

Capital Structure Determinants of Start-Up Businesses: An Empirical Study of India

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Abstract

One of a firm's most crucial decisions is undoubtedly its financing structure. It is described as how a company finances its assets by carefully balancing equity and debt. Through this study, we have investigated the capital structure determinants of startup firms in India by applying panel data regression methodology. The sample consists of 21 startup firms located in the Delhi NCR region of India and the period from 2017 to 2021 has been considered in this study. The results have revealed that firm size, profitability and liquidity are the main factors that have significantly influenced the capital structure decision of start-up firms in India. This study will help the present and future entrepreneurs consider some important factors while deciding on their financial structure and also help the policymakers to frame policies that promote a friendly entrepreneurial system in the country.

Keywords: [Capital Structure, Determinants, Leverage, Startups, India]

Introduction

The majority of emerging economies rely substantially on start-ups; start-ups have been identified as a metric of innovation and progress, and nations with more start-ups have better economic stability (Okrah et al. 2018). An organisation in its early phases of existence is referred to as a start-up. Start-ups are established by one or more entrepreneurs who wish to create a good or service they think people will pay for and which will solve an existing problem they are facing in the current scenario. At the early stage of its development, the start-up gets funding through informal sources like own savings of entrepreneurs, other start-up team members, credit cards family and friends (Nofsinger and Wang 2011, Gartner et al. 2012, Calopa et al. 2014) and later on resort to external sources like banks and other financial institutions to finance its business operations. Bank debt and trade credit also played a quite important role in financing these new small ventures (Berger and Udell 1998, Huyghebaert and Van de Gucht 2007). Finance is one of the most crucial elements that link with the successful growth of a business.

Small firms are distinguished from huge corporations by informational opacity, which is a major distinction between small, privately held businesses and large, publicly-traded businesses. These businesses typically have owner management and choose to issue external debt over external stock to preserve both the right of ownership and control (Coleman et al. 2016). Start-up companies have little prior experience or reputation, a

significant risk of failure, and highly concentrated ownership (Huyghebaert and Van de Gucht 2007) so due to these distinctive characteristics, they struggle in getting the sufficient finance required for the smooth running of their business. Various studies have documented that newly established businesses experience severe financial challenges at the start-up stage, which could lead to their eventual failure. (Huyghebaert 2003, Dennis 2004, Abor 2008, Chong and Luyue 2014, Cotei and Farhat 2017).

Various studies have been conducted yet that have identified the factors influencing the capital structure of publicly listed firms and small and medium enterprises (Titman and Wessels 1988, Rajan and Zingales 1995, Berger and Udell 1998, Cassar and Holmes 2003, Huang and Song 2006, Sheikh and Wang 2011, Chadha and Sharma 2015, Pratheepan and Yetiwella 2016, Rao et al. 2019, Shah et al. 2022). Some of the factors that have significantly influenced the capital structure of these firms that have been reported in the existing literature are firm size, profitability, growth, liquidity, earning volatility, tax etc. Few studies have been conducted on the financial structure of start-up businesses (Cassar 2004, Huyghebaert and Van de Gucht 2007, Nofsinger and Wang 2011, Rob and Robinson 2014, Coleman et al. 2016). Therefore, there is a need to conduct some more studies in this later context. So this research is an attempt made to fulfil the gap by investigating the factors that explain the capital structure decision of start-up firms in the case of India by studying the sample

of 21 manufacturing start-up firms from 2017 to 2021. To the best of the author's knowledge, this is the first study to use the most recent data to evaluate how capital structure influences start-up businesses in the context of India. The main aim of the present study is to extend the existing capital structure literature to newly founded firms.

The remaining sections of the research are structured as section 2 provides briefly the review of existing literature, section 3 deals with the data and methodology, section 4 presents the results and interpretation of the current research, and finally, we conclude in section 5.

2. Literature Review

For decades, capital structure has been an interesting area of research among academicians, researchers and policymakers. Various empirical studies have been carried out on the determinants of capital structure of firms all around the world. These studies have been performed mainly in the context of listed firms and SMEs in developed and developing countries. The predictions of various capital structure theories like static trade-off, pecking order theory and agency theory have also been supported by various empirical researches.

The study of Titman and Wessels (1988) determined the determinants of capital structure using manufacturing firms for which data were taken from Annual Compustat Industrial files (1974-1982). Growth, non-debt tax shield, asset structure and earning volatility were not found to be associated with debt ratios, however, uniqueness and profitability were found to be negatively associated with debt ratios. Additionally, it was discovered that smaller businesses utilised short-term loans more frequently than bigger ones. In the study, Berger and Udell 1998, they had examined the sources of funding for small firms, their interdependence, the financial growth cycle, the effects of the macroeconomic environment, and the relationship between the capital structure and the size and age of the firm. The findings suggested that the principal owner, commercial bank and trade creditors, three constituted the largest source of finance (70% of total funding) and even they were largest for every size and age group of firm although larger firms used more proportion of debt than smaller firms. Different capital structures would be ideal at different points in the growth cycle as a firm progressed from the early to the late stage owing to more growth, more experience, and becoming less informationally opaque, although the model might not fit all small enterprises.

Cassar and Holmes (2003) explored the determinants of capital structure and use of financing by SMEs by using OLS regression on data of a large Australian nationwide panel survey (1994-1998). The asset structure, profitability and growth were found to be important determinants of capital structure. The firm size, asset structure, and growth were positively related to leverage while profitability, risk was negatively related to leverage this research has highlighted the importance of short-term debt over long-term debt in SME financing the findings supported the static trade-off and pecking order theory. **Huang and Song (2006)** found firm size, profitability asset tangibility, non-debt tax shield growth and managerial shareholding as important factors affecting listed Chinese firms. **Newman et al. (2010)** studied the firm-level determinants of capital structure of Chinese SMEs and tested the applicability of financial theories using Cross-sectional regression on a dataset taken from the Zhejiang Provincial Statistics Bureau (2004-2005). The firm size, profitability, age, and incorporation were found to be significantly related to debt assets ratios while there was weaker evidence exhibited for the asset structure. The results supported the applicability of the pecking order theory. **Pahuja and Sahi (2012)** examined the factors that determine the capital structure of Indian firms by using annual reports of 30 companies listed at BSE (2008-2010). The dependent variable was taken as the debt-equity ratio, the independent variable was represented by size, growth, profitability, liquidity, and tangibility. The correlation and OLS regression were used. The debt-equity ratio was found to be positively related to liquidity and growth, whereas negatively related to size, profitability, and tangibility but the relation was statistically insignificant. The finding supported the pecking order theory of capital structure.

Using multiple regression analysis, the study by **Handoo and Sharma (2014)** determined the factors that affected the capital structure decisions made by 870 Indian companies (which included both private and government companies) listed on the NSE (2001-2010). Leverage had been seen as significantly impacted by the factors like size, asset tangibility, profitability, cost of debt, growth, debt serving capacity and tax rate. Another study by **Pratheepan and Yetiwella (2016)** explored the capital structure determinants of companies listed on the Colombo Stock Exchange of Sri Lanka by conducting a panel data analysis (2003-2012). The results depicted that profitability firm size and growth were important determinants having a significant effect

on leverage while tangibility and non-debt tax shield were found insignificant. **Sofat and Singh (2017)** in their study identified the key factors affecting the capital structure of Indian manufacturing companies and investigated whether the financial theories of developed nations can be applied to developing country like India. A correlation matrix and multiple regression models were applied on 100 BSE-listed manufacturing companies. Firm size and debt servicing capability were found to be negatively associated with the debt ratio, while asset structure, business risk, and ROA, were found to be positively related. The findings confirmed that the tradeoff, pecking order, and agency theory predictions were useful in explaining the financing practices of Indian manufacturing companies.

Rao et al. (2019) explored the factors influencing SMEs capital structure decisions in India by taking into account 174 non-financial firms and how their relationship with leverage influences SMEs financing decisions. The leverage of businesses was influenced by variables like age, size, growth, liquidity, tangibility, non-debt tax shield, ROE and cash flow ratio and it was discovered that debt was a significant source of funding, with short-term debt being more common. The findings were in line with the pecking order theory for SMEs. **Jaworski and Czerwonka (2021)** examined the factors affecting the capital structure of energy firms in European Union countries during the period 2011-2018 using multiple regressions. The results had shown a significantly positive relationship between size and tangibility with the debt while a significantly negative relationship between profitability and liquidity with the debt. In the case of country-specific variables, we found stronger evidence of a negative relationship between inflation, GDP growth, and stakeholder rights protection for Energies, capital market development, and debt levels of the energy companies which are taken under this study. **Shah et al. (2022)** explored the capital structure in three South Asian countries i.e Pakistan, India and Sri Lanka using the panel regression technique. The finding had revealed that profitability, tangibility, volatility, NDTs and tax are the key factors influencing the capital structure of firms in these countries.

In the case of newly established businesses, regarding firm-specific characteristics the firm size, growth (Gartner et al. 2012), asset tangibility (Cassar 2004, Sanyal and Mann 2010) profitability (Coleman et al 2016, Loan et al. 2020) had significantly influenced debt composition of these firms. As regard to entrepreneur related factors education, prior experience (Gartner et al. 2012,

Ko and McKelvie, 2018), age (Achleitner et al. 2011, Loan et al. 2020) gender, ethnicity (Scherr 1993) were found to be playing an important role in the financing decision making of the startup firms.

3. Research Methodology

3.1. Sample and Data Collection

The current study employs panel data regression methodology to examine the important determinants of the capital structure of start-up firms in the manufacturing sector of the Delhi NCR region in India. The sample size consists of 21 firms from the manufacturing industry extracted from the Tofler database based on the following criteria: a) firms being incorporated during the year 2014, b) an annual turnover below 100 crores, c) location of the firms in Delhi NCR and d) certain firms are eliminated due to the lack of information on all necessary proxies used into this study for both dependent and independent variables and the entire 5 years of data. For running the panel data regression models, the Eviews statistical software has been used here in this study.

The audited financial statements of these firms from the year 2016-2017 to 2020-21, have been used for the empirical analysis. The data has been collected from the Tofler database. This database may also gather information from many websites run by governments, businesses, and other public domain sources. About 1 million firms' worth of data is in Tofler's database, which is continually updated with both new and old businesses. Since the information was taken from the website of the Ministry of Corporate Affairs, it is credible.

3.2. Variables and hypothesis formulation of the study

Based on the above literature, the proxies used for measuring dependent and independent variables are explained in this section. Those variables are taken into the study which are found to be significant in most of the studies and can be calculated from the required dataset. The dependent variable of the current study is the debt ratio which is measured as the total debt to total assets ratio. The total debt contains both long-term and short-term debt (Cassar and Holmes 2003, Sheikh and Wang 2011, Chadha and Sharma 2015). The first independent variable taken into this study is the firm size which is measured as a natural logarithm of sales (Titman and Wessels 1988, Huang and Song 2006, Rao et al. 2019). We assume here a positive relationship between firm size and debt ratio. Due to economies of scale that reduce information asymmetry, transaction costs, the ex-

istence of obstacles to market access, and risk exposure, firm size is a crucial element in defining a firm's capital structure (Cassar 2004). The next variable is tangibility which is calculated as tangible assets divided by the total assets of the firm (Rajan and Zingales 1995, Abor 2008), here we are assuming a positive relationship between tangibility and debt ratio. As if a firm has more of its assets in tangible form would help it in raising financing due to its collateral capacity.

Another one is the growth variable measured in terms of total sales in the current year minus total sales in the previous year divided by total sales in the previous year, growth is expected to tighten the retained earnings and thus force the company to borrow so, therefore, leads to a positive relationship with debt (Benkraiem and Gurau 2013). Therefore, we assume a positive relationship between growth opportunities and debt ratio. The next variable is the profitability of the firm measured as profit before interest, tax and depreciation to total assets, the firm managers would choose risky debt over equity and internal finance over external funding because information asymmetries, in this case, are the only important factor for outside funding. Pecking order theory also states that more profitable businesses have access to greater internal financing and the retained earnings are the preferable method of funding future investments (Psillaki and Daskalakis, 2009) so we are expecting here a negative relationship between profitability and debt ratio.

Lastly, the liquidity variable is computed as current assets divided by current liabilities. Because a firm with greater liquidity prefers to use internally generated funds when financing new investments, so that's why the pecking order theory predicted a negative relationship between liquidity and debt of a firm (Loan et al. 2020). Accordingly, we are assuming a negative relationship here in this study.

3.3. Model Specification

Table 1 Descriptive Statistics of the sampled data

Variables	Mean	Std. dev.	Median	Minimum	Maximum
DR	0.570269	0.469814	0.568678	0.011778	2.940434
SIZ	18.28983	1.321497	18.49557	14.03071	20.55935
TAN	0.338148	0.332897	0.256589	0.000592	1.682381
GRO	1.542592	4.327739	0.391556	-0.587446	28.73048
PRO	0.002903	0.205940	0.051242	-0.954986	0.293034
LIQ	1.699041	1.564302	1.198856	0.060005	7.938285

4.2. Correlation matrix

The multicollinearity of the sample data has been investigated. For each set of dependent and independent variables for manufacturing start-up companies included in the study, Table 2 shows the correlation analysis. The ma-

We have used a balanced panel dataset for the empirical analysis. The hypothesis of independent variables being determinant of the capital structure of firms will explain the variation in the dependent variable which is the debt ratio here is tested using panel data regression models. The regression model is estimated as follows:

$$DR_{it} = \beta_0 + \beta_1 SIZ_{it} + \beta_2 TAN_{it} + \beta_3 GRO_{it} + \beta_4 PRO_{it} + \beta_5 LIQ_{it} + \epsilon_{it}$$

Where:

DR_{it} = total debt to total assets ratio of the firm i at period t

SIZ_{it} = size of firm i at period t

TAN_{it} = tangibility of firm i at period t

GRO_{it} = percentage change in Sales of the firm

PRO_{it} = profitability of firm i at period t

LIQ_{it} = the ratio of current assets to current liabilities of the firm

β_0 = common y-intercept

β_1 - β_5 = coefficients of the independent variables

ϵ_{it} = error term

4. Empirical results and Interpretation

4.1. Descriptive statistics

The descriptive statistics of the dependent and Independent variables used in the current study are presented in Table 1. The average value of debt ratio of the startup firms is 57.02 percent which shows that a major part of the total assets of the firms gets financed through debt in the case of startup businesses in the manufacturing sector and the remaining 42.98 with the help of equity. The average asset tangibility of these firms is found as 33.81% of the total assets of the firm. The mean profitability of the firms is very low 0.29% only, which indicates that the case of new ventures is different; they suffer losses or rarely can generate profit in the early years of their operations.

trix showed that the cross-correlation coefficient for the majority of each pair of independent variables is less than 0.80, indicating that multicollinearity among the independent variables used in this study is not a serious problem.

Table 2 Matrix of correlations of variables

Variables	DR	SIZ	TAN	GRO	PRO	LIQ
DR	1.0000					
SIZ	-0.4779	1.0000				
TAN	0.1527	-0.1784	1.0000			
GRO	-0.1397	-0.0171	0.0794	1.0000		
PRO	-0.1132	-0.0755	0.2052	-0.0525	1.0000	
LIQ	-0.3744	0.0710	-0.1688	0.0068	-0.2550	1.0000

4.3. Regression Analysis

Panel data methodology consists of three types of models: pooled ordinary least square model, random effect model and fixed-effect model. In the case of pooled OLS model, we assume that every individual's coefficients with the intercept are the same. So in Pooled OLS, we, therefore, combined all of the observations. The fixed-effect model enables heteronomy or individuality for all enterprises, by allowing each company to have its unique intercept value. In the random effect model, the intercept's mean value is shared by all companies. Now the question is which model is the best?

We used the Likelihood Ratio (LR) test and the Hausman test to determine which model would be most appropriate for the data under consideration. These tests are presented in Table 3 of this section. First, the pooled OLS and fixed effect models were compared using the likelihood ratio (LR) test. The fixed effect model is chosen above the pooled OLS model because the cross-section chi-square p-value was less than 0.05, rejecting the null hypothesis that it is the best model. After the selection of the fixed effect model now there is a need to apply the Hausman test to examine which one, whether the fixed effect model or the random effect model is appropriate. Here, under this test, the null hypothesis is that the Random Effect model is the best-suited model for the data under consideration. Because the p-value is higher than 0.05, the null hypothesis that the random effect model is the proper model is not rejected. As a result, the panel data from this study were analysed using a random effect model to investigate the association between capital structure and firm-level determinants of start-up firms in the manufacturing sector in India.

Table 3 Likelihood Ratio (LR) Test and Hausman Test

Model	LR Test	Hausman Test
DR	81.81 (0.0000)*	5.56 (0.3510)
p-value * indicates significant at 1% and 5% level.		

The regression estimation results are presented in table 4 which revealed that firm size, growth, profitability and liquidity are the key determinants of the capital structure of start-up firms in India. Among these, the three variables firm size, profitability and liquidity are found to be significant at 1 % level of significance, and the growth variable is found to be significant at 5% level of significance. The tangibility factors are not found to be significant.

In the results, the F-statistic p-value was observed to be less than 5% level of significance, indicating that the model is well-fit. It implies that all independent variables considered simultaneously in the investigation have the potential to affect the debt ratio i.e the dependent variable here in this current study. The value of R² showed that the independent factors used in this study explained 42.56 per cent of the variation in the dependent variable. There is no autocorrelation in the residuals, according to the Durbin-Watson test value of (1.219495), which is in the range of 1 to 3. The Jarque-Bera test's p-value of (0.068810), which is more than 5% level of significance, indicates that the null hypothesis that residuals are normally distributed is not rejected.

Table 4 Regression Analysis

Variables		Coefficients	Std. Error	t-statistic	p-value
Constant		3.310545	0.756804	4.374375	0.0000
SIZ		-0.139277	0.040535	-3.435963	0.0009***
TAN		0.211768	0.179117	1.182289	0.2407
GRO		-0.014912	0.007483	-1.992749	0.0498**
PRO		-0.713455	0.265328	-2.688955	0.0088***
LIQ		-0.140933	0.028413	-4.960130	0.0000***
R2	0.425674				
Adj. R2	0.388858				
F-statistics	11.56227				
Prob.(f-statistics)	0.000000				
Durbin Watson	1.219495				
Jarque-Bera	5.352806				
Probability	0.068810				

Note: ***, ** significant at 1% and 5 % respectively.

The results of the Random Effect model, which is determined to be the appropriate model for the data taken into consideration, are provided in Table 4. The tangibility factor is found to be positively associated with the debt ratio but it is not statistically significant. This positive relationship between tangibility and debt ratios indicates that the larger the composition of fixed assets in the total assets would help the firm to take debt more easily by putting them as collateral for financing the business activities. Therefore, the hypothesis is rejected here. This result is different from that of these studies (Rajan and Zingales 1995, Cassar and Holmes 2003, Ortqvist et al. 2006, Chadha and Sharma 2015) which have shown a positive significant effect of asset tangibility on debt financing but the current finding is supported by some existing studies which have documented the tangibility as insignificant (Huang and Song 2006, Pratheepan and Yetiwellla 2016, Loan et al. 2020). In this model, debt is negatively correlated with firm size, which shows that bigger businesses have more steady earnings and hence views debt financing as a less advantageous alternative. The findings are consistent with those (Titman and Wessels 1988, Chadha and Sharma 2015, Rao et al. 2019). A significantly negative relationship is found between the growth and debt ratio. The results indicated that higher growth firm uses a lesser amount of debt which is found to be as per the prior empirical studies (Rajan and Zingales 1995, Huang and Song 2006, Vijayakumaran and Vijayakumaran 2019).

The firm's profitability turned out to be negatively related to the debt ratio. Therefore the higher debt level with low profitability suggested that startup firms follow the pecking order theory. This is consistent with most of the previous empirical findings (Rajan and Zingales 1995, Hall et al. 2000, Huang and Song 2006, Psillaki and Daskalakis 2009, Benkraiem and Gurau 2013, Sofat and Singh 2017, Jaworski and Czerwonka 2021). Thus the null hypothesis is not rejected here. The results have revealed a significant negative relationship between Liquidity and Debt ratio implying firms having higher liquid assets can meet their liabilities though these funds hence require a lesser amount of debt. This result also confirms the pecking order theory and is in line with these studies (Sheikh and wang 2011, Ohman and Yazdanfar 2017, Lamichhane 2020). Thus, the null hypothesis is not rejected in this regard. The negative relation of Profitability and liquidity with the debt ratio shows that firms having more internal funds with them tend to use a lesser amount of debt. So they supported the predictions of the pecking order theory (Ohman and Yazdanfar 2017, Lamichhane 2020).

5. Conclusion and Research Directions

Start-up businesses contribute significantly to the creation of new jobs, innovations and the expansion of the national economy and make it a more developed and better-functioning economy. A start-up company is a recently established, rapidly expanding firm that in-

tends to fill a market need by providing the people with a novel good or service. They help the economy grow over time while also establishing newer industries and are becoming a major contributor to economic expansion. Taking into consideration their important role it is necessary to conduct a study on start-ups. This study looked at the factors that affected the capital structure choices made by start-up firms in India. The final sample consisted of 21 start-up firms located in the Delhi NCR region for a period from 2016-17 to 2020-21. The findings show that firm size profitability growth and liquidity are significantly related to the debt ratio while tangibility is found to be insignificant. Hence the findings of this study would contribute to the empirical literature on capital structure. Thus from this study, it is concluded that firm size, profitability, growth and liquidity are found as the main determinants of the capital structure of start-up firms in India. Additionally, it is revealed that the pecking order theory is more applicable in the Indian context in the current scenario. This study identifies the key elements influencing start-up financing decisions, enabling financial managers and owners of the businesses to concentrate on them when choosing the capital structure of their business. It may help the present and future entrepreneurs regarding their financing planning of business so that that may help them to avoid the risk of failure due to ineffective financial structure. This study is based on five-year data and some selected variables, so any future research can be conducted with a longer time duration and some other important variables can also be considered along with these and having an impact on the financial decision of these firms.

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