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Financial risk and firm value: is there any trade-off in the Indian context?

Koustav Roy
Department of Commerce, Khandra College, Khandra, India, and
Kalpataru Bandopadhyay
Department of Commerce, Vidyasagar University, Midnapore, India

Abstract

Purpose – The objective of the paper is to investigate the relationship between financial risk and the value of the company. In this context, the study is to revisit the trade-off theory of capital structure in the Indian context.
Design/methodology/approach – After applying outlier, the study considered 389 nonfinancial companies from BSE500 from 2001 to 2018 collected from the Capitaline database. The statistical package *E*-views 10 has been utilized for analysis. To understand the nature of the data the descriptive analysis, correlation analysis, normality, unit root, multi-collinearity and Heteroskedasticity were conducted. The Panel Estimated Generalised Least Square with cross-section weight was found suitable for analysis due to the existence of cross-correlated residuals. Further, the study has classified the levels of financial risk to determine the relationship of different levels of financial risk with corporate value.
Findings – It was found that the financial risk and corporate value had a significant negative relation during the period of study. On class interval-wise financial risk analysis, it was found that the debt-equity (DE) of around 1:1 may be considered optimal. Below that threshold limit, the DE affects value positively above which the ratio affects the value negatively.
Originality/value – The paper makes an attempt to determine the optimal financial risk at the corporate level in the Indian context.

Keywords Value of the firm, Financial risk, Debt-equity ratio, Trade-off theory, Panel EGLS model
Paper type Research paper

The risk is inherent in business. The business concern assumes the higher financial risk to have higher profitability. The purpose of borrowed capital is to utilize financial leverage to have higher profitability. However, the use of debt in capital structure increases the risk of the firm and consequently increases the cost of capital. As the number of debt increases, the marginal benefit of using debt in capital structure reduces gradually and after a certain point, the use of debt in capital structure would increase the cost of capital in such a way so as to affect the value of the firm negatively. The optimum level is when the marginal value of the benefit of low-cost debt and tax-shield on debt exactly offsets by the increase in the cost of capital due to an increase in financial risk. This proposition is called the static trade-off theory of capital structure. Kraus and Litzenberger (1973) first considered the necessity of maintaining a balance between the cost of bankruptcy and the tax shield of borrowed capital. Niu (2008) suggests that the highly profitable firm has a high target debt ratio because they would ensure higher tax shields and a lower level of bankruptcy cost. However, Millar (1977)

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was not in favor of the logic of trade-off theory. He commented that tax and tax shield is a sure-shot phenomenon whereas bankruptcy and the related cost is a rare phenomenon. Therefore, both of those could not be considered and compared at a similar level.

The financial risk arises out of future contractual commitment toward borrowed capital. Financial risk is directly associated with corporate financial leverage (Luoma and Spiller, 2002). In the context of total risk, the financial risk is to be managed by the company. Primarily, the management of risk should ensure desired profitability keeping in mind the objective of maximization of value of the company. The mismanagement due to financial risk may even put the company in the land of bankruptcy. The faltering of business affects the economy adversely. Further, if a highly indebted company fails due to mismanagement of financial risk, then not only the related financial institute suffers but prospective borrowers intended to indulge in economic activity may also suffer by not getting financed for their projects from the financial institutions. In many of such downfall of businesses, along with the management of the company, the financial institution should also be held accountable for irresponsible lending. According to the quarterly newsletter of Insolvency and Bankruptcy Board of India, October–December, 2018, out of total dues of ₹3.45 lakh core bad loan from 12 top NPA accounts only 14% could be realized by the banks in the year 2017–2018. According to the database of the Reserve Bank of India, the scheduled commercial banks have written off over eighty thousand core as bad loans in six months up to September 2019 to stand at an NPA level approximately at 10%.

The financial risk is to be managed at the corporate level by the company themselves for their interest. However, if the climate of investment of the economy is indifferent about the assumption of an unhealthy level of risk, the government should certainly issue an advisory. Even, the apex bank Reserve Bank of India should recommend the banks to reassess the lending criteria. This would not only affect the financing culture of the economy positively but also help the companies to maintain a healthy balance sheet by managing risk management better.

Practically, the financial institutions sanction loan on examining "ability to repay in future." They hardly put importance on the risk assumed by the company. However, to assess the "ability to repay" is not as futuristic as an assessment of the risk. The risk of a business could be taken care of either by assessing the standalone total risk of the company or by estimating the future valuation of the company which not only considers future cash flow but also considers the risk of the business.

Figure 1 is a diagrammatic representation of the above discussion. Theoretically, the value of a company may be a resultant product of profitability and the total risk as assumed by the company. The financial risk is affected directly by capital structure and indirectly by other risks including operating risk. There are some factors that affect the capital structure and again there are several factors that affect the operating risk. The financial institution sanctions loans based on the ability of the firm to repay its obligation including the debt-related dues in the future. There is a provision of sensitivity analysis that is also too much premeditated and nowhere depends and varies on the risk profile of the prospective borrowers. Some financial institutions follow the policy of margin lending to reduce their risk. Some banks forms consortium to finance to distribute risk among themselves. Some financial institutions follow age-old risk parameters (e.g. DE ratio of 2:1). For this purpose of the viability study for sanctioning loans, the financial institution examines the forecasted cash profitability of the company. However, the risk of the company is it the total risk or the financial risk is not given due importance at the time of sanctioning loans. Thus, the authors of this paper propose to look into the profitability and the risk of the company separately or to examine the future value of the company as lending criteria.

In this context, the basic objective of the study is to examine the relationship between financial risk and the value of the company. The secondary objective of this study is an

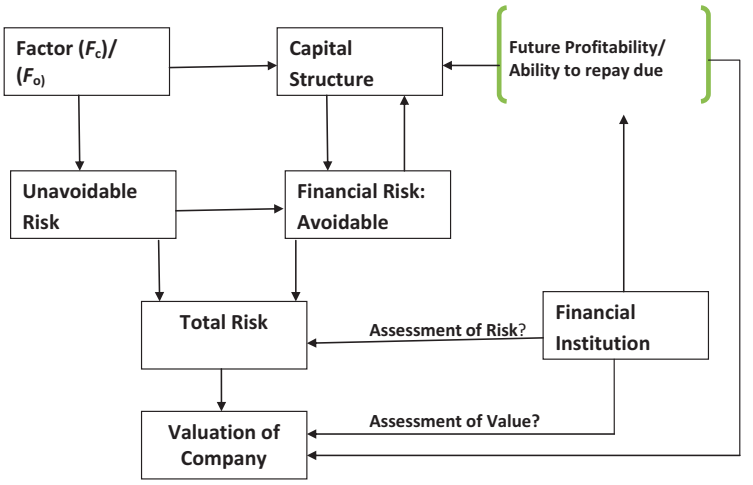


Figure 1.
Business and lending framework

Source(s): Authors

endeavor to find out the trade-off point between the financial risk and the value of the company, if any. The findings of this study would help the company in one hand to assess the desired level of financial risk and also would help the regulator and financial institution at the time of sanctioning loan to the business concerns.

Literature review and research gap

There is no dearth of study on the relationship between financial risk and values of the company in the Indian context and abroad. Based on two objectives, the literature surveyed can be divided into two parts. Firstly, examining the relationship between the financial risk and the value of the company and if the result is in affirmative then to seek whether there is any trade-off between the said two variables. Modigliani and Miller (1963) concluded that if the tax shield effect works then the market value of a levered firm would be more than an un-levered firm. His research paper created a great debate on the capital structure and adding to the aforesaid Modigliani and Miller models (1958, 1963), the number of works has provided further contributions in the said field. Stephen Ross (1977) concluded that the leverage would be able to increase the market value of the stock since investors increasing the market's perception of value. Opler and Titman (1994) reported a negative relationship between leverage and firm value during financially distressed periods. The authors noted that the adverse consequences of financial risk are more vivid in concentrated industries. The study also found that highly leveraged companies lose substantial market share than their conservatively financed competitors during industry downturns. McConnell and Servaes (1995) investigated the relationship between corporate value, equity ownership and leverage where they found a negative correlation between the value of the high-growth firm and their leverage and a positive correlation between the value of the low-growth firms and their leverage.

Myers (1977) observed that the debt offers firms a tax shield, and firms, therefore, pursue higher levels of debt to gain the maximum tax benefit and ultimately enhance profitability. However, the high levels of debt increase the possibility of bankruptcy. In their study of capital structure financing, Fama and French (2002) applied cross-sectional regressions to

study how a firm's value is related to debt and dividend. The authors observed negative relations between the debt and the value of the company after controlling with related factors.

They documented that the leverage is generally value-decreasing among high-growth firms globally. They observed that the debt in the capital structure is a value-decreasing component among low-growth US firms but in the case of firms outside the US, the debt is value-enhancing. Rayan (2008) conducted a study on 113 sample firms listed in the Johannesburg Stock Exchange (JSE) to find out the relationship between financial leverage and firm value. The data set was collected for the period 1998–2007 from the McGregor BFA database. The regression analysis of the study showed that firm value was negatively correlated with the financial leverage during study periods.

In the context of Australia, Mollik (2008) examined the impact of corporate capital structure on the market value of the firms. The author showed that the value of a business raises significantly with financial leverage up to a certain range by employing the least square dummy variable (LSDV) method on the pooled time-series and cross sectional data set. His work also revealed a statistically significant positive effect of total interest-bearing and long-term financial leverage on the market value of a firm in Australia. A study conducted by O'Connell and Cramer (2010) noted a significant and positive relationship between value of the firm and financial risk. The findings further noted that a high level of debt improves the share market performance of the firm. Mseddi and Abid (2010) examined the relationship between risk and the value of the company. They extended both the theoretical and empirical issues as dealt with by Mandelker and Rhee (1984) and Cotei and Farhat (2009) in their study that investigated the effect of financial structures of firms on their values. In that study, they used data of ISE indexed 127 firms. The data were analyzed using the SPSS 15.0 program. According to the results of the analysis, the values of the firms were affected by the financial structures of the firms.

Several research studies have supported the trade-off theory of capital structure. Jong *et al.* (2011) observed that the trade-off of capital structure decisions is evidenced in the US more specifically at the time of repurchase decisions. Shyam-Sundar and Mayers (1999) compared and concluded that the Pecking Order model has more explanatory power than the static trade-off theory. Brusov *et al.* (2014) observed that the absence of optimum capital structure in the trade-off theory of capital structure decisions. There are some studies in the Indian context as well. Pandey and Chotigeat (2004) conducted a study to find that shareholder risk and return is affected by the capital structure decision of the corporate. There are several studies that tested the trade-off theory of capital structure in the Indian context. Singh and Kumar (2012) have observed the evidence of the trade-off theory in capital practices in India between the periods 1990 and 2007 with a sample from 10 industries. Chakrabarty (2010) applied panel regression based on Generalized Methods of Moments over a thousand nonfinancial firms for a period of 13 years to support trade-off theory. In the context of the textile industry, Kaur and Rao (2009) observed the support of the trade-off theory. In an analysis of the capital structure of BRIC countries, Silva *et al.* (2016) evidenced observance of both Pecking Order theory and trade-off theory for the Indian companies after the mortgage crisis. Bandopadhyay and Barua (2016) found that debt financing has an influence on firm performance by conducting a study of 1,594 manufacturing companies in India. However, the scope of the study was not to determine the optimal level of debt in capital structure. Bajaj *et al.* (2018) has examined trade-off theory in the context of manufacturing companies from nine different industries. In their study, they assumed that all companies target to achieve optimal capital structure which we tend to drop in our analysis. Recently, Tripathy and Singh (2018) supported the trade-off theory with their study considering a period from 2000 to 2017. In their study, the authors examined the relationhip between the DE ratio and the profitability ratio as proxied by Earning Before Interest and Tax (EBIT) to Total Asset.

There are several papers that do not find any evidence to support the trade-off theory of capital structure. Chandha and Sharma (2015) with a sample size of 422 listed companies for a 10-year period ending 2013 did not find any theory that supported the capital structure practices in the Indian context. Datta and Agarwal (2009) did not find the support of the trade-off theory of capital structure in India.

Research Gap: It is important to mention that in the Indian context, the approach of most of the papers (Chakraborty, 2010; Singh and Kumar, 2012 etc.) examining the trade-off theory is indirect. They have considered debt level as the dependent variable and the profitability or the value as an explanatory variable. It is to be noted further that some studies in the Indian context (e.g. Tripathy and Singh, 2018) consider the relationship between DE ratio and profitability ratio for examining trade-off theory. The trade-off theory is related to the "value of firm." The value (or its change) may not be proxied by the profitability (or its change) as the latter does not consider the impact of financial risk associated with the issuance of debt capital. In this context, this study wishes to examine trade-off theory by investigating how DE affects market value multiple (p/e ratio). The paper further attempts to fill up a research gap by examining the optimal level of financial risk, if any, exists hardly attempted so far in the Indian context.

Data and methodology

This study is secondary in nature. This paper considers constituent companies of BSE 500 that include eleven industries as classified as per NIC 2004. The study covers 16 years of data ranging from 2002 to 2017. The data are collected from audited annual reports that were available at the Capitaline database 2019. As part of the data management, one percent of the extreme data both in the positive direction and in the negative direction for all the variables have been omitted as an outlier. In the case of missing data, the average of two adjacent data has been considered.

Variables discussion: Based on the objective of the study, a discussion on two types of variables is required: (1) business valuation variable and (2) risk variables.

Business valuation variables

According to several previous works such as Tasker (1998), Kim and Ritter (1999), Kaplan and Ruback (1989), it was found that price multiples can be a proxy of business valuation. Therefore, the price-earnings multiple has been considered taken as dependent variables in this research work.

Independent variable

According to Opler and Titman (1994), McConnell and Servaes (1995), Fama and French (2002), Mollik (2008), etc. the risk variables are one of the determinants of the firm value. In this paper, the DE ratio is a proxy of financial risk and has been considered as an independent variable. The paper also considers EPS (earning per share) as a control variable. To explain the variation of the price-earnings ratio, the earning per share is so important; no other control variable has been considered except the nature of the industry. The industry classification has been considered as a dummy variable.

Research methods

The analysis of descriptive statistics is carried out to understand the nature of the data set. The normality of the data series is an assumption for applying the ordinary least squared method in any investigation that could be tested through the Jerque-Bera statistic. Montgomery (2001) observed that multicollinearity leads to a high variance of coefficients

which decreases the precision of estimation, wrong sign in estimated coefficients; it can inflate the estimated variance of predicted values. The correlation matrix and VIF help us to detect multicollinearity problem. The dependent variable of this study is price earning multiple. PE multiple is a stock market dependent variable and expected to be inherently heteroskedastic in nature. The heteroskedasticity of the data series has been tested through regression residual under panel ordinary least square model. Following the principle of Levin and Lin (1992) and assuming common unit root process the stationarity of the data has been examined. By assuming individual unit root process, Im, Pesaran and Shin *W*-test has also been applied for the same purpose. As there was no unit root in the level in any series, so they are integrated at the same level. With the help of Durbin's *H* statistic, the autocorrelation problem within the variable could be detected. The OLS panel regression would yield an inefficient result in this case. In this paper, Estimated Generalized Least Square (EGLS) has been applied to avoid the problem of heteroskedasticity.

The significance of the regression model has been tested through adjusted R^2 statistics and to test the applicability of the said regression model in the population, *F* or adjusted *R* squared statistic has been noted. To examine the difference in coefficient at a different class of DE, the Wald test has been applied. If the co-efficient of the different classes of the DE develops a bell-shaped curve, then trade-off theory would be supported.

Empirical model

The data were analyzed by a linear regression model primarily and then after confirming the nature of the relationship nonlinear model was also applied. The measurements for the variables displayed as under. The primary empirical models are as follows:

(1) Linear model to describe the effect of industry nature, DE and financial leverage (FR) and types of the industry (*D*) on the value of the firm (H_1)

$$\text{Value of firm } (H_1) = C_1 + \beta_1 * \text{DE} + \text{ß}_2 * \text{EPS} + \beta_j D_i + e_1 \quad (1)$$

$i = 1$ to 11 and $j = 3$ to 13

$$\text{Value of firm } (H_1) = C_2 + \beta_i * D_j \text{DE} + e_2 \quad (2)$$

j = class interval = 1 to 15 (C, C_1, C_2, C_3 = constant, e, e_1, e_2, e_3 = error term)

There are three categories of independent variables in our panel data regression model - the usual independent variable, the control variable and the dummy variable. The overall DEDE, Earnings Per Share (EPS), and industry category (dummy) are taken in the first equation as the independent variables to assess the effect of firm-specific risks nature on the firm value (H_1). In the second model, to determine the relationship between valuation and financial risk at different levels, the DE ratio is classified in fifteen class intervals and treated as dummy variables. The regression equation of EPS and H_1 of different companies has been computed under the different classes of DE. In equation (2), such classes (D1, D2, D3 to . . . D15) are from D1 = 0.0 to 0.15, D2 = 0.16 to 0.30 and so on. The price-to-earnings ratio (PE) is considered as a proxy of the valuation of the firm and thus considered the dependent variable. The lag 1 of PE ratio is considered as the independent variable in the second model.

Data analysis

To study the nature of data, the analyses through descriptive statistics were conducted. Table 1 shows the results of descriptive statistics.

Table 1 demonstrates the descriptive statistics. The mean PE ratio, DE ratio and EPS are greater than the median in all three cases indicating the data are skewed toward the right.

	PER	DER	EPS
Mean	32.54949	0.972848	62.684293
Median	15.01500	0.390000	51.203287
Maximum	4990.000	89.67000	357.8769
Minimum	−533.3100	0.000000	0.010261
Std. Dev	138.4793	2.510473	157.839029
Skewness	19.58238	16.57797	15.75742
Kurtosis	510.3404	453.7691	328.5747
Jarque–Bera	69867437	55124817	28870025
Probability	0.000000	0.000000	0.000000
Observations	6,476	6,476	6,476

Table 1.
Descriptive statistic

Note(s): PER = price earnings ratio; DER = debt equity ratio; EPS = earnings per share
Source(s): Authors' Calculations

The positive value of Skewness is confirming the right-tailed distribution of data. The data series in all three cases are leptokurtic and much higher than 3. Further Jarque–Bera test result where the probability value is less than 0.05% indicates that data are non-normal. However, the study considered 6,476 observations, which may be considered as large series and may be preceded with further analysis with the data. To examine multicollinearity between dependent variables DE and EPS and also to note the relation between dependent variables and independent variables correlation matrix is prepared.

From the above Table 2, it is shown that there was a significant correlation between the dependent and the independent variables. After conducting descriptive analysis, the stationarity of the data series was checked with the help of a unit root test. Table 3 shows the results of the panel unit root test.

In the above Table 3, Levin, Lin and Chu common unit root test, Im, Pesaran and Shin, ADF (AugmentedDickey- Fuller) -Fisher Chi-sq, PP (Phllip-Perron) -Fisher Chi-sq individual unit root test was conducted. The test results of each variable show that there had no unit root in the common and individual data set as the value of each test statistic are not significant (P-value 0.00). So, the null hypothesis of common or individual unit root present in panel data is rejected here. Therefore, it is concluded that the data series is stationary.

Development of model

After descriptive analysis and testing for the normality and stationarity of the data series, the linear regression of panel data was conducted. However, the result could not be accepted because the D-W statistic is found to be 1.29 indicating serial correlation in data series.

Covariance analysis: Ordinary Included observations: 6,476 Correlation Probability	PER	DE	EPS
PER	1.000000 –		
DE	−0.015551 0.2108	1.000000 –	
EPS	0.092515 0.0000	0.060317 0.0000	1.000000 –

Table 2.
Correlation matrix

Note(s): PER = price earnings ratio; DE = debt equity ratio; EPS = earnings per share
Source(s): Authors' Calculations

Summary Series: PER, DER, EPS Method	Statistic	Prob.	Crs. Sec	Obs
Null: unit root (assumes common unit root process)				
Levin, Lin and Chu *t*	−38.7493	0.0000	3	19409
Null: unit root (assumes individual unit root process)				
Im, Pesaran and Shin *W*-stat	−48.2103	0.0000	3	19409
Tests assume asymptotic normality				

Note(s): PER = price earnings ratio; DER = debt equity ratio; EPS = earnings per share
Source(s): Authors' Calculations

Table 3.
Unit root test

Panel cross-section Heteroskedasticity LR test				
Null	Residuals are Homoskedastic			
LR	Value	104428.6	Probability	0.00
Panel period Heteroskedasticity LR test				
Null	Residuals are Homoskedastic			
LR	Value	53837.87	Probability	0.00

Source(s): Authors' Calculations

Table 4.
Heteroskedasticity test of regression residual

Therefore, the data set is tested with auto-regressive panel regression. To examine the robustness of the result of the analysis, the residual analysis was conducted.

Residual analysis

The residual of the auto-regressive panel regression has been tested to find out homoskedasticity and outlier problems in the data series. In Table 5 heteroskedasticity test of regression residual has been displayed. The null hypothesis of LR (likelihood ratio) test for examining heteroskedasticity in data series, both under panel cross-section method and panel period method is that residuals are homoskedastic. The table shows that the null hypothesis has been rejected.

Thus, the data series indicates Heteroskedasticity and the auto-regressive regression analysis is not suitable. Further, the long-run or short-run equilibrium could not be tested for the risk variables. In this case, estimated generalized least square with cross-section weight data would be more suitable for the panel data series considered in this study.

Panel EGLS model with cross-section weights

Under the pretext of the above discussion, the panel estimated generalized least square method is likely to be suitable for the regression analysis. In this context, the relationship between valuation variables and risk variables has been experimented with a linear panel generalized least square model. Table 5 shows the result of the panel EGLS model. The table shows the *F*-statistic is statically significant indicating the model is fit and risk variables are explaining around 30% of the variation of valuation variable.

In the above Table 5, it was found that the DE is negatively correlated with PER of a company. The coefficient value of the dummy variable shows the effect of industry nature on the firm value. In the above Table 5, it is found in some cases that some industries have a significant positive effect on the value of a firm, and some industry has the negative effect on the value of the firm that signifies industry effect on the value of a corporate.

Dependent variable: PER
Method: Panel EGLS (cross-section weights)
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	*t*-statistic	Prob
DER	−0.248447	0.061858	−4.016375	0.0001
EPS	−0.468205	0.668360	6.849138	0.0000
D2D	−1.857337	0.885218	−2.098170	0.0359
D3E	−2.449905	1.353375	−1.810219	0.0703
D4F	0.392162	2.436450	0.160956	0.8721
D5G	8.521846	2.746201	3.103140	0.0019
D6H	4.204312	3.066649	1.370979	0.1704
D7I	−0.663283	1.182402	−0.560962	0.5748
D8J	−5.328867	0.955708	−5.575835	0.0000
D9K	1.296647	1.808548	0.716954	0.4734
PER (−1)	0.463966	0.010273	45.16505	0.0000
C	11.81865	0.902237	13.09928	0.0000

Weighted statistics

R-squared	0.306964	Mean dependent var	136.5272
Adjusted *R*-squared	0.305691	S.D. dependent var	133.1479
S.E. of regression	95.62900	Sum squared resid	54750555
F-statistic	241.0731	Durbin–Watson stat	1.909231
Prob (*F*-statistic)	0.000000		

Note(s): PER = price earnings ratio; DER = debt equity ratio; EPS = earnings per share
Source(s): Authors' Calculations

Table 5.
Panel-EGLS model with cross-section weights: PER and DE

In this context, a pertinent question is why a company is interested to use debt in capital structure in spite of the fact that the DE of the firm has a negative relationship with the firm value. To understand the relationship a closer look at the relationship is required. The relationship between the value of the company and DE at different class intervals were tested.

The effect of different classes (levels) of DE on corporate valuation was examined. Table 6 below shows the results of regression where the value is a dependent variable and different classes of DE and one lag PE ratio are independent variables. With the help of the trial-and-error method, the level of DE was divided into 16 classes starting with 0 with an interval of 0.15. The cluster was considered as 15 dummy variables. Table 6 shows the result of regression.

The above co-efficient of the DE ratio has been plotted in a graph. The overall trend of the curve is negative. But initially there was an uptrend and then there was a down trend. Due to positive skewness, data series has a right tail and causing such a phenomenon.

Figure 2 in the above, shows that there was a significant relationship between different categories of DE and the firm value. A significant relation was found between the firm value and the DE cluster. The R^2 value was also significant for PER valuation ratio. After the regression result was found, the coefficient was tested to find out whether they were significantly different or not. For the purpose Wald statistic is used. The results of the statistic are given in Table 7.

From the above analysis we found that DE ratio as measures of financial risk have a negative impact on the value of firm. However, the relationship between the value of the firm and financial risk is positive at the initial stage, and at the financial risk beyond a level, the DE affects the valuation negatively. On a closer look at the result, it could be observed that up to DE level of 0.15:1, the debt could be most efficiently used and thereafter the marginal benefit

Dependent variable: PER (class-wise effect of DE)
Linear estimation after one-step weighting matrix

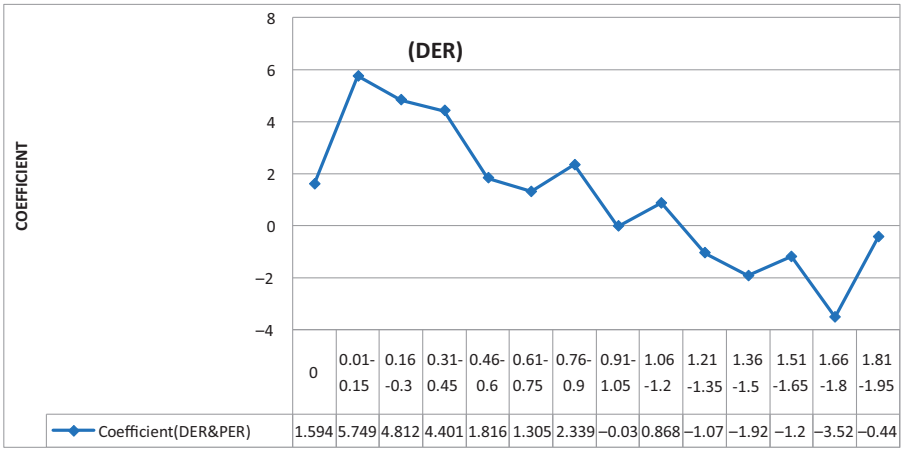
Variable	Coefficient	Std. Error	*t*-statistic	Prob
D1DE	1.594061	0.634952	2.510522	0.0121
D2DE	5.748651	0.693200	8.292922	0.0000
D3DE	4.812272	0.908248	5.298409	0.0000
D4DE	4.400931	0.994433	4.425570	0.0000
D5DE	1.816026	0.927527	1.957923	0.0503
D6DE	1.304546	0.891426	1.463438	0.1434
D7DE	2.339485	0.920414	2.541776	0.0111
D8DE	−0.028285	1.031597	−0.027419	0.9781
D9DE	0.867915	1.230491	0.705340	0.4806
D10DE	−1.068444	1.195330	−0.893848	0.3714
D11DE	−1.923475	1.356077	−1.418411	0.1561
D12DE	−1.199975	1.706622	−0.703129	0.4820
D13DE	−3.517483	1.641493	−2.142856	0.0322
D14DE	−0.444953	1.803051	−0.246778	0.8051
PER(−1)	0.459577	0.010097	45.51453	0.0000
C	8.829228	0.594250	14.85777	0.0000

Weighted statistics

R-squared	0.295678	Mean dependent var	125.3124
Adjusted *R*-squared	0.293912	S.D. dependent var	131.1149
S.E. of regression	91.12664	Sum squared resid	49683213
F-statistic	167.4461	Durbin–Watson stat	1.898001
Prob (*F*-statistic)	0.000000		

Note(s): PER = price earnings ratio; DE = debt equity ratio
Source(s): Authors' Calculations

Table 6.
Panel-EGLS model with cross-section weights: PER and class-wise DE



Source(s): Authors

Figure 2.
Coefficient of DE on regression equation of PE

out of debt may be reduced gradually. It is very important to note that the marginal benefit of using debt at DE level of 1:1 is nil. Further, the DE level beyond 1.2:1 could yield negative valuation for the company.

Wald test Test statistic	Value	df	Probability
F-statistic	14.51379	(10, 5983)	0.0000
Chi-square	145.1379	10	0.0000

Null hypothesis summary Normalized restriction (= 0)	Value	Std. Err
C(1)	1.594061	0.634952
C(2)	5.748651	0.693200
C(3)	4.812272	0.908248
C(4)	4.400931	0.994433
C(5)	1.816026	0.927527
C(6)	1.304546	0.891426
C(7)	2.339485	0.920414
C(8)	−0.028285	1.031597
C(9)	0.867915	1.230491
C(10)	−1.068444	1.195330

Restrictions are linear in coefficients

Source(s): Authors' Calculations

Table 7.
Wald test (Class wise effect of DER)

Scope of further research: This paper examined optimality of financial risk by considering windows for different levels of DE ratio. However, the methodology considering the dynamic optimization model could yield even more robust result.

Conclusion

The study is related to examining the relationship between corporate financial risk and the value of the company. The financial risk has several connotations. However, this study is restricted to the traditional concept of financial risk and is proxies by the DE ratio of a company. To achieve the desired objective, the price-earnings ratio concept of valuation has been considered as the dependent variable. To reflect the nature of the industry as a control variable, this study has considered the type of industry as a dummy variable. The dependent variables are characterized by autocorrelation and heteroskedastic. In this context, to drop both the assumptions of ordinary least square model, the panel estimated generalized least square method was applied. It was found that the financial risk negatively influences valuation of the firm. To investigate the reason, a closer look at the relationship between valuation and different levels of financial risk as represented by different classes of DE ratio was examined. It was observed that the financial risk initially influences the business valuation positively. The valuation of the firm is impacted negatively at a higher level of financial risk. It is further observed that the amount debt up to the equal amount of equity in the capital structure could have positive impact on valuation of the company. It is recommended that companies may follow the guideline as prescribed in this study. In this context, it is also suggested that the financial institutions should modify their lending criteria accordingly to ensure manageable financial risk as assumed by the company.

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Further reading

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Corresponding author

Kalpataru Bandopadhyay can be contacted at: rana4312000@yahoo.com