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RESEARCH PAPER

Debt Capital, Default Risk and Financial Performance of Firms

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ABSTRACT

This research aimed to examine the effect of debt capital on firms' performance in Pakistan. For the purpose of analysis, the study selected a sample of 220 firms from 05 sectors listed at Pakistan Stock Exchange. Debt capital was measured in terms of short term and long term debt to assets ratio. The financial performance was measured through return on assets. Certain other firm level variables were taken as the control variable. Secondary data of the firm level variables were extracted from the annual audited reports and the official website of Pakistan Stock Exchange. The study covered the time span of 2011-2017, examined the effect of debt capital on overall sample firms and then across the firms of different default risk level. For placing the firms in relevant default risk class, the study applied Z-score model. The firms were placed in safe, gray and distress zone on the basis of low, indeterminate and high default risk level, respectively. Panel regression model was used to examine the effect of debt capital on firms' performance in each scenario. The study only observed the significant effect of long term debt capital for overall firms and the firms placed in safe zone while in other scenarios, it remained negative but insignificant. The study suggested the officials of the firms for taking care in determining the proportion of short term and long term debt capital in the capital structure.

KEYWORDS Debt Capital, Default Risk, Firms' Performance, Panel Regression, Z-Score

Introduction

The decision pertaining to capital structure could significantly influence the firms in many aspects. It may affect the liquidity, profitability and even tangibility of the firms. It may also influence the risk and return complexities thereby guiding the decision making of the investors. The formal discussion on capital structure was initiated by Modigliani and Miller (1958) who supported the proposition of net operating income approach. It was suggested that the firms' value is independent of its capital structure. There were, however certain assumptions behind the theory including absence of market imperfections. In real world, the imperfection generally exist that may influence the decision making process. The work of M&M provided a pathway for further discussion and contributions in this domain. Jensen and Meckling (1976) explained it in terms of agency cost and tax advantages pertaining to debt financing. Myers (1984) developed the pecking order theory by suggesting that the firms generally favor the funds available internally instead of the external funds. In case of external financing, a proper order is to be followed from least risky to high risky financing instruments. These and certain other theories, such as signaling, market timing, behavioral and game theory induced the researchers for empirical contributions in the domain of capital structure.

The researchers observed a positive influence of appropriately designed and managed capital structure on firms' financial performance while noticed and reported issues if it is improperly managed (Abor, 2005; Afrasiabishani, Ahmadinia, & Hesami, 2012; Phuong & Nguyet, 2017). Capital structure thus holds significant bearing on financial decision making of the firms. The composition of debt and equity in the capital structure may also

affect and be affected by the default risk probabilities of the firms (Zeitun, Tian, & Keen, 2007). Financial institutions generally probe the default risk level of the loan applicants before deciding to make or refuse for granting of loan (Jacobson, Roszbach, & Linde, 2013). Despite of long debate and numerous contributions, the discussion on capital structure and firms performance remained inconclusive, debated and hot topic of research. Considering the importance, it is attempted in the study to address this phenomenon in context of the consequences of debt capital for firms' performance and in background of default risk level. The incorporation of default risk element could be a significant addition in the existing discussion.

To empirically address the matter, the study selected 220 firms from 5 major sectors of economy listed with Pakistan Stock Exchange. Sample firms were classified based on their default risk for which Z-score model was applied. Debt capital was measured in terms of short term and long term debt to assets ratio. The data pertaining to firm level variables were extracted from annual reports and official website of stock exchange. Panel regression model was applied for analysis of the collected data. The results showed an insignificant effect of short term debt ratio on firms' performance. For long term debt ratio, it remained significant for overall sample firms and the firms of low default risk. The effect, however remained negative in almost all the cases. The study is expected to contribute in existing literature of capital structure and could be relevant for academicians, practitioners, firm officials and the financial institutions. The results of the study may induce for further research in this domain. The research may also help to develop an understanding regarding the sensitivity of default risk in decision making process.

Literature Review

The discussion of capital structure initiated through M&M model in 20th century remained alive in the literature during 21st century and numerous contributions have been made by the researchers from all over the world. In one such study, Abors (2005) observed the firms' performance in Jordan to be influenced significantly by their of capital structure. Ahmad, Abdullah, and Roslan (2012) also observed that firms performance in Malaysia be positively associated with their capital structure. The researchers used return on assets as the proxy of financial performance. Contrary to this, Mumtaz, Rauf, Ahmed, and Noreen (2013) noticed the negative and significant association among the two variables in Pakistan. Furthermore, Badar & Saeed (2013) observed a negative influence of short term debt while positive of long term debt on performance of firms from food sector in Pakistan.

Extending the literature, Daniel (2015) observed a positive association of debt and performance of firms selected from Germany, France and United Kingdom. Muchiri, Muturi, and Ngumi (2016) observed nearly similar pattern in East Africa. Contrary to this, Nassar (2016), Ali, Amir Ullah, Shah, Shehzad, and Nawab (2016), Hassan and Aitimon (2017) documented a negative effect of capital structure on firms' performance in Turkey, Pakistan and Nigeria. Usman (2019), however, didn't find a significant effect of short term debt on firms in Nigeria. Recently, Olusola, Mengze, Chimezie, and Chinedum (2022) reported a positive while Ali, et al. (2022) a negative effect of capital structure on firms' performance. Despite of the number of studies in the domain of capital structure, any conclusive evidence has not yet emerged. A mixed trend of positive, negative and insignificant influence has been found in the existing literature. The researchers also proposed the relevance of firms default risk in capital structure determination and its implications (Aretz, Florackis, & Kostakis, 2017; Li & Islam, 2019; Manuelli & Sanchez, 2019). The current study addressed both of these domains in parallel. The study intended to probe the consequences of debt capital for firms' performance and then determine this effect across the firms belonging to different default risk zone.

Hypotheses

H_1: Debt capital significantly influenced the firms' performance in Pakistan.

H_2: Effect of debt capital on firms' performance is influenced by the level of default risk.

Material and Methods

For examining the outcome of debt capital for firms and the role of default risk in this scenario, the study applied a quantitative approach. The population of the study was comprised of non-financial firms of Pakistan listed on Pakistan Stock Exchange (PSE). 220 firms were selected as sample for the purpose of empirical analysis. These firms were selected on the basis of size from five different sectors. The selection of sectors was based on their contribution towards economy of the country. The firm level data of the sample firms were extracted from annual audited reports. The study covered the time span of 2011-2017. The study first examined the outcome of debt capital for the performance of firms. For this purpose, the overall debt capital was decomposed into two components, i.e. short and long term. These were measured in terms of assets. The study applied panel regression model on account of its ability to handle the issues of multicollinearity, enhancing data quality, handling omitting variables and measurement errors (Gujratie, 2003). For the selection of suitable model in panel regression, the study used appropriate tests. Different diagnostic tests were applied to establish the reliability of data and fitness of model used for analysis purposes. For probing the effect of debt capital, the study applied following regression model.

$$FP_{it}= \beta_o+\beta_1 SD_{it}+\beta_2 LD_{it}+\beta_3 CR_{it}+\beta_4 TNG_{it}+\beta_5 LNTA_{it}+\beta_6 AGE_{it}+\mu_{it}$$

The study was primarily aimed at examining the outcome of debt capital on performance of firms. Rest of the variables were used as control variables. The study then probed the effect of debt capital across the firms categorized on the basis of default risk. For determining the default risk, Altman (1968) proposed Z-score model widely deployed by the research scholars. This study applied the model in following form:

$$Z = 1.2X_1+1.4X_2+3.3X_3+0.6X_4+1.0X_5$$

Based on Z-score analysis and by following the specified thresholds, the firms were placed in three zones on the basis of default risk, i.e. safe, gray and distress. The panel regression model was then separately applied for firms belonging to each zone for probing the differential effect.

Results and Discussion

Basic data characteristics were examined through the descriptive statistics. Table 1 is presenting the summary statistics of the data.

Table 1
Summary statistics

	FP	STD	LTD	CR	TNG	LNTA	AGE
Mean	0.021	0.219	0.176	1.122	0.597	14.707	3.431
Median	0.021	0.172	0.104	0.993	0.597	14.800	3.434
Maximum	0.324	1.859	2.362	3.975	0.100	19.257	4.234
Minimum	-0.375	0.000	0.000	2.775	0.000	7.045	0.693
Std. Dev.	0.106	0.220	0.229	0.800	0.225	1.751	0.503
Obs.	1631	1631	1631	1631	1631	1631	1631

The statistics presented above show a highest mean value of size while lowest of firms' financial performance. The highest value of size is due to the inclusion of larger firms

in the sample from each sector. The highest dispersion was also observed in size while lowest in firms' financial performance. Summary statistics confirmed the normal distribution of data with the absence of outliers. Certain other tests were also used for establishing the data normality but the results are not reported here. The data normality was, however affirmed by each test. Once the data normality is established, the study applied panel regression model in e-views to empirically examine the hypothesized effects. The results of panel regression analysis for overall and categorized sample firms are presented in table 2.

Table 2
Debt capital and firms performance

Variable	Model 1	Model 2	Model 3	Model 4
C	.602*** (.096)	.752*** (.104)	.520** (.248)	-.225*** (.028)
STD	.017 (.014)	-.006 (.016)	-.077* (.045)	.017 (.011)
LTD	-.029** (.014)	-.059*** (.019)	-.074 (.046)	-.024 (.015)
CR	.028*** (.003)	.040*** (.005)	.034 (.021)	.046*** (.010)
TNG	-.019 (.019)	-.059*** (.023)	-.062 (.065)	.120*** (.031)
LNTA	-.016*** (.006)	-.014** (.007)	-.011 (.015)	.004** (.002)
AGE	-.113*** (.018)	-.145*** (.023)	-.101** (.047)	-.003 (.009)
Adj. R squared	.60	.57	.46	.10
DW stat.	1.77	1.72	1.82	1.80

***, **, * indicates significance at three level, i.e. 1%, 5% and 10%.
In parenthesis, standard error values are specified.

Model 1 is about the impact of debt capital on performance of overall sample firms. Results indicated that the short term debt to assets ratio didn't not significantly influence the firms' performance. Effect of long term debt to assets, however remained significantly negative. The results of overall analysis are consistent with some studies earlier conducted in different environment (Kieschnick & Moussawi, 2018; Vithessoonthi & Tongurai, 2015). The results of control variables also showed some mixed trend. Model 2, 3 and 4 are about the effect of debt capital on firms' performance belonging to safe, gray and distress zone, respectively. The effect of short term debt ratio on firms' performance remained insignificant for safe and distress zone firms while weakly significant for the firms of gray zone. The effect of long term debt ratio remained significantly negative for firms placed in safe zone while negative and insignificant for firms of gray and distress zone. The adjusted R- squared and Durbin-Watson statistics conforms to the explanatory power and absence of autocorrelation, respectively. The overall results of the analysis didn't show any substantial difference across firms of different default risk in terms of the outcome of debt capital for performance of firms.

Conclusion

This research was aimed at examining the outcome of debt capital for performance of firms in Pakistan. The study further attempted to examine the pattern of effect across firms of different default risk. For empirical analysis, the study took a sample of 220 non-financial firms from 5 sectors listed on Pakistan Stock Exchange. Z-score model was applied to categorize and place the firms in safe, gray and distress zone. The firms were placed in these categories on the basis of high, indeterminate and low default risk level. The data for analysis were extracted from annual published reports of the firms and Pakistan Stock Exchange. Panel regression model was applied initially for overall sample firms and then for firms placed in three different categories on the basis of default risk. The results show an

insignificant effect of short term debt ratio on selected firms' financial performance in each category. The effect of long term debt, however remained significant for overall and low default risk firms. Based on results, the study concluded that the default risk is not a much relevant phenomenon in Pakistan. This might be due to the limited application of sophisticated credit scoring models by the financial institutions in Pakistan. The study can be extended in future by adding more firms from all the sectors, by using broader time frame and incorporating the other capital structure components for more extensive and conclusive evidences.

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