



DETERMINANTS OF LEVERAGE CONSERVATISM DUE TO FINANCIAL DISTRESS

Nahid Ferdousi*

ABSTRACT

The research investigates the impact of the different determinants on leverage conservatism which is one of the significant effects of financial distress. The paper examines leverage conservatism over the three consecutive years (1984 to 2001). 'Granger Causality Test' explores the causality relationship between our dependent and independent variables. The result reveals that some of the variables do not create any causal relationships but the empirical results imply the considerable effects to adopt conservative policy. Moreover, we implement 'Augmented Dickey-Fuller test (ADF)' to find stationary or non stationary of leverage variables of the sample firms'.

Keywords: *Leverage conservatism, financial distress, causality relationship, granger causality test, stationary variables.*

*Lecturer, Department of Business Administration, University of Asia Pacific, Bangladesh.



1. INTRODUCTION:

To enhance the economic growth as well as to participate into the global competition, capital structure of the firm plays a significant role. According to Ross, Westerfield and Jaffe (2005), the financial distress is an incident when a firm has less operating cash flow to meet the current obligations. The probability of distress and the magnitude of costs determine the cost of financial distress.

The objective of this research is to conduct the further investigation on determinants of leverage conservative which is adopted for the risk aversion of financial distress risk. This research examines the phenomenon of financial conservatism by adopting low leverage. Financial leverage is one of the sources to finance the investment. The theory such as ‘‘Trade of Theory’’, the firm will adopt debt when the marginal tax advantages of additional borrowing can be offset the increased cost of financial distress. That means higher the debt, higher the tax benefit but increased the debt will increase the probability of default as well as the cost of bankruptcy. The conservative firms are more sensitive to financial distress risk which has become an important issue for spreading the credit crunch. The manager will risk averse for the expected risk of bankruptcy and adopt the leverage conservatism to eliminate the risk of financial distress risk. The ownership structure, the government effectiveness and the financial developments are responsible for financial distress..

The rest of this research is discussed as follows: Section 2 covers the literature review. Section 3 explains the methodology. Section 4 shows the sample selection. Section 5 explores the empirical results for low leverage model including the whole sample. Section 6 explores the low leverage model in six panels. Section 7 reveals the possible investigations of all independent variables in six panels. Section 8 shows the causality relationships between the dependent and independent variables with the help of Granger Causality Test. Section 9 investigates whether the dependent variable is stationary or non stationary and section 10 implies the summary of our research and conclusion.

2. LITERATURE REVIEW:

Financial distress has a significant negative effect on the borrower’s returns. Dichev (1998) explore the direct relationship between distress risk, size, book to market and returns where bankruptcy risk used as a proxy for the distress. The firm requires financial flexibility (firm’s ability to face the unexpected events) to ignore the external fund’s cost (Mayers 1984 and Mayers and Majluf, 1984) .The asymmetric information problem can be characterized by moral hazard and adverse selection which is incorporated with the principal agent relationships (Martin Brownbridge) and distort the financial soundness of a firm. So in order to achieve financial flexibility, the firm can take conservative financial policy.

Debt is an essential factor for capital structure of the firm but creates potential conflicts of interest between firm’s security holders when the new securities are issued or change in investment policy. Myers (1984) explore that there is a negative relationship between profitability and leverage and Graham (2000) finds that a typical firm borrow less than the level which is optimum. Myers and Majluf (1984) supports ‘The Pecking Order Theory’ and explains that the firm will prefer internal finance to finance the project after that it will prefer debt and at last option it will issue equity when information cost and signalling cost is dominated. Myers (1977) explains that highly leveraged firms cannot use the valuable growth opportunities than the low leveraged firm but debt will help the firm as well as the investor to



operate the business and to invest. The issuance of debt makes the firm responsible to pay the interest and principle which will make the manager of that firm more responsible and accountable. But when the level of debt is higher than optimum then the firm will face the distress risk because of investing in the non-profitable projects. So, the firm can utilize its leverage to enhance the shareholder wealth but in the case of failure the firm will have to face interest payment and credit risk of default payment which in turn decreases the shareholder value. Whited (1992) has shown that the investment is sensitive for the firm which is highly leveraged than the firm which is low leveraged. Cantor (1990) has explains that investment is more sensitive to earnings for highly levered firms. So the leverage leads the gains as well as losses for the firm. To eliminate risk and to get the healthy financial environment the firm can adopt leverage conservatism policy. When the present value of the cost of financial distress is small and tax advantage dominated then the level of debt is sustainable (Modigliani and Miller, 1963, 1966, Miller, 1977 and Deangelo and Masulis, 1980).

Manager has an incentive to adopt leverage conservative policy to enhance liquid assets (Jensen) and to reduce pressure. The financial distress will be costly when conflicts of interest will enter in the way of proper operating and financing decision (Jensen and Mackling, 1976) and it is difficult to measure the present value of interest tax shields (Fama French, 1998). So the firm adopts conservative financial policies because high leveraged firms are vulnerable to financial distress and that firms involved in research and development suffer most in economically distressed periods .This affects are severe for the concentrated industries (Tim and Titman 1994)

3. METHODOLOGY:

According to Minton and Wruck (2001), the firm will be leverage conservative if its leverage falls in the bottom 20%.

In order to identify leverage conservatism, we incorporate the dummy or qualitative variable which assumes 0 and 1 values to classify data into mutually exclusive categories. We proceed as follows-

Use dummy variable to find the leverage conservatism such as-

$$D_{i_t} = 1 \text{ if the firm take low leverage} \\ = 0 \text{ otherwise (high cash)}$$

We estimate different determinants according to different theories for low leverage firms.

(Insert variables definition)

3.1 Low leverage model:

$$\text{Low leverage}_i = \beta_1 + \beta_2 mtook + \beta_3 cashflow2 + \beta_4 \log ass + \beta_5 liq2 + \beta_6 \tan gible1 + \omega_i$$

Where,

β_1 = intercept for low leverage model.

β_k = the coefficients of all explanatory variables for firm i (k=2, 3.....6)

ω_i = the error term for low leverage model for firm i.

4. THE SAMPLE SELECTION:

We randomly select 1196 UK firms to estimate leverage conservatism. Here we take different individual variable as a determinant of leverage conservatism from the period 1984 to 2002. At first we investigate the policy for the whole sample. After that to simplify our analysis, we make six non overlapping panels like 1984-1986, 1987-1989, 1990-1992, 1993-1995 1996-



1998 and 1999-2001(**Table1**). Here each panel is treated as an observation which is independent and statistically appropriate. Here we exclude the one year and two observations to capture the persistency which reduces the sample size relative to studies where one year definition is adopted such as **Fama and French (1999), Graham (2000), and Titman and Wessels**.

5. THE EMPIRICALLY EXPLORE THE DETERMINANTS OF LOW LEVERAGE MODEL INCLUDING WHOLE SAMPLE:

Table2: All the regressors except tangible assets are statistically significant at 5% level of significance because of the lower p value but the firm size (log ass) and tangible assets have significantly negative impact on low leverage. According to log likelihood and chi square distribution, the null hypothesis will be rejected. The higher AIC shows the good selection of the model.

6. EMPIRICAL ANALYSIS OF SIX PANELS:

Table 3, 1984-1986: The results imply that higher growth opportunities, higher liq2 and cashflow2 will induce the firm to take more leverage policy. The firm size has the negative impact on the dependent variable that means the large firm can take debt at lower asymmetric information cost. The p value of the chi-square distribution is so small indicates that all the independent variables are worth full to explain the model.

Table 4, 1987-19:The mtook, cashflow2 and logass have significant impact on estimated logit but liq2 and tangible 2 have insignificant impact on estimated logit. The higher cash flow means higher retained earnings and firm is able to invest in net present value project without any debt risk.

Table 5, 1990-1992: All regressors have significant impact on dependent variable. The p value of chi square distribution is so low and strong convergence will be found.

Table 6, 1993-1995: Here all the variables have significant impact on the probability of taking low leverage of the firm.

Table 7, 1996-1998: Here cflow2, logass and the tangible1 are significant but others are insignificant impact. The AIC value is lower than before and the value of chi square shows the significance to reject the null hypothesis.

Table 8, 1999-2001: All variables except the mtook and tangible1 have some influence on the dependent variable. Here the AIC value, chi square value and the strong convergence shows the good estimation of model.

7. EXAMINATION OF ALL INDEPENDENT VARIABLES IN LEVERAGE CONSERVATIVE MODEL:

We can find the value of the company by comparing book value of the company with its market value. The market value means the market capitalization in the stock market. With the help of this ratio, we can identify the undervalued or overvalued securities. The ratio of market to book values shows the overall performance of the company. If the ratio is greater than 1 then securities is overvalued but when it is less than 1 then it is undervalued. So the ratio of book to market value is a symbol of financial distress risk and the market require a risk premium for this extra systematic risk. High distress risk has a high book to market ratio because when the company facing asymmetric information or agency cost, the book value is higher than market value. That means the liabilities of the company is increased. Fama and



French (1992) find that there is positive relation between expected returns and book to market ratio.

Liquidity has significant impact on leverage conservatism policy when the firm has ample amount of liquid assets, it will take conservatism policies to ignore the future risk. The firm will follow the 'Pecking Order Style' to finance the investment.

The leverage has tax advantage; higher debts have higher tax benefits as well as higher debts create default problems and bankruptcy. According to Ross (1997), higher amount of leverage will show the quality of the firm and higher future cash flow. That means the lower quality of the firms will not be able to take higher amount of debt because of future bankruptcy.

There is a positive relationship between size and leverage (Rajan and Zingales, 1995). The larger the firm, lower the information asymmetries induce firm to take higher debt. The large firms have greater access to capital markets and the cost of issuing is lower for large firms than small firms and more debt will be adopted by the large firms.

The term cash flow means the extra funds that the firm can use in any future profitable projects. If the firm has higher cash inflow then the firm will want to hold more cash as precautionary motives and make the firm able to invest in bad time.

Higher the tangible assets lower the motive to take conservatism policies. The relationship between tangibility and leverage depends on the performance of the firms. If the firm is credit constrained then there is positive relationship between the leverage and tangibility. According to Ranjan and Winton (1995), the tangible assets such as land, building will depreciated gradually as well as the cost of external funds is lower, so higher the tangible assets higher the leverage. But for credit unconstrained firms this is not significant because they no need to enhance the debt capacity.

8. THE GRANGER CAUSALITY TEST BETWEEN DEPENDENT AND EXPLANATORY VARIABLES:

In order to find the causality relationship between dependent variables and all our independent variables of model, we test Granger Causality which was developed in 1960 by Clive Granger.

With the help of F test in Eviews we make our discussion about the causality relationship among the variables.

The Granger Causality test for low leverage model:

We test the Granger Causality for low leverage model and take the following hypothesis—

H_0 : There is no evidence of causal relationship between Lev2 and all the regressors

H_1 : There is evidence of casual relationship between Lev2 and the regressors.

Table 9: The higher F-statistic value rejects the null hypothesis that there is no Granger Causal relationship. So mtook significantly attract the variable Lev2.

But for Cflow2, Lev2 does not Granger Cause Cflow2. But we use Cflow2 as an independent variable because the higher the ratio of pretax profit plus depreciation to total assets, the lower will be the value of Lev2 and has an impact of Cflow2 on Lev2.

The firm size has an impact on Lev2. The null hypothesis also rejected that Liq2 has no Granger Cause Lev2 implies that higher values of Liq2 affect the Lev2. So leverage significantly depends on the liquidity assets of the firm.



Tangible1 does not Granger Cause Lev2 and Lev2 does not Granger Cause Tangible1 at all level of significance. Here the tangible1 is incorporated to show the impact of the tangible assets on level of leverage. The firm debt capacity positively depends on the tangible asset.

9. THE AUGMENTED DICKEY-FULLER (ADF) TEST:

We use our whole sample to explore the stationary or non stationary. In order to do that we estimate the Augmented Dickey-Fuller test.

Here our null hypothesis is –

$\delta = 0$ (There is unit root – time series is non stationary)

And the alternative hypothesis is –

$\delta < 0$ (That is time series is stationary)

Unit root test on lev2:

(Insert table 10)

The $t (= \tau)$ value of lev2 is -1.7846. In absolute term it is lower than 5% and 10% critical values. We cannot reject the null hypothesis. So the lev2 series is non stationary.

10. SUMMARY AND CONCLUSION:

Actually the firm accept leverage conservative motive to disregard the financial distress risk. This research reveals the explanation that all of our determinants have significant impact on low leverage conservatism. The conservative categories of the firm depend on the precautionary demand as well as on the pecking order theory. In the perfect financial market, the conservative motive is not efficient to adopt although it is considerable for the imperfect financial market. We also demonstrate the Granger causality test to imply the casual relationship among the dependent and independent variables. The results reveal that some of the explanatory variables are not able to provide any information about the dependent variables but these variables play an important role to make a decision of whether the firm should adopt leverage conservative policy or not. At last we examine the Augmented – Dickey – fuller test to investigate the stationary or non stationary of our dependent variables. The statistical results reveal that leverage is non stationary.

REFERENCES:

1. Auret CJ and Sinclair RA. 2006. Book-to-market ratio and returns on the JSE. *Investment Analysts Journal*, 63.
2. Brownbirdge M. 1998. *The Causes of Financial Distress In local Banks in Africa and Implications for Prudential Policy*. Geneva: UNCTAD/OSG/DP/132.
3. DeAngelo H and Masulis RW. 1980. Optimal Capital Structure under Corporate and personal Taxation. *Journal of Financial Economics*, 8(1):3-27.
4. Fan JPH, Huang J and Zhu N. 2008. *Financial Distress without Bankruptcy: The case of China* (WWW). Available from: <http://faculty.gsm.ucdavis.edu/~nzhu/papers/distresschina.pdf> (Accessed 28/08/09).
5. Fama EF and French KR. 1999. *Testing tradeoff and pecking order predictions about dividends and debt*. University of Chicago: CRSP Working Paper (506).
6. Giambona E and Schwiendbacher A. 2008. *Debt Capacity of Tangible Assets: What is Collateralizable in the Debt Market?* (WWW). Available from: <http://ssrn.com/abstract=1099331> (Accessed 15/08/09).



7. Graham JR.2000. How big is the tax benefit of debt? *Journal of Finance*, 55(5):1901-1941.
8. Harford J. 1999. Corporate cash reserves and acquisition. *Journal of Finance*, 54(6):1969-1997.
9. Jensen M.C.1986.*The agency cost of free cash flow, corporate finance and takeovers*. United States: American Economic Review, 76(2), pp. 323-329.
10. Jensen MC and Meckling WH. 1976.Theory of firm: managerial behaviour, agency cost and capital structure. *Journal of Financial Economics (JFE)*, 3(4):305-360.
11. Koshio S. 2003. *The Determinants of Corporate Cash Holdings in Brazil*. CLADEA.
12. Kim CS et al.1998.The determinants of corporate liquidity: theory and evidence. *Journal of Financial and Quantitative Analysis*, 33(3):335-359.
13. Lona A, Leonida L and Ozkan A. 2004. *Determinants of Financial Conservatism: Evidence from low leverage and Cash Rich UK Firms*. University of York: Department of Economics and Related Studies.
14. Li D and Liu J. 2009. *Determinants of Financial Distress of ST and PT Companies: A Panel Analysis of Chinese Listed Companies (WWW)*. Available from: <http://ssrn.com/abstract=1341795>(Accessed 20/08/09).
15. Modigliani F and Miller M.H. 1963.*Corporate Income Taxes and the Cost of Capital: A Correction*. United States: American Economic Review, 53(3), pp.433-443.
16. Myers SC and Majluf NS.1984.Corporate financing and investment decisions when firms have information those investors do not have. *Journal of Financial Economics*, 13(2):187-221.
17. Myers SC.1984.The capital structure puzzle. *Journal of Finance*, 39(3):575-592.
18. Minton BA and Wruck KH.2001.*Financial Conservatism: Evidence on Capital Structure from low leverage Firms*. AFA 2002 Atlanta:Dice Ctr:Working Paper (2001-6).
19. Ozkan A and Ozkan N.2004.Corporate cash holdings: an empirical investigation of UK companies. *Journal of Banking and Finance*, 28(9):2103-2134.
20. Opler T et al.1999.The determinants and implications of corporate cash holdings. *Journal of Financial Economics*, 52(1):3-46.
21. Odit MP and Chittoo HB.2008.Does Financial Leverage Influence Investment Decisions? The case of Mauritian Firms. *Journal of Business Case Studies*, 4(9):49-60
22. Robert H et al.2005.FDI and Pollution: A Granger Causality Test Using Panel Data. *Journal of International Development*, volume 17(3): 311-317.
23. Ross SA, Westerfiels RW and Jordan BD.2008. *Corporate Finance* 6th ed. New York: Mc-Grow-Hill.
24. Schoubben F and Van Hulle C. 2004. The Determinants of leverage: Differences between Quoted and Non Quoted firms.*Tijdschrift voor Economie en Management*, 49(4).
25. Titman S and Wessels R. 1988. The determinants of capital structure choice. *Journal of Finance*, 43(1):1-19.



Appendix:
Variables Definition:

Variables	Definition	Code
Leverage	The ratio of total debt to total assets	Lev2
Market to book	The ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets	mtook
Cash flow	The ratio of pre-tax profits plus depreciation to total assets	Cflow2
Liquidity	The ratio of current assets minus current liabilities and total cash to total assets	Liq2
Size	The logarithm of total assets in constant prices	Logass
Fixed assets	The ratio of tangible assets to total assets	Tangible1

Table 1: Distribution of firms over the six panels:

Year	Total	Leverage conservatism
A 1984-1986	188	110
B 1987-1989	650	30
C 1990-1992	902	58
D 1993-1995	949	51
E 1996-1998	905	64
F 1999-2001	795	54

Table 2: Logistic regression analysis for Low Leverage model including the whole sample:

	Coefficient	Std.Error	t-value	t-prob
Constant	2.69933	0.1204	22.4	0.000
Mtook	0.207552	0.01885	11.0	0.000
cflow2	2.35869	0.1405	16.8	0.000
logass	-0.218449	0.009779	-22.3	0.000
liq2	1.28101	0.1026	12.5	0.000
tangible1	-0.677655	0.06001	-11.3	0.000

no. of observations	14638
log-likelihood	-8976.43187
AIC	17964.8637
Test: Chi ² (5)	1588.4 [0.0000]**

Table 3: 1984-1986(panel A)

	Coefficient	Std.Error	t-value	t-prob
Constant	1.53766	0.7818	1.97	0.050
Mtook	0.547783	0.2043	2.68	0.008
CFlow2	11.5118	2.222	5.18	0.000
Logass	-0.300680	0.06284	-4.78	0.000
liq2	3.40068	0.7384	4.61	0.000
tangible1	0.485784	0.4810	1.01	0.313

no. of observations	14638
log-likelihood	-300.759824
AIC	613.519649
Test: Chi ² (5)	123.22[0.0000]**



Table 4:1987-1989(panel B)

	Coefficient	Std.Error	t-value	t-prob
Constant	1.05622	0.7162	1.47	0.141
Mtook	-0.403467	0.1502	-2.69	0.007
Flow2	14.4001	2.254	6.39	0.000
Logass	-0.195747	0.05791	-3.38	0.001
liq2	1.12063	0.6565	1.71	0.088
tangible1	0.110181	0.4106	0.268	0.789

No. of observations	550
Log-likelihood	-341.323623
AIC	694.647246
Test: Chi ² (5)	79.225 [0.0000]**

Table 5:1990-1992(panel C)

	Coefficient	Std.Error	t-value	t-prob
Constant	0.809023	0.4803	1.68	0.092
Mtook	-0.0267398	0.003311	-8.08	0.000
CFow2	12.4904	1.287	9.70	0.000
Logass	-0.148281	0.04091	-3.62	0.000
liq2	1.13014	0.4610	2.45	0.014
Tangible	-0.812286	0.3019	-2.69	0.007

No. of observations	903
No. of parameters	6
Log-likelihood	-533.68017
AIC	1079.36034
Test: Chi ² (5)	174.45 [0.0000]**

Table 6:1993-1995(panel D)

	Coefficient	Std.Error	t-value	t-prob
Constant	1.10831	0.4857	2.28	0.023
Mtook	0.189602	0.08386	2.26	0.024
CFlow2	4.85691	0.8264	5.88	0.000
Logass	-0.135194	0.03873	-3.49	0.001
liq2	1.23218	0.4165	2.96	0.003
tangible1	-0.766897	0.2581	-2.97	0.003

No. of observations	905
No. of parameters	6
Log-likelihood	-569.475511
AIC	1150.95102
Test: Chi ² (5)	108.02 [0.0000]**



Table 7:1996-1998(panel E)

	Coefficient	Std.Error	t-value	t-prob
Constant	3.02609	0.5124	5.91	0.000
Mtook	0.0245418	0.06632	0.370	0.711
CFlow2	3.01875	0.6371	4.74	0.000
Logass	-0.245429	0.04238	-5.79	0.000
liq2	0.777582	0.4251	1.83	0.068
tangible1	-1.40269	0.2597	-5.40	0.000

No. of observations	949
Log-likelihood	-608.334708
AIC	1228.66942
Test: Chi ² (5)	97.776 [0.0000]**

Table 8:1999-2001(panel F)

	Coefficient	Std.Error	t-value	t-prob
Constant	1.41112	0.7402	1.91	0.057
Mtook	0.0315176	0.09919	0.318	0.751
CFlow2	6.33695	1.232	5.15	0.000
Logass	-0.235465	0.05677	-4.15	0.000
liq2	2.11529	0.6396	3.31	0.001
tangible1	0.0138180	0.2738	0.0505	0.960

No. of observations	452
No. of parameters	6
Log-likelihood	-254.842045
AIC	521.68409
Test: Chi ² (5)	97.229 [0.0000]**

Table 9: Pair wise Granger Causality Test for Low Leverage Model:

Null Hypothesis	Observations	F-statistic	Probabilities
Mtook does not Granger Cause Lev2	17	4.93312	0.02732
Lev2 does not Granger Cause Mtook	17	0.13147	0.087805
Cflow2 does not Granger Cause Lev2	17	0.17703	0.83990
Lev2 does not Granger Cause Cflow2	17	3.86974	0.05047
Logass does not Granger Cause Lev2	17	6.28938	0.01354
Lev2 does not Granger Cause Logass	17	1.14962	0.034931
Liq2 does not Granger Cause Lev2	17	5.30431	0.02236
Lev2 does not Granger Cause Liq2	17	0.039101	0.68469
Tangible1 does not Granger Cause Lev2	17	0.07310	0.92992
Lev2 does not Granger Cause Tangible1	17	0.11326	0.89386

Critical values: 1.56(25%), 2.45(10%), 3.20(5%), 5.32(1%)

Table 10: The Augmented Dickey –Fuller test:

Variable	Coefficient	t-Statistic	Prob.	Critical values	
				5%	10%
LEV2(-1)	-0.240522	-1.784628	0.0960	-3.0521	-2.6672
D(LEV2(-1))	0.461699	1.759541	0.1003		
C	0.042961	1.837154	0.0875		