

**THE INDUSTRIALISATION AND EXCESS CAPACITY  
IN THE REGISTERED MANUFACTURING  
SECTOR OF WEST BENGAL**

A DISSERTATION SUBMITTED FOR THE DEGREE OF  
DOCTOR OF PHILOSOPHY OF NORTH BENGAL UNIVERSITY

UNDER THE GUIDANCE OF

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WEST BENGAL  
INDIA  
MAY, 1994

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: ACKNOWLEDGEMENT :

During my service from 1978 to 1983 in the Field Operation Division of National Sample Survey Organisation, I had gone through with the ASI works viz. ASI Frame for survey design and sample, Instruction Sets for preparing ASI Returns and scrutiny of schedules and the National Industrial Classification for Industry Groups and Sub-Groups which all backed on to a perceptive knowledge to get hang of ASI data to destine for a research work. For this I had pulled out all the stops to the act of drawing detail information from the premises. But the effort did not find favour with an up-shot, until I had a recourse to my teacher Prof. Manas Dasgupta, a mugwump, who supervised to open up this work. I am ever grateful to his opinion of importance.

I acknowledge the sincerest co-operation of Sri Subhash Chandra Pal, Department of Computer Science, North Bengal University, for needful computation to make wide use of the research method. He stood to attention when I hurriedly needed the work complete. Without this care few tasks would have been fallen apart.

For this highly data-intensive study I am deeply indebted to the Directorate of Bureau of Applied Economics and Statistics, NSSO(FOD)(W.B) Zone, I.S Wing, Calcutta and few District Statistical Officers of West Bengal. It is not possible for me to name individually all the officials and friends who have generously helped with their informations and comments.

I can't go without referring my owing gratitude to eldest brother Sri Prasanta Kumar Pal who has done this excellent type work notwithstanding the stresses and strains of his illness.

Finally, I must thank my wife, Pratima, for spurring me on to study 'higher' or 'better' through this work.

24th May, 94.  
Balurghat College,

  
Asit Kumar Pal.



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CHAPTER - I

INDUSTRIAL GROWTH OF WEST BENGAL —

ITS HISTORICAL PERSPECTIVE.

THE NATURE OF "DECLINE."

## CHAPTER - I.

### INDUSTRIAL GROWTH OF WEST BENGAL —

#### ITS HISTORICAL PERSPECTIVE .

#### THE NATURE OF "DECLINE".

#### 1.1: Introduction: The Continuity in Industrial Development and Economic Turnings:

The marvels of modern science are results of a continuous industrial development and progress in technology which are bringing more and more new industries into existence and fundamentally altering the structure of industry - its energy and raw material base. Unprecedented opportunities have cropped up before mankind for mastering nuclear power, ocean-resources, outer space and laser power. Many modern major inventions are now commercially successful. Present-day industrialisation is characterised by a rapid development of sophisticated branches of economy.

Of enormous significance in the life of man and in his struggle with industrial inventions was creation of industrialised society — one in which a busy transformation is on rush in the way people work and live. The society in which economic laws express the essential aspects of relation

of production and their inter-connection with productive forces. This society gave birth to an Industrial Revolution; rise of capitalism; exploitation of workers; slums; and labour unions. The spontaneous working-class movement brought socialism, social legislation and Govt. regulations.<sup>(1)</sup> Then a competition between the two-world systems, the socialist and the capitalist, has taken place. In the course of this competition, the capitalist world has approached production more realistically. Having some advantages in the sphere of production and circulation, the non-socialist world has been subjected to a contrast with itself in the form of a North-South Dialogue i.e. wristling of the developing countries with the developed countries.<sup>(2)</sup>

During the past decade the developing countries have been faced with a series of severe external shocks - Oil price increases, Global price-inflations, recession, high interest rates and exchange rate instability, and most recently interruption of supplies of accustomed external finance.

From 1979 on they were hit by the longest and most severe recession since the Second World War and then by unprecedented increases in interest rates, appreciation of U.S. Dollar ( in which most of their external-debt is denominated), low price for export commodities ( except petroleum ), and from mid 1982 on by sharp reduction in the inflow of commercial capital. <sup>(3)</sup>

Their exports generally consisted of a few primary commodities which were main industrial inputs for Northern - industries. But now the Northern-industrial inventions have gone up to such an extent that out of 65 (sixty five) chief industrial raw materials ( from L.D.C ) 63 ( sixty three) have been substituted ( except Oil ). This has caused the disruption of markets for their products. The programme for industrialisation in developing countries has emerged from this critical situation. They need developing import-substitutes and a quality production for export. But sharp and wide technology gaps exist between developed and developing countries. The capital labour ratio- necessarily reflects the difference in access to technology. The industrialised countries are naturally far superior to the developing countries so far as production technology is concerned. For industrialisation and economic development the developing countries have to depend on technology export from the developed countries which are found verymuch unwilling to transfer the latest technology. Consequently developing countries find themselves in disadvantageous position so far as their exports are concerned and they are compelled to borrow industrial capital from the advanced countries. Things have now come to such a pass that these developing countries are so heavily indebted that they can hardly repay their debt and service burden. To over-come these problems attempts have been made in the

developing countries to encourage export-oriented production and production of import-substitutes. This results construction of plants less than-efficient-minimum-size.<sup>(4)</sup> It leads to nagging problems of 'excess capacity' in the industries.<sup>(5)</sup>

Excess capacity is barrier to entry in an industry and hinders the growth of new units in the industry. It not only forestalls entry but also generates oligopolistic or monopolistic market structure.<sup>(6)</sup> If industrialisation is followed by excess capacity then it will generate further crisis. Again, most of the developing countries, during the period of their planned development, experienced 'enclave type' development because of the larger concentration of modern-sector activities in urban centers mainly matropolies, degenerating growth impulses to their peripheries.<sup>(7)</sup> So, the problem of regional intra-industry disparity in terms of excess capacity has now become an acute problem in the industrialisation programme of developing countries. India, being a developing country, is no exception to this crisis. To India experience of West Bengal is conspicuous in this respect.

### 1.2: The 'Bygone Glory' in Industrial Activity of Bengal:

The reminiscences tell us that the economy of Bengal in ancient period was glorious in the sub-continent. Since then Bengal has been famous for the high artistic skill of her

craftsmen. Her muslins, brocaded silk, Jamdani Sari and harmonious cotton prints were famous in the world. 'The cotton textiles and silk fabrics were provinces' most famous industries and these had markets not only in other parts of Mughal Court, was one of the connoisseurs of the products but also in many countries'.<sup>(8)</sup> The working of metals and precious stones, the preparation of essences, and ivory works attracted admiration of many travellers from Europe and Far East. Under suitable patronage art and industry blossomed at their exquisite delicacy and beauty unrivalled by the products of any other nation. These glorious days lasted long through hereditary transmission of skills based on casts and sub-casts.

Bengal maintained an active overseas trade with South India and Ceylon in the first century A.D.<sup>(9)</sup> The important centers of trade and industry were: Pundra Vardhana, Lakshmanavati, Vikrampura, Karnasuvarna, Triveni, Suvarnagram, Saptagrama and Tamralipti. 'Two important overland trade-routes were popular; one connected Bengal through Kamarupa with China, the another passed through the Himalayas across Nepal, Sikkim and Chumbi Valley to Tibet and China.'<sup>(10)</sup> Through trade her wealth had been increased enormously. The wealth of Bengal about a century before British conquest has been vividly described by Bernier. The prosperity of Bengal before Plassey (1757) was ascribed by Verelst to the

'cheapness and quality and the prodigious traffic of their manufactures'. But the day of damnation came immediately after Plassey with series of events:

1. Acquisition of Dewani by the East India Company in 1777 had opened the line of drainage of wealth from Bengal. An estimate by late Dr. J.C. Sinha put the outflow of resources from Bengal between 1757 and 1780 at nearly £38 million. It includes drainage of silver currency in England via China. By this, funds for development of new forms of enterprise had been drained off to England where industry and commerce were flourishing as never before. (11)
2. Industrial Revolution ( with series of inventions ) encouraged the British industrialists to capture the market of Bengal for their products. J.C. Sinha opined that the Industrial Revolution in England only hastened the Bengal Industries.
3. 'The policy pursued in England to discourage Indian manufactures. (12) It had started the process of de-industrialization through British camp-followers and fortune-hunters.
4. The Maratha, Mughls and Portugese pirates followed loots which brought uncertainties in the economy of Bengal whereon artisans were adversely affected in their trade and transactions.

By this way in course of time decade from Plassay all industries in Bengal declined - cotton and silk-spinning and weaving, sugar, salt, iron-smelting, tool-making, dyes and ship-building were noted. (12) Ultimately Bengal became the supplier of raw materials for British Industries and market for British manufactured goods. People concentrated on agriculture by leaving traditional industries. The transfer of power from the company to the crown is another phase to hit out Bengal. Then, the commercialisation of agriculture began with the beginning of Civil War in North America which diverted the British demand for raw cotton and indigo from United States to India. (14) The best lands of Bengal were forcibly thrown for indigo plantation. The non-food to food-crop output ratio began to rise and self sufficiency of rural Bengal had broken down tremendously. Cockrell, enquired in the famine, himself admitted that 'one of the causes ( scarcity of food-grains ) was the increasing cultivation of indigo which year by year absorbed large areas of lands which otherwise would have been devoted to the cultivation of cereals'. (15)

The accumulated capital in private-hands in Britain started flowing to India through 'push and pull effect and Bengal got localisation of two industries as Tea and Jute. For jute the world's highest localisation came into force on the banks of river Hughlee. From 1854 to 1863 the growth



of this industry was rapid. As Mr. H.C.Kerr had mentioned the romance of jute on the occasion in his report: 'Jute was a monopoly of India and in this the Bengal industry had a strong advantage'.<sup>(16)</sup> In Bengal the tea was planted first in the year 1856 and therewith fostered Fulbari T.E. (1877 ), Washabari T.E. (1877 ), Damdim T.E ( 1877), Dalimkot T.E. (1876 ), Manabari T.E. (1877), Manihope T.E. (1878), Patabari T.E. (1878) and Ranichera T.E. (1878) etc. Upto 1906 all waste lands of Jalpaiguri came under tea plantation. By this way there were 150 tea gardens in the year 1934. During this time many tea gardens had fostered in Darjeeling district.<sup>(17)</sup>

Industrialisation in Calcutta-Howrah-Hughlee area followed a characteristic feature which was the presence of large managing agency firms under Europeans. They controlled the majority of the cotton jute, Tea and other mills. The doctrine of imperial preference did attract many private investors to set up their ventures in the area. Men who diverted from traditional industries and land began to gather round the factories, trap for exploitation as they had never become a strong collective-burgainer in the factory system. Thus, slow growth of trade union, falling wages, rising prices and huge profits did attract again few industrial units for which commercial and geographical advantages had already prevailed in the area.

With Bengal discrimination followed by British rulers.

'We saw Madras and Bombay had always sharing the larger amount

than Bengal where it collected more revenue than others. It accentuated the disparity. The inequality was enshrined in the Govt. of India Act. 1935, and fifteen years thereafter in the constitution of 1950 -- in a worsen form. Many public works had in restricted scale in Bengal than in Bombay and Madras. (18)

The Bengal famines repeatedly famished millions of people and mounted profits to industrialists. And finally partition violently disrupted the economy of West Bengal with the exodus of population from the then East Pakistan. Accordingly about 4.53 lakhs of immigrants had been rehabilitated outside West Bengal upto date from 1946 to 15.7.1970 and 22.8 lakhs within the states. (19) Thus, the economy of West Bengal was shuttered.

### 1.3: The Experience with Centre: A Set Back to-wards Development.

Discrimination with West Bengal started at the dawn of independence when West Bengal Govt. discovered that the centre had on the stroke of 12 O'clock the previous night slash the state's share of jute export duty. (20) Even during the first decade after independence, West Bengal was the most industrial state in India. In the year 1955-56 West Bengal had the highest per capita NDP (Net Domestic Product) compare to Maharashtra, Punjab, Gujrat and Karnataka as shown in Table 1.1. (21) In the year 1962-63, the position became third. In 1976, the position had gone down to the 7th in order of rank. From 1962-63 to 1975

the per-capita N.D.P. increased for West Bengal Rs. 460, for Maharashtra Rs. 678, for Punjab Rs. 934, for Gujrat Rs. 513, for Karnataka Rs. 573 and for Haryana Rs. 813. It is due to the remonstrant planning by which West Bengal had been pushed back to the tail end in the ranking. Throughout the planning period in India a picture of discrimination with West Bengal is clear from table (1.1). As in the 2nd Plan period the per-capita state-plan expenditure was the lowest for West Bengal (Rs. 59 ) compared to Maharashtra, Punjab, Gujrat and Karnataka in order of rank. The same rank was observed in the 5th Plan period. From 2nd Plan to 5th Plan for West Bengal the per-capita state plan expenditure increased by Rs. 141, for Maharashtra Rs. 306, for Punjab Rs. 437, for Gujrat Rs. 286 and for Karnataka Rs. 215. Amazingly Haryana's per-capita income increased tremendously with massive increase of per-capita state plan expenditure. At the close of the 5th plan it was found that West Bengal was behind the states in the both respects as referred.

Since the planning allocation was not favoured, the income and expenditure deteriorated as shown in table (1.2) where West Bengal settled at lowest rank in respect of per-capita revenue receipts and per-capita development expenditure to revenue receipts. From the year 1982 to 1985 per-capita revenue receipts increased for West Bengal Rs. 58.78, for Gujrat Rs. 100.37, for Maharashtra Rs. 102.06, for Punjab Rs. 64.91, for Haryana Rs. 97.83 and for Karnataka Rs. 102.07. Hence, the

Table No. 1.1

Per Capita Net Domestic Product and Per Capita State Plan  
Expenditure at Different Plan Period in Some Major States.

State	* Per Capita N.D.P. for 1955-56 (in Rs.)	** Per Capita State Plan Expenditure (in Rs.) under 2nd Plan	** Per Capita N.D.P. for 1960-63 (in Rs.)	*** Per Capita State Plan Expenditure (in Rs.) under 3rd Plan	** N.D.P. for 1964-65 (in Rs.)	**** Per Capita State Plan Expenditure 1966-69 (Three Annual Plan) (in Rs.)	** Per Capita N.D.P. for 1967-70 (in Rs.)	**** Per Capita State Plan Expenditure (in Rs.) under 4th Plan	***** Per Capita N.D.P. for 1972-75 (in Rs.)	**** Per Capita State Plan Expenditure (in Rs.) under 5th Plan
West Bengal	449	59	399	86	465	46	667	82	925	200
Maharashtra	404	66	418	110	478	98	686	199	1156	372
Punjab ‡	389	94	388	125	492	109	910	316	1426	531
Gujrat	379	90	402	115	462	101	667	204	975	376
Karnataka	308	61	312	106	373	81	552	128	946	276
Haryana					445	111	810	358	1258	481

‡ For the 2nd and 3rd Plan Punjab included Haryana, Assam and Meghalaya.

Sources:

- \* N C A E R -- 1967
- \*\* State Plan documents and 1951 census.
- \*\*\* Finance Commission 1969, '71, '73.
- \*\*\*\* Based on State Plan document and 1961 census.
- \*\*\*\*\* C.S.O. (1979).

Table No. 1.2

Per Capita Revenue Receipts and Development  
Expenditure to Revenue Receipts in Some Major  
States.

States	Per Capita Revenue Receipts ( in Rs. )			Per Capita Development Expenditure to Revenue Receipts ( in Rs ).			Per capita Development Expenditure Increased by	Per capita Revenue Expenditure Increased by
	1982-83	1983-84	1984-85	1982-83	1983-84	1984-85	(in Rs.) 1982-85	(in Rs.) 1982-85
West Bengal	244.64	261.55	303.42	200.73	206.97	262.35	61.62	58.78
Gujrat	381.69	426.46	482.06	278.76	299.05	353.11	74.35	100.37
Maharashtra	438.67	479.42	540.73	264.25	313.05	371.67	107.42	102.06
Punjab	450.97	486.62	515.88	267.59	322.73	340.51	72.92	64.91
Haryana	455.75	489.24	553.58	316.77	328.91	393.07	76.30	97.83
Karnataka	331.26	370.91	433.27	221.32	238.91	304.31	82.99	102.07

Source: " Report on Currency and Finance;  
Reserve Bank of India, in West  
Bengal (Economic Review) 1988,  
Page 192.

Per capita development expenditure to revenue receipts for West Bengal was the lowest among the states as shown in the table. The discrimination started generating the regional disparities (each state as a region ) and West Bengal receded to the background in a developing economy. So, it is an easy surrender on the part of the Bengali Public opinion to the temptation of putting the entire responsibility of this sorry state of affairs on the shoulder of the Union Govt. (22)

A very interesting view of the Bengal Chamber of Commerce (1971) that 'the centre's dealings with West Bengal and its problems lead to one broad conclusion that while demanding modification and change in certain policies and practices persuade by the Union Govt. affect that state, West Bengal must also take a long and hard self-critical look. Bemoaning centre's attitude on every form is neither justified nor likely to produce any helpful result'. (23) So, the discrimination and disparities continued in planning periods.

#### 1.4: The Regional Disparity :- A Crisis Process.

The northern five districts of West Bengal -- Darjeeling, Jalpaiguri, Coochbehar, \*West Dinajpur, and Malda jointly hold

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\* West Dinajpur is now divided into two districts viz. Uttar Dinajpur and Dakshin Dinajpur.

the identity of a Region called North-Bengal. The remaining part comprises of eleven districts holds the regional name as South Bengal. North Bengal is agro-dominated and rural based economy where the five districts are more or less backward in every respect. Limited infrastructure facilities stand in the way of creating atmosphere for manufacturing activities. In agriculture sector also the outdated method is mostly followed causing little improvement in production. Except tea few other industries like timber, plywood, rice and flour milling are seen in Ektiasal of Jalpaiguri and Dabgram of Siliguri area. Few rice Mills are working in the district West Dinajpur wherein Ralganj spinning mill and a small paper mill have been working for a few years. Since, there presence only a few and poor mineral resources, as copper in Darjeeling and line stone in Jalpaiguri, no big industrial units based on mineral resources yet started.

In South Bengal the Calcutta-Howrah-Hughlee industrial belt is the biggest; a region longing about 80 km. on the bank of River-Hughlee, starts from North Triveni to South Birlapur. The nearness of Calcutta port and its hinterlands like Bihar, Assam and Orissa make facilities of machines, men and raw-materials for industrial units. Coal from Raniganj and electricity from D.V.C., Bondel and Soutaldi make advent of many units like Jute, Cotton, Aluminium, Paper, Match, Engineering, Chemical, Glass and many other industries which we cannot classify here. In this region we see a car making unit at Uttarpara, a shoe-making unit at Batanagar, a Railway coach

making unit at Kachrapara, a ship-building unit at Khidirpur and the gun factory of Kashipur. Here many private companies have established their manufacturing units as for their necessary inputs other industrial outputs are available in the area.

The Asansole industrial belt comprises of Raniganj, Burnpur, Kulti, Barakar, Rupnarayan and Chittaranjan where we see industrial units like iron and steel, cycle, aluminium, paper and locomotive manufacturing for which power produce mainly by coal available in Raniganj area. Adjacent to this the Durgapur industrial region where main industrial units are D.P.L. Durgapur Chemicals, Mining and Alloyed Machineries Corporation etc. Here a coke coal producing unit, a fertilizer manufacturing unit and a spectral-glass manufacturing unit are important among other than hundred units in the area. The industrialisation at Haldia is made mainly by Govt. facilities. Total investment in Haldia area by State Govt., Government of India and the major private sector enterprises are to the tune of Rs. 900 crores. The important existing industrial units are: Haldia Dock Complex with composit cargo, Haldia Refinery, Haldia Fertilizers, Shaw Wallace, Hindustan Leaver, Chloride India and Petro Carbon etc.

For mineral resources the south is endowed with coal, limestone, ulfram, fire-clay, cyramic manganese, copper and iron-ore. Any additional amount of power as produced in the state brought a border allotment for South as needed by its growing demand. The draw-back keeps North less prosperous. So, diversity and disparity are co-existing along with growth and development as shown in the map No. 1.1, 1.2 and 1.3.

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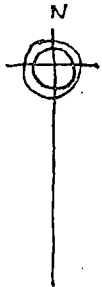
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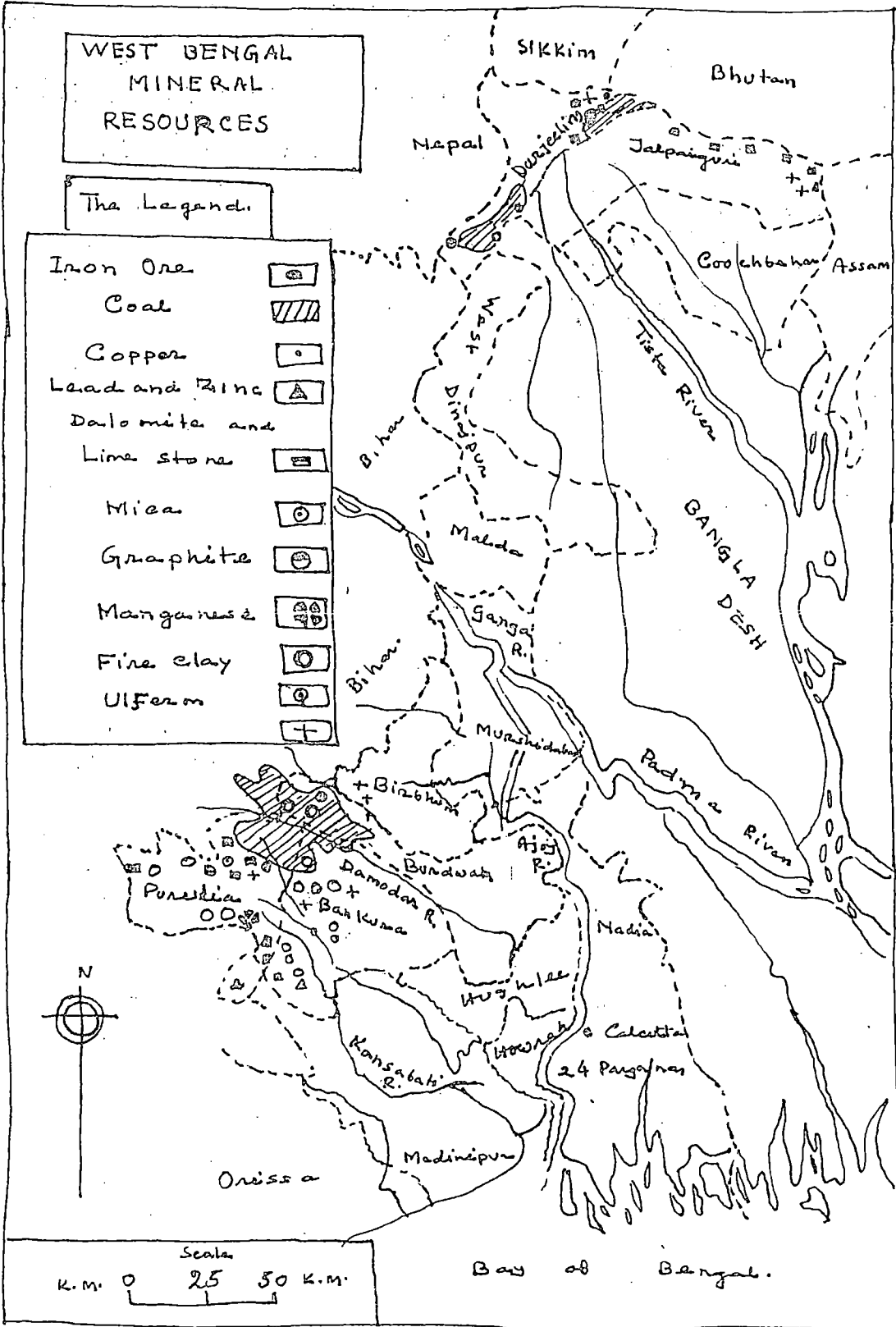
# WEST BENGAL MINERAL RESOURCES

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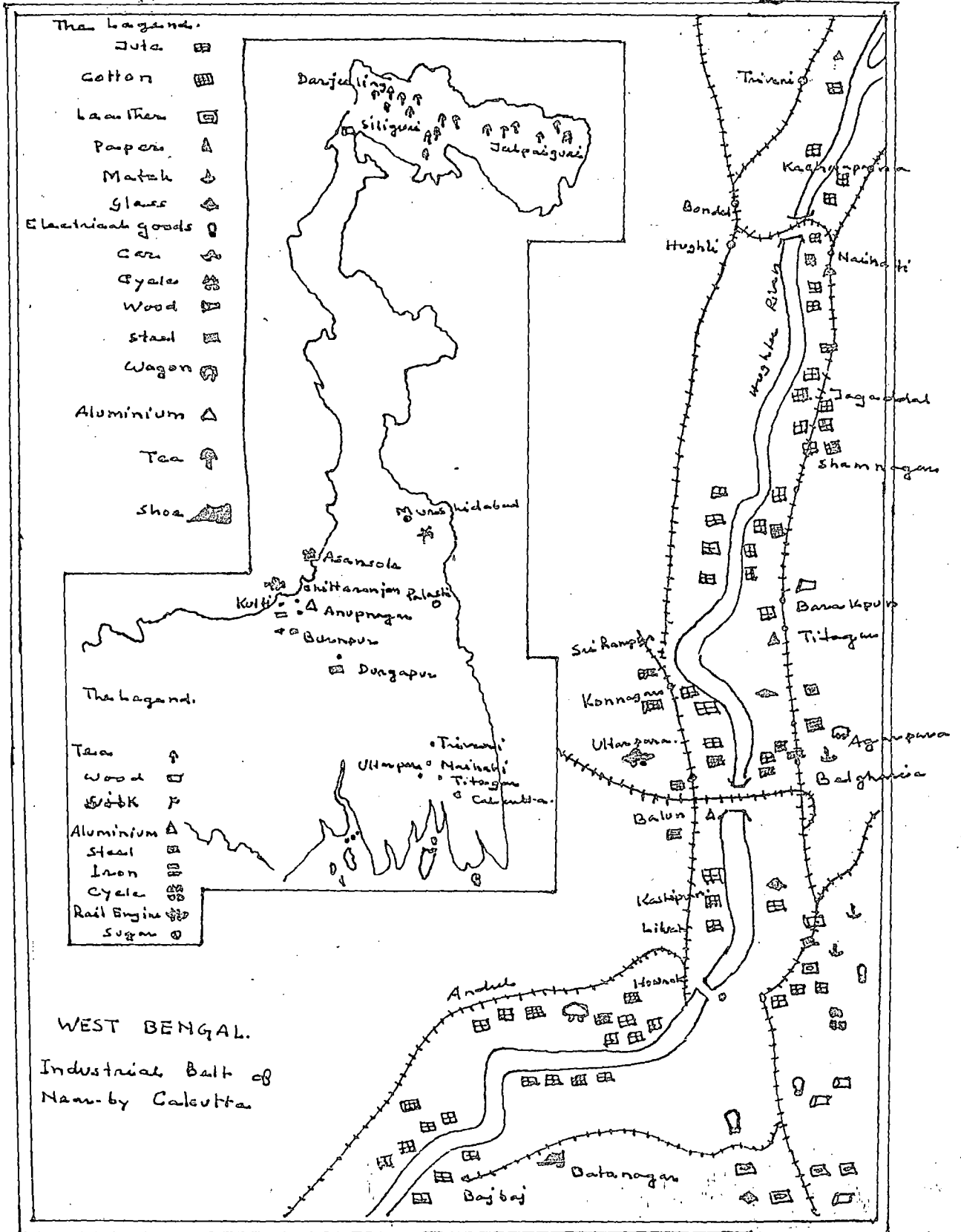
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Copper	
Lead and Zinc	
Dolomite and Lime stone	
Mica	
Graphite	
Manganese	
Fire clay	
Uiferon	



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MAP: 1.2





1.5: Forces of Divergence and Convergence between Regions: As Backwash and Spread Effect.

The tertiary sector is the most important employment providing sector in urban areas of North Bengal. One of the most distinguishing features of the towns of North Bengal is presence of large number of retailshop in the urban areas. The small retail shops are predominant in all the towns and villages of North. Kurseong remains an exception as there people are engaged largely in transport and construction works.<sup>(24)</sup>

'The nature of occupational pattern in the urban areas of North Bengal shows that it has failed to achieve growth and so there is an excess population in retail trade'.<sup>(25)</sup>

The degree of urbanisation for the year 1961 for North Bengal was 10.1, raised to 13.7 in the year 1981.<sup>(26)</sup> The degree of urbanisation of Siliguri, Alipurduar, English-Bazar, Old Malda and Raiganj are comparable as similar to some towns of South Bengal. The peculiarity is that the degree of urbanisation in North Bengal is the expression of agrarian crisis where as the degree of urbanisation in South Bengal (for comparable towns ) is the expression of industrialisation. Because in agrarian sector North Bengal is far behind any sample size of five districts of South Bengal regarding the distribution of ground water structure. The areas irrigated by Govt. Canals in North Bengal are so insignificant they are never before Burdwan, Birbhum and Midnapore alone. However, the

'Tista Project' has a good prospect for future irrigation facility in North Bengal. The farmers of the South are advanced to commercialize their agriculture products as use of fertilizer reflects their motive for commercialization of agriculture. Lack of irrigation facilities limits the use of fertilizers and hence, unprofitability diverts the farmers of North to other occupation mainly in urban areas. The process lifted the high degree of urbanisations in the North.<sup>(27)</sup> Here analysis of Gunnar Myrdal requires special attention that 'it appears to be generally true that urban growth in under-developed regions is not a function of the expression of industrial base but an expression of the severity of agrarian crisis. In some towns of the South urbanisation is the result of 'Spread Effect' of industrialization. For this reason the 'Backwash Effect' would be more for rural-north than that of rural-south.<sup>(28)</sup>

Regarding income distribution the Lorenze Curves of Siliguri,<sup>(29)</sup> Durgapur-Asansole<sup>(30)</sup> and Kurseong<sup>(31)</sup> are more or less the same. The upper 10% families enjoy 33% to 36% of total income whereas the bottom 10% families enjoy 1% to 3% of total income. The deference is that the co-efficient of variation of income for Kurseong is first in rank whereas Siliguri stands second and Durgapur-Asansole the third. The degree of variability of business income for the former is more than the wage-income of the latter. Fluctuation being settled with greater divergence in rural areas of North, the

disparity between North and South is now acute in recent years. The problem of intra-industry disparity in terms of excess capacity between regions is now one of the crisis processes. The problem retards the growth of new units and industrialization in West Bengal . . . reflects the facial features of concentration in few specific places only. The Registered Manufacturing Sector brought an evidence for this:

During the last decade the districts like Coochbehar, West Dinajpur, Malda, Murshidabad, Purulia and Bankura got little improvement in industrial activity. Under these districts many units run into debt and work at less-than-minimum-capacity which baffle the forthcoming entrepreneurs unless they break fresh ground. Few entrepreneurs have taken a leap in the dark since we observed a slight change in industrial activity. Many manufacturing units in these districts have come to terms with loans and subsidies from public funds. They have become loss concerns within few days of their birth. The industrial development in these districts have passed down on recourse from Govt. only.

The growth of Registered Working Factories ( Excluding Defence Factories) in the state brings us an opportunity to inveigh against concentration viz. units , employment and output in two specific places only.

Table : 1.3.

Registered Working Factories (Excluding Defence  
Factories) in West Bengal by District. Table No.1.3.

District	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
West Bengal	5967	6144	6421	6548	6954	7324	7628	7864	8064	8348	8573	8746
Burdwan	325	347	367	381	397	421	434	465	477	491	499	508
Birbhum	78	80	82	83	86	86	88	89	91	94	95	95
Bankura	73	69	66	69	66	65	67	68	76	80	75	79
Midnapore	86	83	92	101	101	91	119	124	126	134	134	146
Howrah	1274	1326	1394	1421	1541	1643	1687	1728	1774	1816	1841	1869
Hooghly	169	205	221	231	238	248	251	282	290	301	313	324
24 Parganas	2811	2861	2979	3032	3209	3381	3504	3609	3684	3828	3988	4087
Calcutta	544	559	594	596	671	715	757	772	782	801	813	819
Nadia	73	84	91	96	101	114	124	123	128	133	138	138
Murshidabad	18	17	14	13	13	15	15	15	15	17	18	18
West Dinajpur	31	29	30	29	30	29	34	34	34	36	37	37
Malda	7	6	8	8	9	10	12	12	12	14	15	17
Jalpaiguri	249	253	254	254	260	271	289	294	312	325	330	336
Darjeeling	161	161	166	172	176	180	187	190	196	200	201	201
Coochbehar	13	13	13	13	13	13	17	17	18	18	18	18
Purulia	55	51	50	49	42	42	43	47	49	51	54	54

Source: Chief Inspector of Factories, West Bengal.

## 1.6: The Poor Performance in Industrial Activity: The Registered Manufacturing Sector as a Reference:

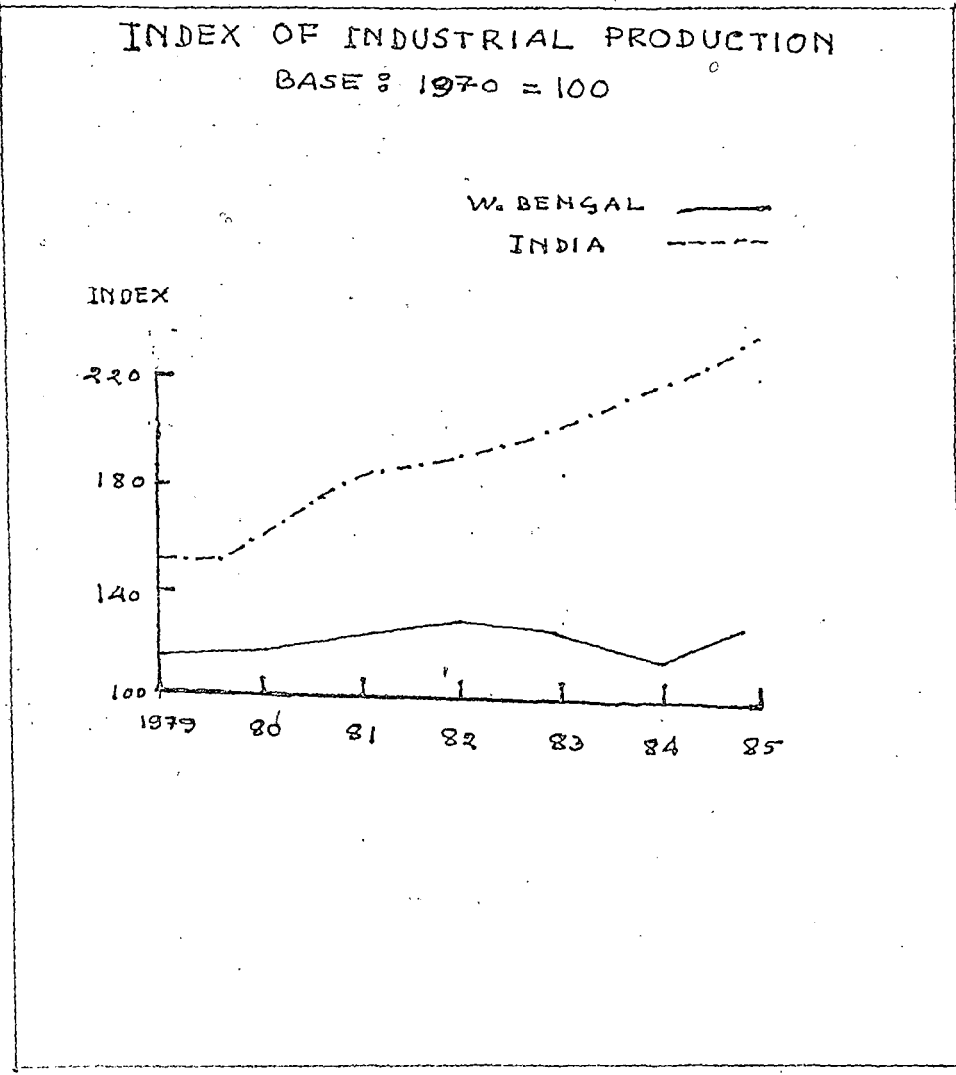
Apart from regional problem the industries of West Bengal stand back by mediocre performance. The picture for index number of industrial production of West Bengal compare to the rest of India (Fig. 1.1 ) shows that the industrial activities had faced a hard time for the period from 1980 to 1985 via a gult in the year 1984. For India the growth of industrial production continued at a rising trend. However, in West Bengal there was a slight improvement in the following years. It is due to the small scale manufacturing units which had been started with aid and subsidies for few years. But their continuity is questioned as most of them ought to be sick within few years.

The ex-factory value of output of West Bengal to India was 9.8% in the year 1980-81, then began to fall in the following years upto 1986-87 when it was 7.4% only. It is due to a sticky growth rate of output in West Bengal. The index (with base 1980-81 = 100 ) of exfactory value of output in West Bengal had grown to 165.1 in the year 1986-87 when India significantly noted at 217.8<sup>(32)</sup>. The day for damp growth of output is evidently causing a fact that the ground once industries were fabricated now loosing robustness.

From Directorate of Industries (West Bengal) the source says that the period from 1980 to 1989 industrial licences



GRAPH NO. 1.1



Source: WEST BENGAL  
ECONOMIC REVIEW - 1988-89

issued ( granted under Industries Development and Regulation Act. 1951 ) for 33 new undertakings, 52 licences issued to units for production of new articles and 24 licences for substantial expansion. (33) Among them manufacturing of Rubber, Plastic, Petroleum and Coal products, Chemical products and Electrical Machinery are projecting the forefront of their succession. During the same period a pre-record from Ministry of Industry, Govt. of India, helps us to perpend about letters of intent and industrial licences issued to different states in India, where West Bengal is behind the states like Andhra, Gujarat, Haryana, Karnataka, Madhyapradesh, Maharashtra, Tamil Nadu and Uttarpradesh. West Bengal is only before Assam, Bihar, Kerala, Orissa, Rajasthan and Punjab. Punjab was left behind for political crisis. But what crisis is inherent in West Bengal where industrialists are reluctant to get more industrial units? Why they reveal their preference for M.P., U.P. Haryana, Andhra and Karnataka over West Bengal where they could have constructed industrial units ? Only industrialists can divulge this retrogression.

Here capital output ratio, output labour ratio and capital labour ratio are unfavourable in industrial scene when compared to those of Maharashtra, Gujarat, Karnataka and Haryana as shown in table ( 1.4 ).

Table No. 1.4.

The Capital Output Ratio, Output Labour  
and Capital Labour Ratio in Registered  
Manufacturing Sector for Different  
States in India.

Year 1981-82

States	C/O	O/W	C/W
West Bengal	0.7210	0.9240	0.663
Maharashtra	0.5656	1.7469	0.9880
Punjab	0.6765	1.4772	0.9993
Gujarat	0.5487	1.5314	0.8402
Karnataka	0.7220	1.0793	0.7792
Haryana	0.6393	0.9756	1.0772
Uttarpradesh	0.9764	0.8840	0.8631
Madhya Pradesh	1.2423	1.2462	1.5482
Andhra Pradesh	0.8375	0.5638	0.4722

Source: Data Calculated from Table No. 17.6.  
'Statistical Abstract' West Bengal  
1978 to 1989 (combined) Bureau  
of Applied Economics and statistics  
P. 482-494. (value Rs. in lakhs.)

In recent years for Registered Manufacturing Sector of West Bengal the picture of net profit is implying poor performance in industrial activities. We know that net value added is equal to gross output minus total input and depreciation. The net income is equal to net value added minus rent and interest. From the information the net profit is equal to net income minus implicit earnings. For West Bengal the net profit is negative. Side by side lower productivity of labour with high value of returns to scale leads to the conclusion that the industries in West Bengal have been 'trapped' at the problem of excess capacity. This problem is to be examined furthered.

#### 1.7: Objectives of Study:

This study evolves round the following objectives:-

- 1) To examine the structural anatomy of industries of Registered Manufacturing Sector of West Bengal.
- 2) To examine the regional intra-industry disparity, and the rate of disparity in terms of per-capita income and excess capacity in West Bengal.
- 3) To examine the variation of excess capacity in the Public Sector and Private Sector units for same industry group or sub-group in West Bengal.

- 4) To examine the response of capital labour <sup>ratio</sup> to the growth rate of productivity of labour.
- 5) To examine the cause and effect of excess capacity.

#### 1.8: The Area of the Study:

The Registered Manufacturing Sector in West Bengal has been selected as area of this study. The Registered sector is the coverage of A.S.I. extends to all factories registered under Factories Act, 1948 with (i) 10 or more workers and using power, or (ii) 20 or more workers and not using power. In it the Census-Sector comprises of Factories employing 50 or more workers and using power and 100 or more workers and not using power. The remaining factories go to Non-census sector. According to the NIC- 1970 the available industries (in census and Non-Census Sector) from the frames of West Bengal (1978), amounted to 269 ( a total of 3- digit and 4- digit industries). The National Industrial Classification is made by output criteria i.e. specifying a product under the industry group. The 3- digit industry group belonging to the NIC Division 2 and 3, is related to manufacture. The 4th "digit" is under 3rd digit to specify a product under the industry which produces it. For all these industries we study the function to understand the problem.

#### 1.9: Survey of the Literature.

From Marshall to such later economists as Khan (1935),<sup>(34)</sup>

Harrod ( 1934-35)<sup>(35)</sup> and J.M. Cassals (1936-37)<sup>(36)</sup> defined excess capacity in their own respective ways. From what they have said, it follows, that excess capacity is the difference between the Ideal Output and the output actually attained in the long run. The Ideal Output of firm was generally regarded as the output which is associated with minimum long-run average cost. Chamberlin (1962) argued that excess capacity arises when free entry is coupled with the absence of price competition.<sup>(37)</sup> Thereafter a series of works had been done on this line. Lovall, C.A Knox (1968 ) worked on 'Capacity Utilization and Production Function Estimation in Post War American Manufactures',<sup>(38)</sup> Wonders (1971) worked on 'Excess Capacity As a Barries to Entry',<sup>(39)</sup> Shepared, W.G. (1979) on 'Excess Capacity and Control of Prices',<sup>(40)</sup> Murry D. Bryce (1961)<sup>(41)</sup> defined excess capacity in terms of " Poor" performance in unit as well as in industry.

In India the performance of industries has been assessed by eminent economists like P.R.Brahmananda(1982)<sup>(42)</sup> who in his studies on 'Productivity in the Indian Economy' found rising inputs for falling outputs in Registered Manufacturing sector where public sector units suffered from a rising degree of under utilisation of capacity.

Prof. I.J Ahluwalia (1985),<sup>(43)</sup> through her studies on 'Industrial Growth in India', found stagnation in Indian industries since the mid-sixties due to very poor performance

in terms of productivity growth. The points contributed to industrial stagnation were (i) slow growth of agricultural incomes and their effect in limiting the demand for industrial goods, (ii) the slow down in public investment after the mid-sixties with its particular impact on infrastructural investment, (iii) poor management of the infrastructure sector leading to severe infrastructural constraints, and (iv) the industrial policy framework, including both domestic industrial policies and trade policies and their effect in creating a high cost industrial structure in the economy.

In her later work (1991)<sup>(44)</sup> she found growing trend of capital intensity with falling trend of capital productivity in India manufacturing during the period from 1965 to 1985. For the same period the productivity of labour showed off insufficient growth and some down in total factor productivity growth which reasoned out under utilisation of capital and excess capacity.

The capital deepening and under utilisation were also traced by A.K. Banerjee (1975)<sup>(45)</sup> in his work on 'Capital Intensity and Productivity in Indian Industries'. Y. Satya Narayan (1972)<sup>(46)</sup> also studied excess capacity in Indian manufacturing through the impact of Licensing Policy on industrial output.

Apart from these ~~studies~~ we note down excess capacity

from our own view point. Operating and industrial enterprise considerably below capacity -- one or two shifts when three would be more economic or without great concern for cost control or efficiency or without any concern regarding average productivity of labour -- is an evidence of excess capacity. For this we use the production function parameters, e.g. returns to scale and technical efficiency to identify the problems of excess capacity. We also consider input output ratio, capital output ratio and capital labour ratio for realisation of the problem.

A greater excess capacity in an industry of a region compare to that of another region is observed when (I), a higher returns to scale is associated with lower average product, or (II) higher capital output ratio is associated with higher capital labour ratio and higher input output ratio. In the same way we can trace the excess capacity' higher or lower, in the public and private sector units in the same industry group. For the industries in Registered Manufacturing Sector of West Bengal no work has so far been done on excess capacity to the best of our knowledge. So, we pass down our task into deeper for realisation of the problem.

#### 1.10: Research Hypotheses:

- 1) The index of industrial production of West Bengal was at a slow pace from 1979 to 1987 due to exogeneous and endogeneous factors.



- 2) Major industries like Jute, Iron and Steel, Tea and Engineering showed a slow rate of growth of production from 1980-1989. However, some other industries Cotton (Cloth), Salt, Vanaspati and Chemical industries has a slightly higher rate of growth.
- 3) The figure for average daily number of workers employed in Registered Manufacturing Sector of West Bengal for the period from 1978 to 1987 was stagnant. (47)
- 4) The concentration of vacancies notified and placement effected through employment exchange by public and private sector have gone down in West Bengal since 1980.
- 5) The productivity of labour in Registered Manufacturing Sector of West Bengal is the lowest when compared with labour productivity among the states as Maharashtra, Gujarat, Karnataka, Haryana, U.P. and Madhya Pradesh.
- 6) The capital output ratio and capital labour ratio for industries were unfavourable in West Bengal in some sector as compared to the aforesaid states.
- 7) In the same industry group, the regional disparity in terms of productivity and returns to scale showed the variation of excess capacity. Variation of excess capacity is in existence also in public sector units as well as private sector units in same industry groups.

8) The working capital for many ventures in different industry groups had been weakened as the big volum of bank loans has been increasing.

1.11: The Methodology:

The study follows the sequences of Methodology:

1) We study the Location Quotients and Localisation Co-efficients with the help of Florence's formula to understand the dispersal of industries in West Bengal.

2) We fit K'menta Approximation to the CES in order to observe scale of returns, elasticity of substitution, distribution parameters and average productivity of labour to study a comparative view of excess capacity.

3) We take a suitable approach in order to observe the different components of per-capita income causing the rate of intra-industry disparity between regions, and among regions.

4) We set the 'Variable Elasticity of Substitution Production Function' with the purpose to examine the response of capital labour ratio to the productivity of labour to understand the problem of excess capacity.

5) We select various samples (through circular systematic sampling) to study the other reasons for excess capacity in Registered Manufacturing Sector of West Bengal.

### 1.12: The period and Sources of Data:

The period of study is mainly from 1977-78 to 1988-89 with a view to using the A.S.I. Data available in different records. In many cases we take a look at the act of drawing conclusion from the premises.

### 1.13: Limitations and Scope:

In this study we try to find intra-industry disparity in the special feature of industrialisation in West Bengal where manufacturing activity runs into greater excess capacity in both public and private sector units. Though Indian industries are allied to this problem, yet the problem in West Bengal is special due to its politico-economic condition. On the way of this study many considerable things come to frustrate our estimation work. Because paucity of data and inadequacy in the information system limit full view of this work for which detail study of many aspects could not be drawn.

It opens the line of scope for research work. An indepth study on the nature of rate of capacity utilisation can be carried out for the industry groups to identify the capacity expanding industries which can be better treated by finding ways of development.

The work does not take a quantitative study on managerial

ability and trade Union's activity which are of crucial importance for productivity in any organisation especially in industrial sector. So, studies should come out to include managerial ability and trade Union's activity as inputs to production function to distinguish the relative importance of public and private sector units in the state.

#### 1.14: The Work in Brief:

The work has been organised in the following chapters in addition to the concluding chapter:

Chapter I carries discussion on acquaintance-ship of West Bengal at her past and neoteric industrial activity. In this afterthought we discuss forces of divergence and convergence between regions in the state where performance of industrial activity specially in Registered Manufacturing Sector stands back by greater excess capacity compare to those of other states in India.

Chapter II bears a close examination of pro-pensity of dispersal of manufacturing industries by the anatomy of industrial frame to reveal the existing nature and pattern of industrialisation in the state. Through this analysis we go in the nature of dispersal of industrial activity in compliance with Govt. Policy and measures.

Chapter III alludes to the consequences of Govt. policy and measures. And the regional intra-industry disparity between North and South Bengal becomes an interesting analysis in terms of capital output ratio, output labour ratio, capital labour ratio and rate of disparity.

Chapter IV establishes the regional variation of excess capacity in same industry groups through the study of production function and average productivity. The greater excess capacity in North stands as an agent of entry barrier to keep the area less industrialise. By this other backward districts of West Bengal bear greater amount of excess capacity for their operating units which establishes a generating crisis process of industrialisation programme.

Chapter V makes wary weigh of productive efficiency in terms of excess capacity of public sector units with those of private sector. We find public sector units receive greater importance in West Bengal but creation of vacancies does wane and excess capacity gears up.

Chapter VI falls in with a study of response of capital-labour ratio to the growth rate in labour productivity to the potential reduction of excess capacity. In this study we use the VES production function and see that higher product per man is obtained by increasing capital per work and capital intensive method is preferred to seven out of eight industry groups.

under Registered manufacturing sector of West Bengal.

Chapter VII deals with some conflicting consideration as market structure, bargaining power of labour and nature of management as the cause and effect of excess capacity. We study response of wage to labour productivity through instrumental variable method of VES production function and find that productivity of labour in the registered manufacturing sector does not lie behind the nominal wages. For some industry groups in public sector units wages raise more than those of private sector units; however to the productivity the public sector units stay behind the private sector units. Following trends of strikes and lock-outs we find higher share of lock-outs than strikes in mandays lost. Through a survey on management and labour activity we arrive at reasonable conclusion: there must be something wrong in the Politico - Economic situation in West Bengal which makes inroad in the industrial units and results industrial activity with greater excess capacity.

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CHAPTER -- II

LOCATION QUOTIENTS AND LOCALISATION CO-EFFICIENTS

OF WEST BENGAL'S INDUSTRIES. A STUDY OF

CONCENTRATION AND DISPERSAL.

LOCATION QUOTIENTS AND LOCALISATION CO-EFFICIENTS  
OF WEST BENGAL'S INDUSTRIES. A STUDY OF  
CONCENTRATION AND DISPERSAL.

2.0: It is the characteristic of developing countries that their industrial development renders centralisation of capital with concentration of output and employment in some specific regions where off them others remain industrially backward. Their atypical development, the product of urban-bised strategy of development, crops up inter-regional and intra-regional disparities over and above the problem of divergence in backward regions where chronic unemployment and underemployment are overwhelmed with other crisis process. For sakvation of depressed regions, the task of industrial development through package of policies needs knowledge about 'propensity of industries for dispersal'. There are three measures which determine the 'propensity for dispersal'.

i) Localisation Co-efficient.

ii) Location Quotient.

iii) Intra-Industry Linkage.

A close examination of these three aspects would reveal the existing nature and pattern of industrialisation in the state and would help in finding the way the planners should move through.

2.1: Localisation Co-efficient: It gives a general picture of the degree of local concentration of a particular industry compared with the distribution of the working population as a whole. Through the Co-efficient of localisation for a particular industry we study the nature of propensity for dispersal. The industries which show low co-efficient of location, have a propensity for dispersal since they can flourish in widely different environments. Bread making, brick making and such other market controlled industries fall in this category. On the other hand iron and steel and various metallurgical industries are raw-materials control and hence have high co-efficient of localisation and one cannot be capable of considerable dispersal. Between these two extremes are industries like Cotton, Jute, Paper, Match and general engineering which have a wide choice of location. In case of these industries, transport, labour and agglomeration decide the location.

The localisation co-efficient in the present study, has been computed with Florence's formula<sup>(1)</sup>

$$C.L = \frac{1}{2} \sum_{j=1}^n (W_{ij} / \sum_{j=1}^n W_{1j} - \sum_{i=1}^m W_{1j} / \sum_{i=1}^m \sum_{j=1}^n W_{ij} ) \dots (1.1)$$

Where,  $W_{ij}$  = Employment of the  $i$ th industry in the  $j$  th region.

$i = 1, 2, \dots, m =$  number of industry sectors.

$j = 1, 2, \dots, n =$  number of regions.

The values of co-efficient of localisation (C.L) vary in the intervals of ( 0, 1 ) and the relative magnitude of C.L. characterises the dispersal or localized nature of the industry concerned.

## 2.2: Location Quotient:

It measures the degree of concentration of a particular industry in a particular region. If an industry is evenly scattered over the whole region, the location quotient will be more than unity for that particular region or so far others. The location quotient has been calculated by following formula:

$$L.Q = \frac{( W_{ij} / \sum_{j=1}^n W_{ij} )}{( \sum_{i=1}^m W_{ij} / \sum_{i=1}^m \sum_{j=1}^n W_{ij} )} \dots\dots (2.2)$$

The notations are identical with the notations used in the formula for localisation co-efficient. Prof. D.T. Lakdawala, Atul Sharma and Y.K. Alagh had worked with this procedure on Indian industries. (2).

## 2.3: Intra-Industry Linkage:

It measures by the Leontief inverse Matrix, (3)  
Constructing the Leontief Inverse Matrix the structure



can be stated in the following form which is more useful for calculating the backward and forward linkage:

$$AX + F = X \quad \text{or} \quad (I - A) X = F \dots\dots\dots ( 2.3 )$$

$$\text{or} \quad X = (I - A)^{-1} F. \dots\dots\dots ( 2.4 )$$

where  $X$  = Gross output Vector.

$F$  = Final demand Vector.

$A$  = Technology Matrix.

If  $(I - A)^{-1}$  be designated by 'B' then forward and backward linkage will be :

$$\text{Forward linkage} = \sum_{j=1}^n B_{ij} \dots\dots\dots ( 2.5 )$$

= Total increase in output of  $j$  th sector for a unit increase of output in all the sectors.

$$\text{Backward linkage} = \sum_{i=1}^n B_{ij}$$

= Total input requirement for a unit increase in the output of the  $j$  th sector.

$$\text{Thus, the total linkage} = \sum_{j=1}^n B_{ij} + \sum_{i=1}^n B_{ij} \dots\dots ( 2.6 )$$

Higher forward linkage of a particular industry group refers to more potential for other industries based on the

product of that industry group and vice versa; thus, a lower value refers to direct consumption without boosting up other industrial activities.

The Higher the value of backward linkage of an industry, more is the scope of ancillary units to feed that particular industry ( high diffusion effect ) and vice versa; thus, a lower value refers to those industries which are principally based on the raw material inputs rather than input produced by ancillaries. The Leontief Inverse Matrix  $( I - A )^{-1}$  has been prepared by the Directorate of Bureau of Applied Economics and Statistics, Govt. of West Bengal. But availability of other information limit this analysis. A full view of this type of work has done by M.K. Chowdhury for Assam<sup>(4)</sup>.

#### 2.4: The Nature of Dispersal in Registered Manufacturing Sector of West Bengal:

We study the localisation co-efficients and location quotients for industries in Registered Manufacturing Sector of West Bengal where all units are registered under sec. 2m(i) and 2m(ii) of Indian Factory Act, 1948.<sup>(5)</sup> In Registered Manufacturing sector for A.S.I. we have two frames, one for census<sup>(6)</sup> and another for Non-census

factories, <sup>(7)</sup> which enlisted units in pursuance of National Industrial Classification, 1970. The Classification covers major items produced by each 3-digit industry group belonging NIC Division '2' and '3' relating to manufacturing. <sup>(8)</sup>

The first 2 digits of the Code indicate the NIC of industry group under which the 3 - digit industry groups are classified. The 4th digit of a 3 - digit industry indicates a specific product under the industry group <sup>(9)</sup> Through the classification of product we find the following industries in Registered Manufacturing Sector of West Bengal <sup>(10)</sup>

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
20 - 21		<u>Manufacture of Food Products</u>
	201	Manufacture of dairy Products.
	202	Canning and preservation of fruits and veg.
	203	Canning and preservation and processing of fish, crustacean and similar foods.
	204.1	Flour Milling ( by power Machine).
	204.2	Rice Milling (by power machine).
	204.3	Dal Milling (by power machine).
	204.4	Processing and grinding of cereals and grain manually.

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	204.9	Other Grain Milling and Processing activities.
	205	Manufacture of Bakery Products.
	207.4	Manufacture of other bakery products.
	208	Product of Common Salt.
	209	Manufacture of Cocoa, Chocolate and Sugar confectionery (Including Sweetmeats)
	210	Manufacture of hydronated Oils Vanaspati Ghee etc.
	211	Manufacture of other edible Oil and fats, for example Mustered Oil, Ground nut oil and Til oil etc.
	212	Tea Processing.
	215	Manufacture of Ice.
	216	Manufacture of prepared animal feeds.
	217	Manufacture of strach.
	219.9	Other food processing activities.
22.		<u>Manufacture of Beverages, Tobacco &amp; Tobacco Products:</u>
	222.0	Malt liquors and Malt
	224	Soft drink and carbonated water industries.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	228.2	Manufacture of Garba.
23.		<u>Manufacture of Cotton Textiles.</u>
	230	Cotton ginning, cleaning and bailing.
	231	Cotton spinning, Weaving, Shrinking, Sanforzing, mercersing and finishing of cotton textiles in Mills.
	232	Printing, dyeing and bleaching or cotton textiles.
	235	Weaving and finishing of cotton textiles in hand loom other than khadi.
	236	Weaving and finishing of cotton textiles in Power-looms.
	235	Cotton tixtiles not elsewhere classified (n.e.c.).
24.		<u>Manufacture of wool, silk and Synthetic Fibre Textiles.</u>
	241	Wool cleaning, bailing and pressing.
	243	Dyeing and bleaching of Woollen textiles.
	244	Manufacture of Wool (n.e.c.)
	246	Printing, dying and bleaching of silk textiles.

<u>Major Group</u> (1)	<u>Group /</u> (2)	<u>Sub-Group</u> (3)	<u>DESCRIPTION</u>
	247		Spinning Weaving and finishing of other textiles as Synthetic fibres, rayons and nylons etc.
	249		Silk and synthetic fibre textiles (n.e.c.).
25			<u>Manufacture of Jute, Hemp and Mesta Textiles.</u>
	250		Jute and Mesta Pressing and bailing.
	251		Jute and Mesta spinning and weaving.
	259		Manufacture of Jute bags and other Jute textiles (n.e.c.).
26			<u>Manufacture of Textile Products Including Weaving appared other than foot-wear.</u>
	260		Knitting Mills.
		261.1	Thread and Thread ball making.
		261.3	Manufacture of other rope and cordage.
		261.9	Manufacture of other.
	262		Embroidery and making of carpats laces and fringes.
	263		Weaving carpets rugs and other similar textile products.

<u>Major Group</u> <u>(1)</u>	<u>Group /</u> <u>(2)</u>	<u>Sub-Group</u> <u>(3)</u>	<u>DESCRIPTION</u>
	264		Manufacture of all types of textiles, Garments including weaving apparel.
		265.1	Manufacture of umbrellas.
	266		Manufacture of made up textile goods (except garments) such as curtains mosquito nets.
		267.2	Manufacture of Rubbarised cloth
		267.3	Manufacture of Tarpaulin.
		267.4	Manufacture of artifiical leather.
		267.9	Manufacture of others.
		269.2	Manufacture of gas mantles.
		269.3	Manufacture made up cade of canvas goods (tents sails etc.).
		269.9	Manufacture of others(n.e.c.)
27			<u>Manufacture of Wood and Wood Products, Furniture and Fixtures.</u>
	270		Manufacture of Veneer Plywood and other products.
	271.		Sowing and Planning of wood (other than Plywood ).
	272		Manufacture of wooden and cane boxes, crates, drums, barrels, bamboo reeds etc.
	273.		Manufacture of structural wooden goods such as beams posts, doors and windows etc.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	274	Manufacture of wooden industrial goods, such as bobbins, blocks sadelling and simi equipment and fixtures.
	275	Manufacture of cork and cork products.
	276	Manufacture of wood, bamboo and cane products not elsewhere classified.
28		<u>Manufacture of paper and paper products and printing and allied industries.</u>
	280.4	Manufacture of Packing paper (Machine made ).
	280.5	Manufacture of paper Boards and straw boards (machine made)
	280.7	Manufacture of hand made pulps, paper boards etc.
	280.9	Manufacture of others.
	281	Manufacture of container and boxes of paper and paper board.
	283	Manufacture of Paper and Paper board articles not elsewhere classified.
	284	Printing and Publishing of News Papers.



<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	285	Printing and Publishing of Periodicals, books, Journals, articles, maps and sheet, music directories etc.
	286	Printing of bank notes, currency notes, Postages Stamps.
	287	Engraving, etching, block making etc.
	288	Bookbinding.
	289	Printing, Publishing and allied activities not elsewhere classified like envelope printing, picture, Post card Printing embossing etc.
29		<u>Manufacture of Leather and Leather and For Products (except Repair).</u>
	290	Tanning, Curcine, finishing embossing and japanning of leather.
	291	Manufacture of footwear except vulcanized or mould rubber or plastic footwear.
	293	Manufacture of leather consumer goods.
	299	Manufacture of leather and for products not elsewhere classified.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
30		<u>Manufacture of Rubber, Plastic Petroleum and Coal Products.</u>
	300	Tyre and Tube industries.
	301.1	Manufacture of Rubber footwear.
	301.2	Manufacture of Plastic and PVC footwear.
	301.3	Manufacture of canvas cum rubber/ plastic footwear.
	302.2	Prophylastics (Rubber contra- ceptives.
	302.9	Others n.e.c.
	300	Manufacture of Plastic products n.e.c.
	305	Manufacture of products of Petroleum n.e.c.
	307	Manufacture of other cote tar products.
31.		<u>Manufacture of Chemicals and Chemical Products except Petroleum and Coal.</u>
	310.1	Manufacture of Basic heavy inorganic chemicals.
	310.2	Manufacture of Basic heavy organic chemicals.
	311.1	Manufacture of Inorganic Fertilizers.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	311.2	Manufacture of Organic Fertilizers.
	311.3	Manufacture of Mixed Fertilizers.
	311.4	Manufacture of Pesticides (insecticides, fungicides and Weedicides.
	311.5	Manufacture of Pesticides fasonulations.
	312.1	Manufacture of paints, varnishes Lacquers, etc.
	312.2	Manufacture of Dye-stuffs.
	312.3	Manufacture of indigo.
	312.4	Manufacture of waxes and polishes.
	312.9	Manufacture of others
	313.1	Manufacture of allopathic medicines.
	313.2	Manufacture of Ayurvedic and Unani medicines.
	313.3	Manufacture of Homeopathic medicines.
	313.9	Manufacture of other medicines.
	314.8	Manufacture of Detergent.
	314.9	Manufacture of others.
	315.1	Manufacture of vegetable oils including solvent extracted oils.
	316.2	Manufacture of Turpentine and Resin.

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	316.4	Manufacture of Plastic materials.
	316.9	Manufacture of others.
	318	Manufacture of explosives and annunities and fire works.
	319.4	Manufacture of Drug inter- mediaries.
	319.7	Manufacture of shellac.
	319.9	Manufacture of others.
32		<u>Manufacture of Non-Metallic mineral products.</u>
	320.1	Manufacture of Fire Bricks.
	320.2	Manufacture of Refractories.
	320.4	Manufacture of Tiles.
	320.9	Manufacture of others.
	321.1	Manufacture of Hollow Glassware (bottles jars etc.)
	321.4	Manufacture of Labrotary Glass-ware.
	321.9	Manufacture of other Glassware.
	323.1	Manufacture of Chinaware.
	323.3	Manufacture of Insulators.
	323.9	Manufacture of others.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	324.2	Manufacture of lime.
	324.9	Manufacture of others.
	326.1	Manufacture stone dressing and stone crushing.
	326.9	Manufacture of others.
	328	Manufacture of asbestos, cement and other cement products.
	329.1	Manufacture of Hume pipes and others concrete products, slabs, Poles Pillers.
	329.2	Manufacture of R.C.C. Bricks and Tiles.
	329.5	Manufacture of Grinding Wheels and Abrasives.
	329.9	Manufacture of others.
33		<u>Basic Metal and Alloys Industries.</u>
	330.1	Manufacture of Iron and Steal.
	330.9	Manufacture of Special Steal.
	331.1	Manufacture of castings and forgings.
	331.2	Manufacture of structure.
	331.3	Manufacture of pipes.
	331.9	Manufacture of others.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	332	Manufacture of ferrous alloys
	333	Copper Manufacturing.
	334	Brass Manufacturing.
	335.	Aluminium Manufacturing.
	336	Zinc Manufacturing.
	339	Other non-ferrous metal industries.
34		<u>Manufacture of Metal Products and Parts except Machinery and Transport Equipments.</u>
	340.1	Manufacture of safes and vaults and Almirahs.
	340.2	Manufacture of steel Trunks.
	340.3	Manufacture of Drums, Tanks Rail and metal Containers n.e.c.
	340.4	Manufacture of sanitary Plumbing fixtures and of metal fittings
	340.5	Manufacture of stoves.
	340.6	Manufacture of Haricane Lanterns & Oil Pressure Lamps.
	340.7	Manufacture of Welding n.e.c.
	340.9	Manufacture of structural Metal products.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	341	Manufacture of structural Metal products.
	342	Manufacture of furniture and fixtures primarily of metal.
	343	Manufacture of hand tools and general hardware
	343.5	Manufacture of agricultural handtools and implements.
	343.9	Manufacture of others.
	344	Enamelling ,Japanning, Lacquering Galvanizing plating and polishing of metal products.
	345	Manufacture of metal utensils, Cutlery and Kitchenware.
	349	Manufacture of metal products like type, Razer, blades, spring.
35		<u>Manufacture of agricultural machinery and equipments and parts.</u>
	350	Manufacture of agriculture machinery and equipments.
	351	Manufacture of Earth moving, drills coal cutting machines, lift, hoisting machinery, cranes, conveyors and road rollars and other heavy Machinery and equipments used by construction and mining industries.

<u>Major Group</u> <u>(1)</u>	<u>Group/ Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	342.1	Manufacture of Boilers and steam Generating plants.
	352.9	Manufacture of others.
	353.1	Manufacture of Rice, Dal and flour Mills machinery.
	353.2	Manufacture of Oil Mill machinery.
	353.3	Manufacture of Sugar machinery.
	353.4	Manufacture of Tea machinery.
	353.5	Manufacture of textiles machinery. Spinning, Carding Power looms. and textiles accessories.
	353.6	Manufacture of Jute machinery.
	353.9	Manufacture of others.
	354.1	Manufacture of Pharmaceutical machinery.
	354.4	Manufacture of mining machinery.
	354.9	Manufacture of others.
	355.1	Manufacture of Refrigerator air-conditioning plants for Industrial & Commercial use.
	355.4	Manufacture of fire lighting equipment and engines.
	355.9	Manufacture of others.



<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
	356.1	Manufacture of size Reduction equipment crushers and conveying equipment bucket elevators, ship-hoist, cranes, derricks, etc.
	356.2	Manufacture of Mixers and Reactors (turbo-mixers etc.)
	356.3	Manufacture of centrifugal machines driers.
	356.4	Manufacture of power driven pumps reciprocating centrifugal etc.
	356.5	Manufacture of Air, Gas compressors and vacuum pumps (excluding electrical furnaes).
	356.6	Manufacture of Ball, Roller tapered bearings.
	356.9	Manufacture of others.
357		Manufacture of machines tools part and accessories.
	358.1	Manufacture of Type-writers.
	358.6	Manufacture of weighting machines.
	358.9	Manufacture of others.
	359.1	Manufacture of sawing machines.
	359.2	Manufacture of knitting.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	359.4	Manufacture of Arms & Armaments.
	359.6	Manufacture of Filtration and distillation equipments.
	359.9	Manufacture of others including sobbery engineering.
36		<u>Manufacture of electrical machinery apparatus, appliances supplies and parts.</u>
	360.1	Manufacture of Generators.
	360.2	Manufacture of transformers.
	360.3	Manufacture of switch gears.
	360.4	Manufacture of electric motors.
	360.9	Manufacture of others.
361		Manufacture of insulated wire, cables, dry and wet batteries.
	362.9	Manufacture of others.
	363.3	Manufacture of ordinary electric lamps.
	363.4	Manufacture of Miniature lamps.
	363.7	Manufacture of House hold appliances (like electric irons and heaters etc.
	363.9	Manufacture of others.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
	364.2	Manufacture of radios.
	364.3	Manufacture of Television sets.
	364.9	Manufacture of others. (including public address equipments).
365		Manufacture and repair of radiographic, X-Ray apparatus and tubes and parts.
367		Manufacture of electric components and accessories n.e.c.
369		Manufacture of electrical Machinery apparatus appliances and supplies and parts n.e.c.
37		<u>Manufacture of transport equipments and parts.</u>
	370.1	Making of ships and other vessels drawn by power.
	370.8	Parts and accessories.
371		Manufacture of Locomotives and parts.
372		Manufacture of Railway Wagons and Coaches and parts.
373		Manufacture of Rail-Road equipments.
374		Manufacture of Motor Vehicles and parts.

<u>Major Group</u>	<u>Group /</u>	<u>Sub-Group</u>	<u>DESCRIPTION</u>
	375		Manufacture of Motor-cycles and Scooter and parts.
	376		Manufacture of bicycles cycle-rickshaw and parts.
	379		Manufacture of transport equipments and parts n.e.c.
38.			<u>Other Manufacturing Industries.</u>
	380.1		Manufacture of surgical and medical instruments.
	380.2		Manufacture of laboratory and Scientific instruments.
	380.3		Manufacture of mathematical instruments.
	380.4		Manufacture of Water-meters, steam meters and electricity meters.
	380.5		Manufacture of instruments indicating recording and regulating devices of pressure, temperature, rate of flow weights and levels etc.
	380.6		Manufacture of industrial instruments.
	380.9		Manufacture of others.
	381		Manufacture of Photographic and optical goods (excluding photo-chemicals, sensitised paper and film.

<u>Major Group</u> (1)	<u>Group / Sub-Group</u> (2)	<u>DESCRIPTION</u> (3)
6	382	Manufacture of watches and Clocks.
	383	Manufacture of Jewellery and related articles.
	385	Manufacture of sports and athelatic goods and play equipments.
	386	Manufacture of musical Instruments.
	387.1	Manufacture of fountain pens and Ball pens.
	387.9	Manufacture of others.
	389.4	Manufacture of Non-Mechanical Toys.
	389.5	Manufacture of Bones, ivory, Hornes and similar products
	389.7	Manufacture of Wigs.
41		<u>Gas and Steam.</u>
	410	Manufacture of Gas works of electricity and distribution of electric energy to households industrial and commercial and other users.
42		<u>Water Works and Supply.</u>
	420.0	<u>Water supply i.e. Collection Purification and distribution of water.</u>

<u>Major Group</u> <u>(1)</u>	<u>Group / Sub-Group</u> <u>(2)</u>	<u>DESCRIPTION</u> <u>(3)</u>
74		<u>Storage and Wire-House.</u>
	741	Cold storage.
91		<u>Sanitary services.</u>
	910	Sanitation and similar services such as Garbage and Sewage disposal works collected with p Public Health.
95		<u>Recreational and Cultural Services.</u>
	950	Motion Picture production.
96		<u>Personal Services.</u>
	961	Laundries, laundry services & cleaning, dying plants.
97		<u>Repair services.</u>
	971	Repair of footwear and other leather goods
	972	Electrical repairs
	973	Repair of motor vehicles. and Motor Cycles.
	974	Repair of Watches, Clocks and Jewellery.
	979	Repair of enterprises not elsewhere classified.

The above enumeration bears the evidence of industry-gap in the census and non-census sector as in every major industry-group there is a break in continuity failed to form the pyramidal picture. Other little worth industrial works have been carried by few units which were not entered in the frames. We count them from the source of Inspector of Factories, West Bengal and see that the growth of industrial units in these industries is uneven in character as shown in table 2.1<sup>(11)</sup>

From the year 1980 to 1987 there were growth of new units in the industries like Leather, Chemical, Basic, Metal and alloy products, Electrical Machineries and Parts, storage and Ware Housing and Repair services. Except Ware Housing and Repair services the growth were mainly in Calcutta, 24 Parganas, Howrah and Hooghly industrial belt. As in the year 1987 for Leather products there were 171 units of which 162 units were in 24 -Parganas and 9 units in Calcutta; for Chemical products there were 509 units of which 319, 47, 31 and 33 units were in 24 Parganas, Howrah, Calcutta and Hooghly respectively; for manufacture of electrical machineries and parts there were 401 units of which 96% units were in same belt<sup>(12)</sup> And there is nothing worthy of re-mark at growth rate for other industries in Registered Manufacturing Sector of West Bengal. This information makes step for a study about regional inter-industry as well as intra-industry disparity in the state.

Table : 2.1

Enumeration of Working Factories.  
Progress of Manufacturing Industries in West Bengal.

Code No.	Industry	Total working factories.									
		1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Total West Bengal.	5967	6144	6421	6548	6954	7324	7629	7864	8064	8348
20.	Manufacture of Food Products	483	473	478	490	484	464	500	516	534	546
21.	Manufacture of Food Products.	434	432	439	446	449	462	472	477	482	490
22.	Manufacture of Beverages, Tobacco and Tobacco products.	36	37	32	33	32	32	32	34	33	33
23.	Manufacture of Cotton Textiles.	245	253	262	260	260	264	270	268	270	273
24.	Manufacture of Wool, Silk and Synthetic Fibre Textiles.	25	25	26	26	26	26	27	26	28	30
25.	Manufacture of Jute, Hemp and Mesta Textiles.	113	122	125	130	136	139	140	145	146	140
26.	Manufacture of Textiles products (Including Weaving Apparel other than Footwear).	133	137	149	151	152	155	158	158	166	170
27.	Manufacture of wood and wood products, Furniture and Fixtures:	284	286	288	296	304	309	328	331	341	352
28.	Manufacture of paper and paper products and Printing, Publishing and allied Industries.	407	418	436	434	447	459	467	477	483	494
29.	Manufacture of Leather and Leather for products ( except repair).	129	136	147	150	153	156	160	163	164	171
30.	Manufacture of Rubber, Plastic, Petroleum and coal products.	261	279	3061	318	489	641	703	745	769	836

contd...2



Table : 2.1 (contd....2)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
31.	Manufacture of chemicals and chemicals products (except petroleum and coal products)	352	362	379	386	408	426	450	664	481	509
32.	Manufacture of Non-Metallic Mineral products	185	192	205	212	225	235	244	252	262	273
33.	Basic Metal and Alloys Industries	706	734	783	801	828	853	877	899	916	939
34.	Manufacture of Metal Products and parts.	728	749	787	801	822	843	865	883	910	925
35.	Manufacture of Machinery	548	552	574	579	600	612	630	643	654	669
36.	Manufacture of Electric Machinery	238	243	259	281	297	311	331	357	367	401
37.	Manufacture of transport equipments.	194	200	207	204	210	212	217	225	228	228
38.	Other Manufacturing industries	88	89	92	91	103	106	107	109	114	122
40.	Electricity	70	69	72	72	72	72	73	75	75	76
41.	Gas and Steam	4	4	4	4	4	4	4	5	6	6
42.	Water Works and supply.	13	15	16	16	18	19	19	20	20	20
50.	Construction	1	1	1	1	1	1	1	1	1	1
70.	Land Transport	4	4	4	4	4	4	4	4	5	6
71.	Water Transport	5	5	5	5	5	5	5	5	5	5
73.	Service incidental to Transport	12	12	13	13	13	17	16	16	16	15
74.	Storage and Ware housing	60	101	118	127	131	140	144	160	164	171
82.	Real Estate and Business Services	6	5	8	8	10	11	19	21	25	26
91.	Sanitary services	8	8	8	8	8	8	8	8	8	8
92.	Edn., Scientific and Research services	10	10	10	10	10	10	11	11	10	11
95.	Recreational & Cultural Service	6	6	5	5	5	5	5	5	5	5
96.	Personal Services	14	14	16	16	16	16	18	18	21	22
97.	Repair services	167	168	169	170	232	307	322	342	354	372

So, with the identification of industry-gap the inter-industry disparity in terms of localisation co-efficients and location quotients has been an interesting view of this analysis. For this, the nature of spread of these industries has been observed in 16 districts which are by following codes:-

- |                    |                 |                 |
|--------------------|-----------------|-----------------|
| (1) Darjeeling.    | (2) Jalpaiguri. | (3) Coochbehar. |
| (4) West Dinajpur. | (5) Malda.      | (6) Nadia.      |
| (7) Murshdabad.    | (8) Calcutta    | (9) Howrah.     |
| *10) 24-Parganas.  | (11) Hooghly,   | (12) Burdwan.   |
| (13) Birbhum       | (14) Bankura.   | (15) Midnapore. |
| (16) Purulia.      |                 |                 |

By the Frames of 1977-78 for census and Non-census factories, the distribution of workers under different industry groups and 'sub-groups',<sup>(13)</sup> among districts of West Bengal are summed up to the major industry group and arranged in tables 2.2 and 2.3. Then we calculate the localisation co-efficient and location quotients for the industries as presenting in the tables 2.2, 2.3, 2.4 and 2.5. Through localisation co-efficients the highly dispersal.

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\* 24 Parganas is divided into two districts viz. Uttar 24 Parganas and Dakshin 24 Parganas. By Frames few factories under Calcutta entered under district 24- Parganas.

Table : 2.2

Localisation Co-efficient based on the  
Distribution of Workers Under Different Major Industry Groups  
among Districts of West Bengal. (For Census Factories )

Industry Code	District Code																Column Total	Localisation Co-efficient
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
20-21	6203	24302	102	1281		181	1182	6461	1019	616	647	1216	3480	604	2429		49723	0.001
22							122	2241			392	461		50			3266	0.130
23						921	3910	23997	8660		13196	591	412				51687	0.040
24					180			4870			2875			321	482		8728	0.179
25								150458	59710		43747						253915	0.101
26								1279	1092	251	601						3223	0.096
27	319	445	57				64	2074		103		74					3136	0.165
28	179		101				64	11078	3161	5660	1148	2068			562		23957	0.026
29								11014									11014	0.250
30							59	8038	1581		5664	1033			467	341	16783	0.245
31	146							14471	1228	464	2070	1929			184	910	22002	0.294
32					217		193	8731	777		1773	5369	229		85	59	17433	0.031
33							554	15084	17044	100	3754	46388			388		83312	0.030
34							178	10726	5760	189	793	432		135	72		18285	0.029
35							686	23283	4911	125	1829	4474		100			35408	0.037
36					78			18117	32011	318	135	1831					23690	0.043
37							553	29898	18757		11057	9307			6556	571	76699	0.034
38	59							6199									6258	0.245
41								140									140	0.250
42								590			65	149					804	0.136
24												195					195	0.447
91								161									161	0.250
96								156		59							215	0.245
97	136		335	93		605		15109	495	430		1057				867	19127	0.096
Column Total	7042	24747	595	1374	475	1707	7501	364175	127406	9315	89946	76574	4121	1210	12092	1881	729161	

Source: ASI PRAMB, 1977-78

Table : 2.3.

Location Quotients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal (For Census Factories).

Industry Code	District by Code															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20-21	12.90	14.40	2.51	13.67	-	1.55	2.31	0.26	0.12	1.09	0.11	0.23	12.38	7.32	2.95	-
22							3.63	1.37			0.97	1.34		9.23		
23						7.61	7.35	0.93	0.96		2.07	0.11	1.41			
24					31.66			1.12			2.67			22.16	3.33	
25								1.19	1.35		1.40					
26								0.79	1.94	6.83	1.51					
27	10.53	4.18	22.27				1.98	1.32		2.88		0.22				
28	0.77		5.17				0.26	0.93	0.76	20.72	0.39	0.82			1.41	
29								2.00								
30							0.34	0.96	0.54		2.74	0.59			1.68	7.88
31	0.61							1.32	0.32	1.85	0.76	0.83			0.50	16.03
32					19.10		1.08	1.00	0.26		0.82	2.93	2.32		0.29	1.31
33							0.65	0.36	1.17	0.11	0.37	5.30			0.28	
34							0.95	1.17	1.80	0.91	0.35	0.22		4.45	0.24	
35							1.88	1.31	0.79	0.31	0.42	1.20		1.70		
36					5.05			1.53	0.78	1.18	0.05	0.74			5.15	2.89
37							0.70	0.78	1.40		1.17	1.16				
38	0.98							1.98								
41								2.00								
42								1.47			0.66	1.76				
74												9.52				
91								2.00								
96								1.45		24.06						
97	0.74		21.46	2.58		13.51		1.58	0.15	1.97		0.53				17.57

Source : ASI FRAME - 1977-78.

Table : 2.4

Localisation Co-efficients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal. ( For Non-Census Factories).

Industry Code	District Code.																Column Total	Localisation Co-efficient.	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
20-21	1678	638				379		2247	842	596	179	426	242	343	160	65	7795	0.006	
22								86	25	10							121	0.068	
23		47					468	2202	1275		155	139			19		4305	0.079	
24								191	6					30			227	0.119	
25								465	190		35						690	0.113	
26		14						1031	512	613	35	12			46		2263	0.032	
27	83	605	35				4	2311	260	132	27	146		12	21	10	3646	0.007	
28	59	16					32	2322	150	3096	53	30					5758	0.016	
29								2153									2153	0.249	
30								2576	521	867	75	53			27		4119	0.042	
31	45							2974	687	154	245	107	135	12	45	211	4615	0.020	
32		41			29	15	150	1201	287	83	111	57	128	37	14	60	2213	0.013	
33		17						47	3027	6144	95	169	131	7		39	26	9702	0.020
34	40	6			30		10	4886	3536	388	64	245				34		9239	0.012
35	48	112				40	46	3974	2783	331	36	162						7532	0.014
36							89	2192	578	329	51	17						3256	0.040
37							55	1187	1026	69					18			2355	0.059
38								856	50	563	31	40						1540	0.046
41									16		14							30	0.363
42								78		26	11	58						173	0.173
74								59	30	33	110	103			40			375	0.168
91								64			11	40						115	0.227
95								142										142	0.249
96										110		36			16			162	0.429
97								1015	10	456		157	49		125			1812	0.048
Column Total	1953	1496	35	-	59	434	901	37239	18928	7951	1412	1959	561	434	604	372		74338	

Source: ASI FRAME, 1977-78.

Table : 2.5.

Location Quotients based on the Distribution of Workers under Different Major Industry Groups among Districts of West Bengal. (For Non-Census Factories.)

Industry Code.	District By Code.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20-21	8.19	4.07				8.33		0.58	0.42	0.71	1.20	2.07	4.11	7.53	2.53	1.67
22								1.42	0.81	0.77						
23		0.54					8.97	1.02	1.38		1.90	1.23			0.54	
24								1.68	0.10					22.64		
25								1.35	1.08		2.67					
26		0.30						0.91	0.89	2.53	0.81	0.20			2.50	
27	0.86	8.25	20.39				0.09	1.27	0.28	0.34	0.39	1.52		0.56	0.71	0.55
28	0.39	0.14					0.46	0.81	0.10	5.02	0.49	0.20				
29								2.00								
30								1.25	0.50	1.97	0.96	0.49			0.81	
31	0.37							1.29	0.58	0.31	2.79	0.88	3.88	0.45	1.20	9.14
32		0.92			16.51	0.07	5.59	1.08	0.51	0.35	2.64	0.98	7.66	2.86	0.78	5.42
33		0.09					0.40	0.62	2.49	0.09	0.91	0.51	0.10		0.49	0.54
34	0.16	0.03			4.09		0.09	1.06	1.50	0.39	0.36	1.01			0.45	
35	0.24	0.74				0.91	0.50	1.05	1.45	0.41	0.25	0.82				
36							2.26	1.34	0.70	0.94	0.82	0.20				
37							1.93	1.01	1.71	0.27					0.94	
38								1.11	0.13	3.42	1.06	0.99				
41									2.09		24.57					
42								0.90		1.41	3.35	12.72				
74								0.31	0.31	0.82	15.44	10.42				
91								1.11			5.04	13.20				
95								2.00								
96										6.35		8.43			12.16	
97								1.12	0.02	2.35		3.29			8.50	

Source: ASI FRAME, 1977-78

Industries are 20-21, 23, 28, 32, 33, 34, 35, and 38 for census sector. For Non-census sector they are 20-21, 28, 27, 34, 32, 33, 34, 35 and 36. We observe that the following industries under census and non-census sector were less dispersal compare to other industries in major groups:

High Localisation Co-efficient for  
Major Industry Groups for  
Census Factories.

Manor Industry Group.	Description
29	Manufacture of Leather and Leather Products.
30	Manufacture of Rubber, Plastic and Coal Products.
31	Manufacture of Chemical and Chemical Products.
36	Manufacture of Electric Machinery and Parts.
37	Manufacture of Transport equipments and Parts.
74	Storage and Wire-house.

(For Non-census factories)

29	Manufacture of Lather and Leather Products.
41	Manufacture of electricity and gas.
91	Sanitary Services.
95	Recreational Cultural services.
96	Repair Services.

In the year 1978 almost all of them were concentrated in the districts like Howrah, Hooghly, Calcutta and 24-Parganas and gradually they became dispersal as in the year 1987 the distribution of total units among district shows that there were slight growth of new units in these industries in other districts of West Bengal. We see that in the year 1987 except for manufacturing of leather and leather products most of them showed inclination of dispersal as it will appear in table ( 2.6), where few specific industries (added) bear high degree of concentration.

To highlight spatial cluster of industries we have calculated localisation quotients. Higher values are observed for major industry group 20-21, 27, 28, 31 and 34 for North Bengal. Low values are observed for every major industry groups for Calcutta, Howrah, Hooghly, 24-Parganas and Burdwan districts. In terms of location quotients the disparity between North and South is evident as crisis process of concentration of employment. It leads concentration of capital and output. For census and Non-census factories higher employment is observed in Howrah, Calcutta, 24-Parganas, Hooghly and Burdwan district. For North Bengal significant employment is observed in Darjeeling and Jalpaiguri districts. It is only because of tea gardens. But in the tea gardens of Darjeeling and Jalpaiguri districts hectorage under tea has been stagnating or slowly decaying between 1950 and 1974. Again employment in tea industries has remained static over last twenty five years<sup>(14)</sup>



Table : 2.6

Localisation Co-efficients based on Factory Workers Classified by Industry at 2-digit Level by District in West Bengal, 1987.

Industry Code	District Code																Column Total	Localisation Co-efficients
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
20	756	508	128	1381	200	1013	151	897	1433	7331	1057	3721	2600	844	1211	138	23369	0.000
21	6913	16962	81	54		159		330	675	4705	993	247	182	378	580	63	32331	0.002
22	97	20	50			203		71	25	3122	501	336		33			4458	0.327
23		27		677		3501	872		11029	24344	11038	1092		28	97		52705	0.022
24					147				41	5240	6621				770		12819	0.106
25				425					53471	130017	43701	5					227315	0.057
26		12						1114	3682	4180	465	19			44		9516	0.023
27	533	1603	118	86	14	147		215	773	3643	42	202		10	7	9	7402	0.004
28	341	17	50	125		1213	12	7965	3319	10753	1433	3038			1349		29615	0.001
29								236		13539							13775	0.257
30	86	25				913		751	3452	12776	5602	817	90	15	1582	441	26550	0.004
31	226	49			45	256		1167	2874	21775	4018	2248	269	16	767	795	35475	0.004
32	80	143	9	8		353	25	147	2137	10958	2532	6752	291	76	134	667	24312	0.002
33		276				1150		153	29446	18618	6304	55260	176	38	328	630	112379	0.009
34	79	25			34	683		1169	13021	22980	2836	902			335	104	42168	0.007
35	60	161				1177		613	6236	22688	765	7303		48	3152	19	42222	0.006
36	34	16				270		572	5464	28457	139	2999			356		38307	0.008
37		8				599		195	8103	31480	10554	14391			174		65504	0.016
38	132						78	417	148	5150	177	54	12				6168	0.039
40	313	184	92		40		1603	135	92	4688	2018	3275			1909	1582	15931	0.014
41									63	137	16	1181					1397	0.059
42								165		1078	73	915					2231	0.136
50										383							383	0.268
68	50									16							66	0.262
70		33								17			114			35	139	0.324
71								16		210							266	0.257
73								34	115	681			300				1130	0.107
74		207		35		142		32	262	1102	1643	1468	83	119	642		5735	0.003
82								503		131		46					680	0.125
91										365	7	81					453	0.147
92	19	23							108	64	543	68	16	19	18		878	0.024
95										154							154	0.268
96								160		204		29					393	0.125
97	471	237	245	242	15		523	1177	8858	17932	11	912	58	75	11867	488	43111	0.006
99						20											20	0.493
Column Total	10190	20536	773	2733	495	12069	3264	18234	154848	408901	103089	108475	3782	1699	25357	4936	879381	

Own Calculation.

Source: Economic Review West Bengal, 1992. P. 517- 520.

However, the over all picture of West Bengal does not speak favourably of industrial development. As here during the period from 1978 to 1987 the average daily number of workers employed in registered working factories did increase from 839316 to 879381. It is only at the rate of 0.5% per year.<sup>(15)</sup> For the same period average daily number of workers employed in manufacture of beverage, tobacco and tobacco products has been reduced from 4789 to 4458, for Cotton textiles reduced from 54343 to 52705, for jute textiles reduced from 235286 to 227319 and for Manufacture of paper and paper products and printing, publishing and allied industries reduced from 32237 to 29615. For other industries the employment had increased at a very insignificant rate as for wood products 1.8%, for leather products 0.5%, for rubber and plastic 2.7%, for Chemical 0.8%, for basic metal and alloys industries 1.4%, for manufacture of electric Machinery and parts 2% only. And only a significant rate of increase of employment had found in storage and wire housing for which average daily number of workers increased at the rate of 12% per year. The generation of employment in old units either in public sector or in private sector had practically been stopped since 1978 and only a few new units come out through public funds at the interest of new employment. As Govt. made a promise for industrial development in backward areas, Govt. allowed public funds for new and old units even made them hard to carry through.

But swelling industrialisation of an area needs power and rapid infrastructural development which are decisive indicators to meet the interest of the entrepreneurs. With this, available raw materials and markets follow ideological preference for manufacturing units to have a start. If industrialisation programme does not follow this connotation, within short period the new venture will enter into deep crisis for capacity utilisation. Following under utilisation of capacity every unit incurs loss, runs into debt and dries up through debt servicing burden. Then sickness and closure of units overthrow the industrialisation programme. The programme for industrialisation in backward areas of West Bengal have come at this juncture.

Through the change of localisation co-efficients we observe that industrialisation in West Bengal had followed the nature of dispersal in compliance with Govt. policy and measures. From the year 1978 to 1987 there had come of a few industrial units in different districts which are industrially backward in the state. As studies have been made <sup>through</sup> co-efficient of variation for different years that the degree of variability in industrial development among the districts has already been decreasing which may partly be attributed to Govt's effort in mitigating disparities among the regions. (16)

Alive to the consequences the regional intra-industry disparity has become an interesting view for which we project an analysis in next chapter.

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**CHAPTER \* III.**

**REGIONAL INTRA-INDUSTRY DISPARITY:**

**A COMPARATIVE STUDY \* IN TERMS**

**OF DIFFERENT 'COMPONENTS'**

**OF PER CAPITA INCOME.**

## CHAPTER - III.

### REGIONAL INTRA-INDUSTRY DISPARITY:- A COMPARATIVE

### STUDY IN TERMS OF DIFFERENT

### 'COMPONENTS' OF PER

### CAPITA INCOME

3.0: The problem of regional disparity, a common experience of the developing countries in their planning process for development, is therewith the problem of inter-regional intra-industry disparity. The problem of inter-regional disparity at the levels of development have been discussed by many economists by their theorisation. According to Williamson,<sup>(1)</sup> the regional disparity may be there in the early development but they will ultimately diminish and it is better to have regional balance at a high level obtained after a long period of regional imbalances than regional balance at a low level.

In the Circular and Cumulative Causation Principles Myrdal<sup>(2)</sup> argued that 'the play of forces in the market normally tends to increase, rather than to decrease, the inequalities between regions'. Market forces lead to the clustering of increasing returns activities in certain areas of economy.



Regardless of the initial location advantage (natural resources, transport facility etc.) this build-up becomes self sustaining because of increasing internal and external economies at these centres of agglomeration. There are two kinds of effect: 'spread effect' (positive) and 'backwash effect' (negative) induced by the prosperous areas which influence the rate of growth of lagging regions. The spread effect includes for the primary products of the lagging regions and diffusion of innovation. But these are outweighed by strong backwash effect-- particularly disequalibrating flows of labours, capital, goods and services from the poor regions to rich regions and thus inhibits industrialisation and distort the pattern of production in the poor regions.

The Theory of Development Poles as evolved by Perroux<sup>(3)</sup> is derived inductively from observations of the actual process of economic development. Based on the observation and subsequent recognition: of the fact that 'development does not appear everywhere and all at once: it appears in points on development poles with variable intensities; it spreads along diverse channels and has varying terminal effects for the whole of the economy'. Perroux was lead to consider development as essentially polarized in the sense that forces inherent in the development process worked to-wards the clustering of economic activities and growth to-wards an imbalance between industries and geographical areas.

The Central Place Theories were developed by Christaller<sup>(4)</sup> and Losch<sup>(5)</sup> to explain the structure of spatial organisation. The Theories have been further developed by Beckmann<sup>(6)</sup>, Von Boventer<sup>(7)</sup> and Berry.<sup>(8)</sup> Through their finding spatial organisation becomes the identification of the resulting spatial distribution of plants in production having different (a) transportation costs, (b) demand functions and (c) possibilities of exploiting economies of scale.

As localisation of industries emphasises on cost factor, demand and locational inter-dependence, Von Thunen<sup>(9)</sup> argued that localisation of industries in certain regions is an important reason for inter-regional differentials. According to Lampard<sup>(10)</sup> urbanisation is related with industrialisation. Through industrialisation urban centres create economies which have a cumulative and re-inforcing effect upon subsequent growth. R.P. Mishra<sup>(11)</sup> finds that spatial economy of India is marked with centralized concentration with a few metropolitan areas which are exploitative in nature through disadvantages to the rural areas.

### 3.1: Components of Per-Capital Income for Measurement of Disparity:

For the measurement of economic disparity methods have been offered by scholars like Hanna (1959), Perloff (1971) and Auer (1971). They mainly consider productivity in sectors as important explanatory factors for inter-regional differentials.

The per-capita incomes from different sectors are linked with labour productivity in related sectors. The per-capita income for a reference period ( one year) is :

$$\frac{Y}{P} = \frac{\text{Value of Output}}{\text{Total number of Population}}$$

This measure can be specified with the consideration of different sectors in the economy. So, the measurement is :

$$\frac{Y}{P} = \frac{W}{P} \sum_{i=1}^n \frac{W_i}{W} \cdot \frac{Y_i}{W_i} \dots\dots\dots ( 3.1 )$$

Where, W = Total main workers in different sectors.

W<sub>i</sub> = Workers in sector i (where i=1,2,...n ).

Y<sub>i</sub> = Nominal value of output in sector i.

$\frac{Y_i}{W_i}$  = Average productivity of labour in sector i.

This measurement can also be extended as :

$$\frac{Y}{P} = \frac{W}{P} \sum_{i=1}^n \frac{W_i}{W} \cdot \frac{K_i}{W_i} \cdot \frac{Y_i}{K_i} \dots\dots\dots (3.2 ) .$$

Where, K<sub>i</sub> = Amount of capital (nominal term) in sector i ( where i=1,2, ...n).

The identity (3.2) shows that the per-capita income is the function of total population in the area or economy, total main

workers from all sectors, the ratios of workers in sectors to the total workers, output capital ratios or capital output ratios of different sectors. The main purpose of this illustration is that through sampling if we can estimate independently the ratios which are in right hand side in the identity (3.2), then we must have an estimated value of  $\frac{Y}{P}$ . It is this very scientific way to estimate the per capita income in a region. Another purpose of this illustration is that we can identify the inter-industry disparity as well as the disparity in same industry groups situated in different regions in terms of labour productivity, technology and capital output ratio.

### 3.2: Attribute of a Region:

For attribute of a region let us suppose that A and B are two regions which are very adjacent but by geographical identity they are separate regions. Here the approach accepts the identification of a 'Region' which emphasises on the factors of homogeneity, nodality and administrative convenience for a planning region.<sup>(12)</sup> A homogeneous region bears dominant industry, specialised function, Per-capita income level, employment level etc.<sup>(13)</sup> A nodal region is homogeneous in that it combines areas dependent in some trade or functional sense or a specific centre.<sup>(14)</sup> According to Malgavkar and Ghiara, Geographically, it should be a contiguous units though it could be sub-divided into plain, hilly track, coastal belt, lake area etc.<sup>(15)</sup> The people of the region should have cultural cohesiveness. The region

should be separate unit for data collection and analysis. The region should have an economic existence which can be assessed from statistical records. It should be under one administrative agency. There should be common appreciation of local problems and common aspiration and approaches to their solution. It should permit and encourage competition but not rivalry or apathy between the area and the other. By this way A and B have been identified as two regions. Let us suppose that there is an insignificant trickle down process and absence of spill-over. The gap between lagging region and developed region goes on widening and this generates the tension which may be stated to be three.

- a) historical growth base on natural advantages,
- b) non-uniform distribution of natural resources and
- c) high concentration of resources.

Following Nijkamp it is stated that regional disparities are result of long run development and not of short-run cycled fluctuations. (16)

### 3.3: Rate of Disparity:

For construction of rate of disparity let us suppose that the per-capita income of the two regions are  $U^A$  and  $U^B$  respectively. And the result is that  $U^A > U^B$ . After a few years for A and B it is observed that per-capita incomes are at a higher stage. Supposing the result is  $U^{A'} > U^{B'}$ . From this set

of information the actual rate of disparity in terms of per-capita income for period  $t$  between regions is  $r$ . It can be presented in the following way:

$$r = \frac{(U^{A'} - U^A) - (U^{B'} - U^B)}{(U^A - U^B)} \dots\dots\dots(3.3).$$

∟ Note:

$$(1 + r)(U^A - U^B) = U^{A'} - U^{B'}$$

$$\text{or, } U^A - U^B + r(U^A - U^B) = U^{A'} - U^{B'}$$

$$\text{or, } r(U^A - U^B) = U^{A'} - U^{B'} - U^A + U^B$$

$$\text{or, } r(U^A - U^B) = (U^{A'} - U^A) - (U^{B'} - U^B)$$

$$\text{or, } r = \frac{(U^{A'} - U^A) - (U^{B'} - U^B)}{(U^A - U^B)} \quad \text{J}$$

If the rate of disparity is constant over the periods the gap between the two regions will be wider in terms of per-capita income. It leads to a dismal conception. If  $r$  is zero or seems to be zero, the situation is not worseing at least.

Now an expectation can be formed by the information set consists of capital output ratio, output-labour ratio, capital labour ratio, workers and population which are available for past and present periods. Suppose  $r_t^e$  is the expected rate

of disparity for period  $t$  and  $r_t$  is the actual rate of disparity for the same period. Now, by adoptive expectation process for the formation of  $r^e$  through error adjustment, such that<sup>(14)</sup>

$$r_{t+1}^e = r_t^e + b ( r_t - r_t^e )$$

Where,  $0 < b < 1$ .

Now, if  $r_t - r_t^e = 0$

then  $r_{t+1}^e = r_t^e = r_t$

But, if  $r_t > r_t^e$

then  $r_t - r_t^e > 0$

and if  $r_t - r_t^e = K$

then  $r_{t+1}^e = r_t^e + bK$

i.e.  $r_{t+1}^e > r_t^e$

than the sequences are that

$$r_{t+1} > r_{t+1}^e \dots\dots\dots \text{and so on.}$$

If this situation is running ceteris paribus the actual rate of disparity will be higher and higher which will be a grave situation. As because for next time expected as well as actual rate of disparity will be at rising trend. The implication of this statement is that:

1) The capital output ratio for different sectors in region A will be lower than that of region B. It is resulting the fact that growth rate of output in region A is higher than that of region B. In this sense the marginal efficiency of capital is more in region A.

2) Average productivity of labour for region A will be higher than that of region B. It means that the value added per labour will result the inequality status. Higher return per labour will encourage additional investment in the sectors which reflects the scope for employment opportunity in region A.

3) The capital labour ratio represents the technology of a sector or a unit. If the ratio differs for the same industry group between two regions, the explanation calls either for technology gap or for under utilization of capacity in region B. In this respect region A is in a better position than the region B.

4) If for region A average productivity of labour as well as capital-labour ratio are more than those for B, then it is clear to say that the under utilisation of capacity is existing in the sectors of region B. The under utilisation of capacity may be higher or lower in comparison to different sectors ( or industry group or units) in region B.

5) The concentration of capital, output and employment will be higher in region A, leaving B far behind. It is resulting the further development of general crisis.



6) The competitive units from A will push their product in the markets of B by the process of narrowing the markets for units in B. The process will run towards non-reciprocity.

7) Unemployment and industrial sickness will be a serious view in region B.

8) Urbanisation in region A will be an expression of spread effect of industrialisation where as unbanisation in region B will be the expression of the severity of agrarian crisis. Hence, forms of divergence (back-wash effect) will be accentuated in terms of rural crisis.

9) 'Reverse transfer of technology' (i.e. immigration of educated persons from B to A ) will be a common picture between regions.

So, the existence of rate of disparity is a very serious view between regions in any economy.

#### 3.4: The Empirical Results:

We focus the above attention on West Bengal where Northern five districts -- Darjeeling, Jalpaiguri, Coochbehar, West Dinajpur and Malda -- holds the identity of a region called North Bengal and the remaining part comprises of twelve districts holds the regional name as South Bengal. The

intra-industry disparity between these two regions has been observed in Registered Manufacturing sector with reference to the Census and Non-census factories.

To make a statement about the disparity between North and South in registered manufacturing sector a table ( No. 3.1) is drawn for census factories from A.S.I. Frame<sup>(17)</sup> Six different industry groups have been chosen through sampling to catch the disparity as shown in table. For the industries the capital-output ratios of North Bengal are always more than those of South Bengal. On average for North Bengal one unit of capital produces three units of output where as for South one unit of capital produces six units of output. It directs that growth rate of output is higher in South Bengal than that of North Bengal in the referred industries. Average labour productivity and capital labour ratio of South Bengal are always more than those of North Bengal. It is due to the fact that the excess capacity lies in the factories of North Bengal. Here narrow domestic market and limited infrastructure stand on the way of expansion of output and productivity. Here the final disparity is reflected in the per capita income earned from different industries. So, in the census manufacturing sector regional intra-industry disparity is empirically evident. In non-census sector from the Frame<sup>(18)</sup> we calculate another table (No. 3.2) and find that there also have the same trend of disparity between regions.

Table : 3.1.

The Disparities in Different Industry Groups of  
Census Sector of North Bengal and South Bengal.

Industry Group code *	Capital output Ratio ( $\frac{K_i}{Y_i}$ )		Output labour Ratio $\frac{Y_i}{W_i}$		Capital labour Ratio $\frac{K_i}{W_i}$	
	North Bengal	South Bengal	North Bengal	South Bengal	North Bengal	South Bengal
1	2	3	4	5	6	7
270	0.64	0.02	17086.98	383630.100	10935.617	7672.602
271	0.60	0.08	19389.597	233930.920	11633.758	18714.473
276	0.08	0.06	5231.316	13039.073	418.505	782.344
3131	0.10	0.30	35038.356	71223.341	3508.836	21367.000
973	0.50	0.40	47002.749	48477.736	23501.374	19391.094
204.2	0.20	0.10	38922.524	40752.200	7784.500	4075.220

( Contd....2 )

Table : 3.1 ..... (contd....2)

$\frac{\text{Total workers of particular industry}}{\text{Total workers of all main industry}} = \frac{W_1}{W}$		$\frac{\text{Total workers of all main industry}}{\text{Total population of the region}} = \frac{W}{P}$		per capita income (in Rs.) by identity No. 3.1 and 3.2.	
North Bengal	South Bengal	North Bengal	South Bengal	North Bengal	South Bengal
8	9	10	11	12	13
0.00013	0.00003	0.23	0.29	0.51	3.34
0.00007	0.000019	0.23	0.29	0.31	1.29
0.00005	0.00003	0.23	0.29	0.06	0.11
0.00007	0.0006	0.23	0.29	0.56	12.39
0.000164	0.000325	0.23	0.29	1.77	4.57
0.00012	0.00014	0.23	0.29	1.07	1.65

Source :- Data calculated from 1977-78 A.S.I FRAME. (CENSUS)  
Govt. of India (Frame used from 1977-78 to 1985-86).

\* Industry Code.

- 270 -- Manufacture of Plywood, Veener and their products.
- 271 -- Manufacture of Sawing, Planning wood (other than Plywood).
- 276 -- Manufacture of wood furniture and fixtures.
- 3131 -- Manufacture of Drugs and Medicins.
- 973 -- Repair of Motor Vehicles.
- 204.2 - Rice Milling.

The serious view of disparity in the Non-census sector is observed by the same model in the following table 3.2.

Table : 3.2.

The Disparities in Different Industry Groups of Non-census Sector of North Bengal and South Bengal

Industry Group Code *	Capital output ratio ( $\frac{K1}{Y1}$ )		Out put labour Ratio ( $\frac{Y1}{W1}$ )		Capital labour Ratio $\frac{K1}{W1}$	
	North Bengal	South Bengal	North Bengal	South Bengal	North Bengal	South Bengal
1	2	3	4	5	6	7
204.1	0.1280084	0.12827194	531663.93	3194147.24	68057.449	40971.94
205	0.099357	0.0734803	41727.50	54676.138	4145.92	4017.62
270	0.4574963	0.2243497	32963.28	58889.71	15080.577	13211.89
271	0.4077451	1.6946347	13927.95	47289.21	5679.053	80137.94
353.4	0.2129037	0.195532	18419.85	45930.574	3921.65	10740.696
359.9	0.3460458	0.3650245	17015.35	39187.87	5888,091	14304.53
973	0.2133282	0.2432948	33043.93	50415.313	7049.20	12265.78

(Contd.....2)

Table : 3.2

(contd.....2)

$\frac{\text{Total Workers of particular Industry}}{\text{Total Workers of all main Industry}} = \frac{W_1}{W}$		$\frac{\text{Total workers of all main industry}}{\text{Total population of the region}} = \frac{W}{P}$		Per capita income (in Rs.) by identity no. 3.1 and 3.2.	
North Bengal	South Bengal	North Bengal	South Bengal	North Bengal	South Bengal
8	9	10	11	12	13
0.000008	0.00003	0.23	0.29	0.98	2.78
0.000008	0.00006	0.23	0.29	0.08	0.95
0.00005	0.00007	0.23	0.29	0.38	1.20
0.00006	0.00004	0.23	0.29	0.19	0.55
0.00004	0.00002	0.23	0.29	0.17	0.32
0.00003	0.00008	0.23	0.29	0.12	0.91
0.00005	0.00008	0.23	0.29	0.38	1.17

Source:- Data calculated from 1977-78 A S I FRAME (NON-CENSUS),  
Govt. of India. (Frame used from 1977-78 to 1985-86 )

\* Industry code:-

- 204.1 ---- Flour Milling ( by power Machine).
- 205 ---- Manufacture of bakery products.
- 270 ---- Manufacture of Plywood and Veener and their products.
- 271 ---- Manufacture of sawing planning of wood (other than Plywood).
- 353.4 ---- Manufacture of Tea Mechinary.
- 359.9 ---- Manufacture of Machinery n.e.c. and parts.
- 973 ---- Repair of Motor vehicles.



The above study moves to the proception about rate of disparity between regions in terms of per-capita income. If the task extends to time series observations which will enumerate Y (difference of per-capita income in each industry between regions), then fitting a straight line by least square method will confirm the rate of disparity.<sup>(19)</sup> For convenience, we consider the per-capita income earned in Registered Manufacturing Sector, of both regions for the period from 1980-81 to 1985-86.

Table : 3.3.

PER-CAPITA INCOME BY REGISTERED MANUFACTURING  
SECTOR IN NORTH BENGAL AND SOUTH BENGAL.

Year (t)	Per-capita Income South Bengal. (Rs.)	Per-capita Income North Bengal. (Rs.)	Difference of per-capita Income (Y). (Rs.)
1	2	3	4
1980-81	279.68	20.36	259.32
1981-82	273.03	16.44	256.59
1982-83	315.65	24.22	291.43
1984-85	296.10	52.65	243.45
1985-86	337.04	32.87	304.17

Sources: (1) Data calculated from 'Statistical Abstract' West Bengal, 1978-1989 (combined), Bureau of Applied Economics and Statistics, Govt. of West Bengal, Table 17.5, P. 476-481.

(2) Census - 1981- 1991.

From this arrangement the simple rate of disparity by identity (3.3) is 17% approximately. But for a refine result we set a straight line as,

$$Y = 246.7 + 8.3 t$$

And the rate of disparity is confirmed at 8.3.

The result for remaining part of the model is very difficult as the way of keeping long time-series data in different forms are not available.

So, the regional intra-industry disparity in Registered Manufacturing sector of West Bengal is a crisis process so far as the rate of disparity is concerned. A very interesting idea evolves round a fact that in almost all industries of North Bengal, there lies more excess capacity as far as the capital output ratio, labour value added ratio and capital labour ratio are compared with those of South Bengal. The things have now come to such a pass that in North Bengal poor performance in industrial activity is a nagging problem. It stands as an agent of entre barrier against new firms to keep the area less industrialise. This postulate has encouraged our deep driving desire for a new chapter through which productive efficiency and excess capacity has been traced.

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CHAPTER - IV.

THE PROBLEM OF EXCESS CAPACITY IN WEST BENGAL

— A STUDY OF PRODUCTION FUNCTION AND

AVERAGE PRODUCTIVITY.

## CHAPTER - IV.

### THE PROBLEM OF EXCESS CAPACITY IN WEST BENGAL

#### — A STUDY OF PRODUCTION FUNCTION AND

#### AVERAGE PRODUCTIVITY.

4.0: Operating an industrial enterprise on full capacity aspires after theoretical phenomenon and practically what the operation does, is a draw-back from the ideal capacity. So, every industrial enterprise is subject to bear more or less excess capacity apart from actual capacity. In the imperfectly competitive market the practice of a general unit is to use capacity at certain level beyond that there lies an excess capacity. As for an entrepreneur degree of monopoly rises the use of this lying capacity becomes volitional, based on the principle that letting demand condition on market the determination of output and price are relative. Excess capacity works as a barrier to entry in an industry and frustrates the growth of new units in the industry. (1) Pashigian briefly alludes to the possibility that excess capacity may be used by established firms to

forestall entry by threatening to lower price and use such excess capacity to increase output if an entrant should appear. (2)

#### 4.1: Returns to Scale and Productivity as a Measure of Excess Capacity.

In our assignment we are interested to identify the regional variation of excess capacity in the same industry group rather than the estimation of excess capacity in an industry or industrial unit. Here we call excess capacity in terms of 'Poor Performance'. As earlier we had mentioned that operating an industrial enterprise considerably below capacity — one or two shifts when three would be more economic or without great concern for cost control or efficiency or without any concern regarding average productivity of labour — is an evidence of excess capacity. There is a vast difference between this kind of operation and full capacity production at high efficiency. Usually it amounts to the difference between substantial losses and high profits. We deserve that a greater excess capacity in an industry of a region compare to that of another is observed when a higher returns to scale is accompanied with a lower average product. (3) For this we use the production function parameters e.g., returns to scale and technical efficiency to identify the problem of excess capacity of a plant or an industry.



#### 4.2: Studies on Returns to Scale:

In earlier works more often, the Cobb-Douglas production function<sup>(4)</sup> had become handy for testing the economies of scale. Through this function Dutta<sup>(5)</sup> (1955) found evidence in favour of constant returns to scale for Indian Manufacturing on the basis of cross section data for 1946-47. Murti and Sastry (1957)<sup>(6)</sup> estimated Cobb-Douglas production function with cross section data for the industrial sector as a whole, as well as for the same groups of industries for the years 1951 and 1952. Data used was of 320 firms of 28 manufacturing industries. The hypothesis is that the sum of elasticities of output with respect to labour and capital might differ from unity was rejected, indicating constant returns to scale at 0.01 level of significance for each industry group, except for Jute Textiles. Production function estimated for total industry indicated the constant returns to scale as the sum of two elasticities was not statistically different from unity.

Dutta Majumder (1966)<sup>(7)</sup> arrived at the constant returns to scale of industry, on the basis of a time series study for the period 1951 to 1961. Aggregate study of Dadi and Hashim (1971)<sup>(8)</sup> also found evidence of constant returns to scale in Indian industries. Narasimham and Fabray (1974)<sup>(9)</sup> gave estimates of returns to scale for 28 Indian industries for the period 1946 to 1958 and showed constant returns to scale in all 28 Indian industries individually and together.

Many studies had brought out increasing returns to scale. Yeong Her Yeh (1966)<sup>(10)</sup> used different specifications of Cobb-Douglas production function and showed that Indian industries together enjoyed large economies of scale. His study covered the period, 1953-58 and inferred increasing returns to scale. Diwan (1967)<sup>(11)</sup> also produced supporting evidence of increasing returns to scale for 1953-58. Banerjee (1971)<sup>(12)</sup> in his study of Indian industries together for the period, 1946-1958 observed the evidence of increasing returns to scale in estimation of Cobb-Douglas production function. The estimation of returns to scale for 28 individual industries by Narasimham and Fabray (1974) also showed considerable variation between different industries. Subramanian (1980)<sup>(13)</sup> conducted an interstate production function study for Indian Sugar Industry and found evidence of increasing returns to scale in all India and Tamil Nadu and constant returns to scale in Bihar, Maharashtra, Uttar Pradesh & Andhra Pradesh on the basis of estimation of Cobb-Douglas production function for 1953 to 1969. But main defect of Cobb-Douglas estimation is that it assumes elasticity of substitution as unity and perfect competition in input and output market.

The Constant Elasticity of Substitution (C.E.S.) production function brought a new type of estimation for knowing about productive efficiency. Arrow, Chenery, Minhas and Solow show the use of CES in making international comparison.

of productivity efficiency. <sup>(14)</sup> Several works have been done on estimation of CES for Indian Industries. Diwan and Gujarati (1968), <sup>(15)</sup> by CES, found the high economies of scale during the period 1964-1968. Sankar (1970) <sup>(16)</sup> also found evidence of economies of scale on estimating the CES for 15 industries together covering the period 1953-1958. Similarly increasing returns to scale was observed by Sakong and Narasimham (1974).

This survey on production function studies of Indian industries is taken up in details because we are interested to provide a specific guideline for our research studies. Since the original form of CES production function carries some defects as to estimate returns to scale and restrictive assumption of perfect competition, we take the superior K'menta approximation of CES production function <sup>(17)</sup> needfully in our estimation.

#### 4.3: The M K'menta Approximation:

J. K'menta suggests an approximation to the CES production function in slightly different form as :

$$V = Ae^u \left[ (1 - \delta) K^{-\rho} + \delta L^{-\rho} \right]^{-\frac{R}{\rho}} \dots\dots (4.1)$$

Where,

V = Value added,

A = role of technical parameters,

$\rho$  = substitution parameter,

$\delta$  = distribution parameter

$$0 < \delta < 1.$$

R = Returns to scale.

L = Labour

K = Capital.

$e^u$  = Stochastic term.

Now,

$$\begin{aligned} V &= A L^{-\rho} (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta J^{-\frac{R}{\rho}} \\ &= A \cdot L^{-\rho} \cdot \frac{R}{\rho} \left[ (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta J^{-\frac{R}{\rho}} \right] \\ &= AL^R \left[ \dots \right]^{-\frac{R}{\rho}} \end{aligned}$$

$$\text{or, } \frac{V}{L} = AL^{R-1} \left[ \dots \right]^{-\frac{R}{\rho}}$$

and taking logarithms, gives

$$\log \left(\frac{V}{L}\right) = \log A + (R-1) \log L - \frac{R}{\rho} \log \left[ (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta J \right]$$

$$\text{or, } \log \left(\frac{V}{L}\right) = \log A + (R-1) \log L - \frac{R}{\rho} \cdot f(\rho)$$

where,

$$f(\rho) = \log \left[ (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta J \right]$$

The expression  $f(\rho)$  can be approximated by the use of Taylor's expansion,

$$f(\rho) = f(0) + \rho f'(0) + \frac{\rho^2}{2!} f''(0) + \dots \dots \dots$$

In the above form

$$f(\rho) = \log \left[ (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta \right]$$

$$f(0) = \log [1 - \delta + \delta] = \log 1 = 0$$

$$f'(\rho) = \frac{1 \times (1 - \delta) \left(\frac{K}{L}\right)^{-\rho} \cdot \log \left(\frac{K}{L}\right) \times (-1)}{(1 - \delta) \left(\frac{K}{L}\right)^{-\rho} + \delta}$$

$$\text{or, } f'(0) = \frac{-(1 - \delta) \log \left(\frac{K}{L}\right)}{1 - \delta + \delta}$$

$$= -(1 - \delta) \log \left(\frac{K}{L}\right).$$

Now,

$$f'(\rho) = \frac{-(1 - \delta) \left(\frac{K}{L}\right)^{-\rho} \cdot \log \left(\frac{K}{L}\right)}{\delta + (1 - \delta) \left(\frac{K}{L}\right)^{-\rho}}$$

[Since for  $a^x$  we have  $a^x \log a$ ]

$$\begin{aligned}
&= \frac{-(1-\delta) \log\left(\frac{K}{L}\right)}{\left(\frac{K}{L}\right)^{\rho}} \\
&= \frac{\delta + \frac{(1-\delta)}{\left(\frac{K}{L}\right)^{\rho}}}{-(1-\delta) \log\left(\frac{K}{L}\right)} \\
&= \frac{\delta \left(\frac{K}{L}\right)^{\rho} + (1-\delta)}{-(1-\delta) \log\left(\frac{K}{L}\right)} \\
&= \frac{\delta \left(\frac{K}{L}\right)^{\rho} + (1-\delta)}{-(1-\delta) \log\left(\frac{K}{L}\right)} \\
&= -(1-\delta) \log\left(\frac{K}{L}\right) \cdot \frac{1}{\delta \left(\frac{K}{L}\right)^{\rho} + (1-\delta)}
\end{aligned}$$

$$f''(\rho) = -(1-\delta) \log\left(\frac{K}{L}\right) \cdot \frac{\left[\delta \left(\frac{K}{L}\right)^{\rho} + (1-\delta)\right] \times 0 - 1 \cdot \delta \left(\frac{K}{L}\right)^{\rho} \cdot \log\left(\frac{K}{L}\right)}{\left[\delta \left(\frac{K}{L}\right)^{\rho} + (1-\delta)\right]^2}$$

$$\begin{aligned}
f''(\rho) &= \frac{\delta(1-\delta) \left[\log\left(\frac{K}{L}\right)\right]^2}{\left[\delta + (1-\delta)\right]^2} \\
&= \delta(1-\delta) \left[\log\left(\frac{K}{L}\right)\right]^2
\end{aligned}$$

Since,  $\log \left( \frac{V}{L} \right) = \log A + (R - 1) \log L - \frac{R}{\rho} f(\rho)$ .

The expression made to

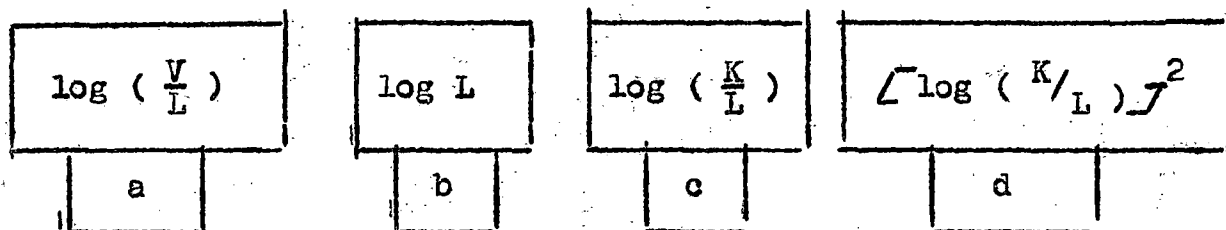
$$\begin{aligned} & \log A + (R - 1) \log L - \frac{R}{\rho} \left[ f(0) + \rho f'(0) + \frac{\rho^2}{2!} f''(0) \right] \\ = & \log A + (R - 1) \log L - \frac{R}{\rho} \left[ 0 - \rho(1 - \delta) \log \left( \frac{K}{L} \right) \right. \\ & \left. + \frac{\rho^2}{2} \cdot \delta(1 - \delta) \left\{ \log \left( \frac{K}{L} \right) \right\}^2 \right] \end{aligned}$$

Hence,

$$\log \left( \frac{V}{L} \right) = \log A + (R - 1) \log L + R(1 - \delta) \log \left( \frac{K}{L} \right) - \frac{R\rho\delta(1 - \delta)}{2}$$

$$\left[ \log \left( \frac{K}{L} \right) \right]^2 \dots\dots 4.2$$

It is linear expression of the production function. Thus, nonlinear production function turns into linear production function. If we have the informations about V, L and K we find the following:



Now, if we regress  $\log\left(\frac{V}{L}\right)$  on  $\log(L)$ ,  $\log\left(\frac{K}{L}\right)$  and  $\left[\log\left(\frac{K}{L}\right)\right]^2$ , we find the equation 4.2. This procedure will help to find all the parameters of function. The advantage of this estimation is that without the assumption of perfect competition parameters are determined and henceforward the returns to scale. If the function is Cobb-Douglas then the estimated co-efficient of  $\left[\log\left(\frac{K}{L}\right)\right]^2$  should not be significantly different from Zero. If this co-efficient is significantly different from Zero the Cobb-Douglas form is rejected. But since the approximation to the CES required  $\rho$  to be close to zero the approximation is valid.

#### 4.4 : The Empirical Evidence of Returns to Scale.

We study this estimation for West Bengal wherein we carry out comparison of excess capacity between North Bengal and South Bengal for the same industry groups. Three groups of industries in Non-census sector have been chosen as sample to catch the whole literature in this respect. We use the data from 1985 - 86 A.S.I. Returns<sup>(18)</sup> (Non-census) and find the following results:-

(1) K'menta Approximation to the CES for the Industry Group

205 Under North Bengal is,



$$\log(V/L) = -894.29 + 10.779 \log L + 197.74 \log (K/L) \\ + 11.100 \left[ \log (K/L) \right]^2$$

$$S.E \quad (142.51) \quad (2.9817) \quad (33.137) \quad (1.8895)$$

$$t \quad (-6.2752) \quad (3.6150) \quad (5.9672) \quad (-5.8744)$$

$$R^2 = 0.9954085, \quad F_{3,8} = 72.265 \quad d^W = 1.2903$$

(Good fitness)      (statistically)      (A.C. negligible  
as the data are  
cross section).

Here  $\log A = -894.29$  (

Hence  $A = .1950E-0894$

$$R - 1 = b$$

$$R - 1 = 10.779$$

$$R = 11.779$$

Since,

$$a = -894.29$$

$$b = 10.779$$

$$c = 197.74$$

$$d' = -11.100$$

Again,

$$R(1 - \delta) = c$$

$$\text{or, } 11.779(1 - \delta) = 197.74$$

$$\text{Hence, } \delta = -15.787503$$

Since,

$$\frac{R \rho \delta (1 - \delta)}{2} = 11.100 = d'$$

$$\rho = 0.0071112$$

By this the original function is,

$$V = .1950 E^{-.0894} \left[ (1 + 15.787503) K^{-.0071112} - 15.787503 L^{-.0071112} \right]^{-\frac{11.779}{.0071112}}$$

(2) Kmenta approximation to the C.E.S. for industry Group 205 under South Bengal is.

$$\log\left(\frac{V}{L}\right) = -1.8253 + 0.5805 \log L + 1.8445 \log\left(\frac{K}{L}\right) + 0.055429 \left[ \log\left(\frac{K}{L}\right) \right]^2$$

$$S.E. \quad (1.4478) \quad (0.3472) \quad (0.5196) \quad (0.035568)$$

$$t_{20} \quad (1.2607) \quad (1.6719) \quad (3.5479) \quad (-1.5584)$$

$$R^2 = 0.9419189, \quad F_{3,20} = 108, \quad D^W = 1.7387$$

By the above procedure the original function is:

$$V = .06688 \left[ (1 + 0.1670357) K^{-0.3598152} - 0.1670357 L^{-0.3598152} \right] - \frac{1.5805}{0.3598}$$

(3) Kmenta approximation to the CES for the industry group

353.4 under North Bengal is:

$$\log\left(\frac{V}{L}\right) = 5.8713 + 3.1768 \log L - 1.7182 \log\left(\frac{K}{L}\right) - 0.038473 \left[ \log\left(\frac{K}{L}\right) \right]^2$$

$$S.E \quad (0.9773) \quad (0.9822) \quad (0.5469) \quad (0.054678)$$

$$t^* \quad (6.0078) \quad (3.2343) \quad (-3.1419) \quad (0.7036)$$

$$R^2 = 0.9630874, \quad F_{3,1} = 8.6970 \quad d^w = 1.4157$$

Here the Original function is:

$$V = 743500 \left[ (1 - 1.4113675) K^{-0.031701} + 1.4113675 L^{-0.03170301} \right] - \frac{4.1768}{0.031701}$$

## (4) K'menta approximation to the CES for Industry Group

353.4 under South Bengal is:

$$\log\left(\frac{V}{L}\right) = 5.9229 + 0.2367 \log L - 0.7398 \log\left(\frac{K}{L}\right) - 0.064307 \left[ \log\left(\frac{K}{L}\right) \right]^2$$

$$S.E. \quad ( 1.6524 ) \quad ( 0.5785 ) \quad ( 0.5033 ) \quad ( 0.058486 )$$

$$t^y \quad ( 3.5843 ) \quad ( 0.4092 ) \quad ( -1.4699 ) \quad ( 1.0995 )$$

$$R^2 = 0.6054916 \quad F_{3,2} = 1.0232 \quad D^W = 1.0316$$

From the above form the original function is:

$$V = 837300 \left[ ( 1 - 1.5982049 ) K \right]^{0.1087781} + 1.5982049 L \left[ \frac{1.2367}{0.10877} \right]$$

## (5) K'menta approximation to the CES for the industry group

204.1 under North Bengal is:

$$\log\left(\frac{V}{L}\right) = 0.3419 - .9926 \log L + 1.3470 \log\left(\frac{K}{L}\right) + 0.034313 \left[ \log\left(\frac{K}{L}\right) \right]^2$$

$$S.E. \quad ( 9.3449 ) \quad ( 0.1180 ) \quad ( 3.9835 ) \quad ( 0.4261 )$$

$$t \quad ( 0.036585 ) \quad ( -8.4153 ) \quad ( 0.3382 ) \quad ( -0.080523 )$$

$$R^2 = 0.9962918 \quad F_{3,1}^* = 89.558 \quad d^W = 1.2410$$

The original function is :

$$V = 2.198 \left[ (1 + 0.8202702) K^{-0.0621103} \right. \\ \left. - 0.8202702 L^{-0.0621103} \right]^{-\frac{0.74}{0.0621103}}$$

(6) Kmenta approximation to the CES for the industry group

204.1 under South Bengal is :

$$\log(V/L) = 1.9433 + 0.8578 \log L + 0.2898 \log(K/L) \\ - 0.0016239 \left[ \log(K/L) \right]^2$$

$$S.E. \quad ( 4.7283 ) \quad ( 0.2761 ) \quad ( 2.1686 ) \quad ( 0.2490 )$$

$$t^* \quad ( 0.4110 ) \quad ( 3.0844 ) \quad ( 0.1337 ) \quad ( 0.0065213 )$$

$$R^2 = 0.8513485 \quad F_{3,2}^* = 3.8181 \quad d^w = 1.27$$

The original function is:

$$V = 87.76 \left[ (1 - 0.8440091) K^{-0.0132783} \right. \\ \left. + 0.8440091 L^{-0.0132783} \right]^{-\frac{1.8578}{0.0132}}$$

From the above analysis a table can be formed by returns to scale with corresponding average productivity of labour in each industry group for both regions. The table shows that more excess capacity is existing in the industries of North Bengal. However, there would have been better results if Cochrane-Orcutt method would be followed for the data. The industry group 204.1 suffers from decreasing returns to scale which stands as barrier to new entrants. By role of technical parameters the Southern industries are more efficient than those of Northern and it proves a regional intra-industry disparity in terms of excess capacity.

Table : 4.1.

Excess Capacity in Different Industry Groups in North Bengal and South Bengal.

Industry Group	Returns to scale		* Average product of labour in (Rs)		Technical Efficiency	
	North Bengal	South Bengal	North Bengal	South Bengal	North Bengal	South Bengal
1	2	3	4	5	6	7
205	11.779	1.5805	103438.67	161663.35	.1950E-0894	.06688
353.4	4.1768	1.2367	4565.7933	78562.301	743500	837300
204.1	0.74	1.8578	22053.805	27103.517	2.198	87.76

\* Average product calculated from the A.S.I. Returns (Non-census) for 1985-86.

#### 4.5: The General View:

In North Bengal for industry group 205 under Non-census sector few units are producing some common types of yeast bread as wheat bread, rye bread and biscuits. The products have limited local demand for which the units use their capacity as accordingly. A few units like Glenary at Darjeeling, Perazzines Bakery at Siliguri and JECIJ & Co. at Jalpaiguri produce variety of products which have good local market span. As the preference pattern of general consumers is to select a good quality of items, the local products are inferior to those of outside. In the town areas of North a large percent of people is quality conscious about the bakery products and they do not use the local products, instead of these they use the quality from outside. By this local units loose some portion of their market and hence a stickiness of demand for their product is observed. For the industry the units in the South produce not only quality but also variety of bakery products of which biscuits are getting large market at outside the region. In Calcutta area East India Bakery, Santosh Biscuits, Farinni Continental Bakers, Prince Bakery, New Baby Biscuits Co. Standard Biscuits and Solar Bakery and Confectionery are maintaining the variety of products. The quality products are maintaining by Senco's Bakery at Hooghly and Paramount Traders at Durgapur. Here many big units in census sector produce various dietary breads and quick breads which get a good market share outside the state. The capacity utilization of these units are linked with large market span.

For the industry group 204.1 the flour mills in the northern region are running with hardship as the big market portion for their products is at outside where supply comes mostly from other than the northern region. A good quality of input for output is not available in the area where factories are dependent on the imported wheat. Shortage of working capital, a common problem of the units, takes them to senile decay of activity although the units are not so old. We see same type of problem in the units like National Flour Mill on Burdwan Road, Siliguri. Flour Mill and Northern Flour Mill on Sevoke Road. The losses in other units bring them to statemate. But under South mainly in Calcutta area many units are running on normal condition. These are Mahabir Flour Mill, New India Flour Mill, Biswanath Swadeshi Mill etc. The mills of Ghosuri area at Howrah as Food Products Corporation, Bangabashi Roller Flour Mill and Mahakali Flour Mill are running with poor capacity but regularly. The units of other districts as Madanmohan Roller Flour Mill of Serasol, Ananda Flour Mill in Bankura are running with good installed capacity. However, the Murshidabad Roller and Flour Mill at Bengatia, Cossimbazar, Srma Roller Flour Mill on Bankura Road in Purulia have closed down as the working capital had been eaten by the service burden of loans from bank and private sources.

Between regions, we are also interested to compare manufacturing of agricultural machinery, equipments and parts



in Non-census sector. For this we choose industry sub-group 353.4 wherein units are producing tea machineries. Now, tea processing needs modern machineries to confirm perfection of varieties for black and green tea -- as dust, blended, unblended, leaf grade, waste and instant tea powder. For better quality better machineries are demanding for withering, rolling, fermenting and firing steps. In North Bengal the units for producing tea machineries are mainly Economic Engineering Works, Associated Engineering Co. at Siliguri and Northern Engineering Works at Gairkata, Jalpaiguri. For them the volume of output in each unit is sufficiently low as compare to the volume of output produced in each unit situated in Calcutta-Howrah belt where units are producing a better quality. It is true that the units like James Warren Hilde, Samuel Osborn Ltd. Calco Engineering Works, Nippa Manufacturing Co.(P) Ltd., The General Industries Co. and Sigma Engineering Co. are in right place for producing machineries which need many inputs from other industrial units. Through this privilege they produce more and significantly share the market in the tea belt of Northern region.

Having a greater privilege to minimize the cost of production by better sophisticated technology, the outer competitive units push their products through supply agents in the markets of the backward areas where local units find themselves in narrow pace. The fear of competition then limits the activity of running units and the growth of new units of the area. This is the fact by which the existing

units in North operate on greater excess capacity than those of South.

The same sort of result seems right for our purpose if we study the variation of excess capacity for same industry group among different districts of West Bengal where backward districts bear the greater excess capacity for operating units. As in registered manufacturing sector of backward districts we observe combination of higher capita-output ratio with lower value added labour ratio compare to those of Calcutta-Howrah-Hughlee industrial belt<sup>(19)</sup> However, keeping in view the overall picture of productivity in registered manufacturing sector of different industrial states in India, we clear up a perception of higher excess capacity in all industries of West Bengal. Here generation of excess capacity is observed if any one pay attention to the table (4.2):

Table : 4.2.

The Productivity in Registered Manufacturing Sector of West Bengal.

Year	Intensity of capital	Productivity of labour	Productivity of capital	Input output ratio
1977-78	0.528	0.761	1.426	0.72
1980-81	0.568	0.791	1.390	0.74
1981-82	0.663	0.9240	1.386	0.76
1982-83	0.668	0.936	1.401	0.75
1984-85	0.884	1.248	1.412	0.77
1985-86	1.110	1.504	1.355	0.77

\* Value Rs. in lakhs.

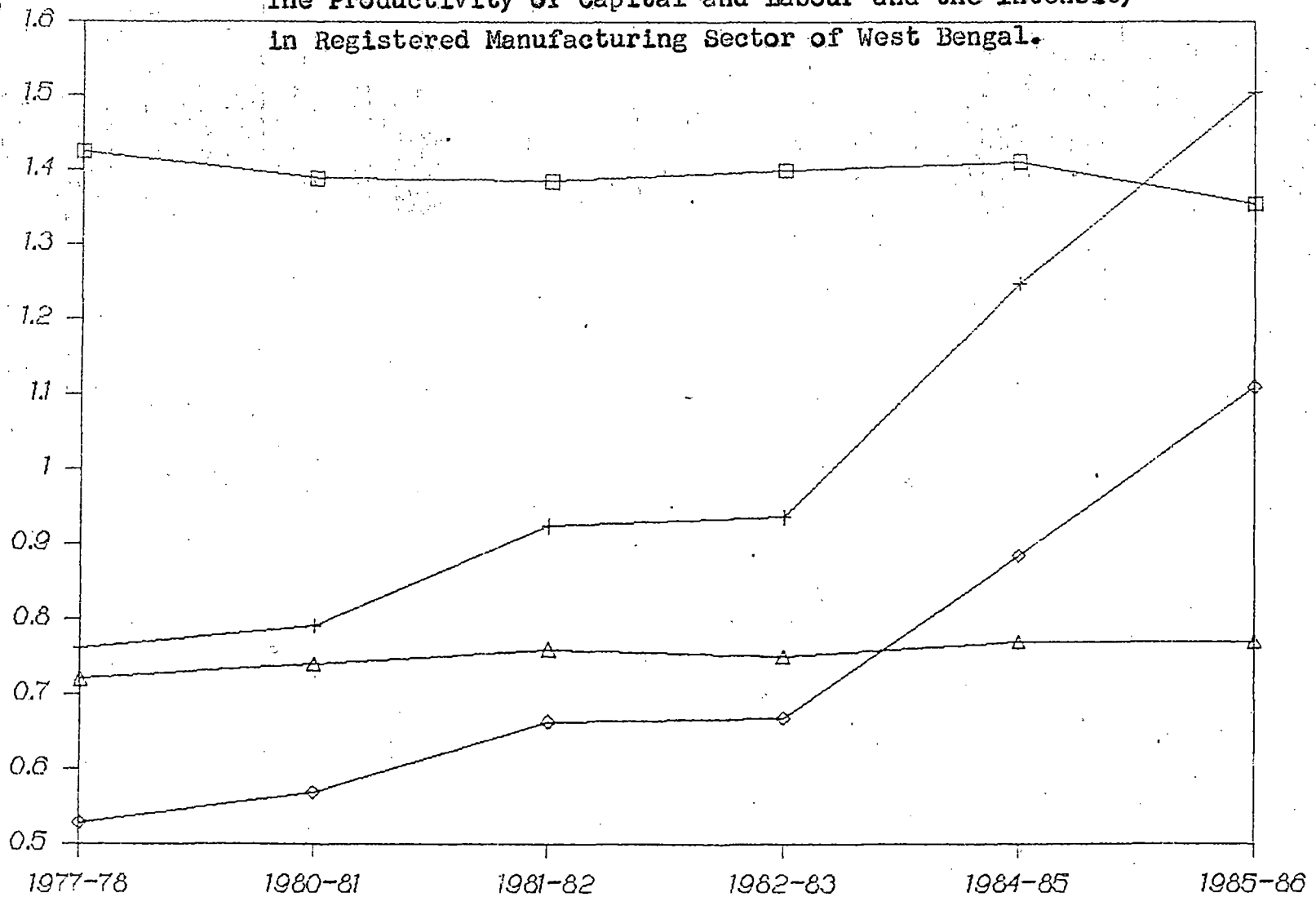
Sources: 1) Data calculated from ASI Frames 1977-78 for the year 1977-78.

2) From 1980-81 to 1985-86 data calculated from Statistical Abstract, West Bengal (1978-1989), Table 17.5, Bureau of Applied Economics and statistics. P. 481.

From the year 1977-78 to 1985-86 the labour productivity had increased because capital intensity (capital labour ratio) attended upon labour productivity. For the period productivity of capital and input output ratio had fallen through because of falling growth rate of output and rising inputs in the sector. It shows under utilization of capital and hence a rising degree of excess capacity in Registered Manufacturing Sector of West Bengal. In addition to this, here in backward areas most of the units are following greater excess capacity within few days of their birth i.e. a generating crisis process of industrialisation programme. Following this crisis process we go through the function of public and private sector manufacturing units in the state.

FIG. No. 4.1.

The Productivity of Capital and Labour and the Intensity  
in Registered Manufacturing Sector of West Bengal.



□ Capital Prod.

✦ Labour Prod.

◆ Capital Intensity

△ Input Output ratio

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Table. 17.5, P. 476. 481.

CHAPTER - V

A COMPARATIVE STUDY OF EXCESS CAPACITY IN PUBLIC AND

PRIVATE SECTORS IN WEST BENGAL --AN ANALYSIS

IN TERMS TO RETURNS TO SCALE

AND PRODUCTIVITY.



## CHAPTER - V

### A COMPARATIVE STUDY OF EXCESS CAPACITY IN PUBLIC AND PRIVATE SECTORS IN WEST BENGAL-- AN ANALYSIS

IN TERMS TO RETURNS TO SCALE

AND PRODUCTIVITY.

5.0: The question of management of manufacturing enterprises either in the hands of Govt. or private does reside in preference under an obligation on the economic problems and needs of a country. The objective for non-capitalist development sometimes encouraged some developing countries where bad features of private and good of public form had been emotionalized through theoretical speculation. An unwillingness had developed to pay the price in profit that private ownership required to establish and operate industrial enterprises. The idea generated as: the new industrial venture will make large profit which will be used to further worthy public activities; that it will produce at such low costs that prices of the goods to the

consumer will be reduced; that it will provide a market for the products of the raw material producers at prices better than they received before and finally, that labour will find working conditions more pleasant than hitherto, and that, as a result of having their own plant they will also benefit through higher earnings. (1) By this, transition of the developing nation to the road of non-capitalist will be achieved; inter-regional integration will be tied through natural extension of its function as an instrument for implementing the national economic policy. (2)

#### 5.1: Indian Experience With Public Sector Units:

With the aforesaid expectation the public sector enterprises in India had some head way to provide specially for further development of basic and strategic industries. As upto 1985-86 massive capital invested (Rs. 58,125 crores), number of people employed ( 17.60 Lakhs) in 221 public enterprises. (3) In spite of this phenomenal growth the public enterprises have been incurring heavy losses since 1977-78 continuously. In 1977-78, they incurred a loss of Rs. 91 crores, in 1980-81, it was Rs. 203 crores; in 1983-84 it was Rs. 1610 crores and in 1984-85 it was amounted to Rs. 1819 crores. In the matter of profitability they have lagged behind by far the expectation and hence not yet justified the huge investments made from the public exchequer by their

inefficient, below capacity functioning. Under-utilisation of capacity is one of the main causes of low profitability. During 1985-86 about 24% public sector enterprises were operated in the utilisation of 50% to 75% and 25% were functioning below 50% utilisation of capacity. The manufacturing/producing group (excluding textile) are now so crucial to the country's economy that a fact is underlining the need for their efficient operation. <sup>(4)</sup> For this Prime Minister rightly said " We were unable to achieve socialism, since we had laid emphasis on one aspect ignoring the others. In stead of concentrating on the condition of the poor, we concentrated on the role of the public sector to achieve socialism. And the country was unable to achieve socialism as the public sector was eating up the wealth of the nation."

## 5.2: West Bengal: The Spare for Public Sector Units:

The sector wise distribution of estimated employment in West Bengal shows that during the year 1970 private sector had remarkable employment potential compare to that of public sector, as for the year the private sector had 1.38 lakhs more employment than that of public sector (Table 5.1):-

Table : 5.1.Sectorwise Distribution of Estimated  
Employment in West Bengal

(Number in lakhs)-

Year ended December	Public sector	Private sector	Total
1	2	3	4
1970	10.88	12.26	23.14
1975	13.52	11.58	25.10
1980	15.80	10.84	26.64
1983	16.68	9.95	26.63
1984	16.93	9.41	26.34
1985	17.21	9.38	26.59
1986	16.94	9.32	26.26
1987	16.99	9.30	26.29
1988(P)	16.90	9.03	25.93
1989(P)	16.84	8.92	25.76
1990(P)	16.92	8.87	25.79

P=Provisional. Sources: (1) National employment service, W.B.  
(2) Bureau of Applied Economics and Statistics, West Bengal.

Note:- Private sector refers to organised Private sector.

From 1980 to 1990 the employment potentiality of private sector had wined under the blow of public sector, as some private sector units had turned into public and their employment counted under the Public Sector. During the period from 1970 to 1989 the share of employment of private sector had came down by 3.39 lakhs ( volume of employment decreased by 27% ) on the other hand the share of public sector had elongated by 5.96 lakhs more employment. From 1975 to 1989 the total employment had raised only 0.15% by the sectors. The total number of employment had been remaining more or less the same but the share of public sector was favoured by transforming few private sick units into public sector units. It implies in addition to the primary meaning that public sector had been espousing by the Govt. of West Bengal where private sector units were left in lurch or out of liberty to act at pleasure.

The concentration of vacancies notified and placement effected through employment exchange by public and private sectors have been gradually deteriorating in West Bengal since 1980.<sup>(5)</sup> For the year 1980, 13.5 thousand placement were effected against some notified vacancies by public sector where as in the year 1989, only 7.8 thousand placement were effected. For the same period the private sector offered 1.2 thousand average placement each year. The dissolute conduct of placement in public sector has been going on the hope of future capacity expansion of the units

(which has never been attained), so much so that the excess capacity has been dominating to pull down the concentration of vacancies in public sector. For as much as the public sector units had failed to yield of intended results, deterioration of total concentration of vacancies cleared up. Indeed! public sector has been receiving greater importance in West Bengal; but creation of vacancies has waned and excess capacity geared up.

However, excess capacity is a dominating feature in all Indian industries like manufacturing, basic, capital goods, intermediate goods and consumer goods industries in both public and private sectors. The capacity utilization in manufacturing industries declined steadily since, 1966, i.e. the beginning of the Third Plan. From a level of about 88 percent during the Third Plan, it declined to 81 percent during the period of Annual plans and further declined to 79 percent during the fourth plan. It fell further to an average of about 75 percent during 1976-78. Among the various groups of industries, capacity utilisation was the least in the capital goods industries.<sup>(6)</sup> A study carried out by USAID in India noted substantial degree of excess capacity in Industry.<sup>(7)</sup> Here we study the variation of excess capacity in fine classified manufacturing industry groups under public and private sectors of West Bengal.

### 5.3: The Variation of Excess Capacity in 3-digit Industry Groups under Public and Private Sectors of West Bengal.:

In an industrial unit the excess capacity is meant output falling short of the capacity or non-utilisation of installed capacity. It tends to higher capital output ratio, lower value added labour ratio and higher returns to scale of production. The same line of enquiry follows to identify the trend of excess capacity in an industry. For West Bengal we put this work down in public and private sectors for following manufacturing industry groups:

Industry Group	Description
231	Cotton Spinning, Weaving, Shrinking Sanforzing, mercerising and finishing of Cotton textiles in Mills.
280	Manufacture of packing paper, paper boards, strow, boards and pulps.
313.	Manufacture of Medicines.
330	Manufacture of Iron and Steal.
331	Manufacture of castings, forging structure and pipes.
340	Manufacture of safes, vaults, steal trunks, Drums, tanks, Plumbing fixtures, stoves, Haricane lantern & Oil pressure lamps
343	Manufacture of hand tools and general hardware agricultural hand tools and implements.

Industry Groups	Description
356	Manufacture of Crushers, buckets, elevators, cranes, derricks, reactors, centrifugal machines driers, power driner pumps compressor , ball, roller and bearings.
360	Manufacture of Generators, Transformers switch gears and electric motors.
370	Making of ships and other vessels drawn by power, parts and accessories for vessels.
372	Manufacture of Wagones, Coaches and parts.

We may mention that under these 3-digit industry groups few sub-groups have been added on, however to the finer classification of industries these 4-digit industries (sub-groups) are always counted in 3-digit industry groups.

For the above 11 (eleven) industry groups we calculate the capital output ratio ( $K/O$ ), value added labour ratio ( $V/L$ ) and capital labour ratio ( $K/L$ ) in public and private sectors and arrange them in table 5.2 for comparison. We use the

' A.S.I. Census Frame -- 1977-78<sup>(8)</sup> for this purpose:



Table : 5.2

Comparison in terms of Capital Output Ratio, Value Added Labour Ratio and Capital Labour Ratio between Public and Private sector for same Industry Groups under Registered Manufacturing sectors of West Bengal.

Industry Group	Public sector			Private sector		
	$\frac{K}{O}$	$\frac{V}{L}$	$\frac{K}{L}$	$\frac{K}{O}$	$\frac{V}{L}$	$\frac{K}{L}$
231	3.0455294	4255.2748	12959.564	1.8651549	6858.291	12791.775
280	2.4845245	33612.324	83510.642	20.163941	1803.9643	36375.029
313	1.2759689	26529.841	33851.252	1.7696051	15626.219	27652.236
330	133.84615	22175.19	2968063.8	2.094229	15365.562	32179.005
331	1.7511922	30843.205	54012.38	2.0921783	11720.326	24521.011
340	1.618736	14187.374	22965.613	1.0871106	11521.788	12525.457
343	3.3262826	14749.584	49061.284	1.7222954	14413.884	24824.966
356	1.3094483	39734.631	52030.445	8.2852176	13239.274	10969.026
360	1.7788346	18542.299	32983.683	1.5121935	17698.886	26764.14
370	4.0952968	21960.692	89935.551	0.5564049	12290.656	6838.5812
372	1.0828224	12462.666	13494.853	0.9665249	16702.882	16143.751

Source:- Data calculated from ASI Frame census, 1977-78.

Adherence to the work we are also interested in returns to scale for the industries. For estimation of returns to scale we carry back to the Kmenta approximation of C.E.S. production function which has made in the preceding chapter.

The function is :

$$V = Ae^u \left[ (1 - \delta) K^{-\rho} + \delta L^{-\rho} \right]^{-\frac{R}{\rho}}$$

And the linear form is:

$$\log(V/L) = \log A + (R - 1) \log L + R(1 - \delta) \log(K/L) - \frac{R\rho\delta(1 - \delta)}{2} \left[ \log(K/L) \right]^2$$

where R is the returns to scale.

Now, we carry out the estimation at least for 4 industry groups under public and private sectors as follows:

NIG : 331

Public Sector.

No. of obs. Equation

15       $-2.4496 + 0.6581 \log L + 1.1699 \log(K/L) - .016248 \left[ \log(K/L) \right]^2$

S.E ( 3.6925)    (0.2506)    ( 1.5146)    ( 0.1647)

$t^*$  11 (-0.6634) (2.62566) (0.7724) (-.098638)

$t^T = 1.796.$      $R^2 = 0.65$      $F^*(3, 11) = 6.80$      $F^T(3, 11) = 3.59$

$D^W = 2.4112.$

$$\text{Here } \log A = - 2.4496$$

$$\text{So, } A = .002816$$

$$\text{and } R - 1 = 1.6581$$

$$\text{So, } R = 1.6581$$

$$R(1 - \delta) = 1.1699$$

$$\text{So, } (1 - \delta) = 0.7055666$$

$$\text{and } \delta = 0.2944334$$

$$\text{Since } - \frac{R \rho \delta (1 - \delta)}{2} = - .016248$$

$$\text{Hence } \rho = - 0.9433967.$$

By this the function is:

$$V = .002816 \left[ (1 - 0.2944334)K^{-0.9433967} + 0.2944334 L^{-0.9433967} \right]^{-\frac{1.6581}{0.9433967}}$$

We follow the above procedure and find the Co-efficients for the function in other cases:

NIG : 331.

Private Sector:

<u>No. of obs.</u>	<u>Equation</u>			
32	$2.4844 + 0.1938 \log L + .2358 \log(K/L) - .019506 \left[ \log(K/L) \right]^2$			
S.E	(0.4909)	(0.1049)	(.097677)	(.025282)
$t_{28}^*$	(5.0609)	(1.8474)	(2.4138)	(-0.7715)
$t^T = 1.701$ .	$R^2 = 0.51$ .	$F_{(2,28)}^* = 3.3961$ .	$F^T = 2.99$ .	$D^W = 2.40$

And,

$$V = 305.1 \bar{L}^{-1} (1 - 0.8024795) K^{0.2061679} \\ + 0.8024795 L^{0.2061679} J^{-1} - \frac{1.1938}{0.2061679}$$

NIC : 340

Public Sector.

<u>No. of obs.</u>	<u>Equation</u>
7.	$-29.745 + 24.386 \log L - 5.9314 \log(K/L) + 0.4807 \bar{L}^{-1} \log(K/L) J^2$

S.E. (24.849) (17.748) (4.1543) (0.3192)

$t_3^*$  (-1.1970) (1.3740) (-1.4278) (1.5062)

$t_3^T = 2.353$ .  $R^2 = 0.89$ .  $F_{(3,3)}^* = 8.28$   $F^T = 9.28$

$D^W = 1.79$

And,

$$V = .5559E-029 \bar{L}^{-1} (1 - 1.2336327) K^{-0.1313984} \\ + 1.2336327 L^{-0.1313984} J^{-1} - \frac{25.386}{0.1313984}$$

NIC : 340Private Sector

<u>No. of obs.</u>	<u>Equation</u>			
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18.	$4.9525 + 0.74354 \log L - 3.4286 \log(K/L) + 0.4459 \log(K/L)^2$			
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S.E.	(3.4164)	(0.2957)	(1.5136)	(0.1781)
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$t_{14}^*$	(2.9131)	(0.2515)	(-2.2652)	(2.5039)
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$$t^T = 1.761. \quad R^2 = 0.46. \quad F_{(3,14)}^* = 3.95. \quad F^T = 3.34. \quad D^W = 2.02$$

And,

$$V = 81870 \left[ (1 - 4.1913131) K^{-0.0620584} + 4.1913131 L^{-0.0620584} \right] \frac{1.074354}{0.0620584}$$

NIC : 343Public Sector

<u>No. of obs.</u>	<u>Equation</u>			
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8	$-1.4834 + 0.6227 \log L - 134.85 \log(K/L) + 68.235 \log(K/L)^2$			
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S. E.	(0.5723)	(0.1318)	(392.11)	(196.12)
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$t_4^*$	(-2.5920)	(3.9662)	(-0.3439)	(0.3479)
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$$t^T = 2.132. \quad R^2 = 0.88. \quad F_{(3,4)}^* = 9.8825 \quad F^T = 6.39. \quad D^W = 2.357$$

And,

$$V = .03044 \left[ (1 - 82.102237) K^{-0.0123262} - 82.102237 L^{-0.0123262} \right] \frac{1.6227}{0.0123262}$$

NIC : 343Private Sector.No. of obs.                      Equation

$$17 \quad 1.1303 - 4.2401 \log L - 2.2459 \log(K/L) + 2.9563 \sqrt{\log(K/L)} J^2$$

$$S.E. \quad (0.1636) \quad (3.0053) \quad (2.3663) \quad (1.1288)$$

$$t_{13}^* \quad (6.9075) \quad (-1.4109) \quad (-0.9491) \quad (2.6190)$$

$$t^T = 1.771. \quad R^2 = 0.44. \quad F_{(3,13)}^* = 3.45. \quad F^T = 3.41. \quad D^W = 2.18$$

And,

$$V = 13.50 \sqrt{(1 - 0.3068424) K - 8.5797138}$$

$$+ 0.3068424 L - 8.5797138 \sqrt{\frac{3.2401}{8.5797138}}$$

$$\text{Here } R = -3.2401.$$

NIC : 360Public Sector.No. of obs.                      Equation

$$10 \quad 4.6710 + 0.6861 \log L - 2.3573 \log(K/L) + 0.4132 \sqrt{\log(K/L)} J^2$$

$$S.E. \quad (7.1828) \quad (0.3481) \quad (3.0603) \quad (0.3296)$$

$$t_6^* \quad (0.6503) \quad (1.9710) \quad (-0.7703) \quad (1.2534)$$

$$t_6^T = 1.943. \quad R^2 = 0.74. \quad F_{(13,6)}^* = 5.70. \quad F^T = 4.76. \quad D^W = 1.74$$

And,

$$V = 46880 \sqrt{(1 - 2.3980784) K - 0.1461881}$$

$$+ 2.3980784 L - 0.1461881 \sqrt{\frac{1.6861}{0.1461881}}$$

NIC : 360

Private Sector.

<u>No. of obs.</u>	<u>Equation</u>
13	$0.4558 + .0072025 \log L - 489.37 \log(K/L) + 245.01 \left[ \log(K/L) \right]^2$

S.E. ( 0.3447 ) ( 0.1394 ) ( 228.10 ) ( 114.10 )

$t_9^*$  ( 1.3224 ) ( .051673 ) ( -2.1454 ) ( 2.1473 )

$t_9^T = 1.833$ .  $R^2 = 0.50$ .  $F_{(3,9)}^* = 2.9704$ .  $F^T = 3.86$ .  $D^W = 1.65$

And,

$V = 2.856 \left[ ( 1 - 484.87051 ) K^{-0.0020651} \right.$

$\left. + 484.87051 L^{-0.002065} \right]^{-\frac{1.0072025}{0.0020651}}$

The analysis brings into the open that out of 11 (eleven) industries, public sector bears up greater excess capacity than that of private sector in 7 (seven) industries and for remaining 4 (four) industries private sector falls behind the public. By K'menta approximation to the C.E.S. every one in the sample of four industry groups under public sector brings out higher returns to scale than that of private sector. Higher returns to scale does make evidence that all the four industries under public sector fall into underutilisation of capacity. It also follows that higher

productivity of labour in public sector is maintained through higher amount of capital per labour which pushes back the productivity of capital and keeps up excess capacity in the industry under the sector. If this situation arises, it reflects in the falling tendency in the rate of profit. In other words labour productivity does not rise at such a high rate as to overcome falling capital productivity. By this way higher capital output ratio does instil in production operation and excess capacity results in the industry.

Prof. P.R. Brahmananda ( 1982 )<sup>(9)</sup> rightly observed that Registered Manufacturing Industries under Public Sector of India, during the period from 1970-71 to 1980-81, had accounted falling rate of profit in terms of (i) a rise in relative share of wages, (ii) a rise in capital intensity of labour, (iii) the rise of input output ratio and (iv) the possible effect of a rising degree of under utilization of capacity. Our results lighted on the same terms, however to the interest we went round few units to know the difficulties in the production operation.

Under industry group 231 the capital labour ratio of the both sectors are more or less same; still productivity of labour in private sector is higher than that of public sector. It shows the under utilisation of capital in public sector wherein one unit of output needs 3 units of capital and on the other hand private sector needs less than two units of



capital to produce one unit of output. In view of this situation we find that many units, like Vinod Textile Inds. Ltd. at Muragachia at Jugberia, Oriental Cotton Cultivation & Mills Ltd. on South Station Road at Agarpara, Jatia Cotton Mills Ltd. on Kendua Road at Mourigram and Mayurakshi Cotton Mills Ltd. at Panchra hat in Birbhum, have been working towards higher input output ratio, now have reached at 0.96 level, which will set off big negative figure for value added in these units in no time. Already the negative figure in value added got struck with the units like Textile processing unit R.I.C Ltd. at Bonhooghly, Sri Durga Spinning and Weaving Mills Ltd. at Konnagar in Hooghly, Kesoram Inds. & Cotton Mills Ltd. at Garden Reach, Kalyani Spinning Mills Ltd. at Kalyani and recently the Mayurakshi Cotton Mills Ltd. We have seen a low input output ratio in the industry Group under private sector units like Joyoti Weaving Fey(P) Ltd. in Calcutta as 0.42, Sri Maha Laxmi Cotton Mills on Ghoshpara Road at Palta as 0.55, Bowreah Cotton Mills at Howrah as 0.61 and Banga Laxmi Cotton Mills at Serampur as 0.62. Most of the units in private sector have brought out input output ratio less than 0.70, but most of the public sector units have brought out the ratio above the point. So, higher input output ratio in public sector under the industry group does make an affirmation that the units have failed in desired capacity utilisation.

For industry group 280 the older factories were localised mostly in West Bengal where proximity to the coal fields and raw materials make advent of new units in the state. From early years of Fifty to early Sixties output, Capital stock and employment showed substantial growth trend over the period.<sup>(10)</sup> But now the industrial units under private sector are yielding diminishing returns which has been cleared up by high capital output ratio and low value added labour ratio in the industry. We find very big negative amount of value added in three giant units like Titagarh Paper Mills Co. Ltd. (No, 1) and No. 2 at Titagarh and Indian Paper Pulp Co. Ltd. at Halisahar. Under the sector two units as M/s. Corrograting & Paper Processing Co. on B.T Road in Calcutta and Satish Paper & Board Mills, at Barasat, operate on high input output ratio. Only 6 ( six) Board Mills of the sector operate on input output ratio near about 0.70. However, except Tribeni Tissue the units under public sector do not show any moderate input output ratio. The overall picture of this industry is that the utilisation of capital have remained behind when higher capital labour ratio attended upon labour productivity.

The manufacture of medicine under industry group 313 included Allopathic, Ayurvedic and Homeopathic medicines. For manufacture of allopathic medicines the units both under public and private sectors worked at relatively backward machinaries and equipments. Demand for their products have slackened off and stocks started in on accumulating. We have

seen low input-output ratio in the units like Govt. Quinion Fey at Mangpoo as 0.56, Bengal Immunity Co. Ltd. at Baranagar as 0.47, Indian Health Institute & Laboratories Ltd. at Dum Dum as 0.48, G.D. Pharmaceutical Ltd. in Calcutta as 0.49 and Glucunate Ltd ( No.1) also in Calcutta as 0.47. The high input-output ratio have observed in the units like Smith Stanistreet, Dey's Medical store and British Medicine & Pharmaceutical Co. In Calcutta. A very low capital intensity in many units under private sector has caused low productivity of labour which has reflected upon excess capacity in the industry under the sector.

It is noticeable that capital deepening play an important role in the growth of steel manufacturing (330) of a country. But for public sector units of the industry in West Bengal whatever deepening the capital, none of them came upto the installed capacity. Here one unit of output is produced by 133 units of capital in public sector where high capital labour ratio is imputed to high productivity of labour. High input output ratio is observed in Durgapur Steel Project as 0.70, Alloy Steel Project as 0.63 , Burnpur Sec. of IISCO as 0.83, Bengal Rolling Mills Ltd. at Sodepur as 0.90, Hind Wire Industries Ltd. at Sukchar as 0.82. Many units also in private sector are incurring losses due to a high input output ratio; the units are Bhagwati Steel (P) Ltd. as 0.82, Asian Industries as 0.90, Swastika (P) Ltd. as 0.82 and Agarwal Hardware Industries as 0.87, at Liluah in Howrah. The steel

manufacturing under public sector units in the state have barely got through the production operation as except Alloy Steel Plant of Durgapur, no unit in the state has come in on utilisation of remarkable percentage of installed capacity. For percentage of capacity utilisation Durgapur Steel Plant (58.1%) has fallen behind Rourkella Steel Plant (66.8%), Bokaro Steel Ltd. (71.7%) and Bhilai Steel Plant (84.6%).<sup>(11)</sup> We look back on to the poor performance of the plant. After completion of the unit the retrenched construction workers could not be provided with employment in new plants and installations and hence the trouble started. " Even from the inception the plant gave operational troubles. A coke oven had to be dismantled. Relining was done in one of the blast furnaces. Overhauling of the pig casting machine was also necessary. The blooming and billet mills had to be overhauled partially because also of operational difficulties. The Durgapur Steel Plant thus could never utilise its full capacity and produced only about 50% of its capacity."<sup>(12)</sup> Recently in connection with modernisation programme labour trouble has made inroad the work culture in the plant.

However, in regard to Bhilai, Rourkela, Bokaro and Durgapur plants in the public sector, no one will be satisfied with their performance compare to that of TISCO; a private sector plant producing mild steel." TISCO performance has been

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\* TISCO: Tata Iron and Steel Company, a mild steel producing unit at outside the state, West Bengal.

much better than that of the other integrated steel plants; it has operated at more than 90% of capacity of saleable steel output in many of the years since 1969-70. Its financial results also compare very favourably. Even in the bad year 1971-72 when the three Hindustan Steel Plants did only 59% of capacity in saleable steel, incurring a heavy loss of Rs. 44.8 crores, TISCO did 92% utilisation making a profit of Rs. 12 crores (before tax). Selling prices are equally applicable to both the sectors. It becomes obvious that TISCO profit is due to high efficiency in capacity utilisation and to its lower depreciation cost per tonne of capacity!"<sup>(13)</sup>

Closing upon steel, the industry group 331 shows a different picture. For this industry we infer from production function more or less same returns to scale in both the sectors. In regard to labour productivity private sector has remained behind the public in which higher amount of capital per labour has brought out higher productivity of labour. Lower labour productivity in this industry under private sector was not the result of underutilization of labour power; it was the result of relatively backward technology which did not turn up the productivity. However, with privilege of relatively better technology public sector units did not give the best use of their capital in many cases as we have an evidence for this :

Name of the Unit	No of workers	Invested capital (Rs.)	Input (Rs.)	output (Rs)	Value Added (Rs)
1. Asiatic Wires Ltd. Madhyamgram	67	2893646	5823975	6470426	524862
2. Jeetmal Jaichandlal (P) Ltd. Liluah	83	1083008	5575988	6681083	1008946

Source:- A.S.I. Frame '78.

Here the Asiatic Wires, a public sector unit, invested 2.67 times capital of the Jeetmal, a private sector unit, and by less amount of input Jeetmal not only made more output but also made more value added (approximately double) than those of Asiatic Wires. Like this we have few other information and we make a whole that underutilization of capital in this industry specially under public sector is too much.

A very high returns to scale with higher capital labour ratio in industry group 340 under public sector has kept up same appearances of underutilisation of capital and high excess capacity. We see comparitavely high input output ratio in public sector units like Containers & Closures Ltd. at Naihati as 0.80 and Industrial Container Ltd. at Paharpur in Calcutta as 0.89 which would have been less than 0.70 at

ideal operation. Although, by capacity these units may come up with export quality. Their contribution is important like other private sector units in the industry.

For manufacture of agricultural tools and implements under industry group 343, the private sector units show up decreasing returns to scale and public the increasing. Very low labour productivity has reflected upon decreasing returns to scale in the industry under private sector. For capacity utilization the public sector equally suffers from low productivity of capital. Higher prices of inputs, higher wage bill and shifting of market have made the manufacturing work unprofitable in both the sectors.

The same result does accord with the industry groups 360, 370 and 372 in which public sector stay behind the private. Industry group 356 remains exception to this statement. However, under this industry group the giant public sector unit Jessop & Co Ltd. is incurring heavy losses in recent years. From the Twenty Ninth Report on Jessop and Co. (1981-82) we know the costs structure which brings out cumulative losses in the company. The cost of production of the company was afflicted with high overheads (about 51% of cost of production). There was over-staffing to the extent of 2000 in certain categories, out of a total work force of 8000. The working capital was mostly financed through cash credit from banks. Besides salaries and wages the interest

element of cost was the highest in this company. Audit had observed something wrong as follows:

"There is a system for ascertaining idle time in labour and machinery specifying the reasons thereof, but due to apprehension of disruption in industrial relation such systems are not being used."

"Fear of being declared surplus makes them take longer time to do a job. By this productivity gets sacrificed. In spite of this assurance of the management that they will not be retrenched, workers's response to forward thinking and improvement of productivity is poor. Idle labour cannot be booked and workers cannot be transferred from one area to another. Progressive measures like modern product documentation systems cannot be implemented. In general the workers resist all measures to progress" (14)

By this the productivity in-credibly had gone down. It was about 0.3 tonnes per month whereas in other private and public sector plants it was around 3 tonnes. The workers in the company were not putting in more than  $2\frac{1}{2}$  to 3 hours of work a day. The value added per man month was  $\frac{1}{3}$  that of BHEL over 1980-81. Yet the overtime allowance (OTA) ranging from Rs. 59 lakhs to Rs. 129 lakhs had been paid annually over the same year. The OTA expenditure could not be brought down because under the agreement between the management and one of the unions certain unproductive categories like sweepers, drivers and crane operators were guaranteed payment of OTA



for 2 hours daily. The concession could not be withdrawn because there was a lot of resistance. <sup>(15)</sup> Hence, the cost of production had been higher than realisable value of production. Like Jessop & Co. Ltd. many other public sector units in Calcutta are suffering from similar problems and generating crisis process to excess capacity.

#### 5.4: The Government Intervention for Industrialisation.

Notwithstanding the greater excess capacity in public manufacturing units, the Govt. of West Bengal does not give up all hope of success; the Govt. moves rather too much in on industrial activity. The joint sector activity started with state partnership. Through partnership state shared decisions and activity involved in equity control and output with the presumption that risk will be lowered that it would be if they started the manufacturing unit all alone various development corporations come to grips with industrial programme of the state.

##### 5.4.1: The West Bengal Industrial Development Corporation: (W.B.I.D.C).

The West Bengal Industrial Development Corporation has set up number of industrial projects in joint-sector. <sup>(16)</sup> The Haldia Petrochemicals Project briefs that a big green field industry had been finalised under joint sector partnership in Haldia where among partners the WBIDC would hold

26% of the share, the Tata Tea Limited 24.99% and the remaining 49.01% of the share would be held in public<sup>(17)</sup>. The latest addition is Granulated Slag Cement Project commencing commercial production of Portland Slag Cement in the plant near Madhukunda in Purulia district. Apart from this the Corporation has been implementing a number of joint sector projects e.g. Biaxially Oriented Polypropylene Film Project and Polyester Filament Yarn Project at Barjora in Bankura. At Haldia in Midnapore they are Acrylic Fibre Project and Nitro-Chloro-Benzene Project. A project for manufacture of toilet soap, Glycerine and Synthetic detergent, at Kalyani in joint sector collaboration with Tata oil Mills Co. Ltd. is under consideration of the corporation. West Bengal Filaments and Lamps Ltd., a joint sector project of WBIDC ltd. with M/s. Andrew Yule Co. Ltd., has taken up a project for manufacture of Digital Microwave Communication Equipment.

The WBIDC provides financial assistance in various forms. Till the end of Dec., 1989, 454 units with a total project cost of Rs. 498 crores were assisted by WBIDC. From April, 1989 to Dec., 1989 the Corporation assisted 9 units with a total project cost of Rs. 31.28 crores. During that period the Corporation disbursed an amount of Rs. 19.50 crores by way of financial assistance to industrial units including assistance under State Incentive Scheme and Central Investment subsidy scheme. From 1st April, 1989 to 31st. December, 1989

the WBIDC sanctioned term loans amounting to Rs. 51400 lakhs to different industrial units which in turn is likely to catalyse an investment of Rs. 31.28 crores. During 1989-90 (Till Dec., '89 ), 15 industrial projects assisted by WBIDC involving investment of Rs. 56 crores were implemented, the project mostly being located in the backward districts. It has assisted so far 25 units in North Bengal with a total project cost of about 35.80 crores. (18)

#### 5.4.2: The West Bengal Electronics Industry Development Corporation Limited (WEBEL):

The WEBEL is setting up one R and D centre jointly with Department of Electronics at Salt Lake Electronics Complex. In Electronics Complex at Salt-Lake a number of units have started their production and 7 more units have started their construction. Here one ASIC Design centre is being set up by Indian Telephone Industry in collaboration with Department of Electronics. WEBEL Telematik Limited, a joint venture with Sielens Limited has started production of latest generation of electronic teleprinters. WEBEL Telecommunication Limited is a joint venture with Pieco-Electronics and Electricals Limited for manufacture of V.H.F. transreceiver sets and accessories. Another joint venture viz. WEBEL SL Energy Systems has recently formed which implement the project for manufacture of solar PV Cells Modules and Systems.

**5.4.3: The West Bengal Pharmaceutical and Phytochemical Development Corporation ( WBPPDC ):**

The corporation has come to terms with the promotion of drugs and pharmaceutical industries in the state. A few production units like 8 -Hydroxyquin oline / Diodohydroxyquinoline and Asprin at Kalyani, etc., have been set up by the Corporation. The commercial production and sale of Aspirin started during the year. The laboratory of the Corporation at Behala has expanded. At Torolpara in the district of Jalpaiguri, Construction of a building for starting Oleoresin/ Essential Oil from spice and N-Triacontanol from sugarcane press mud, was completed. The production of the Infusions (I) Ltd. is now under the management of the Corporation.

**5.4.4: The West Bengal Tea Development Corporation Ltd. :**

The Corporation owns five gardens — three in Darjeeling district and two in Jalpaiguri district. The Corporation also manages two gardens in Darjeeling district. The number of owned gardens has increased by one during 1989-90 as the Hilla Tea Estate in Jalpaiguri district has been leased out to the corporation by the State Govt. in December, 1989. The Corporation will construct a factory in the Hilla Tea Estate for manufacturing made tea for Hilla and Mahua.

**5.4.5: The West Bengal Sugar Industries Development Corporation Ltd.  
( WBSIDC ) :**

It takes cane crushing operations in its sugar Mills at Ahmedpur. The Corporation organised cultivation on 2000 acres of land in the mill command area of Ahmedpur Sugar Mill and on 250 acres of captive form land at Beldanga, for crushing in the Ahmedpur Sugar Mill.

**5.4.6: The West Bengal Mineral Development and Trading Corporation  
( WBMDTC ) :**

The Corporation is engaged in the development of mines and trading of minerals. It has opened new quarry faces and set up two additional crushers in Pachami Hatgacha area of Birbhum district for commercial production of stone materials. The North Bengal Dolomite Ltd., a joint venture of the Corporation has resumed production of Dolomite at Hatipota in Buxaduar, Jainti area, Jalpaiguri.

**5.4.7: The West Bengal Industrial Infrastructure Development Corporation ( WBIIDC ) :**

The Corporation is engaged in construction of Growth centres in different districts. It had set up growth centres in Haldia (Midnapore), Kalyani (Nadia), Kharagpur (Midnapore) and Dabgram (Jalpaiguri). Works at Uluberia (Howrah),

Raninagar (Jalpaiguri), Falta (South 24-Parganas) have completed. The Corporation has started work at Bishnupur, Coochbehar, Kalyani (Ph. II) and Malda.

#### 5.4.8: Programme for Sick Units:

The Jute Modernisation Fund Scheme and the Special Development Fund Scheme ( J.M.F.S. and S.J.D.F. ) have come to terms with the problems of sick units in jute industries in the state. Till 31.1.1990 a total of Rs. 60.97 crores sanctioned to fifteen cases. The amount includes Rs. 58.57 crores under the JMFS and Rs. 240 crores under SJDF. For the New Central Jute Mills, a sick unit, the State Govt. agreed to an equity contribution of Rs. 400 crores for the purpose of rehabilitation of the company.

For Mayurakshi Cotton Mills Ltd., another sick unit, the state Govt. has released a substantial amount of fund for renovation of the Mill and commencement of production. The Haldia unit of the Hindustan Fertiliser Corporation Ltd. had closed down in August 1986 and now under consideration of heavy investment (more than Rs. 500 crores ) for revamping and rehabilitation.

#### 5.4.9: Subsidy and Incentive Schemes: for Private Sector Units:

Under Central Investment Subsidy Scheme the subsidy on fixed capital had varied, depending on location, from 10%

to 25% with a ceiling ranging from Rs.10 lakhs to Rs. 25 lakhs. Under the new scheme of incentives, the rate of subsidy has been raised, varying from 15% to 30% with a ceiling ranging from Rs. 15 lakhs to 30 lakhs, depending on the location. The West Bengal Incentive Scheme, 1983 had provisions for Sales-Taxes loans to entrepreneurs. In the New Incentive Scheme there are provision for deferred payment of sales-tax for periods varying from 5 to 7 years, depending on location. The ceiling in respect of total amount of deferred tax will range from Rs. 2.50 crores to Rs. 10.50 crores in case of new units and from Rs. 1.75 crores to Rs. 7.35 crores in case of expansion of existing ones.

The New Incentive Scheme ( 1989)<sup>(19)</sup> comes up with packages of benefits to entrepreneurs for setting up new industrial units as well as for expansion of existing units in the state. The development subsidy through new scheme covers.

- (i) stamp duty paid for purchasing or taking lease of land or registration of documents;
- (ii) Charges paid to West Bengal State Electricity Board or any licensed electric supply company in the state or Greater Calcutta Gas Supply Corporation Ltd. for drawing Ht/Lt power line or Coal Gas pipe lines;

- (iii) charges paid to local body, notified authority etc. for drawing water and sewerage lines;
- (iv) 50% of the fees paid for procurement of know-how, subject to a ceiling of Rs. 1 lakh;
- (v) fees paid for conversion of land use in certain cases;
- (vi) an incentive of Rs. 5 lakhs to the first three Pioneer units to be set in a new growth centre developed by the State Govt.;
- (vii) for anti-pollution measures an incentive equal to 25% of the investment for conversion of furnaces etc. for switch-over from conventional fuels to piped coal gas subject to a ceiling of Rs. 50 thousand;
- (viii) incentives to Bio-Technology units, Solar Oriented leather goods manufacturing units, 100% Export oriented jewellery units and 100% Export oriented garments & hosiery goods units.

Further liberalisation of state incentive scheme observed in budget speech (1990-91) with reference to sales tax benefits as: (20)



- (i) Sales tax holiday for a period of ranging from 3 to 5 years depending on the location of the new industrial units will be available to the entrepreneurs.
- (ii) The existing scheme of deferred sales tax will be available as an alternative for an increased period of 7 years.
- (iii) The cumulative financial limit imposed on the amount of exemption/ deferred sales tax has been increased to a maximum of Rs. 35 crores and was linked with the cost of plant and machinery of the industrial unit. In case of new industrial units having investment in plant and machinery upto Rs. 10 lakhs, the existing incentive scheme relating to sales tax holiday will continue.
- (iv) In case of expansion of existing industrial units the above facilities of exemption/ deferred sales tax will be available on a reduced scale of 2, 3 and 4 years in respect of exemption and 5, 6 and 7 years in respect of deferred depending upon the location of the industries.

the measures have reasoned out that the people who run the Govt. are biased to-wards state intervention in industrial activity. But, how long will the development corporations carry on industrialisation job by giving huge amount of money

and machines to less-than-efficient minimum size units which all in future will fall through because of greater excess capacity? Then, how long will these units await for rejuvenation? As we know ' for last 10 years .... only 10% of the schemes for rejuvenation of industries has been implemented'. (21) Entrepreneurs heard about state incentive schemes in voluble talks that if they come at this moment the state facility will serve them as lackey. Still the response is very insignificant, In fact some members of development boards in the industrial belts of the state are unable to give any explanation for the reluctance of the entrepreneurs to invest in their areas. There had been no major investment in the Durgapur-Asansole belt in past many years. But many units in this belt have closed down like a paper mill, aluminium factory, glass works, a foundry, a unit for manufacturing screen for coal washeries, a cycle factory, ceramic units and a wheel-making unit. The latest to have closed down is the Hindustan Fertilizer Corporation in Durgapur. In Durgapur-Asansole belt 80% of major industries are public sector undertakings, 20% are in state sector and the rest in private sector. All the public sector units are running at loss and all the units in the state sector have been lossing concerns from the time of their commissioning. The pathetic situation is understood by the fact that many plots earmarked for industries in this zone are lying vacant. In Durgapur, there are still 400 acres awaiting occupation by industries. (23)

In connection with modernisation unrest is brewing here and there in West Bengal. As we see unrest over issue of appointment of workers by the contractors engaged in execution of jobs under the modernisation programme of D.S.P. The principle that had been framed earlier in consultation with the state Govt. and the different central trade unions to avoid such situation did not work well. People were to be recruited by contractors from an 'agreed list' of workers with names from both CITU and INTUC unions. The CITU did not object when their supporters whose names were on the 'agreed list' were hired. They however, protested whenever supporters of the INTUC were to be given appointment. Even a cease-work was observed by the CITU when INTUC workers were allowed to go the site and that impeded the progress of work. The meeting to solve the deadlock recently proved to be ineffective. There were even clashes also between the supporters of two unions at the work sites. <sup>(24)</sup> This type of problem puts strain upon the owners of manufacturing units elsewhere in West Bengal and the question of capacity expansion turns over future workers' trouble in their units. Being aware of trouble at length the entrepreneurs reveal their preference to add new technology without appointing men in their units where only workers do not stand out against this addition. So, we go ahead of the study for response of capital labour ratio to the growth rate of labour productivity.

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CITU: Union leaded by Communist Party.

INTUC: Union leaded by Congress Party.

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CHAPTER - VI.

A STUDY OF "RESPONSE" OF CAPITAL-LABOUR RATIO TO THE  
GROWTH RATE OF LABOUR PRODUCTIVITY FOR  
THE POTENTIAL REDUCTION OF  
EXCESS CAPACITY.

## CHAPTER - VI.

### A STUDY OF "RESPONSE" OF CAPITAL-LABOUR RATIO TO THE GROWTH RATE OF LABOUR PRODUCTIVITY FOR THE POTENTIAL REDUCTION OF EXCESS CAPACITY.

6.0: Capital labour ratio represents the intensity of industry in the production operation. A higher amount of capital per man may raise the productivity of man not only by quantity but also by quality of production. It is a going and needed test of every entrepreneur to select an optimum combination of capital and labour in production operation for better income which highly encourage him to see the use of capital and capital series corrected for rates of capacity utilization. <sup>(1)</sup> So, the estimation of another production function requires observation on capital for capacity utilization.

As long as 1932 Hicks noted that in the absence of technological change an increasing capital/labour ratio might



induce a tendency towards a diminishing elasticity of substitution, thereby at least implicitly recognizing the possibility of a variable elasticity of substitution. (2)

This statement seems to have encouraged writers to introduce the variable Elasticity of Substitution (VES) production function of one form or another designating them homothetic or transcendental production function. (3)

#### 6.1: The VES Production Function: As a Measure of Intensity:

The VES production function explicitly permits the capital labour ratio to be an explanatory variable of productivity. (4) A comprehensive study by Hildebrand and Liu has shown the weakness of the CES production function in which efficiency parameter has a downward bias because of omission of the variable  $(K/L)$ , for which it does not explain the productivity variation in a majority of industries. (5) The VES production function overcomes this defect of the CES. The function can be stated as:

$$V = A \left[ \delta K^{-\rho} + (1 - \delta) \left( \frac{K}{L} \right)^{-\rho} \right]^{-\frac{1}{\rho}} \quad \dots 6.1$$

The function can be stated in stochastic form (6) Here  $A$ ,  $\delta$  and  $\rho$  are efficiency, distribution and substitution parameter respectively. In this function  $u$  is important parameter which holds an important explanation as when  $u > 0$ ,

a higher product per man is obtained by increasing the capital per worker, or in other words by introducing a more capital intensive process of production. (7) When  $u = 0$ , we get identical results from the CES and the VES production function.

The VES differs from CES in one important respect. The CES requires that the elasticity of substitution be the same at all points of an iso-quant, independent of the level of output, hence at all points of the iso-quant map. The VES on the other hand, requires that this substitution parameter should be the same only when on the ray from the origin. (8) In this analysis we are interested to through light on the response of capital. For this we break the function fo find out  $u$  and other parameters. We write again the VES production function for steps towards modification.

$$V = A L^{-\rho} \left[ \delta K^{-\rho} + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+\rho)} \right] L^{-\rho} J^{-\frac{1}{\rho}}$$

For modification we have,

$$\begin{aligned} V &= A L^{-\rho} \left[ \delta \left( \frac{K}{L} \right)^{-\rho} + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+\rho)} \right] J^{-\frac{1}{\rho}} \\ V &= A L^{-\rho} \left[ \delta \left( \frac{K}{L} \right)^{-\rho} + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+\rho)} \right] L^{-\rho} J^{-\frac{1}{\rho}} \\ &= A \cdot L \cdot \frac{K}{L} \left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+\rho)} \right] L^{-\rho} J^{-\frac{1}{\rho}} \end{aligned}$$

Now,

$$\frac{V}{L} = A \cdot \frac{K}{L} \left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+\rho)} \right] L^{-\rho} J^{-\frac{1}{\rho}}$$

Taking log of both sides,

$$\log\left(\frac{V}{L}\right) = \log A + \log\left(\frac{K}{L}\right) - \frac{1}{\rho} \log \left[ \delta + (1 - \delta) \left(\frac{K}{L}\right)^{-u(1+\rho)+\rho} \right]$$

$$\text{When } f(u, \rho) = \log \left[ \delta + (1 - \delta) \left(\frac{K}{L}\right)^{-u(1+\rho)+\rho} \right]$$

We have,

$$\log\left(\frac{V}{L}\right) = \log A + \log\left(\frac{K}{L}\right) - \frac{1}{\rho} f(u, \rho)$$

Now Taylor's series expression of two variables committed as  $u$  and  $\rho$  in the familiar form, (9)

$$f(u + 0, 0 + \rho) = f(0,0) + \left(u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial \rho}\right) f(0,0) + \frac{1}{2} \left(u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial \rho}\right)^2$$

$$f(0,0) + \frac{1}{3} \left(u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial \rho}\right)^3 f(0,0) + \dots$$

taking  $f(u, \rho)$  as  $f(u, v)$

for convenience.

$$\text{So, } f(u, v) = \log \left[ \delta + (1 - \delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right]$$

when  $u = 0$  and  $v = 0$

$$f(0, 0) = \log \left[ \delta + (1 - \delta) \right] \cdot 1 = \log 1 = 0.$$

$$\text{Now } \left[ u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \right] f(u, v)$$

$$= \left[ u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \right] \left[ \log \left\{ \delta + (1 - \delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \right]$$

$$= \left[ u (1 - \delta) \left\{ -(1+v) \right\} \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \log\left(\frac{K}{L}\right) + \rho (1 - \delta) \right]$$

$$\left[ (-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \log\left(\frac{K}{L}\right) \right]$$

$$= \frac{\left[ \delta + (1 - \delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right]^2}$$

When  $u = 0$  and  $v = 0$  i.e. the expression for

$$\left( u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \right) f(0, 0) = u \left[ (1 - \delta) (-1) \right] \log\left(\frac{K}{L}\right) + \rho (1 - \delta) \log\left(\frac{K}{L}\right)$$

$$= \log\left(\frac{K}{L}\right) \left[ \rho (1 - \delta) - u (1 - \delta) \right]$$

$$= (1 - \delta) (\rho - u) \log\left(\frac{K}{L}\right)$$

Again for  $\frac{1}{2} \left( u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \right)^2 f(u, v)$ .

$$= \frac{1}{2} \left( u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \right)^2 \left[ \log \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \right]$$

$$= \frac{1}{2} \left( u^2 \frac{\partial^2}{\partial u^2} + 2u\rho \frac{\partial^2}{\partial u \partial v} + \rho^2 \frac{\partial^2}{\partial v^2} \right) \left[ \log \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \right]$$

for convenience the part differentiation is assigned here as for 3rd form.

$$u^2 \left[ (1 - \delta)(1+v)^2 \left( \frac{K}{L} \right)^{-u(1+v)+v} \cdot \left\{ \log \left( \frac{K}{L} \right) \right\}^2 \times \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \right. \\ \left. - (1 - \delta) \left\{ -(1+v) \right\} \cdot \left( \frac{K}{L} \right)^{-u(1+v)+v} \cdot \log \left( \frac{K}{L} \right) \times (1 - \delta) \left\{ -(1+v) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \cdot \log \left( \frac{K}{L} \right) \right]$$

$$\left[ \frac{\partial^2}{\partial u^2} \right] = \frac{\left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right]^2}{\left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right]^2}$$

$$u^2 \left[ (1 - \delta)(1+v)^2 \left( \frac{K}{L} \right)^{-u(1+v)+v} \cdot \left\{ \log \left( \frac{K}{L} \right) \right\}^2 \times \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \right. \\ \left. - (1 - \delta)^2 \left\{ (1+v)^2 \right\} \left( \frac{K}{L} \right)^{-u(1+v)+v} \left\{ \log \left( \frac{K}{L} \right) \right\}^2 \right]$$

$$= \frac{\left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right]^2}{\left[ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right]^2}$$

$$u^2 \frac{\partial^2}{\partial v^2} (1-\delta)(1+v)^2 \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \left\{ \delta + (1-\delta) \right. \\ \left. \cdot \left(\frac{K}{L}\right)^{-u(1+v)+v} - (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \\ = \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}$$

$$u^2 \delta (1-\delta)(1+v)^2 \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \\ = \frac{\left\{ \delta (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{\left\{ \delta (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}$$

$$\rho^2 \frac{\partial^2}{\partial v^2} (1-\delta)(-u+1)^2 \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \\ \times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} - (1-\delta)(-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \\ \cdot \log\left(\frac{K}{L}\right) \times (1-\delta)(-u+1) \cdot \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \log\left(\frac{K}{L}\right) \Big/$$

For  $\rho^2 \frac{\partial^2}{\partial v^2} =$

$$\frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2} \\ \rho^2 \frac{\partial^2}{\partial v^2} (1-\delta)(-u+1)^2 \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \\ - (1-\delta)^2 (-u+1)^2 \left\{ \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \Big/ \\ = \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}$$

$$\rho^2 \frac{\partial^2}{\partial u \partial v} (1-\delta)(-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \\ = (1-\delta) \cdot \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \right\}$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2$$

$$\rho^2 \delta (1-\delta)(-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2$$

$$2 \rho u \frac{\partial^2}{\partial u \partial v} (1-\delta) \left\{ -(1+v) \right\} (-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \\ \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}$$

$$- \left\{ (1-\delta)(-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \log\left(\frac{K}{L}\right) \right\}$$

$$\times (1-\delta) \left\{ -(1+v) \right\} \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \log\left(\frac{K}{L}\right) \left\{ \right\}$$

For;  $2 \rho u \frac{\partial^2}{\partial u \partial v} =$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2$$

$$2 \rho u \frac{\partial^2}{\partial u \partial v} (1-\delta) \left\{ -(1+v) \right\} (-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} - (1-\delta)^2 \left\{ -(1+v) \right\} (-u+1) \\ \left\{ \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \left\{ \right\}$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2$$

$$2 \rho u \int (1-\delta) \{ -(1+v) \} (-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^2$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} - (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{2}$$

$$2 \rho u \delta (1-\delta) \{ -(1+v) \} (-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^2$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2}{2}$$

taking  $u = 0$  and  $v = 0$ , Then arranging we have,

$$= \frac{1}{2} \int u^2 \delta (1-\delta) \left\{ \log\left(\frac{K}{L}\right) \right\}^2 + \rho \delta (1-\delta) \left\{ \log\left(\frac{K}{L}\right) \right\}^2 - 2 \rho u \delta (1-\delta) \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \int$$

$$= \frac{1}{2} \int \delta (1-\delta) \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \{ u^2 + \rho^2 - 2 \rho u \} \int$$

$$= \frac{1}{2} \delta (1-\delta) (\rho - u)^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2$$

For forth term we have,

$$\frac{1}{3} \int u \frac{\partial}{\partial u} + \rho \frac{\partial}{\partial v} \int^3 \int \log \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \int$$

$$= \frac{1}{6} \int u^3 \frac{\partial}{\partial u^3} + 3 u^2 \rho \frac{\partial}{\partial u^2 \partial v} + 3 u \rho^2 \frac{\partial}{\partial v^2 \partial u} + \rho^3 \frac{\partial}{\partial v^3} \int$$

$$\int \log \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \int$$



For convenience the part differentiation is assignable as for:

$$u^3 \int_{\delta}^{1-\delta} \{-(1+v)\}^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$\times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 - \delta(1-\delta)(1+v)^2 \left(\frac{K}{L}\right)^{-u(1+v)+v}$$

$$\left\{ \log\left(\frac{K}{L}\right) \right\}^2 \times 2 \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \times (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v}$$

$$\left\{ -(1+v) \right\} \log\left(\frac{K}{L}\right) \int$$

$$u^3 \frac{\partial}{\partial u^3} = \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

$$u^3 \int_{\delta}^{1-\delta} \{-(1+v)\}^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2$$

$$- 2\delta(1-\delta)^2 \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \left\{ -(1+v) \right\}$$

$$\left\{ \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \int$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

$$u^3 \int_{\delta}^{1-\delta} \{-(1+v)\}^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} - 2(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \int$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

When  $u = 0$  and  $v = 0$  we have,

$$= -u^3 \int_0^1 \delta(1-\delta)(2\delta-1) \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$\rho^3 \int_0^1 \delta(1-\delta)(-u+1)^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$\times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 - \left\{ \delta(1-\delta)(-u+1)^2 \right.$$

$$\left. \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \times 2 \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \right.$$

$$\left. \times \left\{ (1-\delta)(-u+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \left\{ \log\left(\frac{K}{L}\right) \right\} \right]$$

$$\text{For, } \rho^3 \frac{\partial^3}{\partial v^3} = \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

$$\rho^3 \int_0^1 \delta(1-\delta)(-u+1)^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 - 2\delta(1-\delta)^2(-u+1)^3 \times$$

$$\left\{ \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \right]$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

$$\rho^3 \int_0^1 \delta(1-\delta)(-u+1)^3 \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$\times \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right.$$

$$\left. - 2(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \right]$$

$$= \frac{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}$$

When  $u = 0$  and  $v = 0$ , we have

$$= \rho^3 \int \delta (1 - \delta) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \left\{ 1 - 2(1 - \delta) \right\} \int$$

$$= \rho^3 \int \delta (1 - \delta) (2\delta - 1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \int$$

$$3 u^2 \rho \int \delta (1 - \delta) (1+v)^2 (-u+1) \cdot \left( \frac{K}{L} \right)^{-u(1+v)+v}$$

$$\cdot \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \times \left\{ \delta + (1 - \delta) \cdot \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^2$$

$$\delta (1 - \delta) (1+v)^2 \left( \frac{K}{L} \right)^{-u(1+v)+v} \cdot \left\{ \log \left( \frac{K}{L} \right) \right\}^2$$

$$\times 2 \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \times (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v}$$

for  $3 u^2 \rho \frac{\partial^2}{\partial u^2 \partial v} = \frac{(-u+1) \cdot \log \left( \frac{K}{L} \right) \int}{\left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}$

$$= 3 u^2 \rho \int \delta (1 - \delta) (1+v)^2 (-u+1) \cdot \left( \frac{K}{L} \right)^{-u(1+v)+v} \left\{ \log \left( \frac{K}{L} \right) \right\}^3$$

$$\times \left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^2 - 2 \delta (1 - \delta)^2 (1+v)^2 (-u+1)$$

$$\left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \left\{ (1 - \delta) \right\} \left\{ \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^2$$

$$\left\{ \log \left( \frac{K}{L} \right) \right\}^3 \int$$

$$= \frac{\left\{ \delta + (1 - \delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}{}$$

$$\begin{aligned}
& 3 u^2 \rho \int_{\delta} (1-\delta)(1+v)^2 (-v+1) \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \\
& \left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right. \\
& \quad \left. -2(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \\
= & \frac{\left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}
\end{aligned}$$

When  $u = 0$  and  $v = 0$  then we have,

$$\begin{aligned}
& = 3 u^2 \rho \int_{\delta} (1-\delta) \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \left\{ 1 - 2(1-\delta) \right\} \\
& = 3 u^2 \rho \int_{\delta} (1-\delta)(2\delta-1) \left\{ \log\left(\frac{K}{L}\right) \right\}^3
\end{aligned}$$

$$\begin{aligned}
& 3 u^2 \rho^2 \int_{\delta} (1-\delta)(-u+1)^2 \left\{ -(1+v) \right\} \left(\frac{K}{L}\right)^{-u(1+v)+v} \\
& \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \times \left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^2 - \delta(1-\delta)(-u+1)^2 \\
& \cdot \left(\frac{K}{L}\right)^{-u(1+v)+v} \cdot \left\{ \log\left(\frac{K}{L}\right) \right\}^2 \times 2 \left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\} \\
& \times \left\{ (1-\delta) \left\{ -(1+v) \right\} \cdot \left(\frac{K}{L}\right)^{-u(1+v)+v} \left\{ \log\left(\frac{K}{L}\right) \right\} \right\} \\
\text{For } 3 u \rho^2 \frac{\partial^2}{\partial v^2 \partial u} = & \frac{\left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta+(1-\delta) \left(\frac{K}{L}\right)^{-u(1+v)+v} \right\}^4}
\end{aligned}$$

$$\begin{aligned}
& 3 u \rho^2 \left[ \delta (1-\delta)(-u+1)^2 \left\{ -(1+v) \right\} \left( \frac{K}{L} \right)^{-u(1+v)+v} \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \right. \\
& \quad \times \left. \left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^2 - 2 \delta (1-\delta)(-u+1)^2 \left\{ -(1+v) \right\} \right. \\
& \quad \times \left. \left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \left\{ \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^2 \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \right] \\
= & \frac{\left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}
\end{aligned}$$

$$\begin{aligned}
& 3 u \rho^2 \left[ \delta (1-\delta)(-u+1)^2 \left\{ -(1+v) \right\} \left( \frac{K}{L} \right)^{-u(1+v)+v} \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \right. \\
& \quad \times \left. \left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\} \right. \\
& \quad \left. - 2(1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right] \\
= & \frac{\left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}{\left\{ \delta + (1-\delta) \left( \frac{K}{L} \right)^{-u(1+v)+v} \right\}^4}
\end{aligned}$$

when  $u = 0$  and  $v = 0$  then we have

$$\begin{aligned}
& = -3 u \rho^2 \left[ \delta (1-\delta) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \left\{ 1 - 2(1-\delta) \right\} \right] \\
& = -3 u \rho^2 \left[ \delta (1-\delta)(2\delta-1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \right]
\end{aligned}$$

Now, rearranging the fourth term we have,

$$\begin{aligned}
& \frac{1}{6} \rho^3 \delta (1-\delta)(2\delta-1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 - 3 \rho^2 u \delta (1-\delta)(2\delta-1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 \\
& + 3 \rho u^2 \delta (1-\delta)(2\delta-1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3 - u^3 \delta (1-\delta)(2\delta-1) \left\{ \log \left( \frac{K}{L} \right) \right\}^3
\end{aligned}$$

$$= \frac{1}{6} \delta (1-\delta) (2\delta-1) \left\{ \log\left(\frac{K}{L}\right) \right\}^3 \left\{ \rho^3 - 3\rho^2 u + 3\rho u^2 - u^3 \right\}$$

$$= \frac{1}{6} \delta (1-\delta) (2\delta-1) (\rho - u)^3 \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

Finally,

$$\log\left(\frac{V}{L}\right) = \log A + \log\left(\frac{K}{L}\right) - \frac{1}{\rho} \delta (1-\delta) (\rho - u) \log\left(\frac{K}{L}\right) + \frac{1}{2} \delta (1-\delta) (\rho - u)^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2 + \frac{1}{6} \delta (1-\delta) (2\delta-1) (\rho - u)^3 \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

$$= \log A + \log\left(\frac{K}{L}\right) - \frac{1}{\rho} (1-\delta) (\rho - u) \log\left(\frac{K}{L}\right) - \frac{1}{2\rho} \delta (1-\delta) (\rho - u)^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2 - \frac{1}{6\rho} \delta (1-\delta) (2\delta-1) (\rho - u)^3 \left\{ \log\left(\frac{K}{L}\right) \right\}^3.$$

Hence,

$$\log\left(\frac{V}{L}\right) = \log A + \left\{ 1 - \frac{1}{\rho} (1-\delta) (\rho - u) \right\} \log\left(\frac{K}{L}\right) - \frac{1}{2\rho} \delta (1-\delta) (\rho - u)^2 \left\{ \log\left(\frac{K}{L}\right) \right\}^2 - \frac{1}{6\rho} \delta (1-\delta) (2\delta-1) (\rho - u)^3 \left\{ \log\left(\frac{K}{L}\right) \right\}^3$$

..... (6.2)

The above expression of VES production function is verified with the expression of CES production function by taking  $u = 0$ . The expression for CES production function is as follows:

$$\log\left(\frac{V}{L}\right) = \log A + \delta \log\left(\frac{K}{L}\right) - \frac{\rho \delta (1-\delta)}{2} \left[ \log\left(\frac{K}{L}\right) \right]^2 - \frac{\rho^2 (1-\delta) (2\delta-1)}{6} \left[ \log\left(\frac{K}{L}\right) \right]^3$$

..... (6.3)

Now we regress  $\log\left(\frac{V}{L}\right)$  on  $\log\left(\frac{K}{L}\right)$ ,  $\left[ \log\left(\frac{K}{L}\right) \right]^2$  and  $\left[ \log\left(\frac{K}{L}\right) \right]^3$  and find out the co-efficients for the expression of VES production function as mentioned in equation No. 6.2. From the Co-efficients of the expression we find out the value of the parameters for the VES production function.

## 6.2: The Empirical Response of the Function in Registered Manufacturing Sector of West Bengal:

We study this attention on West Bengal for Registered Manufacturing Sector wherein 8(eight) 3-digit industry groups of census sector have been chosen as sample to catch a literature on the 'response' of capital to the productivity of labour. We use the data from the census factories in the ASI Frame which bears the records for the year 1977-78. <sup>(10)</sup> Through the cross section data we find the following results:

Industry Group 251.

Jute and Mesta spinning and Weaving.

Equation for number of observations: 33.

$$3.3701 - 1.6543 \log\left(\frac{K}{L}\right) + 0.6408 \left[\log\left(\frac{K}{L}\right)\right]^2 - 0.054870 \left[\log\left(\frac{K}{L}\right)\right]^3$$

$$S.E. (1.4479) (0.7176) (0.1383) (0.015120)$$

$$t_{(29)}^* (2.5901) (-2.3053) (4.6321) (-3.6289)$$

$$T_{29}^t = 1.699 \quad F_{(3,29)}^* = 19.369 \quad F_{(3,29)}^t = 4.68 \quad R^2 = 0.67 \quad DW = 1.5131$$

From the equation we have

$$\log A = 3.3701$$

$$\text{So, } A = \text{antilog } 3.3701 = 5624.$$

Again, ( by 2nd co-efficient)

$$1 - \frac{1}{\rho} (1 - \delta) (\rho - u) = -1.6543$$

So,

$$-\frac{1}{\rho} (1 - \delta)(\rho - u) = -2.6543 \dots \dots \dots (6.4)$$

Another Co-efficient (2nd.)

$$-\frac{1}{2\rho} \delta (1 - \delta)(\rho - u)^2 = 0.6408 \dots \dots (6.5)$$

From 6.4 and 6.5 we have,

$$\delta (\rho - u) = -0.1207097 \dots \dots (6.6)$$

Again we have, ( from 3rd and 4th Co-efficient):

$$\frac{-\frac{1}{6\rho} \delta (2\delta - 1)(\rho - u)^3 (1 - \delta)}{-\frac{1}{2\rho} \delta (1 - \delta)(\rho - u)^2} = \frac{-0.054870}{0.6408}$$

$$\text{or, } (2\delta - 1)(\rho - u) = -0.0285424 \dots \dots (6.7)$$

Dividing (6.7) by (6.6) we have,

$$2 - \frac{1}{\delta} = 0.0285424$$

$$\text{Hence } \delta = 0.5670396$$

$$\text{So, } \rho - u = -0.212877$$

$$\rho = -0.0347237.$$

$$\text{and } u = 0.1781533.$$

Here we construct the VES function by the parameters:

$$V = 5624 \left[ 0.5670396^{0.0347237} + (1 - 0.5670396) \right]$$

$$\cdot \left( \frac{K}{L} \right)^{-0.1781533} (1 - 0.0347237) \cdot L^{-0.0347237} \left[ \frac{1}{0.0347237} \right]$$



## Industry Group 313.

Manufacture of Drugs and Medicines.

Equation for number of observation : 15.

$$0.9956 - 5.4813 \log(K/L) + 256.44 \left[ \log(K/L) \right]^2 - 169.03 \left[ \log(K/L) \right]^3$$

$$S.E. (0.1745) (6.1998) (48.781) (32.343)$$

$$t_{11}^* (5.7041) (-0.8841) (5.2569) (-5.2264)$$

$$T_{11}^t = 1.796 \quad F_{(3,11)}^* = 11.4000 \quad F_{(3,11)}^t = 3.59$$

$$R^2 = 0.76 \quad D^w = 1.5809.$$

From the Co-efficients of the equation we find out the parameters by previous Method:

Here,

$$A = 9.900$$

$$\delta = 0.502792$$

$$\rho = -3.018431$$

$$b = 42.364856.$$

By these parameters we construct the VES production function for the Industry Group:

$$V = 9.900 \left[ 0.502792 K^{3.01843} + (1-0.502792) \right.$$

$$\left. \cdot (K/L)^{-42.364856(1-3.018431)} \cdot L^{3.018431} \right] \frac{1}{3.018431}$$

## Industry Group 330.

## Iron and Steel Industries.

Equation for number of observations :21.

$$-6.8074 + 4.4950 \log(K/L) - 0.4589 [\log(K/L)]^2 + 0.00014996 [\log(K/L)]^3$$

$$S.E. ( 8.1582 ) ( 3.8023 ) ( 0.4396 ) ( 0.00036462 )$$

$$t_{(17)}^* ( - 0.8344 ) ( 1.1822 ) ( -1.0438 ) ( 0.4113 )$$

$$T_{(17)}^t = 1.740, \quad F_{(3,17)}^* = 4.3286 \quad F_{(3,17)}^t = 3.20$$

$$R^2 = 0.43 \quad D^W = 1.7038$$

From the co-efficients of the equation we find out the parameters as;

$$A = .6418E-05.$$

$$\delta = 0.5004146$$

$$\rho = 0.0187531$$

$$u = 0.1499461.$$

By these parameters the production function is:

$$Y = .6418E-05 \left[ 0.5004146 K^{-0.0187531} + (1 - 0.5004146) \right.$$

$$\left. \cdot (K/L)^{-0.1499461(1+0.0187531)} \right]^{-\frac{1}{0.0187531}}$$

## Industry Group 331.

Foundries for casting and forging iron and steel.

Equation for number of observations : 15.

$$-1.1395 + 457.21 \log(K/L) - 227.32 \sqrt{\log(K/L)} - 0.2957 \sqrt{\log(K/L)} J^2$$

$$S.E. (0.7365) (294.21) (147.35) (1.7428)$$

$$t_{(11)}^* (-1.5471) (1.5540) (-1.5375) (0.1696)$$

$$T_{(11)}^t = 1.796 \quad F_{(3,11)}^* = 4.7648 \quad F_{(3,11)}^T = 3.59$$

$$R^2 = 0.57$$

$$D^W = 2.7403.$$

From the Co-efficients of the equation the parameters are:

$$A = .1379$$

$$\delta = 0.4995653$$

$$\rho = 0.0005479$$

$$u = 0.4992606$$

By these parameters the production function is:

$$V = 0.1379 \sqrt[0.4995653]{K}^{-0.0005479} + (1 - 0.4995653)$$

$$\cdot (K/L)^{-0.4992606(1+0.000547)} \cdot L^{-0.000547} J^{-\frac{1}{0.000547}}$$

## Industry Group: 340.

Manufacture of fabricated metal products such as metal cans from tin-plate, terne plate or enamelled sheet metal, metal shipping containers barrels, drums, kegs, pails, safes vaults, enamelled sanitary products. (11)

Equation for number of observations : 18.

$$3.7263 + 1.4601 \log(K/L) - 0.7262 \sqrt{\log(K/L)} + 0.091903 \sqrt{\log(K/L)}^2$$

$$S.E \quad (16.178) \quad (11.582) \quad (2.7262) \quad (0.2111)$$

$$t_{(14)}^* \quad (0.2303) \quad (0.1261) \quad (-0.2664) \quad (0.4363)$$

$$T_{(14)}^t = 1.761 \quad F_{(3,14)}^* = 4.0286 \quad F_{(3,14)}^t = 3.34$$

$$R^2 = 0.46$$

$$D^w = 2.0048.$$

From the Co-efficients of the equation the parameters are:

$$A = 5325$$

$$\delta = 0.5137303$$

$$\rho = 1.6235427$$

$$u = 3.1597109$$

Hence the VES production function for the industry Group:

$$V = 5325 \sqrt[0.5137303]{K}^{-1.6235427} + (1 - 0.5137303) \cdot (K/L)^{-3.1597109(1.6235427)} \cdot L^{-1.6235427} \sqrt[1.6235427]{1}$$

Industry Group : 231.

Cotton spinning, weaving, shrinking, sanforizing  
mercerising and finishing of cotton textiles in mills.

The equation for number of observations: 18.

$$3.7401 - 315.89 \log(K/L) + 81.033 \sqrt{\log(K/L)} - 6.8947 \sqrt{\log(K/L)}^2$$

$$S.E. (124.94) (102.99) (28.143) (2.5497)$$

$$t_{(14)}^* (3.2978) (-3.0671) (2.8794) (-2.7041)$$

$$T_{(14)}^t = 1.761 \quad F_{(3,14)}^* = 12.146 \quad F_{(3,14)}^t = 3.34$$

$$R^2 = 0.72 \quad D^W = 1.4298$$

From the co-efficients of the equation the parameters  
are as noted:

$$A = 5496$$

$$\delta = 0.5623738$$

$$\rho = -0.0003139$$

$$u = 0.2276655$$

By these parameters the VES production function for the  
industry group .

$$V = 5496 \sqrt{0.5623738 K^{0.0003139}} + (1 - 0.5623738)$$

$$\cdot (K/L)^{-0.2276655} (1 - 0.0003139) \cdot L^{0.0003139} \sqrt{\quad} - \frac{1}{0.0003139}$$

Industry group: 356

Manufacture alteration and repair of general items of non-electrical machinery, components, equipment and accessories.

The equation for number of observations: 6.

$$-61.331 + 47.825 \log(K/L) - 11.666 \left[ \log(K/L) \right]^2 + 0.9483 \left[ \log(K/L) \right]^3$$

$$S.E. (37.657) (26.850) (6.3096) (0.4886)$$

$$t_2^* (-1.6281) (1.7812) (-1.8490) (1.9409)$$

$$T_2^t = 2.920 \quad F_{(3,2)}^* = 32.044 \quad F_{(3,2)}^t = 19.2$$

$$R^2 = 0.98 \quad D^W = 1.3563$$

From the Co-efficient of the equation the following parameters are;

$$A = .2143 E - 60$$

$$\delta = 0.5610143$$

$$\rho = 0.0020816$$

$$u = 0.2241262.$$

By this parameters the function is:

$$V = .2143E-60 \left[ 0.5610143 K^{-0.0020816} + (1 - 0.5610143) \right]$$

$$\cdot \left( \frac{K}{L} \right)^{-0.2241262(1+0.0020816)} \cdot L^{0.0020816} \cdot \frac{1}{0.0020816}$$

## Industry, Group : 343.

Manufacture of hand tools and general hardware.

The equation for number of observations: 8.

$$26.459 - 13.857 \log(K/L) + 2.6234 \left[ \log(K/L) \right]^2 - 0.1463 \left[ \log(K/L) \right]^3$$

$$\text{S.E.} \quad (182.65) \quad (102.02) \quad (18.402) \quad (1.0663)$$

$$t_{L}^* \quad (0.1449) \quad (-0.1358) \quad (0.1426) \quad (0.1372)$$

$$T_{L}^t = 2.132 \quad F_{(3,4)}^* = 0.8528 \quad F_{(3,4)}^t = 6.39$$

$$R^2 = 0.39 \quad D^W = 1.8372.$$

Since, the co-efficients are statistically very insignificant, we set the K'menta approximation of the CES production function for the same number of observation.

The equation for K'menta approximation is;

$$-1.4834 + 0.6227 \log L - 134.85 \log(K/L) + 68.235 \left[ \log(K/L) \right]^2$$

$$\text{S.E.} \quad (0.5723) \quad (0.1318) \quad (392.11) \quad (196.12)$$

$$t_{L}^* \quad (-2.5920) \quad (3.9662) \quad (-0.3439) \quad (0.3479)$$

$$T_{L}^t = 2.132 \quad F_{(3,4)}^* = 9.8825 \quad F_{(3,4)}^t = 6.39$$

$$R^2 = 0.88 \quad D^W = 2.3577.$$

So, for the industry group 343 we are away from decision making as the number of observations are not sufficient to have a good fit multiple regression line.

From the results we find the fact that the VES production function is consistent and dominant in some important homogeneous and finer class of industries under Registered Manufacturing sector of West Bengal. It lends substantial support to the fact that the VES production function is a more relevant hypothesis for Indian industries compare to the homogeneous production function. The capital labour ratio variable is also an extremely important variable which cannot be ignored in explaining productivity.<sup>(12)</sup>

Most of the studies relating to estimation of production function show a decline in the capital productivity and an increase in labour productivity, Mostly because of capital intensity in Indian Industries.<sup>(13)</sup> We find no exception for this. Here we have no answer for other place in India where investors increase capital intensity and follow labour displacing technology when labour productivity is high. We have answer for West Bengal.

Here for all these industries since,  $u > 0$ , a higher product per man is obtained by increasing the capital per worker, So, capital intensive method of production is preferred to all the seven industry groups in West Bengal. Here more and more capital in need of higher productivity of labour is likely to induce the manufacturing unit to use more capacity in existence. It reveals that the investors of West Bengal industries increase their capital intensity in industry as here labour productivity is sufficiently low for which investigation may be of exploratory type.



### 6.3: The Exploration of Function of the Units under the Industry Groups:

For jute and mesta spinning, weaving and finishing works (industry group 251) under factory system, mainly in Howrah and hooghly area, we find tragic suffering of the industry which once had a dominant role in economic life of Bengal. The competition from substitutes violently disrupted the industry as jute manufactures are now commanding uneconomic prices in the international markets. Besides set-back here 'almost all factories produce only certain type of goods required traditionally so far as in certain markets'.<sup>(14)</sup>

The recruitment in jute industries has already been stoped for a decade and in some units the staffs are eager for taking early retirement. Few jute mills are engaged in selling their land to building promoters. In almost all factories there exist old, worn-out and obsolete machinery. Only a few jute mills are running in well condition as, Calcutta Jute Mfg. Co. Ltd., Anglo Indian Jute Mill, Aucland Jute Mills, Kelvin Jute Co. Ltd., Hukumchand Jute Mills, Birla Jute Mfg. Co. Ltd. Empire Jute and Baranagar Jute fey Co. ltd. Many are likely to be closed as loans and subsidies won't pull them a long time. These are Union Jute Co. Ltd., (Cal), Khardh Jute Mill at Titagarh, Anglo Indian Low Jute Mill at Jagatdal, Sri Ram Jute Mill, Sri Hanuman Jute Mill, Premchand Jute Mill, Naskarpur Jute Mill Co. Ltd and Wellington Jute Mill at Rishra in Hooghly.

Now, research on jute is a positive endeavour to diversify production as it is sometimes combined with wool in carpets and with cotton, linen or silk in draperies or novelty dress fabrics. The outcome of research has proved that the effect of capital for modern dyeing, printing bleaching and artistic weaving is a fillip to the productivity of labour.

The pharmaceutical works, under industry group 313, in West Bengal had been developed in early sixties, when many establishments and Cahoots came into force. The then production of Ayurvedic medicines in the form of granule, Kejal, liquid, oil, powder, ointment and syrup have imposed impression in the minds of people through the establishments like Sadhana Aushadhalaya and Dabar. Homoeopathic medicines being the cheapest among all types of drugs and medicines are now becoming popular in poor mass for which the Economic Homeo Pharmacy and National Homeo Laboratory wage into better days. For the production of bio-chemic and chemical medicines many units set up modern machines which are although not ahead of their times for quality production but indispensable for labour productivity and market. We observe modern set of machines in these units like Bengal Chemical & Pharmaceutical Works Ltd., Smith Stanistreet, Albert Devid Ltd., Dey's Medical Store (Mfg), East India Pharmaceutical Works Ltd., Standard Pharmaceutical Works Ltd. & Rallis India Ltd. ( Pharmaceutical Div.). Due to desisidene with labour organisation for modern machines few units like Dy-SE Chems Ltd., EMKE Pharmaceutical Ltd. BMG Pharmaceutical & Balahari Sarkar and Bros. have designed in

themselves to create ill will as they can't go through helve after the hatchet.

Even greater efficiency and speed were achieved with the introduction of the continuous casting method in different steel mills under industry Group 330 in West Bengal, the total production in the year 1988 was not a cut above the production for the year 1978. The causes for deterioration of production in different units were surveyed. The entrepreneurs from the units like K.R. Steel Unions Pvt. Ltd. at Nadia, Hind Wire Industries Ltd at Sukchar, Bengal Steel Industries Pvt. Ltd. at Agarpara, Bharatiya (Com) Co. Pvt. Ltd in 24 Parganas, Chaliha Rolling Mills Pvt. Ltd. in Calcutta, Swastika Steel & Allied product, Bhagawati Steel (P) Ltd. and Chowdhury Iron Co. (P) Ltd. at Howrah opened that the producers from outside states regularly rig the market and brought them to a stalemate. By this many units at Howrah as Aluminium cables & Conductors Pvt. Ltd., G & H Show Pvt. Ltd., Golden Steel Corporation Pvt. Ltd., Liluah Steel Wire Co. Ltd., Grand Smithy Works, Kuram Iron & Steel Works and Rishi Rolling Mills are likely to be closed within few days. Many foundry units under industry groups 331 at Banaras Road of Howrah keep their shop open to collect raw materials and sell the same at a premium outside the state. About labour few entrepreneurs let the cat out of the bag that capital is the compromising factor for greater productivity in their units. But labour organisations stand for popular believe against modernisation. It comes into light when we see that IISCO at

Burnpur and D.S.P. at Durgapur modernisation schemes which would offer vast opportunities for growth and development of small scale and ancillary industries in the state, are now a bone of contention among trade unions.

For fabricated metal products, under industry group 340 few units are important for their contribution. These are Containers & Cloures Ltd. at Naihati, The Metal Box Company of India Ltd. in Calcutta, Industrial Container Ltd. at Paharpur, Annapurna Metal Works near Bondel Road Rly. Crossing, Sri Iron Foundry and Engg. Works Pvt Ltd. at Liluah, the Oriental metal Industries Pvt. Ltd. at Agarpara, Pioneer Industrial Works Pvt. Ltd. and Dewarance & Mecneill Co. Ltd. in Calcutta. They produce the quality but not as much as needful for export business. Few established units did not make an effort to build up financial strength even during periods of good business. It has been found that the units like Bal Gopal Bose Iron Co.(P) Ltd. at Kiddirpore, the oriental Metal Industries Pvt. Ltd. at Agarpara and India Industries (P) Ltd. at Salkia are not interested to run their units and wanting to close them down to show sickness with the hope that they will get compensation for land, building and equipment at market prices. By compensation they want to start either new business or a new unit outside the state. Although for this type of situation the interest of labours is safeguarding by the Working Group of Central Trade Unions. (15)

Like other traditional industries Cotton has been afflicted with sickness, although many units in West Bengal have not been formally declared, but have become sickness prone. For this we state that from 1980 to 1988 only one cotton mill entered in the industry and with this we count 42 working units in the state. For that period more or less 324 additional looms and 206 thousand spindles have been installed with more employment in the industry. But additional machine and men gave nothing as when we see that total production of piece goods was 124800 thousand meters in the year 1980 and 73754 thousand meters in the year 1988. So, also the total production of yarn was 72164 thousand kgs. in the year 1980 and 66956 thousand kgs in the year 1988. It shows that the industry has failed to achieve the desire capacity utilisation as Productivity of labour is sufficiently lower than the productivity of labour of same industry in Maharashtra. In early years of seventies many cotton textiles Mills in West Bengal had been fallen in labour trouble; everywhere found 'ca'canny' which was connived at union-leaders' dream for socialism. Being hopelessly unsuitable for compromise ' few owners milked their enterprises dry, declared them closed, then handed it over to the Govt. '(16)

In such situation nationalisation of units like Manindra Mills at Cossimbazar, Sri Annapurna Cotton Mills at Shyamnagar, Podder Projects Ltd. at Garden Reach, Vinod Textiles Industries at Jugberia, Basanti Cotton Mills Ltd. at Panihati, New Gujrat Cotton Mills at Uluberia and Arati Cotton Mills at Dasnagar had been carried for interest of the labours. But what about

productivity when the free new management redesigned their units? For improvement of quality and quantity of production to withstand competition in the market, the belief of the labour organisations on modernisation/ rationalisation in state industries' is conditioned by leftist politicians in power. Being in doubt on state Govt's sincerity for owners interest, many units thus cut back their production by depicting the activity with greater excess capacity.

One wonders why units under industry group 356 — producing non-electrical machinery, compounds and equipments comprised of air / gas compressor, ball-bearing, booster pumps, centrifugal machines, cranes, crushers, derricks, foot-valves, worn gears and mechanised jackets — have not been increased for a long time. It is true that the growing use of electrical machineries expressed the demand for oil-engine and hence the accessories for alteration and repair. The producers of Gujrat, Maharastra and Delhi are now in market with well-finished machineries and equipments cheaper than those of Calcutta-Howrah which once earned itself the name, Sheffield in India for experties in manufacturing machinery equipment. Only few units are reletively long in existence and advance in years as International Combustion (India) Ltd. at Hoogly, Johnstone Pump(P) Ltd. at Panihati, Flender Macnell Gears Ltd. and Garden Reach Workshop Ltd. in Calcutta. Many units are in bad shape as Viswa Engineering Works at Belurmeth, Kusum Engg. Co. Ltd. at Sukchar, C. Comers & Sons Ltd. in Calcutta, Baroja Vegal Pumps (P) Ltd. at Batanagar and Tecalmit ( Hind) Ltd. in 24-Parganas.

The high wage in big units is now an envy of workers in small units by turmoil which turning the entrepreneurs to run their units at below the mediocre level. It sets in a chain of reaction at small and smaller units.

Industrial units in West Bengal are now facing so many exogeneous and indogeneous problems which limit their function and finally force them to run into the mediocre performance at below the level. Here not all but few problems are out of the common. May be manufacturers would beset with difficulties of distribution, face the rig of market, get changes of preference, see storatage of power, raw materials, transport and would experience detariorating industrial relation by many reasons and what may we not say all these are descended from modern manufacturing and business activity wherein entrepreneurs are to gain on some one in a race to outweigh the rivals' reaction. But, if they are forced to bent on doing something, no one will be so callous to suffering. So, their preference reveal to run enterprises with greater excess capacity in which only addition of technology responds to productivity.

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**CHAPTER - VII.**

**MARKET STRUCTURE, BARGAINING POWER OF LABOUR AND**

**NATURE OF MANAGEMENT AS THE CAUSE AND**

**EFFECT OF EXCESS CAPACITY**

**: A FIELD SURVEY.**

## CHAPTER - VII.

### MARKET STRUCTURE, BARGAINING POWER OF LABOUR AND

### NATURE OF MANAGEMENT AS THE CAUSE AND

### EFFECT OF EXCESS CAPACITY

### : A FIELD SURVEY.

7.0: The mediocre performance of industrial unit results from an obligation to build mechanism against conflicting considerations for which compromise is unreasonable. If Govt. industrialisation is politically dependent on organised labour and if unions are dominating forces in the Govt. party then for political reason it cannot adopt a strong policy in negotiations. The inevitable results are concession in wage rates, fringe benefits, over manning, absence of rapport among management and unions, faulty planning which make an adverse to capacity utilisation. For private sector enterprises self interest, self-responsibility and unwillingness to face all maladies born from socio-political culture limit the function and finally keep management away from manoeuvre. Many factors come to cease manoeuvre to pull down production; but few among

them are important for which inference can be drawn through ratiocination. In our assignment we work out following factors as the causes and effects of excess capacity:

- (1) Market Structure,
- (2) Bargaining Power of Labour,
- (3) Nature of Management.

#### 7.1: Market Structure:

In a free-enterprise economy, marketing activities bring about a flow of goods and services from producers to users or consumers. Therefore, the principal activity in marketing is selling. The producer sells goods to a wholesaler; the wholesaler to a retailer; and the retailer to a consumer. For a product following this channel, transportation and storage are generally arranged by wholesalers. The product may be advertised and promoted by producer or wholesaler. Now a days may producers are quite concerned with and involved in the full marketing sequence for their products. It is becoming more and more common, particularly with large manufactures, for a sales or marketing department to plan and direct the entire marketing effort. The practice of a producer planning or managing the marketing of his product past an initial sale is often referred to as the marketing

concept.<sup>(1)</sup> To develop a plan or strategy, the manufacturers' marketing department must estimate when, where and in what quantities a product will be needed or wanted.<sup>(2)</sup> The marketing department will probably also have a substantial voice in making production and packaging decisions — that is directing production to-wards the more salable products, styles and designs. To carry out a marketing strategy, the manufacturer must have the co-operation of wholesalers and retailers.<sup>(3)</sup> So, to run the industrial enterprise the marketing knowledge has now become essential for the proprietor.<sup>(4)</sup>

In our assignment we study the marketing through a survey for different products under Registered Manufacturing Sector of West Bengal and find the following tertiary events which directly or indirectly have averted the performance of industrial units.

#### 7.1.1: The locking up Working Capital: A Liquidity Problem:

The purchasing input and selling output peculiarly affect the working capital of industrial unit. The working capital<sup>(5)</sup> comprises of:

Cash in hand  $\pm$  (Amount receivable — Amount payable)  
 + Value of finished goods in stock + Value of unfinished goods + Value of raw materials (inputs) in stock.

In the face of crisis for working capital the entrepreneurs purchase raw-materials on debit which come through big wholesalers who charge high prices for the items. Then after processing entrepreneurs sale the output to other wholesalers on credit which is likely receivable in due time. But in practice the traders use the sale-value as their working capital for a few days when a crisis generates for working capital in manufacturing units. So, the lots of amount receivable and amount payable affect the production operation of industrial enterprise.

In non-census sector many units for manufacture of bakery products, grain milling, oil milling, flour milling and beverages suffer from the above peculiar event. For bakery products the units Floras Bakery, Tower White Products, Standard Biscuits, Barua Bakery (P) Ltd. at Calcutta, East Bengal Biscuits Factory at Ultadanga, Zenith Biscuits Co. at Belgachia, Paramount Traders at Durgapur and Paradise Bakery in Birbhum had reported the shortening of working capital through the crisis of amount receivable and amount payable. For oil and flour mills we observed that wholesale traders unnecessarily had put off time for payment against credit for which the producers were compelled to sit idle for sometimes; and they did not want to miss the wholesale traders as the producers from other states provide privilege to the traders for making payment. Pursuant to an enquiry for soft drink and carbonated water industries the same type of problem had been

reported by Spencer Acreated Water Fey (P) Ltd. at Entally, Ferrinni Eleven Up, Sambhunath Pandit St. in Calcutta and Rose & Thistle at Calcutta in slight different view.

### 7.1.2: The Discardment of Wholesalers.

The wholesale traders play an important role to distribute a product to the retail traders. For a product they are key to make an advent before the consumer. In non-census sector many entrepreneurs under industry group of weaving and finishing cotton textiles in powerlooms, and bleaching of woolen textiles, spinning weaving and finishing of synthetic fibres, rayons and bylons eat their heart out over their failure to get favour from the wholesalers who are always engaged to know on which side the bread is buttered. We observed that the units like Basak Textiles, Ranaghat, Sri Sita Ram Co, at Agarpara, Pranati Textiles at Dum Dum, Amar Bharat Textiles at Cossipur, Siddeswari Powerlooms, Adharsha Powerlooms and Domjur Powerlooms at Howrah, Oriental Tape Mefg. Co. at Shibpur, Ladak Chand Yoras Cotton Waste Fey at Salkia and Kusum Wool and Woolen at Belighata are trembling in the balance. By few observations we ever that the product of the Co-operative societies were always evaded by the wholsale traders.

### 7.1.3: Discouraging Market for Few Products:

The two main industrial products as Jute and Tea have fallen in trouble due to a tough competition and disruption of market



abroad. Many substitutes as plastic, paper and synthetic fibre bags have threatened the demand for gunny bags which are main products of 68 jute mills in West Bengal. Jute research had developed many possible commercial decorative products which may have high artistic value and market in home and abroad; but little effort have made to produce and sale them in market. For tea a similar scene of market disruption has recently been observed as now is developed countries of Europe and America Coca-cola and bear are preferred to tea which relivently change the degree of capacity utilization of domestic tea producing units.

#### 7.1.4: The Inert Action against Competition:

From few specific places of India different industrial products are now suppling profusely in the market where products of West Bengal are bring at bay through competition. Saveral products as textiles, chemicals, perfumes, glass, transport equipments, cutlery and kitchen ware, Razer, blade, springs, machines, machinery parts and accessories, electric generators, switchgear and motors, photographic and optical goods, and various nonmetallic meneral products from Bombay, Delhi, Gujrat and Madras have overfilled the markets where Bengal's products annex to an insignificant amount to the stack. Now products from few other places as Hoslery products from Ludhiana & Kanpur Glass from Pune and Chemical products from Vijoyara, Faridabad, Borada and Kanpur, Engineering goods from Bangalore, Hydrabad,

Ranchi, Raypur, and Bhupal, sports goods from Amritsar, Sanatary items from Orissa, Ahmedabad and Faridabad have become popular in the market where Calcuttan products have never stolen a much on some one.

#### 7.1.5: Little Concernment about Marketing Knowledge:

Verily, an industrial product can be promoted and an entrepreneur can make the most or best of modern marketing knowledge. But here we observe that many of them had little programme for entire marketing effort as they did never concede to the marketing concept. We study the promotion effort for few products and find fault with following items as Veneer Plywood, Leather and Plastic products, Footwear, Petroleum and Coal products, Tiles, Asbestos, Sanatary Plumbing fixtures and pens. In Many instances, once the producers had sold his product to a wholesaler he had little or no further concern with where it had gone, who had retailed it or who had finally used it. This inefficient marketing practices had resulted in lost sales and lost profits to the producers.

#### 7.1.6: Unfavourable Orders:

Unfavourable orders from big units dismay the small units under non-census sector and make production operation more dismal in character. As in the year 1989 most of the orders

from Durgapur Steel Plant had gone outside the state. A very small percentage of orders between 17 to 20 percent had been placed with the local units. At least 85 local units were selected for modernization jobs in the D.S.P. and only 56 units got work orders. Owners of units under non-census sector reported that the biggest chunk of the D.S.P.'s orders had been secured by a big industrial house and some favourable companies which had no such capacity to deliver the goods. Then they did pass the order to small units at a very low rate. A sort of guerilla war had been done among small units to secure those orders. That cut throat competition did further lowered the rates. If this continues, many units in Durgapur-Asansole will close in no time. (6) The Ruhr of India is now failing to fulfil its purpose to cut a dash on industrial works.

#### 7.1.7: Enhancement of Price through Standarization:

Higher price for higher quality does not always follow favour of all consumers; only a small section does prefer to a good quality what a higher price of it. So production of a quality should be tied with reasonable cost and pricing. But here we have few observations on the products of some units in different industry groups; as for machines tools parts and accessories units are Elench Engg. (P) Ltd., Calcutta, Indian Tools Crafts at Dasnagar, Procession Tool & Instruments (P) Ltd. at Narendrapur and B.S. Machine Tools Crps. at Jessore Road; for asbestos caramic and pottary products the

units are Asbestos Cement Ltd. at Taratola, Techno Ceramic India at Panihati, Modern Art Floor Ltd. at Hooghly and Hindustan Pottaries of Liluah; for rubber and leather products the units are India Rubber goods Mfg. Co. in Calcutta, Kep Rub (P) Ltd. at Liluah and National Tannery Co. Ltd. (footware Dvin.) in Calcutta. Most of the units were engaged in production of quality which enhanced high price beside that a slight below quality, the product of Delhi Gujarat and Maharashtra, at lower price had appeared in the market to despire of their success.

#### 7.1.8: Production Gap.

Of course, the West Bengal industries have failed to form specialised products, the items for to-day's society and industries, for which producers of Bombay, Gujrab and Delhi put their best foot forward. No industrial units either in census or non-census sector have so far been set up in the state to produce the following specialized items for which a big volume of market demand is domineering by few producers in India. The products are in 4th digitd form i.e. in Sub-groups: (7)

<u>Sub-Group:</u>	<u>Description</u>
248.1	Printing, dyeing and bleaching of synthetic Textiles by hand.
248.2	Printing, dyeing and bleaching of synthetic Textiles other than by hand.

Sub-groups:	Description.
268.1	Manufacture of coir fibre and yarn.
268.2	Manufacture coir Matting, Carpets etc.
268.3	Manufacture of coir ropes and twins.
268.9	Manufacture of other coir products.
270.1	Manufacture flush doors and boards.
281.1	Manufacture of Pulp (Machine made).
293.2	Manufacture of ladies leather purse and hand bags.
302.6	Manufacture of Foam Rubber Mattresses and cushions.
303.2	Acrylic Plastic Sheets.
303.3	Reinforced and laminated plastic sheet.
319.5	Manufacture of Glue and gelatine.
319.6	Manufacture of Synthetic sweeteners.
321.5	Manufacture of optical glass.
321.7	Manufacture of glass Bingles.
357.2	Manufacture of Broaching Drilling and Threading Machines.
357.3	Manufacture of Milling, Planing, Shaping, Gear cutting and Slotting Machines.
357.4	Manufacture of Grinding, Lapping, Honing and Polishing Machines.
357.5	Manufacture of Sowing, Contour sowing Filling and cut-off machines.

<u>Sub-groups:</u>	<u>Description</u>
357.6	Manufacture of metal forming Machines.
387.2	Manufacture of Pencil.
387.6	Carbon & Type writer Ribbon.

Following the expansion of industrial works in other specific places of India, as we have mentioned earlier, the market for industrial inputs which are the products of other industries, have become wide open closely to the areas. For engineering and manufacturing of machines, Howrah, the sheffiled of India, is now experiencing a depressing demand for her product in India. By this Guest Keen William, Bridge & Roof, Hooghly Docking are in bad shape. The small engineering units around Bellious Road are in a moribund state. All foundry units around Banaras Road one on the verge of collapse. A big engineering units, which had reopened a few years ago under a new name, had closed down again. (8)

## 7.2: Bargaining Power of Labour:

Bargaining between management and union represents a situation where a single seller faces a single buyer.<sup>(9)</sup> In a developing economy the demand for higher wages is geared up to the inflationary situation as nominal wages hardly get around real wages. Like a developing country, India has been shocked at this setback since 1961. Between 1961 and 1975 money wages rose by 107 percent ( Base 1961 = 100 ) but the

working class consumer price index had gone up by 217 percent during the same period. As a result, the index of real earning decreased by 35 percent. Leaving a few years, the index number of real earnings was less than 100 (1961 = 100) showing a deterioration in the standard of living of the masses. <sup>(10)</sup>

This shows the extent of inflation and its adverse effect on the working classes. Since 1972, rise in prices was much higher than in money wages and real earnings had some down for all industrial workers, demand for higher wages had become slogan in every industrial units in which many were hit out

at labour unrest. There was no exception to this for West Bengal. But here bargaining power of labours had been put forward by rulling political parties; and in addition to nominal wages many other privile-ges had thrust at the demand. Higher wage does not always lead to higher productivity. <sup>(11)</sup>

Only gaining on productivity the cost condition does concede to pay higher wages for labours. <sup>(12)</sup>

In West Bengal labour productivity had responded to wages only in few industries. Following 'Instrumental Variable Method to the VES production function <sup>(13)</sup> we study on the response of wage (W) and technology ( $K/L$ ) on productivity in some industries under Registered Manufacturing Sector of West Bengal for the period from 1978 to 1986 and find interesting results.

For eight industries we set eight equations; and all of them satisfy the test of overall significance with maximum

percentage of variation of productivity explained by the regression plane. As through Durbin and Wasson test two of them suffer from the problem of auto-correlation. The results reflect that the productivity responds to wages for only 4 (four) industries as 25, 31, 35 and 37. The calculated t values for the co-efficients of the variable W being higher than those of table values we accept that the Co-efficients are significant to explain labour productivity in those four industries. For two cases the labour productivity does respond to technology. From the results we reel off the fact that productivity of labour in the industries of West Bengal does not lie behind the nominal wages. It does corroborate in table 7.1 where for same period, wages in public sector units raised remarkably than those of private sector units for same industries. The higher productivity in public sector units is not the result of higher wages. As we have mentioned that higher labour productivity in public sector units is maintained through higher amount of capital per labour which pushes back the productivity of capital and keeps up the excess capacity in the units under the sector. It may be, more exploitation resulted in higher capacity utilization at private sector units. But here bargaining power of labours has gone to such extremes that the entrepreneurs sometimes take the insult lying down: sometimes fell in with disputes which carry through stoppage of works i.e. strikes and lock-outs.



The equation for VES Production function by  
Instrumental Variable Method:

$$\log(V/L) = a + b \log w + c \log(K/L) \dots \dots (7.1).$$

Industry Code	Obs.	$\log(V/L)$ on $\log w$ and $\log(K/L)$	$R^2$	$F_{2,4}^*$	$D^w$
21	7	$-7.1833 + 0.5555 \log w + 2.0780 \log(K/L)$ S.E. (5.7279) (0.4626) (1.6845) $t_{(4)}^*$ (-1.2541) (1.2008) (1.2336) $t_{L_4}^T = 2.132$	0.83	9.5051	2.0629
				$F_{2,4}^T = 6.94$	
25	6	$-.40362E-01 + 0.7382 \log w + .038134 \log(K/L)$ S.E. (.24268E-01) (.31722E-01) (.18216E-01) $t_2^*$ (1.6632) (23.232) (2.0934) $t_2^T = 2.920$	0.99	471.84	2.3214
				$F_{2,2}^T = 19.0$	
27	7	$1.5961 + 1.0118 \log w - 0.3265 \log(K/L)$ S.E. (0.4317) (0.5809) (0.4820) $t_{L_4}^*$ (3.6968) (1.7436) (-0.6774) $t_{L_4}^T = 2.132.$	0.88,	14.110	3.06
				$F_{2,4}^T = 6.94$	
29.	7	$-2.7444 + .084157 \log w + 1.5222 \log(K/L)$ S.E. (1.0063) (.057450) (0.2270) $t^*$ (-2.7273) (1.4649) (6.7062) $t_{L_4}^T = 2.132$	0.98	24.222	2.46
				$F_{2,4}^T = 6.94$	

Industry Code	Obs.	$\log(V/L)$ on $\log w$ and $\log(K/L)$	$R^2$	$F^*$	$D^w$
31	7	$3.7710 + 2.9045 \log w - 2.2242 \log(K/L)$ S.E. (1.1676) (0.5295) (0.6229) $t_L^*$ (3.2297) (5.4852) (-3.5709) $t_L^T = 2.132$	0.96	46.21	2.27
				$F_{2,4}^T = 6.94$	
34.	7	$0.1956 + 0.5898 \log w + 0.2937 \log(K/L)$ S.E. (0.4010) (0.4662) (0.5748) $t_L^*$ (0.4878) (1.2651) (0.5111) $t_L^T = 2.132$	0.80	7.83	1.51
				$F_{2,4}^T = 6.94$	
35	7	$-0.8591 + 0.9272 \log w + 0.2983 \log(K/L)$ S.E. (0.3042) (0.062378) (0.093769) $t_L^*$ (-2.8241) (14.865) (3.1810) $t_L^T = 2.132$	0.99	334.00	2.81
				$F_{2,4}^T = 6.94$	
37	7	$0.9555 + 0.9096 \log w - 0.093502 \log(K/L)$ S.E. (1.5586) (0.1363) (0.3201) $t_L^*$ (0.6131) (6.6749) (-0.2921) $t_L^T = 2.132$	0.92	22.327	2.02
				$F_{2,4}^T = 6.94$	

Source: Data prepared from statistical  
Abstract, West Bengal(1978-1989)  
174. P. 460-475 and A.S.I. Frames 1978-79

Table : 7.1

Average Annual Wages of The Employees  
by Industry in West Bengal (in Rs. )

Industry	For Govt. Factorles (in Rs. )			For other Factorles (in Rs. )		
	1984	1987	Indes as 1984=100	1984	1987	Index as 1984=100
20	12381	14749	119	4626	6148	133
21	6470	6827	106	6318	6773	107
22	-	-	-	12508	14059	112
23	11171	13012	116	11200	12348	110
24	6836	8133	119	15816	15858	100.2
25	8096	14652	181	9768	14148	145
26	-	-	-	11494	11511	100
27	-	-	-	7947	6839	86
28	13524	15185	112	8779	11548	132
29	-	-	-	8357	9965	119
30	10442	16389	157	8362	11622	139
31	12486	13459	108	13254	11055	83
32	11437	11458	102	9993	7456	75
33	-	-	-	10288	10607	103
34	15647	18187	116	11282	13468	119
35	12338	16502	134	12919	11623	90
36	10052	16724	166	13576	12430	92
37	15752	16715	106	15911	19003	119
38	9363	15179	162	10588	8394	79
40	-	-	-	14681	19688	134
73	-	-	-	3685	5442	148
74	-	-	-	8255	10432	126
82	-	-	-	5623	13644	242
95	-	-	-	4581	5992	131
96	-	-	-	3333	6005	180
97	14201	15218	107	7643	8543	112

\* Table prepared from the source: Chief Inspector of Factorles, West Bengal. P529- 530 T. 20.5. , 92.

- Note :- (i) Information cover workers of registered working factories drawing less than Rs.1,600 per mensem.
- (ii) Wages include bonus and any sum payable to workers by reason of termination of his employment but does not include the value of any house accomodation, supply of light, water, medical attendance or other amenity or of any service specially excluded by the state Govt. any travelling allowance or employer's contribution to any pension or provident fund or any gratuity payable or discharge or any sum paid to employee to defray special expenses entailed or him by the nature of his employment.
- (iii) Information exclude certain industries returns for which were not available:
- 

### 7.2.1: Strikes and Lockouts in Industries.

We worried ourselves about industrial disputes in West Bengal, that from the year 1982 they are at rising trend in cotton, jute engineering and miscellaneous industries. In the year 1982 total 146 disputes comprised of 4 disputes for cotton, 24 for jute, 39 for engineering, 11 for plantation (Tea) and 68 for miscellaneous industries, had entered upon the industrial carrier of the state. In the year 1988 the total disputes had come up to 246. <sup>(14)</sup> In the year 1988 an observation made by Labour Commissioner, West Bengal, that most of the

industrial disputes resulted strikes were connected with demand for higher wages and bonus; but most of the industrial disputes resulted lockouts were connected with uneconomic running, financial stringency, loss of economic viability and alleged labour dispute. (15) Though the information vehemently claimed that indiscipline, rowdiness, violence and vilification were nil, yet some entrepreneurs have informed that they have fallen upon evil days as through unions activity workers have been over-secured day by day. In the year 1980 the number of persons laid-off and retrenched were 11,966 and 1043 respectively; and the figures had come down significantly in the year 1988 when 1572 persons were laid-off and only 74 persons were retrenched. (16) Of course, unions have secured salutary service for the workers. But from this action side by side if it says that the entrepreneurs had not been cornered and deprived of strength to direct their units then it will lead to fake up a story.

Following trends of strikes and lock-outs we puzzle out what have done with the bargaining power of the entrepreneurs:

Table-7.2:

## Strikes and lock-outs in the Industries of West Bengal.

Period	Number of cases			Men involved (in thousand)			Mandays lost (in lakh)		
	Strikes	Lock-outs	Total	Strikes	Lock-outs	Total	Strikes	Lock-outs	Total
1	2	3	4	5	6	7	8	9	10
1970	678	128	806	371.3	82.8	454.1	57.8	36.5	94.3
1980	78	130	208	68.4	85.4	153.8	14.8	47.0	61.8
1985	39	165	204	13.5	135.9	149.4	2.0	151.1	153.1
1986	29	178	207	23.1	129.7	152.8	2.7	132.7	135.4
1987	39	197	236	92.5	161.6	254.1	16.4	214.7	231.1
1988	34	212	246	99.2	162.9	262.1	33.2	284.5	317.7
1989	16	207	223	14.2	149.4	163.6	2.5	275.5	278.0

Source: (1) Labour Commissioner,  
West Bengal.

(2) Labour in West Bengal.

Note:-Lock-out is inclusive of cases of strikes following by Lock-out.

In the early years of seventies the number of strikes were more than that of late eighties; and reverse was for lock-out cases. As in the year 1980 there were 208 disputes which had caused 78 strikes and 130 lock-outs whereas in the year 1988 within 246 cases, 34 were strikes and 212 were lock-outs. The more frequent use of lock-outs by the employers had raised the number of man-days lost every year. The relatively high share of lock-outs in man-days lost suggests

that there have been a qualitative change in the character of industrial disputes. Slacken off strikes have been born one evidence that there have been eased off utter enslavement of workers. But what about lock-out? The traditional believe on lock-out stems from socialist idea that it is a form of punishment that the burgeois class inflicts on workers. Since, in West Bengal the entrepreneurs are not strong enough to punish workers, the decision of many lock-outs lie on other factors. With this, management can't take quittance from feeble functioning of some industrial enterprises.

### 7.3.: Management: A Hope to-wards the Desire Goals.

In making decision, the function of management is the efficient direction for an industrial enterprise which is always subjected to the problems of scarcity and choice at present and future practice. The unit under uncertainty in an imperfect market represents a coalition of different groups as manager, workers, shareholders, customers and suppliers who have their separate goals <sup>which</sup> do conflict each other through a continuous bargaining process. The management performs 'five main goals'<sup>(17)</sup> of the firm as the (i) Production Goal, (ii) Inventory Goal, (iii) Level of Sales Goal, (iv) Market-share Goal and (v) Profit Goal.

The top management makes various payment to resolve the conflict within the firm. The example of such payments are money payments, side payments and slack payments. Money payments refer to the payments of regular wages and salaries etc. On the other hand side payments are in the form of policy commitments by the top management to satisfy some demands of groups within the firm. As to keep a good scientists employed in the firm the management has to allocate certain funds for the development and conduct of the research plans of the scientists. The slack payments or organisational slacks refer to those payments made to the members of the coalition in excess of what is required to maintain the organisation. Among them the managerial slack takes the form of higher salaries or other perquisites that the firm provides to the top management. The existence of slack has a stabilizing effect on the performance of the firm to pursue its goal and have a steady performance in a changing environment. (18)

### 7.3.1: The Aberrant Management to set back Manoeuvre:

Our inclination to study the role of decision maker had dealt with word of mouth as although many entrepreneurs did never let the eat out of the bag. In many public sector enterprises we observed the parental and political managements, whose members belong to the dominant family groups and whose members are powerful in politics or connected with influential persons. Other qualifications of managers, such as leadership



and knowledge were of secondary importance. As stronghold of union had been encouraged by Govt. party through recruitment, an attitude was born (now in existence) that the plant should be operated only for benefit of the employees. With this the members of top management had enveloped in faulty planning, delaying bureaucratic exercise, absence of experience and expertises, and many other erratic shocks which fouled up a good working partnership in many public sector units like Central Dairy at Belgachia, Sodepur Cotton Mills at Sodepur, Oriental Cotton Cultivation & Mills on South Station Road at Agarpara, Encoply wood & Saw Mill at Siliguri, Tribeni Tissues at Tribeni in Hooghly, Hindustan Wire at Sukchar and Bengal Tools in Calcutta.

Having been fully aware of the gravity of public sector unit and erratic shock of management, Govt. made effective contract with joint sector with the hope that it will endorse savoir-faire of private sector in feeble management of public sector. But when we come across the management of few joint sector units like Webel Telematik Limited, Webel Tele Communication Industries Limited, Webel SL Energy Systems Limited at Salt Lake, Biaxially Oriented Polyporpylene Film Projects and Polyester Filament Yarn Project at Bankura, we find fact of enfeoffment of public sector units. These units have not directed to-wards desire capacity utilization.

In Gujarat the progress of multipurpose Co-operative societies during last decade is more than any other state in

India. The state had got through ' the scope of service Co-operative' (19) back off twenty years. But here in West Bengal we see painful and slow work effort of management of some units under service co-operative as Dooars Co-operative Rice Mill Society Ltd. at Siliguri, Arambag Co-operative Rice Mill Society Ltd. at Garbati in Arambag, West Bengal Appex-Co-operative Agricultural Marketing Society Ltd. (Rice Mill sec.) at Memari Moutiswar Thana Co-operative Processing Society Ltd. at Baraipara, Saktigarh Co-operative Cotton Mill Ltd. at Agarpara, Vidyanagar Co-operative Multipurpose Society Ltd. at Behala, Ashokenagar Cotton Mill Co-operative Society Ltd. at Ashokenagar and Siliguri Powerloom Co-operative Society Ltd. on Cussipore Road in Calcutta. In all these units management took the forms of Govt. department. Here Govt. officials who supervise the units, were not aware of the needs of the units. Moreover, the office bearers were not strict in getting payment from those whom they gave the output on credit. By this the working capital of 6 units out of 8 (eight) had fallen into decline and gummed up the works.

Under private sector many a company has units in and outside the state; and alike a number of companies have scaled down their productive activity under the units in the state, however, to the activity their units at outside the state have got into their stride. The wit and wisdom of management of these companies have got abreast of state politico-social condition which kept themselves away from step off on wrong foot.

In British period the social root of business entrepreneurship and supply of capital brought Parsis and Jain community to the fore.<sup>(20)</sup> By this the entrepreneurial activities in the field of industry had concentrated in certain religious groups for which a discussion would be a purely sociological phenomenon.<sup>(21)</sup> Many of them had come up and started industrial units in the state with no other motive than to horn in on loans and subsidies which might have invested in other profitable business and the units are now throwing out the baby with bath water. We try to know the difficult position for some units. Generally they reported that (i) demand for their output had slackened off, (ii) the working capital had fell away to meet the amount payable to bank-loans, (iii) partners had fell apart and (iv) family had disintegrated to put the units in difficult position. Notwithstanding the reasons we stole over their cunning which get themselves into a situation seems profitable. Furthermore enquiry would be just bang our head against brick wall.

### 7.3.2: Study on Managerial Slack and Side Payments:

We went on to study the managerial slack and side payments in public and private sector under a few groups as shown in table 7.3 and get amezed at the fact that not a single private sector unit had side payment as although they had payments for slack amount to much. On the other hand public sector units being allied to research and development made side payment for many cases. But sanction made at such long procedure that the

Table : 7.3.

The Response of Units to side and Slack Payments in Registered Manufacturing Sector under Different Industry Groups.

Industry Group	Number of Units.									
	Public sector					Private sector.				
	SL	S	SL and S	No. SL or S	Total	SL	S	SL and S	No SL or S	Total
1	2	3	4	5	6	7	8	9	10	11
231	2	3	1	1	4	4	-	-	1	5
280	-	2	1	-	3	2	-	-	2	4
313	-	2	-	1	3	2	-	-	1	3
330	-	2	-	2	4	3	-	-	-	3
340	-	-	-	3	3	2	-	-	2	4
360	-	2	-	2	4	4	-	-	1	5

SL → Slack Payment.  
S → Side Payment.

Source: Survey From Premises 1989-90.

scientists, whom we had questioned, had applied themselves less enthusiastically to the work which would have been pleasure task for them. As the management of public sector unit is tied with Govt. rules, the top official person's service conditions and payments are also subjected to the discorums of Govt. employee. And their dream of additional money, like extra perquisites of a top manager in a private sector enterprise, find some illegal ways of amassing their own capital. However, no one of the employees admitted that they had additional sources of income from the premises in some other ways contrary to the law. We stole ever their replay and it would be worthwhile to mention the corruption have wrapped up in the work culture. On the problems there are so many variables and uncertainties affecting the issue of wages fixation, revision or determination that many public and private sector units are not succeeded in their effort at compromise. And the industrial relations climate have become adverse. Many units are closing down and few are reopening as shown in table 7.4:

Table :7.4.

Industrial Units Closed and Re-opened in West Bengal

Period	Unit closed Number	Units re-opened Number
1	2	3
1970	260	170
1980	63	23
1985	27	11
1986	27	8
1987	26	8
1988	25	5
1989	12	4
1990	17	4

Source : (1) Labour in W.B. (2) Labour Commissioner, W.Bengal.

No wonder, the situation was threatening since 1970 when 260 units had closed down and 170 units re-opened. In the year 1980, 63 units were closed and 23 units re-opened and by this in the following years many units were closed but re-opened at a very insignificant rate. As generation of new units had slowed down, both the number of close and re-open had wineed in the latter years. Many units have not closed down; they have just opened with greater excess capacity.

In this through working order we found many other imponderable effects which could not be estimated were adverse to the capacity utilization of the units. And we found that many manufacturing units in West Bengal followed excess capacity and finally closed down where of re-opening did not prevent the chain of deterioration which had been born from a number of weak links. Haggler trade-unionism is one of them. As now in West Bengal, the practice of a part of working-class in manufacturing units is misfeasance i.e. doing of lawful work in wrongful manner which is difficult to subdue by entrepreneurs and it finally forces the function to remain on tenterhooks Hence, it is reasonable to conclude that there must be something wrong in the economic-political situation in West Bengal which have made inroad in the industrial units and resulted industrial activities with greater excess capacity.

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**CHAPTER - VIII.**

**SUMMARY**

**AND**

**CONCLUSION.**

## CHAPTER - VIII.

### SUMMARY AND CONCLUSION.

As the problem of excess capacity bears hard upon industrial carrier of West Bengal and as prospect suffers from it at poor industrial relation which does heavy production losses due, interalia, to strikes and lockouts, some thinking on radical line should be done to take the bull by the horns. Our study for Registered Manufacturing sector of West Bengal shows that while capital co-efficients rise at remarkably high rates, output grows at a slow rate. Here capital deepening seemed to be the major influence behind increases of labour productivity. But increasing capital co-efficients have failed to produce labour productivity across the industries. Continuous capital deepening without adequate increases in productivity means low rate of growth and cost push inflation. This has been found tested in state owned manufacturing enterprises of West Bengal where they have grown in size, investment, coverage

and expectancy. But their performance and profitability has not yet been shown up very much. Working capital of many enterprises has been locked up largely in heavy inventories and trade credits, creating a tremendous liquidity problem. Many public enterprises are incurring heavy losses and overburdening with loans. What would be socialist substitute for their bankruptcy? If they were carried through deficit operation, who will bear the burden? The crisis is serious; the authorities and leaders are aware of direct load bearing on the public funds. They had believed that joint venture would endorse *savoir-faire* of private sector in feeble management of public sector. But it being a kind of enfeoffment of public sector unit has failed desire capacity utilisation. However, productivity under private sector units in the state had drawn some down as increasing capital intensity was not accompanied by increasing capital deepening. Entrepreneurs in this sector might have avoided capital deepening at the risk of labour trouble in their units. Still, compare to public sector units, private sector units are working better to-day. For this we favour the following  
Diagnosis:

Privatisation of State Owned Enterprises and Public Sector Units for Commercial Viability and Social Responsibility:

If an enterprise, be it public or private, ensures greater value of output than the value of input employed, provides quality to consumers, pays reasonable wages and salaries to workers and employees, contributes public exchequer through taxes and makes available fair return on the investment; we recognise its commercial viability & social responsibility. So, social responsibility is quite compatible with commercial viability. The public sector units and state owned manufacturing enterprises in West Bengal have fulfilled neither commercial viability nor social responsibility. They run on high input output ratio and fail to generate adequate return on the investment of public money. By this, they have become a burden rather than being an asset to the Govt. and failed requirements of the economy mainly of employment generation in the state. For these units we support transfer of controlling interest to specific firms and persons. We also support preferential offer of share to workers and employees in the units they worked. (1) It will increase operational efficiency, reduce cost, improve quality and productivity.

For improving productivity and efficiency privatisation is now a global phenomenon. Even a Communist country like China is now indicating its urges emancipation from the bondage of controlled economy. The developed countries had already passed down their private path experience over new

enterprises in their countries. Recently, it has been put forward as when we see the process of privatisation in Britain began (1980) with 'British Aero-space Bill'. In France the 39 banks and 4 major industries, had nationalised in 1981, are expected to be privatised gradually. The Italian Govt. has given the I.R.I's Chairman a freehand regarding privatisation of I.R.I. The then West German had privatised 958 companies. Other advanced countries namely Spain, Sweden, Japan and Canada have got down to privatisation. The underdeveloped and developing countries are also not lagging behind. In Ghana, after Nkrumah, the new Govt. offered thirty state enterprises for sale. In 1982 Bangladesh had sold off 100 companies to private sector. And recently Pakistan have denationalised 200 rural industrial units. The other countries were Malaysia, Singapore, Brazil, South Korea, Mexico, Peru, Argentina, Chile, Venezuela and Senegal etc. (2) In India question of privatisation assumes greater significance and relevance as Central Government (1991) announced its intentions to divert 20 percent of state investment in a few public sector units and pass on the same to the private sector. (3) There is now a definite political trend towards privatisation as it not only grants creation of competitive environment to improve efficiency but also endorses utilisation of private funds to relieve the country from budgetary problem.

**Greater Reliance on 'Private Sector' for  
Resource Mobilisation and Investment :**

We have seen that the private sector manufacturing units in West Bengal were left to their own resources. But Govt. backed up public sector units notwithstanding their inefficiency and excess capacity. For worthy motive they did turn many private sector units into public, but not a single public sector unit into private. It is due to an ideological bias. In West Bengal the left front leaders' morale stand is to create more and more units under public sector that workers can fall in love with them; that the generation of huge black money can be lessened; that the bias bigger private entrepreneurs can't threaten the smaller ones; and that, as a result the Laissez-faire economy can't have an entry to create chaos and anarchy<sup>(4)</sup> This Socio-Political condition in the state has been putting the private sector in fear of death and dried up the trend of growth and development which once had maintained through remarkable employment and output. Nevertheless, the private sector manufacturing industries in the state were more efficient, better administered and better managed than the industries under public sector. It has been broke out through the analysis of excess capacity. For the country as a whole the picture is not different. In support of this contention it has been pointed that when public enterprises in the manufacturing sector recorded a growth rate of 7.18% in their

profit after tax in the year 1985-86, the same in the cases of large public limited companies under private sector as studied by the Reserve Bank of India had been 27.4%. This promising contribution of Private sector manufacturing enterprises in the economy suggests itself to encourage private path manufacturing development in India as well as in West Bengal.

We know that private individuals are free to run their affairs as they see fit. And for this competition usually errs by selfishness and indifference to the well being of others. Still, it would force businessmen to improve their products and keep their prices reasonable. The public interest would therefore be served by competition. For this competition has now become deliberateness and not the selfishness at modern age. Whether the competition is good or evil it indicates the undisputed fact as Marshallian thesaurus tells us:- "Modern business is characterized by more self-reliant habits, more forethought, more deliberate and free choice. There is not any one term adequate for this purpose: FREEDOM OF INDUSTRY AND ENTERPRISE, or more shortly, ECONOMIC FREEDOM, points in the right direction and may be used in the absence of a better."<sup>(5)</sup> This thirst has been reflected on our 'New Economic Policy (1991)' or popularly known as liberalisation policy which laiding stress on restoration of competition, moderanisation of industries with high tech bias, smooth



functioning of market economy and integration of domestic economy with the world economy. (6) It can be achieved only through a bigger role of private sector.

#### Abatement of Activity of Unions.

In West Bengal the activities of most of the private sector manufacturing enterprises are under union leaders surveillance. Many union leaders of ruling party are formidable and rough for their demand and party catchwords. They pick on quarrels, even those might have been a local, with owners and stand out against duty. Sometimes these local quarrels fortify against owners and give off strikes which get in with Government support. And entrepreneurs have been backing down most quarrels by this way. This situation is closed in on the door of many private sector manufacturing units in the state and their wheels have been slowing down from late years of seventies. The industrialists are now reluctant to set up new units in the state. As before starting any manufacturing unit a successful industrialist always keeps his finger on the pulse of the Politico-economic condition of the place, one can't hope for West Bengal the growth and expansion of private sector units which would have been able solve a part of severe unemployment problem in the country.

In fact, so long our institutional frame work is concerned and labour is dissociated from management, one should expect 'War' and 'Peace' in industrial relation. But battle by so called union leaders on all issues against entrepreneurs would work for a false standariaztion of workers' consciousness.

For the interest of sound industrial development we are eager for trade union leaders to come at the risk of omitting haggler trade unionism in West Bengal. They should not forget the lesson of V.V.Giri, a famous trade unionist in the country, about their work culture: 'For the achievement of the goal of progressively speeding up production, it is necessary that workers should completely eschew indiscipline, stoppage of production and indifferent quality of works and for this it is necessary that they should build strong democratic trade unions'.<sup>(7)</sup> So, we hope for removing the existing work culture through the formation of autonomous work groups. For this the process of crafting awareness in the mind of workers about future of their unit and acculturation would call forth a good work culture. With this a short of trusteeship approach and collaboration are also necessary from the part of the industrial leaders. We cann't negelect public openion too. Due to stoppage of work the loss of public sector units shifts on to tax payers and the same of private sector shifts on to consumers who are also tax payers in the society. Their openion based on sound economics sometimes should be an arbiter to the trade union leaders and entrepreneurs to split the difference.

## Consideration of Mergers: A Need for Active Participation in Rising International Market.

In West Bengal we have seen more exploitation of labour and lower wages in small manufacturing enterprises than big ones. By taking loans and subsidies many new small units in the state have made themselves burdensome which not only put back operational efficiency but also put the cart before the horse. They can't take the full benefits of economies of scale and operate under greater excess capacity due to a lack of research and development. So, they can't survive international competition. For this we have to permit bigger firms in the state. We also deem preferable mergers on industrial leaders' attention. The business houses will find it worthwhile to focus only in a few areas. The rest they will shed off and in their main lines they will consolidate their business by acquiring more capacities. This will make the groups more homogeneous. We give the example of the R.P.G. groups which have decided to concentrate on tyres and tubes, electricity, electronics and chemicals. Mergers have now become the order of the day. (8) D.H. Pai Panadikar, a business economist, says "every month around 15 (fifteen) mergers take place and this will increase". We believe that mergers will improve quality and specialization for particular products which can be supplied in international market.

Amelioration of Management and Technology for Learning Process by doing.

To come through the export deficiencies of the country the issue of improving quality of domestic manufacturing needs amelioration <sup>of</sup> decision process for product line design, new markets, new co-operation, new thinking and new survival strategies in changing course of time ahead. Accumulation of these invisible assets is the foundation of sustainable competitive advantage. The dream can't be realised without having new machineries. So, we need collaboration as well as multinational ( foreign private investment) firms for organisational learning. They will provide opportunity to build the work method, standard and belief as a blue print of certainty. As our foreign fiscal deficit have reached at such unworkable magnitude and foreign exchange reserve depleted to such a level that these could be improved only by following a new policy.

The Indian company can offer transnational access to the lucre local market by allowing a part of the equity. In return it can acquire well known brand name which can get part in rising world market. However, one may think differently by pointing out the transfer of resources and encroachment in the huge local market through transnational firms which may create problem for the country; but one can't deny the gain from export trade and employment by this access.<sup>(9)</sup>

'We must recognise that the world is moving rapidly to-wards trading blocks, whose members enjoy preferential access to one another's markets. This large block-defined market becomes a major attraction for foreign investors, diverting investment to them from countries without such access',<sup>(10)</sup> Without having membership of these block defined markets we can't expect to safe-guard our internal economic interest in cutting down industrial inefficiency, excess capacity, unemployment and regional disparity. As now in the country, the regional disparity is increasing regional politics.

So, this new policy suggests that we should change our attitude to new technology and new market. In fact, we have to do every thing to bring new industrialisation in West Bengal to solve the problem of hunger, poverty and unemployment.

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