The Indian manufacturing sector: finance, investment and performance of firms

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Abstract

The paper tests the hypothesis that financial stress caused the stagnation in the manufacturing sector, using firm level data on a sample of 804 large, mid, and small cap manufacturing firms for 15 years from 2005 to 2019. We analyse the trend in the financial indicators and estimate dynamic panel data regression using a two-step GMM method. We do not find substantial for financial stress to be a major determinant of the investment slowdown in these firms. Our results support the Pecking order theory, particularly for larger firms. In addition, we find that the declining growth in sales is a major determinant in explaining the slowdown in fixed investments and profits. For small cap firms, the size of the firms also matters. We therefore suggest that measures to increase demand can help in reviving the sales growth of firms and thereby private investments and profits.

Keywords: Capital structure, Investment, Profitability, Manufacturing, India

Introduction

The performance of the Indian economy and in particular of manufacturing has been disquieting in recent years, mainly in the aftermath of the global financial crisis (GFC). The Index of Industrial Production declined by 1.1 percent in August 2019 as compared to August 2018 and the index for manufacturing production declined by 1.2 percent. Subsequently, the decline steepened. Nagraj (2013) notes that the boom period before the GFC from 2003 to 2008 was mainly driven by private corporate investments raised through debt which led the corporate sector to be over-leveraged. Due to fall in demand after the GFC, there has been a sharp deceleration in capital expenditure in the corporate sector. This decline in the capital investments of firms is mainly attributed to the debt overhang in the corporate sector (Shukla and Shaw, 2020). The worsening of the balance sheets of the corporates due to debt overhang and of banks due to huge non-performing assets is termed as the twin balance sheet problem. Agarwal (2018) found that the manufacturing sector performed poorly in developing countries; it did better in India than in many other developing countries. However, he did find that the rate of growth of value added in manufacturing had slowed during 2005-14. During this period, the rate of return on net worth of the largest manufacturing companies had declined in all sub-sectors. Intense competition seemed to be one of the factors responsible for the decline in returns. The slow growth in demand and rising wage costs also contributed to the decline in returns.

Agarwal et al., 2020 found that the hypothesis of high leverage causing slowdown in private investments in the manufacturing sector does not hold. In this paper, we examine the performance of manufacturing companies. We first examine the financial performance of large, mid and small cap firms. This is in the context of what is called the twin balance sheet problem. The deterioration of balance sheets of companies constrained investment and weakened the position of banks who had lent to companies further weakening their desire to lend to companies. We analyse the growth of manufacturing firms in terms of their growth of gross fixed assets. We hypothesize that the growth of their gross fixed assets, leverage and profitability of firms are endogenously determined. The growth of fixed assets is depend on profits and the ability of firms to borrow. Profits in turn depend on the growth of assets and the debt equity (D/E) ratio. The D/E ratio also depends on the ability of a firm to service its debt which would depend on its profits and its capital stock. So after discussing the trends in the manufacturing sector, we use a panel data set for the time period 2005- 2019 for a dynamic panel data model using the two step GMM estimation to describe the behaviour of the three important variables identified above, i.e. growth of fixed assets, debt equity ratio and the profitability ratio.

Literature Review

Theoretical literature

The seminal paper of Modigliani and Miller (1958) provided the capital structure irrelevance theory i.e. the debt equity mix is irrelevant in impacting the value of the firm. However, it was based on several unrealistic assumptions such as the presence of perfect markets with no taxes and transaction costs. Modigliani and Miller (1963) revised their conclusions by incorporating corporate taxes in the model. The tax shield on interest payments of debt made it cheaper than equity. Thus, a levered firm has more value than an unlevered firm. Therefore, increasing debt in the capital structure raised the return to equity. Theoretically, in this case, the optimal capital structure should be 100% debt. However, empirical studies showed that the choice of full debt over equity by firms rarely occurs (Graham and Leary, 2011, Frank and Goyal, 2008). With a high level of debt, a firm also has to incur the cost of financial distress. "Financial distress refers to the cost of bankruptcy or reorganization, and also to the agency costs that arise when the firm's creditworthiness is in doubt" (Myers, 2001).

A major development in the capital structure theories is by Kraus and Litzenberger (1973), who introduced the trade-off theory (TOT) of capital structure in which firms balance the tax shield benefit with the bankruptcy cost of debt. The optimal level of debt is determined where the marginal benefit is equal to the marginal cost (Myers, 1984). The trade-off theory predicted a debt level which was much higher than what was actually observed (Miller, 1977). The empirical studies suggested that firms tend to practice debt conservatism whereby they forgo a substantial portion of their debt capacity (Graham, 2000).

The other major development is the pecking order theory (POT) of Myers and Majluf (1984). The POT ranks the different sources of funds i.e. retained earnings, debt and equity. According to the POT, retained earnings is preferred to debt and debt is preferred to equity. In explaining the POT, Myers and Majluf (1984) focused on the adverse selection problem due to the presence of information asymmetry regarding the actual valuation of the firm. For internal financing (retained earnings), there is no adverse selection problem. The preference of debt over equity builds on the signaling theory of Ross (1977). The issuance of debt requires the obligation of regular interest payments. If managers issue debt, it provides a signal of confidence to the market that the firm has sufficient cash flow for servicing debt, and that the stock is undervalued. On the other hand, if managers issue equity, it sends a negative signal to the market

that the stock is overvalued. Therefore, debt has a lower adverse selection than equity i.e. equity is riskier than debt for an outside investor (Frank and Goyal 2003). As explained by POT, larger firms or more profitable firms practice debt conservatism because of the availability of internal funds whereas small firms with lack of sufficient internal funds will choose debt over equity. But Myers and Majluf (1984) do not explain why managers should act in the existing shareholders' interest in maximizing the value of the existing shares (Myers 2001).

Another theory that affects the POT is the agency cost theory of Jensen and Meckling (1976), which is based on the principal-agent problem of (1) managers and shareholders (2) shareholders and creditors. In the first case, managers try to maximize profit for their own gain at the expense of the shareholders. In the second case, shareholders have the incentive to use the debt in sub-optimal investment projects at the expense of the creditors. The cost to monitor the agent to work according to the principal's objective is the agency cost. Use of debt will increase the firm's value by (1) tax shield in debt (2) absence of high premium as required for equity investors (3) reduction in agency cost by forcing the managers to make regular interest payments. This theory also has implications for firm's investment decisions as we will see later.

The other important consideration of firms while issuing debt instead of equity is their financial flexibility and credit ratings (Graham and Harvey, 2001). In their paper, the authors finds that the managers are willing to employ lower debt ratios and forgo its tax advantage in order to preserve their financial flexibility or debt capacity in order to be able to borrow in the future to take advantage of potential growth opportunities. The financial flexibility theory provides an alternative explanation for why more profitable firms follow debt conservatism, thereby reiterating the POT.

As noted earlier in the agency cost theory, debt plays a disciplinary role. Managers have an incentive to overinvest by undertaking the negative net present value (NPV) investment opportunities to increase the scale of the firm, which can be detrimental to shareholders' welfare, thus leading to overinvestment problem. However, the use of debt to finance investments prevents them from undertaking the negative NPV projects. On the other hand, debt overhang incentivizes firms to underinvest because (1) with excessive debt, the benefits of a profitable investment project will not only accrue to the shareholders but also to the debt holders; (2) high leverage implies lower financial flexibility which can lead to liquidity issues in the future (Myers 1977). This indicate a negative relation between debt and investments.

The relationship between investments and profitability of the firms is expected to be positive. High profits implies higher ability of firms to use retained earnings for investments. High profitability of firms gives an indication of the efficiency of investments which influences the decision of future investments (Odit and Chitoo, 2008).

Empirical literature

Using data on 10 developing countries, Booth et al. (2001) found a negative relation between leverage and firm's profits**.** Various other studies arrive at a similar conclusion (Rajan and Zingales, 1995; Shyam-Sunder and Myers, 1999; Long and Malitz, 1985; Titman and Wessels, 1988; Graham, 2000). Using data on publicly traded American firms, Frank and Goyal (2003) found that the POT is more relevant in the case of large firms. This effect gets diluted as more small firms are included. However, Rao et al (2019) find that POT is applicable for small and medium enterprises in India. McConnell and Servaes (1995) finds that firm's value is negatively correlated with leverage for high growth firms and positively related with leverage for low growth firms. The authors indicated that the negative effect dominates for firms with high growth opportunities as debt forces the management to not undertake positive NPV investment projects and the positive effect dominates for firms with low growth opportunities as debt prevents the management from undertaking the negative NPV projects. Using data on Canadian publicly traded companies, Aivazian et al. (2005) shows a negative relation between leverage and investment, the effect being stronger for low growth firms than for the high growth firms. Using data on Indian non-financial firms from 2004-2017, Shukla and Shaw (2020) finds that a firm's leverage adversely affects its investment activity after a threshold. Martinez-Carrascal and Ferrando (2008) found a positive relation between profitability and investment of non-financial corporations in six euro area countries. Using Annual Survey of industries (ASI) data on 19 major Indian states from 1983-84 and 2007-08, Basu and Das (2015) found that profit rate has a positive impact on investments, both in the short run and long run.

To the best of our knowledge, we are not aware of any study explains the recent investment slowdown in the Indian manufacturing sector after accounting for the potential simultaneity between the three variables i.e. fixed investments, leverage and profitability. We attempt to fill this research gap in our paper.

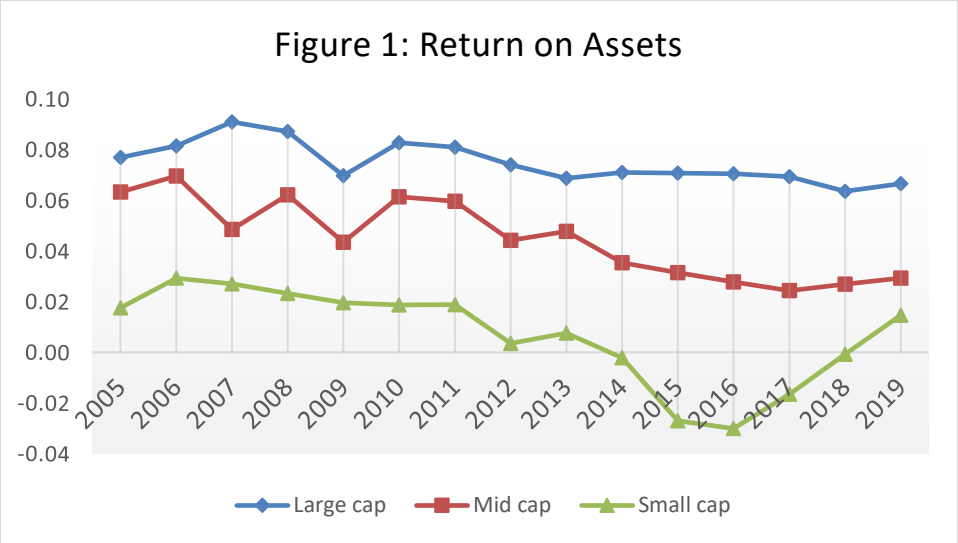
Data and Sample Selection

All firm level data on financial variables is extracted using the prowess database provided by the Center for Monitoring Indian Economy (CMIE). We have divided the manufacturing firms based on market capitalization into large cap, mid cap and small cap firms and selected top 300 firms in each category. We define small cap firms to be those with market capitalization less than Rs 1000 million, mid cap firms as those with market capitalization greater than Rs 1000 million but less than Rs 10,000 million and large cap firms of market capitalization greater than Rs 10000 million (as on March 2015). Then, we retained those firms for which values on key variables (debt, equity, profits, total assets, sales, and gross fixed assets) are not missing for more than five years in the entire 15 years period from 2005 to 2019. Our sample consists of 263 large cap firms, 284 mid cap firms and 257 small cap firms.

Stylized Facts

We analyse the financial situation of large, mid and small cap firms of different sectors. Figure 1 shows that the return on assets over the period 2005-2019 has shown downward trend for all the firms with a recovery phase in the later years particularly for small cap firms and mid cap firms.

The return on assets (ROA) declined for the three groups of firms, with the largest fall in small cap firms followed by mid-cap and large cap firms (Figure 1). Overall, the ROA has declined but largely remained positive in the large cap and mid-cap firms, it turned negative in the case of small cap firms in the period 2015-18. The negative ROA in the small cap firms is driven by sectors such as construction & real estate, consumer goods and FMCG and industrial equipment sectors, ports... minerals & metals, power generation/distribution and textiles. The industry-wise analysis is given in table 1. In construction & real estate, consumer goods and FMCG and industrial equipment sectors, ROA has significantly declined across all manufacturing firms over the period 2005-19.



Source: Author's calculation from Prowess database.

Table 1: Return on assets of manufacturing firms

	Large cap			Mid cap			Small cap		
Industry	**2005-10**	**2011-15**	**2016-19**	**2005-10**	**2011-15**	**2016-19**	**2005-10**	**2011-15**	**2016-19**
Automobiles	0.068	0.077	0.079	0.059	0.064	0.058	0.046	0.020	0.021
Chemicals	0.081	0.095	0.088	0.048	0.050	0.026	0.038	-0.007	0.027
Construction and Real Estate	0.077	0.036	0.038	0.067	0.028	0.031	0.005	-0.017	-0.022
Consumer Goods and FMCG	0.099	0.090	0.086	0.051	0.049	0.023	0.015	-0.015	-0.004
Industrial Equipment	0.084	0.064	0.060	0.074	0.055	0.037	0.026	-0.001	-0.024
Industrial Gases & Fuels	0.074	0.072	0.063	0.034	0.004	0.016	0.036	0.032	0.019
Oil Exploration and Refineries	0.065	0.040	0.043	0.057	-0.019	0.053	.	.	.
Paper, Media and Paper products	.	.	.	.	.	.	0.014	-0.010	0.045
Pharmaceuticals & Agro Business	0.092	0.095	0.075	0.063	0.042	0.009	-0.033	0.020	0.001
Ports, Steel, Glass, Coal, Mining , Mineral & Metals	0.112	0.076	0.071	0.064	0.020	0.009	0.044	-0.007	-0.025
Power Generation/ Distribution	0.052	0.050	0.047	0.038	0.034	0.012	-0.209	-0.061	-0.122
Rubber and plastics	.	.	.	.	.	.	0.011	0.023	0.025
Textiles	0.044	0.060	0.053	0.057	0.054	0.035	0.042	-0.004	-0.037
All industries	0.081	0.073	0.067	0.058	0.044	0.027	0.023	0.0001	-0.008

Source: Author's calculation from Prowess database.

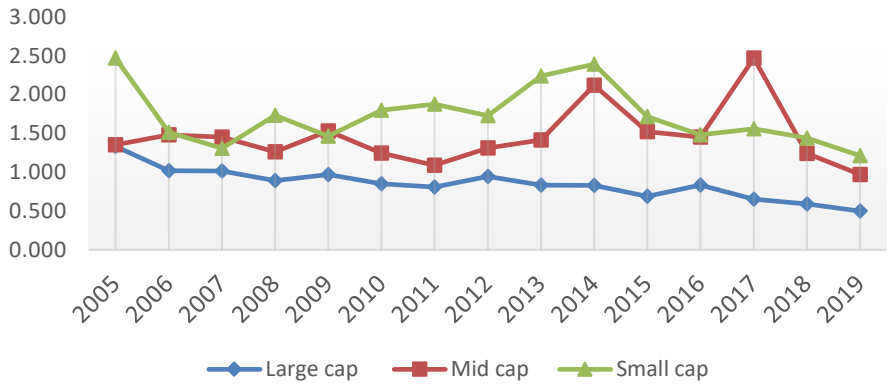
Debt to Equity ratio

The average debt equity (D/E) ratio of firms fell across all sectors during this period 2005-2019. This D/E ratio is based on total debt, short term plus long term. The declining debt equity ratio is in line with Chauhan (2017), which finds consistent deleveraging of non-financial firms in India since the liberalization. The D/E ratio has consistently declined for large cap firms for most years during 2005-2019 whereas the trend is mixed in mid and small cap with D/E ratio rising during 2011-15 and declining during 2016-19 particularly in chemicals, FMCG, Industrial gases and metal sectors (Figure 2 and Table 2).

Debt Structure

Tables 3, 4 and 5 show the composition of borrowings of large, mid and small cap firms respectively. The major sources of borrowings of large cap firms are from banks and foreign currency borrowings (FCB). For mid-cap and small cap firms, the major source of borrowings is from banks consisting of 51-76% of total borrowings from 2005 to 2019. The bank borrowings of large, mid and small cap firms have increased over this period. Moreover, both the short term and long term borrowings from banks have consistently increased over this period except only for 2017 and 2018.[1] The borrowings from the other major source for large cap firms, i.e. the foreign currency borrowings (FCB) have consistently declined over this period expect in 2011-13.

Figure 2: Debt to equity ratio



[1] See Appendix (Tables A2, A3 and A4)

Table 2 Debt equity ratio of manufacturing firms									
	Large cap			Mid cap			Small cap		
	2005-10	2011-15	2016-19	2005-10	2011-15	2016-19	2005-10	2011-15	2016-19
Automobiles	1.11	1.03	0.54	1.27	0.73	0.57	1.34	1.30	0.96
Chemicals	0.86	0.62	0.36	1.28	1.46	2.07	1.20	1.72	1.21
Construction and Real Estate	1.39	1.26	1.22	1.53	1.30	0.95	1.51	3.19	1.66
Consumer Goods and FMCG	1.15	0.68	0.57	1.45	1.34	2.27	1.32	3.35	0.78
Industrial Equipment	0.40	0.38	0.51	0.67	0.68	0.68	1.15	1.59	0.89
Industrial Gases & Fuels	0.61	0.61	0.41	2.01	1.26	3.26	1.04	1.22	0.71
Oil Exploration and Refineries	1.12	1.37	0.64	0.19	1.69	6.20	.	.	.
Paper, Media and Paper products	.	.	.	.	.	.	3.50	1.78	1.13
Pharmaceuticals & Agro Business	0.79	0.67	0.42	1.33	1.11	1.08	1.37	1.60	1.53
Ports, Steel, Glass, Coal, Mining, Minerals & Metals	0.97	0.79	0.84	1.88	2.52	2.06	1.38	2.35	2.04
Power Generation/ Distribution	0.78	0.79	0.76	1.20	0.89	1.00	1.19	0.93	0.44
Rubber and plastics	.	.	.	.	.	.	1.27	1.70	1.41
Textiles	2.10	1.41	0.93	1.57	2.22	0.98	3.15	1.91	1.74
All industries	1.01	0.82	0.64	1.39	1.49	1.53	1.71	1.99	1.42
Source: Author's calculation from Prowess database.									

Table 3: Trends in composition of borrowings (%) of large cap firms					
year	**Banks**	**Financial Institutions**	**Debentures and bonds**	**FC borrowings**	**Other borrowings**
2005	41.6	6.7	5.2	32.0	14.5
2006	47.3	5.4	3.2	31.2	13.0
2007	50.8	4.9	1.9	31.0	11.5
2008	54.3	4.7	1.1	30.3	9.6
2009	59.9	3.6	1.8	25.6	9.0
2010	54.3	4.9	3.6	25.9	11.3
2011	51.3	4.8	4.0	30.4	9.5
2012	47.2	3.3	3.7	32.9	13.0
2013	46.6	3.0	4.8	34.2	11.4
2014	49.4	2.9	5.1	32.0	10.6
2015	50.2	3.2	6.1	29.1	11.4
2016	50.0	2.3	6.2	27.3	14.2
2017	48.1	1.9	6.2	27.3	16.5
2018	50.8	1.8	5.6	25.4	16.3
2019	49.5	1.5	5.0	25.1	18.9
Source: Author's calculation from Prowess database.					

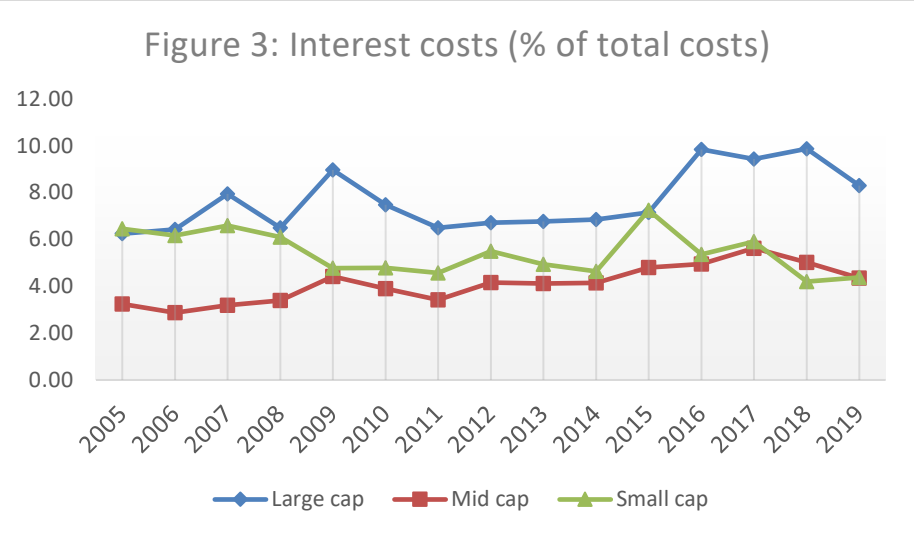
Table 4: Trends in composition of borrowings (%) of mid cap firms					
year	**Banks**	**Financial Institutions**	**Debentures and bonds**	**FC borrowings**	**Other borrowings**
2005	52.9	12.1	6.4	15.4	13.3
2006	55.0	9.6	6.7	16.9	11.8
2007	56.4	7.7	5.5	17.8	12.6
2008	61.4	6.5	4.0	17.8	10.3
2009	61.5	6.6	4.2	17.5	10.3
2010	63.7	4.5	4.5	18.1	9.3
2011	64.5	3.6	4.3	18.7	8.8
2012	64.5	3.4	3.3	18.6	10.2
2013	68.8	2.7	2.6	16.4	9.4
2014	73.8	2.7	2.4	12.3	8.7
2015	76.1	2.2	2.1	11.1	8.6
2016	75.0	2.8	1.9	10.4	9.9
2017	72.7	3.3	2.0	8.4	13.6
2018	69.3	4.6	1.9	7.7	16.5
2019	67.9	4.2	1.5	6.3	20.1
Source: Author's calculation from Prowess database.					

Table 5: Trends in composition of borrowings (%) of mid cap firms					
year	**Banks**	**Financial Institutions**	**Debentures and bonds**	**FC borrowings**	**Other borrowings**
2005	52.9	12.1	6.4	15.4	13.3
2006	55.0	9.6	6.7	16.9	11.8
2007	56.4	7.7	5.5	17.8	12.6
2008	61.4	6.5	4.0	17.8	10.3
2009	61.5	6.6	4.2	17.5	10.3
2010	63.7	4.5	4.5	18.1	9.3
2011	64.5	3.6	4.3	18.7	8.8
2012	64.5	3.4	3.3	18.6	10.2
2013	68.8	2.7	2.6	16.4	9.4
2014	73.8	2.7	2.4	12.3	8.7
2015	76.1	2.2	2.1	11.1	8.6
2016	75.0	2.8	1.9	10.4	9.9
2017	72.7	3.3	2.0	8.4	13.6
2018	69.3	4.6	1.9	7.7	16.5
2019	67.9	4.2	1.5	6.3	20.1
Source: Author's calculation from Prowess database.					

The total non-food gross bank credit to industry has risen from 2007-08 to 2019-20.[2] This holds for small, medium & large industries. The total non-food gross bank credit has increased for all the industries individually. Combining this with the earlier observation that the bank borrowings for our sample of firms are increasing over this period, it suggests that the declining debt equity ratio is not due to external borrowing constraints.

It is claimed that higher interest rates were a deterrent to investment. We see a slightly upward trend in interest cost to total cost ratio (Figure 3) despite a decline in the debt equity ratio. But the share of interest cost to total cost is very small and the increase in this share over the period 2005-19 is low. Both these observations does not support the hypothesis that high interest expenses has led to the investment slowdown in the manufacturing sector.

[2] See Appendix (Tables A5 and A6)



Source: Author's calculation from Prowess database.

Based on the credit ratings of firms,[3] large cap firms perform the best followed by mid-cap firms and then small cap firms. A majority of the large cap firms are rated in the highest safety or high safety, mid-cap firms are rated in the high safety or adequate safety and small cap firms are rated in the moderate safety.[4] As shown in figure 2, large cap firms also have the lowest debt equity ratio. This indicates that in order to maintain financial flexibility or higher credit worthiness, large cap firms are having lower leverage, which is consistent with the financial flexibility theory.

Growth in Gross Fixed Assets, Shareholders funds and Sales of manufacturing firms

Tables 6, 7 and 8 shows the average annual growth in gross fixed assets, shareholders' funds and sales. Among all firms, the growth in shareholders' funds is higher than the growth in gross fixed assets in almost all sectors during 2006-10 and 2016-19. This supports our earlier finding that the debt equity ratio fell.

However, the growth in shareholders' funds is lower than the growth in gross fixed assets during 2011-15. In large cap firms, this trend was driven by sectors such as construction and real estate, industrial gases & fuels and automobiles. In mid cap firms, it was driven by all sectors except automobiles, chemicals, power and textiles.

[3] Data on credit ratings is obtained from CMIE PACE.

[4] See Appendix (Figure A1).

In small cap firms, it was driven by negative growth rate in shareholders' funds in sectors such as pharmaceuticals & agro business and ports, steel, glass, coal, mining, minerals & metals.

In large cap firms, sales growth is higher than growth in gross fixed assets during period 2005-10 and 2015-19 but it lower in 2011-15. In mid cap firms, the growth in sales is higher than growth in gross fixed assets during 2011-15 and 2016-19 whereas it is lower in 2006-10. In small cap firms, the growth rate in sales is higher than the average growth rate in gross fixed assets in all time periods. This would reflect improved capacity utilisation. But despite higher capacity utilisation, investment slowed.

Table 6: Average annual growth rate (%) in GFA, Shareholders funds and sales of large cap firms

Large cap	Gross fixed assets			Shareholders funds			Sales		
	2006-10	2011-15	2016-19	2006-10	2011-15	2016-19	2006-10	2011-15	2016-19
Automobiles	17.88	14.73	6.93	25.8	14.6	17.1	15.4	12.6	8.8
Chemicals	7.86	11.61	4.53	18.4	16.6	13.1	14.3	13.9	4.3
Construction and Real Estate	18.31	17.48	0.20	41.6	12.7	9.5	22.0	11.4	4.4
Consumer Goods and FMCG	14.71	12.67	4.27	20.5	12.4	11.8	18.7	14.6	0.3
Industrial Equipment	13.09	11.38	-1.40	28.0	11.8	5.9	22.3	6.8	6.7
Industrial Gases & Fuels	10.92	14.98	-1.00	16.4	13.0	11.5	19.8	21.9	6.1
Oil Exploration and Refineries	9.76	2.12	5.42	10.8	-1.2	10.9	16.0	6.8	6.9
Pharmaceuticals & Agro Business	16.76	13.11	9.92	24.6	18.4	12.1	18.7	12.9	5.6
Ports, Steel, Glass, Coal, Mining, Minerals & Metals	12.98	21.33	12.14	30.0	12.3	6.0	16.4	8.8	9.3
Power Generation/ Distribution	10.28	14.49	-4.70	11.9	8.0	4.9	15.0	10.2	3.4
Textiles	15.21	11.01	3.32	18.1	13.2	20.2	19.5	16.6	2.0
All industries	11.16	11.65	4.13	18.3	9.7	9.8	16.5	8.5	6.3

Source: Author's calculation from Prowess database.

Table 7: Average annual growth rate (%) in GFA, Shareholders funds and sales of mid cap firms

Mid cap	Gross fixed assets			Shareholders funds			Sales		
	2006-10	2011-15	2016-19	2006-10	2011-15	2016-19	2006-10	2011-15	2016-19
Automobiles	16.90	11.24	3.98	19.6	11.5	13.2	9.5	12.1	7.6
Chemicals	11.92	9.30	1.85	21.8	11.6	11.2	10.5	15.4	4.3
Construction and Real Estate	14.75	12.00	6.82	61.0	8.5	20.0	22.8	8.0	15.3
Consumer Goods and FMCG	6.59	11.90	1.92	10.4	11.0	5.9	7.9	15.4	3.0
Industrial Equipment	18.53	14.82	-1.62	28.8	5.9	3.5	17.5	8.6	3.2
Industrial Gases & Fuels	22.78	14.77	-14.54	29.0	5.4	5.0	27.6	-14.7	4.6
Oil Exploration and Refineries	23.92	6.49	1.00	34.1	-8.8	14.0	18.8	8.8	6.1
Pharmaceuticals & Agro Business	12.89	11.02	-12.05	17.7	-0.1	17.9	16.8	11.0	0.5
Ports, Steel, Glass, Coal, Mining, Minerals & Metals	18.77	9.04	-2.98	29.4	4.1	11.3	14.8	6.8	3.8
Power Generation/ Distribution	24.18	14.89	7.84	25.4	17.5	12.0	29.2	28.3	8.6
Textiles	14.12	5.84	-2.56	14.4	8.7	8.3	11.8	10.4	3.3
All industries	13.73	9.60	-1.30	21.4	7.4	10.3	12.8	10.9	3.8

Source: Author's calculation from Prowess database.

To analyse the change in GFA, we divide the companies into three groups. Group 1 consists of companies whose real capital stock has declined during this period. Real capital stock is calculated using the perpetual inventory method. Data for Gross Fixed Capital Formation deflator and GDP at constant prices is obtained from RBI, Handbook of Statistics on Indian Economy. For group 2, the increase in the nominal value of the capital stock was less than the product of the rate of inflation of GFCF and of the real growth of GDP, namely their importance relative to GDP declined during this period. Group 3 consists of companies whose capital stock grew faster than nominal GDP, namely they were fast growing companies. The large cap firms have the highest percentage of firms in the fast growing sector followed by mid-cap and small cap firms.

Table 8: Average annual growth rate (%) in GFA, Shareholders funds and sales of small cap firms									
Small cap	**Gross fixed assets**			**Shareholders funds**			**Sales**		
	2006-10	**2011-15**	**2016-19**	**2006-10**	**2011-15**	**2016-19**	**2006-10**	**2011-15**	**2016-19**
Automobiles	22.25	14.31	-2.13	19.9	1.3	36.5	14.5	9.6	4.4
Chemicals	3.23	-0.17	1.87	22.9	-8.0	56.3	4.4	7.8	10.3
Construction and Real Estate	15.55	11.54	27.89	37.0	9.9	-1.8	21.3	13.7	5.9
Consumer Goods and FMCG	10.67	13.60	2.72	9.0	0.1	-2.2	12.2	5.5	1.6
Industrial Equipment	8.77	4.46	0.48	25.4	2.0	7.2	10.4	6.5	11.6
Industrial Gases & Fuels	23.11	18.51	0.87	33.0	15.2	5.0	20.2	15.3	-2.2
Paper, Media and Paper products	10.79	2.35	17.25	13.2	-4.0	50.3	9.5	7.4	15.5
Pharmaceuticals & Agro Business	7.79	0.74	-2.03	11.4	-13.4	11.6	12.7	7.7	2.8
Ports, Steel, Glass, Coal, Mining, Minerals & Metals	10.14	8.25	0.46	38.9	-17.8	40.5	18.7	0.1	-5.2
Power Generation/ Distribution	-1.32	0.67	11.51	15.3	13.7	-1.7	19.6	13.9	13.4
Rubber and plastics	4.22	6.03	8.21	-1.9	52.3	21.3	13.2	12.6	4.5
Textiles	8.01	3.29	-3.98	41.7	11.0	28.7	15.2	7.2	-3.7
All industries	8.14	4.87	-0.05	23.2	-9.7	20.3	13.5	5.1	0.8
Source: Author's calculation from Prowess database.									

Table 9: Change in Gross Fixed Assets			
	Large Cap (in %)	Mid Cap (in %)	Small Cap (in %)
Group 1	39.46	52.36	81.53
Group 2	14.56	9.45	7.23
Group 3	45.98	38.18	11.24
Source: Author's calculation from Prowess database.			

Methodology

In the following section, we present a model to identify the factors contributing to investments in manufacturing firms and to analyse the interactions of the three important variables identified i.e. growth of fixed assets (INV), debt equity ratio (DE) and the profitability ratio (ROA) using a structural equation model. In the presence of endogenous variables, OLS estimation produces biased and inconsistent estimates.

Therefore, we have employed the two-step generalized method of moments (GMM) approach to estimate the equations by taking the exogenous variables in the equations as instruments in the moment conditions. The two step feasible efficient GMM estimates are more efficient than the traditional 2SLS estimates in the presence of heteroscedasticity and/or autocorrelation and when the equation is over-identified (Greene, 2012). Otherwise, GMM estimates is exactly the same as 2SLS estimates. We do not report the R^2 of the estimated regression equations as the R2 in the system estimated techniques does not necessarily lie between zero and one (Goldberger, 1991). Return on assets, debt equity ratio, and annual changes in the gross fixed assets are used as a measure of profitability, leverage and investment respectively. To capture the dynamic effects of the three identified endogenous variables, namely change in gross fixed assets, debt-equity ratio and return on assets, we include the one time period lagged variable (t-1) in the regression equations.

The three equations are as follows:

$$INV_{it} = \alpha_i + \beta_1 INV_{it-1} + \beta_2 ROA_{it-1} + \beta_3 DE_{it-1} + \beta_4 SIZE_{it}, + \beta_5 AGE_{it} + \beta_6 GR_{it} + \beta_7 MBV_{it} + \beta_8 CF_{it-1} + n_t + \varepsilon_{1it} \quad (1)$$

$$DE_{it} = \alpha_i + \beta_1 DE_{it-1} + \beta_2 INV_{it-1} + \beta_3 ROA_{it-1} + \beta_4 SIZE_{it}, + \beta_5 AGE_{it} + \beta_6 GR_{it} + \beta_7 NDTS_{it} + n_t + \varepsilon_{2it} \quad (2)$$

$$ROA_{it} = \alpha i + \beta_1 ROA_{it-1} + \beta_2 DE_{it-1} + \beta_3 INV_{it-1} + \beta_4 SIZE_{it}, + \beta_5 AGE_{it} + \beta_6 GR_{it} + \beta_7 LIQ_{it-1} + \beta_8 MBV_{it-1} + \beta_9 TAX_{it} + n_t + \varepsilon_{3it} \quad (3)$$

where,

i	firm
t	year
INV	Investment Rate = $(GFA_t - GFA_{t-1})/GFA_{t-1}$
ROA	Return on Assets = Profit after tax/Total Assets
DE	Debt to Equity Ratio
SIZE	natural log of sales
GR	Percentage change in sales YOY
AGE	natural log of age of firm
MBV	Market to book value = Market Capitalization/Total Assets
LIQ	Liquidity = current assets/ current liabilities
CF	Cash flow/capital = (Net income + depreciation – dividend – change in capital expenditure)/GFA
NDTS	Non-debt Tax Shields = Depreciation/ Total Assets
TAX	Tax burden = Corporate tax/ Total costs
a i	firm fixed effects

n_t year fixed effects

ε_{jit} error term; j=1,2,3

The hausman specification test suggest the use of a fixed effects model. So, we have employed a fixed effects model. The hausman endogeneity test indicates that the three variables (Investment, leverage and profitability) are endogenous in equations (1) and (3). In equation (2), only leverage and profitability are endogenous i.e. investment is taken as an exogenous variable in equation (2). Since these financial variables tend to be persistent, we estimate the dynamic panel data regression model. The regression results are presented in table 8, 9 and 10 taking investment, debt equity ratio and return on assets as the dependent variable respectively. The firm level data pertaining to the variables in the regression are winsorized at 1% to exclude the outliers in the data. The regression analysis is done separately for large cap, mid-cap and small-cap firms. In each category, column (1) shows the OLS fixed effects regression without dynamic effects, column (2) shows the two step GMM regression without dynamic effects and column (3) shows the two step GMM regression with dynamic effects. The p value of the Hansen's J statistic for each regression is stated in tables 8-10. We fail to reject the null hypothesis in all the regressions, which provides support for the overall validity of the instruments. Moreover, the autocorrelation test (m2) for which the p values are specified in tables 8-10 indicates that there is no second-order serial correlation implying that the moment conditions are correctly specified.

Control variables

Size of the firm: The size of the firm is measured by the natural log of sales. Leverage is expected to have a direct relation with firm size as the accessibility of external funds is better in larger firms as compared to the small firms. It is also expected to have a positive relation with investment as larger firms have more resources available to raise funds for investment. Larger firms tends to have high profitability due to economies of scale and higher borrowing capacity. Therefore, we expect a positive relation between firm size and ROA.

Growth of firm (GR): It is measured as year-on-year percentage change in sales. A priori, higher growth of firms is expected to be positively associated with investment, and profitability of firms. Its effect on leverage can be uncertain. On one hand, as firms grow and expand, it will prefer internal financing to debt according to the POT, thereby reducing debt. Higher growth is also associated with higher volatility in firm's value and thereby risk, incentivizing the firms to decrease their debt. On the other

hand, high growth firms may require to raise funds externally if their internal funds are exhausted.

Age of firm: Older firms are generally associated with higher credit worthiness than newer firms. Hence their capacity to avail debt is higher. The effect of firm's age on its investment and profit is uncertain i.e. it can be either positive or negative. On one hand, older firms have higher experience but are also prone to inertia whereas newer firms lack experience but are generally more agile and flexible.

Cash Flow: Higher cash flows implies higher availability of internal funds for investments. Thus, we expect a investment to be positively correlated with cash flows.

Liquidity: Liquidity is expected to be directly related to profitability as firms with high liquid assets enjoy high credit worthiness due to their ability to meet their debt obligation which enables them to raise funds easily and increase their profits.

Market to Book Value (MBV): It is measured as the market capitalization divided by book value of assets. Higher MBV implies that the firm is overvalued and there is potential growth opportunities. Higher growth opportunity is expected to increase investments of the firm.

Non-debt Tax Shields: It is measured as depreciation divided by total assets. It is expected to have an inverse association with leverage as it can be seen as an alternative to tax shield on leverage (interest tax shield).
Higher the depreciation expenses, lower the return would be for the firms implying a negative relation between them. But if we consider the tax shield of depreciation then this shares a positive relation with ROA as higher tax shield will result in higher return.

Tax burden: It is calculated as the share of taxes in total costs of sales. Corporate tax is expected to be negatively associated with ROA since higher taxes implies less PAT.

Regression results:
The regression results are presented in tables 11, 12, and 13. We find that the behaviour of the financial variables is similar for large cap and mid-cap firms, which is somewhat distinct from the small cap firms.

Investment is negatively associated with the debt equity ratio, but the effect is insignificant. Profitability is also insignificant in affecting the investment of all firms. The sales growth is significant in positively affecting the investment of large and mid-

cap firms, and the size of firms measured in terms of the level of sales is significant in positively affecting the investment for small cap firms. In mid-cap and large cap firms, however, investment is negatively associated with the size of the firms. Investment tend to decrease with age, the effect being significant only for large cap firms. As expected, investment is positively associated with cash flow, the effect being significant only for large cap firms. The association of investment with the market to book value is significant only for small cap firms with a positive association. In small cap firms, the high growth opportunity firms have higher investments. The dynamic effect of investment is significant only for small cap firms, which shows a positive association.

Debt equity ratio is negatively associated with ROA for large cap and mid cap firms suggesting a pattern predicted by Pecking order theory, while for small cap firms the association is insignificant but positive. Debt equity ratio is negatively associated with investments of large and small firms suggesting firms are using other sources of funding the investments, though the effect is insignificant. For mid-cap firms, this effect is positive and significant. Debt equity ratio is increasing in the size of the firms, particularly the mid-cap and small cap firms. The other variables such as age, growth of sales and non-debt tax shield are insignificant in affecting the debt equity ratio. We see significant dynamic effects of debt equity ratio only in the case of large cap firms, with a negative association. The negative association indicates a downward revision in the debt equity ratio of these firms over the period.

As expected, ROA is positively associated with investments, the effect being significant for large firms. The slowdown in investments has adversely affected the profits, particularly for large cap firms. The debt equity ratio is insignificant in affecting the ROA. The sales growth is significant in positively affecting the ROA of all firms, and the size of firms is significant in positively affecting the investment for small cap firms. As expected, the ROA is positively associated with the market to book value for large cap and small cap firms and the effect is significant. As expected, the tax burden is significant in negatively affecting the ROA of small cap firms. Surprisingly, ROA is positively associated with tax burden for large cap and mid-cap firms. While ROA is positively associated with the firm's age for small cap firms, the effect is insignificant for mid-cap and large cap firms. Liquidity is insignificant affecting the ROA of all firms. The ROA shows significant dynamic effects for all firms. This suggests that profitability is directly affecting firms' ability to raise resources and therefore future profitability.

In brief, we find evidence in support of Pecking Order Theory in the capital structure of firms, particularly for large cap and mid-cap firms. The POT effect is

stronger for large cap firms than for the mid cap firms. This finding is in accordance with Frank and Goyal (2003) which indicated that pecking order theory works best for large firms while paradoxically, the small firms which can have high information asymmetries do not behave according to this theory. Leverage is largely insignificant in affecting the investments and profitability of firms. Unlike other studies (Shukla and Shaw, 2020), we do not find evidence to support the hypothesis that debt overhang has caused the investment slowdown in the Indian manufacturing sector. The positive association of profitability with investments, particularly for the large cap firms, in the Indian manufacturing sector is consistent with the finding of Basu and Das (2015). In addition, the decline in the growth of sales is found to be a major determinant in explaining the investment slowdown and declining profits of all firms. For small cap firms, the size of the firm is also a major determinant of behaviour of investments and profitability.

Table 10: Regression results

Dependent variable: Investment to capital ratio									
	Large cap			Mid cap			Small cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)
L(INV)			0.050			-0.009			0.056**
			(0.035)			(0.053)			(0.023)
L(ROA)	0.292**	0.399	-0.079	0.120	0.469	-0.018	0.036	-0.044	0.129
	(0.129)	(0.811)	(0.177)	(0.116)	(0.591)	(0.165)	(0.074)	(0.187)	(0.098)
L(DE)	-0.005***	-0.002	-0.000	0.000	-0.000	-0.000	-0.000	-0.001	-0.001
	(0.002)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
SIZE	0.037	-0.003	-0.003	0.003	0.075*	-0.181*	0.024***	0.048***	0.028***
	(0.027)	(0.009)	(0.008)	(0.023)	(0.044)	(0.102)	(0.004)	(0.013)	(0.008)
AGE	-0.223***	-0.054***	-0.042***	-0.099	-0.046**	-0.265	-0.041*	-0.036	-0.023
	(0.074)	(0.014)	(0.016)	(0.102)	(0.021)	(0.185)	(0.024)	(0.032)	(0.022)
GR	0.179***	0.202**	0.166*	0.101***	0.146***	0.183**	0.071**	0.060**	0.036
	(0.067)	(0.088)	(0.085)	(0.034)	(0.035)	(0.072)	(0.029)	(0.029)	(0.024)
L(CF)	0.059***	-0.079	0.089**	0.145***	-0.144	0.081	0.064***	0.078	0.039
	(0.021)	(0.184)	(0.043)	(0.042)	(0.228)	(0.061)	(0.023)	(0.160)	(0.050)
MBV	-0.007	0.006	-0.019	-0.010**	0.136	-0.034	0.005	0.073**	0.041*
	(0.006)	(0.026)	(0.037)	(0.005)	(0.087)	(0.049)	(0.004)	(0.032)	(0.022)
Observations	3,355	3,128	3,337	3,118	2,891	2,866	2,567	2,365	2,546
Number of firms	262	262	262	284	284	284	256	256	256
Instruments		45	60		45	59		46	60
m1 (p value)		0.001	0.000		0.000	0.000		0.001	0.000
m2 (p value)		0.524	0.495		0.322	0.556		0.379	0.777
Hansen's J test (p value)		0.16	0.256		0.418	0.257		0.51	0.354
Firm and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1									

Table 11: Regression results

Dependent variable: Debt equity ratio									
	Large cap			Mid cap			Small cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)
L(ROA)	-1.375	-3.630*	-2.977***	-1.877	-2.385*	-1.279	1.356	1.015	1.433
	(1.380)	(1.934)	(1.109)	(1.363)	(1.289)	(1.501)	(1.136)	(1.381)	(1.007)
L(DE)			0.282**			0.060			0.105*
			(0.121)			(0.144)			(0.058)
SIZE	0.344	0.446	0.022	0.359	0.245*	0.211*	0.392***	0.747**	0.266***
	(0.318)	(1.070)	(0.030)	(0.315)	(0.127)	(0.116)	(0.143)	(0.361)	(0.080)
AGE	0.038	-1.517	-0.100	-4.066*	0.009	-0.119	0.312	-1.737	0.265
	(0.601)	(2.554)	(0.072)	(2.170)	(0.187)	(0.229)	(0.394)	(3.827)	(0.289)
GR	0.043	3.099	0.171	-0.634	-0.559	-4.509	-0.083	-0.534	0.066
	(0.063)	(3.729)	(0.259)	(0.612)	(0.613)	(3.073)	(0.439)	(1.460)	(0.515)
L(INV)	-0.441	-3.516*	-0.680	0.225	0.954*	1.277**	0.427	-0.346	-0.080
	(0.532)	(1.939)	(1.175)	(0.282)	(0.520)	(0.615)	(0.374)	(3.250)	(3.190)
NDTS	6.521	-96.877	-0.621	10.557	17.667	-7.965	-1.027	3.597	4.437
	(4.856)	(108.446)	(1.783)	(11.050)	(31.316)	(7.475)	(5.278)	(9.071)	(5.155)
Observations	3,438	3,075	3,056	3,645	3,376	3,339	3,240	2,862	2,841
Number of firms	263	262	263	284	284	284	257	257	257
Instruments		31	47		33	49		32	50
m1 (p value)		0.008	0.031		0.024	0.046		0.006	0.007
m2 (p value)		0.284	0.733		0.615	0.607		0.278	0.994
Hansen's J test (p value)		0.555	0.144		0.369	0.419		0.62	0.373
Firm and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1									

Table 12: Regression results

Dependent variable: Return on Assets									
	Large cap			Mid cap			Small cap		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
VARIABLES	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)	FE	GMM	GMM (DP)
L(ROA)			0.271***			0.184***			0.370***
			(0.061)			(0.067)			(0.056)
L(INV)	0.002	0.005	0.006*	-0.005	-0.001	0.002	-0.003	0.004	0.003
	(0.004)	(0.006)	(0.004)	(0.004)	(0.007)	(0.007)	(0.005)	(0.010)	(0.007)
L(DE)	-0.005*	-0.005	-0.004	0.000	0.000	0.000	0.001	0.000	0.000
	(0.003)	(0.005)	(0.006)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
SIZE	0.025***	0.001	-0.001	0.042***	0.013	0.006	0.017***	0.037***	0.016***
	(0.006)	(0.004)	(0.003)	(0.008)	(0.009)	(0.007)	(0.005)	(0.011)	(0.005)
AGE	-0.045**	0.000	0.004	-0.030	-0.002	-0.004	-0.009	0.026	0.031**
	(0.022)	(0.007)	(0.006)	(0.022)	(0.009)	(0.007)	(0.010)	(0.025)	(0.014)
GR	0.020***	0.016**	0.020**	0.024***	0.022***	0.025***	0.033***	0.030*	0.030**
	(0.005)	(0.008)	(0.009)	(0.006)	(0.008)	(0.006)	(0.011)	(0.016)	(0.013)
L(LIQ)	0.002	-0.002	-0.014	0.004**	0.043**	0.018	0.004**	0.081	0.023
	(0.002)	(0.016)	(0.011)	(0.002)	(0.018)	(0.013)	(0.001)	(0.054)	(0.014)
L(MBV)	0.008***	0.040***	0.019**	0.004**	-0.014	-0.006	0.002	0.038***	0.024**
	(0.002)	(0.010)	(0.008)	(0.002)	(0.009)	(0.006)	(0.002)	(0.013)	(0.011)
TAX	0.320***	0.347	0.374**	0.467***	0.858***	0.787**	0.111	-1.928***	-1.824***
	(0.047)	(0.244)	(0.177)	(0.077)	(0.313)	(0.313)	(0.125)	(0.324)	(0.174)
Observations	3,307	3,296	3,295	3,152	3,152	3,152	2,504	2,499	2,494
Number of firms	263	262	262	284	284	284	253	253	253
Instruments		47	61		47	61		47	61
m1 (p value)		0.002	0.003		0.002	0.007		0.004	0.014
m2 (p value)		0.483	0.679		0.485	0.332		0.125	0.684
Hansen's J test (p value)		0.414	0.31		0.269	0.186		0.759	0.344
Firm and Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1									

Conclusion

We analysed the slowdown in the growth of assets of firms and the decline in the rate of profit of different sized firms over 2005-19. The decline in asset growth was hypothesized to be a consequence of financial distress. We find that debt equity ratio usually declined over this period. This declining trend in debt equity ratio together with the relatively small share of interest costs in total costs and only a small increase in this share do not support the hypothesis that financial stress caused the slowdown in investment. The slowdown in asset growth was mainly because of the slowdown in sales growth and the decline in rate of return. The increase in shareholder funds relative to increase in gross fixed assets and in debt is higher in small cap firms than in mid-cap firms and large cap firms which points to debt conservatism and that firms are following the pecking order theory of capital structure.

Looking at the composition of borrowings, we find that there has been an increase in the bank borrowings, which is the major source of borrowings in all firms. The other major source of borrowings for large cap firms i.e. foreign currency borrowing has declined. In the selected sample of firms, credit worthiness is highest for large cap firms, followed by mid-cap and small cap firms. Returns on assets fell across all firm sizes with a slight recovery in the later phase and considerable variation across sectors. The highest fall in return on assets was registered in the case of small cap firms. In terms of gross fixed assets, a considerable proportion of firms in the large cap and mid-cap is in the fastest growing sector as opposed to the small cap firms.

In the regression analysis, we find evidence in support of Pecking Order Theory in the capital structure of firms, particularly for large cap and mid-cap firms. We find that the POT effect is stronger in the case of large cap firms than the mid-cap firms. The slowdown in investments is correlated with declining profits, particularly for large cap firms. Our findings suggest that manufacturing firms, particularly the larger firms, are practicing debt conservatism. The capital structure of firms is largely insignificant in explaining the declining capital expenditure and profitability of these manufacturing firms. Thus, we find no significant evidence in support of the hypothesis that financial distress has caused decline in investments of firms.

In addition, we found that sales growth of firms is a major determinant of the declining investments and profits. For small cap firms, the size of the firms measured in terms of sales is also a major determinant in explaining the behaviour of these two

variables. Therefore, we suggest that measures to increase demand can help in reviving the sales growth of firms and thereby private investments and profits.

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Appendix

Table A1: Distribution of firms			
Industry	**Large cap**	**Mid cap**	**Small cap**
Automobiles	29	29	13
Chemicals	21	61	28
Construction and Real Estate	28	21	7
Consumer Goods and FMCG	40	33	23
Industrial Equipment	38	27	29
Industrial Gases & Fuels	4	2	2
Oil Exploration and Refineries	9	3	.
Paper, Media and Paper products	.	.	8
Pharmaceuticals & Agro Business	43	28	31
Ports, Steel, Glass, Coal, Mining, Minerals & Metals	19	45	44
Power Generation/Distribution	13	5	2
Rubber and plastics	.	.	22
Textiles	19	30	48
Total	263	284	257

Table A2: Trends in composition of short term and long term borrowings (%) of large cap firms[5]

	Long term borrowings					Short term borrowings				
Year	Banks	FIs	Debentures and bonds	FCB	others borrowings	Banks	FIs	Debentures and bonds	FCB	others borrowings
2011	31.6	13.5	28.6	24.1	2.3	21.8	5.8	12.5	55.8	4.1
2012	27.9	9.6	33.8	25.5	3.2	20.8	9.0	7.3	56.8	6.1
2013	29.2	8.8	32.9	26.6	2.6	18.5	5.1	7.8	63.6	5.0
2014	29.4	8.4	31.2	28.6	2.3	21.6	5.5	0.0	67.8	5.1
2015	29.5	7.5	34.4	26.7	1.8	23.0	17.3	18.5	35.4	5.7
2016	30.9	4.8	35.1	27.1	2.1	27.3	20.5	1.4	43.6	7.2
2017	29.3	4.6	38.6	25.7	1.8	20.5	13.1	7.2	54.2	5.1
2018	27.9	4.5	41.7	24.3	1.6	26.0	14.9	12.3	42.7	4.1
2019	25.1	3.4	41.6	28.7	1.3	26.7	16.9	11.8	40.9	3.7

Source: Author's calculation from Prowess database.

[5] Data for long term borrowings and short term borrowings is available from 2011 onwards (Source: Prowess, CMIE).

Table A3: Trends in composition of short term and long term borrowings (%) of mid cap firms										
	Long term borrowings					Short term borrowings				
Year	Banks	FIs	Debentures and bonds	FCB	others borrowings	Banks	FIs	Debentures and bonds	FCB	others borrowings
2011	30.5	12.5	21.4	32.3	3.2	30.8	5.0	27.0	32.8	4.4
2012	32.2	12.3	21.0	31.0	3.5	41.5	6.4	13.7	32.0	6.4
2013	37.8	12.1	17.0	29.9	3.3	42.5	4.2	11.7	36.6	5.1
2014	40.8	11.3	19.1	25.7	3.1	60.8	5.0	0.0	27.7	6.5
2015	47.6	8.9	21.2	19.5	2.9	64.4	6.8	0.0	22.7	6.1
2016	45.8	9.1	21.8	20.9	2.4	66.9	3.9	0.0	23.5	5.6
2017	38.4	13.5	25.5	20.2	2.4	58.6	3.1	12.3	21.9	4.2
2018	33.1	16.8	28.2	19.1	2.7	57.9	6.0	9.8	21.4	4.9
2019	39.7	16.2	23.1	17.5	3.5	50.9	11.5	20.8	11.2	5.6
Source: Author's calculation from Prowess database.										

Table A4: Trends in composition of short term and long term borrowings (%) of small cap firms										
	Long term borrowings					Short term borrowings				
Year	Banks	FIs	Debentures and bonds	FCB	others borrowings	Banks	FIs	Debentures and bonds	FCB	others borrowings
2011	21.0	24.4	28.2	22.9	3.5	57.3	13.0	0.0	22.4	7.3
2012	21.6	9.7	28.1	34.7	5.9	63.0	10.8	0.0	15.5	10.7
2013	31.4	7.0	19.0	37.2	5.3	26.6	6.1	53.3	8.1	5.9
2014	34.9	4.3	17.5	38.0	5.3	61.1	3.8	0.0	22.2	12.9
2015	38.5	3.5	31.9	20.9	5.1	61.0	5.7	0.0	19.3	14.1
2016	40.7	3.5	31.1	20.1	4.6	61.3	5.8	0.0	20.2	12.7
2017	26.6	3.5	52.0	15.4	2.5	50.8	17.7	0.0	25.6	5.9
2018	37.0	5.9	14.6	35.5	7.0	25.9	59.9	0.0	9.7	4.5
2019	25.6	20.3	19.1	29.9	5.1	24.9	56.7	0.0	13.6	4.8
Source: Author's calculation from Prowess database.										

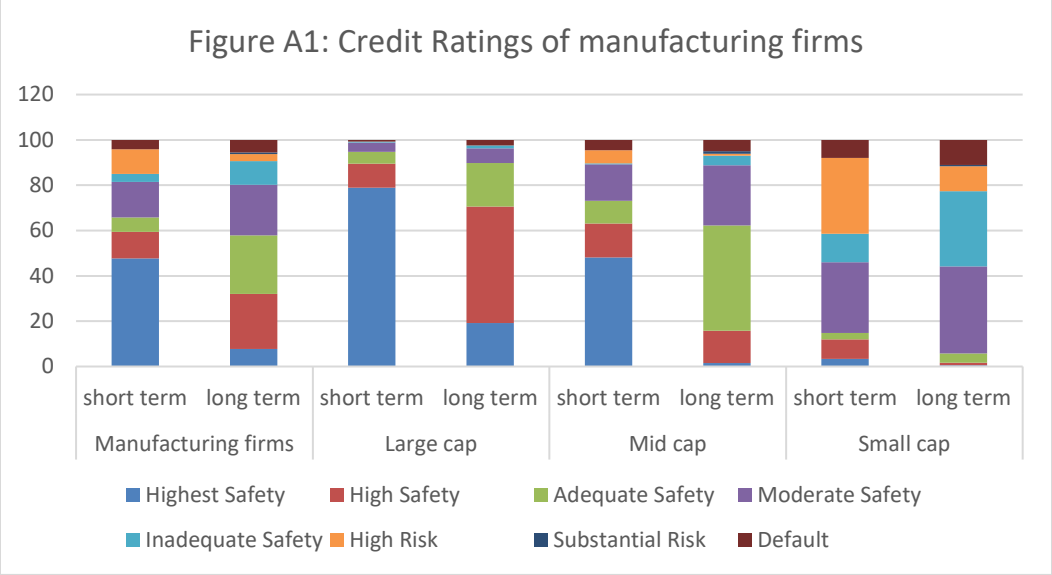
Table A5: Industry-wise deployment of gross bank credit

	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
A	122.8	142.4	180.8	254.8	324.5	346.4	358.5	359.5	390.2	345.0	413.1	417.5
B	494.0	537.8	656.8	772.5	941.5	1173.7	1462.5	1715.0	1500.9	1455.2	1553.6	1570.6
C	62.9	84.1	109.7	133.7	150.6	165.1	182.9	186.5	181.5	172.6	155.8	146.6
D	964.0	1027.0	1213.8	1461.0	1594.1	1835.4	2022.1	2019.2	2058.0	1963.0	2099.0	2035.5
E	57.4	61.5	62.3	73.7	76.3	86.7	102.1	102.5	105.0	107.1	113.1	110.7
F	31.6	41.4	43.7	49.7	61.5	76.7	94.2	98.3	94.9	105.2	108.6	119.7
G	134.7	159.8	190.7	213.2	249.8	282.7	328.2	340.7	355.1	326.2	306.3	303.2
H	420.7	681.5	785.8	509.9	611.8	643.3	648.4	561.5	512.3	595.4	651.3	631.4
I	625.6	755.6	857.1	1088.5	1269.9	1592.4	1663.4	1544.9	1645.3	1724.3	1629.9	1914.8
J	112.1	135.9	156.2	259.1	299.0	312.2	370.7	377.7	373.7	391.7	423.8	458.0
K	27.8	42.4	48.3	54.8	62.7	74.5	87.0	88.4	88.9	79.3	84.5	98.9
L	125.4	192.2	247.2	296.2	369.1	458.6	539.3	560.4	543.3	542.5	525.9	556.8
M	1075.9	1287.6	1629.3	2144.5	2618.1	3141.2	3607.8	3853.9	4160.2	4209.6	4160.2	3715.6
N	544.4	658.1	738.2	933.2	1130.1	1284.5	1463.6	1540.1	1541.7	1496.2	1553.2	1686.2
O	293.2	346.4	387.8	457.9	517.8	588.6	665.3	682.1	689.9	735.7	787.4	798.6
P	251.0	285.4	317.5	400.1	513.3	611.4	698.9	718.2	727.3	690.4	726.7	720.1
Q	279.5	385.1	442.2	434.5	486.2	521.7	625.7	743.0	745.4	822.3	900.7	994.7
R	2053.4	2699.7	3798.9	5234.1	6299.9	7297.2	8363.6	9245.3	9648.1	9063.9	8909.4	10559.2
S	907.0	1020.3	1248.2	1360.5	1797.2	1809.7	1880.6	1839.3	1945.4	1972.9	1890.2	2019.5

Source: Handbook of Statistics on Indian Economy, Reserve Bank of India.

A	Mining & Quarrying (incl. Coal)
B	Food Processing
C	Beverage & Tobacco
D	Textiles
E	Leather & Leather Products
F	Wood & Wood Products
G	Paper & Paper Products
H	Petroleum, Coal Products & Nuclear Fuels
I	Chemicals & Chemical Products
J	Rubber, Plastic & their Products
K	Glass & Glassware
L	Cement & Cement Products
M	Basic Metal & Metal Product
N	All Engineering
O	Vehicles, Vehicle Parts & Transport Equipment
P	Gems & Jewellery
Q	Construction
R	Infrastructure
S	Other Industries

Table A6: Trends in composition of borrowings (%) of small cap firms					
year	Banks	Financial Institutions	Debentures and bonds	FC borrowings	Other borrowings
2005	51.2	15.2	7.4	7.6	18.6
2006	56.1	11.5	6.1	7.8	18.4
2007	61.2	6.7	4.7	9.4	17.9
2008	61.6	5.8	6.6	8.9	17.1
2009	61.3	5.8	5.3	8.9	18.7
2010	67.4	5.9	2.3	7.4	17.0
2011	68.1	6.9	2.5	6.9	15.6
2012	71.4	3.0	1.3	6.4	17.8
2013	70.7	2.7	1.1	6.2	19.3
2014	73.2	1.5	0.6	5.7	19.0
2015	75.0	1.3	0.9	3.7	19.1
2016	74.7	1.9	1.1	3.9	18.4
2017	74.4	2.7	3.6	5.1	14.3
2018	68.2	8.2	0.5	5.1	18.0
2019	64.4	14.0	0.5	5.3	15.9
Source: Author's calculation from Prowess database.					



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