Determinants Of Distress Risk Of Nepali Commercial Banks

Dil Krishna Shahu Mphil

Assit. Lecturer

Bhaktapur M Campus, TU

Abstract

This paper aims to examine the banks' specific factors affecting distress risk. Using modified Altnan Z score as measure of distress risk, the study employed secondary data of 18 banks listed in Nepal Stock Exchange Limited for the study period from 2008 to 2014. The results show that the liquidity, profitability and size have the significant positive effect on z score indicating lower distress risk of firms. These results support the too big to fail doctrine and provides justification to increment of capital to 8 Arba by Nepal Rastra Bank. The study provides insight into the regulatory body and concerned authority of banks. Managers should make effort in maintaining the liquidity position of the bank and make effective strategy to earn higher profitability to avoid from being financially distressed.

Key words: Distress risk, Z score, size, book to market ratio, random effect, fixed effect.

I.   Introduction

Financial distress is the likelihood of bankruptcy, which depends on the level of liquid assets as well as on credit availability (Hendel, 1996). It is a situation in which a firm is having operational, managerial and financial difficulties. Reason for this financial distress can be anything including declining or persistently low margins, profits, cash flows, financial leverage or/and liquidity of these firms. The risk of mild financial failure resulting from loss of banks and/or liquidity problem may go up to the bankruptcy. Understanding financial distress is getting important to managers, creditors, auditors and financial analysts..

Banks play a critical role in providing financing channels. They are a crucial medium for stabilizing the financial order and promoting industrial development. The issue of financial distress and bankruptcy is very important

in the area of the banking sector. Failure of banks may lead to economic crises ((Demiguc and Detraigaialche 1998). The disasters of a bank failure start with bank run, which is a situation in which all depositors came to windrow their money from the bank at one time and can end up with the general economic crises.

Numerous studies attempted to predict financial distress based on firm specific characteristics. The study on business failure started with the seminal paper of Beaver (1966) that first proposed to use financial ratios as failure predictors in a univariate context. Altman (1968) suggested a multivariate approach based on discriminant analysis. Afterward, there have been many contributions to this field (Balcæn & Ooghe, 2006; Ohlson, 1980, Poddighe & Madonna, 2006; Ravi Kumar & Ravi, 2007).

Although Nepal has been categorized as the least developed nation by united nation 2010, Nepalese capital market is developing significantly in terms of volumes of trading and in terms of its tremendous growth potential. Its size and market capitalization are growing day by day. Therefore, this study focuses on finding the determinants of the distress risk using modified Altman Z score as a proxy of bankruptcy risk.

The remainder of the study is organized as follows. The next section presents literature review. Section II briefly method used. The results are presented in section IV, while conclusion and discussion are reported in Section V.

Literature Review

Several previous studies have investigated whether various financial ratios are effective variables for predicting and explaining a bank failure. Al-Saleh and Al-Kandari (2012) analyzed the first ratio (Investment in Securities to Total Assets), the second ratio (Loans to Total Assets), and third ratio (Loans to Deposits), which are considered the best predictors of bank distress. The Valahzaghard and Bahrami (2013) found a meaningful relationship between default probability and management quality, earning quality and liquidity quality. When predicting failure at longer horizons, the most persistent firm characteristics, market capitalization, the market-book ratio, and equity volatility become relatively more significant (Campbell, Hilscher& Sziligyi, 2006). Studies made by Ahmad (2013) and Elloumi and Gueyee (2001)

documented the evidence that the financial distress increases if the leverage increases. The greater the leverage, the greater the risk of the company, the greater the probability of the company to experience financial distress. Previous studies (Chen & Lee, 1993; McEwen, 2001; Elloumi & Gueyee, 2001) showed that liquidity and profitability had an important role to resilience into bankruptcy. The profitability of firms has negative effect on financial distress (Donnato & Nieduu, 2014; Parker et al, 2011). According to too big to fail doctrine, the bigger firms have less probability to be a failure. Contrary to this, empirical studies like Chancharat (2008) and Parker et al (2011) found that size have positive effect on financial distress of firm.

II. Research Method

This study adopted both descriptive and causal comparative research designs to deal with fundamental issues. In this study, the factors affecting distress risk is examined using unbalance panel data of 18 commercial banks listed in Nepal Stock Exchange Limited (NEPSE) 107 observations from 2008 to 2014. The secondary data collected from websites of respective banks have been used to test the issues of the study. Market equity is used as a proxy for the size of firms. Book to market equity is calculated as per end of fiscal year. Financial distress risk is measured by using Altman Zscore following Dichev (1998), Griffin and Lemmon (2002), and Ferguson and Shockley (2003). The study used robust standard error to correct the heteroscedasticity. The important property of robust standard error is that the form of heteroscedasticity and/or autocorrelation does not need to be specified (Crox, Dhanae and Hoorelbeke, 2004). When dealing with the panel data, it is important to choose between the fixed effect and random effect model. The selection criterion is the Hausman test (1978).

Model:

$$D/risk = \alpha + b_1\, B/M_{it} + b_2\, Size_{it} + b_3 lev_{it} + b_4 Liq_{it} + b_4 Prof_{it}\, u_t$$

Table 1

Description of variables

Variables	Measure
Dependent variable	
Distress risk (D/risk)	Altam's Z score
Independent variables	
Size	Market equity
Book to market Ratio (BM)	Book value/ market value
Liquidity (liq)	Current ratio
Profitability(Prof)	ROA
Leverage (lev)	Debt / total assets

III. Results

Descriptive statistics

Table 2 presents the descriptive statistics of the variables used in the study**.** The table shows that average distress risk as measured by Atman Z score (1968) of a commercial bank in Nepal is 2.8894 with standard deviation of 1.250. The Average Z score demonstrates that Nepali commercial bank falls under the Non bankrupt category. While minimum z score of 1.029 reveals the fact that there is profanity of being financially distressed. Average size as measured by marketing and the Book to market ratio of Nepal commercial bank is found to be 14267 million. Similarly, Profitability, leverage and liquidity of commercial bank in Nepal are 1.66 percent, 90.04 percent and 1.604 percent respectively.

Table 2

Descriptive Statistics

Variables	Unit	N	Mean	Minimum	Maximum	Std. Dev.
Distress Risk	Value	107	2.884	1.029	10.029	1.250
Market equity	Rs. (Mil)	107	14267.40	2450.45	67647.14	13026.01
Book to market ratio	Times	107	0.328	.005	2.779	0.357
Return on Assets	Percent	107	1.664	0.050	4.410	0.854
Leverage	Percent	107	90.046	71.056	97.797	3.340
Liquidity	Times	107	1.604	1.001	2.821	0.331

Note: This table presents the descriptive statistics of the variables used for the study. The first three variables: market price per share, Market Equity and book value per share are measured in Rs, Return on Assets, dividend and Excess stock returns are in percentage, the market equity is measured in millions Book to market ratio is in times in million. Distress risk is calculated using Modified Altman' Z score. Liquidity is the ratio of current ratio to current liabilities. Leverage is is the ratio of total debt to total assets Book to market ratio was calculated as per the end of the Fiscal year and Market Equity is measured as per Poush, 30t. All the variables are measured for the period 2008 to 2014.

Correlation matrix

Table 3 shows the correlation coefficients of the variables are considered for the study. The table reveals that size and profitability have a significant negative relationship with the z score indicating lesser distress risk during the study period. Likes wise, book to market ratio and liquidity both have asignificant positive relationship with z score. Leverage has an insignificant negative relationship with z score.

Table 3

Correlation Matrix

	Drisk	Size	BM	Lev	Liq	Prof
Drisk	1					
Size	-0.347*	1				
BM	0.251*	-0.410*	1.			
Lev	-0.112	0.203*	-0.416*	1		
Liq	0.754*	-0.542*	0.285*	-0.142	1	
Prof	-0.225*	0.423*	-0.055	-0.147	-0.321*	1

* Significant at 5%

Note: This table shows the correlation coefficients of the variables employed for the study which are: Book to market ratio (BM), Size, Distress Risk(D/risk) Profitability (Prof), leverage (lev) and liquidity(liq). Distress risk is calculated using Modified Altman' Z score. Liquidity is the ratio of current ratio to current liabilities. Leverage is is the ratio of total debt to total assets whereas profitability is measured by Return on Assets (ROA).

Portfolio analysis

Panel A of Table 4 reveals that firms with high BM ratio are small in size and have less probability of financial distress as measured by Altman Z-score, lower profitability as measured by ROA, higher liquidity as measured by current ratio and lower leverage as measured by debt ratio. In Panel B of table 3, the portfolios sorted on size of firm are shown. The table also shows that larger firms have lower book to market equity, higher probability of financial distress as measured by Altman Z score, higher Profitability as measured by ROA, lower liquidity as measured by current ratio and higher leverage as measured by debt ratio. In Panel C of table 3, the portfolios sorted on distress risk of the firm are presented. The table shows that firm with higher distress are larger in size and have

a lower book to market equity. Likewise, the high distress risk firms have a higher probability, lower liquidity and higher leverage.

Table 4

Portfolios sorted by BM ratio, size and distress risk

Panel A: Sorted on BM ratio

	BM	D/risk	Size	Prof	Liq	Lev
Low	0.0682	2.16	26234.49	1.92	1.39	90.66
2	0.2021	2.81	17683.85	1.78	1.55	91.34
3	0.3283	3.10	9743.37	1.63	1.68	90.37
High	0.7297	3.49	4941.16	1.32	1.80	87.73

Panel B: Sorted by size

	BM	D/risk	Size	Prof	Liq	Lev
Small	0.6043	3.22	3973.49	1.50	1.73	88.20
2	0.3385	3.03	7387.84	1.42	1.72	89.99
3	0.2442	2.95	13193.56	1.53	1.62	91.08
Big	0.1188	2.30	33216.51	2.23	1.34	90.95

Panel C: Sorted by Distress risk

	BM	D/risk	Size	Prof	Liq	Lev
Low	0.4685	4.39	8685.98	1.31	1.86	89.05
2	0.4808	3.06	9055.71	1.55	1.74	89.16
3	0.2083	2.42	14915.80	1.68	1.57	91.31
High	0.1495	1.62	24802.27	2.14	1.23	90.68

Note: This table reveals portfolio sorted by BM ratio, Size and distress risk over the period 2008 to 2014. BM represents the Book value of equity to Market value of equity as per end of fiscal year and size represent market capitalization as per end of fiscal year. Similarly D/risk represents distress risk measured by Altman's Z score, Liq. and lev

represent liquidity and leverage respectively which is calculated by current assets divided by current liabilities and total debt divided by total assets. Likewise Prof represents Profitability measured by return on assets (ROA).

Regression Results

The Hausmann test (1978) was performed on the models to determine appropriate model. The p-value for the tests is less than %, indicating that the random effects model is not appropriate and that the fixed effects specification is to be preferred.

The coefficients of regression results are presented in Table 5. The relationship between the dependent variable i.e. distress risk and the book to market equity is assumed to have positive whereas size is assumed to have negative. The results presented in the table reveals that BM ratio has negative effect on Z score indicating a positive relationship with the distress risk since lower z score indicates higher distress risk. However, the effect is insignificant. Likewise, size has significant a negative effect on Z score at 95% confidence level indicating the positive relationship with distress risk. The positive effect of BM is in consistent with that of Dichev(1998). Book to market ratio has insignificant effect and size have significant negative effect on distress risk. Leverage has an insignificant positive effect on distress risk whereas liquidity has significant positive effect on z score indicating the lesser probability of distress risk. In the same way, the regression results also provide the evidence that profitability has a positive effect on z score signifying the negative relationship with distress risk.

Table 5

Regression results

Model	Pooled OLS	Random	Fixed
A	-2.324	-4.364	-5.006
	3.324	2.306	2.410
	0.486	0.058	0.041
b_1	0.264	0.014	-0.068
	0.163	0.259	0.296
	0.109	0.954	0.818
b_2	0.001	0.001	0.001
	8.010	8.310	9.140
	0.140	0.063	0.059
b_3	0.002	0.010	0.013
	0.032	0.023	0.025
	0.948	0.664	0.589
b_4	2.991	3.616	3.740
	0.683	0.241	0.247
	0.000	0.000	0.000
b_5	-0.023	0.197	0.263
	0.094	0.095	0.099
	0.808	0.038	0.010
R-square	0.5787	0.5554	0.5384
Hausman test	Prob>chi2 = 0.0271		
	Results:Fixed effect		

Note: The dependent variable is distress risk as measured by Altman Z score and independent variables are Book to market value of equity, size as measured by market capitalization, D/risk represents distress risk

measured by Altman's Z score, Liq. and lev represent liquidity and leverage respectively which is calculated by current assets divided by current liabilities and total debt divided by total assets. Prof represented Profitability a measured by ROA. Robust error and p-value is presented in second and third row in the cell respectively.

Test of Multicollinearity

Variance Inflation Factor (VIF) test has been conducted in order to confirm the multicollinearity problem not among the variables used in the study. The VIF test suggests that if VIF > 10 then there is multicollinearity exists. Since, VIF<10 for all the variables, the results confirms that there is no multicollinearity problem among the variables. The result of multicollinearity test is shown in table 6.

Table 6

Test of Multicollinearity

Variable	VIF	1/VIF
Size	1.81	0.552511
Liq	1.46	0.686620
bm	1.41	0.709208
Prof	1.34	0.746861
Lev	1.28	0.780504
Mean VIF	1.46	

V. Conclusion and discussion

Understanding financial distress risk is getting important to managers, creditors, auditors and financial analysts. Thus, this study aims at examining the firm-specific determinants of the distress risk of Nepal commercial banks listed in NEPSE. The liquidity has the significant positive effect on z score indicating lower distress risk of firms. This result is in line with theory that suggests companies with higher liquidity

ratio have a higher capacity to pay the debt in time thus decreasing the possibility of default and bankruptcy. In a similar manner, profitability and size also too have a positive and significant effect on z score that shows higher the profitability and bigger the size, higher z score indicating less probability to bankrupt. These results supports the too big to fail doctrine. The study provides justification to increment of capital to 8 Arba by Nepal Rastra Bank. The Results is in consistent with the studies by Fama and French (1992), Shumway (1996), Vassalou and Xing (2004), which found that the size of the company negative effect on the probability of bankruptcy. Likewise, the firm with higher profitability has sound the financial position thus has lesser possibility to be bankrupt. Similarly, the book to market ratio and leverage has insignificant effect on distress risk. The insignificant effect may imply that distress risk is unresponsive to the change in debt and book to market ratio. The study provides insight to the regulatory body and concerned authority of banks. Managers should make effort in maintaining the liquidity position of the bank and make effective strategy to earn higher profitability to avoid from being financially distressed.

References

Abdullah, Md. N., Parvez, K., Karim, T., & Tooheen, R.B. (2015). The Impact of Financial Leverage and Market Size on Stock Returns on the Dhaka Stock Exchange: Evidence from Selected Stocks in the Manufacturing Sector. *International Journal of Economics, Finance and Management Sciences.* Volume 3(1)

l-Saleh, M. A., & Al-Kandari, A. M. (2012). Prediction of financial distress for commercial banks in Kuwait. *World Review of Business Research*, 2(6), 26-45.

Altman, E. I. (1968). Financial ratios: Discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23(4), 589-609.

Altman E.I. (2000), Predicting financial distress of companies: revisiting the Z-score and ZTM model. *Working Paper*. New York University.

Basu, S. (1977). Investment performance of common stocks in relation to heir price earnings ratios: A test of the efficient market hypothesis. *Journal of Finance* 32, 663-682.

Banz, R.W. (1981). The Relationship between Return and Market Value of Common Stocks. *Journal of Financial Economics*, 9: 3-18.

Berk B. J. (1995). A critique of size-related anomalies, *the review of financial studies* vol. 8 No.2 pp 275-286

Bhandari, L. C. (1988). Debt/Equity Ratio and Expected Common Stock Returns: Empirical Evidence. *The Journal of Finance,* Vol. 43, No. 2 pp. 507-528

Chan, L. K. C; Y. Hamao; & J. Lakonishok. Fundamentals and Stock Returns in Japan. *Journal of Finance*, 46 (1991), 1739-1764.

Chava, S. & Purnanandam, A. (2010). Is Default-Risk Negatively Related to Stock Returns. *The Review of Financial Studies*, 23(6), 1-57.

Chen, J., Kan, K., L. & Anderson, H. (2007). Size, Book/Market Ratio And Risk Factor

Daniel, Kent, & Sheridan Titman (1997). Evidence on the Characteristics of Cross-Sectional Variation in Stock Returns. *Journal of Finance* ,52 1-33.

Fama, E. E, & K. R. French (1992). The Cross-Section of Expected Stock Returns. *Journal of Finance,* Al 427-65.

George, T. & C.-Y. Hwang (2007), Leverage, financial distress and the cross section of stock returns. *Journal of financial economics*.

Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46, 1251-1271.

Hendel, I. (1996). Competition under Financial Distress. *The Journal of Industrial Economics*, 54(3).

Malik et.all (2013). Distress Risk and Stock Returns in An Emerging Market, Research *Journal of Finance and Accounting,* ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online) Vol.4, No.17, 2013

Valahzaghard, M. K., & Bahrami, M. (2013). Prediction of default probability in banking industry using CAMELS index: A case study of Iranian banks. *Management Science Letters,* 3(4), 1113-1118.

Vassalou, M. & Xing, Y. (2004) Default Risk in Equity Returns. *Journal of Finance*, 59, 831-868. https://doi.org/10.1111/j.1540-6261.2004.00650.x