CHAPTER-7
SUMMARY AND CONCLUDING REMARKS

Industrial development, as theory states, plays considerable role in the economic development of any economy. As economy grows, structural changes in the economy are observed in favour of industrial and service sector. Besides, the manufacturing sector in the complete process of production and its ultimate disposal, experiences sectoral changes in its inter and intra industry environment. Such changes are reflected in the form of changes in market concentration, monopoly power, pricing trends, output, competition strategy, R & D and so on. Consequently, firms may register improvement in their performance in terms of profitability, price-cost margins, sales, equity participation, efficiency etc.

Market share of a firm in industry determines its potential to command market power in the industry. Therefore, leading firms develop capacity, in due course, to raise prices and earn remarkable profits which can further be raised through collusions and other measures of joint profit maximization. Impact on performance through changes in market concentration influences the market concentration in the industry in next round of production. Changes in market concentration are expected to be reflected in the stock market in terms of valuation of respective firms. Market valuation of firms depends on numerous factors that may or may not be under the control of respective firms. Market concentration through performance and expected performance variables affect the firm’s performance in stock market. Higher concentration, it is expected, increases the profitability of the firms, hence, is positively reflected in stock market. Better performance in stock market enhances the market valuation of firms. Subsequently, it becomes easy for performing firms to
mobilize cheap funds from the market for further expansion. If such funds are reinvested in same product line, in the subsequent rounds of production industry may register higher market concentration.

To establish such relationship, **electronics industry** and **pharmaceutical industry** are selected as representatives of Indian industry in this study. Both are very significant manufacturing segments in Indian industrial setup and contribute remarkable share of industrial production. Both the industries have registered dramatic growth in recent years and have some influence on the pattern of industrial growth in India. Electronics and the pharmaceutical industries have economic, social and strategic significance for the national economy of India, hence, a matter of concern for democratically elected government in India.

Since both the industries have experienced dramatic changes in policies and international scenario, therefore, they are expected to register higher levels and growth of market concentration overtime. Hence, firms in both the industries are expected to witness change in their performance overtime. We have tried to capture this performance through some performance variables. Since market concentration can be linked to performance, positively as well as negatively, an attempt has been made to establish the nature of such relationship in both the industries and how do they differ on such parameter. The level and change in market concentration and performance accordingly reflect in stock market, so an attempt has been made to discover the relationship of market concentration and performance with stock market behaviour in both the industries. Given the different nature of both the industries, such relationship has also been compared to find the movement of stocks in comparison to firm, industry and national environment.

Data managed and adjusted from these sources has been analyzed by using various statistical and econometric techniques. Growth of relevant input and output variables helps to understand the general change in industry. Such growth in variables has been calculated by using semi-log trend growth (TGR) technique. Though several techniques to find the market concentrations are available in literature but this study uses most popular - concentration ratios and Harfindhal-Harishman Index. The study continues with carrying groups of firms as used in concentration ratios, coefficient of variation to find variation among the groups which are indicator of concentration among concentrated firms.

The market performance of firms in industry is measured through the level of profitability (profit/output ratio), price-cost margin and profit/net-worth ratio. Performance in stock market has been measured through stock market related variables like market value over book value of assets, price-earnings ratio and earning-per share. Performance in stock market and its relationship with market concentration and performance has been captured through bivariate correlation. Stock market variation of industries concerned here and the overall stock market index may move in the same direction or opposite direction with more or less speed. In this
context $\beta$ has been calculated to check the volatility in stock market valuation of these industries compared to stock market index-Sensex. Market concentration and stock market variables are generally not uni-directional but expected to be bi-directional. To ascertain this fact, market concentration has been regressed on profitability and profitability has been regressed on market concentration (linear and non-linear) by using ordinary least square (OLS) technique. Market concentration in one period may have cumulative effect on market concentration in subsequent period; hence, market concentration is regressed on market concentration with one period lag.

7.1. Conclusions:

Electronics industry has been passing through several policy regimes since independence, ranging from public sector and small scale sector dominance in 1970’s to relatively liberal policy environment in 1980’s and almost complete liberalization in 1990’s and afterwards. Restrictions on capacity expansion and diversification are removed and reservation for public sector in electronics and information technology industry is eliminated. Private and foreign investment is allowed without any restriction. Thus, the industry now enjoys liberal and restriction free environment.

Both value-added (15.3 percent per annum) and level of output (10.9 percent per annum) have experienced notable growth in the industry but pace of growth was superior for value addition than output during the study period. Value addition has rid on technology growth which reduced the cost of production in the industry. Value addition through charging higher prices is ruled out, for, increased competition in the market. However, high value addition did not contribute to boost employment as the growth in the employment (-0.1 percent per annum) is negligible. Emoluments
disbursed to the employees’ recorded significant growth (9 percent per annum), for
the superior labour productivity was able to produce higher emoluments.

Market concentration has shown fluctuating but increasing trend during the
entire study period (1.7 percent per annum). However, it recorded decline in initial
years (1996-2002) as the ratio ranged in 32.23 to 44.96 (at the rate of -6.4 percent per
annum). After 1991 when opportunities were provided by the market, many new firms
and firms of other sectors made their entry in this industry. In this decade, there was
large scope for growth of industry and export market produced encouraging returns.
Moreover, stock market played a role to boost the sector. These factors contributed in
reduction of concentration up to 2002. Thereafter, concentration starts rising (ranged
in 32.23 to 60.77; at the rate of 7.6 percent per annum), as many small and unviable
units could not survive the harsh competition provided by large firms. For, industry is
technology oriented and firms with strong footing were able to corner the benefits of
expanded market and small firms either have to quit the market or shed the market
share. This pattern is more vigorous after 2002 as evident from the value of
coefficient of variation for output (which have increased dramatically after 2002, from
0.211 to 0.852) among the dominating firms.

The study has established that market concentration and profitability are
positively associated in electronics industry irrespective of method of measurement.
Top firms recorded highest level of profitability (ranging between 2.291 and 10.839).
In the initial years of the study, profitability was largely explained by the favorable
markets, however, in subsequent years the concentration was more dominating factor.
In the second phase of the study period (2003-2008) strong competition from large
firms forced small firms and many new entrants to quit the industry, resulting in
higher share for the bigger firms, hence, more market concentration after 2002. To
consolidate this market share they had to create additional capacity, more R & D facilities and better market management. It resulted in increased cost of production initially, however, provided a strong base for them for additional gains (2003-05). Consequently, the levels of profitability jumped after 2005 (from 2.627 in 2005 to 10.839 in 2007). Profitability is a function of market concentration but the study revealed that changes in the market concentration was more important factor instead of market concentration itself to explain the variations in the profitability variable. Concentration ratio in current period is also found to be a function of profitability in the previous periods.

Changes in levels of market concentration and performance of a firm reflect in the stock market performance of the relevant firm. The relationship got established for the electronics industry in the study. Book value per share is positively affected by market concentration. Average book value is higher for the larger firms in comparison to the smaller firms (ranging between 74.32 and 334.36). Levels of profitability are more fluctuating in bigger firms and comparatively less fluctuating in smaller ones (highest S.D. 353.68 for large firms and 127.67 in small firms). That is the reason for correlation coefficient between profitability and book value is, though, positive but very low in the larger group of firms (0.085).

Larger firms are considered to be more reliable in the stock market, thus, expected to have higher PE ratio. Higher PE ratio help a firm in gaining more market cap which, in turn, facilitate it to secure more market share. Results of electronics industry regarding this relationship are on expected lines, for, large firms in the industry have registered higher PE ratio. Average PE Ratio value is highest in top four firms staying between 11.6 and 23.12 except for the years 2000 and 2008. However, due to financial meltdown in 2008, largest losers in terms PE Ratio were top twenty
firms (from 23.12 in 2007 to 6.54 in 2008). For, support the larger firms got from the international market reduced considerably. Conversely, smaller firms which were more dependent on the domestic market were able to survive in stock market during the economic slowdown. The coefficient of correlation between profitability and PE ratio for top four firms had turned out to be 0.271. However, such relationship was relatively weak but positive for top twenty firms (0.024) and entire industry (0.0388). But this relationship was stronger for entire industry as compared to top twenty firms. This type of relationship indicates that so far the performance in terms of PE ratio is concerned small cap firms were better than midcap firms.

Performance of electronics industry in the stock market is more volatile in comparison to Sensex. In the period 1996-2001, when electronics industry was passing through its boom period and recognized as sunrise industry, it had outperformed the market, thus, its calculated β value was 3.445. However this performance could not be maintained in the successive period of study from 2002 to 2008. Consequently β tumbled down to 1.2144. During the first period segment of the study, electronics technology started getting popular and was experiencing large entry of new firms in the market. The performance of the industry and the psychology of the investors and boom in internet sector contributed largely to performance of this industry in stock market. But the industry failed to maintain the same momentum in the subsequent period. However, after 2004 the industry again consolidated its position and outperformed the market till 2007.

So it can be concluded here that under the liberal policy environment, Electronics industry has experienced decline in market concentration till 2002. However, this variable has increased with faster pace after that. With the growth in markets, benefits of the larger markets were cornered by relatively bigger firms.
Moreover, the levels of production gaps between larger and smaller firms have increased overtime within the groups also. Large firms have become larger and many small firms quit the market, the market share of others (small firms) has gone down. The industry experienced increasing trends in the price-cost margin with more fluctuations after 2002. Moreover, positive correlation has been established between market concentration and profitability. Rate of change in market concentration is more important variable in explaining the change in PCM than market concentration itself. Concentration is also affected by the profits earned by the firms in previous periods. Besides, book value per share bears positive relationship with market concentration ratio. The hypothesis of higher PE ratio for the larger firms has been established in this industry. So the discussion highlights the larger gains for the top firms in the industry in terms of profitability and the stock market performance.

Pharmaceutical industry occupies considerable share in the manufacturing segment of Indian industry. It commands good reputation in the third world for its excellence in technology, quality and range of medicines produced. In terms of volume and value of production, industry is ranked third and fourteenth respectively. The industry has experienced substantial policy shifts and change in patents laws in recent years. The industry faced a restrictive regulatory policy environment which aimed at discouraging foreign investment and limiting expansion and growth of large firms. After adopting liberal industrial policy and signing WTO agreement, policy environment has changed dramatically as restrictions are either eliminated or eased and public sector reservation removed.

Liberal policy environment is expected to generate capacity expansion. Hence, during the study period, the growth in fixed capital is remarkable (10.9 percent per annum), especially after 2005. For, firms had to invest in infrastructure and R & D
facilities to cope up with competition provided by foreign firms in changed new patents environment. Undoubtedly, capacity expansion is expected to generate employment, as it grew at the rate of 2.8 percent per annum and stayed stagnant after 2005. However, wages disbursed to employees increased at the rate of 11 percent per annum. The growth in number of employees (overall growth 2.8 percent per annum) has not risen even after 2005 in spite of the fact that emoluments being disbursed to employees has increased rapidly (overall growth 11.0 percent per annum), may be the companies either started paying more to their skill based employees or they have hired costlier R & D experts. Both the values of output (10.6 percent per annum) and gross value added (11.6 percent per annum) has performed remarkably but growth in gross value added surpassed the value of output indicating technology gains. The industry got remarkable support from international market too in from of exports (19.7 percent per annum).

Changing policy environment is expected to be reflected in the market concentration of industry and it has increased significantly in pharmaceutical industry during the study period. By 2008, largest 20 firms had cornered almost 67 percent of the market share. The growth in concentration was very high during period 1996-03 (5.3 percent per annum), however, the growth slowed down dramatically in the subsequent period (3.9 percent per annum). Still it can be concluded that large firms strengthened their position overtime. However, in spite of that, small firms were able to create niche for themselves in the new market environment, as they started working as subsidiaries for the larger firms by supplying the bulk drugs and formulations. Besides, large firms have shown convergence overtime. For, the benefits of increasing concentration were not limited only to one or two top firms but many big firms have gained from it.
The industry has performed remarkably so far as the level of PCM and profitability are concerned; it has recorded eight fold increase with 21.7 percent average annual growth. As expected, levels of profitability were highest for top four firms (ranging in 12.94 to 20.54), followed by CR-20 group (ranging in 10.00 to 16.96) and it was lowest for all firms (ranging in 7.44 to 13.86). However, the results are contrary when these variables measured in terms of trend growth rate (1.7 for CR-4, 3.8 for CR-20 and 4.6 percent per annum for entire industry). Given the complex structure of industry, small firms were able to earn profits and were succeeded to stay in the market. This industry has also shown positive and significant relationship between profitability and market concentration. But the rate of change in market concentration proved less important to explain the PCM than CR. Profitability emerged as significant variable to increase the concentration in the subsequent round. This industry also proves the hypothesis that market concentration leads to more concentration.

Increase of market concentration and improved profitability variables are reflected positively in the stock market. The industry outperformed the market till 2004 and subsequently it lost its sheen. So far the size segments of the industry are concerned, investors have reposed more faith in large firms as compared to, once desired, small firms. Moreover, the stocks of pharmaceutical firms were less volatile as compared to the market as a whole. Though the industry in the stock market moved along with the market but was more vigorous during 1996-2001 ($\beta$ was 1.5673 in 1996-2001, 0.2468 in 2002-2008 and 0.3801 in 1996-2008).

It can be concluded that Pharmaceutical industry has shown increasing trend in market concentration during the liberalized era. However the increase was sharper up to 2005. The difference of value of output among top firms has decreased in the
study period. Performance variable of the industry has also increased at significant rate during the period. The industry has outperformed the stock market between the years 1999 and 2004. For rest of the years, it has underperformed the market. Positive relationship has been established between market concentration and profitability. Similar relationship have emerged between profitability and book value, and profitability and earning per share. Therefore, large gains for the larger firms in the industry in terms of profitability and the stock market performance occurred.

Knowledge and technology oriented electronic and pharmaceutical industries account for about 5 percent share of Indian manufacturing output. Both industries responded quickly to the recent policy changes, however, behaved differently.

Both industries experienced increased market concentration, overtime, during study period. However, such levels were higher for electronics industry than pharmaceutical industry irrespective of method used to measure it. Four firm concentration ratio ranged between 32.17 and 60.77 for electronics industry, whereas it ranged between 17.97 and 26.82 for pharmaceutical industry. Besides, the speed of increase in concentration was higher in electronics industry (CR-4 grew at 1.7 percent per annum in comparison to 0.5 percent for pharmaceutical industry). Mergers and acquisitions have intensely affected the industrial structure of these industries. As a result, the 20-firms market concentration ratio has recorded outstanding increase in both the industries.

Pharmaceutical industry is much more comfortable in making profits in spite of the fact that the growth in demand and output was higher in the electronics industry. The profit/output ratio is much higher in the pharmaceutical industry during the entire study period and sometimes this difference rises to more than twenty times
in favour of pharmaceutical industry. For top four firms profit/output ratio is 14.62 percent in 1996 and gone up to 17.58 percent in 2008 for pharmaceutical industry, whereas, for electronics industry, it was mere 3.281 percent and 7.779 in the corresponding years. Similar trends are seen for entire industries as the value is 9.49 in 1996 and 13.21 in 2008 in pharmaceutical and 1.304 and 3.58 percent in electronics industry.

The hypothesis of high concentration-high profit did not prove true here. For, electronics industry is more concentrated than pharmaceutical industry, but the profitability is higher in case of pharmaceutical industry than electronics industry. This hypothesis is true when we see it in individual industry but failed to prove when compared the industries under study.

Performance of Pharmaceutical industry is better than the electronics industry in the stock market. It got higher PE Ratio and EPS and it performed better in its share index. However, the beta value was higher in case of electronics industry (beta value for electronics industry is 0.9358, whereas, in pharmaceutical industry it is 0.3801). Besides, electronics industry was more volatile in the stock market. The values seemed to be more affected by surrounding factors in electronics industry, whereas, it appeared to be more associated to fundamentals of firms in case of pharmaceutical industry. Market concentration hardly matter in the relationship of profitability and stock market.

In both the industries bi-directional relationship has been proved between PCM and concentration ratio. And both bear position relationship. So far electronics industry is concerned changes in PCM are explained by concentration ratio, however in case of pharmaceutical industry such change is explained by the rate of change in
concentration ratio overtime. For, electronics industry is highly concentrated and any small increase in concentration further strengthens the firms whereas presently this scope is least in pharmaceutical industry.

7.2. **Policy Implications:**

Growth in Value added outperformed the growth of output in electronics industry. Cost reduction due to technology improvement had helped the industry in making such achievement. This favorable factor for the industry can further be supported by giving boost to R & D and technology development.

Growth in value addition and emoluments could not enhance employment generation in electronics industry, growth of which is almost negligible. Such situation may be due to two reasons; firstly, nature of the industry is such that it is getting more and more support from capital. Secondly, the quality of the trained human capital for the industry (engineers, diploma holders etc) is not adequate. Large numbers of such persons are likely to be in the queue in near future. But the industry is not seemed ready to absorb them. The government should develop mechanism that can help to improve quality of technocrats.

Stock market valuation of firms in an industry has also some bearing on concentration. Moreover, it is a reflection of performance of the firms and industry. Thus, market valuation should be taken into consideration by policy makers while calculating potential concentration and performance of an industry.
Pharmaceutical industry has experienced considerable increase in market concentration overtime. Since this industry cater to social sector and such behaviour may let the firms acquire monopoly positions. This may be a dangerous trend for the health care. The market concentration increase has increased more by merger and acquisition rather than the real capital formation in the industry. Hence, this industry should stay under the realm of government. Firms should not be allowed to attain the status of monopoly especially when the MNCs are gaining importance in the industry.

Though profitability has increased in pharmaceutical industry but it is more remarkable in small firms segment. Since these firms, generally, indulge in unlawful activities such as nexus with doctors and medical agencies. Authorities concerned should keep check over the activities of such firms and they should not be allowed to make profits at the cost of masses. Moreover, the government should not be emotional towards them due to their small scale status. It should be more concerned about the societal need and law enforcement agencies should further be strengthened.

Market concentration in favour of large firms in pharmaceutical industry has been attained by changing their business model. They are acting more as marketing firms rather than the production firms and they acquire formulations and bulk drugs from the small firms/subsidiaries. In this process, entire onus of quality and other liabilities fall on the smaller firms and the larger firms escape the responsibility. Government should ensure that ultimate seller own such liabilities.
It has been observed that research in new drugs is very poor in the country. There is negligible stride in this field. The state should create and strengthen R & D infrastructure for long term survival of this industry in India. Otherwise, dependence on other nations may be threat to health care. Quality of human resources in the forms of engineers and scientists supplied by institutions should further be improved.

Since pharmaceutical industry caters to social sector and any move towards more market concentration may put the people in difficult situation. Hence, irrespective of the level of concentration, price mechanism in this industry should be under surveillance.

Competition Commission of India should take into consideration the level of relationship between market concentration and profitability of specific industry to ensure the adequate competition among firms. As the results reported in this study highlight that the nature of industry is also important.

**For Investors:**

Larger firms are more trusted in the stock market. But larger firms have higher PE ratio and they have less potential for further growth in the stock market. Small firms with strong fundamentals and better growth potential should also be taken into consideration by investors.

Stock market investors should take into consideration the business model the firms opt and its survival in long period before investing in such firms. The authorities should also supply this information to the investors time to time.