 3 discusses the research design, sample and data selection, model specification and estimation strategy. Section 4 describes the empirical analysis and results. The final section concludes the paper.

## Literature Review and Hypotheses Development

Schipper (1989) was among the pioneers, who defined earning management as an intentional intervention in financial reports, intending to get private gain. Further, Healy & Wahlen (1999) also defined earning management as the usage of managerial discretion in judgment as well as contracts and hiding actual performance in financial statements from stakeholders. Earnings management can be classified as legitimate or illegitimate. Illegitimate earnings management hides the true performance of the company from its stakeholders (Al-khabash & Al-Thuneibat, 2008).

Banks are exposed to obscure problems, which increases credit risk that ultimately affects the economy (Macey & O'hara, 2003). Accounting adjustments are of discretionary and non-discretionary nature. The former is manipulated by the management and is termed as discretionary loan loss provisions. Whereas, the latter is dependent on business fluctuations. Some loans of the banks become slow-moving over a period of time or default. Therefore, banks set aside reserves for non-accrual loans termed LLPs. Japanese banks also used LLPs to manage their earnings during the financial distress period from 1990 to 1994 and the banking crisis period from 1995 to 1999 (Agarwal, Chomsisengphet, Liu, & Rhee, 2007, Altamuro & Beatty, 2010). Regulators of Federal banks also support that managers manipulate margin for impression (Anandarajan, Hasan, & McCarthy, 2007). Most of the literature discusses managers' usage of DDLP (Peasnell, Pope, & Young, 2000, Cornett, McNutt, & Tehranian, 2009; Shen & Chih, 2005). Therefore, it is hypothesized that;

**H<sub>1</sub>:** *There is a relationship between Z-score and discretionary loan loss provisions.*

Banks play a crucial role in the stability of the economy and bankruptcies negatively affect the stakeholders, which ultimately leads to financial crises. Credit risk gives rise

to liquidity risk and bankruptcies (Ignatov, 2006, Binti, Zeni, & Ameer, 2010). Consequently, bank managers use earning management practices to hide actual performance from stakeholders (Hamdi & Zarai, 2012; Quttainah, Song, & Wu, 2013). Z-score is a practical and acceptable proxy used to study financial distress in banks as it does not require strong assumptions about the distribution of returns on assets (Boyd & Graham, 1986, Roy, 1952, Strobel, 2011). Further, earlier studies also revealed that banks use NDLLP to attain efficiency to cover expected credit losses (Agarwal et al., 2007, Kanagaretnam, Lobo, & Yang, 2004). Dushku (2016) also studied a panel of Albanian banks that also provides strong support that LLPs are driven by the non-discretionary segment. Thus, based on the above discussion, it is hypothesized;

**H<sub>2</sub>:** *There is a relationship between Z-score and non-discretionary loan loss provisions.*

Financial distress can be caused either due to exogenous or endogenous risk factors. Endogenous risk factors include inner problems, which affect a specific company, working in the same area of business. Whereas, the exogenous risk factors affect many other companies in the market (Karels & Prakash, 1987). Z-score is widely used as the proxy of financial distress and LLPs are major accrual tools used by commercial banks for earnings management (Leaven & Majnoni, 2003). Moreover, LLPs are also used for different purposes including capital management and income smoothening (Collins, Shackelford, & Wahlen, 1995, Beatty, Chamberlain, & Magliolo, 1995, Ahmed, Takeda, & Thomas, 1999, Anandarajan et al., 2007 and signaling (Wahlen, 1994, Anandarajan et al., 2007).

Earlier studies have found mixed results in earning management. Ahmed et al., (1999); Beatty et al., (1995); Bhat, (1996) & Collins et al., (1995) investigated income smoothening through loan loss provisions in the US and found inconclusive evidence. Whereas, Australian and European commercial and cooperative banks also manipulated provisions to smoothen their income (Anandarajan et al., 2007, Bouvatier & Lepetit, 2008). Moreover, the study of Perez, Salas-Fumas, & Saurina (2008) also witnessed the smoothening of income in Spanish and Japanese commercial banks. Based on the literature, this study tests the following hypotheses:

**H<sub>3</sub>:** *There is a relationship between the likelihood of financial distress and earning management.*

## Research Design

### *Sample Selection and Data*

To examine the relationship between earning management practices and financial distress, we selected a sample of 20 commercial banks listed on the Pakistan Stock exchange for the period 2010-2018. We selected the banking sector because the bank-

ing sector contributes to the country's GDP by 57.9% in FY2018. Further, the banking has improved its asset quality, profitability and risk profile. Moreover, the non-performing loans to gross loans (infection) rate was recorded at only 7.97% in the year 2018. Likewise, the State Bank of Pakistan has aggressively increased the benchmark interest rate by 7.5 % points since January 2018 to an eight-year high at 13.25%. According to SBP Financial System Review (2018), SBP tightened the monetary policy towards the end of 2018, which also had an impact on the re-pricing of loans. This improved the net interest income, profitability and solvency of the banking sector. On the other side, this strategy aggravated credit risk and aggravated the probability of default. This had an impact on the non-performing loans and provisioning expenses of the banks. Our sample consists of both large and small banks based on their size, volume and market capitalization. Financial data is collected from the Financial Statements Analysis of the Financial Sector published by the State Bank of Pakistan.

### *Model specification and estimation strategy*

#### Model Specification

Financial distress has been estimated by using the famous Altman Z-score model. Moreover, NDLLP and DLLP have been used as a proxy for earning management. This model has been taken from earlier studies (Cornett et al., 2009; Kanagaretnam et al., 2010; Leventis et al., 2011; Othman & Mersni, 2014; Van Oosterbosch, 2010).

$$Z - Score_{it} = \beta_0 + \beta_1 NDLLP_{it} + \beta_2 Size_{it} + \beta_3 PROF_{it} + \beta_4 LEVG_{it} + \beta_5 LIQ_{it} + \beta_6 AQ_{it} + \varepsilon_{it} \quad (1)$$

$$Z - Score_{it} = \beta_0 + \beta_1 DLLP_{it} + \beta_2 Size_{it} + \beta_3 PROF_{it} + \beta_4 LEVG_{it} + \beta_5 LIQ_{it} + \beta_6 AQ_{it} + \varepsilon_{it} \quad (2)$$

#### *Measurement of Variables*

##### Financial Distress

Altman's Z-Score model (Altman, 1968) developed by Professor Edward Altman has been widely used as a proxy for financial distress by lenders, researchers as well as professionals. Later on, three different models have been developed for financial firms in three different periods including the original in 1968, the revised in 1993 and the further revised in 1993 model with four variables. This model has wide applicability in financial institutions and has a success rate between 90 to 98 percent in predicting financial distress. Ghosn (2019) also employed Z-score to assess the financial health of Lebanese banks from the year 2013 to 2017 and found that banks do not face any financial distress. Khaddafi, Heikal, & Nandari (2017) also utilized Z-score

to assess financial distress and found mixed results including bankruptcy as well as a grey zone. The same has been also been used in the recent study by Yohannes (2021).

Keeping in view earlier studies, the modified Altman Z-score model has also been estimated as follows:

$$Z - Score_{it} = 3.25 + 6.56 \frac{Net\ Working\ Capital}{Total\ Assets} + 3.26 \frac{Retained\ Earnings}{Total\ Assets} + 6.72 \frac{EBIT}{Total\ Assets} + 1.05 \frac{Book\ Value\ Equity}{Book\ Value\ Debt}$$

The value of Z-Score is used as a proxy for Financial Distress. Based on the Z-Score value banks are categorized into three zones, as per the detail given below:-

**Z-Score < 1.1 “Distress”**

There is a high possibility that the bank will face financial distress or even bankruptcy in near future. It can be said that the bank is in a vulnerable position.

**1.1 ≤ Z-Score ≤ 2.6 “Grey”**

The bank falls in the gray area which means that there is less possibility that the bank will face financial distress in the near future.

**Z-Score > 2.6 “Safe”**

The bank is financially sound and there is the least possibility that the bank will face financial distress. It can be said that the bank is financially healthy.

## Earning Management

Following the studies of Ahmed et al., (1999) and Shawtari, Saiti, Razak, and Ariff (2015), this study has employed the Discretionary Loan/Finance Loss Provisions as a measure of earning management. Discretionary loan loss provisions is used as a proxy for earnings management rather than focusing on the banks' loan loss provisions. Further, previous studies by Ahmed et al. (1999), Shawtari et al. (2015), Kanagaretnam, Lobo, and Mathieu (2004) and Taktak, Zouari, and Boudriga (2010) have adopted a two-step approach to calculate the discretionary accruals practices through the Discretionary Loan/Finance Loss Provisions. In the first stage, the non-discretionary Loan/Finance Loss Provisions are estimated by using the following equation.

$$LLP_{it} = \alpha_0 + \beta_1 NPL_{it-1} + \beta_2 \Delta NPL_{it} + \beta_3 \Delta Loan_{it} + \varepsilon_{it} \quad (3)$$

Where; LLP is loan loss provisions of banks and is used as a proxy for non-loan provisions (NDLLP). NPL is Non-performing loans of the banks.  $\Delta NPL_{it}$  is the change in non-performing loans.  $\Delta Loan_{it}$  is the change in total loans of the bank. In

the second stage, the Discretionary Loan/Finance Loss Provisions is estimated by the Equation.

$$DLLP_{it} = LLP_{it} - [\beta_1 NPL_{it-1} + \beta_2 NPL_{it} + \beta_3 \Delta Loan_{it}] \quad (4)$$

### Bank Size

Size is estimated by transforming total assets into a log. Literature reveals an inverse relationship between the size of the bank and the Z-score (Boyd & Runkle, 1993), which means that banks with large asset bases have more chances of bankruptcy (Cole and White, 2012; Jin et al., 2011). Therefore, bank size has a positive relationship with earning management behavior (Abdullah & Ansar, 2013; Flamini et al., 2009; Othman & Mersni, 2014; Quttainah et al., 2013; Taktak et al., 2010; Zoubi & Alkhazali, 2007). As per existing literature, it is expected that the larger the size of the bank, the higher are loan loss provisions.

### Bank Profitability

EBIT (Earnings before interest and taxes) to TA (total assets) has been used as the measure of profitability in banks. It assesses the ability of the management to squeeze the profits out of its assets. As the existence of an institution is purely based on earning ability of the assets, therefore this ratio is appropriate for the detection of corporate failure. Moreover, high Profitability also increases the stability of the bank (Flamini et al., 2009).

### Leverage

Leverage is measured by capital ratio i.e., total equity to total assets. Earlier literature shows that highly leveraged banks have more risk exposure, which increases the chances of bankruptcy (Vazquez & Federico, 2015) and it has a positive impact on financial distress (Abdullah & Ansar, 2013). Moreover, leverage has a negative relationship with performance (Abubakar, 2015).

### Liquidity

Liquidity is ascertained by using cash and cash equivalents to total assets. Increased liquidity reduces the chances of bankruptcy (Chiaramonte & Casu, 2016).

## Asset Quality

The last control variable used in this study is Asset Quality Ratio which is ascertained by non-performing loans to gross advances. Karim, Chan, & Hassan (2010) indicated that higher non-performing loans have an inverse relationship with the efficiency of the bank (Ozili, 2017).

### *Estimation Strategy*

This study examines the relationship between earning management practices and financial distress for a sample of 20 commercial banks listed on the Pakistan Stock Exchange. We employed the Panel regression technique for the analysis of the data. The nature of the collected data is panel data. The panel data has pooled time series of cross-sectional observations of 'N' banks for 't' points in time such as yearly. The panel data estimation technique is utilized to account for endogeneity and heteroscedasticity in the data. Moreover, Gujarati (2009) suggested that by combining time series of cross-section observations, panel data gives more informative data and shows less collinearity among variables, more degrees of freedom and efficiency. We also deployed both Fixed Effect and Random Effect Model in panel data analysis to estimate unbiased results. The Fixed Effect Model assumes that slopes remain constant but the intercepts vary according to cross-section and time, while the Random Effect Model assumes that intercepts used as random not fixed according to each cross-section. Further, Hausman (1978) indicated retaining the results of the random-effects model.

## **Empirical Analysis and Results**

### *Descriptive Statistics*

Table 1 shows a summary of the descriptive statistics of all variables included in the paper. The mean of the Z-score is Rs. 2.007 M, the median is Rs.1.081M, the minimum is Rs.-3.068 M and the maximum is Rs.24.337 M, which shows that the sample includes both financial distressed and sound banks. The variation in the mean value is of standard deviation Rs. 3.736 M.



Table 1: Descriptive Analysis

Variable	Mean	Median	Maximum	Minimum	Std. Dev.
LLP	243000000	183000000	1080000000	14505537	217000000
NDLLP	209000000	161000000	878000000	-14787574	196000000
LLP	34414644	23188376	501000000	-583000000	105000000
AQ	8.947	8.610	27.970	0.000	4.940
LIQ	8.564	7.490	98.320	3.400	7.344
LEV	8.224	6.770	51.860	-1.890	6.954
PROF	16.228	16.321	18.734	11.771	1.295
SIZE	19.706	19.857	22.276	16.111	1.155
ZSC	2.007	1.081	24.337	-3.068	3.736

LLP Loan loss provisions NDLLP Non-discretionary loan loss provisions DLLP Discretionary loan loss provisions AQ (Provisions against NPLs to gross advances) LIQ (Cash & Cash equivalent to total assets) LEV Leverage PROF Profitability SIZE Total Assets ZSC Z-score.

### Correlation Matrix

Tables 2 present the correlation analysis for the variables used in this study. As per expectation, non-discretionary loan loss provisions, discretionary loan loss provisions, profitability, liquidity and SIZE in terms of total assets have a positive relationship with loan loss provisions, which shows that increase in the size of banks in terms of total assets, profitability and liquidity lead to more provisioning in terms of NDDLPP and DDLP. Whereas leverage, asset quality and z-score (ZSC) have a negative relationship with loan loss provisions, which means when financial distress, AQ and leverage are less, it leads to less provisioning.

Table 2: Correlation Matrix

	AQ	DLLP	LIQ	LEV	LLP	NDLLP	PROF	SIZE	ZSC
AQ	1								
DLLP	-0.180	1							
LIQ	-0.048	0.071	1						
LEV	-0.107	-0.127	-0.018	1					
LLP	-0.054	0.429	0.306	-0.222	1				
NDLLP	0.037	-0.063	0.300	-0.176	0.875	1			
PROF	-0.231	0.172	0.245	-0.270	0.772	0.761	1		
SIZE	-0.024	0.179	0.197	-0.358	0.777	0.762	0.837	1	
ZSC	-0.031	0.016	0.074	-0.079	-0.122	-0.143	-0.176	-0.386	1

### Empirical Results

Table 3 shows the results of the fixed and random effect of NDLLP with a Z-score. Fixed effect results are reported in Column 3 of Table 3. The overall model of NDLLP has good explanatory power with an adjusted R<sup>2</sup> of 35.57% for the fixed effect and 26.27% for the random effect. The fixed effect result shows there is a positive and significant relationship between NDLLP, PROF, LIQ and Z-score, which means that non-discretionary loan loss provisions increase Z-score, which shows that financial distress decreases through non-discretionary provisioning behavior in Pakistani commercial banks. Profitability findings reveal that financial distress reduces which ultimately strengthens the stability of banks (Flamini et al., 2009). Similarly, the findings on liquidity are supported by Abdullah & Ansar (2013) and Chiaramonte & Casu (2016).

The negative sign of SIZE, LEV and AQ coefficient shows that an increase in the size of the bank, leverage and asset quality in terms of provisions against NPLs to gross advances, reduces X-score which gives rise to financial distress. In the case of size; the same is also witnessed by Boyd & Runkle (1993), De Haan & Poghosyan (2012) and Köhler (2015). Moreover, the result of leverage is also observed by Abubakar (2015). The result of AQ is also supported by Karim et al. (2010) and Ozili (2017).

Table 3: Panel Regression Results

Variables	Signs	Model 1 (NDLLP)		Model 2 (DLLP)	
		Fixed Effect	Random Effect	Fixed Effect	Random Effect
Constant		37.9620	48.1372	41.0744	50.3095
		(0.0001)***	(0.0002)***	(0.0003)***	(0.0001)***
NDLLP	+/-	0.0000	0.0000		
		(0.0055)***	(0.0090)***		
DLLP	+/-			0.0000	0.0000
				(0.0021)***	(0.0000)***
SIZE	+/-	-2.5800	-3.1902	-2.7401	-3.2805
		(0.0001)***	(0.0012)***	(0.0004)***	(0.0013)***
PROF	+	0.9059	1.0240	0.8356	0.9620
		(0.0356)**	(0.0540)**	(0.0381)**	(0.0627)***
LEV	-	-0.0904	-0.1483	-0.0980	-0.1386
		(0.0122)***	(0.0029)***	(0.0270)**	(0.0036)***
AQ	+/-	-0.0965	-0.0136	0.0017	0.0086
		(0.2965)**	(0.7843)*	(0.9864)*	(0.8449)*
LIQ	+	0.0449	0.0475	0.0414	0.0418
		(0.0000)***	(0.0010)***	(0.0000)***	(0.0052)***
Adjusted R-squared		0.3557	0.2627	0.3717	0.2635
F-statistic		4.7538	11.0963	5.0229	11.1367
Hausman Test $\chi^2$		6 (1.000)		6 (1.000)	

Furthermore, the panel regression estimation technique has been employed due to dual reasons: Firstly, due to the cross-sectional nature of data. Secondly, to cater for the possibility of endogeneity problems in data. Column 4 of Table 3 depicts the results of the random effect. Further, the Hausman test has also been employed to retain the results of fixed or random effect. The Hausman test suggests ( $\chi^2=6$ , p-value = (1.000)), where the p-value is not significant. Therefore, we retain the results of the random effect. The result of the random effect also shows that there is a positive and significant relationship with Z-score, which means that Pakistani banks manage financial distress through non-discretionary loan loss provisions. Further, profitability and liquidity have a positive and significant relationship with Z-score, which reduces financial distress. The findings of profitability and liquidity are also supported by various studies (Abdullah & Ansar, 2013; Flamini et al., 2009; Othman & Mersni, 2014; Quttainah et al., 2013; Taktak et al., 2010; Zoubi & Alkhazali, 2007) and (Chiaramonte & Casu, 2016) respectively.

Whereas SIZE, LEV and AQ have a negative relationship with Z-score, which increases financial distress in Pakistani commercial banks. Whereas; the control variable SIZE and LEV have a negative and significant relationship with Z-score. The findings of SIZE are also noted by Boyd & Runkle (1993), De Haan & Poghosyan (2012) and Köhler (2015). Moreover, the result of leverage is also witnessed by (Abubakar, 2015). Asset quality also has a negative but insignificant relationship with Z-score. This implies that Z-score decreases as a result of an increase in asset quality ratio, which means that financial distress increases with an increase in asset quality. It is also supported by Karim et al. (2010) and Ozili (2017). The regression results of Eq. (2), pertain to ascertaining the relationship between Z-score and DLLP through fixed effect are shown below in Column 5 and random effect in Column 6. The overall model of DLLP has good explanatory power with an adjusted  $R^2$  of 37.17% for the fixed effect and 26.35% for the random effect.

Column 5 of Table 3 depicts the results of the fixed effect result of Model 2. The coefficient of DLLP is positive and significant, which shows that increase in DLLP results in an increase in the Z-score, which means that DLLP reduces FD. The fixed effect result shows there is a positive and significant relationship between DLLP, PROF, LIQ and Z-score, which means that discretionary loan loss provisions increase Z-score, which shows that financial distress decreases through discretionary provisioning behavior in Pakistani commercial banks. The findings of PROF and liquidity are also supported by Flamini et al. (2009). The findings of liquidity are in line with the research of Abdullah & Ansar (2013) and Chiaramonte & Casu (2016) respectively. Whereas, asset quality has a positive but insignificant relationship with Z-score. Whereas, the negative and significant sign of SIZE and LEV coefficient shows that an increase in the size of the bank and leverage, reduces Z-score which increases financial distress in Pakistani commercial banks. The findings of SIZE are also witnessed by Boyd & Runkle (1993), De Haan & Poghosyan (2012) and Köhler (2015). Moreover, the results of leverage are observed by Abubakar (2015).

Column 6 of Table 3 depicts the results of the random effects result of Model 2. Further, we employed the Hausman test to retain the results of fixed or random effect. The Hausman test suggests ( $\chi^2=6$ , p-value = (1.000), where the p-value is not significant. Therefore, we retain the results of the random effect. The result of the random effect also shows that Pakistani banks manage financial distress through DLLPs. Further, discretionary loan loss provisions, profitability and liquidity have a positive and significant relationship with Z-score. The findings on profitability and liquidity are consistent with some of the studies on the subject (Flamini et al., 2009, Abdullah & Ansar, 2013, Chiaramonte & Casu, 2016). Whereas, asset quality has also a positive but insignificant relationship with Z-score. Whereas, the negative and significant sign of SIZE and LEV coefficient shows that an increase in the size of the bank and leverage, reduces Z-score which means that financial distress increases in Pakistani commercial banks. This shows that large banks have more risk exposure, which affects banks' efficiency and ultimately increases financial distress. The findings of SIZE are also observed by Boyd & Runkle (1993), De Haan & Poghosyan (2012) and Köhler (2015). Moreover, the result of leverage is also linked to a study conducted by Abubakar (2015).

### *Robustness Check*

We have applied a robustness check by estimating our baseline variables using a logistic econometric model. These robustness tests and further checks have helped to validate our identification strategy and baseline estimates as per the detail given below.

Table 4: Results Logistic Regression Model 1 and Model 2

Variables	Model 1	Model 2	Odd Ratio 1	Odd Ratio 2
<b>Constant</b>	-15.40 (-1.642)	-8.127 (-0.73)	0	0
<b>NDLLP</b>	-0.543 (-1.121)	-	0.581	-
<b>DLLP</b>	-	-0.468 (-1.06)		0.626
<b>SIZE</b>	1.436 (2.15)	0.96 (2.01)	4.20	2.611
<b>PROF</b>	-0.06 (-0.115)	-0.08 (-0.181)	1	1
<b>LEVG</b>	2.94 (0.649)	3.37 (0.64)	0.044	0.174
<b>AQ</b>	-1.37 (0.69)	-1.483 (-0.42)	1.25	0.227
<b>LIQ</b>	-1.85 (0.902)	-1.084 (-0.07)	0.156	0.338
<b>McFad R-square</b>	0.103	0.103	-	-
<b>LR statistic</b>	7.60193	7.85	-	-
<b>Prob LR statistic</b>	0.026	0.027	-	-

The results of Model 1 (Eq 1) pertain to an association between NDLLPs and FD as shown in Column 2 of Table 4. In this robustness check, odd ratios have been utilized and coefficients are indirectly interpreted. The results show that there is also an inverse but insignificant association between the likelihood of financial distress and NDLLPs as distress levels decrease with an increase in NDLLPs. Therefore, Pakistani banks have used non-discretionary practices to a reduction of distress level. The study of Dushku (2016) has also supported the provisions are manipulated through the non-discretionary component. The odd ratio of SIZE is 4.20, which is greater than one, which means that the increase in bank size raises the financial distress of the bank. The results are consistent with the findings of the random effect methodology. Furthermore, the studies also supported that increase in bank size contributes to the financial distress of the bank (Hoffmann, 2011, Köhler, 2015). Similarly, the odd ratio of profitability is 1, which shows that it is neutral and has no impact on the financial distress of the bank. The odd ratio of the leverage is 0.044, which is less than one, which shows that an increased level of bank leverage reduces financial distress. Abdullah & Ansar (2013) also supported that financial leverage has a positive outcome on financial distress. Moreover, the odd ratio of the liquidity is 0.156, which is less than one, which also means that it has an inverse relation with the financial distress. It shows that an increase in liquidity reduces bank financial distress and strengthens banks to meet their short-term obligations. Chiaramonte & Casu (2016) also maintained that financial distress decreases with increased liquidity holdings. Further, the odd ratio of the asset quality of 1.252 is greater than 1, which means it is positive. Therefore, AQ increases the financial distress of the banks. The results are also in accordance with the research of Ozili (2017), which also supports that NPL reduces the stability and efficiency of the bank. The robustness tests applied to test the association between NDLLP and FD by using logistic regression also validate our baseline estimates results of the random effect model except in the case of profitability and Leverage.

The results of Model 2 (Eq2), related to the association between DLLP and FD are also shown in Column 3 of Table 4. The findings also show that there is an inverse but insignificant relationship between the likelihood of DLLPs and FD, which shows that discretionary accruals reduce financial distress in Pakistani Commercial banks. The odd ratio of SIZE is 2.611, which is greater than one, which shows that the increase in bank size increases the financial distress of the Pakistani banks. The same is also witnessed in the literature (Hoffmann, 2011, Köhler, 2015). Further, the odd ratio of profitability is 1, which implies that profitability does not have a significant relationship with the financial distress of the bank. The odd ratio of the leverage is 0.174 which is less than one, which shows that an increase in the bank leverage decreases the financial distress of the bank. The result of this study is also supported by earlier research by Abdullah & Ansar (2013) which also revealed that financial leverage decreases financial distress. Moreover, the odd ratio of the liquidity is 0.338, which is

also less than one, which also shows that it reduces financial distress. The results of this study are also consistent with the research of Chiaramonte & Casu (2016) which reveals that the probability of financial distress decreases as a result of an increase in liquidity holdings. Whereas, the odd ratio of the asset quality is 1.227, which is greater than 1; it shows that it has a positive linkage with financial distress, which means that an increase in non-performing loans increases financial distress in banks. The results of earlier research by Ozili (2017), also reveal that non-performing loans negatively impact the stability and efficiency of banking system.

The robustness tests applied to test the association between DLLP and FD by using logistic regression also validate our baseline estimates results of the random effect model except in the case of profitability, leverage and asset quality.

## **Conclusion and Recommendations**

This study explores the linkage between earning management practices, which includes discretionary as well as non-discretionary LLPs and financial distress, along with other control variables like SIZE, PROF, LEV, AQ and LIQ in Pakistani commercial banks. Panel data and regression technique has been used to carry out the analysis. To achieve research objectives, the two-stage method has been deployed to study the impact of non-discretionary loan loss provisions and Discretionary loan loss provisions and other control variables including SIZE, PROF, LEV, AQ and LIQ on financial distress measured by its famous proxy i.e., Altman Z-score. In the first stage, the financial distress of the banks has been estimated by using the Altman Z-score. Then, earning management practices have been further segmented into non-discretionary loan loss provisions and discretionary loan loss provisions. Further, the findings of the study reveal that both NDLLP and DLLP have a positive and significant role in reducing the financial distress of commercial banks. This shows that Pakistani Banks identify and handle credit issues in their start, especially in good times, by building loan loss reserves.

In the case of NDLLP, liquidity reduces the probability of financial distress. Whereas, a bank's SIZE, LEVG and AQ enhance the likelihood of financial distress. The robustness tests were applied to test the association between NDLLP and FD using logistic regression and to validate baseline estimates results of the random effect model except in the case of profitability and Leverage. In the case of DLLPs, SIZE and LEVG increases financial distress. Whereas, profitability, asset quality and liquidity reduce financial distress. The robustness tests applied to test the association between DLLP and FD by using logistic regression also validate our baseline estimates results of the random effect model except in the case of profitability, leverage and asset quality.

The findings of this study have implications for the policymakers and regulators in the formulation of relevant regulatory measures. It may help regulators, to restrict management from using unethical practices. Moreover, this study also provides important and useful insights for internal stakeholders of banks as it informs management about the impact of discretionary as well as non-discretionary earnings management and its particular influence on financial distress in terms of Z-score, which assist them in formulating policies and strategies to handle going concern issues. Furthermore, this research study also provides useful insights for external stakeholders like investors and creditors to assess the influence of provisioning practices on bankruptcy and the customization of their strategies and investment decisions. It will also help auditors in critically scrutinizing the financial reports and effective decision-making.

This research study also suffers from certain limitations, which provide a guiding path for future research. Firstly, research may be extended to Islamic banks with a slight modification of variables, which may provide different results. Secondly, this research can be carried out in emerging economies, which will extend the existing line of research. Thirdly, research can be extended by using other predictive models including the O score, and S-score (bankometer model) to assess and compare the financial distress condition of banks.

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