Economic Reforms and Market Competition in India: An Assessment

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Beena Saraswathy*

*[**Abstract**: The announcement of New Industrial Policy in July 1991 marked a paradigm shift in the overall macroeconomic policies followed in India from greater control and regulations to the free play of market forces. Subsequently, there has been a paradigm shift in the competition regulation in India, with the establishment of Competition Commission of India (CCI). The underlying motive behind the regulatory changes has been to increase competition in all spheres of economic activities. Given this background, the present study intends to assess whether the changes in policy regimes could bring out the desired output in terms of increased competition in various spheres of the manufacturing sector. Specifically, our interest is to assess market competition across various sub-sectors in the manufacturing sector, which are important from the consumers' point of view and to identify the areas of concern for vigilant policy implementation. Using multiple indicators of concentration, the study found that despite the increase in competition across various sub-sectors, concentration levels remain high for many sub-sectors. High levels of concentration noticed in seven out of 29 sub-sectors studied and in another three high-moderate concentration level noticed.]*

***JEL Classification**: L11, L12, L4, D41, D42*

***Keywords**: Market Structure and Pricing, Monopolisation Strategies, Antitrust Issues and Policies, Perfect Competition, Monopoly*

The New Economic Policies implemented in the 1990s and the consequent market orientation was intended to augment market competition and economic efficiency in every sphere of economic activity. Liberalisation of industrial and trade policies through increased access to import of capital goods, intermediary goods and technology; lifting of curbs on growth and size of firms and to expose the domestic firms to internal and external competition were the three major tools of reform, which were ultimately intended to bring in better efficiency and welfare outcomes. Besides this, the increased integration with the global market further pressurised the domestic firms to become more competitive to withstand market competition within and outside the borders. Under this scenario, firms

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adopted various strategies to build and strengthen competitiveness on the one hand, and also to bypass the competitiveness requirement on the other hand. The unprecedented surge in consolidation strategies such as mergers, acquisitions, joint venture and tie-ups occurred from the 1990s to be viewed in this context. The enhancement of competition proposed through the above mentioned regulatory changes might have been resisted to a great extent through consolidation strategy. The present study intends to understand whether the changes in policy regimes could bring out desired output in terms of increased competition in various spheres of the manufacturing sector.

I. Curbing Monopolies to Promoting Competition

The announcement of New Industrial Policy in July 1991 marked a paradigm shift in the overall macroeconomic policies followed in India from greater control and regulations to the free play of market forces. Further, Finance Minister Sri. Yashwant Sinha, during his budget speech in on February 27, 1999, has made it clear that '*the MRTP Act has become obsolete in certain areas in the light of international economic developments relating to competition laws. We need to shift our focus from curbing monopolies to promoting competition. Government has decided to appoint a Committee to examine this range of issues and propose a modern competition Law suitable for our conditions*'. With this, the government formally acknowledged the need for a drastic change in competition regulation in India. Consequently, in October 1999, a High Level Committee on Competition Policy under the chairmanship of SVS Raghavan was appointed to recommend appropriate policy changes in the context of economic reforms of the 1990s. The committee recommended the need for setting up a new competition law and a competition authority to prevent anti-competitive practices. This led to the adoption of Competition Act, 2002, replacing the three decade old MRTP Act, 1969. Further, the Competition Commission of India (CCI) has taken over the functions of MRTP Commission[1], from 2009 onwards, which marked a paradigm shift in the competition regulation in India.

One of the major focuses of the MRTP Act, was to limit the '*concentration of economic power in the hands of a few*' which has been dismantled in the new competition regime implemented in India (i.e. the Competition Act, 2002). MRTP Act (1969) in its preamble defines, "*An Act to provide that operation of the economic system does not result in the concentration of economic power to the common detriment, for the control of monopolies, for the prohibition of monopolistic and restrictive trade practices and for matters connected therewith or incidental thereto"* (MRTP Act, 1969). Whereas, Competition Act (2002) is *"An Act to provide, keeping in view of the economic development of the country, for the establishment of a Commission to prevent practices having adverse effect on competition, to promote, sustain competition in markets, to protect the interests of consumers and to ensure freedom of trade carried on by other participants in markets, in India, and for matters connected therewith or incidental thereto"*

[1] Enforcement authority of Monopoly Restrictive Trade Practices Act, 1969.

*(*Competition Act, 2002*)*. From this, it is clear that there is an undeniable deviation of regulatory focus from '*economic concentration*' or '*controlling monopolies*' to '*promoting competition*'. As mentioned in the beginning, this is in addition to the changes in the overall macro-economic policies from a regime of greater control towards promoting competition. The functioning of the present regulator is mainly based on the principles of *Rule of Reason* Approach, that is, to find out the likely impact on competition in the 'relevant product market' and 'relevant geographic market'.

The new Competition Act has three important provisions such as, to prohibit anticompetitive agreements and abuse of dominance and to regulate combinations (such as mergers, acquisitions) to ensure that they are not likely to create an appreciable adverse effect on competition within the relevant market in India. The first two provisions i.e. on anti-competitive agreements and abuse of dominance implemented from 2009 onwards while the combination regulations in India implemented from June 2011 onwards. Hence, it is almost 10 years, that the Competition Commission of India started its effective functioning. In this context, it is important to assess whether the market competition across various product lines is moving in the right direction as envisaged while changing the policy focus. The underlying idea is to understand, how far the regulatory changes succeeded in bringing competitive markets and to identify the challenges existing.

Specifically, the following is the major issue addressed in the study:

(i) An Empirical assessment of competition across various sectors in the Indian manufacturing at the disaggregated level

II. What the Literature said about Market Concentration in India

Competition is viewed from different perspectives. There are two strands of thought on competition exists. They are, (i) static competition and (ii) dynamic competition. Static view treat competition as a static affair and the other refers to it as a process. The major proponents of the dynamic competition are Marx, Schumpeter (1950), Downie (1958) and JM Clark (1961), which is closer to the Smith's concept of competition (Pushpangadan and Shanta, 2009). The static view can be associated with the mathematical economists like Stigler (1957) and also Cournot.

McNulty (1967) beautifully narrated the history of perfect competition, in which he illustrated the views of various economists on market competition. He says the elements of competition has prevailed in the literature even a decade before the publication of *Wealth of Nations* by Adam Smith. He mentioned the letter written by Hume to Turgot in 1766, in which Hume stated '*price of labour will always depend on the quantity of labour and the quantity of demand…there cannot be two prices for the same species of labour…' (*Hume, 1955; as in McNulty, 1967). Smith linked competition to the rivalry, i.e., *a race to get limited supplies or a race to be rid of excess supplies* (Smith, 1937; as in McNulty, 1967). i.e., For Smith, competition is a process through which the predicted result of equating prices and cost is achieved. Unlike this, Cournot's analysis is devoid of behavioural content. Stigler pointed out that, it is not the definition of the behavioural process of competing, but the definition of competition as *a state* in which that process had run its limits (Stigler, 1957; as in McNulty, 1967). The major concern in these two streams of thought was not competition as a *process*, but as a *state* in which that process has run to its limits. Cournot's model was not explicit on the market structure since 'entry' is not bothered. The merging of these two concepts, i.e., competition and market were done by Jevons, Edgeworth and Clark later in the late nineteenth century. After that Frank Knight fully developed this idea (Pushpangadan and Shanta, 2009).

In India too, concentration in general and market concentration, in particular, has been a major issue ever since our independence. Government of India appointed the Monopoly Inquiry Commission (MIC) in April 1964 under the chairmanship of Justice. KC. Das Gupta, mainly to examine the concentration of economic power in private hands and the prevalence of monopolistic and restrictive practices except for the agriculture sector. In the report submitted by MIC in 1965, the MIC has comprehensively covered the product level concentration across various sectors using the following criteria: if the three firm concentration ratio is 75 percent or more, concentration is considered to be High, if C3 is between 60 to 75 percent concentration is medium; 50 to 60 percent is low and if it is less than 50 percent, concentration is nil. MIC found that out of the 100 selected products, which are important for ordinary consumers, high concentration exists for 65 products, medium concentration was found for 10 products, concentration was low for 8 products and in 17 products, concentration was nil. In several product lines, MIC found 100 percent market ownership by a single company or close to 100 percent share is owned by one company. High concentration was registered for crucial consumption items such as various medicines, automobiles, rubber, footwear and so on. Low concentration was found mainly for textile and food items. In 41 products, the maximum number of firms engaged in production was less than or equal to four (Monopolies Inquiry Commission Report, 1965). Table 1 shows the concentration levels across various sectors.

Table 1: Product-wise Concentration across Selected Products as per MIC Report

SN.	*Sector*	*High (≥75)*	*Medium (60-75)*	*Low (50-60)*	*Nil (<50)*	*Total*
1	Food	3	1		5	9
2	Clothing			2	7	9
3	Fuel	2			1	3
4	Household Goods	12	4	4	2	22
5	Conventional Necessaries	9				9
6	Medicines	18	1			19
7	Transport Goods	19	3	1		23
8	Building Materials	2	1	1	2	6
	Total	65	10	8	17	100

Source: Author's compilation from Monopoly Inquiry Commission Report (1965).

In the Indian context, there are many previous attempts to study various aspects of market concentration especially in the context of the pre CCI regime (eg. Hazari, RK (1966); Baskar, M.V (1992); Bhavani and Bhanumurti (2007), Kambhampati (1995; 1996), Vaidya, R (1993), Pushpangadan and Shanta (2004; 2005; 2006; 2009), Atreya and Kapur (2006) and so on. These studies covered both concentration ratio based assessment of competition and the indirect reflection of competition on profitability and such indicators. Using the CMIE's Size and Market Share data, Bhavani and Bhanumurti (2007) compared the HHI levels in two time points, i.e., 1992 and 2005 and found that low concentration is visible only in 48 out of the 83 selected products, for which HHI levels remained less than 0.25. For 6 products namely, cigarettes, wafers/potato chips etc, jams/sauces etc, iodised salt, medium and heavy commercial vehicles and fuel injection pumps and nozzles, an HHI of greater than 0.5 was evident, which is taken as high concentration. Over time, there has been an increase in the concentration ratio for 38 products. There are also sectoral level studies which examined the competition issues within certain specific sectors (For eg. Singh, 2013 and Burange and Yamini (2009) on cement industry; Mondal and Pingali (2015) on pharmaceutical sector; Gauri, G (2010); Kathuria, R (2010) on server market and so on).

The major departure of this study compared to the earlier macro level studies is the paradigm shift in competition regime implemented in India and an empirical assessment of the outcome of such a drastic departure on various sub-sectors of the manufacturing sector.

III.Data and Methodology used in the Study

3.1 The Data

The study used firm level information based on the Centre for Monitoring Indian Economy (CMIE)'s PROWESS Database to assess competition across the manufacturing sector. As per PROWESS, the database covers all the companies traded in the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) and a large number of public limited and private limited companies. The data is based on the National Industry Classification 2008[2] (NIC, 2008) at four digit level. Based on this, identified the sectors which are facing serious competition concern. Disaggregated estimates are made for the selected sectors, which are facing competition concern. Though the competition issues are important for every sector, we are focusing on the manufacturing sector to identify the areas of concern for vigilant policy implementation. The study period is 1989-90 to 2016-17. We are skipping the latest year from the analysis since data is not reported for many companies in that year[3]. Broadly, the study is done in a comparative framework involving the Competition

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[2] NIC 2008 is the latest NIC classification brought out by the Central Statistical Organisation, Govt. of India. CMIE used NIC 2008 in its industry classification.

[3] It is to be noted that most of the firms are engaged in the production/business of multiproduct. It is very difficult to get data on each of the products separately, which is a limitation imposed by

Commission of India (CCI) regime and the pre-CCI regime. Based on data availability, we have selected the period 1989-90 to 2007-09 as the Pre-CCI regime while the CCI regime is selected from 2009-2010 to 2016-2017[4]. We have made sub-classifications i.e., 1990-94 (phase I), 1995-1999 (phase II), 2000-2004 (phase III), 2005-09 (phase IV), 2010-14 (phase V) and 2014-18 (phase VI) covering 5 years in each group, except for the latest period (phase VI) for which data covers only four years. In this, phase V and VI represent post CCI era and the rest are pre CCI regime.

3.2 The Methodology

The literature suggests various indicators of competition such as K-firm concentration ratios, Herfindahl Hirschman Index (HHI), Price Cost Margin (PCM), Variance of Logarithms of Firm Size, Relative Profit Difference and so on[5]. However, there has not been a consensus on the best indicator of competition. Curry and George (1983) noted that every concentration measure has some anomalies and exceptions, which one need to tolerate since a completely perfect tool is not available. Hence, in this study, we have used multiple indicators of competition such as the levels and changes in concentration ratios, HHI and PCM to assess the competition. Within concentration ratios, four firm (C4) and ten firms (C10) concentration ratios across various sectors are calculated. The average C4 and C10 across various time phases of competition are worked out to represent the status of competition across various sectors.

Four firm concentration ratio (C4) is defined as the sum of the market shares of the largest four firms in the relevant market while ten firm concentration ratio (C10) is defined as the sum of the market shares of the ten largest firms in the relevant sector. The C4 and C10 can be denoted as:

$$C_4 = \sum_{i=1}^{4} s_i \text{ and } C_{10} = \sum_{i=1}^{10} s_i$$

where, 's' indicates market share

In India, the Monopoly Inquiry Commission Report (1965) (hereinafter 'MIC') used three firm concentration ratio (C3) to assess product market concentration. MIC considered very high concentration if C3 is 75 percent or more; medium concentration if the value is between 60 to 75 percent; low concentration if it is between 50 to 60 percent and no concentration if the value is below 50 percent. However, there is no clear-cut consensus on the exact interpretation of concentration ratios in defining the market structure (Gwin, C. R, 2001). Commonly used interpretation of C4 is as follows.

It can be seen from Table 2 that C4 above 60 is considered to be tight oligopoly or it can be the dominant firm with the competitive fringe market situation. And if the market share

the absence of data.

4 For the MRTP regime, we have data limitation for the initial years since firm level data on that is not available. PROWESS, CMIE provides data from 1989 onwards only.

5 See Curry and George (1983), Saraswathy, B (2018) for related discussion.

of the dominant firm is above 90 percent, it can be considered as an effective monopoly or near monopoly. One major limitation of the C4 is that it fails to identify the tight competition between dominant firms placed within the first four ranks. Nevertheless, concentration ratios give a clear signal on the overall trends in concentration. We have calculated sales and asset based concentration ratios, which indicate the market concentration based on the value of sales and assets respectively.

Table 2: Market Structure based on Four Firm Concentration Ratio

SN.	Level of 'C4'	Likely Market Structure
1	C=0	Perfect Competition
2	0< C4<40	Effective Competition or Monopolistic Competition
3	40≤C4<60	Loose Oligopoly or Dominant Firm with Competitive Fringe
4	60≤C4	Tight Oligopoly or Dominant Firm with Competitive Fringe
5	90≤C1	Effective Monopoly (Near Monopoly) or Dominant Firm with Competitive Fringe.

Source: Gwin, Carl R (2001); Naldi and Flamini (2014).

HHI is defined as the 'sum of squares of the individual firm's market shares', which can be denoted as:

$$HHI = \sum_{1}^{n} Si^2$$

where, 's' is the market share. As per the Horizontal Merger Guidelines brought out by the US Department of Justice and the Federal Trade Commission (FTC), competition agencies generally define an HHI below 1500 as un-concentrated market; between 1500 and 2500 as moderately concentrated market and HHI above 2500 as highly concentrated. Also, the competition authorities rely on the following general standards while defining the changes in HHI and market structure (Table 3). It is to be mentioned that this interpretation has been given in the context of horizontal merger guidelines. However, the implications of the range can be implemented even without M&As.

Table 3: Value of HHI and Market Structure

HHI	*Range*	*Change in HHI*	*Range*
Un-concentrated	<1500	Small Change: Unlikely to have any adverse effect on concentration and further analysis is not required normally	Increase of <100 points
Moderately Concentrated	1500-2500	Moderately Concentrated markets: In this, change in HHI above 100 points potentially increases significant competition concerns and thereby the scrutiny is required	Increase of >100 points
Highly Concentrated	>2500	Highly concentrated markets: if the change in HHI is between 100 to 200 points, it creates significant competition concerns and often warrant scrutiny.	100-200 points
		Highly concentrated markets: If the change is above 200 points, presumed to be likely to enhance market power.	>200 points

Source: Compiled from US Department of Justice and the Federal Trade Commission (2010).

The literature on mark-up pricing recognised that the Lerner Index is one of the more direct indicators of monopoly power (Schmalensee, 1989 and Bresnahan, 1989; Martins et.al, 1996). This index is developed by Lerner (1934). The index is defined as the prices (P) over marginal costs (MC), that is,

$$L = \left(\frac{P - MC}{P}\right)$$

When prices exceed the marginal costs, the index will become positive and varies between zero and unity. When the value approaches zero, the market power will be the least, or it will be equal to perfect competition whereas the market power will be the highest when the value approaches one. Hence, closer the value to unity, greater will be the market power. This is a static measure of actual firm *conduct*, and may not reflect the potential monopolistic behaviour (Martins et.al, 1996). From the empirical point of view, a major obstacle with this measure has been the direct estimation of marginal cost is not possible. Also, the static nature of assumptions and the unsuitability in the context of imperfectly competitive market conditions has also been criticised (Kriesler, 1987; as in Babu, S.M, 2018). After that, there have been various attempts to derive an empirically measurable mark-up. Hall's approach based on Solow residual[6], which is the well-known total factor productivity estimation method is widely quoted amongst this (Hall, 1986; and 1988).

Price Cost Margin (PCM) is considered to be an approximation of the Lerner Index (Domowits et.al, 1986; Salinger, M, 1990). This approximation is based on the implicit assumption that in the long run, average cost and marginal costs are same and in the short run, marginal cost equals average variable costs (Salinger, M, 1990). PCM is introduced by Collins and Preston which is used as an indicator of '*the ability of firms in an industry to obtain prices in excess of direct costs*' (Collins, N. R and Lee E. Preston, 1968; and 1969). PCM is generally computed for the narrowly defined industries (Schmalensee, R, 1989). According to Schmalensee, R, (1989), assuming the condition of constant returns to scale, the mark-up of prices over long run average (and marginal) cost can be defined as follows:

$$\frac{P - v - (p + \delta)\,(\frac{K}{Q})}{P} = \frac{PQ - vQ}{PQ} - (p + \delta)\,\frac{K}{PQ}$$

where, 'P' is price, 'v' is variable cost, 'p' is the competitive rate of return, 'δ' is the rate of depreciation of capital used, 'K' is the dollar value of capital used and 'Q' is output. The first quantity of the above mark-up equation represents $\frac{Revenue - Variable\ Cost}{Revenue}$ which is PCM. The ratio will be equal to the second quantity of the equation, under competitive conditions. Collins and Preston (1969) originally defined PCM as:

$$PCM = \frac{Value\ Added\ (adjusted) - Payroll}{Value\ of\ Shipments\ (including\ resales)}$$

[6] Solow residual is the difference between the growth rate of output and the weighted average of the growth rate of factor inputs (Martin, et.al, 1996).

Later Domowits, Hubbard and Petersen (1986) elaborated as follows to make it in accordance with the Census data.

$$PCM = \frac{(S + \Delta I - P - M)}{(S + \Delta I)}$$

where, 'S' is the value of sales, 'ΔI' is the change in inventories, 'P' is payroll, 'M' is the cost of materials. We have used this definition in the study.

This study used multiple indicators of competition such as the levels and changes in concentration ratios, HHI and PCM to assess the competition. Within concentration ratios, four firm (C4) and ten firms (C10) concentration ratios across various sectors are calculated. For this, both sales and assets based concentration ratios are calculated. The average C4 and C10 across various periods is worked out to represent the status of competition across various sectors. Based on the foregoing discussion, the following criteria used to interpret the concentration ratios and HHI (Table 4). Amongst this, the criteria for the change in concentration ratio is arbitrarily decided, all other indicators are based on the studies discussed earlier.

Table 4: Competition Indicators: CR and HHI

C4		*Change in C4*		*HHI*		*Change in HHI*	
Range (%)	*Outcome*	*Range*	*Outcome*	*Range*	*Outcome*	*Range*	*Outcome*
0	Zero	0	No change	<1500	Un-concentrated	Increase of <100 points	Small
0-40	Low	1-5 (+/-)	Low (+/-)	1500-2500	Moderately Concentrated	Increase of >100 points	Moderate
40-60	Medium	5-15 (+/-)	Medium (+/-)	>2500	Highly Concentrated	100-200 points	High
60-90	High	>15 (+/-)	High (+/-)			>200 points	Very High & presumed to increase concentration
>90	Very High						

Source: Author's compilation based on relevant literature discussed in the text.

PCM is estimated based on the definition given by Domowits et.al (1986), which is discussed earlier.

$$PCM = \frac{(S + \Delta I - P - M)}{(S + \Delta I)}$$

In order to get the changes in inventories, we have used the change in inventory compared to the previous year. Cost of materials is defined as the sum of raw materials, store and spares; packaging expenses, purchase of finished goods, power, fuel and water charges.

PCM is calculated at the firm level across each sector and then the average sectoral values are worked out for various period. Table 5 shows various sub-sectors covered for the study and the number of firms covered across various sectors. We have selected 29 sub-sectors in the manufacturing sector[7]. Next, we shall move to the major observations emerged from the study.

Table 5: Sector-wise Data Coverage

SN.	*Broad Sector*	*Sub-Sector*	*NIC*	*Firms covered (No.)*	*Share (%)*
1	Food Products	Vegetable and animal oils and fats	1040	585	7.2
2		Dairy products	1050	138	1.7
3	Beverages	Alcoholic Beverages	1101, 1102, 1103	133	1.6
4		Soft Drinks; Mineral Water and other bottled water	1104	157	1.9
5	Tobacco Products	Tobacco Products	1200	32	0.4
6	Textiles & Wearing Apparels	Textile	13 (1310 and 1390)	1406	17.4
7		Wearing Apparel	14 (1410, 1420, 1430)	339	4.2
8	Leather & Related	Leather & Footwear	15 (1510, 1520)	163	2.0
9	Paper and paper Products	Paper and paper Products	1700	439	5.4
10		Printing and reproduction of recorded media (excl. publishing activities)	1800	55	0.7
11	Petroleum Products	Refined Petroleum Products	1920	142	1.8
12	Chemicals	Basic chemicals	2011	464	5.7
13		Fertilizers	2012	112	1.4
14		Pesticides and other Agrochem products	2021	124	1.5
15		Paints, Varnishes and similar coatings	2022	100	1.2
16	Pharmaceuticals, Medicinal Chemical and Botanical Products	Medicinal substances used in the production of pharmaceuticals…	21001	68	0.8
17		Allopathic Pharmaceutical preparations	21002	284	3.5
18	Non-metallic minerals	Articles of concrete, cement and plaster	2395	69	0.9
19	Basic Metals	Basic Iron and Steel	2410	999	12.4

[7] We have excluded plastics and synthetic rubber, manmade fibres, Ayurveda, Homeo, veterinary products, Basic, precious and other casting of metals, consumer electronics, magnetic and optical media, others categories from the analysis. For some of these categories, there are only a few firms covered in the database. Also for some of these categories, a large number of small scale firms exists, which makes the sector more competitive.

SN.	Broad Sector	Sub-Sector	NIC	Firms covered (No.)	Share (%)
20	Computer, Electronics and Optical Products	Computer and Peripheral equipment	2620	47	0.6
21		Communication Equipment	2630	80	1.0
22		Measuring, Testing, Navigating and control equipment	2651	157	1.9
23		Irradiation, electo-medical and electro Therapeutical equipment	2660	61	0.8
24	Electrical Equipment	Domestic Appliances	2750	99	1.2
25	Machinery and Equipment	General Purpose Machinery	2810	529	6.5
26		Special Purpose Machinery	2820	512	6.3
27	Motor Vehicles: Trailers and Semi-trailers	Motor Vehicles	2910	40	0.5
28		Bodies (coachwork) for motor vehicles; Manuf. of trailers and non-trailers	2920	211	2.6
29		Accessories and parts of motor vehicles	2930	534	6.6
	Total Covered			***8079***	***100.0***

Source: Based on PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

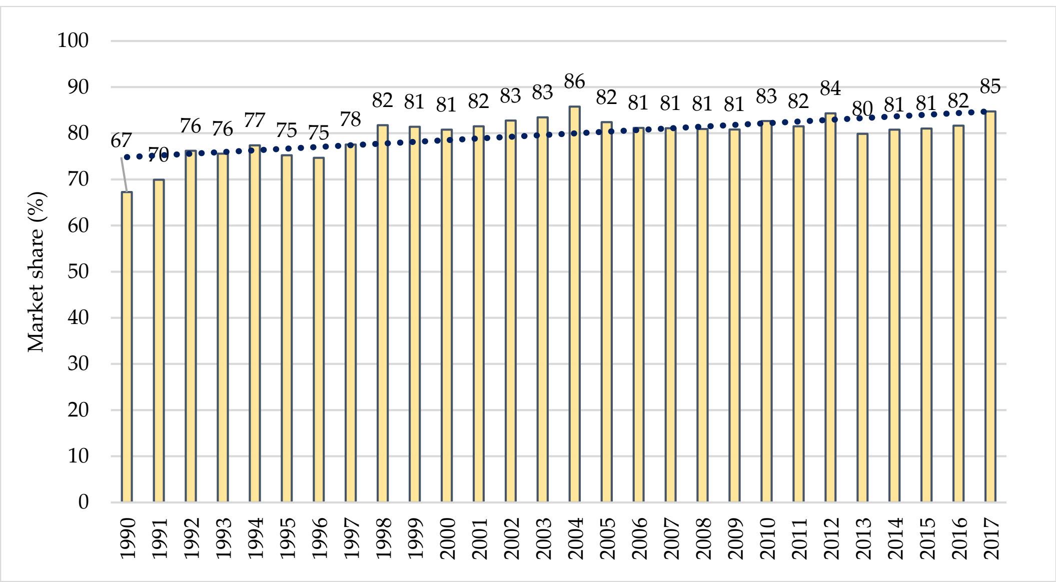
IV.Major Observations from the Study

4.1 Based on Concentrated Ratios and HHI

4.1.1 Highly Concentrated Sub-Sectors

Based on all multiple indicators based on concentration ratios and HHI both based on sales and assets, the following observations are noticed. Seven sub-sectors, i.e, (i) Tobacco products; (ii) computer & peripheral equipment; (iii) Printing and reproduction of recorded media (excl. publishing activities); (iv) Refined Petroleum Products; (v) Communication Equipment; (vi) Measuring, Testing, Navigating and control equipment; and (vii) Medicinal substances used in the production of pharmaceuticals can be classified as the sub-sectors experiencing high market concentration (Table 6). Tobacco products and computer & peripheral equipment exhibited very high concentration levels based on all indicators. During the latest phase of assessment (2014-17, 6th phase), C4 for tobacco products is 93 percent for both sales and asset based measures. And for computer, it is 85 and 86 percent respectively. High level of concentration in these two sectors is visible from the HHI based on sales and assets too. HHI for tobacco during the 6th phase is 6038 and 6797 respectively for sales and assets based measures. Similar figures for the computer is 3312 and 4633. The next important question is how the concentration levels in these sectors are moving over time. Compared to the pre-CCI regime, there has been a small decline in the C4 levels of tobacco during post CCI period for both sales and assets based C4. Irrespective of the declining market shares, the sector exhibited a high increase in HHI levels during the post CCI period, which may be indicating the increased presence of top firms in the sector. From the firm level data, it is clear that the market leader in the sector, i.e., ITC Ltd constituted around 67 percent of the market in 1989-90 period, which substantially increased to 85 percent in 2016-17 (Figure 1). The presence of other players are relatively insignificant in the sector. Next ranking firms are Dharampal Satyapal (7 percent), Desai Godfrey Phillips India (4 percent) and Desai Brothers (2%). As per the website of ITC, '*ITC Is the market leader in cigarettes in India. With its wide range of invaluable brands, ITC has a leadership position in every segment of the market*[8]'.

Figure 1: Sales Based Market Share of ITC in Tobacco Products (%)



Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

In the case of computer and peripheral equipment, the sales based C4 is 93 for the sub-sector while asset based is 92. As per HHI levels too, this sub-sector is exhibiting high concentration. HHI is 3112 and 4034 respectively for sales and assets based HHI. When the pre and post CCI levels of these measures are examined, there has been a moderate increase in C4 levels during the post CCI period as well as the 6th phase of operation (2014-17). Asset based HHI also shows a smaller increase for the period whereas, the sales based HHI shows a high decline during the post CCI period. This decline may be representing the increasing significance of smaller firms in the market. Figure 2 shows the market share of the top 4 firms of phase 6 in recent periods. It can be seen that the phase 6 market share

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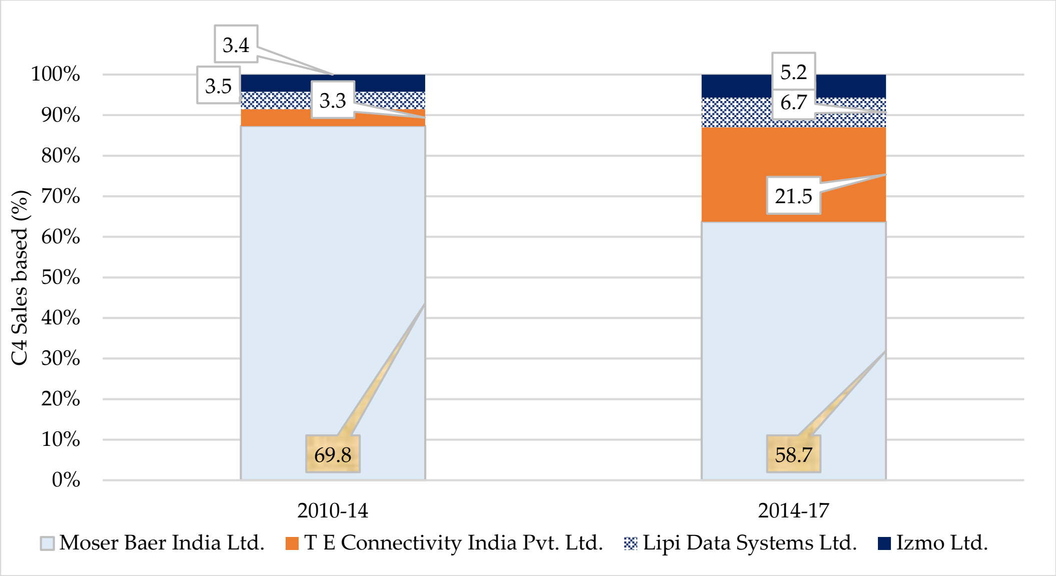
8 As available in https://www.itcportal.com/businesses/fmcg/cigarettes.aspx, Accessed on 21st June, 2019.

of top 4 firms is 92, which was only 80 percent in phase 5. However, the market shares of the top firm (Moser Baer) declined from 70 to 59 percent in phase 6, whereas the share of TE Connectivity India increased to 22 from 3 percent. A similar trend can be seen for other firms in this sub-sector too. Hence, this shows an upward movement of other firms in the sector, which may be considered as a positive sign of increasing competition.

Figure 2: C4 in Computer and Peripheral Equipment



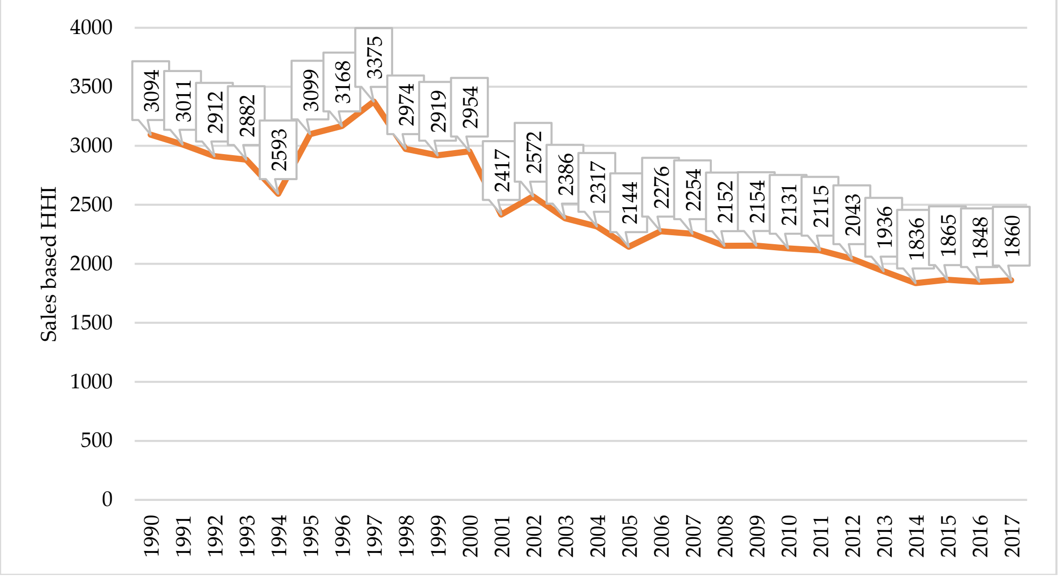
Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Printing and reproduction of recorded media (excl. publishing activities) experienced 'very high' asset based C4, while it is coming under the 'highly concentrated' category in the sales based C4. This difference arises because the market share is located closer to the classification boundary levels. In this, the C4 is 89 and 92 for sales and assets based measures respectively. The HHI figures based on both sales and assets also classify this sub-sector under highly concentrated category. During the post CCI regime, the C4 (sales) for this sector is increased to 89 percent from 70 percent and C4 (assets) increased to 90 from 76 percent, which indicates a substantial increase over the years. Nevertheless, during the second phase of the CCI regime (2014-17), the rate of increase has substantially come down. After closely examining the sub-sector, we have observed that the first two companies under this category are catering to the currency printing requirements of the country. Security Printing & Minting Corporation of India is first in the list, which is one of the wholly owned Schedule 'A' Miniratna companies in the government sector. In 2017, the company has a share of 51 percent while the second ranking Bharatiya Reserve Bank Note Mudran Pvt. Ltd. Has 36 percent market share, which is established as a wholly owned subsidiary of RBI for balancing the demand-supply gaps in banknotes. Around 79 percent of market share in this segment is owned by these two companies. Manipal

Technologies is the next player with around 6 percent market share. Here it is to be mentioned that unlike the MRTP Act, the Competition Act applies to public sector monopoly as well. However, uniformly applying such clear-cut provisions across all sectors is not desirable for the long term development of the country, from the national security point of view.

Next four sub-sectors are coming under 'high' concentration as per the three concentration indicators are (i) refined petroleum products; (ii) communication equipment; (iii) medicinal substances used in the production of pharmaceutical products; and (iv) measuring, testing, navigating and control equipment. We shall discuss these sectors next. Refined petroleum products had been appearing in very high concentration from the 1990s itself based on asset and sales based C4 as well as HHI. The declining trend is visible from 2000 onwards based on all indicators. C4 based on assets and sales is 81 percent and that of HHI is 2523 and 1852 respectively. It can be seen that unlike other measures, the sales based HHI is showing only moderate concentration in the sector. However, almost all indicators are showing a declining trend compared to the pre-CCI period as well as the 5th phase (2010-14). Figure 3 shows trends in sales based HHI in this sub-sector.

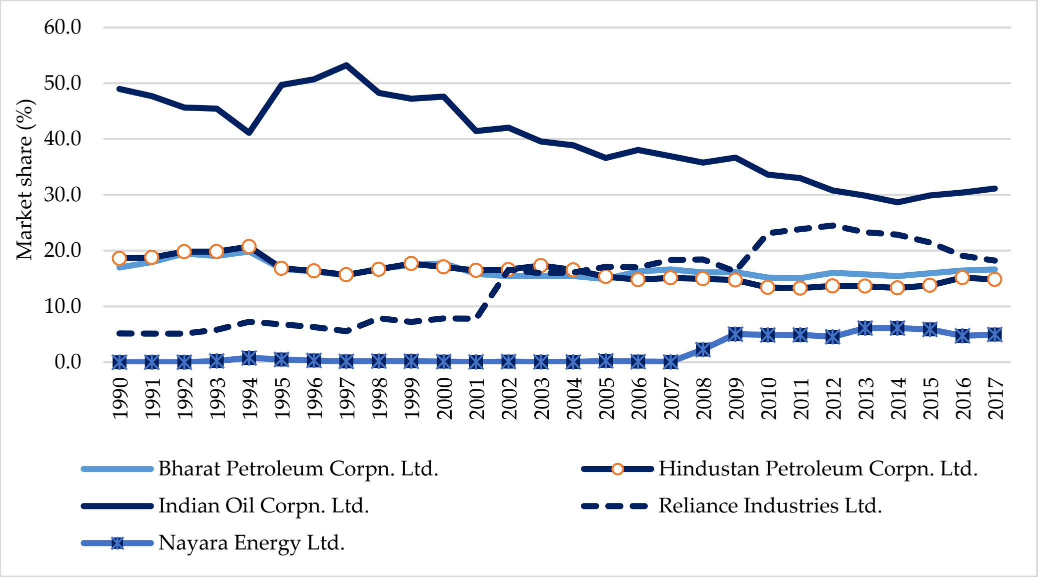
Figure 3: Refined Petroleum Products: HHI (sales)



Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

The top players in this sub-sector are: (a) Indian Oil Corporation (b) Reliance Industries (c) Bharat Petroleum and (d) Hindustan Petroleum. From Figure 5 it can be noticed that the share of Indian Oil Corporation declined sharply from 49 percent in 1990 to 18 percent in 2017. The share of Hindustan Petroleum declined from 18.6 to 14.8 and that of Bharat Petroleum remained almost the same at 17 percent. At the same time, the share of Reliance drastically increased to 18 percent from 5.2 percent in 1990. It is interesting to note that a drastic increase in Reliance's share occurred in 2002, the year in year in which major changes in fuel policy introduced. Private firms allowed to sell petrol and diesel from March 2002 onwards and in April deregulation in fuel pricing also introduced[9]. Price regulations re-introduced in 2004-05 and after that again withdrawn in June 2010. Consequently, a corresponding increase in shares can be noticed from 2010 for Reliance. The Essar owned Nayara Energy is also increasing its share recently. Nayara was having only a minuscule market share in the early 1990s, which increased to 5 percent now (Figure 4).

Figure 4: : Top firm's market share (sales) in Petroleum



Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Next, we shall move to the communication equipment. The main products in this sub-sector are, communication and broadcasting equipment, defence communication equipment, mobile/cellular phones, etc. This sub-sector exhibited 'high' level concentration based on all indicators except asset based HHI, for which the ratio is closer to the classification boundary. C4 is 78 percent based on both assets and sales, while HHI figures are 2441 and 3655 respectively during the latest phase of assessment (2014-17). The competition indicators for the sub-sector suggests a moderate increase in concentration during the post CCI era. However, there is a decline in the rate of increase during the second phase of CCI's operation and hence the overall increase in concentration during the sixth phase (2014-17) is minimal. Market leaders in the sub-sector are Samsung India, Nokia Solutions, Bharat Dynamics and so on. It is interesting to observe that though the sub-sector is highly concentrated, there is high fluctuation in the market share of

[9] See https://economictimes.indiatimes.com/industry/energy/oil-gas/private-fuel-retailers-double-petrol-diesel-market-share/articleshow/63366996.cms?from=mdr, Accessed on 24th June, 2018.

individual companies over time, which indicates the frequent entry of new firms or new products or new brands into the sector, which overthrow the incumbents or the existing brands of incumbents, which is the case of Schumpeterian competition. In 2017, the share of Samsung is around 64. For the 6th phase, Samsung has 58 percent and Nokia has 10 percent market share. When one compares with the previous phase (2010-14), for Samsung, it is a clear increase while for Nokia a clear loss in market share. Concentration ratios usually fail to show this kind of trends in competition. As long as one firm gaining market share, while the other experience loss, this will not be reflected in the CR4 levels. Looking at the change in competition during post CCI regime as well as comparing with the 5th phase, CR4 shows a generally increasing trend. But the same for HHI is declining in general, which represents the tight competition existing. Nevertheless, in this sector, a more disaggregated study is required to examine the competition dynamics in various equipment production, which is beyond the scope of the present study.

The next important sub-sector coming under 'High' concentration category is the measuring, testing, navigating and control equipment. Main products under this category are control panels, control instrumentation and industrial electronics, air pollution control equipment, electronic test and measuring instruments and so on. C4 levels in the sub-sector are 61 and 71 for sales and assets based measure. And the HHI values are 1649 and 3283 respectively. All the indices suggest a decline in concentration during the post CCI regime and phase 6. Major firms in the sub-sector are, Bharat Electronics, Honeywell Automation and so on. The major share of the sub-sector from the initial years itself belongs to Bharat Electronics. However, there has been a decline in its shares over time. It controlled 70 percent of the market in 1990, which declined to 41 percent in 2017. At the same time, the share of Honeywell was minor in the initial 1990s, which increased to 11 percent in 2017 (Figure 5).

One more sub-sector is appearing in 'highly' concentrated group, i.e., medicinal substances used in the production of pharmaceuticals. Here, the phase 6 C4 levels are 64 and 77 respectively for sales and assets based measures. The HHI figures are 1906 and 3325 respectively. Except for the sales based HHI, all other indicators show an increase in concentration during the post CCI period and also during the 6th phase. The Pune based Serum Institute of India is the leading producer of medicinal substances with a market share of 40 percent, whose share was only 28 percent in 2005. The Serum is the world's largest vaccine manufacturer in terms of the number of doses produced and sold globally. And also India's largest biotech firm[10]. Another firm, Syngene International is also increasing its presence in the market. Syngene's share was only 3 percent in 2005 which increased to 12 in 2017. Biological E. Lab has 11 percent share in the market now. Kanoria Chemicals[11] and Inds. Ltd significantly lost its market presence over time. In 1990, the share

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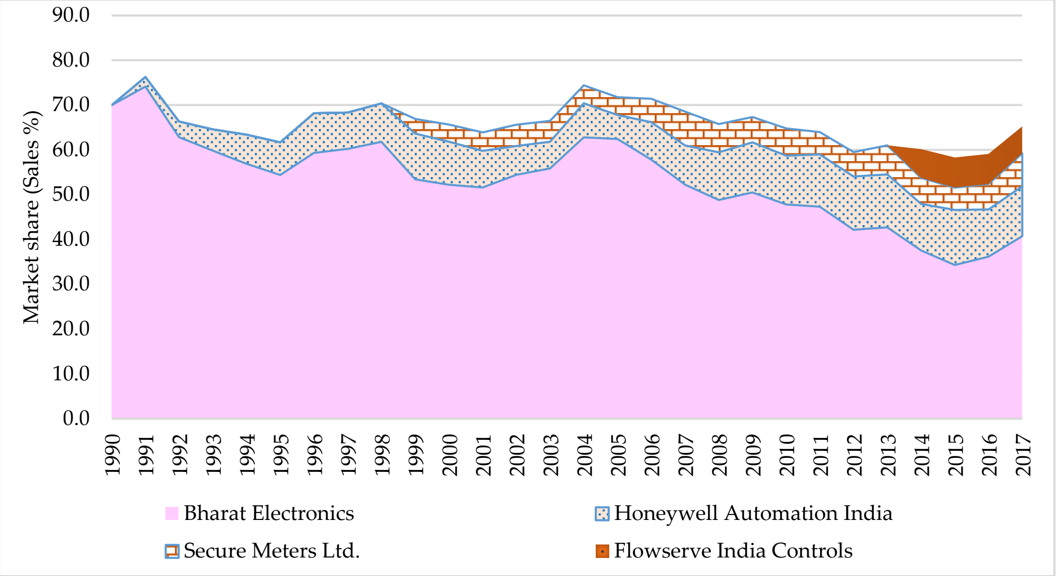
[10] Based on the official website of Serum available at: https://www.seruminstitute.com/, Accessed on 25th June, 2019.

[11] This firm is more into the production of chemicals.

of Kanoria was 36, which declined to 3 percent in 2017. The pharmaceutical sector has been known as one of the largest consolidation intensive sectors in India. Though the prices are regulated in the sector, any monopolisation effort from the firms can adversely affect the sector since the existence of inelastic demand owing to the indirect consumption decisions and the low supply substitutability. Price hike or supply shortages will be passed on to the production of the formulations, which can lead to the price hike of medicines.

Figure 5: Market Leaders in Measuring Equipment



Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

In short, these are the seven sub-sectors which experienced high concentration in the manufacturing sector (Table 6). Next, we shall move to a few sub-sectors for which a mix of high and medium concentration have shown by various indicators.

Table 6: Highly Concentrated Sub-Sectors: Competition Indicators

		*Category**	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*change pre and post*	*last two points*	*C4 phase 6*	*ch C4 (pre post)**	*c4 ph 5 and 6**
1	Tobacco Products	C4 S	100	98	93	93	93	93	95	93	-2.1	0.5	Very High	Low -	Low +
		C4 A	100	98	94	93	93	94	95	93	-2.0	0.9	Very High	Small -	Small +
		HHI S	4935	5548	5900	6415	6347	6038	5700	6222	522.3	-308.9	High	Very High +	Very High -

		Category*	1990-1994	1995-1999	2000-2004	2005-2008	2010-14	2014-2017	1990-2009	2009-2017	change pre and post	last two points	C4 phase 6	ch C4 (pre post)*	c4 ph 5 and 6*
		HHI A	5645	6253	6925	6667	6756	6797	6372	6797	424.6	40.9	High	Very High +	Less +
2	Computer and Peripheral equipment	C4 S	91	75	88	91	82	92	70	85	14.3	10.9	Very High	Medium +	Medium +
		C4 A	87	63	90	91	85	92	74	85	11.3	7.3	Very High	Medium +	Medium +
		HHI S	3259	2677	3788	4772	3428	3112	3624	3312	-312.0	-316.0	High	Very High -	Very High -
		HHI A	2995	2132	5887	7138	5114	4034	4538	4633	94.5	-1079.7	High	Less +	Very High -
3	Printing and reproduction of recorded media (excl. publishing activities)	C4 S	100	100	89	94	88	89	70	89	18.6	1.3	High	High +	Low +
		C4 A	100	100	84	96	89	92	76	90	14.4	2.7	Very High	Medium +	Small +
		HHI S	8000	8167	6725	4410	5217	3563	6825	4613	-2212.9	-1654.1	High	Very High -	Very High -
		HHI A	8000	8831	6177	5525	5695	4576	7133	5310	-1823.2	-1118.8	High	Less -	Very High -
4	Refined Petroleum Products	C4 S	90	90	88	85	84	81	81	83	1.8	-2.9	High	Low +	Low -
		C4 A	85	72	76	83	82	81	79	82	2.4	-1.5	High	Small +	Small -
		HHI S	2898	3107	2529	2196	2012	1852	2683	1954	-728.4	-159.7	Medium	Very High -	High -
		HHI A	3308	1985	2084	2376	2400	2523	2439	2470	31.9	123.5	High	Less +	High +
5	Communication Equipment	C4 S	77	71	79	68	59	78	55	65	9.4	18.8	High	Medium +	High +
		C4 A	70	80	80	67	77	78	61	76	14.9	1.0	High	Medium +	Small +
		HHI S	3890	2221	2808	3805	2514	3655	3181	2969	-211.3	1140.1	High	Very High -	Very High +
		HHI A	3659	2399	2868	2295	2477	2441	2805	2528	-277.0	-35.5	Moderate	Less -	Moderate -
6	Measuring, Testing, Navigating and control equipment	C4 S	83	74	72	74	66	61	73	63	-9.4	-5.3	High	Medium -	Medium -
		C4 A	87	76	75	80	76	71	78	74	-3.5	-5.5	High	Small -	Medium -
		HHI S	4420	3540	3250	3162	2151	1649	3593	1962	-1631.1	-501.4	Medium	Very High -	Very High -
		HHI A	5381	4128	3968	4678	4139	3283	4539	3825	-713.7	-856.2	High	Less -	Very High -

		Category*	1990-1994	1995-1999	2000-2004	2005-2008	2010-14	2014-2017	1990-2009	2009-2017	change pre and post	last two points	C4 phase 6	ch C4 (pre post)*	c4 ph 5 and 6*
7	Medicinal substances used in the produ.of pharmaceuticals	C4 S	75	62	59	60	55	64	52	56	3.5	9.1	High	Small +	Medium +
		C4 A	69	67	58	61	67	77	53	68	15.7	10.2	High	High +	Medium +
		HHI S	2168	1778	1400	1506	1350	1906	1713	1569	-143.9	556.1	Medium	High -	Very High +
		HHI A	2372	1643	1359	1516	2147	3325	1723	2621	898.5	1177.8	High	Very High +	Very High +

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).
*Note**: C4 S denotes sales based C4; C4 A indicates assets based C4, HHI S indicates sales based HHI, HHI A indicates assets based HHI; (+) denote 'increase' and (-) denotes 'decline'

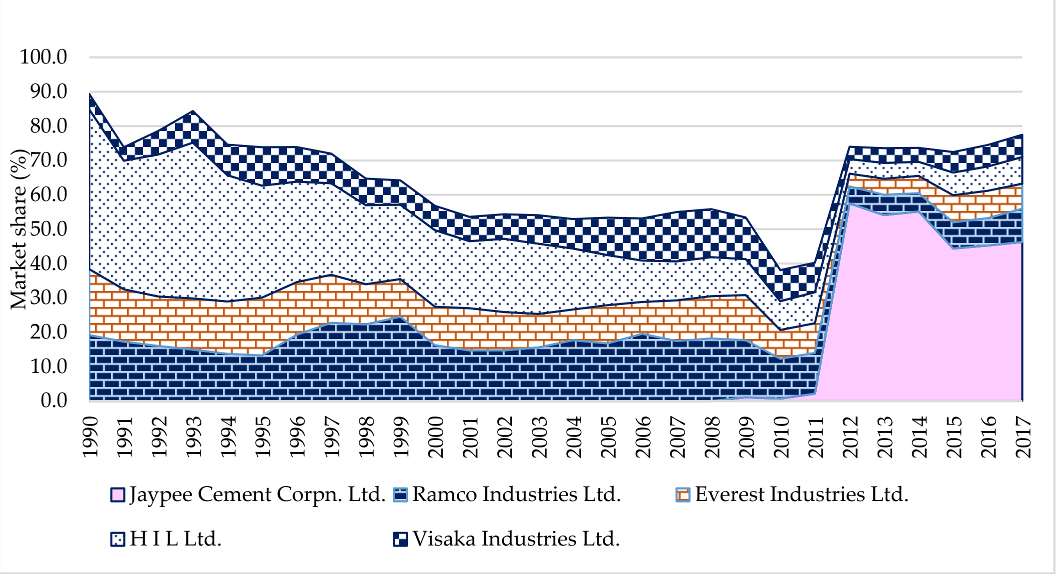
4.1.2 High-Medium Concentration

Appendix Table 1 shows the four sub-sectors coming under this category. For articles of concrete, cement and plaster, asset based C4 and HHI shown a high level of concentration while sales based C4 it is medium, and HHI it is low. As the name suggests, this sub-sector consists of all kinds of cement and asbestos related products. The cement sector is badly known for the cartel and such collusive activities. Recently the Competition Commission of India imposed penalties on 11 companies for violating the competition regulations. An important observation made by the Commission is that the companies are underreporting production[12], which may be reflecting in sales figures too. This may be the reason for low sales based C4 and HHI figures whereas 'high' concentration in terms of asset based measures. Another important characteristic in cement sector is the 'regional' concentration of companies, which makes the national level figures less concentrated. We are not taking up the regional pattern here since the focus of the study is not that. C4 levels in the sub-sector are 56 and 69 for sales and assets respectively. HHI figures are 1011 and 2545 respectively. Though the HHI figures show an increasing concentration during the post CCI period and 6th phase, the overall declining trend is shown by the C4 ratio. In order to overcome the underreporting issue discussed earlier, we have shown the assets based market shares of leading companies in Figure 6. It can be noticed that in recent years, Jaypee controls a very large segment of the market. In 2017, Jaypee's share is 46 percent compared to 2 percent in 2011. In 2012, the assets share was 58 percent. Jaypee is incorporated in 1996 only. Ramco, CK Birla owned HIL and the Gujarat Ambuja owned

[12] Available at Menon, B and Suresh P. Ayengar (2017), 'CCI Finds Cement Firms Guilty of Forming Cartel', The Hindu Business Line, https://www.thehindubusinessline.com/economy/CCI-finds-cement-firms-guilty-of-forming-cartel/article20455622.ece, Accessed on 26th June, 2019.

Everest is the next in the list with 10, 8, 8 percent shares respectively. Visaka is the next major player, which gained market share compared to initial 1990s. In 2017, the first four companies in the market own 71 percent market share. In terms of sales too, the same firms are the dominant players. From the 1990s onwards HIL and the Everest top the list. HIL's share was down significantly from 44 percent to 15 percent. And that of Everest declined from 25 percent to 17 percent. As discussed earlier, if the firms are colluding and sharing the market, then the market share based assessment and also the HHI based assessment will become immaterial in reflecting the actual competition in this market. Even without those possibilities, in 2017, 58 percent of the sales share is coming from the top four firms.

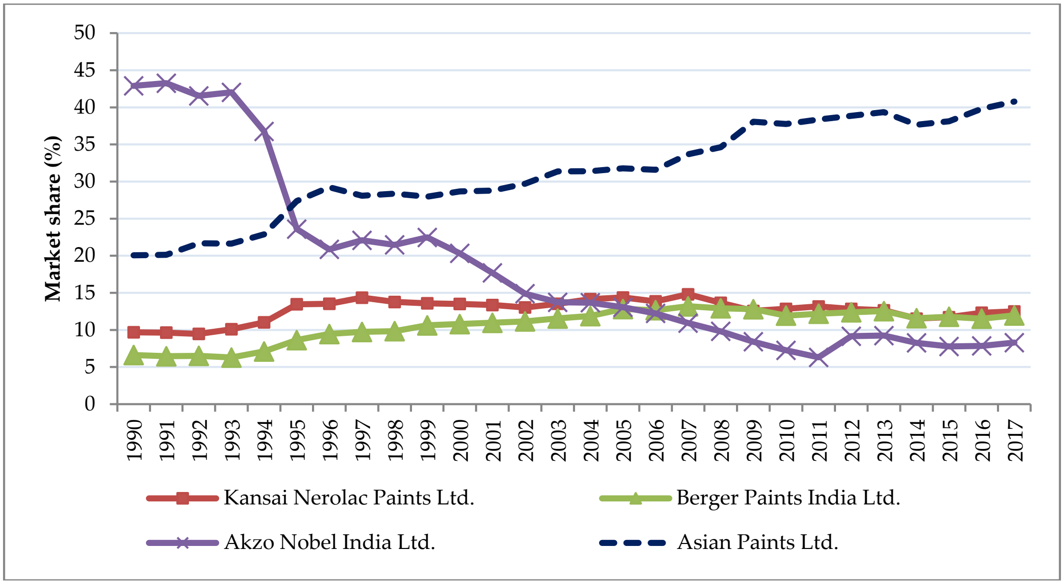
Figure 6: Cement & Related: Market Leaders (Assets)



Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Next, we shall move to the sub-sector on paints, varnishes and similar coatings, where the CR4 is high both based on assets and sales, however, both measures of HHI are showing moderate level only. C4 levels are 71 and 68 for sales and assets respectively and the HHI levels are 1956 and 1658. Compared to the pre-CCI regime, the change in C4 is very less. With respect to the HHI levels, it is showing mixed results. When the market leaders are examined, Asian Paints tops the list from the mid-1990s onwards and it continues to gain market share. In 2017, it has a 41 percent share, which was only 20 percent in 1990. Akzo Nobel was market dominant in the initial 1990s, which started declining when Asian paints started gaining momentum. Akzo's share is only 8 percent now compared to the 43 percent in 1990. Berger Paints is also sustaining its share continuously, which increased from 7 to 12 percent for the same time period. Kensai Nerolac had 10 percent, which is now 13 percent share (Figure 7).

Figure 7: Paints and Varnishes: C4 Sales



Domestic appliances consist of products such as blowers, refrigerators, electric appliances, washing machine and so on. The competition indicators for domestic appliances exhibited mixed results. The C4 levels in the sector are 64 and 54 respectively for sales and assets and that of HHI is 1663 and 957. Sales based indicators are showing more concern than that of assets based figures. This sub-sector is known for brand competition. Most of the firms are specialising in multiple products within the sub-sector. Products are differentiated based on brand names and their product configuration. With the drastically changing innovation and the consumer requirements, the product life cycle for these products is less. Hence, sustaining market share, in the long run, requires cutting edge technological up-gradation and mastery over consumer preferences, which helps in constantly evolving and introducing the new products in the market. The major players in this segment are LG Electronics, Whirlpool of India, Bajaj Electricals and Blue Star. In 2017, LG is having 35 percent of the market, while others' share is in the range of 9-10 percent. Bajaj and Whirlpool have considerably lost market their market presence compared to the 1990's value of 29 and 17 percent. These firms constitute around 64 percent market share in 2017.

4.1.3 Moderate and Less Concentrated Product lines

In 5 sub-sectors, i.e., (i) motor vehicles; (ii) soft drinks, mineral water & other bottled water; (iii) fertilizers; (iv) irradiation, electro-medical and electro therapeutical equipment; and (v) dairy products, moderate levels of concentration is visible (See Appendix Table 2). For these sub-sectors, the C4 based on both sales and assets ranges from 50 to 59 percent, which essentially means more than half of the market share. However, in all these sectors HHI levels based on both sales and assets are showing low concentration, which ranges between 896 to 1076. And in the post CCI period, there has been a declining trend in all these sectors based on HHI and decline is visible in four sectors based on C4. A minor increasing trend is visible in fertilizers and Irradiation, electro medical and electro therapeutical equipment sub-sector. For leather and footwear, the C4 levels remained 44 and 42 for both sales and assets based ratios. However, HHI values show less concentration. Post CCI period shows an increasing trend in concentration.

All other sub-sectors namely (i) basic iron and steel; (ii) pesticides and agro-chem products; (iii) vegetable and animal oil and fats; (iv) allopathic pharmaceutical preparations; (v) paper and paper products; (vi) special purpose machinery; (vii) general purpose machinery (viii) bodies (coachwork) for motor vehicles; (ix) basic chemicals; (x) textile; (xi) wearing apparel; and (xii) accessories and parts of motor vehicles exhibited low-level concentration (See Appendix Table 3). Out of this, for 9 sub-sectors, the C4 (sales) ratios during the post CCI period decreased. The exceptions are allopathic pharmaceutical preparations, vegetable and animal oil and fats and textiles. For these sectors, the C4 based on assets also registered an increasing trend during the post CCI regime. Additionally, in the case of basic chemicals too, this trend is visible for assets based ratio. Trends based on both HHI based ratios are almost similar. All these sectors are coming in lower level concentration category. Based on HHI sales, in 6 product lines, there has been a declining trend in concentration compared to the pre-CCI period and as per asset based measure, the declining trend is visible in 8 sub-sectors. The increasing trend is visible for the three sub-sectors mentioned above for C4 ratio. Apart from that, for basic chemicals increasing trend is visible in both HHI figures. For paper products, sales based HHI shows an increasing trend. Here the increasing trend in concentration is more concerned in the case of crucial consumer products like allopathic pharmaceutical preparations and vegetable and animal oil.

As it is evident from Table 7, during the post CCI period, the declining trend dominated across various sub-sectors. C4 ratios show a declining trend for 16 sub-sectors, whereas HHI sales and assets figures show a declining trend for 18-20 sub-sectors. However, it is to be mentioned that under the highly concentrated category, the presence of increase is higher than that of overall declining trends in concentration. Similarly, during the second phase of CCI's operation, there has been an increasing trend in concentration ratios across a large number of sub-sectors. This trend is showing reverse when we assess based on HHI figures. This may be indicating the presence of competition from the next ranking and or other small-sized firms. Here too the increasing trend is higher for the 'highly' concentrated sub-sectors.

Table 7: Changes in Concentration (sub-sectoral count) during Post CCI Period

Concentration Range of the sector	*Direction of change*	*Post CCI changes*				*5th to 6th phase*			
		C4A	*C4S*	*HHIA*	*HHIS*	*C4A*	*C4S*	*HHIA*	*HHIS*
High	Increase	5	5	4	1	5	5	3	2
	Decline	2	2	3	6	2	2	4	5
High Medium	Increase	1	2	1	4	2	2	2	1
	Decline	3	2	3	0	2	2	2	3
Medium Low	Increase	3	3	0	1	2	1	1	1
	Decline	3	3	6	5	4	5	5	5
Low	Increase	4	3	4	5	10	10	7	6
	Decline	8	9	8	7	2	2	5	6
Total	*Increase*	*13*	*13*	*9*	*11*	*19*	*18*	*13*	*10*
	Decline	*16*	*16*	*20*	*18*	*10*	*11*	*16*	*19*
	All	*29*	*29*	*29*	*29*	*29*	*29*	*29*	*29*

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Note: C4A and C4S denotes four firm concentration based on assets and sales, HHIA and HHIS denotes HHI based on assets and sales respectively.

4.2 Observations based on Price Cost Margin

For this analysis, a change in PCM between (+/-) 0.05 is considered as 'minor change' category and the rest is classified according to the usual direction of change. The following observations are found based on the PCM analysis. Compared to the pre-CCI period, for most of the sub-sectors, there has not been any substantial change in the value of PCM. Hence, a minor change is found for the majority of the sub-sectors. For three sub-sectors namely, (i) cement; (ii) medicinal substances; and (iii) pesticides, PCM increased in the post CCI period. And for two product lines, i.e., (i) printing and reproduction; and (ii) tobacco products, PCM declined during the post CCI era. As discussed earlier, both of these sub-sectors experienced high concentration as per most of the competition indicators. When we compare the recent two phases (2010-14 and 2014-17), the changes in PCM remained almost the same for 27 out of 29 sectors. The declining trend is visible in the case of cement and motor vehicles. We have also examined the PCM levels of top 4 firms in each of the sectors to see whether there is any change in the outcome for the top firms in each sector since those firms are the ones control the market compared to other firms, in many sub-sectors. As against 3 cases of increase in overall firms, 7 sub-sectors have shown increasing trends in PCM for Top 4 firms. Apart from the three sub-sectors mentioned; (i) alcoholic beverages; (ii) allopathic pharmaceutical products; (iii) electrotherapeutic equipment; and (iv) soft drinks shown an increasing trend in the post CCI regime. However, during the latest phase, the levels remain the same as the overall category, i.e., the increase is visible only for the previously mentioned three sub-sectors. In 8 sub-sectors, the decline is visible compared to 2 in the overall firms' list. Appendix Tables 4, 5 and 6 show the PCM levels across various product lines. Hence, in general, for three sub-sectors (i) cement; (ii) medicinal substances; and (iii) pesticides a concern in terms of increased PCM is visible in terms of overall analysis and top firms based analysis, which is again confirmed when compared with the last phase of operation of CCI.

V. Concluding Observations and Policy Implications

Our attempt in this study has been to examine the concentration levels across various sub-sectors in the context of the newly implemented competition regime. In India, the new competition law became effective since 2009. In our analysis, we have taken the period after 2009 as post CCI regime and vice versa. Based on multiple indicators of competition, the study observed that still, the levels of concentration indicators are *high* for many sub-sectors. Seven sub-sectors exhibited major concern in terms of high concentration levels are, (i) tobacco, (ii) computer and peripheral equipment (iii) printing and reproduction of recorded media (iv) refined petroleum products (v) communication equipment (vi) medicinal substances used in the production of pharmaceutical products and (vii) measuring, testing, navigating and control equipment. Four sub-sectors have shown a mix of *high-moderate concentration* trends based on multiple indices, which are (i) alcoholic beverages (ii) concrete, cement and plaster (iii) domestic appliances and (iv) Paints, Varnishes and similar coatings. Six sub-sectors, namely, (i) dairy products, (ii) fertilizers (iii) Irradiation, electo-medical and electro therapeutical equipment (iv) Leather & Footwear (v) Motor Vehicles and (vi) Soft Drinks; Mineral Water and other bottled water has shown *moderate/less concentrated* trends. The rest of the 12 sub-sectors are showing *less concentrated* trends.

Despite the overall declining trend during the post CCI period, concentration levels of many sub-sectors remained very high. In addition, what makes the trend worrisome is the rising figures for the highly concentrated sub-sectors. A mix of sales and assets based concentration ratios and the HHI values are used to arrive this conclusion. Besides these indicators, we have also estimated the PCM to examine the profit-wise performance of companies across various sectors. This is done with the view that dynamic changes in the sector can be captured through profitability indicator. The outcome of this shows that in general PCM is showing minor variations only. However, the PCM for cement, medicinal substances and pesticides increased compared to the pre-CCI regime. In this, the medicinal substances and cement appeared in the highly concerned sector as discussed earlier. Increasing PCM along with high concentration levels is not a good sign. In addition to these three sectors, alcoholic beverages, allopathic products, electro medical equipment, soft drinks and dairy products have also shown an increasing PCM for top four firms, when compared with the pre-CCI period. For tobacco and printing, there has been a decline in PCM. Both of these products are having high levels of concentration. As said earlier, public sector firms dominate the printing sector, while for tobacco the sectoral characteristics are different, especially from the social welfare point of view compared to other products. In this context, it is to be mentioned that Pushpangadan and Shanta (2009) analysed the post liberalisation era HHI for the period 1995 to 2001 and found that for the majority of the sectors (10/14 sectors) there has been an increase in HHI compared to 1995. And the study noted a high and steady increase in HHI for tobacco and beverages. The study also found an increasing monopoly power in this sector in the long run, while taking into account the share cutting approach too.

This study is only a preliminary attempt to assess competition across various sub-sectors. Hence there are several possibilities of extending this work to bring in other dimensions of competition such as foreign firms intervention in market structure, trade factors, entry and exit, using other dynamic measures of competition and so on. From the policy point of view, the message from the study is that, despite the implementation of new regulation to sustain and promote competition, the levels of concentration remain high in many sub-sectors. This is in addition to the fact that concentration levels increase when we further disaggregate the sector. Such product level estimates for the entire manufacturing sector is an arduous task given the data constraints. This study provides indication on the sub-sectors which needs to be focused for future in-depth micro level analysis.

References

Atreya and Kapur (2006), 'Industrial Concentration in a Liberalising Economy: A Study of Indian Manufacturing', *Journal of Development Studies,* Vol. 42, No. 6, pp. 981-99.

Babu, Suresh, M. (2018), 'Hastening Slowly: India's Industrial Growth I the Era of Economic Reforms', Orient BlackSwan, New Delhi: India.

Baskar, M.V. (1992), 'Concentration in Indian Manufacturing Industry: 1970 to 1990', Centre for Development Studies, Thiruvananthapuram.

Bhattacharjea, A. 2003. "India's Competition Policy: An Assessment". *Economic and Political Weekly,* XVIII (34), pp. 3561–3574.

Bhattacharjea, A. 2010. "Of Omissions and Commissions: India's Competition Law". *Economic and Political Weekly*, XLV (35). pp. 31–37.

Beena, P.L. (2008), 'Trends and Perspectives on Corporate Mergers in Contemporary India,' *Economic and Political Weekly*, Vol. 43, No. 39, Pp. 48–56.

Bhavani and Bhanumurti (2007), 'The State of Competition in the Indian Manufacturing Sector', Institute of Economic Growth, New Delhi.

Bresnahan (1989), 'Empirical Studies of Industries with Market Power', in Schmalensee, R and Willig, R. (ed), *Handbook of Industrial Organisation,* North Holland: Amsterdam.

Burange and Yamili (2009), 'Performance of the Indian Cement Industry: The Competitive Landscape' *Artha Vijnana* Vol. LI, No. 3, September 2009, pp. 209-242.

Centre for Monitoring Indian Economy (CMIE), PROWESS Database.

Clark, J. M. (1961), *Competition as a Dynamic Process,* Brookings Institution, Washington.

Clark, J.M. (1961), *Competition as a Dynamic Process*, Washington: Brookings Institution.

Collins, N.R. and Lee E. Preston (1969), 'Price Cost Margins and Industry Structure', *The Review of Economics and Statistics,* Vol. 51, No. 3, pp. 271-86.

Curry, B. and George, K.D. (1983). Industrial Concentration: A Survey. Journal *of Industrial Economics,* 31(3), pp. 203-255.

Dhall, V. (Ed.) (2007), *Competition* Law *Today: Concepts, Issues and the Law in Practice*, New Delhi: Oxford University Press.

Domowits, I., Habbard and Peterson (1986), 'Business Cycles and Oligopoly Supergames: Some Empirical Evidence on Prices and Margins', Working Paper No. 2057, National Bureau of Economic Research, Cambridge, October.

Downie, J. (1958), *The Competitive Process,* Gerald Duckworth, London.

Gouri, Geeta (2010), 'Competition Issues in the Generic Pharmaceuticals Industry in India' Competition Commission of India, Available at: https://www.cci.gov.in/sites/default/files/presentation_document/ComIssGenPharmIndusIndia_20100401142346.pdf?download=1, Accessed on 10th July, 2019.

Government of India (1999), Budget Speech 1999-2000, 27th February.

Goyal, S.K. (1979) *Monopoly Capital and the Public Policy,* Delhi: Allied Publishers

Gwin, Carl R. (2001), 'A Guide for Industry Study and Analysis of Firms and Competitive Strategy', Available at https://www.scribd.com/document/137034638/A-Guide-for-Industry-Study-and-the-Analysis-of-Firms-and-Competitive-Strategy-pdf, Accessed on 29th May, 2019.

Hall, Robert E. (1986), 'Market Structure and Macro Economic Fluctuations', *Brookings Papers on Economic Activity 2*, pp. 285-338.

Hall, Robert E. (1988), 'The Relation between Price and Marginal Cost in US Industry', *Journal of Political Economy*, Vol. No. 96, No.5, pp. 921-947.

Hazari, R.K. (1966); *The Structure of the Corporate Private Sector,* Asia Publishing House, Bombay.

Hume, D. (1955), 'Letter from Hume to Adam Smith, April 1, 1776', in Rotwein, E (ed) '*Writings on Economics'*, Madison: University of Wisconsin Press, pp. 216-217.

Kambhampati (1995), 'The Persistence of Profit Differentials in Indian Industry', *Applied Economics,* Vol. 27, pp. 353-61.

Kambhampati (1996), *Industrial Concentration and Performance,* Oxford University Press, Mumbai.

Kathuria, R and Subhasis Bera (2010), 'Issues of Competition in the Indian Server Market, *Economic and Political Weekly*, Vol. XIV, No. 35, 28th August, pp. 58-65.

Kriesler, P.R.T. (1987), '*Kalecki's Micro Analysis'*, Cambridge: Cambridge University Press.

Martin, J.O., Stefano Scarpetta and Dirk Pilat (1996), 'Mark-Up Pricing, Market Structure and the Business Cycle', OECD Economic Studies No. 27.1996/11, Available at https://www.oecd.org/eco/growth/17981306.pdf, Accessed on 29th May, 2019.

McNulty (1967), 'A Note on the History of Perfect Competition', *Journal of Political Economy,* part I, No. 4, pp. 395-97.

Michael Salinger, 1990. "The Concentration-Margins Relationship Reconsidered," *Brookings Papers on Economic Activity*, Economic Studies Program, The Brookings Institution, vol. 21(1990 Micr), pages 287-335.

Mondal and Pingali (2015), 'Competition Law and the Pharmaceutical Sector in India', Working Paper No. 2015-11-02, Indian Institute of Management Ahmedabad, November, 2015. Available at: https://web.iima.ac.in/assets/snippets /workingpaperpdf/19305828832015-11-02.pdf, Accessed on 10th July, 2019.

Monopoly Inquiry Commission Report (1965), 44, Govt. of India.

Naldi, M. and Marta Flamini (2014), 'The CR4 Index and the Interval Estimation of the Herfindahl-Hirschman Index: An Empirical Comparison', HAL-01008144, Available at: https://hal.archives-ouvertes.fr/hal-01008144/document, Accessed on 29th May, 2019.

Pushpangadan and Shanta (2004), 'Concentration and Market Structure: A Case Study of Dominant Firms with Fringe Competition in Indian Industry', *The ICFAI Journal of Industrial Economics,* Vol. 29, No.2, pp. 119-29.

Pushpangadan and Shanta (2005), 'Competition in Indian Manufacturing Industries: A Study using Static and Dynamic Measures of Concentration', *The ICFAI Journal of*

Industrial Economics, Vol. 1, No. 1, pp. 7-19.

Pushpangadan and Shanta (2006), 'Competition in Indian Manufacturing Industries: A Mobility Analysis', *Economic and Political Weekly,* Vol. XLI, No. 39, pp. 4130-39.

Pushpangadan and Shanta (2009), '*The Dynamics of Competition: Understanding India's* Manufacturing Sector, Oxford University Press, New Delhi.

Pushpangadan, K. and N. Shanta (2009), *The Dynamics of Competition: Understanding India's Manufacturing Sector*, New Delhi: Oxford University Press.

Saraswathy, B. (2018), "*The Globalisation of Indian Business: Cross-border Mergers and Acquisitions in Indian Manufacturing*", Routledge, UK.

Saraswathy, B. (2018), *Impact of Mergers on Market Competition in the Indian Manufacturing: An Assessment*", Working Paper No.188, Institute for Studies in Industrial Development, New Delhi, March.

Schmalensee, R. (1989), "Inter-Industry Studies of Structure and Performance', in Schmalensee, R. and Willig, R. (ed), *Handbook of Industrial Organisation,* North Holland: Amsterdam.

Schumpeter (1950), *Capitalism, Socialism and Democracy,* Harper and Row, New York.

Singh (2013), 'Assessment of Competition in Cement Industry in India', Report submitted to the Competition Commission of India, Available at http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.469.2018&rep=rep1&type=pdf, Accessed on 10th July, 2019.

Smith, Adam (1937), *The Wealth of Nations,* New York: Modern Library.

Stigler, G.J., (1957), 'Perfect Competition, Historically Contemplated', J.PE, Vol. No. LXV, No.1, February, pp. 1-17.

US Department of Justice and the Federal Trade Commission (2010), 'Horizontal Merger Guidelines', Available at: https://www.ftc.gov/sites/default/files/attachments/merger-review/100819hmg.pdf, Accessed on 29th May, 2019.

Vaidya, R. (1993), 'The Persistence of Profits: The Indian Experience', *Journal of Quantitative Economics,* Vol. 9, No. 2, pp. 333-48.

Verma, K. and Burange (2018), 'Analysing Import Competition on the Performance of India's Machine Tools Industry, Working Paper No. 35, ISFIRE Working Paper Series, Available at: http://iire.in/ojs/index.php Issue, Accessed on 10th July, 2019.

Appendix

Table 1: Sub-sectors with High-Medium Concentration

		Category	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*change pre and post*	*last two points*	*C4 phase 6*	*ch C4 (pre post)*	*c4 ph 5 and 6*
1	Alcoholic Beverages	C4 S	60.7	58.0	37.8	51.1	59.0	68.2	41.1	60.5	19.4	9.2	High	High +	Medium +
		C4 A	64.7	58.4	43.3	51.6	60.3	59.5	45.6	59.8	14.1	-0.8	Medium	Medium +	Small -
		HHI S	1403	1162	774	1252	2335	2204	1148	2301	1153.4	-131.2	Medium	Very High +	High -
		HHI A	1583	1094	782	1370	2119	1736	1207	1978	771	-384	Moderate	Very High -	Very High -
2	Articles of concrete, cement and plaster	C4 S	84.4	71.3	69.4	58.0	45.5	56.0	69.0	49.7	-19.4	10.6	Medium	High -	Medium +
		C4 A	80.1	70.4	77.4	55.3	63.1	68.8	69.8	62.5	-7.3	5.7	High	Medium -	Medium +
		HHI S	2441	1662	1663	1070	1002	1011	1709	1009	-700.1	9.3	Low	Low +	Low +
		HHI A	2403	1608	1835	1087	2425	2545	1733	2388	655	120	High	Very High +	High +
3	Domestic Appliances	C4 S	56.9	56.3	73.4	69.5	65.1	64.4	59.1	64.6	5.6	-0.7	High	Medium +	Low -
		C4 A	56.6	64.7	62.7	61.8	56.1	53.8	55.2	54.3	-0.9	-2.3	Medium	Small -	Small -
		HHI S	1147	1101	1988	2358	1829	1663	1649	1758	109.0	-165.8	Medium	High +	High -
		HHI A	1090	1301	1327	1523	1170	957	1310	1092	-218	-214	Low	Very High -	Very High -
4	Paints, Varnishes and similar coatings	C4 S	79.2	73.7	70.8	71.6	72.0	70.9	73.8	71.4	-2.4	-1.2	High	Low -	Low -
		C4 A	76.6	65.9	67.4	72.6	67.2	68.4	68.2	68.0	-0.2	1.3	High	Small -	Small +
		HHI S	2378	1649	1606	1795	1959	1956	1857	1972	114.6	-3.5	Medium	High +	Low -
		HHI A	2470	1446	1376	1620	1636	1678	1728	1665	-63	42	Moderate	Less -	Less +

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

*Note**: C4 S denotes sales based C4; C4 A indicates assets based C4, HHI S indicates sales based HHI, HHI A indicates assets based HHI; (+) denote 'increase' and (-) denotes 'decline'

Table A2: Sub-sectors with High-Medium Concentration

	Sub-sector	*Category*	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*Change pre and post*	*Last two points*	*C4 phase 6*	*Ch C4 (pre post)*	*C4 ph 5 and 6*
1	Dairy products	C4S	75.6	72.2	72.2	62.3	54.8	50.1	68.4	49.5	-19.0	-4.8	Medium	High -	Low -
		C4A	82.1	80.8	80.3	66.3	59.2	51.8	76.7	55.5	-21.1	-7.5	Medium	High -	Medium -
		HHI S	2217	1732	1935	1887	1463	896	1943	1251	-692.0	-566.9	Low	Very High -	Very High -
		HHI A	4852	3843	3526	2205	1354	1008	3607	1213	-2394	-347	Low	Less -	Very High -
2	Fertilizers	C4S	60.1	55.1	57.2	61.9	59.6	54.3	56.6	57.4	0.7	-5.3	Medium	Small +	Medium -
		C4A	66.1	63.4	62.1	61.0	58.9	55.8	61.8	57.7	-4.1	-3.1	Medium	Small -	Small -
		HHI S	1229	1071	1205	1545	1384	1076	1263	1259	-3.8	-308.4	Low	Low -	Very High -
		HHI A	1398	1245	1199	1557	1442	1113	1350	1318	-32	-329	Low	Less -	Very High -
3	Irradiation, electo-medical and electro therapeutical equipment	C4S	97.2	90.2	61.1	72.1	68.8	50.2	58.2	60.1	2.0	-18.5	Medium	Small +	High -
		C4A	97.2	90.2	61.1	72.1	68.8	50.2	58.2	60.1	2.0	-18.5	Medium	Small +	High -
		HHI S	6291	3782	2365	2330	2595	1062	3692	2049	-1642.8	-1533.4	Low	Very High -	Very High -
		HHI A	6291	3782	2365	2330	2595	1062	3692	2049	-1643	-1533	Low	Less -	Very High -
4	Leather & Footwear	C4S	59.1	39.5	42.5	39.4	42.3	44.1	36.2	43.4	7.2	1.8	Medium	Medium +	Low +
		C4A	54.5	44.7	36.8	39.8	40.5	42.2	33.3	40.3	7.0	1.7	Medium	Medium +	Small +
		HHI S	2199	762	757	651	695	756	1092	753	-339.7	61.2	Low	Low +	Low +
		HHI A	1775	832	707	645	681	700	990	701	-289	18	Low	Less -	Less +
5	Motor Vehicles	C4S	92.2	91.8	79.2	78.9	70.7	59.0	83.9	66.1	-17.8	-11.7	Medium	High -	Medium -
		C4A	92.2	91.8	79.2	78.9	70.7	59.0	83.9	66.1	-17.8	-11.7	Medium	High -	Medium -
		HHI S	2480	2607	1958	1913	1470	1063	2239	1314	-925.0	-406.4	Low	Very High -	Very High -
		HHI A	2480	2607	1958	1913	1470	1063	2239	1314	-925	-406	Low	Less -	Very High -
6	Soft Drinks; Mineral Water and other bottled water	C4S	84.7	77.3	71.6	69.2	65.1	57.3	71.0	58.3	-12.7	-7.8	Medium	Medium -	Medium -
		C4A	72.9	66.9	51.2	53.8	58.1	59.1	54.2	56.5	2.3	1.0	Medium	Small +	Small +
		HHI S	5287	3619	2710	1944	2270	1046	3390	1801	-1589.4	-1224.1	Low	Very High -	Very High -
		HHI A	3680	2066	1324	1182	1356	1054	2063	1237	-826	-302	Low	Less -	Very High -

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

*Note**: C4 S denotes sales based C4; C4 A indicates assets based C4, HHI S indicates sales based HHI, HHI A indicates assets based HHI; (+) denote 'increase' and (-) denotes 'decline'

Table A3: Less Concentrated Sub-Sectors

	Sub-Sector	*Broad Sector*	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*Change pre and post*	*Last two points*	*C4 phase 6*	*Ch C4 (pre post)*	*C4 ph 5 and 6*
1	Accessories and parts of motor vehicles	C4S	31	28	18	15	16	15	23	16	-7.0	-1.7	Low	Medium -	Low -
		C4A	31	28	18	15	16	15	23	16	-7.0	-1.7	Low	Medium -	Small -
		HHIS	421	344	205	174	160	114	286	143	-143.3	-45.6	Low	High -	Low -
		HHIA	421	344	205	174	160	114	286	143	-143	-46	Low	Less -	Moderate -
2	Allopathic Pharmaceutical preparations	C4S	35	28	30	32	33	33	28	32	3.8	0.6	Low	Small +	Low +
		C4A	33	38	32	36	36	38	29	35	5.8	2.3	Low	Medium +	Small +
		HHIS	464	369	403	419	417	459	414	436	22.0	41.6	Low	Low +	Low +
		HHIA	518	547	455	496	471	589	504	530	26	118	Low	Less +	High +
3	Basic chemicals	C4S	28	20	20	18	17	19	20	17	-2.5	2.3	Low	Low -	Low +
		C4A	24	23	23	22	27	39	21	31	10.2	12.0	Low	Medium +	Medium +
		HHIS	365	237	227	215	198	221	261	206	-55.5	22.9	Low	Low +	Low +
		HHIA	303	274	267	253	393	638	274	500	226	244	Low	Very High +	Very High +
4	Basic Iron and Steel	C4S	67	58	52	42	37	38	54	37	-17.1	0.6	Low	High -	Low +
		C4A	78	64	53	46	45	44	59	45	-14.3	-0.6	Medium	Medium -	Small -
		HHIS	2464	1484	1089	680	466	464	1429	467	-961.7	-1.7	Low	Very High -	Low -
		HHIA	2588	1580	970	754	673	667	1473	674	-799	-6	Low	Less -	Moderate -
5	Bodies (coachwork) for motor vehicles; Manuf of trailers and non-trailers	C4S	59	50	37	30	23	22	41	22	-19.1	-1.7	Low	High -	Low -
		C4A	59	50	37	30	23	22	41	22	-19.1	-1.7	Low	High -	Small -
		HHIS	1647	969	538	406	299	232	890	273	-617.7	-66.7	Low	Very High -	Low -
		HHIA	1647	969	538	406	299	232	890	273	-618	-67	Low	Less -	Moderate -
6	General Purpose Machinery	C4S	30	30	28	38	31	25	30	28	-2.4	-5.5	Low	Low -	Medium -
		C4A	30	30	28	38	31	25	30	28	-2.4	-5.5	Low	Small -	Medium -
		HHIS	406	375	335	466	355	260	396	320	-75.9	-94.3	Low	Low -	Low -
		HHIA	406	375	335	466	355	260	396	320	-76	-94	Low	Less -	Moderate -
7	Paper and paper Products	C4S	43	40	33	27	26	27	35	26	-9.5	0.8	Low	Medium -	Low +
		C4A	53	44	38	32	31	36	41	33	-7.8	5.4	Low	Medium -	Medium +
		HHIS	864	714	494	343	296	319	604	309	-294.6	23.4	Low	Low +	Low +
		HHIA	1192	744	627	489	411	493	763	451	-312	83	Low	Less -	Less +
8	Pesticides and other Agrochem products	C4S	74	58	41	38	40	36	46	37	-9.9	-3.5	Low	Medium -	Low -
		C4A	63	50	44	52	45	43	46	44	-1.9	-1.7	Medium	Small -	Small -
		HHIS	3321	1944	820	623	643	536	1677	607	-1070.5	-106.8	Low	Very High -	High -
		HHIA	1852	1032	723	1276	1013	825	1221	958	-263	-188	Low	Less -	Moderate -

	Sub-Sector	*Broad Sector*	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*Change pre and post*	*Last two points*	*C4 phase 6*	*Ch C4 (pre post)*	*C4 ph 5 and 6*
9	Special Purpose Machinery	C4S	45	45	39	27	28	26	38	27	-10.8	-2.0	Low	Medium -	Low -
		C4A	45	45	39	27	28	26	38	27	-10.8	-2.0	Low	Medium -	Small -
		HHIS	759	664	549	358	393	300	582	357	-225.3	-92.7	Low	Very High -	Low -
		HHIA	759	664	549	358	393	300	582	357	-225	-93	Low	Less -	Moderate -
10	Textile	C4S	19	15	12	13	16	19	13	17	4.1	2.7	Low	Small +	Low +
		C4A	20	22	25	20	22	28	19	25	6.0	5.6	Low	Medium +	Medium +
		HHIS	188	127	105	97	158	180	129	162	32.9	21.4	Low	Low +	Low +
		HHIA	216	211	296	253	234	363	244	290	46	129	Low	Less +	High +
11	Vegetable and animal oils and fats	C4S	26	30	28	35	41	35	25	38	12.9	-5.7	Low	Medium +	Medium -
		C4A	34	31	24	33	37	37	26	36	9.7	0.4	Low	Medium +	Small +
		HHIS	500	384	391	546	631	447	455	567	111.9	-183.8	Low	High +	High -
		HHIA	532	347	302	568	616	568	437	608	171	-48	Low	High +	Moderate -
12	Wearing Apparel	C4S	65	31	30	27	19	18	27	18	-9.8	-0.6	Low	Medium -	Low -
		C4A	63	28	32	25	18	18	25	16	-9.3	0.0	Low	Medium -	No change
		HHIS	1817	536	447	359	261	232	790	249	-541.3	-29.1	Low	Very High -	Low +
		HHIA	1676	487	463	333	241	213	740	232	-508	-29	Low	Less -	Moderate -

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

*Note**: C4 S denotes sales based C4; C4 A indicates assets based C4, HHI S indicates sales based HHI, HHI A indicates assets based HHI; (+) denote 'increase' and (-) denotes 'decline'

Table A4: Price Cost Margin

Sub-Sector	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*Change pre and post*	*Last two points*
Vegetable and animal oils and fats	0.24	0.22	0.19	0.08	0.18	0.16	0.18	0.17	-0.01	-0.02
Dairy products	0.27	0.15	0.17	0.07	0.16	0.18	0.16	0.17	0.01	0.02
Alcoholic Beverages	0.49	0.45	0.50	0.47	0.47	0.48	0.48	0.47	0.00	0.00
Soft Drinks; Mineral Water and other bottled water	0.42	0.40	0.34	0.31	0.36	0.33	0.37	0.34	-0.02	-0.03
Tobacco Products	0.59	0.65	0.58	0.49	0.53	0.48	0.58	0.52	-0.06	-0.05
Textile	0.27	0.24	0.22	0.12	0.21	0.19	0.21	0.20	-0.01	-0.02
Wearing Apparel	0.36	0.31	0.34	0.24	0.33	0.29	0.31	0.31	0.00	-0.04
Leather & Footwear	0.39	0.33	0.25	0.21	0.30	0.26	0.29	0.29	-0.01	-0.04
Paper and paper Products	0.30	0.28	0.27	0.14	0.21	0.20	0.25	0.21	-0.04	-0.02
Printing and reproduction of recorded media (excl. publishing activities)	0.93	0.92	0.57	0.54	0.49	0.44	0.68	0.48	-0.20	-0.04
Refined Petroleum Products	0.34	0.33	0.32	0.18	0.27	0.24	0.29	0.26	-0.03	-0.03
Basic chemicals	0.46	0.43	0.40	0.30	0.35	0.35	0.40	0.35	-0.05	0.00
Fertilizers	0.26	0.25	0.22	0.12	0.22	0.20	0.21	0.21	0.00	-0.02
Pesticides and other Agrochem products	0.17	0.32	0.36	0.32	0.33	0.34	0.29	0.36	0.07	0.01
Paints, Varnishes and similar coatings	0.45	0.40	0.35	0.21	0.33	0.30	0.35	0.32	-0.03	-0.03
Medicinal substances used in the production of pharmaceuticals…	0.30	0.31	0.34	0.23	0.36	0.36	0.29	0.36	0.07	0.00
Allopathic Pharmaceutical preparations	0.38	0.33	0.35	0.29	0.32	0.35	0.34	0.33	0.00	0.03
Articles of concrete, cement and plaster	0.42	0.42	0.46	0.33	0.49	0.43	0.41	0.47	0.06	-0.06
Basic Iron and Steel	0.29	0.25	0.23	0.12	0.20	0.17	0.22	0.19	-0.03	-0.03
Computer and Peripheral equipments	0.36	0.30	0.36	0.20	0.25	0.26	0.31	0.26	-0.05	0.02
Communication Equipments	0.44	0.30	0.25	0.15	0.26	0.25	0.29	0.26	-0.03	-0.01
Measuring, Testing, Navigating and control equipments	0.34	0.29	0.31	0.17	0.30	0.27	0.28	0.29	0.01	-0.02
Irradiation, electo-medical and electro therapeutical equipment	0.46	0.36	0.43	0.26	0.36	0.33	0.38	0.35	-0.03	-0.03
Domestic Appliances	0.34	0.32	0.30	0.23	0.31	0.29	0.30	0.30	0.00	-0.02

Sub-Sector	*1990-1994*	*1995-1999*	*2000-2004*	*2005-2008*	*2010-14*	*2014-2017*	*1990-2009*	*2009-2017*	*Change pre and post*	*Last two points*
General Purpose Machinery	0.37	0.36	0.34	0.22	0.32	0.32	0.32	0.32	0.00	-0.01
Special Purpose Machinery	0.37	0.34	0.31	0.20	0.32	0.29	0.31	0.31	0.00	-0.04
Motor Vehicles	0.30	0.32	0.25	0.21	0.28	0.21	0.27	0.25	-0.02	-0.07
Bodies (coachwork) for motor vehicles; Manuf of trailers and non-trailers	0.38	0.38	0.38	0.21	0.31	0.27	0.34	0.29	-0.05	-0.04
Accessories and parts of motor vehicles	0.38	0.36	0.35	0.23	0.31	0.27	0.33	0.30	-0.03	-0.04

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Table A5: PCM for Top 4 companies based on C4 Sales

SN.	Sub-Sector	1990-1994	1995-1999	2000-2004	2005-2008	2010-14	2014-2017	1990-2009	2009-2017	Change pre and post	Last two points
1	Vegetable and animal oils and fats	0.19	0.08	0.09	0.00	0.12	0.09	0.08	0.09	0.02	-0.03
2	Dairy products	0.23	0.22	0.23	0.07	0.21	0.19	0.15	0.19	0.03	-0.02
3	Alcoholic Beverages		0.94	0.63	0.68	0.76	0.75	0.67	0.76	0.08	0.00
4	Soft Drinks; Mineral Water and other bottled water	0.38	0.39	0.48	0.30	0.40	0.42	0.32	0.40	0.09	0.01
5	Tobacco Products	0.76	0.68	0.69	0.65	0.68	0.65	0.68	0.67	-0.01	-0.03
6	Textile	0.27	0.32	0.36	0.25	0.32	0.21	0.30	0.26	-0.04	-0.10
7	Wearing Apparel	0.33	0.36	0.44	0.29	0.31	0.28	0.37	0.29	-0.07	-0.03
8	Leather & Footwear	0.36	0.32	0.32	0.22	0.33	0.35	0.29	0.34	0.05	0.02
9	Paper and paper Products	0.21	0.47	0.46	0.35	0.33	0.28	0.39	0.31	-0.07	-0.05
10	Printing and reproduction of recorded media (excl. publishing activities)			0.59	0.56	0.41	0.43	0.58	0.42	-0.15	0.01
11	Refined Petroleum Products	0.42	0.43	0.26	0.08	0.14	0.18	0.30	0.17	-0.13	0.04
12	Basic chemicals	0.56	0.58	0.52	0.33	0.52	0.32	0.42	0.34	-0.08	-0.20
13	Fertilizers	0.28	0.24	0.20	0.04	0.17	0.00	0.19	0.09	-0.10	-0.17
14	Pesticides and other Agrochem products	0.49	0.06	0.16	0.28	0.11	0.40	0.22	0.28	0.06	0.29
15	Paints, Varnishes and similar coatings	0.42	0.43	0.42	0.33	0.41	0.44	0.40	0.42	0.02	0.03
16	Medicinal substances used in the production of pharmaceuticals…	0.44	0.42	0.60	0.48	0.53	0.60	0.47	0.56	0.09	0.07
17	Allopathic Pharmaceutical preparations	0.42	0.41	0.45	0.33	0.44	0.48	0.40	0.45	0.06	0.03
18	Articles of concrete, cement and plaster	0.40	0.34	0.30	0.21	0.29	0.37	0.27	0.33	0.06	0.08
19	Basic Iron and Steel	0.50	0.54	0.42	0.41	0.36	0.35	0.46	0.36	-0.10	-0.02
20	Computer and Peripheral equipments	0.40	0.39	0.36	0.15	0.25	0.15	0.30	0.21	-0.09	-0.10

SN.	Sub-Sector	1990-1994	1995-1999	2000-2004	2005-2008	2010-14	2014-2017	1990-2009	2009-2017	Change pre and post	Last two points
21	Communication Equipments			0.33	0.19	0.28	0.25	0.29	0.27	-0.02	-0.03
22	Measuring, Testing, Navigating and control equipments	0.31	0.35	0.34	0.18	0.41	0.23	0.28	0.31	0.03	-0.17
23	Irradiation, electo-medical and electro therapeutical equipment		0.25	0.42	0.18	0.38	0.16	0.21	0.28	0.06	-0.22
24	Domestic Appliances	0.26	0.27	0.30	0.20	0.30	0.33	0.27	0.32	0.04	0.02
25	General Purpose Machinery	0.37	0.37	0.37	0.36	0.35	0.36	0.37	0.36	-0.01	0.01
26	Special Purpose Machinery	0.31	0.29	0.32	0.08	0.28	0.27	0.25	0.28	0.03	-0.01
27	Motor Vehicles	0.34	0.38	0.36	0.18	0.26	0.27	0.30	0.27	-0.04	0.01
28	Bodies (coachwork) for motor vehicles; Manuf of trailers and non-trailers	0.47	0.39	0.37	0.21	0.30	0.27	0.28	0.28	0.00	-0.02
29	Accessories and parts of motor vehicles	0.46	0.40	0.42	0.22	0.35	0.29	0.32	0.33	0.01	-0.06

Source: Calculated from PROWESS Database, Centre for Monitoring Indian Economy (CMIE).

Table A6: PCM Across Sub-sectors

PCM for all firms	*No.*	*Row Labels*	*No.*
Pre-Post CCI Regime		*Last two phases*	
Decreased	2	*Decreased*	2
Printing and reproduction of recorded media (excl. publishing activities)	1	Articles of concrete, cement and plaster	1
Tobacco Products	1	Motor Vehicles	1
Increased	3	*Minor Change (+/-)*	27
Articles of concrete, cement and plaster	1	Grand Total	29
Medicinal substances used in the production of pharmaceuticals…	1		
Pesticides and other Agrochem products	1		
Minor Change (+/-)	24		
Grand Total	29		
PCM for Top 4 Firms	*No.*	*Row Labels*	*No.*
Decreased	*8*	*Decreased*	*7*
Basic chemicals	1	Accessories and parts of motor vehicles	1
Basic Iron and Steel	1	Basic chemicals	1
Computer and Peripheral equipments	1	Computer and Peripheral equipments	1
Fertilizers	1	Fertilizers	1
Paper and paper Products	1	Irradiation, electo-medical and electro therapeutical equipment	1
Printing and reproduction of recorded media (excl. publishing activities)	1	Measuring, Testing, Navigating and control equipments	1
Refined Petroleum Products	1	Textile	1
Wearing Apparel	1	*Increased*	3
Increased	7	Articles of concrete, cement and plaster	1
Alcoholic Beverages	1	Medicinal substances used in the production of pharmaceuticals…	1
Allopathic Pharmaceutical preparations	1	Pesticides and other Agrochem products	1
Articles of concrete, cement and plaster	1	*Minor Change (+/-)*	19
Irradiation, electo-medical and electro therapeutical equipment	1	Grand Total	29
Medicinal substances used in the production of pharmaceuticals…	1		
Pesticides and other Agrochem products	1		
Soft Drinks; Mineral Water and other bottled water	1		
Minor Change (+/-)	14		
Grand Total	**29**		

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