Chapter 6

Regional Dispersal Analysis of Indian Industries- A Diagrammatic Presentation of Long Term Trends of Dispersal Measures of Variables and Structural Ratios

6.1 Introduction:

This Chapter 6 deals with Graphical Presentation of Long Term Trends of Dispersal Measures (HH and CV) of Five Size Variables and Structural Ratios of two-digit Indian Industries for the time period 1956-95. The Chapter comprises of 4 Sections. Each Section deals with Groups of two-digit industries identified and grouped on the basis of similar characteristics. Group 1(Consumer Non-Durables-CND) clubs Food Products Industry (IN21=IN20+IN21), Beverages Industry (IN22) and the Textile Group of Industries (IN25=IN23+IN24+IN25). All these above industries are Consumer Goods Non-Durable (CND). Group 2 comprises Intermediate and L-Intensive (ILI) Goods like Textile Products (IN26), Wood and Wood Products Industry (IN27), Paper (IN28) and Leather (IN29). Group 3 comprises of Intermediate Goods with higher Capital Intensity (IKI), viz. Chemical Industry (IN30), Rubber, Petroleum and Coal (IN31), Non-Metallic Mineral Products (IN32), Basic Metals and Alloys (IN33), Metal Products (IN34). Group 4 comprises of Capital Goods Industry (CGI) like Electrical and Electronic Machinery other than Transports (IN36=IN35+IN36), Transport Equipment Industry (IN37), Other Manufacturing Industry (IN38) and Electricity, Gas and Steam (IN41=IN40+IN41).
6.1 This Section deals with Consumer (Durable and Non-Durable) Goods like Food (IN21), Beverages (IN22) and Textiles (IN25). HH and CV Trends of each Size Variable for this Group1 is presented separately to facilitate comparable analysis to enable drawing more appropriate policy measures.

Figure 6.1.1.a. Dispersal (HH) Trend in Factories of CND Industries for 1956-95

Figure 6.1.1.b: Dispersal (CV) Trend in Factories of CND Industries for 1956-95

While HH and CV measures of Food Industry (IN21) show concentration of Factories over the long period, Beverages (IN22) and Textiles (IN25) show a rising trend. The latter two are more dispersed, though marked by severe fluctuations. However, CV shows less rising trend though HH is clearly on an upward mode. Notwithstanding this, there was a fall in factories’ dispersal in 1980s and again in 1992 in both HH and CV that goes on to show liberalization moves in both these times did not account for this crucial agro Industry. The planners probably hoped that trickle-down effects of prosperity and entrepreneur-ship in industrial and trade sectors will filter down to the agricultural and agro-industrial sectors.
Similar trends noticed in both measures of HH and CV for Productive Capital in Food Industry with all the three Consumer Non-Durable showing marked signs of more concentration from 1980 onwards. The increasing tendencies towards greater dispersal was marked both in the Pre-Retrogression and the Recovery Phases, then greater concentration (more marked in HH) in late 1970s depression when oil prices shot up and there was political instability at the Centre.
Employment is concentrated in Food Industry for all of the 40 years, except of high in mid 1970s during 4th and 5th Plan period when special attention was being given to Small Scale Industries and Backward Area Development.

Employment in Beverages and Textiles however show higher dispersal, though marked by great fluctuations. Both started low when they were concentrated and then dispersed. Dispersal marked downward trend during retrogression and again in mid 1980s when Rajiv Gandhi Government laid much focus on imports of machine goods and luxury items.
NVA Dispersal in Food Industry followed similar pattern to its Inputs Dispersal pattern. However, the sharp spurts in dispersal got manifested a little earlier in 1968-9 since gestation period in this industry is much less. Yet, a small spurts noticed during Rajiv Gandhi liberalization measures of mid 1980s and NarasimhaRao-Manmohan Singh reforms of 1992-3 showed that liberalization impulses quickly impacted the output growth and dispersal than inputs.

While Food Industry showed less fluctuations due to low technological diffusion and so lesser increases in capital intensity in this industry which has followed not very radically
innovative methods to boost production. Beverages also showing similar culture of technological diffusion, did increase very high in mid 1980s, largely due to import led growth and demonstration effect in consumption patterns led by the urban rich. Textiles however followed large jumps and falls in dispersal due to the unsustainable nature of liberalization processes that did not matched high capital injections in spurts with less capacity for labor entry or exit.

6.2 This Section shows trend of the Size Variables and Structural Ratio of K/L in Group 2 Industries of Intermediates that are more Labor Intensive in character comprising of Textile Products (IN26), Wood (IN27), Paper (IN28) and Leather (IN29).

Figure 6.2.1.a: Dispersal (HH) Trends in Factories in ILI Industries for 1956-95

Figure 6.2.1.b: Dispersal (CV) Trends in Factories in ILI Industries for 1956-95

This group of industries show severe fluctuations, more prominently in HH. Textile Products show more of concentration. Leather shows high dispersal in both HH and CV. The mid-seventies and mid eighties show relatively more movement towards dispersal, due to growth inducing policies undertaken in those periods. The advent of the 4th Plan in 1970s that laid stress on removal of regional disparities effected more dispersal in industry. The post 1990s spurt in Leather could be due to liberalization and reform measures of the government that brought about much optimism for industrial progress and economic development, though
our data is limited to 1995, when the impact of reforms had not made itself felt in much of the industries and the economy as a whole.

High dispersal of PK noticed in mid 1970s and mid 1980s, the first due to Recovery and focus on small scale industries development and second phase as an outcome of post Indira Gandhi assassination import liberalization drive. Wood and Paper dispersal or lack of it, move at tandem largely due to direct input-output dependency relationship in this two industries. Hence the need for planning for these two industries considering their nature of a structurally dependent relationship
Dispersal of employment is highest in Leather but concentration noticed in Textile Products (IN26). But Paper showed more employment dispersal than Wood especially in the 4th Plan. However, Wood and Paper Industries show greater clubbing than Textile Products Industry or Leather Industry. However, despite higher Labor Intensiveness of production of these Intermediates, employment dispersal is less than expected. The Labor absorption capacity in these industries being high, a more rigorous employment planning with a period wise monitoring mechanism is needed. Productivity and wage relationships in these industries that depend so much on greater Labor Intensification is also necessary for proper employment planning in them if economy is to reap the rewards of a just industrialization leading to more equitable income distribution.
High dispersal of NVA in Leather compared to other three industries of the group in mid 1970s. But NVA more concentrated in all through the 40 years except this brief mid 1970s phase. This concentration noticed in all the 4 Intermediates showing a distinct lack of planning for Intermediates of the nature of more Labor-intensive production. NVA tending towards more concentration than dispersal is due to lack of employment planning and not treating employment planning as an addendum of growth. NVA in Textile Products is lagging as much as NVA in Textiles as seen in Sec.6.2.
Severe fluctuations in dispersal of Capital Intensity noticed in both HH and CV measures. There have been high phases of dispersal in Pre 1964, then 1968 when there was an infusion of more capital during recovery phase but falling in dispersal again. Thus capital infusion for expediting recovery phase must have been internal trade related or it led to conspicuous consumption feeding on pent-up demand or Labor absorption was instantaneous, leading to fall in K/L dispersal. There was a relatively stable phase in 1977-1986, but later periods marked by high fluctuations in dispersal figures. Textile Products showed more concentration in K/L and marked by absence of severe fluctuations.

Section 6.3:
This section shows long term trends in Factories for Group 3 or IKI Industries comprising Capital Good Intermediates with higher capital intensity in the nature of production. They are
Chemicals (IN30), Rubber-Petroleum and Coal (IN31), Non metallic Mineral Products (IN32), Basic Metals and Alloys (IN33), Metal Products (IN34)

While all industries show concentration in Factories, Metal Products (IN34) start from high dispersal. The Pre retrogression period marked a tendency for greater dispersal in these Capital Intensive Intermediates, that was cut short by the retrogression. While industries tended to get concentrated, the mid-1970s was marked by a brief recovery cycle that was short lived. Then all these 5 industries concentrated, except in 1992 phase, it showed a tendency to disperse.

Figure 6.3.2.a: Dispersal (HH) Trend for PK For IKI Industries for 1956-95.
Both Line Diagrams of Dispersal Trends of Productive Capital for Group 3 Industries show similar trends. Chemicals show high concentration. Metal Products show dispersal with high spurt in mid seventies. Less dispersal in IKI group is due to relative neglect of planning for dispersal of Prodcutive Capital.

Figure 6.3.3.a: Dispersal (HH) Trend in Employment in IKI Industries for 1956-95

Figure 6.3.3.b: Dispersal (CV) Trend in Employment in IKI Industries for 1956-95
There is more of employment concentration in this group of industries though Metal Products show increases in sixties before settling down towards concentration as other metal and mineral intermediates were showing no signs of dispersal. Concentration in Intermediates in Employment shows low commitment for a comprehensive planning for Intermediate expansion and integrated with other industries, esp. K-goods Industries.

Severe fluctuations noticed in each of these 5 intermediate industries and being K- intensive in nature, has been less amenable to dispersal. Concentration is seen in long term for IKI Industries. But Metal Products showed higher relative dispersal with Basic Metals closely following it. Chemicals are concentrated that shows that the potential of this sunrise industry of 1970s and 1980s has not been adequately tapped. RPC (IN31) seems to follow Chemicals
route to concentration, both being being mutually dependent to a certain extent and also being similarly Kintensive in nature.

Figure 6.3.5.a: Dispersal (HH) Trend IN K/L in IKI
Figure 6.3.5.b: Dispersal (CV) Trend in K/L in IKI Industries for 1956-95

Similar patterns as above for this group of industries also noticed here. Severe fluctuations are seen in dispersal patterns with CV measure showing fluctuations in all industries more prominently. IKI Industries are concentrating in K/L in long term. Economies of Scale are not being reaped in this IKI Group as NVA and Employment showed more concentration than Factories. Over and above this, K/L is less dispersed, though regularity in spurts is evidence that capital infusion has not helped employment dispersal in these Intermediates.

Section 6.4:
This Section charts long term trends in dispersal measures of HH and CV for capital goods industries like Electrical and Electronics machinery, Transport Equipment and Parts, Other Manufacturing and Electricity, Gas and Steam (IN41).
Electrical and Electronics Machinery (IN36) show high concentration in both HH and CV. Electricity, Gas and Steam (IN41) start from higher dispersal but come down to concentration due to lack of dispersal in other supporting high investment industries. Of late after 1992, EGS show movement towards dispersal as an outcome of new growth impulses released due to liberalization measures for industry, trade and the economy as a whole.

Transport showed a dip in dispersal in recession hit period of mid sixties. Other manufacturing industries due to its miscellany nature of type of industries comprising it, show a more chequered graph, though still moving towards concentration. This industry capable of high Lintensiveness needs a clear policy thrust that would enable it to act a leading sector for growth in an economy like India’s.
Electrical and Non Electrical Machinery other Than Transport (IN36) show high and uniform concentration in both HH and CV. This is an industry that is more related to the development in the knowledge based economy, akin to the software industry of latter decades. Progress, growth or dispersal in this industry IN36 is dependent on R&D development and development of the education sector, a service or tertiary sector. The recent upsurge in service originated GDP does not give much weightage to this and even then it is difficult to deduce the dispersal fortunes and potential of IN36. Transport Equipment Industry (IN37), more related to fortunes of other sectors and industries, shows greater dispersal than IN36. This being a key infrastructure industry, the relative negligence meted out to infrastructure sector is seen in the post recession or recovery phase of Indian industry, when this industry struggled to get more dispersed. But after 1979, it shows more vibrancy and spread and this phase continued till 1987-88 when imbalances in economic indicators, leading to bop crisis, fiscal crisis etc, hence leading to economic reforms, did reduce the spread of this Industry (IN37) again, till post 1992 reform phase brought in a concomitant awareness of the importance of this sector.

OMI (IN38) shows high dispersal but given to fluctuations as does the EGS (IN41). Despite high dispersal in the beginning phase, these 2 industries found it difficult to sustain its spread and grew more concentrated with post 1992-93 saw quicker and more immediate response in
terms of higher dispersal, which is a good sign for Indian Industrial development and economic progress.

Employment in capital goods industry is more concentrated than seen in PK or NVA. Yet maximum dispersal is noticed in EGS (IN41) which does not show smooth downward sloping line as in other three industries. OMI trying to be nearer EGS trend line, did not really follow it and showed more concentration in 1980s. That showed the nature of OMI industry, which despite being capital intensive caters to the direct consumption needs as regards the need and usage of capital goods of this type say instrumentation, surgical instruments, agricultural implements, electronics goods, etc that caters to a market segment, quite distinct from heavy machine goods or the Type for EGS that required heavier capital investment. IN37 dispersal in employment followed more towards and bunches with OMI group, especially in later 1980s, showing trade related concerns had gained prominence.
HH dispersal in NVA show similar trends for all industries of this group with high fluctuations in mid seventies and ultimately settling down after 1980s. CV trend show concentration in all, though initial dispersal is high in EGS. OMI Nva pattern is similar to other variables and ratios for this industry. EGS follows patterns of other industries in this group, except OMI. Thus all capital goods industries show greater concentration in outputs, if not fully in inputs of K and L.
K/L dispersal shows fluctuations in CV, though HH is more clear-cut. EGS is more dispersed in K/L which is a good sign when the Indian economy is seeking more decentralization of the power sector. Electrical and Electronic machinery is highly concentrated in K/L and is clearly in need of more clear policy inputs as to dispersal. This group showed reaping of scale economies more than IKI group.

**Section 6.5:**

**Summary Results and Policy recommendations:**

While Consumer and User and Intermediates show greater dispersal, Capital Goods and Capital goods Intermediate are more concentrated in long term Indian Industrialization. Beverages, Leather, Metal Products and EGS in each of the respective Groups show a contrary trend vis a vis trends in variables and structural ratios of their respective groups. More clear-cut policy formulations await Chemicals, Electrical and Non electrical Machinery, Textile Products for each of these to act as leading sectors of growth.

Williamson hypothesis of Growth leading to dispersal in long run, is proved in Food Products, EGS, Textiles, Metal Products and mostly IKI group.

Wood (IN27), Textile Products (IN26), Transport equipment (IN37) and Electrical and electronic machinery (IN36) prove Self-perpetuation hypothesis. Dispersal in most of K-goods group and Self-Perpetuation in IN36 from K-goods Industry group. However, concentration comes about due to low growth and industry-specific and region specific policy packages to boost their key factor use to raise efficiency will help in greater dispersal of Indian Industry.