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# The Indian Manufacturing Sector, Finances and Growth

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Discussion Paper # 253

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# The Indian Manufacturing Sector, Finances and Growth

Manmohan Agarwal*
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***Abstract:*** The paper analyses the behavior of a sample of large cap, mid cap and small cap firm. It finds that the rate of return over equity declines for large cap and mid cap firms but not small cap firms. We find that gross fixed assets grew faster for mid cap firms. This implies that for most large cap and small cap companies there was no increase in their real capital stock. We then try to explain the increase in gross fixed assets. Sales are significant for the three groups of companies. Exports are significant for large and mid cap companies. The D/E ratio has a significant positive effect for large and mid cap companies but not for small cap companies. The rate of return influences investment by for small cap companies but not the other groups. We do find any support the hypothesis that financial stress was restricting investment by manufacturing firms.

***Keywords:***
***JEL Codes:***

The performance of the Indian economy and, in particular that of manufacturing, has raised considerable disquiet in recent years. The Index of Industrial Production showed that the index declined by 1.1 per cent in August 2019 as compared to August 2018 and the index for manufacturing production declined by 1.2 per cent. Subsequently, the decline steepened. A previous paper (Agarwal, 2018) found that manufacturing has been facing difficulties in the whole world, particularly developing countries; the manufacturing sector has done better in India than in many other developing countries. However, we

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did find that the rate of growth of value added in manufacturing had slowed over the period 2005-14. During this period, the rate of return 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.

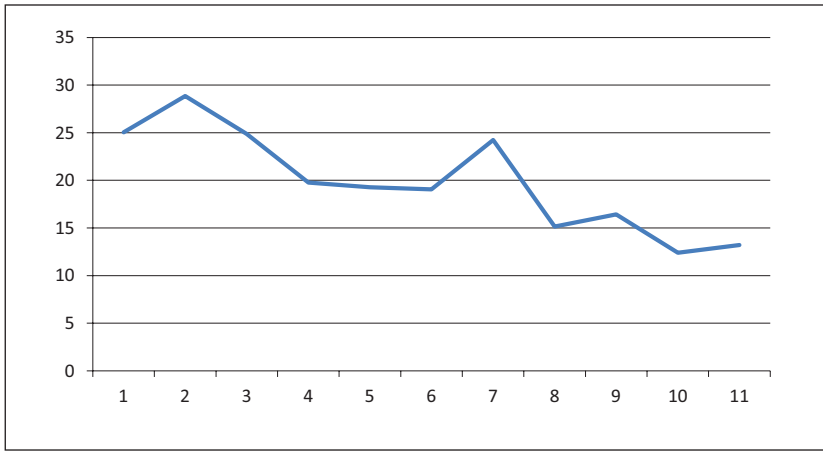
In this paper we examine further the performance of manufacturing companies. We first examine the financial performance of large firms. This is in the context of what is called the twin balance sheet problem. Balance sheets of companies have deteriorated constraining investment and weakening the position of banks who had lent to companies. We seek to find whether rising D/E (debt equity) ratios or rising interest cost contributed to the decline in returns. We find that debt equity ratios have remained relatively stable despite the slowdown in capital formation and the increase in shareholder funds. There seems to be little evidence of worsening of the financial situation of large firms. We then extend our analysis to mid cap and small cap firms. We define small cap firms to be those with market capitalisation in May 2015 to be less than Rs 1000 million and mid cap firms as those with market capitalisation greater than Rs 1000 million but less than Rs 10,000 million. Our sample consists of 166 large cap firms and  mid cap firms and 299 small cap firms.

## Large Cap Firms

In a previous paper (Agarwal, 2018) we found that the rate of return on net worth of the 166 largest manufacturing firms had declined over the period 2005-2015 (Figure 1).

The rate of return fell between 2005-11 and 2012-15 for almost all the sectors, except automobiles, chemicals and gases and fuels (Table 1). The number of firms experiencing a decline in the rate of return was greater than those that experienced a rise.

**Figure 1: Rate of Return on the Net Worth of Large Cap Firms**




***Source***: Based on Authors'own calculation from the CMIE database.

**Table 1: Rate of Return on Net Worth by Sector**

| | 2005-2011 | 2012-15 | Number of companies | |
|---|---|---|---|---|
| | | | Lower return in 2012-15 | Higher return in 2012-15 |
| Automobiles | 21.4 | 21.6 | 10 | 8 |
| Chemicals | 20.2 | 19.1 | 8 | 4 |
| Construction | 23.5 | 6.6 | 24 | 2 |
| Consumer goods | 41.3 | 27.8 | 16 | 3 |
| Industrial Equipment | 19.8 | 1.9 | 17 | 4 |
| Gases and Fuels | 30.8 | 29.5 | 4 | 1 |
| IT Software | 28.5 | 23.0 | 9 | 6 |
| Mining metals ports | 21.4 | 12.5 | 14 | 3 |
| Power generation Oil exploration | 10.0 | 8.3 | 8 | 6 |
| and refining | 14.4 | 7.4 | 7 | 3 |
| Telecommunications | 12.2 | 6.4 | 3 | 2 |
| Textiles | 21.2 | 16.1 | 59 | 4 |

***Source***: Authors' calculations based on data from CMIE.

In this paper, we analyse the financial position of these firms. The average (D/E ratio of firms across all sectors usually fell during this period. However, there was considerable variation between the sectors. The D/E increased considerably for the power equipment sector (Table 2). The textiles and oil sectors also saw an increase in their D/E ratio. For the other sectors the ratio fell. This D/E ratio is based on total debt, short-term plus long-term.

**Table 2:Debt-Equity Ratio, 2005-15**

| | A | B | C | D | E | F | G | H | I | J | K | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 3.7 | 1.9 | 3.0 | 1.7 | 0.7 | 1.1 | 1.1 | 1.3 | 4.8 | 2.8 | 2.4 | 2.2 |
| 2006 | 4.9 | 2.6 | 3.1 | 1.8 | 0.7 | 0.9 | 0.7 | 1.3 | 4.8 | 2.8 | 2.4 | 2.2 |
| 2007 | 5.0 | 2.4 | 2.4 | 2.1 | 0.6 | 0.8 | 0.6 | 1.1 | 3.1 | 3.3 | 2.2 | 2.2 |
| 2008 | 4.4 | 2.3 | 2.3 | 2.2 | 0.8 | 0.8 | 0.9 | 1.0 | 2.7 | 2.8 | 2.3 | 2.1 |
| 2009 | 7.8 | 4.8 | 3.0 | 2.8 | 0.9 | 0.9 | 1.5 | 1.4 | 2.9 | 2.8 | 2.8 | 2.1 |
| 2010 | 4.6 | 3.5 | 2.6 | 2.7 | 1.0 | 0.9 | 1.8 | 1.5 | 4.2 | 4.7 | 5.4 | 3.4 |
| 2011 | 6.2 | 3.3 | 1.3 | 3.0 | 0.9 | 1.1 | 1.4 | 2.3 | 3.9 | 3.2 | 3.7 | 2.8 |
| 2012 | 6.3 | 4.0 | 3.4 | 3.5 | 1.1 | 1.5 | 1.7 | 1.6 | 5.7 | 3.2 | 4.5 | 2.9 |
| 2013 | 5.5 | 4.5 | 3.5 | 4.2 | 1.4 | 1.9 | 2.3 | 1.6 | 5.7 | 2.8 | 4.7 | 3.3 |
| 2014 | 6.6 | 4.5 | 5.8 | 5.4 | 2.1 | 2.1 | 2.6 | 3.7 | 7.6 | 2.4 | 4.2 | 4.2 |
| 2015 | 6.7 | 4.3 | 4.1 | 5.5 | 1.4 | 2.1 | 4.7 | 1.8 | 10.1 | 2.0 | 5.4 | 4.4 |
| Change | 79.7 | 123.7 | 36.0 | 226.8 | 106.7 | 93.2 | 319.4 | 39.5 | 108.9 | -28.8 | 127.2 | 96.2 |

***Source*** Authors' calculations based on data from CMIE.

***Note:*** A is Textiles, B is Oil, C is Pharmaceuticals & Agro chemicals, D is Power, E is Metals & Minerals, F is Industrial Gases, G is Industrial Equipment, H is Consumer Goods, I is Construction materials, J is Chemicals and K is Auto sector.

We try to see what the relative increase in longterm debt is or whether the increase in D/E ratio reflects a rise in short term debt. We find that for some sectors, textiles, industrial equipment, consumer goods and construction materials the increase was more in short term debt. On the other hand, in oil exploration and refining, metals and automobile sectors the increase was largely because of the increase in long term debt.

It has been claimed that higher interest rates were a deterrent to investment. However, there has been no significant increase in interest costs. They remain at about 1 per cent of sales or of total costs. We find that in almost all sectors the increase in shareholders' funds has been greater than the increase in gross fixed assets (Table 3).

The increase in gross fixed assets in relation to the increase in sales presents a mixed picture (Table 3). In about half the sectors the increase in gross fixed assets was greater whereas in others it was less. In consumer goods sectors such as textiles, consumer goods and pharmaceuticals the growth of sales was more than the increase in gross fixed assets. This would reflect the slowdown in investment despite sales doing well. However, a major exception to this was the automobile sector where the increase in growth in gross fixed assets was greater. The capital goods sectors such as industrial equipment, construction materials saw sales growing slower than gross fixed assets.

**Table 3: Change in Attributes between 2005 and 2015 (%)**

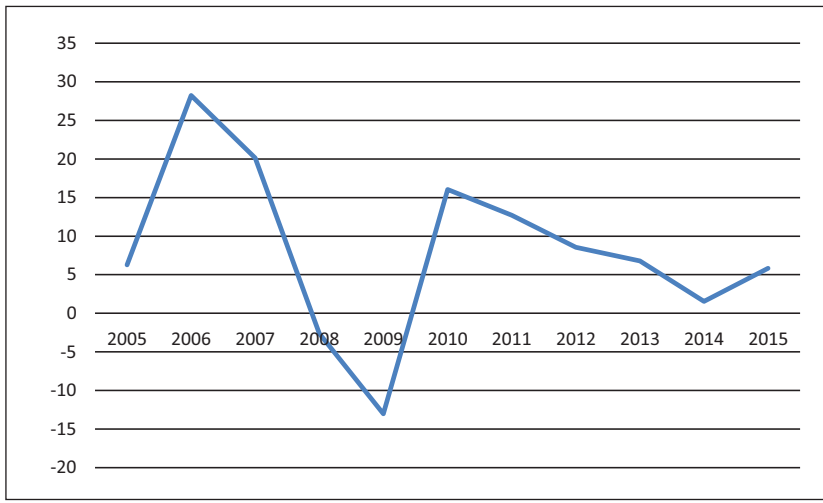
| | Gross Fixed Assets | Reserves Funds and Shareholder | Gross Sales |
|---|---|---|---|
| Textiles | 189.3 | 241.4 | 276.4 |
| Oil | 236.4 | 273.6 | 225.6 |
| Pharmaceuticals & Agro Chemicals | 320.5 | 690.5 | 370.4 |
| Power | 267.4 | 222.0 | 284.7 |
| Metals and minerals | 243.4 | 440.8 | 92.4 |
| Industrial Gases | 230.2 | 355.0 | 540.5 |
| Industrial Equipment | 281.5 | 569.8 | 243.9 |
| Consumer Goods | 295.8 | 364.8 | 331.8 |
| Construction Materials | 463.1 | 1625.5 | 423.8 |
| Chemicals | 185.4 | 400.0 | 320.9 |
| Automobiles | 362.2 | 475.1 | 256.2 |
| Average | 289.4 | 514.7 | 238.4 |

***Source*** Authors' calculations based on data from CMIE.

## Mid Cap Companies

In this section, we analyse the financial situation of mid cap firms. The rate of return on net worth of mid-cap manufacturing firms behaves very similarly as the return for large cap firms. With some fluctuations it declines over the period, even becoming negative in 2008 and 2009 and close to zero in 2014.

**Figure 2: Rate of Return on Net Worth of Mid-Cap Manufacturing Firms**




***Source*** : Authors' calculations based on data from CMIE.

The rates of return on equity declines between 2005 and 2015 for all sectors among large cap and mid cap firms except large cap companies in the metals sector (Table 4).The average decline in return is much greater for mid-cap firms than for large cap firms. Also, the variability of rates of return among sectors is considerably larger for mid-cap firms than for large cap firms.

We now look at the behaviour of the debt equity ratio for mid cap firms. While the average D/E ratio decreased over the period just as for large cap firms, the decrease was much greater for mid cap firms. But the D/E ratios behave very differently than the ROE. Whereas the ROE

**Table 4: Average Debt-Equity Ratio of Mid-Cap Firms, 2005-15[1]**

| Year | Textiles | Oil | Pharmaceuticals & agro | Metal & Minerals | Industrial gases | Industrial Equipment | Consumer Goods | Construction materials | Chemicals | Automobiles | Power | Average YOY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 1.02 | 0.21 | 1.29 | 1.90 | 1.86 | 0.73 | 12.77 | 1.09 | 4.66 | 1.89 | 0.77 | 2.56 |
| 2006 | 1.26 | 0.20 | 1.25 | 2.37 | 2.23 | 0.67 | 1.94 | 1.05 | 1.32 | 1.28 | 1.80 | 1.40 |
| 2007 | 1.66 | 0.26 | 1.26 | 1.66 | 1.90 | 0.69 | 1.33 | 2.77 | 1.13 | 1.53 | 1.43 | 1.42 |
| 2008 | 16.73 | 0.14 | 1.22 | 1.29 | 1.18 | 0.42 | 1.25 | 33.93 | 1.22 | 1.22 | 1.04 | 5.42 |
| 2009 | 2.19 | 0.11 | 2.87 | 1.66 | 2.51 | 0.56 | 1.37 | 33.61 | 1.16 | 1.13 | 1.04 | 4.38 |
| 2010 | 10.20 | 0.32 | 1.19 | 1.27 | 2.38 | 0.53 | 1.39 | 1.35 | 1.10 | 0.92 | 1.12 | 1.98 |
| 2011 | 1.68 | 0.24 | 1.09 | 1.22 | 1.84 | 0.46 | 1.23 | 1.03 | 0.91 | 0.83 | 0.70 | 1.02 |
| 2012 | 1.69 | 0.23 | 1.07 | 1.90 | 2.00 | 0.60 | 1.35 | 0.85 | 1.35 | 0.82 | 0.92 | 1.16 |
| 2013 | 2.73 | 0.53 | 1.31 | 1.38 | 2.04 | 1.00 | 1.16 | 0.98 | 1.46 | 0.72 | 0.93 | 1.29 |
| 2014 | 4.33 | 0.68 | 1.25 | 4.74 | 0.39 | 0.62 | 1.20 | 1.06 | 1.54 | 0.71 | 0.89 | 1.58 |
| 2015 | 1.77 | 0.07 | 1.45 | 2.98 | 0.03 | 0.79 | 1.21 | 1.35 | 1.24 | 0.59 | 1.01 | 1.14 |
| Avg | 4.11 | 0.27 | 1.38 | 2.03 | 1.67 | 0.64 | 2.38 | 7.19 | 1.55 | 1.06 | 1.06 | 2.12 |

***Source***: Authors' calculations based on data from CMIE.

decreased across almost sectors for both large and mid cap companies, the D/E ratios fell for some sectors and increased for others. Furthermore, the behaviour of large cap and mid cap in the same sector is not the same.

The debt equity ratio has decreased over the period on an average basis mainly in Oil, industrial gases, chemicals & automobile sector. However, the scenario is different for textiles, pharma, metals and construction sector where the ratio is high in FY 2008, the D/E ratio is very high in Construction and textile sectors (Table 4).

This debt equity ratio is based on total debt, short-term plus long-term. Now we analysis the relative increase/decrease in long-term debt or short-term contributed to D/E ratio. We find significant differences in the behavior of short term and long-term debt.

Among the sectors showing a decrease in the D/E ratio, both the long- and short-term debt decreased over the period in the oil sector. In chemical sector, there was slight increase in long- term debt but a significant decrease in short-term debt whereas in the automobile sector there was a slight decrease in short term debt with a slight increase in long-term debt. The metals & minerals and construction sectors experienced relatively high increase in long-term debt vis-à-vis short-term. Sectors like consumer, power and textiles sector experienced high increases in short term debts. Long- and short-term debt increased equally in the pharmaceuticals sector.

In the case of large cap companies, we had found no evidence that high interest rates were a deterrent to investment as interest costs were about 1 per cent of sales or costs and were almost constant during the period. But interest costs were much higher in the case of mid cap companies ranging between 2-4 per cent of sales or total cost, and an average of 3 per cent over the period. However, interest costs tended to increase over the period. The sectors where leverage has increased leading to higher interest expense year on year have been accompanied by increase in operational revenues over the period.

We now examine the relation between increases in sales, gross fixed assets, and shareholders' funds. Though gross fixed assets show

on average a larger increase than shareholder's funds, the increase in shareholders' funds has been greater than increase in gross fixed assets, in 7 of the 11 sectors (Table 6). The faster increase in shareholder funds supports the earlier finding that the D/E ratio fell in these sectors. The increase in the overall ratio is because the increase in GFA has been substantially greater than shareholder funds in oil exploration and refineries and industrial gases and fuels sectors.

**Table 5: Change in Attributes between 2005-15 of Mid-Cap Firms**

| Industry group | GFA | Shareholders funds | Sales |
|---|---|---|---|
| Textiles | 12.6 | 13.3 | 14.2 |
| Power Generation/Distribution | 20.7 | 24.1 | 30.5 |
| Ports,Steel, Glass, Coal, Mining , Mineral & Metals | 18.5 | 19.6 | 13.4 |
| Pharmaceuticals & Agro Business | 14.0 | 15.6 | 15.9 |
| Oil exploration & Refineries | 45.7 | 15.0 | 16.2 |
| Industrial gases & fuels | 69.3 | 10.6 | 1.6 |
| Industrial Equipments | 11.1 | 9.2 | 12.4 |
| Consumer Goods and FMCG | 9.6 | 12.2 | 13.0 |
| Construction and Real Estate | 13.6 | 31.5 | 15.0 |
| Chemicals | 9.8 | 15.7 | 13.5 |
| Automobiles | 15.8 | 18.2 | 13.2 |
| Average | 21.9 | 16.8 | 14.4 |

***Source***: Authors' calculations based on data from CMIE.The behaviour of the oil sector is complicated, gross fixed assets increased by almost 45.7 percent much more than the 15 per cent increase in shareholders' funds. The D/E ratio correspondingly increased between 2005 and 2014 (Table 5). But it then decreased sharply in 2015. In the case of the industrial Gases/Equipment sector, shareholders' funds increased by 10.6 percent whereas gross fixed assets by 69.3 percent. The D/E ratio increased till 2013 and then decreased substantially.

The increase in gross fixed assets in relation to the increase in sales presents mixed picture.

In the consumer goods sector like textiles, consumer goods and pharma, growth in sales is higher than that of gross fixed assets (Table 6). The capital goods sectors like power, chemical & construction sector

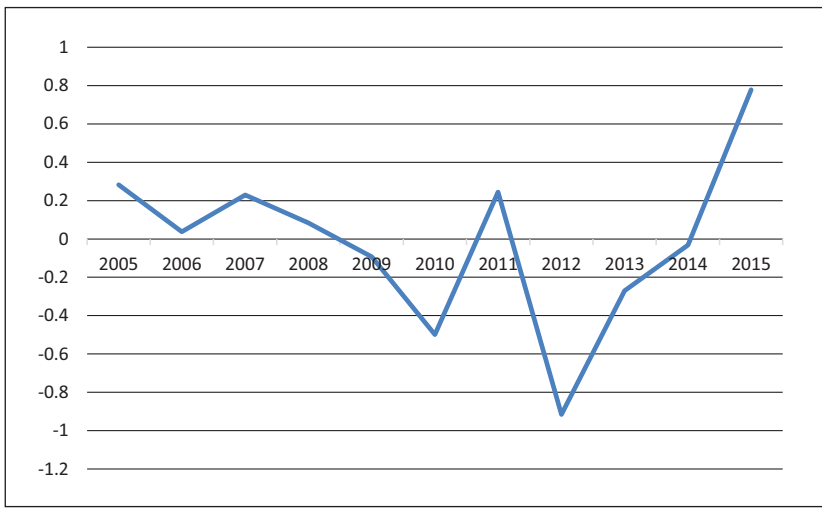
too experienced higher sales growth than growth in gross fixed assets. This indicates a slowdown in investment in these sectors. However, the oil, metal, and automobile sectors show higher growth in fixed assets than sales. The industrial gases experienced high growth in gross fixed assets despite a negative growth (decline) in sales.

## Small Cap Companies

Now we turn our attention to small cap companies. We analysed the financial statements of 299 small cap firms.

The average rate of return on net-worth for small cap firms is positive except in four years, 2010, 2012, 2013 and 2014 (Figure 3). It generally declined between 2005 and 2012, but increased subsequently, so that the ratio in 2015 was considerably greater than in 2005.

**Figure 3: Rate of Return on Return Worth of Small Cap Firms**




***Source***: Authors' calculations based on data from CMIE.

Sector wise also we find that the rates of returns are very small, except for paper, media and paper products. As we will see later, this sector also stands out when we look at the debt equity ratios. No sector had a persistently negative ratio, neither were the negatives too large.

**Table 6: Return on Net Worth of Small Cap Firms, 2005-15**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | Avg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Automobiles | -0.02 | 0.16 | 0.12 | 0.1 | 0.13 | 0.13 | 0.16 | 0.13 | 0.07 | -0.53 | 0.1 | 0.05 |
| Chemicals | -0.01 | -0.41 | 0.15 | 0.39 | 0.09 | 0.01 | 0.01 | -0.32 | 0.1 | 0 | -0.02 | 0.00 |
| Construction and Real Estate | 0.38 | -0.02 | -0.06 | 0.14 | -0.81 | 0.13 | 0.32 | 0.07 | -0.35 | -0.06 | 4.03 | 0.34 |
| Consumer Goods and FMCG | -0.02 | 0.04 | 0.06 | 0.14 | -0.01 | -0.06 | 0.07 | 0.18 | 0.04 | 0.03 | 2.97 | 0.31 |
| Industrial Equipment | 1.55 | 1.32 | 0.1 | 0.13 | 0.06 | 0.03 | 0.06 | 0.1 | 0.16 | -0.03 | 0.23 | 0.34 |
| Paper, Media and Paper products | 0.09 | 0.09 | 2.71 | 0.2 | 0.15 | -0.23 | 1.67 | -19.96 | -10.12 | 0.81 | 0.07 | -2.23 |
| Pharmaceuticals & Agro Business | 0.08 | 0.19 | 0.11 | 0.05 | -0.4 | 0.65 | 1 | -1.31 | 0.02 | 0.04 | 1.31 | 0.16 |
| Ports,Steel, Glass, Coal, Mining , Mineral & Metals | 0.16 | -0.44 | 0.28 | -0.07 | -0.01 | -1.35 | 0.1 | -0.61 | 0.24 | -0.18 | 0.86 | -0.09 |
| Power Generation/ Distribution | 0.45 | 0.33 | 0.19 | 0.07 | 0.06 | -0.02 | 0.06 | 0.05 | 0.03 | 0.07 | 0.07 | 0.12 |
| Rubber and plastics | 0.09 | -0.86 | 0.22 | 0.06 | 0.04 | -5.04 | 0.08 | -0.11 | -0.04 | -0.11 | 0.25 | -0.49 |
| Textiles | 0.17 | 0.09 | 0.12 | -0.01 | -0.29 | 0.48 | 0.04 | 0.16 | 0.04 | 0.03 | 0.16 | 0.09 |
| Average | 0.27 | 0.04 | 0.36 | 0.11 | -0.09 | -0.48 | 0.32 | -1.97 | -0.89 | 0.01 | 0.91 | -0.13 |

***Source***: Authors' calculations based on data from CMIE.

**Table 7: Average Debt-Equity Ratio, Small Cap Companies (2005-15)**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Automobiles | 1.45 | 1.1 | 1.02 | 1.5 | 1.37 | 1.1 | 0.99 | 0.96 | 1.23 | 2.11 | 0.85 |
| Chemicals | 1.19 | 1.1 | 1.15 | 1.16 | 1.05 | 1.13 | 1.32 | 1.8 | 1.58 | 1.86 | 1.61 |
| Construction and Real Estate | 1.97 | 2.07 | 1.11 | 1.22 | 1.22 | 1.44 | 5.57 | 1.57 | 2.28 | 4.93 | 1.61 |
| Consumer Goods and FMCG | 1.16 | 0.91 | 1.08 | 0.89 | 0.98 | 1.43 | 1.44 | 1.21 | 1.37 | 2.83 | 0.8 |
| Industrial Equipment | 2.45 | 2.05 | 0.87 | 0.93 | 0.81 | 1.07 | 1.4 | 0.92 | 1.08 | 1.8 | 1.34 |
| Paper, Media and Paper products | 1.39 | 1.47 | 100.54 | 8.73 | 1.49 | 4.28 | 152.73 | 136.37 | 51.18 | 1.26 | 1.37 |
| Pharmaceuticals & Agro Business | 1.76 | 1.14 | 1 | 1.17 | 1.39 | 1.9 | 2.52 | 2.21 | 5.47 | 2.79 | 1.55 |
| Ports, Steel, Glass, Coal, Mining, Mineral & Metals | 1.36 | 1.35 | 1.28 | 1.08 | 1.22 | 1.42 | 2.02 | 7.18 | 1.78 | 2.28 | 2.46 |
| Power Generation/Distribution | 1.31 | 1.44 | 1.88 | 0.64 | 0.94 | 0.93 | 0.79 | 0.84 | 1.09 | 0.93 | 1.02 |
| Rubber and plastics | 1.27 | 1.35 | 2.02 | 1.15 | 1.07 | 0.96 | 1.11 | 1.59 | 1.34 | 1.63 | 1.7 |
| Textiles | 5.67 | 1.89 | 1.77 | 2.65 | 2.37 | 2.59 | 1.69 | 1.83 | 2.07 | 2.49 | 2.27 |
| Average | 1.91 | 1.44 | 10.34 | 1.92 | 1.26 | 1.66 | 15.6 | 14.23 | 6.41 | 2.26 | 1.51 |

***Source***: Authors' calculations based on data from CMIE.

The average D/E ratios do not change much over the period. There were sudden increases in a few years, but that increase is entirely attributable to the rise in D/E in paper and media products.

Overall, we find that for all sectors except ports, steel, glass, coal, mining, mineral and metal; and rubber and plastics, the debt equity ratio fell across the period under analysis. This is consistent with the findings of large- and mid-cap sectors.

At the sector level we find a few interesting patterns. We find persistence in the D/E ratios. Sectors with a high D/E ratio in the initial year continue to have a high ratio in subsequent years and those with a low ratio continue to have a low ratio. In sectors such as construction and real estate, industrial equipment and textiles, the debt-equity ratio was very high in 2005. On the other hand, sectors such as chemicals, consumer goods and FMCGs, and rubber and plastics had relatively lower ratios. Although there were ups and downs in the ratio, the sectors with higher debts in the beginning of the 10-year period, continued to show relatively higher debt equity ratios even at the end of the 10-year. At the end of the 10-year period, two sectors, automobiles and consumer goods, had the lowest debt-ratios (lower than 1).

We notice an interesting pattern in one of the sectors, the paper, media and paper products sector. The sector in 2005 and 2015 had comparable debt-equity ratios with other sectors. However, when we examine the years in the middle, its debt-equity ratio shot up to over 100 in some years. This is the one sector that has shown very high variation. In the remaining sectors, although there were highs and lows, the variation was not as much.

When examining the sales growth, we find that all industries have a high, positive sales growth (Table 8). The highest growth is registered by construction and real estate, followed by power generation and distribution. Comparing sales growth to growth in gross fixed assets, most sectors have a higher sales growth. The exceptions are automobiles, ports and metals, and consumer goods and FMCGs. Only one sector

shows a small negative growth in GFA which is power generation and distribution. This is surprising as it is this very sector which has one the highest growth rates in sales.

Comparing growth in GFA and reserves and shareholder's funds does not provide a clear picture. There is also no clear pattern to be observed. What is surprising is that the last column is that a few sectors show negative growth rate in shareholders' funds and capital, whereas the other sectors show extremely high growth rates. This distinction is seen only for small cap firms.

**Table 8: Percentage Change in Attributes of Small Cap Firms. 2005-15**

| Industry | Sales | Gross Fixed Assets | Reserves and shareholder's funds |
|---|---|---|---|
| Automobiles | 179.64 | 401.37 | 98.32 |
| Chemicals | 78.46 | 55.64 | 15.91 |
| Construction and Real Estate | 513.06 | 348.27 | 770.48 |
| Consumer Goods and FMCG | 125.86 | 184.88 | 122.71 |
| Industrial Equipments | 109.69 | 96.26 | 377.04 |
| Paper, Media and Paper products | 46.64 | 22.74 | -66.40 |
| Pharmaceuticals & Agro Business | 131.33 | 60.73 | -21.83 |
| Ports, Steel, Glass, Coal, Mining , Mineral & Metals | 110.13 | 301.90 | 1000.45 |
| Power Generation/Distribution | 267.00 | -7.32 | 808.72 |
| Rubber and plastics | 177.11 | 69.96 | 3570.59 |
| Textiles | 201.67 | 109.50 | -627.39 |

***Source***: Authors' calculations based on data from CMIE.

## Large Cap, Middle Cap and Small Cap Firms

We now compare the performance of large, middle and small cap firms.

**Table 9: Change in the Return on Equity and Debt-Equity Ratio for all Firms**

| | ROE | | | D/E ratio | | |
|---|---|---|---|---|---|---|
| ROE | large cap | mid cap | small cap | large cap | mid cap | small cap |
| Sector | Change% | Change% | Change% | Change% | Change% | Change% |
| Textiles | -42.60 | -39.03 | -3.08 | 17.23 | -0.50 | -60.05 |
| Oil | -51.34 | -725.10 | | 14.34 | -39.12 | |
| Pharma-ceuticals | -39.86 | -106.76 | 1607.29 | -45.99 | -12.75 | -11.79 |
| Power | -2.16 | -77.56 | -84.62 | 91.80 | 60.71 | -22.14 |
| Paper, Media and Paper products | | | -26.09 | | | -1.65 |
| Metals | 61.92 | -114.26 | 438.82 | -26.59 | 12.60 | 81.42 |
| Industrial Gases | -37.45 | -56.42 | | -6.73 | -26.29 | |
| Industrial Equipment | -74.12 | -217.58 | -85.44 | 1.90 | 107.69 | -45.10 |
| Consumer Goods | -11.80 | -43.23 | -12448.34 | -21.35 | 16.92 | -30.78 |
| Construction | -66.12 | -46.05 | 953.17 | -32.38 | -79.46 | -18.54 |
| Chemicals | -0.73 | -53.08 | 265.28 | -57.78 | -35.47 | 34.84 |
| Automobile | -51.77 | -43.41 | -558.52 | -5.83 | -36.69 | -41.26 |
| Rubber and plastics | – | – | 180.57 | – | – | |
| Average | -28.73 | -138.41 | -887.36 | -6.49 | -2.94 | -11.50 |
| Standard deviation | 38.58 | 201.56 | 3878.33 | 40.27 | 51.90 | 41.88 |

***Source***: Authors' calculations based on data from CMIE.

The rate of return declined for the three groups of firms, with the fall for large cap firms being less than for mid cap and considerably less for small cap firms. The D/E ratio also fell for the three groups with the largest decline in the case of small cap firms. There is little relation between the increases in the debt equity (D/E) and the rate of accumulation of fixed assets (Tables 9 and 10). Three sectors that had the largest increase in

long term D/E ratio, power industrial equipment and automotive had also large increases in gross fixed assets. However, Oil exploration and refining had a large increase in the D/E ratio without rapid increases in fixed assets. Furthermore, consumer goods and construction materials show a much larger increase in gross fixed assets than in the D/E ratio.

A possible explanation for the rise in the debt equity ratio is that a higher leverage raises the return on own funds. The rise in the D/E ratio may thus be an attempt to raise the return on own funds in the face of the decline in return on shareholder funds.

**Table 10: Growth between 2005 and 2015 in Sales, Gross Fixed Assets, in Different Size Firms**

| | Sales | | | Gross Fixed capital | | |
|---|---|---|---|---|---|---|
| | large cap | mid cap | small cap | large cap | mid cap | small cap |
| Sector | Change% | Change% | Change% | Change% | Change% | Change% |
| Textiles | 276.41 | 270.82 | 201.67 | 189.32 | 218.98 | 109.50 |
| Oil | 225.58 | 307.25 | - | 236.36 | 1198.36 | - |
| Pharma-ceuticals | 370.45 | 323.69 | 131.33 | 320.50 | 256.26 | 60.73 |
| Power | 284.66 | 1123.50 | 267.00 | 267.45 | 518.84 | -7.32 |
| Metals | 92.36 | 237.21 | 110.13 | 243.42 | 437.67 | 301.90 |
| Industrial Gases | 540.54 | -55.32 | - | 230.20 | 628.68 | - |
| Industrial Equipment | 243.85 | 201.89 | 109.69 | 281.50 | 180.34 | 96.26 |
| Consumer Goods | 331.82 | 234.41 | 125.86 | 295.81 | 141.78 | 184.88 |
| Construction | 423.75 | 279.77 | 513.06 | 463.09 | 255.38 | 348.27 |
| Chemicals | 320.94 | 235.92 | 78.46 | 185.37 | 153.01 | 55.64 |
| Automobile | 256.22 | 231.79 | 179.64 | 362.21 | 326.14 | 401.37 |
| Rubber and plastics | - | - | 177.11 | - | - | 69.96 |
| Average | 306.05 | 308.27 | 189.40 | 279.57 | 392.31 | 162.12 |
| Standard Deviation | 115.63 | 288.47 | 126.28 | 80.76 | 309.89 | 140.58 |

***Source***: Authors' calculations based on data from CMIE.

Sales of large cap and mid cap firms grew considerably more than those of small cap firms. Since the earlier paper had concluded that slow growth of sales in real terms was a constraint, this continues for the larger small now and particularly for small size firms. Furthermore, mid cap firms show much greater variability in their increase in sales. Mid cap firms show a much larger increase than big cap and small cap firms in their GFA, with the latter showing the smallest increase. The smallest increase in GFA of small cap firms goes along with the slowest increase in their sales.

To analyse the increase in GFA we divide the companies into three groups. Group 1 consists of companies whose increase in capital stock was less than the increase in the deflator for gross fixed capital formation, namely real capital stock seems to have declined during this period. 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 GD, namely their importance relative to GDP declined during this period. Group 3 consists of companies that showed a faster growth of capital stock than nominal GDP, namely were fast growing.

**Table 11: Increase in GFA for Large, Mid and Small Cap Firms**

(per cent of firms in each category)

| | Large Cap | Mid Cap | Small Cap |
|---|---|---|---|
| Group 1 | 56 | 10 | 40 |
| Group 2 | 28 | 26 | 29 |
| Group 3 | 16 | 64 | 31 |

***Source***: Authors' calculations based on data from CMIE.

Mid cap companies showed the best performance with the largest percentage in the fast growing group and the smallest in the declining companies list (Table 11). The large cap companies show the worst performance with the highest percentage in the declining group wand least in the fast growing group. The small cap companies are in between but with more companies declining than fast growing.

We next try to explain the growth of gross fixed assets. We undertake a cross section analysis. We regress the growth of gross fixed assets between 2005 and 2015 against growth in sales, growth in profits between the two years, the growth in exports ratio, a dummy for multinationals and sector dummies. The specification is:

$$GFA_{ij} = a_j + b\ sales_{ij} + c\ pat_{ij} + f\ D_{1ij} + g\ D_{2ij} + \varepsilon_{ij} \quad (1)$$

$$GFA_{ij} = a_j + b\ sales_{ij} + c\ pat_{ij} + e\ exportsales_{ij} + f\ D_{1ij} + \varepsilon_{ij} \quad (2)$$

where,

$GFA_{ij}$ - average annual growth rate in gross fixed assets from 2005 to 2015 of company i in industry j

$sales_{ij}$ - average annual growth rate in sales from 2005 to 2015 of company i in industry j

$pat_{ij}$ - average annual growth rate in profit after tax from 2005 to 2015 of company i in industry j

$exportsales_{ij}$ - average annual growth rate in % of exports/sales from 2005 to 2015 of company i in industry j (equation 2)

$D_{1ij}$ is dummy that is 1 if company i in industry j is a MNC and 0 otherwise

$D_{2ij}$ is dummy that is 1 if company i in industry j is an exporter and 0 otherwise (equation 1)

$a_j$ is the industry fixed effects

The estimated equations for large cap, mid cap and small cap firms are given below in Table 11.

**Table 11: Regression Output**

| | Large cap | | Mid cap | | Smallcap |
|---|---|---|---|---|---|
| | [1] | [2] | [1] | [2] | |
| VARIABLES | GFA_aagr | GFA_aagr | GFA_aagr | GFA_aagr | GFA_aagr |
| DE_aagr | 0.079*** | 0.07** | 0.063** | 0.074*** | 0.03 |
| | (0.03) | (0.02) | (0.02) | (0.02) | (0.05) |
| sales_aagr | 2.302*** | 2.616*** | 0.127** | 0.138** | 0.34** |
| | (0.41) | (0.41) | (0.05) | (0.06) | (0.1) |

*Table 11 continued...*

*Table 11 continued...*

| | | | | | |
|---|---|---|---|---|---|
| pat_aagr | -0.001 | -0.001 | 0.016 | 0.035 | 0.067** |
| | (0.001) | (0.001) | (0.02) | (0.02) | (0.03) |
| MNC_dummy | -0.063 | -0.032 | -0.056*** | -0.055*** | |
| | (0.05) | (0.04) | (0.01) | (0.01) | |
| export_dummy | 0.229*** | | -0.099** | | |
| | (0.08) | | (0.04) | | |
| exportsales_aagr | | -0.004 | | -0.005 | |
| | | (0.007) | | (0.01) | |
| Chemicals | 0.012 | 0.013 | -0.021 | -0.011 | -0.09* |
| | (0.03) | (0.04) | (0.01) | (0.01) | (0.05) |
| Construction and Real Estate | 0.039 | 0.048 | -0.016 | -0.002 | -0.07 |
| | (0.05) | (0.06) | (0.02) | (0.02) | (0.06) |
| Consumer Goods and FMCG | -0.089 | -0.087 | -0.050* | -0.011 | -0.11* |
| | (0.06) | (0.06) | (0.02) | (0.02) | (0.06) |
| Industrial Equipments | 0.023 | 0.037 | -0.02 | -0.023 | -0.09* |
| | (0.06) | (0.06) | (0.02) | (0.02) | (0.05) |
| Industrial Gases & Fuels | -0.027 | -0.11 | 0.114*** | 0.13*** | |
| | (0.11) | (0.12) | (0.02) | (0.02) | |
| Oil Exploration and Refineries | 0.131 | 0.175* | 0.061 | 0.056 | |
| | (0.09) | (0.09) | (0.03) | (0.04) | |
| Paper, Media and Paper products | | | | | -0.13** |
| | | | | | (0.06) |
| Pharmaceuticals & Agro Business | -0.021 | -0.025 | -0.014 | -0.01 | -0.08 |
| | (0.04) | (0.04) | (0.02) | (0.02) | (0.05) |
| Ports,Steel, Glass, Coal, Mining , Minerals | 0.053 | 0.117 | -0.0001 | 0.014 | -0.05 |
| | (0.08) | (0.11) | (0.02) | (0.02) | (0.05) |
| Power Generation/ Distribution | 0.122* | 0.051 | -0.016 | -0.009 | -0.07 |
| | (0.06) | (0.04) | (0.03) | (0.03) | (0.05) |
| Rubber and plastics | | | | | -0.12** |
| | | | | | (0.0525) |
| Textiles | -0.027 | -0.034 | -0.019 | -0.012 | -0.1* |
| | (0.07) | (0.09) | (0.02) | (0.02) | (0.05) |

*Table 11 continued...*

*Table 11 continued...*

| | | | | | |
|---|---|---|---|---|---|
| Constant | -0.487*** | -0.312*** | 0.253*** | 0.140*** | 0.15** |
| | (0.14) | (0.07) | (0.05) | (0.01) | (0.05) |
| | | | | | |
| Observations | 145 | 129 | 291 | 268 | 252 |
| R-squared | 0.83 | 0.85 | 0.19 | 0.18 | 0.33 |
| Industry FE | Yes | Yes | Yes | Yes | Yes |

***Source***: Authors' calculations based on data from CMIE.
***Note:*** Robust standard errors in parentheses
*** ***p***<0.01, ** p<0.05, * p<0.1

We find that growth of sales has a positive effect on growth of GFA for firms of different sizes. So the slowdown in sales has had a negative effect on investment.

But there is an important difference in the effect of D/E and profit rates on growth of GFA. The average annual growth rate (AAGR) of D/E ratio (high leverage) has a positive significant effect on the AAGR of GFA of large cap and mid cap firms, and the effect of AAGR of profit after tax is insignificant. In the case of small cap firms the D/E ratio has an insignificant effect on growth of GFA but the profit rate has a positive effect. This suggests that small cap firms may have to depend on their profits for investments and be limited in the amounts they can borrow. The results also suggest that mid cap and large cap firms can borrow if they are investing. Apart from their greater ability to borrow it could also be that they borrow as they grow to maintain their profit rates.

The MNC dummy has a negative coefficient for both large and mid-cap companies, and is significant for mid cap companies. While the export dummy has significant effect, the AAGR of export sales has an insignificant effect on the AAGR of GFA for both mid cap and large cap firms.[2] The slowdown in growth of exports in recent years has thus contributed to the slower rate of investment. The large exporting companies have significantly higher AAGR of GFA than large non-exporting companies. The mid cap exporting firms have significantly lower AAGR of GFA than mid cap non-exporting companies. Since most small cap firms considered did not have any exports, a dummy

for export was not included for firms in this category. Also, no firms in small cap segment were MNCs so that dummy was also not incorporated in the specification.

We control for the industry specific effects in the regression analysis by including the industry fixed effects. We find that usually the fixed effects are insignificant for large cap and mid cap companies. But the industry dummies usually have negative signs for small cap companies. The debt-equity ratio's coefficient is significant.

## Conclusions

Building on the previous paper (Agarwal, 2018), this paper examines the changes in the financial situation of the firms of all size over the 10-year period from 2005-15. It was found that average debt equity ratio across all firm sizes was falling, with considerable variation across sectors. The highest fall was seen in the case of small cap firms followed by large cap and mid cap. This and the relatively small share of interest costs in total costs do not support the hypothesis that financial stress was responsible for the slowdown on investment. the trend for return on equity ratio, with the returns falling across all firm sizes. The highest fall even here was in the case of small cap firms. Further we looked at the changes in gross fixed assets and sales.

Firstly, nominal gross fixed assets of all firms across all sizes registered an increase. The only exception comes from the small-cap firms in the power sector which had a decline in capital. But we find considerable variation in increase in fixed capital compared to increase in prices and GDP among the three groups of companies. Among large cap companies more companies belonged to the declining group than rapidly growing groups and the opposite was true for the mid cap companies. We also found considerable variation in increase in fixed capital in different sectors, particularly in the mid-cap segment. Next, sales have been rising, with rise in sales of large cap and mid cap firms being considerably larger compared to small caps. There seems to be no clear relation between the increase in gross fixed assets and sales. Sectors with high growth in sales do not have proportionate increases in fixed capital and vice versa.

Our regression analysis for growth in GFA shows that while sales have a positive effect on growth across all size firms, the D/E ratio has a positive, significant effect for large cap and mid cap firms while being insignificant for small cap, and profits after tax is positive, significant for small cap firms but positive and insignificant for large cap and mid cap firms. This finding suggests a reliance on profits by smaller firms for investments rather than a reliance on borrowing.

Moreover, MNCs seem to have lower growth rates but this effect is significant only for large cap firms. Firms that exports experienced a faster growth in GFA.

## Endnotes

[1] In table 4, the high D/E ratio in textile industry in 2008 and 2010 is due to the very high D/E ratio in one textile firm: Polygenta Technologies Ltd. The high D/E ratio in Construction industry in 2008 and 2009 is due to the very high D/E ratio in one firm: Saurashtra Cement Ltd

[2] The time series is too short for a serious statistical exercise. But correlation between the real exchange rate and exports is .95 for large cap and for mid cap firms. And the correlation between the real exchange rate and average exports to sales ratio for large cap and mid cap firms is .81.

## Reference

Agarwal Manmohan. .(2018. "The Manufacturing Sector in India". *RIS Discussion Paper No. 221*, Research and Information System for Developing Countries New Delhi.

## Appendix: Distribution of Firms Across Industries:

### Large Cap Firms:

| Industry | Firms |
|---|---|
| Automobiles | 17 |
| Chemicals | 11 |
| Construction and Real Estate | 18 |
| Consumer Goods and FMCG | 16 |
| Industrial Equipment | 20 |
| Industrial Gases & Fuels | 5 |
| Oil Exploration and Refineries | 8 |
| Pharmaceuticals & Agro Business | 31 |
| Ports, Steel, Glass, Coal, Mining, Minerals and Metals | 7 |
| Power Generation and Distribution | 12 |
| Textiles | 7 |
| Total | 152 |

### Mid-Cap Firms:

| Industry | Firms |
|---|---|
| Automobiles | 29 |
| Chemicals | 65 |
| Construction and Real Estate | 21 |
| Consumer Goods and FMCG | 34 |
| Industrial Equipment | 33 |
| Industrial Gases & Fuels | 2 |
| Oil Exploration and Refineries | 3 |
| Pharmaceuticals & Agro Business | 30 |
| Ports, Steel, Glass, Coal, Mining, Minerals and Metals | 48 |
| Power Generation and Distribution | 5 |
| Textiles | 30 |
| Total | 300 |

**Small Cap Firms:**

| Industry | Firms |
|---|---|
| Automobiles | 16 |
| Chemicals | 30 |
| Construction and Real Estate | 7 |
| Consumer Goods and FMCG | 29 |
| Industrial Equipment | 36 |
| Paper, Media and Paper products | 10 |
| Pharmaceuticals & Agro Business | 38 |
| Ports, Steel, Glass, Coal, Mining, Minerals and Metals | 48 |
| Power Generation and Distribution | 3 |
| Rubber and Plastics | 27 |
| Textiles | 55 |
| Total | 299 |

***Source***:

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