STRUCTURE AND PERFORMANCE : A CASE STUDY OF PAKISTAN'S LARGE SCALE MANUFACTURING INDUSTRIES (1950 _ 1987)

By

Shahnaz Rauf

Thesis Submitted for the Degree of Doctor of Philosophy at the University of London.

School of Oriental and African Studies

Fall Term 1990

ABSTRACT

The main focus of this thesis is on the measurement of concentration, determinants of levels and changes in concentration, and its effect on the levels and changes in performance in the large scale manufacturing sector in Pakistan at three points of time, 1970,1978 and 1984. Published census of manufacturing industry data and other sources are utilized to develop estimates of selected variables, covering 41 sectors of production. In this way the thesis is the first of its kind in developing countries that attempts to analyze from a dynamic perspective the structure-performance hypothesis. A subject which was in the past approached only in terms of static analysis.

On the basis of the results revealed by this enquiry the thesis argues that the manufacturing sector is dominated by large size establishments. This concentration stems from technological and financial discontinuities prevailing in the sixties. In the subsequent period tight government regulatory policies, public and private investment decisions, were largely instrumental in shaping the structure of manufacturing industries which on balance remained as concentrated as before.

A second part of the thesis attempts to find confirmation of the hypothesis that structure affects performance. We find a frail and declining relationship between structure and performance thus there is little support for the argument advanced in earlier studies that structure exerts a strong positive influence

on performance. The thesis argues that in the sixties the concentrated oligopolies were able to secure high profits which originated from their power to set prices irrespective of the reductions in the cost of production realized through technological and financial discontinuities. Unlike the sixties, in the subsequent period not only were prices controlled,but also increased cost resulting from internal and external changes squeezed the share of the profit, and smuggling more actively and product differentiation modestly also exercised their influence on the performance of the manufacturing sector.

Finally the thesis shows that the relevance of the structure performance model varies from case to case and both the forces of monopoly and efficiency are at work to determine the performance of the manufacturing sector.

CONTENTS

Acknowledgement

Although it took me a long time to complete this thesis, a task which seemed so impossible at every stage of research, but it was the support and encouragement of my supervisor Dr. Nigel Crook that made it possible for which I owe him a debt of gratitude. I benefitted immensely from his valuable comments and his thorough manner of explanations and guidance . If I have at all succeeded in raising the right questions in this thesis it is mainly due to his ways of training me as an economist.

While in Pakistan, earlier drafts of the thesis were read by Dr. Meekal Ahmed, Chief Planing Commission Islamabad, his comments were exceedingly helpful in rewriting it. He has contributed notably to any precision of argument that the thesis may have attained.

I enjoyed special assistance from Miss Shamim Sahibzada, Chief Project Appraisal at the Pakistan Institute of Development Economics, Islamabad. She has been generous without limit in allowing me access to her computer for data analysis, in giving me her time and typist for the preparation of computer diskettes which saved my time while finally shaping and printing the thesis.

I am also most grateful to the Pakistan Banking Council for providing me the financial support and making it possible for me to stay in London and submit my work.

This thesis is dedicated to the
memory of my most loving parents.

LIST OF TABLES

CHAPTER-I

CHAPTER-III

CHAPTER I

ECONOMIC GROWTH AND STRUCTURAL CHANGE (1950-87)

AN OVERALL VIEW

(With Reference to the Growth of the Manufacturing Sector)

With the inception of Pakistan industrial development has been given top priority in the economic development strategy of the country. It was done so because of a number of reasons: First, reliance on agriculture as an engine of economic development meant that sustained growth in per capita income would be far less than what it would be with industrial development. Thus for rapid growth in per capita income, it was considered necessary that the surplus labour be shifted from agriculture to industry and other related areas of development; where labour productivity is relatively high. Second, exports of agricultural raw material would earn limited income from abroad, as world demand for these goods grew slowly. Third, the burden of disequilibrium in the balance of payment, created by the import of raw material and machinery for industrial development, would ultimately be borne by the industrial sector through growth in manufacturing output and exports.

The factual position of Pakistan's development till sixties and seventies has been reported before by Papaneck [1967], Lewis [1969] and [1970] and Amjad [1984]. This chapter reviews the pattern of growth over the longer period

1950-87.In this way the chapter prepares a background for the detailed inter-industry structural analysis in the coming chapters. This chapter reviews the growth, structural change, and the policy and non-policy determinants of industrial growth. In this respect special attention is paid to the foreign trade policies, dependence between the growth of industry and agriculture, domestic savings, investment, external assistance, nationalizations, regulatory and non regulatory policies of various regimes all of which were instrumental in shaping the structure of the Pakistan economy, directing its growth and that of industry in particular.

Growth and Structural Change:

Pre Plan and Plan Period (1950-55, 1955-1970):

Tables 1.1 to 1.3 present the changes in the structure of production and employment that occured during the period 1955-1987 as well as the growth rates in manufacturing, other sectors and GNP.[1]/. In the first place it is noted that the composition of GNP has changed substantially, the share in GDP of agriculture has declined, of industry doubled (18.1%), construction almost quadrupled, of electricity and gas has

1. Census of Manufacturing Industries excludes establishments that do not use power and employ less than 10 workers, the informal sector. Although published estimates of the share of the informal sector in manufacturing employment and value added are not available, it is widely believed that it employs more than 80 percent of labour, engaged in manufacuring activities and account for about 20 percent of total manufacturing value added.

Table 1.1: Sectoral Distribution of Output 1951-88.

(Percentages)

Output at Constant 1959-60 Prices	1951	1961	1971	1977	1983	1988
Agriculture	59.71	48.9	41.9	29.77	23.70	23.76
Manufacturing*	9.2	14.5	18.1	15.28	18.30	20.58
Construction	1.44	3.46	4.2	4.8	5.0	5.72
Electricity & Gas	0.22	0.56	1.98	2.69	3.0	3.63
Services & others	29.43	32.58	33.82	47.46	49.9	46.31

* Includes large and small scale manufacturing.

Source: Estimated from National Accounts, Statistics Division, Government of Pakistan as reported in IBRD (1978,1980,1988).

Table 1.2: Sectoral Distribution of Employment (1951-88).

(Percentage).

Employment	1951	1961	1971	1977	1983	1988
Agriculture	67.5	61.0	57.7	53.71	52.73	49.24
Manufacturing*	10.0	13.6	12.4	13.39	13.54*	14.23*
Constuction	-	-	3.34	4.12	4.80	6.01
Electricity & Gas	-	-	0.25	0.67	1.13	0.73
Services & others	22.5	25.4	26.31	28.08	27.80	29.79

* Includes large scale manufacturing.Also includes manufacturing and min ing for 1983 and 1988.

Source: Estimated from, Population Census of 1951, 1961 Labour Force Survey's, various issues as reported in IBRD (1978,1980,1988).

Table 1.3: Overall and Sectoral Growth Rates
(At Constant 1959-60 Factor Cost).

% per annum

	First Plan 1955-60	Second Plan 1960-65	Third Plan 1965-70	Non Plan 1971-77	Fifth Plan 1977-83	Sixth Plan 1983-88
Agriculture	1.0	3.7	5.6	2.48	4.0	3.7
Min ing*	10.0	11.7	3.4	2.89	8.2	10.2
Manufacturing	10.3	11.6	8.1	1.70	10.6	8.0
(Large scale)	(23.0)	(16.9)	(9.9)	(2.5)	(7.7)	(7.5)
Construction	10.1	22.0	5.7	6.96	6.5	-
Utilities	6.5	14.6	9.9	5.3	9.2	-
Transport	4.5	11.5	5.0	4.2	8.8	-
Others	6.0	6.0	10.9	7.4	12.5	-
GDP^	4.1	6.6	6.2	3.6	6.7	6.9

* Includes mining and quarrying, construction, electricity, gas and water.

^ GDP and GNP at market prices have been different since mid 1970's when net factor income from abroad, particularly from Pakistan's working abroad in Gulf states, began to increase dramatically.

Source: Estimated from National Accounts Data, Statistics Division, Government of Pakistan as reported in IBRD (1978, 1980,1988).

multiplied many fold. A similar shift though relatively less sharp is observed in the sectoral distribution of employment. The share of agriculture has been declining but it is still the major absorber, and the share of the manufacturing sector increased from 10.0 percent during the early period to 12.4 percent in 1970. Other sectors providing more jobs are transport, communication, construction and services.

Table 1.4 provides comparison about structural changes in GDP across five developing countries mainly India, China, Brazil, South Korea including Pakistan. It also shows that the share of manufacturing in GDP has grown fast in S.Korea followed by Pakistan, which has grown steadily.

Industrial growth measured at 1960 constant factor cost was 23 percent per annum in the First Plan (1950-60), 17 percent during the Second Plan (1960-65) and 10 percent during the Third Plan (1965-70). Growth of the industrial sector was not accompanied by rapid increase in the agricultural sector; mainly in the earlier period, later in sixties Pakistan was able to reduce the large difference in the growth rate of the two sectors. With the Green Revolution came the introduction of favourable prices, technology, water and input facilities. This development removed the fears that growth in the industrial sector could not be sustained unless the effective demand in the rural areas increased and the raw material for domestic industries was provided without any shortage.

The differences in the economic performance in different periods is revealed more clearly in the use of resources Table

Table 1.4: Structural Changes in GDP (1966-84) Pakistan and Some Developing Countries.

Sectors	Pakistan	India	China	Brazil	S.Korea	Developing countries
Agriculture						
1966	37.1	47.8	37.5	15.9	34.9	28.6
1978	17.8	38.6	29.8	14.0	20.2	21.4
1984	28.1	36.1	35.3	13.4	13.9	20.8
Manufacturing						
1966	15.2	14.3	30.3	27.2	18.6	21.1
1978	16.2	17.0	37.5	27.5	27.8	22.2
1984	20.7	14.9	32.5	27.2	27.8	20.6
Mining						
1966	0.5	1.0	4.4	0.8	1.9	4.5
1978	0.5	1.4	5.5	0.7	1.4	6.2
1984	0.5	3.3	6.7	1.2	1.4	7.8
Construction						
1966	4.3	5.1	3.2	5.4	3.7	4.5
1978	4.9	5.3	3.7	5.8	7.9	5.9
1984	5.1	5.7	4.6	5.4	8.4	5.7
Services						
1966	42.9	31.9	24.5	50.8	41.0	41.1
1978	60.6	37.7	23.5	52.0	42.7	44.3
1984	45.6	40.0	20.9	53.8	48.7	45.1

Source: Taken from Pakistan Industrial Regulatory Policy Report.Volume II 1988. World Bank Document Industry, Trade and Finance Division.

1.5. Here contrasts in various sub periods are note worthy. While investment increased only marginally during 1955-60 it doubled in the Second Plan 1960-65, rising to 24 percent of GNP. Both the public and the private sector played their role in the expansion process. At the same time domestic savings increased from 6.6 to 13.6 percent and exports expanded at the rate of 8.5 percent per annum in volume terms. The net result of these trends was that two third of the investment expenditure was financed by our own resources, and the share of total investment financed through net capital inflows increased only from 37 to 40 percent.

However, these trends were reversed by mid 1965 due to the war with India, termination of U.S grant for military purposes and poor crops in 1966 and 1967 which meant diversion of foreign exchange to import of food along with the burden of financing imports rising at 8 percent per year. This led to the revision of development strategy which meant: (a) Shift in allocation of resources from capital intensive and long gestation projects towards sectors with more favourable capital output ratios and (b) Shift in development priorities from industry to agriculture. Thus the greatest adjustment to the change in resource availability fell on the manufacturing sector. Both new investment and utilization of existing capacity was affected. And in order to reduce new investments, investment priorities were changed, capacity expansion was limited to industries based on domestic raw material and to export oriented industries.Although the events in the third

Table 1.5: Saving, Investment, Exports and Imports as a % of GNP at Market Prices (1955-88).

	1955	1960	1965	1970	1977	1983	1988
Fixed Investment	7.6	12.0	23.9	14.31	17.2	13.76	14.19
Public	n.a	5.8	11.4	6.68	12.1	8.20	8.21
Private	n.a	6.2	12.5	7.7	5.1	5.5	5.9
Domestic Savings	6.6	9.2	13.6	9.0	8.6	4.9	9.4
NationalSavings	6.6	9.2	13.6	9.0	11.1	12.6	13.7
Public	n.a	2.8	0.7	1.0	2.4	1.9	0.4
Private	n.a	6.4	12.9	8.0	8.7	10.7	13.3
Export of goods and services	5.0	8.7	8.4	7.7	9.0	10.2	12.1
Imports of goods and services	5.5	14.7	17.4	14.5	18.5	20.0	19.3
Foreign savingsas % of fixed Investment	n.a	36.9	39.8	19.2	28.87	19.6	15.3

*. Data refers to all Pakistan, West Pakistan and former East Pakistan.

^ Given the large worker's remittances in 1970's and 1980's the appropriate measure of saving in Pakistan's economy is national rather than domestic savings after the period 1970-88.

Source: Derived from Data in the National Accounts, Planning and Development Division as reported in IBRD (1978,1980,1988).

plan had affected the domestic conditions adversely, the overall achievements of the Third Plan period were not discouraging. The GDP growth was only fractionally less than that achieved in the Second plan. This was mainly so due to the (a) Expansion in agricultural production (b) Achievements in the export of manufactured goods via increasing the allocation of investment in export oriented industries and also through the Export Bonus Scheme (see below).

However the biggest disappointment during the Third Plan was in the performance of the manufacturing sector. The resource shortage led to limited investment and as a result the manufacturing sector recorded a marked slow down from the 16.9 percent per annum growth rate achieved in the Second plan to almost 10 percent per annum in the Third plan period.

Non-Plan Period 1971-77:

Political disturbances which had started in late 1960's ended with the crises of 1971 and consequent separation of the former East Pakistan. The new government took over amidst deteriorating economic growth. The development strategy of the new government also identified manufacturing as the major engine of development. But unlike the previous government favouring import substitution for consumer goods and export oriented industries the priorities of the new government were different, they were to concentrate on big, sophisticated industrial units to increase self-sufficiency in the intermediate and capital goods industries.

In view of the concentration of income and ownership, the main cause of political disturbances of late sixties, the government took some drastic steps like in early 1972 it nationalized 31 largest manufacturing firms, life insurance and most petroleum distributing companies.[2]/. Followed by vegetable ghee in 1973, banks and shipping in 1974 and the export trade of Pakistan's two principal export products, Cotton and Rice. Reforms favourable to labour and to smaller farmers were introduced. In May 1972, the Rupee was devalued and adjusted from Rs.4.76 to Rs.9.90 to the dollar, and the Export Bonus Scheme was terminated. Although these reforms were introducted to improve the efficiency of the manufacturi ng sector and ensure a fair and equitable distribution of income,instead the percentage share of both manufacturing and agriculture in GDP declined and in the case of agriculture the percentage share also declined in employment where as that of the manufacturing industry remained more or less the same.

Industrial performance in terms of growth was disappointing in the seventies. After a spurt in manufacturing output in 1973 and 1974, reflecting a recovery from earlier

---

2. Ten basic industries, were removed from the large scale private sector, namely iron and steel, basic metals, heavy engineering, electrical equipment, automotive assembly and manufacture, tractor assembly and manufacture, chemicals, petrochemicals and natural gas. Thus limiting private sector to textiles, light engineering and consumers goods such as sugar and cigarettes.

disruptions, there was no growth in the last three years of the Bhutto government. Growth rate in large scale manufacturing reached the lowest percent of 4.7 per annum ever since 1955-60. Agricultural sector which had shown a gradual increase in growth rates, in the past now slowed down from 5.6 percent per annum in the Third Plan (1965-70) to 2.48 percent in the Non Plan period. One of the main factors undermining growth in agriculture was the repeated set backs caused by exceptional weather conditions. Decline in these two major sectors of the economy led to a decline in the GDP growth to 3.6 percent per annum, even lower than the rate of growth achieved in the first plan period 1955-60. Decline in industrial growth occured despite large public investment in the industrial sector; which at constant prices (1969-70) increased from Rs 65 million in 1970-71 to Rs 1563 million in 1977. In other words public investment as a percentage of GNP increased from 7.4 percent in 1970 to 12.1 percent by 1977. However increase in public investment is neither accompanied by increase in private investment, nor was it matched by increase in savings. The inflow of capital from abroad reflects the failure to mobilize domestic savings, private savings dropped considerably, partly due to a decline in profits and partly due to the high rate of inflation which accelerated from 10 percent in 1972-73 to about 30 percent in 1973-74 and 1974-75. With a decline in private savings obviously private investment also dropped to 5.1 percent per annum even less than half of what it was in 1965. Public savings were negligible largely because revenues remained low, and subsidies (for wheat, fertilizers, plant protection etc) increased.

Although devaluatio n led to on increase in exports until 1974, but with the declining growth of the manufacturing and agricultural sector (floods in 1973 and pest attack in 1976 caused damage to cotton crop and cotton exports) and the world recession in 1974, exports increased by only 9 percent between 1974-77, thus the average annual growth rate was only fractionally higher than in the Second Plan period (1960-65). Besides export earnings, remittances increased from U.S $124 million in 1972-73 to approximately U.S $500 million in 1977. But the terms of trade took an unfavourable turn as the rise in world oil prices increased the petroleum and oil product bill from Rs 649 million in 1972-73 to Rs 4918 million in 1977. And the world wide inflationary pressure caused the import prices index to rise much faster than export prices. The increase in imports between 1970-77 was from 10.4 percent per annum to 18.5 percent. Although import of all luxury items was banned, to carry on the development program of the government import of development items was liberalized.[3]/.

On the whole the new government's development strategy did not bring immediate results in terms of growth rates. Output remained almost stagnant at constant 1969-70 prices,

---

3. The import license system was changed by the new government. Now a) 327 items mentioned in the free list could be obtained from any where through licenses. (b) the tied list contained 25 items which could be imported from tied sources.

employment increased only slightly between 1972-77 and productivity fell in the same period despite huge public investment during 1971-77. The biggest set back was the marked slow down in the private sector's participation in investment activities which led to the closure of many firms and the consequent decline in the manufacturing sector.

The Military Government 1977-87:

In mid 1977 the military government took over amidst external and internal traumas that the economy and the manufacturing sector in particular had received. Its first half of developmental phase (1977-83 Fifth Plan) was based on ad-hoc policies introduced from time to time. At the same time industrial policy was turned around i.e. policies pursued in the early and mid 1970's of achieving industrial development through the rapid expansion of the public sector were gradually reversed. The industrial strategy during the fifth plan was quite similar to the one adopted in the first, second and third plan periods like import substitution in basic industrial inputs, increase in manufactured exports, increased emphasis on agro-based industries etc. In the second phase of development, Sixth Plan 1983-88, the government outlined the industrial policy in its Industrial Policy statement (1984), laying emphasis on change in the industrial structure towards a more sophisticated engineering chemicals and basic metal, because of their high weight in value added.

Performance of the manufacturing sector has been encouraging and improved since the late 1970s. The manufacturing sector GDP grew at an annual average rate of 9.5 percent between 1977 and 1986. This means a significant improvement when compared with the 3.3 percent annual growth rate of manufacturing GDP experienced in the 1970-77 period.[4]/. Consequently, the share of manufacturing in GDP rose from 16.5 percent in 1981 to 20.58 percent in 1988, reversing the declining trend of the 1970's. Much of the growth in large scale manufacturing stemmed from increase in output in cotton yarn, sugar, fertilizer, cement, steel products,and tractors. In addition, to that output and exports in the small scale, unorganized sector (which produces garments, towels, hosiery, leather products, etc.) have been increasing rapidly in the later period.

However, the manufacturing sector failed to generate sufficient employment. Slow generation of employment is manifest in the share of manufacturing sector in employment which has increased only marginally. Although these trends indicate increase of labour productivity in the manufacturing sector, it is quite possible that higher labour productivity

---

4. Growth of the industrial sector came despite (a) the Afghan crisis faced by the military regime, which led to increased defense expenditure and uncertain political and economic environment inside the country. (b) repeated disturbances in Karachi the main industrial centre, which led to the imposiion of curfew every now and then.

is related to the investment pattern overtime.[5]/. While comparing the rate of industrial growth in Pakistan with other developing countries, Table 1.6 shows that between 1972 and 1984 the average annual growth in manufacturing GDP in Pakistan was 12.7 percent per annum. This was higher than about half the developing countries in the sample despite the slow rate of growth between 1970-77.[6]/.

The share of the agriculture sector in GDP and employment declined to 27.8 percent and 24.1 percent by the end of the

---

5. Comparing capital-output ratios between 1964-86 as reported below, we notice that these ratios have declined, which suggest that increase in production is largely due to increased capital formation:

Year	Capital/labour Ratio	Capital/Output Ratio
1964-72	43,033	3.42
1972-79	8,270	3.60
1979-83	157,100	1.57
1983-86	48,083	1.82
1979-86	75,338	1.68

Source: Economic Survey 1986-87 (p.87), Planning and Development Division, Government of Pakistan.

6. Pakistan's growth performance in comparison with that of Korea is interesting. In 1972 the size of GDP and manufacturing GDP in Korea and Pakistan was not dissimilar. Korea had a GDP of $10.6 billion, Pakistan $9.3 billion; Korea's manufacturing GDP was 2.3 billion, Pakistan's was $1.5 billion. Thus, the importance of manufacturing in GDP was higher in Korea (manufacturing value added was 22 percent of GDP in Korea in 1972, compared to 16 percent in Pakistan).
By 1984 the differences had become more sharp Korea's GDP in 1984 had gone to $83.2 billion while Pakistan's was $ 31.1 billion. Manufacturing GDP rose to $23.7 billion in Korea in 1984, or roughly 12 times in 1972 level, as against $ 6.3 billion or about four times the 1972 level in Pakistan. However, under the liberalized policy environment of the eighties Pakistan's manufacturing GDP actually grew faster than Korea's. [World Bank, Pakistan's Industrial Regulatory Policy Report Vol.II January 1988].

Table 1.6: Average Annual Growth Manufacturing GDP (1972-84).

(% per annum)

Brazil	11.1	India	9.8	Pakistan	12.7
Chile	3.2	Indonesia	20.0	Philppines	12.4
China	7.9	Korea	20.0	Thailand	16.0
Columbia	13.0	Malaysia	19.9	Turkey	13.0
Egypt	14.9	Mexico	11.1		

Source: World Bank, World Development Report, 1986-87; Pakistan Economic Survey 1985-86 as reported in World Bank, Pakistan Industrial Regulatory Policy Report Vol. II January 6, 1988.

Fifth and Sixth Plan period. Variations in production, almost each year, due to weather conditions are reflected in reduced agricultural growth to 2.2 percent in 1987 and lowered the satisfactory 4.4 percent average growth in the sector recorded since the beginning of the sixth Plan to 3.5 percent between 1983-84 and 1986-87.However, declining trends of the agricultural sector and the resulting deficient demand for manufactured goods was to some extent compensated by the increased inflow of remittances, which had a favourable impact, on manufactured output.Gilani Iqbal and Khan[1981].

Other indicators of economic performance have been mixed. Private sector investment was largely confined to projects with short pay offs. Total private investment has not yet increased since new public sector commitments have been limited as a matter of policy, fixed investment/GNP ratio fell from 17.2 percent in 1977 to 13.76 percent in 1983 and it almost remained at the same level in 1988. Although national savings/GNP ratio remained above the levels of the early 1970's it increased only marginally from 12.6 percent in 1983 to 13.7 percent in 1987 (the same as was in 1965). It increased slowly because the increase in domestic savings was partially offset by falling net factor income from abroad. The improvement in national saving rate originated solely from the private sector. Public savings have fallen in most years since the early 1980's. The investment rate in Pakistan during this regime was unusually low in relation to the GDP growth rates picking up from 4.4 percent in 1983 to 6.6 percent towards the end of the Sixth Plan period. One likely explanation for such a situation might be that Pakistan has over the past decade, been depleting its existing capital stock and neglecting maintenance and replacement investment, thus attaining high income growth with low investment at the expense of future growth.

It is also noteworthy that there was a marked shift in the pattern of resource use during the Sixth Plan period from external to domestic sources. The inflow of net external resources (factor income and external financing) declined from about 11 percent of GNP in the first two years of the plan to 9.0 percent in 1986 and 6.3 percent in 1989, due to growing interest payments on foreign debt and falling remittances.

The Determinants of Manufacturing Growth:

A first major determinant of the rapid growth in manufacturing was the disequilibrium in the supply and demand conditions created by Partition. In 1947 Pakistan inherited a very small base of the industry relative to the size of the economy. Thus a large proportion of growth in manufacturing was in response to the disequilibrium in the product market. A second important determinant of manufacturing growth was the trade and exchange control policies of the government. These policies aimed at favouring the manufacturing sector so as to enhance the earnings of this sector. The purpose of doing so was to attain a high rate of saving, capital accumulation and the creation of an active entrepreneurial class. Although, by doing so, inequalities in income were created, it was considered important to do so in the early years so as to achieve fast rate of growth via high rate of saving and investment. The crucial link between the inequality of income and fast growth was profits of the entrepreneurial class; thus fast growth was considered as a function of income inequality Haq [1963]. This strategy of development had important aspects: first, in the early years government chose to manage its trade policies and meet the pressure of demand for imports through a licensing and quantitative controls scheme. Second export tax on major agricultural raw materials meant that the terms of trade were turned against agriculture and in favour of the manufaturing sector. Since most of the agricultural produce were used as input of the manufacturing industry, the availability of low cost inputs along with low money wages, made investment in the ,manufacturing sector highly profitable [Lewis 1970]. Third, investors were provided with foreign exchange, earned by agricultural exports, to import capital goods and industrial raw materials. It may be added that the scarcity of the foreign exchange was not reflected in the price paid by the license holders. Finally, the tariff policies ensured market for the domestically produced manufacturing goods by raising their prices significantly above world market prices. Thus isolating the manufacturers from pressures of international competition and enabling them to earn above normal profit.[7]. These profits were reinvested to accumulate capital and expand investment. [8].

Besides the above mentioned incentives, in 1959 the Export Bonus Scheme was introduced through which export incentive was given to the manufacturing sector only.[9]. It meant that the growth of the manufacturing sector was not to be constrained by the limited domestic demand, instead the sector was encouraged to exploit the advantages that might accrue from the export led expansion in the scale of production.[10].

In the second phase of development 1971-77, as reported earlier, growth of the manufacturing sector was disappointing. The government argued that stagnation in production was mainly due to the external factors, the world recession and oil shock which worsened the terms of trade, and unfavourable

---

7. It is widely believed that profits earned were about 50 to 100 percent on capital invested [Stern and Falcon 1970].

8. The re-investment profit ratio was estimated to be 75 percent. [G.Ranis 1961]

9. The Export Bonus Voucher scheme was introduced in 1959. The scheme entitled an exportor to get, in addition to the amount of rupees converted at official exchange rate, a certain percentage of the value of his export earnings in the form of a Bonus Voucher. This voucher entitled the holder to either (i) have an equivalent amount of foreign exchange for the import of any item on the Bonus list (over 200 items) or (ii) sell the voucher in the market. Given the scarity of foreign exchange, such vouchers usually sold at a premium of between 150 and 180 percent of their face value

10. Donges and Riedel [1971] tested econometrically the impact of the scheme on the manufacturing exports and found that the scheme substantially influenced the growth of manufactured exports.

weather conditions.[11]/. It might well be so, however, the impact of some of the policy decisions on private investment and the constituent decline in manufacturing growth cannot be ignored.

First, nationalization of 1972 and the constant eros ion of profit margins through increased taxes in the remaining industries considerably reduced the private industrial initiative which was considered an essential element of growth by the previous government. More importantly what depressed the private sector investment mostly was the manner in which nationalization was carried out, the fear of further nationalization and the absence on the part of government of a clear and consistent approach towards the private sector deterred both domestic and foreign investment. Although it was possible to invest in new industries, yet virtually no new investment took place because the psychological impact of nationalization of ten industries was magnified by a number of factors; a) the fact that industrialists were already very sensitive as they had already lost assets in the former East Pakistan. b) the slowness in issuing compensation which was

---

11. The import bill was swo llen by the increased oil prices which increased from $63 million in 1972-73 to $ 405 million in 1976-77 about 17 percent of total imports. Besides Oil, import bill increased by the increased cost of Fertilizers, capital goods imports, edible oils and other consumer goods. But in certain respect the economy benefitted from the rapid increase in oil prices since 1973. The oil price increae added some $300 million to Pakistan's imports by 1976-77. On the other hand, it started the Middle East boom which attracted Pakistani labour and worker's remittances increased from $93 million in 1971-72 to $ 100 million in the year 1977-78.

felt to be unfair. c) the fact that the nationalizations of 1972 were followed, despite repeated reassurances by the government, by the nationalization of life insurances in 1972, ghee production in 1973, banking and shipping in 1974, and flour milling, rice husking. The uncertain ty created would have been less and its impact of shorter duration if the nationalization had been carried out all at once.

Second, the tightening of government control over new investment through investment sanctions, which were made compulsory and price controls led to restricted entry.[12]/.

---

12. Investment sanctioning (licensing) policies, introduced in early 1970's consist of a criterion that require private investors to obtain clearance from Federal and Provincial governments prior to establishing certain new projects or expanding existing capacity. The need for prior authorization and the level at which it is decided depend on the project's size, location and the amount of machinery and raw materials to be imported.
Investment sanction was required for projects that: (i) involve investment costs in excess of a pre-determined size limit (Rs.50 million or $ 20 million); or (ii) require imported imputs which exceed 60 percent of the projects total annual material inputs costs, if they also exceed 20 percent of fixed assets or (iii) involve direct foreign investment, or (iv) a list of specified industries includes industries for reasons (a) national security and defense (b) religious and socio-economic considerations; (c) price regulations; (d) projects of national importance; and (e) capacity utilization.
In addition to this there are import license limits on import of machinery and import of industrial inputs in large quantities may be approved on the basis of sanctioned capacity. Like this investment sanctions implicitly set quantitative restrictions on capital and raw material imports, thus serving as a non- price rationing mechanism for allocating foreign exchange.
Government also controlled prices of manufactured goods in order to; (i) redistribute income and minimize political disruption by keeping prices of critical consumer goods low and stable (ghee and pharmaceuticals etc); (ii) stimulate downstream industries by keeping down prices of intermediate products (fertilizer and fuel); and (iii) stimulate investment by ensuring adequate return (cement). Exfactory and retail

Whatever private investment was made it was restricted to traditional and familiar industries. About 50 percent of investment went into textiles and the rest to food production (largely sugar refining), paper and paper products, electric bulbs, ceramics etc. Of the textile investment the bulk went into the traditional activities of producing coarse yarn and unfinished cloth, and very little into processing of fine yarn, the finishing and blending of fabrics.

Third, the termination of the Export Bonus Scheme, reduction in investment incentives, price controls, increase in labour cost per man and devaluation of rupee, increased the cost of production.[13]/.

Finally, public investment, although highest for the first time since partition, was mainly incurred on long gestation projects like steel which was to start yielding by 1980's. Thus prolonged execution phases, along with inadequacy of funds led to the decline in growth rates.

---

prices for a range of products is regulated through official procedures at both the provincial and federal levels to add sufficient margin to costs to allow a 15 percent to 20 percent return on investment for a plant operating at a speecified capacity utilization level.

13. Labour cost per man trippled between 1972-77 part of this increase was due to the increase in wages announced by the government and the rest could be due to the emigration of skilled labour to the Middle East. Gilani, Khan and Iqbal [1981]. One of the reasons for devaluation was to improve the competitive position of the manufactured exports; however the adverse impact of devaluation was that it increased the cost of investment (where import of machinery and raw material was involved) this in turn increased the internal price structure and thus the competitive position of Pakistan industry was further deteriorated, instead of making any improvements, discouraging private sector investment.

Obviously, returns on investment in projects like steel, fertilizer and cement, were to be realized with a lag, which could extend from 4 to 8 years. Just as declining trends in investment in 1965-70 resulted in a downward trend in output in 1970-77 and increased investment in 1971-77 was to lead to accelerated growth in the late seventies and early eighties. This phenomenon is well understood when data about investment is examined together with output growth over time.

In addition to that, the government was burdened with a number of tasks and objectives, like protection to low income groups from domestic price increases through subsidies, increases in salaries and wages, all of which made it impossible for it to improve efficiency of the nationalized industries.

The recovery in the economy since 1977 was aided by several factors, including higher domestic demand associated with i) remittances which led to increased manufacturing investment by the established producers in areas where demand was to increase like construction and related industries ii) better crops and rising rural income due to price incentives to farmers.[14]/. Besides domestic demand, improved foreign demand for Pakistan's exports also led to increased

---

14. Support/procurement prices for crops have generally been set in line with international parity prices, to provide incentives to the farmers. Input subsidies for fertilizer, pestricides, seeds and tractor line took a large proportion of bugetary resources. Farmers also received subsidy for irrigation water. The agriculture sector has also been exempt from income tax, while other taxes like Zakat and Usher (religion based taxes) are levied on agricultural land and/or output, their revenue is small. S.K. Qureshi, [1984].

manufacturing output, to be exported abroad.[15]/. However, credit must also be given to the various policy changes introduced by the government as mentioned below.

The relaxation of administrative controls, investment sanctioning in particular has helped to sustain the upturn in industrial activity.[16]/. To restore the confidence of the private sector the agricultural processing industries taken over in 1976 were denationalized and a number of industrial incentives similar to those existing during the 1960's like tax holidays, excise and import duty concessions, easier access to imported raw materials, concessionary credit, income tax provisions and direct cash rebates have been granted to encourage private investment and exports.[17]/. The government

---

15. The contribution of manufactured goods to total exports has increased from 44 percent to 53 percent between 1970-87 and the share of semi-manufactured goods has fallen (Annex 1-B).

16. In the recent past although government has increased investment sanctioning limits in some of the industries. But the contribution of controlled investment had one favourable impact on the performance of industry that excess capacity was discouraged and existing capacities were fully utilized.

17. Since early 1980's the government has taken periodic steps to liberalize trade. (The measures undertaken initially were aimed at removing most of the additional non-tariff barriers introduced in late 1970's in response to the second oil shock and resulting foreign exchange stringency). This was done by two types of measures. Fisrt, import quotas on non capital imports were removed. The number of commodity categories subject to import licensing value ceiling was reduced from 406 in 1980-81 to 5 consumer goods in July 1983. Second, banned and restricted items were slowly liberalized. Between 1980 and 1986 100 commodity categories, consisting of mostly raw material and capital goods, were added to the free list.

also introduced constitutional safeguards against arbitary nationalization of industries in the future and private investment in cement, fertilizer, tractors and automobiles was permitted. It could not denationalize all the units and return them to the original owners because of the contractual agreement made domestically and abroad. However, the deregulation and decontrols process was expedited following the announcement of the 1984 Industrial Policy Statement, and pressure from the World Bank and IMF to relax investment sanctioning regulations and price controls.

These measures have led to an improvement in private sector confidence, while private sector industrialist are generally still hesitant to commit themselves to large scale investment involving long pay back periods, there has been a sharp increase in proposals for relatively smaller scale private investment projects.

However, Pakistan continues to depend on import bans and restrictions for protection to import substitution industries and restricted import of luxury consumer goods. About 39 percent of the commodities still remain on the banned list of items. About 59 percent of these banned items are consumer goods, and another 30 percent raw materials for consumer goods. In addition, there are more than 100 commodities on the Restricted Import List. Also distinct from these bans and restrictions value limits on cash imports of machinery are still being maintained along with over all investment sanctioning rules.

Another noteable feature of trade policy in the eighties was that there were a substantial number of duty free categories with full/partial duty exemptions. There were 250 duty free categories, including items such as petroleum products, machine tools, agricultural machinery, pharmaceuticals, pesticides, insectecide, fertilizer and cereals etc.

The government also realized that price controls had a major bearing on private sector attitude. The Deregulation commission of 1985 recommended relaxation of price controls because not only was the application of policy cumbersome, it was not conducive to efficient factory operations nor did it provide adequate incentive for further investment. In two sub-sectors where substantial scope for private investment exists, namely fertilizer and cement, the pricing issue has been a major deterent to private sector involvement. Recently private investment has been allowed in cement and fertilizers.

Lastly it is quite possible that huge investments made by the previous government in long gestation projects like steel mill, fertilizers, cement etc showed up in higher growth rates in the manufacturing sector in the eighties. Public sector inherited from the previous government was quite large, a massive investment program of Rs.40 billion was underway. And the military government was not commited to any new investments, except to completing the on going projects. This may have its impact on economic growth in the coming years.

When data about investment in terms of constant and current prices (Table 1.7) is studied together with output growth in manufacturing it is clear that growth of output depends on investment with a lag, in long gestation projects like steel, fertilizer, and cement the lag may extend from 4 to 8 years, thus a declining trend in investment in 1964-70 and 1977-82 resulted in a downward trend in output in 1970-77 and 1982-87, whereas investment increased in 1970-77 and 1982-87. The increased investment in 1970-77 led to accelerated growth of 10.8 in 1977-82. And increased investment in 1982-87 will also have a positive effect on manufacturing growth in the successive years.

In short, the transition from rapid growth of the 1950's and 1960's based on easy and highly protected import substitution to a more diversified and outward looking mode of industrial development was interrupted in the 1970's by both external and internal traumas. This interruption in the form of tight government controls left little opportunity for a systematic industrial policy to ensure conditions favourable for growth, specially so in the private sector. The incentive system of 1978-88 and the ad-hoc measures (including de-regulations and decontrols) taken to raise economic activity have to some extent reversed the declining trends of growth.

Growth Within the Manufacturing Sector:

(A Micro Economic Review)

This section concerns itself in detail with the response of

Table 1.7: Growth Of the Manufacturing Sector (in % per annum based on constant prices).

Period	Investment current prices	Investment constant prices	Value added
1964-70	5.0	1.4	8.4
1970-77	22.8	6.2	3.7
1977-82	6.7	- 2.6	10.8
1982-87	11.1	6.1	7.8

Source: Economic Survey, Ministry of Finance, Government of Pakistan (1986-87).

the manufacturing sector to the policy instruments of the various sub periods, and the unforseen internal/external shocks received by the economy from time to time.

The response of the manufacturing sector is measured in terms of the percentage share in manufacturing value added of in dustries grouped according to major product use: consumers, intermediate and capital goods industries. At a micro level the percentage share of 36 selected sectors in manufacturing value added, employment and capital assets is also measured for the period 1959-84.

It is of interest to observe the response of the industrial sector to the policies adopted and the internal/external shocks received by the economy in various sub-periods.[18]/. Table 1.8 provide in summary form, the pattern of percentage share of consumer, intermediate and capital goods industries in manufacturing value added, while Table 1.9 provides a more disaggregated view.[19]/.

In the early period the percentage share of the consumption goods sector was exceptionally high, as high as 53.93 percent in 1959. It is tempting to explain this growth solely in terms of the relatively greater disequilbrium in this sector

---

18. The policy instruments of various sub periods have also influenced the structure of industry to a large extent, the discussion of which is postponed till the later chapters.

19. According to CMI 1984-85 there are some 154 sub sectors out of which only top 36 sectors ranked according to their share in total manufacturing output, employment and assets have been selected. See Annex 1.A for details.

Table 1.8: Percentage Share of Consumer, Intermediate and Capital Goods Industries in Large Scale Manufacturing Value Added (1959-84).

% share

	1959	1965	1970	1976	1978	1984
Consumer goods	53.93	55.47	63.98	60.92	55.18	54.56
Intermediate goods	13.52	21.35	15.97	17.09	23.49	21.88
Capital goods	14.49	18.57	15.10	18.17	21.0	23.50

Source: Derived from Census of Pakistan, Karachi, Islamabad, (various issues).

in respect of supply and demand condition, and the tight licensing policy for competitive goods. But the consumer goods industries enjoyed two other advantages compared with other producers. In the first place, almost all these industries largely used domestically produced, mainly agricultural, raw material which was purchased at very low prices i.e. vegetable ghee, sugar, tobacco, beverages and textiles industries are some of the examples using domestic raw material.[20]/. In contrast intermediate and capital goods industries which were dependent on imported raw materials were at a disadvantage.[21]/. Second, the size of the domestic market for consumer goods was larger than for the intermediate and capital goods industries, i.e. fertil izer, petroleum refining, cement, iron and steel, machinery and transport industries.

Another interesting fact manifest in Table 1.8 is that the share of the consumer goods in the period between 1959-65 had increased only marginally, while the share of the intermediate and capital goods industries increased substantially. This change was the result of first, accelerated public and private investment which was facilitated by the increased flow of external assistance;

---

20. Besides domestic raw material these industries also used simple technology made available locally

21. Other industries using domestic raw material were fertilizer and cement but due to insufficient demand their growth in the early period was slow.

second, the introduction of the export bonus scheme led to liberal import of raw materials (mainly iron and steel) and capital goods. Third, agricultural production improved with the Green Revolution and the policy of favourable prices for food crops led to increases in income and consequently increases in demand for intermediate and capital goods.

However these trends were reversed since 1965-70 with the consumer goods industry again appearing as the main source of growth. The factors responsible for this change were war with India, and the effects of poor crops in 1966 and 1967 on imports along with decline in external assistance, which meant the ability to import the raw materials and equipment was adversely affected. As a result of the changing environment, the liberalization of the import program was abandoned and the old system of tight quantitative restrictions was restored. This change once again favoured the consumer goods industries and the intermediate and capital goods industries were seriously affected due to shortage of inputs and a rise in import costs.

The period between 1971-77 gave priority to intermediate and capital goods industries with a decline in the consumer goods industries, mainly in Textiles. Decline in the industry is also reflected in the decline of Pakistan's share in world Textile market.[22]/. Declining productivity of

---

22. Pakistan is one of the lowest cost cotton producer in the world, but Annex 1.C shows that its share of world trade in cotton yarn declined from 28.0 percent in 1975 to 8.5 percent in 1977 whereas its share in cloth declined from 7.6 percent to 4.5 percent.

capital (due to old technology) and labour, and falling profits have mainly contributed to the decline in the textile industry. The most important causes of these difficulties have been the floods in 1973 & pest attack in 1976 damaging cotton crops & exports, the world textile recession in 1974 and 1975, acute labour problems and the various restrictions and other measures imposed on the private sector during the early 1970's. For example, production and export incentives were abolished in 1972 and export duties introduced on both yarn and fabrics as well as an excise duty on domestic sales of fabrics. Imported capital goods were subjected to import tariffs ranging from 40 percent to 100 percent. These measures raised capital costs of the textile industry significantly and adversely affected the financial position of the mills. The constant threat of nationalization which prevailed until 1977 and the textile recession of 1974/75 further affected the profitability of the textile industry.

In addition, during the early 1970's labour unions obtained relatively large increases in wages, fringe benefits and virtually unlimited job security without a corresponding increase in productivity. This led to an increase in labour costs, which burdened the textile industry even more. In contrast to the consumer goods industry, the intermediate and capital goods industries, mainly belonging to the public sector have shown an increase in their percentage share in manufacturing output. These sectors include chemicals, iron and steel and machinery. However, this increase in percentage share in manufacturing output is quite insignificant relative to the large public investment made in the same period Table 1.9.[23]/. It then means that the interpretation of data about these two sectors is not so easy for the period 1971-77 in particular. The main cause of marginal increase in output in intermediate and capital goods industry was that most of these industries are long gestation projects, and return on investment is not paid off in the short run. Therefore the output growth in both the intermediate and capital goods industries must be interpreted in the light of the lag effect of investment on output; particularly in long gestation projects like fertilizers, cement, iron and steel, as they were in various stages of implementation and were to start yielding in early 1980's. By the same reason, the lag effect of decline in investment in intermediate and capital goods in late 1960's may also have showed in the slow growth of these industries in the early 1970's.

In addition to the above mentioned factors, the threat of nationalization, withdrawal of concessions, increase in the price of capital and imported raw materials; lack of internal funds and labour costs remained as major obstacles to new

---

23. Public sector investment in projects including fertilizer, cement, Karachi steel mill increased rapidly from 1971 to 1977. But this rapid growth in investment by the public sector levelled off in the last two years of the regime and was marginally above the 1970 level of total capital formation in industry. Only the pattern of investment by the private and public sector were reversed.

Table 1.9: Percentage Share in Manufacturing Value Added Employment and Capital Assets (1959-84, selected sectors).

	% Share				
Industry	1958	1970	1976	1978	1984
Consumer Goods					
1.Food					
Value added	8.3	14.8	22.14	19.0	20.62
Employment	6.7	9.1	8.9	10.9	13.17
Capital	-	21.02	15.91	11.95	17.61
2.Beverages					
Value added	0.4	0.6	1.51	1.72	2.38
Employment	1.3	0.5	0.59	0.77	0.94
Capital	-	6.0	0.77	2.98	3.63
3.Tobacco					
Value added	5.6	9.0	8.28	12.04	13.19
Employment	1.0	2.6	1.49	2.05	2.21
Capital	-	6.0	0.77	2.98	3.63
4.Textiles					
Value added	40.2	31.4	24.23	17.79	16.13
Employment	50.0	45.2	44.70	45.26	38.17
Capital	-	28.73	25.17	23.19	16.47
5.Footwear					
Value added	2.59	0.32	0.13	0.15	0.11
Employment	1.81	0.65	0.36	0.34	0.24
Capital	-	0.20	0.12	0.36	0.10
6.Printing					
Value added	2.3	1.2	1.13	1.09	1.17
Employment	1.6	1.7	1.67	2.01	2.17
Capital	-	1.59	0.81	1.52	1.85
Intermediate Goods					
7.Paper					
Value added	1.7	1.3	1.64	1.32	1.30
Employment	1.0	1.2	1.67	1.28	1.59
Capital	-	4.40	4.57	0.99	1.37

8.Leather					
Value added	1.48	1.18	1.05	2.38	1.60
Employment	1.24	0.85	2.59	0.80	0.98
Capital	-	0.39	0.98	2.19	1.37
9.Rubber					
Value added	0.34	1.32	1.25	1.93	1.62
Employment	0.37	1.59	1.95	2.11	2.09
Capital	-	1.24	0.92	0.35	1.32
10.Chemicals					
Value added	5.34	6.66	6.83	7.54	9.91
Employment	3.37	3.81	6.85	4.63	4.68
Capital	-	13.0	12.07	20.24	13.47
11.Petroleum					
Value added	-	-	-	4.92	1.5
Employment	-	-	-	0.66	0.95
Capital	-	-	-	7.16	6.26
Capital Goods					
12.Non Metals					
Value added	5.9	4.0	3.57	4.69	8.97
Employment	2.5	3.1	5.35	2.66	4.06
Capital	-	4.10	5.91	3.79	4.78
13.Basic Metal					
Value added	3.1	2.4	3.31	4.80	5.15
Employment	3.2	3.4	3.72	3.78	7.33
Capital	-	3.63	9.65	6.12	12.82
14.Metal Products					
Value added	2.5	1.2	1.59	1.52	1.17
Employment	3.5	2.4	2.39	2.27	1.89
Capital	-	2.87	1.11	1.42	1.68
15.Machinery					
Value added	2.5	1.2	2.90	2.13	2.38
Employment	3.2	3.1	2.99	3.49	3.37
Capital	-	0.87	5.76	5.15	3.17
16.Electrical Machinery					
Value added	-	1.1	3.15	1.05	3.15

Employment	-	1.0	3.16	0.73	3.58
Capital	-	0.87	2.26	1.34	5.04
17.Transport Equipment					
Value added	0.90	2.59	6.41	3.96	2.71
Employment	2.0	3.66	4.25	4.46	3.75
Capital	-	3.40	3.68	9.26	4.60

Source: Calculated from Census of Manufacturing Industries, Statistic Division,Federal Bureau of Statistics, Government of Pakistan, Karachi, Islamabad (varios issues).

investment, thus private sector investment declined to its lowest level. (as it was limited to the consumer goods industry mainly). Moreover returns on industry when compared to returns on trade and real estate did not appear so attractive.

In the third phase of development (1977-84) the response of the industrial sector shows only a marginal decline in the consumer goods industries. One of the consumer goods industry showing decline in production is sugar. This fall was due to a combination of several factors. The sugarcane crop was adversely affected by pest attack and decline in the area of production. In addition, a capacity tax on sugar factories led to diversion of sugar cane from sugar manufacture to "gur" and unrefined sugar, the prices of which were relatively high. On the other hand, after a decline, production of cotton yarn increased; encouraged by improved domestic and international demand and some policy measures taken, including the exemption of yarn products from excise duty and introduction of a compensatory rebate of 7% on yarn exports. However, production of cotton cloth, continuing an eight year decline, fell further. This decline occured despite good international demand and the provision of similar to but stronger than incentives given to yarn, and the compensatory rebate on finished cotton cloth exports, for example was 12%. This decline led to serious difficulties in the industry.

However the marginal decline in the consumer goods industry from 55 percent to 54 percent would have been more than what it was in 1984, if a) increase in demand for consumption goods was not sustained by the inflow of remittances from abroad,

b) world demand for our exports, mainly textile, had not increased, or c) government had not relaxed its control over the industrial sector and d) increased investment in textile and food, (hydrogented oil, sugar) was not undertaken.

In contrast to the consumer goods industry, intermediate and capital goods industries showed positive response because of the continued priority received by the two sectors. For example, iron and steel, fertilizer and cement took up about one third of such investment. Considerable investment has also been going on in petroleum refining, textile (to replace the old technology and improve the productivity and external competitiveness of the sector) bulbs, plastics and drugs etc. Thus, industries showing increase in output were fertilizer industry, because of the expansion of capacity at the Multan plant; and steel production which was attributable to large imports of iron and steel scrap. However production of cement declined due to damage caused by heavy rains to cement plants in Sind and mechanical problems. Productive capacity in cement, formerly a major exporter has lagged seriously behind the growth in domestic demand.

Growth in the intermediate and capital goods industries seem to be slow relative to the investment expenditure incurred which reached its peak during the early 80's in the two sectors. This may be so because of the Karachi steel mill and other major industrial projects, mainly cement and fertilizer, were still in various stages of implementation and public sector was not commited to further investments in long gestation projects.

It may also be so due to the decline in the private sector participation in the economic activity due to the uncertain political conditions internally and externally (Afghan crisis) and the private entrepreneurs preference to invest in projects with easy entry and short payoffs. The second oil shock (late 70's) also had its impact on the growth of the two sectors through increased prices of imported raw materials and capital goods.

To sum up, the consumer goods and more traditional industries like textiles, silk, and leather have shown either a declining or an erratic behaviour in their output growth, and percentage share. Nevertheless industrial output is still concentrated in a few sectors including the following:

	Value Added	
	1981	**1984**
Food	20.0	20.63
Textile	18.6	16.13
Tobacco	13.30	13.19
	51.9	49.94

The pattern of industrial growth outlined above also implies a significant redistribution of the work force with reduced employment in traditional industries such as textile, silk, fabricated metal products, and the appearance of employment opportunities in sectors such as vegetable ghee, tobacco, chemical products, garments, plastic, electric bulbs etc in the last twenty years. However textiles are by far the largest industrial employer, 38.17 percent of industrial employment followed by food manufacturing which employs 13.17 percent of the total employed in manufacturing sector.

	Employment	
	1981	**1984**
Textile	39.81	38.17
Food	12.56	13.17
	52.54	51.34

Moreover (Annex 2.B) demonstrates that the rapidly growing industries are vegetable ghee, sugar, tobacco, beverage, fertilizer. iron and steel, cement and more recently petroleum refining, mostly so because of the increase in demand.

Summary :

The section reports the percentage share of industries grouped as consumer goods, intermediate and capital goods, in manufacturing value added along with the impact of policies introduced in various sub periods; on the growth of these industries. It also reports the percentage share of 36 selected industries in manufacturing value added, employment and capital assets.

Consumer goods industries grew rapidly in the early period and only marginally between 1959-65. After receiving a boost for the second time between 1965-70 its percentage share in manufacturing has continously declined ever since. In contrast, in the early period, both the intermediate and capital goods industries had a relatively small share in manufacturing value added, about half of the percentage share of the consumer goods industry. Between 1959-65 government policies were turned in favour of the two sectors thus their percentage share in value added increased. Scarcity of foreign exchange in 1965-70 led to a decline in imports consequently a reduction in the percentage share of the two sectors in manufacturing value added. However after 1970, their importance increased, and their combined share has increased at almost 50 percent of total manufacturing value added.

At a more disaggregated level, it is noticed that besides cigarettes, hydrogenated oil, sugar, cement and fertilizers, some new industries like iron and steel and petroleum refining were increasing their share in manufacturing value added, employment and capital. Whereas traditional industry like cotton textile has shown declining importance in manufacturing value added, employment and capital assets.

CHAPTER II

REVIEW OF LITERATURE

Introduction:

In this chapter the first task at hand is to evaluate the economic theory underpinning most of the empirical work done on industrial structure and performance. In doing so we will engage in a discussion about the structure of industry and the Structure -- Performance paradigm and point out the conflicting hypothesis that one comes across in this field. We will also evaluate the relevance of the Structure -- Performance hypothesis in examining the structure and performance of the manufacturing sector in the industrially less developed countries. In the light of such a discussion we will then review the empirical work done on the industrial structure and performance in the manufacturing industry of Pakistan and point out its limitations.

Bain's [1951] paradigm provided a theoretical underpinning for a great deal of empirical work on the Structure - Conduct - Performance relationship over the past. And results of almost all the earlier studies lend support to the hypothesis. What it states is that the presence of various "barriers to entry" to an industry determines its level of concentration (structure). High levels of concentration in turn facilitate cooperative price behaviour (conduct). This collusive behaviour then leads to high profits (performance) i.e.

Barriers to	- Structure	- Conduct	- Performance
Entry	(concentration)	(collusion)	(profits)

Hence the cause of high profits is high concentration, so the usual micro economic implications follow.[1]/. From this it then seems public policy implication are clear but in fact all this

---

1. The postulated relationship between concentration and profits comes from the understanding that the smaller the number of firms the higher the CR , the easier it would be for firms to collud e by restraining their short run profit maximization tendencies. However such an understanding is not based on well defined theoretical models. Cowling and Waterson [1976] have developed a theoretical model explaining the above relationship more explicity.
They begin with the profit equation of the ith firm in an industry where N firms produce a homogenous product.

$$* \quad \Pi_i = PX_i - c(X_i) - F_i \qquad (1) \qquad i = 1.......N.$$

They assume same level of cost for all the firms. And the inverse demand function takes the following form,

$$P = f(X) = f(X_1 + X_2 + \text{-------} + X_N) \qquad (2)$$

First order conditions for profit maximization are

$$\frac{d\Pi_i}{dX_i} = P + X_i f'(X)\frac{dX}{dX_i} - c'(X_i) = 0 \qquad i = 1.......N \qquad (3)$$

where

$$\frac{dX}{dX_i} = 1 + \frac{d\sum_{j \neq i} X_j}{dX} = 1 + \lambda_i$$

substituting in the above equation,summing over N firms and manipulating thier equations they obtain the following expression,

$$\frac{P - c'(X_i)}{P} = \frac{-1 + \lambda}{NE} \qquad (4)$$

Thus the Lerner' Index of monopoly power is oppositely related to the number of firms in the industry and elasticity of demand. If E is constant across industries, a fall in N will reduce output and price will rise, which in turn should increase the price cost margin. For more general model see footnote 3 chapter 5.

* Where Π = Profit
X = Output
F = Fixed cost
c = Variable cost

is a mixture of half explanations. Is this a good paradigm in explaining why there are inter-industry differences in concentration, and particularly in the way concentration, and performance are related? This idea of a chain of causation running from structure to conduct to performance has come to be increasingly questioned.

The Structure-Performance analytical framework is derived from the traditional micro economic theory of perfect competition and monopoly. If we study the assumptions of perfect competition and compare them with what we observe in practice we notice in the first instance that instead of many small firms the economy is dominated by medium/large firms with significant market shares. Explanations regarding this phenomenon of concentration of the manufacturing sector provided by traditional micro economic theory are weak: it provides loose explanations about the determinants of the structure of industry, and it is commonly hypothesized that economies of scale, barriers to entry and size of market are the determinants of concentraction George and Curry [1983]. Such an approach gives only a snap-shot view of the competitive process, because it relies on static analysis. For a complete and a more reliable analysis it is important that the enquiry is extended over a longer period of time.In that case one will not only be identifying whether the factors that determine the levels of concentration at one point of time are the same for another point of time, but will also investigate if the variables explaining the levels of concentration are important in explaining the changes in concentration as well. Thus a-priori no firm predictions can be made about the determinants of concentration. It is quite possible that the variables explaining the levels of concentration at one point of time may not be relevant at other points of time, and for explaining changes in concentration. Similarly it is difficult to identify whether the top firms having a significant market share previously are the same in order of ranking over a period of time. Small firms may grow and in the long run, dominate the market. Or all firms start from the same initial position but over time turn out different in size even when each firm has the same probability attached to its growth rate. It then implies that the relative growth of firms depend on purely chance effects. Kalecki,M. [1945]).

What then determines concentration? From the above discussion it is understood that concentration is partly determined by systematic forces such as the optimum size of plant, capital / labour ratio, industry size, government regulatory policies, and partly by random forces like luck, uncertainty, change in political and economic enviornment both internally and externally, etc. For empirical analysis it is relatively easy to measure the effect of the systematic forces, as data sources, although not very reliable, are available. However it is not possible to specify and statistically measure the random variables. They can vary from firm to firm and need not be related to the size of firm. Hymer and Pashigian [1962] Edwin Mansfied [1963]; Singh and

Whittington [1968] and [1975] and Marcus [1969].

Furthermore, from the traditional micro theoretic view, we understand that the aim of the firms is to maximize profits. Obviously to them the number and size of firms under perfect competition and monopoly are the important determinants of performance. Under perfect competition price equals marginal cost, there are no profits in the long run and resources are optimally allocated. On the contrary high sales prices, excess profits, X- inefficiency, excess capacity and high wages are the evils associated with monopoly power. Such an explanation of performance under perfect competition and monopoly is static and leaves little scope for changes overtime which affect performance from a broader view point. Whatever explanations of performance are offered by theory when compared with real world we notice that the optimizing behaviour of a firm is just a part of a set of often complicated and conflicting objectives. Large firms may be aware of their size and market power and in order to secure and maintain their dominant position they may have to satisfy various groups like customers, the government authorities and the trade unions by passing on part of their profits to the workers in the form of high wages and other benefits. So optimizing behaviour does not imply short run profit maximisation but a number of objectives for which the firm tries to attain a certain target.

Similarly, Jacquemin and Dejong [1977] State:

"... It is dangerous to compare the monopolistic and perfect competition equilibria. Cost and demand conditions may be radically different. The monopolist might use indivisible equipment which would assure him very low production costs. His output may be short of that obtained where price equals marginal cost, but such an output might still be higher than under perfect competition. The competitive firms would be too small to utilize the large scale indivisible equipment..... the welfare of individuals depend on a much broader range of performance than that taken into account by the perfect competition model. For example, a perfectly competitive market will probably not undertake sufficient investment in Research and Development because of high risks involved" (p.4).

It has also been stated by Nixon, Lee and Kilpatrick [1984] that where changes in concentration have a greater chance of influencing the rate of technical progress and innovation in an industry or increasing the capacity of manufacturing products then one should be more optimistic about changes in welfare over the long term, and may not dwell on the usual micro economic implications of a concentrated structure. While reviewing the literature it was found that such a phenomenon was revealed in a number of less developed countries, where especially the foreign owned enterprises by exploiting the technical and marketing benefits in large scale manufacturing sector were earning a higher rate of return than their local counterparts who fail to exploit such opportunities.

More recently Schumpeter's theory on technical change, industrial structure and development have been tested. According to which it is advocated that non-price competition like expenditure on product differentiation, skill and research and development play a more important role in industrial structure and development rather than the traditional price competition. If this is true then in most less developed countries the current strategies of public policy will have to be changed substantially. N.S. Siddhartan [1984] lends support to the above hypothesis; he finds that industries with fast technical change earned high profits because they produced differentiated products and spent more on research and development.

Even if we accept that high profit rates and high con centration are found together there are two major controversies one relating to interpretation and the other to statistics. Many of those who first tested for the Structure-Performance hypothesis interpreted the positive relationship as an evidence of monopoly power. More recently others suggest that such results are consistent with competition. It is quite possible that some firms earn above normal profits and have a large market share because of either technological reasons or they may possess some other capabilities which their rivals do not have. In that case above average profit is a reward of superior performance rather than monopoly returns. So the problem is that even if we can decide that there is a relationship between concentration and profitability it does not really tell us whether it is a result of competition and efficiency or monopoly power. For an effective economic policy it is important to distinguish one situation from the other, otherwise policy may do more harm than good. However it may not be easy to draw a line between the two situations. (see discussion in chapter-7). In view of the above problems it is suggested that it would be useful to use other indicators of performance than just using profits as a performance criterion and to focus on the long-term direct impact of concentration on the development process. For example Holterman [1974] suggests the use of labour and capital productivity as indicators of performance. And Banerji [1981] associated performance with the industries, ability to raise employment, wages and exports. One other advantage of using these other indicators of performance is that the data is easily available and is fairly reliable, whereas profit data available are tenuous; the errors in the accounting data are not random which introduce a systematic bias into the reported values of the rate of return.

Then there are problems of a statistical nature; if we examine the statistical work starting with Bain, on the one hand there have been a series of such studies which suggest that there is a positive relation between concentration and profits, while on the other hand there are some studies that have shown that there is a loose relationship Bain [1951], Stigler [1963]. Then we have another set of results Brozen [1971], showing that if we take different time periods and not just one point of time, this positive relationship between concentration and profits that others have found tends to disappear. Results based on data for one point of time could be picking more of the disequilbrium effect rather than the actual concentration profitability relation. There is a possibility that the positive relationship found in the U.S is typical for certain phases of the business cycle.2/.(see Technical Appendix).

2. Various studies differ in all sorts of ways from each other. Studies differ in their sample size, the range of industries covered, the degree of disaggregation of the data, the time period (some are 1 year some are 2 or 3 years). The number and kind of other independent variables included such as risk and disequilibrium etc.
The question is to what extent any particular industry and its results are highly specific to that sample and period. In other words to what extent in these studies one is drawing from a random population for testing the hypothesis. In this regard a few points are made to show what the snags are and how they tend to confuse the debate in the discussion of the question.

a).The earliest study was done by Bain [1951], he takes a sample of 42 industries for the year 1936-40 and calculates profit for the top largest firms in each of the 42 industries and correlates profit and concentration, the correlation coefficient is found as 0.28, which is not large but not minute either. Dividing the sample between high and low concentration he found that where CR was above 0.70 profit on average was 11.8 and where CR was below 0.70 profit was 7.5. Brozen [1970] set out to replicate the study with more upto date data. Using the same approach, with a bigger sample he found that for the period 1953-57 (Postwar Span) profit was 11.7% and 10.6% which suggest that there was no difference between concentrated and unconcentrated industries. He conjectured that Bain's answer was accidental and he had hit upon a period when industries were in dis-equilibrium in adjusting the capacity to demand and also in the structure of the industry itself. And some industries were undergoing changes towards a more concentrated form in which the leading firms being larger were already enjoying economies of scale which made them earn high rate of return on capital which influenced the profitability figure in concentrated industries.
This explanation is not as conclusive as it may seem, because it would than be very odd that Brozen had hit upon a period where all industries were more or less in equilibrium. With respect to

Thus the Structure-Performance paradigm on which most of the empirical work is based raise serious questions and hence the inferences drawn are not reliable. Some recent work by Clark and Davies [1982] has suggested that the problem is not so simple and straight forward as is understood in most of the empirical studies. To them the chain of causation that structure influences performance is not one way. The issue is that both profitability and concentration are determined simultaneously. Then in that case the previous results of ordinary least squares are invalid and one would derive quite different policy inferences.

Apart from the above problems there are difficulties which are only relevant to the less developed countries. Statistically testing the model for industrially less developed countries may need to be modified and extended to

---

capacity and the structure of the industry. Nevertheless what Bain's study shows is that a lot does depend on not only how one set up the problem but also on the period of the sample chosen.

b). The same sort of problem relates to a later set of work by Schwartzman [1959]. He took industries which are concentrated in Canada and less concentrated in the U.S and he compared the profitability of the same period between the Nothern and the Southern borders. On the basis of his sample he found prices were about 8.3% higher in Canada (after allowing for other cost differences).
Afterwards Jean [1975] replicate the study with a better sample, less subject to criticism. She did the same exercise for three different years 1958,1963 and 1967. In each case she found no significant difference between Canadian profits and U.S profits for industries which were more concentrated above the border. She proved that the author of the earlier study had happened to stumble on the sample and the time period in which there was disequilibrium.

c).See Foot Note 9 Chapter 5.

allow for the country specific circumstances and problems. We do not wish to comment on such problems here; we will however bring them to notice while reviewing the literature about less developed countries and particularly in the case of Pakistan.

All the above criticisms of the Structure Performance paradigm do not in any case imply we are minimizing the importance of the Structure-Performance model. Undoubtedly it provides a useful starting point. Nevertheless, the conclusion of this section is that unlike the traditional approach the structure of industry needs to be examined both in a static sense and overtime. And the concept of performance can not be restricted to the profit earnings of an enterprise. The traditional concept of optimality is narrow, it needs to be understood in a broader perspective, as a set of targets, taking into account the influence various groups like trade unions, consumers, government regulatory policies have and of course country specific problems.

EMPIRICAL EVIDENCE:

This section is divided into two parts. Part one contains empirical evidence on the measurement of concentration at industry level, determinants of the levels and changes in concentration over time. The second part will review studies testing the structure-performance hypothesis.

Concentration at Industry Level:

The prime task here is to review the studies explaining the patterns of concentration at the industry level in less developed countries. But for purpose of comparison we will also turn briefly to the attempts made at explaining the patterns of concentration in developed countries.

The majority of the studies on industrial structure try to answer questions like:

1. Whether there is an increasing or decreasing trend in the share of the few largest firms in the production and employment of the manufacturing sector at the industry level.
2. What the relationship is between the level of concentration and the market size.
3. Whether the ranking of average size of establishments in individual industries is similar across countries.
4. What are the determinants of concentration in manufacturing industry.

We will review empirical evidence providing answers to the above questions one by one. Our own results regarding these questions are reported in chapters four and five.

1. An important issue in the analysis of industry structure is whether there is a tendency for the production of individual products to become increasingly concentrated in the hands of a few large firms. As far as studies about trends and changes in concentration in advanced countries are concerned the literature is abundant and quite clear. In case

of less developed countries empirical evidence in the first place is inadequate and that too is difficult to compare because of different measures of concentration used; we will therefore report the main findings of some of the studies available to us . For example ,in the case of Pakistan four studies measured aggregate and individual industry concentration . First, Papanek [1967] reports that 7 largest families owned one fifth of the industrial assets and 15 largest families controlled three fourth of the shares in banks and insurance companies . Second, Haq [1968] believes that 20 to 22 largest families controlled 66 percent of total assets of Pakistan manufacturing industry ,70 to 80 percent of insurance and banking assets . Third, White [1974] suggests that out of 197 nonfinancial companies listed on Karachi stock exchange 43 families controlled 97 of these companies in other words they owned 53 percent of the total assets of companies listed . A slightly disaggregated picture shows that the top 4, 10, 20, 30 and 43 families controlled 20, 35.5, 46, 51 and 53.1 percent of all assets respectively. Finally comparing these percentages with those of 1962 he finds that the percentage share of the top 20 groups declined slightly but the percentage share of all the 43 groups remained relatively the same. Lately, Shirwani [1976] compared levels of two-firm concentration ratio (CR2) in Pakistan for four years (1968,1969,1970,1973) over a period of seven years. His results show a slightly rising trend in eleven a declining tendency in twelve and no trend in three industries.[3]/.He also found that the ranking of industries remained fairly stable over the period for which concentration ratios are calculated.

The main problem with all these studies is that they are restricted to the earlier period of development and the time span covered is too short to reveal any conclusive results. Furthermore the choice of concentration measures is arbitrary and based on difficult data like assets and capacity of firms*. Most studies as we will see below take CR4 or CR5 as a reasonable concentration ratio measured as percentage share of the top 4 or 5 firms in manufacturing value added , employment or sales . In a study on India Gosh [1975] calculated changes in four and eight firm concentration ratios over a span of 20 years (1948, 1953, 1958, 1963 and 1968). He reports that in the majority of the industries the level of concentration was persistently high over the period. However changes in CR4 showed a declining pattern over the two decades; the concentration ratio decreased in 18 industries and increased in only 4 industries. It is noteworthy that the decline in concentration ratios was highest in the fastest growing industries like engineering, chemical, paper,

3. The industries experiencing rising trend were leather footwear, fertilizer, cement, tins and cans, woolen textiles, leather tanning, paints, glass products, communications, acids, alkalies, silk, cotton textiles and jute textiles and the ones declining were tea, cigarettes, oil refinery,paper, machinery, beverages, electric motors, vanaspati, sugar, and iron and steel. And no trend was reported in case of alcholic beverages, industrial gases, matches etc. He however did not mention the reason for this rising trend.

* (See Technical Appendix p. 292).

cement, glass and rubber etc. And the industries experiencing an increase in concentration ratios were in the traditional sector like jute and cotton textiles, and the drugs industry, which of course does not belong to the traditional sector. But it is understandable that the drugs industry has an increasing pattern of concentration because the nature of the industry is highly innovative and requires increased size of research and development expenditure to improve the quality of the product, which overtime will squeeze out small firms. Furthermore the pattern of changes in concentration ratios was not uniform overtime.Most of the industries experienced a decline in concentration ratios during 1953-63 when the economy was experiencing maximum growth, before and after this period concentration ratios hardly changed. He further compares the two ratios; CR4 and CR8 , and finds that the same trend of high concentration prevailed during the two decades for both the measures. Nam.W.H.[1975] calculated the magnitude of changes in overall concentration between 1966 and 1969, in Korea. He estimated the weighted average aggregate concentration index. Using the output in each industry as weights. The results reveal a persistent increase in the trend in concentration of Korean industrial sector, which he states could be the result of changes either in concentration within industries or in the relative importance of different industries like cement and fertilizer and import substitute and export industries favoured by government policies.

As far as developed countries are concerned there is enough evidence suggesting that on average the level of concentration in U.K and U.S has significantly increased over the past few decades. For example in U.K the general rise in the trend was confirmed by the estimates of Evely and Little [1960], Armstrong and Silberston [1965], Hannah and Kay [1977] and Hart and Clark [1980]. The estimates of Scherer [1980] for The U.S show the same. However comparing the trends of consumer and producer goods industries separately, Caves and Porter [1980] found that concentration increases in the case of consumer goods industries and is declining in the producers goods industries.

Most authors considered economies of scale, barriers to entry and mergers as important factors responsible for rising concentration. However, if we rank industries according to concentration and compare the rankings across countries, and if the same industries are ranked as more concentrated then technological factors may be responsible for the high concentration.

2. Some of the studies have tested the second hypothesis that the levels of concentration are higher in industrially less developed countries than in developed countries particularly U.S. provided that the size of the market is small. Bain [1966], Merhave [1969], White [1974] and Lall [1979] found evidence in support of the above hypothesis. This hypothesis is based on the belief that because less developed countries have smaller domestic markets therefore one or fewer optimum size enterprises are required to satisfy domestic demand,

whereas for a big country like U.S many optimum size enterprises are required to fulfill the domestic demand (Merhav [1969]. Furthermore the optimum size enterprises are approximately similar across all countries, and finally, the relevant market faced by an enterprise of maximum efficient size is the domestic demand, implying implicity or explicitly that the openness of the economy is not significant.

This line of thinking has been criticized and as discussed earlier, there is ample evidence about trends in concentration levels contrary to what is suggested by the belief that less developed countries are more concentrated than the developed countries. The reason why over time large fimrs have taken over a growing proportion of activity in advanced countries is that for technological reasons minimum efficient size has grown immensly without the market having grown correspondingly. Technological change has replaced labour and resulted in capital intensive methods of production which often (though not always) increases minimum efficient size . Mass production reduces prices and some small firms will be squeezed out. So other things remaining the same, concentration increases if minimum efficient size grows faster than the expansion of the market. On the contrary, in practice, the plant size tends to be smaller in less developed countries, Banerji [1978], because firstly, they use older technologies with lower minimum efficient size; even if the situation is otherwise, i.e technological change is taking place the size of the market is also growing which leaves little scope for the large firms to take over a growing proportion of activity.[4]/. Secondly, the informal sector in less developed countries, which is unaccounted for in all studies, mainly uses local technology because of differences in relative factor prices and administrative reasons. The minimum efficient size of such enterprises would be small compared to the minimum efficient size of an enterprise in advanced countries; and many such enterprises could be accommodated easily contrary to the belief that one or few optimum size enterprises are sufficient to meet the domestic demands of a less developed country. Finally, the majority of the studies do not take account of the fact that most industries in the U.S are regional and not national. In that case the average concentration ratio is grossly underestimated and if this phenomenon is taken into account the results of the above studies may be reversed. In an international comparison of concentration ratios, Proyer [1972] found evidence in support of the above consideration. The weighted average concentration ratios were roughly similar for U.S, France, W. Germany, Italy, Japan, Netherlands and the U.K. From these results two conclusions can be drawn; first, the similarity of pattern in ranking industries by concentration across countries undermines the role of chance events that might be held responsible if ranking was dissimilar across countries.

---

4. See Table [3.9] for comparison of minimum optimum scale of some of Pakistan's industries with the international standards and it is found, minimum optimum scale in Pakistan is smaller than in the developed countries.

But on the other hand the similarity is not so complete, so that there is some scope for chance events influencing concentration levels. Secondly, that the degree of concentration is related to the size of the market and not the level of development, is not all that unexpected, but it is difficult to know the relevant market.

With such results in hand one is confused with the studies asserting beliefs otherwise Haq[1968] White[1974]: that the establishment and firm level concentration are higher in less developed countries, and at the same time expecting that the pressure of oligopolitic market structure will reduce with the expansion of the manufacturing sector and the level of development. There is no evidence to confirm that the concentration level will decline with the level of development, nor can we guarantee such a relationship to hold with the passage of time, because as we examine below, the studies dealing with the third hypothesis listed at the beginning, it is found that the ranking of industries according to average plant size also reveals a similar pattern across both the developed and less developed countries. Again this is suggesting that the level of economic development is not central to the analysis of industrial structure.

3. Some evidence regarding the third hypothesis of whether the ranking of average size of establishments in individual industries is similar across countries is provided by three studies. Tietal [1965] and Banerji [1978] found that in general the ranking of industries according to the average

size of establishment is somewhat similar among the developed and less developed countries. However some differences existed between the two studies, as Banerji [1978] found that in industries like tobacco, basic metals, chemicals and paper products the average size of establishments was larger in most countries: Whereas Tietal [1965] found that the high ranking industries in his study were petroleum products and beverages. Both the studies observed that textile and clothing industries had the lowest rank in terms of the average size of establishment. In another study of international comparison of concentration ratios, Proyer [1972] ranked the manufacturing industries of twelve nations according to their weighted average concentration and the pattern of average rankings of these weighted average concentration ratios emerged to be more or less similar in all twelve nations. Proyer [1972] like Banerji [1978] had found that concentration in all the nations (developed and semi-developed) is highest among the industries in the tobacco, transport equipment, machinery, petroleum and coal products, and lowest in the furniture, lumber products, clothing, leather, textiles and beverages. Implying that the same kind of industries experience a concentrated structure, it is then clear that forces making for an oligopolistic structure in a particular industry are similar in all countries irrespective of the country's economic position or degree of free market competition.

4. Determinants of the Level of Concentration:

Most of the empirical work is carried out with the a priori assumption that concentration is an important part of the structure of industry; therefore concentration and its effects need to be examined carefully. It is perfectly reasonable to follow the above procedure but a question missed out by most of the studies is why concentration exists in the first place. Instead of focusing on what is happening at an instant it is important to examine the behaviour of various firms overtime which may provide some information about the existence of concentration in certain industries. A shortcoming of most of the studies is that they restrict their analysis to the explanation of the levels of concentration at a point of time, using cross-section data for a year. Only a few studies attempt to carry their analysis further to examine what determines the changes in concentration. We will first review studies explaining the levels of concentration and secondly those analysing changes in concentration.

Table (2.1 and 2.2) give a few details about some of the studies investigating the determinants of concentration in the developed and less developed countries. Most of the studies explain inter-industry variations in the levels of concentration by means of regression analysis, where the simple concentration ratio has been used as the dependent variable and the explanatory variables suggested are minimum efficient size of plant, market size, barriers to entry and growth rate of industry. However in less developed countries empirical evidence about the determinants of market structure is inadequate; only a few attempts have been made and those too show no uniformity of results.

We will examine the results according to some of the variables commonly used. Almost all the studies in Table 2.1 and 2.2 suggest the importance of the plant economies of scale as a determinant of concentration. It is quite possible that technological differences across industries determine their concentration levels, as for certain industries, to lower costs per unit, technological changes are necessary.

Empirical studies relied on three measures of plant scale economies: i) The mid-point plant size Weiss (1963). ii) The average plant size Commanor and Wilson [1967] iii) The minimum efficient plant Lyons measure [1980]. The first is a hypothetical plant size such that "half of the output of an industry comes from plants larger than its mid point plant and half from the smaller plants" (p 73). The justification for using this measure is that the observed size distribution of plants will be close to the minimum efficient size of plant, and so some measure of central tendency like the median will provide an approximate measure of the minimum efficient size.He justifies the use of this proxy by suggesting that the mid point " ......is unlikely to be sub optimal." (p 73). All the researchers, Weiss [1963], Strickland and Weiss [1976], Hart and Clarke[1980] using this measure of plant scale economies got similar results and same as those who used the

Table 2.1: Determinants of The Levels of Industry Concentration in U.K and U.S.

Author	MES	AS	PF	INS	ICR	ASR	IG	R^2
Saving 1961	i * +		i * +					0.55
Commanor & Wilson 1967	i * +				i * +			0.81
Pashigian 1969	i * +			i * -				0.74
Greer 1971	i * +				i +	i * +	i-	0.91
Guth 1971	i * +				i * +	i -(1958) +(1963)		0.71
Sawyer 1971	i * +		i * +					0.72
Porter 1974	i * +				i * +		i-	0.85
Strickland & Weiss1976	i * +					i * +		0.49
Lyons 1980	i * +		i * +					0.47
Hart & Clarke 1980	i * +		i * +	i * -				0.85

Notes: 1. i denotes a variable included in the analysis.

2. * denotes significance level at 5% level.

Whereas: MES= Plant scale economies. AS= Average firm size. PF = Plants per firm. INS= Industry size ICR= Initial capital requirement. ASR= Advertising sales ratio. IG= Industry Growth.

Table 2.2: Determinants of The Levels of Industry Concentration for Less Developed Countries.

Author & Country	MES	AS	INS	ICR	IG	K/L	ASR	NF	I/S	D	R^2
Nam 1975 Korea.	i * +			i +	i * +		i +			1.M + 2.X + 3.S *+	0.85
Charles Philippines 1977	i * +		i -		i +	i -			i -		0.87
Gan & Tham. Malaysia. 1977	i +			i +			i * +				0.25
Sandesara. India. 1979	i * +	i * -									0.46

Notes: 1. i denotes a variable oncluded in the analysis.

2. * denotes significance lavel at 5% level.

Whereas: MES= plant scale economies. AS= average size.
INS= industry size. ICR= absolute capital requirement.
IG= industry growth. K/L= capital labour ratio.
ASR= advertising sales ratio. NF= number of firms.
I/S= import sales ratio. D= dummy.

Commanor and Wilson measure [1967] of optimal scale, that is the mean size of plant. They suggest the use of "the average plant size amongst the largest plants accounting for 50% of industry output." (p 428). This proxy is larger than the mid-point and the rationale for its use is the same as above and it is close to the direct physical measures or engineering estimate, of minimum efficient size Greer [1971] and Guth [1971] Porter [1974] Nam [1975] Lindsey [1977] and Gan Tham [1977] all used the Commanor and Wilson measure of MES and except for the latter they found that it performed equally well in their equations.

However these results need to be treated with caution because the above two minimum efficient size measures are not strictly justified in terms of a theoretical approach; they are indirect measures of the direct measures of optimal plant size, engineering and survivor methods.(See Technical Appendix p.300)

Unfortunately it is shown by Davies [1980] that both the above mentioned proxies do not satisfy the above conditions; they tend to overstate the minimum efficient size derived from the direct methods. He casts doubt on the common use of proxies and shows that if they are related to concentration itself, this renders the use of the proxies very doubtful.

To overcome the above problems Lyons [1980] suggested a third measure, according to which "......a firm utilizing two plants will be producing at least MESP output,...."(p20).so he estimates the expected number of plants set up by a firm of a given size.He uses this estimate to generate the estimates for

MEP. This method requires simple Census of production data. This measure of minimum efficient size is closely related to the direct measure of minimum efficient size, the survivor technique used by Stigler [1958]. Besides the above measures of minimum efficient size some researchers like Haldi and Whitecombe [1967] and Pratton [1965] have used the engineering estimates while Johnston [1960] used the statistical cost data. Others like, Stigler [1958], Saving [1961] Sheperd [1967], Rees [1973]. have used the survivor method. Unlike the proxies used for minimum efficient size, all these methods are direct measures of MES, but the results based on these measures are also not free from errors, either because of data limitations or because of the weakness of the measure itself.

Another variable, number of plants/firm ratio, is used to capture the effect of multi-plant economies of scale, Saving [1961], Sawyer [1971] and Hart and Clarke [1980] incorporate this variable in their studies and find it to be significant. However there are problems with this proxy measure of multi-plants economies of scale. A firm may not be operating with multi-plant in order to gain economies of scale, it could be doing so to spread the plant specific risks. Another problem is that the proxy may be definitionally related to the dependent variables through a simple identity.

It has also been hypothesized that the size of the industry will influence the concentration ratio inversely. Pashigian [1969], Sandesara [1979] and Hart and Clarke [1980] lend support to the hypothesis, however Charles.W [1977] found a negative but non-significant relationship between concentration and industry size.

Other determinants of the levels of concentration suggested by some of the studies are some measures of barriers to entry; for example absolute capital requirement and product differentation. The higher the capital required for MES plant size, other things remaining the same, the less likely is entry and therefore the higher is concentration level. The theoretical link between the dependent and independent variable is loose and the evidence found is that the regression coefficient has a positive sign [usuallly insignificant] and the results are not uniform. It is interesting to note that Nam.W.H. [1975] and Gan & Tham [1977] do not lend support to the commonly believed hypothesis that absolute capital requirement is a stronger barrier to entry in less deveoped countries than the developed countries. It may be that capital is a barrier but not an absolute barrier (or binding constraint) to entry. Or it may be that non-significant results are a reflection of poor accounting practices in less developed countries regarding the measurement of capital.

The rational for incorporating product differentiation as an independent variable in most studies is that the more the products are differentiated the lower is the cross elasticity of demand between rival products; hence it makes entry difficult. How it is proxied is by taking the ratio of advertising expenditure to sales denoted as advertising intensity. Although it has a positive coefficient in the regression equations of most studies, (not all) it is argued that it is not a good proxy because we are trying to get a measure which picks up the relevant aspects of product differentiation which is reasonably consistent across industries. So industries with high advertising/sales ratio have more product differentiation barriers to entry than industries with low advertising/sales ratio. Why one would not expect consistency in the results is because i) In some industries one would expect a much higher level of advertising because of the nature of innovation in the industry. If the rate of innovation in a drug company is high it has to advertise more than a drug company with slow innovation. So such advertisments have something to do with the product and not with barriers to entry ii) part of the advertising expenditure in some industries is distilling relevant information to consumers this would in fact increase cross elasticity of demand. One expects the information component may be bigger in one industry than in others, and as long as the ratio varies from one industry to another one could get inconsistency in results. iii) A more serious problem discussed by Martin [1979] is that of simultaneity of the relationship, some studies hypothesise that advertising/sales explains concentration, but it may be that concentration is a cause of advertising intensity so that we get a wrong specification of the model. For example an industry is relatively unconcentrated becomes more concentrated and in the long-run price competition becomes neutral. To maintain its dominant position it may lead to more non-price competition which includes more advertising so the advertising/sales ratio rise Siddharten [1984].

To sum up on advertising intensity: not only is it difficult to relate it to concentration but there are problems of measurement as well.

In spite of the shortcomings of much of the statistical analysis it is realized that the optimum plant size is an important variable in explaining inter-industry differences in concentration. However it is also realized that the explanatory power of plant scale economies is modest.

Studies about less developed countries are few and they are incomplete. In most of the models tested, one important variable relevant to the situation in less developed countries is government policies on matters of monopolies, import controls, protection, nationalization and investment sanctioning license which can influence concentration levels, is ignored. For example, White [1974] argues that to maintain and establish market power significant barriers to entry are required. Economies of scale may be a relevant barrier to entry but it does not explain all the industrial concentration. More important barriers to entry in less developed countries are government policies which create scarcity of resources by stringent licencing policies regarding the import of inputs. However he did not support his argument by statistically testing the strength of the two barriers to entry in affecting concentration.[5]/.

Determinants of Change in Concentration:

In the case of advanced economies several attempts have been made to carry the research about determinants of concentration one step further by explaining changes in industrial concentration using time series data in a multiple regression analysis. Both the dependent and independent variables are measured in terms of proportionate changes. However hardly any effort is made in less developed countries to explain the changes in industrial concentration. Tables (2.3 and 2.4) provide a summary of the studies undertaken by various authors for developed and less developed countries separately.

Most of the studies hypothesise that besides the initial level of concentration the variables which determine the levels of concentration, changes in those variables, must be able to explain some of the changes in concentration. We will review the literature about proportionate changes in

---

5. He simply tested the relationship between dominant families (A) in 1968 and foreign exchange licensing (FFL). His result, as below indicate a strong relationship between family dominance and

$$A = 75.17 + 1.95\ FEL \qquad R^2 = 0.43$$
$$(3.80) \qquad (5.62)$$

the receipt of foreign exchange licenses. What White found, is true for that period, as discussed earlier, licenses were distributed in a way to increase concentration.

concentration according to the findings of the studies by discussing the variables included in the regression analysis by most of the studies.

As a whole most studies suggest that the level of initial concentration seems to be highly correlated with the changes in concentration. The hypothesis tested is that the higher the initial level of concentration the smaller is the likely change in concentration. Besides the economic justification of the use of initial level of concentration, it is expected that the high correlation may be observed for statistical reasons because the limiting values of concentration are zero and one. So if an industry is highly concentrated one would expect the changes in concentration in that industry to be small and vice-versa. Most of the studies in Table (2.3) found the initial level of concentration as highly significant in their regression equations.

A second important variable included in most of the studies is the industy's growth. It is hypothesized that concentration changes are going to be less in case of faster growing industries than in the industries with a slow growth process. One would expect that the industry growth will have a negative influence on changes in concentration. Empirical evidence is not so clear because quite a few studies such as Sheperd [1966] and Gratten and Kemp [1977] show that industry growth and changes in concentration are positively related.

Few studies used changes in the optimal plant size to explain changes in concentration. Except for one study Caves

Table 2.3: Determinants of Changes in Concentration in Developed Countries.

Author	IG	DMES	PD	ASR	ICR	INS	DNF	R^2
Evely & Little.	i * -	i * +						NC
Nelson	i * -							"
Weiss		i * +	i * +					"
Sheperd	i * -				i * -		i * -	"
Sheperd	i +							"
Sawyerer	i * -				i * +		i * -	0.32
Sheperd	i -				i * -			0.10
Ducheneau	i +				i -			0.48
Muller & Hamm	i * -		i * +		i * -	i -	i * -	0.36
Aaronovi-tch & Sawyer					i * -			0.12
Gratton & Kamp.	i -			i -	i * -			0.34
Wright	i -		i * +		i * -	i -		0.44
Muller & Hamm	i -		i * +	i * +	i * -	i -		0.36
Hart & Clarke	i * -	i * +		i +	i * -			0.40
Caves & Porter	i -	i +					i * -	0.15

Notes: 1. i denotes a variable included in the analysis.
2. * denotes significance at the 5% level.

Whereas: IG= industry growth. DMES= change in optimal plant size. PD= product differentiation. ASR= advertising sales ratio. ICR= initial level of concentration. INS= industry size. DNF= changes in number of firms. NC= not calculated.

Table 2.4: Determinants of Changes in Industry Concentration for Less Developed Countries.

Researcher & Country		ICR	IG	DNF	R^2
Ghosh.A India.	1975	i * -			0.37
			i * -	i * -	0.26

and Porter [1980], the studies found that changes in the technical economies at the plant level was an important variable. However it has to be appreciated that the measurement of changes in the optimal plant size variable are measured for a short period of 8- 10 years. Therefore the regression results are unable to pick up fully the effect of a change in the minimum efficient size of the plant which would have been revealed if changes were based on a longer period.

Other determinants of changes in concentration used by some of the studies are product differentiation, advertising-sales ratio and changes in the number of firms. All the studies uniformly lend support to the hypothesis that product differentiation has a positive effect and changes in the number of firms has a negative influence on the changes in concentration. Results on advertising-sales ratio varied across studies. Only Muller and Hamm [1980] found a significant positive effect of advertising-sales ratio on the changes in concentration.

With the exception of one study Gosh [1975], statistical evidence about the changes in concentration in less-developed countries is not available. His results are mentioned in Table (2.4) and it is interesting to see that his study revealed a similar pattern of results as showed by studies mentioned in Table (2.3).

From the results of studies in Table (2.3 and 2.4) we learn that industry growth and the initial level of concentration appear to be the most important variables determining the changes in concentration. However the overall explanatory power of the variables has been low as indicated by the R^2s compared to the results in Table (2.1 and 2.2). The unexplained variation is large which indicates that other forces are more powerful than the static determinants of concentration. Furthermore poor R^2s also means that the changes in the independent variables are not accuratly measured; to have more reliable evidence about changes in variables it would be better to take changes over a longer period of time.

STRUCTURE AND PERFORMANCE:

While reviewing the results of some of the studies exploring relationship between concentration and profitability we will briefly mention the evidence reported in Table 2.5 about U.S the U.K and E.E.C but we do not wish to engage in any discussion about their results. However in the case of less developed countries we will discuss their results fully. Our discussion will focus on the three well known studies of Pakistan, White [1974], Shirwani[1976] and Amjad [1977], measuring concentration levels and its effects on profit. Results of studies on other less developed countries will also be brought to light while comparing their findings with the evidence found in the case of Pakistan.

The pioneering work on Structure-Performance models was done by Bain [1951] for U.S data. As explained earlier he

Table 2.5: Levels of Profitability Concentration and Other Variables. Regression Results for Developed Countries.

Author &Country.	CR	K/O	IG	MES	ASR	M/S	X	EPR	D	ACR	R&D	R^2
Commonari - &Wilson			i +	i +	i*+					i*+		.47
Blake & Helmberger U.S 1971	i+*	i-		i+*	i+						i+	.47
Sheperd U.K.1972	i +	i-*	i*+									.11
Holterman U.K.1973	i +	i*+	i*+	i +	i*+							.45
Khalilzadeh. U.K. 1974	i +	i*+	i +	i*+	i*+		i*+					.54
Strickland & Weiss 1976	i*+	i -	i -	i +	i*+							.65
Hart& Morgan .	i +	i*+	i +	i -	i*+	i +						.43
U.K 1977	i*+			i -		i +						.09
David. Australia 1980	i -	i*+	i +		i*+		i*-					.36

Notes: 1. i denotes a variable is included in the analysis.
2. * denotes significance level at 5% level.

Whereas: CR= concentration ratio. K/O= capital output ratio. IG = growth of industry. MES= size of enterprise or plant. ASR= advertising sales ratio. M/S= import sales ratio. X = exports. D= dummy for producer & consumer goods. EPR= effective protective rates. ACR= absolute capital requirement. R&D= research and development.

finds that profit rate and concentration are significantly related but in a discontinuous manner, i.e the top few firms holding market share greater than 70% showed positive evidence for the concentration profit hypothesis. Whereas in the case of top few firms contributing less than 70% of market share the relationship did not exist. On the other hand Stigler [1963] took a sample of 99 industries for various dates between 1938-1957. He divided his sample into three classes. Industries with concentration ratio above 60%, below 50%, and lower than 20%. He found that the difference between average rate of return in concentrated and unconcentrated industries was significant at 5% for 1951, 1954 and at 2% for 1955-57. Averaging the rates of return on a longer period (1947-54), Stigler did not find any significant difference of averages.

Given the results of the above two studies one cannot safely rely on any one as such, after all, as noted earlier, Bain used data covering a phase of business cycle 1936-1940, which were years of the late depression, while Stigler covered periods characterized by inflation or price controls. Furthermore a simple average on which they based their analysis may be an important single statistic but the problem is that such straight forward application of the Structure-Performance model may obscure important information required for policy purposes. This problem was overcome by the subsequent studies by relying on the multiple regression analysis. Results of these studies varied across the developed and less developed countries.

For the U.K a few studies were carried out but the results showed scepticism about the structure performance paradigm. Hart and Morgan [1977] and Hart and Clarke [1980] found that in a simple regression the explanatory power of concentration was negligible and in a multiple regression model concentration-profit relation was weak. Shirazi-Khalilzadeh [1974] and Holterman [1974] found similar results. The concentration profit relation was not significant and the importance of the concentration ratio was further reduced in a multiple regression analysis. However Cowling and Waterson [1974] suggest the use of H index, defined as the sum of the square of the individual firm's share in industry output, which they found had a significant explanatory power. Table [2.8].

Comparing the studies of U.S and U.K it is concluded that the concentration-profit hypothesis is not supported by the U.K data of manufacturing industries. This could be due to several reasons; our aim is not to go into the details.

For the EEC countries the results of only three studies are reviewed to get some idea about the importance of structural variables in explaining the performance of the manufacturing industries. Horowitz [1971] tested for a four equation model analysing the effect of concentration on industry wages, sales and Investment for a group of countries including Germany, France, Italy, Netherlands, Belgium and Luxemburg. He found that concentration is an extremely important variable in influencing economic activity. Wages, sales and investment were all significantly related to concentration. In other words his results were compatible with the hypothesis that increased concentration leads to increased profits, but he concluded that compatibility and causality are two different things, i.e. which way the causation runs is not determined. Another interesting exercise was done by Phillips. L [1971] for Belgium, Italy and France. He finds that for Italy a positive profit concentration relationship exists, but is not strong, except that in the recession years the relationship is revealed more clearly. This positive relationship appears to be common for industries that are highly concentrated and technologically advanced. For Belgium no significant results could be obtained. Such also was the case for France.

Results of a third study by Jenny and Weber [1976] are equally interesting. For a sample of 44 French manufacturing industries they explored the relationship between performance and concentration, barriers to entry, exports, growth of industry, product differentation and economies of scale. They found that the explanatory power of the structural variables especially concentration, is strongly limited.

Results of the above three studies cause suspicion about the Structure-Performance theory; it is unable to explain several important features of the industrial pattern characterising the European community.

Less Developed Countries:

Table(2.6) gives a list of the studies reviewed, the variables and their significance in explaining profitability in the manufacturing industries of the various less developed countries. Before we start discussing the results it is important to mention the inadequacies of these studies in the first place. Firstly, most of the studies have used cross-section data for one year or taken an average of the concentration and profits variables for three or four years. Results based on one year data can only reveal a short run relationship which has no relevance to the structure performance paradigm which lays stress on the importance of structure of market affecting profit. To smooth out the short-run fluctuations some studies have used average rates of return and concentration over a period of three-four years; but this is a dangerous exercise because nothing is gained by averaging figures; if anything information is lost by doing so. When averages are used one should be careful to stay within the same phase of the business cycle, Phillips L.[1971]. Measures based on single year data can at best give information about the level of concentration and profits, which is far from explaining the long term effects of concentration on profits. Ideally one would like to explore the effect of proportionate change in concentration on proportionate change in profits. Secondly, an important avenue of research which could have provided in depth evidence about

Table 2.6: Level of Profitability Concentration and Other Variables Regression Results for Less Developed Countries.

Author& Country.	CR	CR	K/O	MES	K/L	X	EPR	CU	PP	OC	D	OWS	R^2
Charles.W Philppines 1970	i*+		i -										.26
House.W. Kenya 1972	i*+		i*+			i*-							.48
Sawhney& Sawhney India 1973	i*+	i*-	i +					i*+					.59
Nam. W H. Korea 1975	i*+												NC
Gan.W.B. Mala-1977	i +		i*+	i*-	i*-	i*+	i*+			i*+	i*+		.84
ysia.1978	i +		i*+										.55
Apte.P.& Vadiyanat-han. 1982. India.	i +		i +					i +	i*-	i*-			.67

the structure-performance model is ignored. Other aspects of performance e.g. wages, productivity of labour and capital could provide complementary information about the structure performance link especially when we know the variable measuring profit is not reliable due to data problems. To double check the results it is useful to rely on other measures of performance, Thirdly, the majority of the studies relied on the linear regression equations, hardly any exercise of simultaneous equations was carried out; this could be because it has only recently been suggested that the line of causation between concentration and profitability is undetermined. As mentioned earlier on it is quite possible that both are simultaneously determined. Lastly model specification was to a large extent constrained by the availability of data.

Studies exploring structure-performance relationships in the less developed countries are not many. But most of the work done up till now is a priori theory based on the Structure-Performance link.

In case of Pakistan White [1974], Shirwani [1976] and Amjad [1977] test the hypothesis that highly concentrated industries have a high rate of return. The models of the three studies are stated below. Their result will be discussed according to the variables used:

The models tested were:

1. Amjad: $PC = a + bCR + cK/O + dP + eM + fCU$
2. Shirwani: $P1 = a + bCR + cD_o + dD_c + eD_M + fCU + gCU$

3. White: II = a + bS + cLCM + dLIM

where:

Pc: Price cost margin as a measure of profit.

CR: Concentration ratio taken as the share of top firms of total sales or output of the industry.

K/O: Capital-output ratio was calculated by dividing the book value of fixed assets by the value of production.

P: The level of protection as calculated by Lewis and Guisinger [1971].

M: Competing imports i.e. imports as a percentage of total domestic supply.

CU: Capacity utilisation, data used in CSO Survey (1965)

P1: Profit before tax as a percentage of paid up capital.

Do: Domination of foreign firms (a dummy variable).

Dc : Domination of government regulated fimrs (A dummy variable).

DM: The level of imports; is the value of the imported goods as a percentage of the total value of domestically produced and imported goods.

II: Profit before tax

S The structural variable

LCM: A variable indicating the relative stringency of licenses for competing imports

LIM: A variable indicating the relative stringency of licenses for imported inputs.

Amjad, selected a period of four years 1967-70 and Shirwani focused on the periods 1966-68, 1969-70 and 1972-73 to test their models for 25 and 27 manufacturing industries respectively, (accounting for approximately 80% of the value added of the manufacturing sector). Both the studies based their exercise on almost the same time period which makes it a less interesting analysis for purpose of comparison. They report regression results for each year and also for average concentration and profits of the four years, for alternative model specifications. In contrast to these two studies White, used cross-section data for 1964-65 for 17 industries.

All the studies found a positive relationship between concentration ratio and profits. The significance of concentration in influencing profits varies from study to study and year to year. Compared to Amjad [1977] and Shirwani [1976], White [1974] found a relatively weaker relationship. Their over all conclusion is that concentration and profitability are related, hence the usual micro economic implications of monopolistic competition follows. However empirical findings of others have been different e.g Gan Tham [1977], Apte and Vaidyanathan [1982] and Kemal [1978] did not find a marked relationship between profits and concentration

Table 2.7: Levels of Profitability Concentration and Other Variables Regression Results for Pakistan.

Author		CR	K/O	M/D	PP	CU	CU	D	R^2
White.L 1971.		i * +				i +	i +	i * + (D1)	0.42
Shirwani. 1976.	1.	i * +							0.44
	2.	i * +						i * - (D2) i * + (D3)	0.56
	3.	i * +		i * -		i +	i -		0.60
Amjad 1977.	1.	i * +	i +						0.57
	2.	i * +	i -	i * -					0.55
	3.	i * +	i -			i * +			0.57

CR: Concentration Ratio K/O: Capital Output ratio
M/D: Imports as a percentage of domestic sales.
PP: Share of public sector in industry.
CU: Capacity Utilization. D1: Dummy for domestic price above CIF price. D2: Dummy for growth of firms.
D3: Dummy for foreign firms.

and it is hard for them to reconcile such findings with theory.

Some of the studies explored the possibility of a discontinous relationship existing between concentration and performance, e.g. House [1973] found that beyond a certain degree of concentration level the profit concentration relation gets stronger. However there are studies that report contradictory results, e.g for India, Sawhney and Sawhney [1973] and Katrak [1980] found that profits in fact fall at a very high level of concentration, this could be a reflection of implementations of the anti-monopoly legislation and policies. In general most studies found the relationship was continuous.

These studies also took account of the openess of their economies by including a foreign trade variable in the regression analysis. This was done in three ways. One way also adopted in other less developed countries was to include a variable measuring the level of imports or exports. Second the level of imports taken in combination with the level of concentration in the domestic industry i.e concentration x Dummy variable for competing imports. And a third way is to use effective protection as a measure of foreign trade restrictions. Amjad and Shirwani, unexpectedly did not find a strong impact of competing imports. But House [1973] found that the concentration profit link gets stronger when the foreign trade variable is included in their regression of concentration on profits. Amjad and White have also used effective protection as a measure of foreign trade restriction, although it is an indirect way of accounting for foreign trade restrictions. White argued that effective protection given to the domestic industry through high tariffs, bonus vouchers and license stringency would all influence concentration and hence profits of the monopolist. The central factor to his analysis is that if imported goods were freely allowed to enter at zero or low rates of duty, these imports would have been an important constraint on the power of domestic producers to exploit their monopoly power. If the monopolist tried to raise their prices above CIF import prices plus tariffs one would have seen imported products coming in till prices fell again. Amjad's results were not significant and the sign was unexpectedly negative. He provides two reasons for it: i) Measures of protection may be highly inaccurate ii) Industries might be enjoying protection but by having high cost, low capacity utilization and inefficient labour etc., profits may be pulled down. On the other hand Kemal [1978] and Packard [1969] obtained results in favour of the argument, White [1974] and Gan Tham [1977] found a positive but a less significant relationship between profits and effective protection. However, the reader may be warned that the estimates of effective protection are generally very rough; they tend to vary a great deal from year to year; that they are purely static measures providing a snap shot view of the economy at a moment in time etc. If that is so then one would wonder whether these measures of protection can tell us anything meaningful at all.

Amjad like most other researchers attempted to capture the influence of barriers to entry on profits. The majority of the studies measure the barriers to entry variable by using the capital output ratio except for Gan Tham who uses both capital/output and MES as a barrier to entry (BTE); his results supported the hypothesis that BTE influence profits. Amjad like Lindsey [1970] got a perverse negative sign with an insignificant coefficient. It could be that measures of BTE are just proxies which can at best give approximate results or that concentration itself is correlated with the measures of MES or capital/output ratio due to which the independent effect of these variables cannot be identified.

Another variable common to a number of studies is a measure of capacity utilization. In the case of Pakistan, all the three studies had tested the hypothesis that profits and capacity utilization are positively related. With high capacity utilization the costs per unit would fall. However there are problems of interpretation because of the ambiguity in the hypothesis e.g. if we have a straight forward case where seller concentration is high, firms may earn high rates of return by under utilising their productive capacity. On the other hand what is more typical of less developed countries is that even if seller concentration is high and there is excess demand which is likely to lead to an increase in capacity utilisation, the profit margins may not increase because of the price control policy adopted by the government. In that case capacity utilization will have no significant effect on profits.

Results of the three studies about Pakistan do not show a significant influence of capacity utilization on profits. Amjad is satisfied with the mere positive sign of the regression coefficient, better than what Islam [1967] gets, a negative sign. In fact Islam's results are more interesting and reasonable than Amjad's. The justification provided by Islam is that with a larger output firms tend to set a lower profit margin. Since a lower profit margin on a larger output may still lead to larger absolute profits, depending presumablly on the price elasticity of demand. However his regression coefficient was small. Two studies Nam [1975] and Sawhney and Sawhney [1973] show evidence in support of the hypothesis that in a concentrated structure, under utilization of capacity will enable firms to earn monopoly profit.

Some studies have also enquired about the effect of types of firms within an industry on the levels of profits, Shirwani [1976], Gan Tham [1977] and Apte [1982]. Shirwani found that profit levels were higher in those industries where a foreign firm is a leading producer, and Apte [1982] showed lower profits for a large government regulated firm than the level of concentration in those industries would other wise suggest. These results lend support to our central argument that the structure of the industry may not be the sole determinant of performance. As Shirwani mentions, foreign firms, could be earning higher profit margins because they may be better organised, have more technical know-how compared to their local rivals and even commercially efficient, but Shirwani causes confusion in his conclusions by suggesting that high concentration leads to high profits. Another possibility is that the foreign firms may be operating in more capital intensive faster growing industries, but Gan Tham [1977] found that the foreign enterprise earned higher profit margins in the consumer goods industries but not in the producers goods industries of Malaysia. The findings of Apte [1982] do not imply that government enterprises are not earning higher profits because they are inefficient. In fact the commercial motive may not be the target set by such firms, as pointed out at the beginning, they may be pursuing other goals.

Almost all the studies convey the same message that a concentrated structure leads to above normal profits; therefore they infer that the welfare implications of a concentrated structure of market can be far reaching despite the fact that the explanatory power of their models frequently account for less than 50 percent of the variance in price cost margins. However these writers need to recognize the fact that in most less developed countries a high proportion of manufacturing production takes place in the small scale informal sector, and because of data deficiencies the role of this sector is not taken into account; hence there is an upward bias in the results. Secondly the public sector owns a fairly large proportion of enterprises in the manufacturing sector in most less developed countries whose motives are far from those of private entrepreneurs and the Structure--Performance paradigm may need to be modified to take this factor into account. Finally, even if large firms hold a large proportion of market share, their dominance may be of little importance in the presence of low price elasticity of demand (which is omitted from all models because of data limitations), government regulatory policies, smuggling and dumping of foreign goods.

Summary:

Reviewing studies related to the structure-performance paradigm, in developed and less developed countries it is noticed that most studies attempt to answer four basic questions like i) whether aggregate concentration has in manufacturing industry increased over time? ii) What the relationship is between the level of concentration and market size? iii) what is the pattern of ranks when individual industries ranking is compared across countries? iv) what determines concentration and what are its effects on profitability?

No firm conclusions, about the structure and performance in the manufacturing industry, can be drawn from the results reported by the studies reviewed because of several problems related to the data, measurement error, errors in the model and estimation techniques.

Nevertheless, it is observed that in less developed countries the trends in concentration vary from country to country depending mostly on government policies & country specific circumstances, while as in developed countries concentration has increased mainly because of technological reasons, however, the level of concentration may not depend on the level of economic development as almost the same industries are ranked as highly concentrated in both developed and less developed countries, implying that similar forces are at work in forming oligopoly and monopolistic structure in manufacturing industry.

Most studies examining the influence of explanatory variables on concentration, at a point of time, suggest that economies of scale, industry size, absolute capital requirement, product differentiation etc are the determinants of concentration. Very few writers have tested the relationship between changes in concentration and changes in the right hand side variables. They found that seldom are the same variables explaining levels of concentration important in influencing changes in concentration. Thus suggesting that by restricting the analysis to levels one may draw incorrect inferences. In the second section we reviewed studies examining the Structure-Performance link. Again no firm conclusions can be derived from the results reported by the studies reviewed, because of ambiguity in the efficiency/monopoly hypothesis, market disequilibrium, type of ownership and size, simultaneous equation bias, and errors in data about profits. Hence it is suggested that other measures may also be taken as indicators of performance. Furthermore the traditional approach of profit maximization

Table 2.8: Some Regression Results of Proportionate Changes in Profitability on Proportionate Changes in Concentration.

Author		DCR	DH	DNOE	DTU	DG	R^2
Cowling & Waterson.	1.	i * +					0.06
U.K. 1976.	2.	i * +					0.04
	3.		i * +		i * +	i +	0.09
	4.	i * +			i +	i +	0.06
Hart & Morgan.	1.		i +				0.01
U.K. 1977.	2.		i +	i -			0.03

may not always be very useful when the firms have to operate under tight government regulatory policies.

CHAPTER III

CONCENTRATION AND LARGE ESTABLISHMENTS IN MANUFACTURING INDUSTRY

In Pakistan no studies about the structure of industry were undertaken prior to 1965. Writers began to measure the extent of concentration enjoyed by powerful oligopoly and monopoly groups in Pakistan when concentration of wealth and ownership became a major political issue in the late sixties, but none of the studies measured changes in concentration/ structure of industry except Shirwani [1976] and that too is limited in nature. The main findings of the authors have already been presented in chapter 2.

Before we deal with the determinants of industrial structure, in the next chapter, it is important to examine the evolution of the structure of manufacturing industry by tracing the pattern of changes overtime in some of the basic aspects of industrial structure like (a) distribution of firm size and type of ownership (b) trends in aggregate concentration in manufacturing industry (c) the level of concentration in individual industries and (d) the average size of establishment and plant size in Pakistan in relation to International Standards of average plant size. Like this, information gathered about the key aspects of industries structure will enable us to provide some explanation about the determinants of industrial concentration/structure and thereupon performance of the manufacturing industry in the subsequent chapters.

Distribution of Firms Size And Type of Ownership:

It is important to have some idea about the pattern of distribution of firm size and the type of ownership, in particular the relative importance of the private and public owned enterprises in Pakistan manufacturing industry. Such information is necessary because the structure, conduct and behaviour of different enterprises besides other factors also depend on the size structure and type of ownership.

Annex 3.A illustrates the inter-temporal changes in the size structure of manufacturing industry as a whole. The distribution of value added among the ten size groups for various points of time is presented, and it is observed that the size structure of manufacturing establishment tend to be skewed towards the large size classes.[1]/.

Table 3.1 also shows the size structure by comparing the distribution of size in the three size groups measured in

---

1. Ishikawa [1979] observes that the size structure of manufacturing establishments in Japan have continuously skewed towards the small and medium size establishments and even though overtime the size structure has changed still the smaller size establishments prevail. Comparing the Japanese size structure with selected countries he finds that unlike Japan, the size structure of not only the U.S.A but even of India, Pakistan and the Phillipines are skewed towards the large size classes.

terms of number of workers.[2]. The table also provides a comparison of the percentage share of the three size groups in manufacturing value added.[3].[4]. (For details see Annex 3.A)

At the beginning 87.25 percent of firms had 100 or fewer workers, this percentage declined to 83.5 in 1970 and remained almost the same in 1984. Whereas the percentage of firms with more than 100 but less than 1000 workers increased from 10.33 to 14.70 percent in 1970 and since then has increased only fractionally. In contrast about 3 percent of firms employ 1000 or more workers and this percentage has also changed only fractionally since 1970. It then means that after 1970 the pattern of distribution of employment by the three size groups remained the same. Similarly comparison of percentage share of the three size groups in manufacturing value added manifest that, the share of the small size group continued to decline from 25.40 to 12.94 percent between 1959-84, that of

---

2. The manufacturing establishments are grouped into three size groups, the small, medium and large size which may be defined in terms of the number of workers as a less than 100 size, a 100-1000 size and a more than 1000 size, respectively.

3. As mentioned in the first chapter, the Census of Manufacturing Industries does not include establishments that employ less than 10 workers (the informal sector). Therefore our estimates of the small size group are only partial and biased to that extent.

4. The Census of Manufacturing Industries also provide a second measure of size in terms of ownership of fixed assts. This classification scheme of fixed assets is not comparable between years because they donot take into account inflation and there upon represent only the book value of assets purchased over a number of years rather than a consistent extimate of capital stock (Annex 3.A).

Table 3.1: Size Distributionof Manufacturing Establishments and Value Added (1959-840.

Size (Employment)	Establishments (percent)					Value Added (percent)				
	1959	**1970**	**1975**	**1978**	**1984**	**1959**	**1970**	**1975**	**1978**	**1984**
0-99	87.3	83.5	82.3	83.2	82.7	25.4	15.6	13.0	13.3	12.9
100-999	10.3	14.2	14.5	14.2	14.7	32.4	39.9	45.8	51.9	44.8
1000 & above	3.3	2.3	3.2	2.5	2.6	43.4	40.6	39.4	32.2	42.2
N	(22)	(86)	(108)	(94)	(100)					

N = number of establishments in the largest size group.

Source : Calculated from the Census of Manufacturing Industry(1959-84), Statistics Division, Federal Bureau of Statistics, Government of Pakistan, Karachi,Islamabad.

the medium size has persistently increased except for a slight decline towards the end.[5]/. And the large size establishments recorded approximately the same percentage share in value added throughout except for a decline in the 1970's.

Table 3.2 summarizes some evidence on the relative importance of the public and private sectors in Pakistan manufacturing industry. It suggests that the role of the public sector in manufacturing industries has increased substantially since 1970's, for example public sector investment increased from 12 percent in 1969/70 to 80 percent in 1977/78 and 54 percent in 1984. It is engaged mainly in the basic industries like edible oil, petrochemicals, fertilizer, pesticides, petroleum refining, non-metallic mineral products, cement, iron and steel, engines, motor vehicles, and ship building etc. In contrast the private sector involvement in the manufacturing industry had reached its peak in 1960's and started declining in 1970's and increased only marginally in the 1980's. For example private sector investment reached its highest level of 87 percent in 1969-70 and has now

---

5. Similar trends were reported by A.Ghosh [1975] for Indian Manufacturing Industries. He suggests that the role of the medium size firms has become more important in majority of Indian industries. Since the four and eight firm concentration ratios calculated for 22 industries tend to decline in most of the industries, obviously the share of the smaller firms must have been declining even more. Thus it was the middle size firms that grew in size relative to the large and small size enterprises, and have caused changes in the structure of Indian industry during 1948-68.

Table 3.2 : Large Scale Manufacturing Investment (LSM) 1963-64 to 1982-83 (Rs.million 1959-60 prices).

	Investment in LSM Private (PRI)	Public (PUI)	Total (TI)	VA (LSM)	Percentages PRI/VA	PUI/VA	TI/VA
1963-64	864.4	29.5	893.9	2,233	38.7	1.32	40.0
1964-65	966.7	108.3	1075.0	2,523	38.3	4.29	42.6
1965-66	866.5	110.1	976.6	2,796	31.0	3.93	34.9
1966-67	714.2	89.8	804.0	2,982	24.0	3.0	27.0
1967-68	730.5	97.4	827.9	3,209	22.8	3.0	25.8
1968-69	646.0	59.6	705.6	3,548	18.2	1.67	19.9
1969-70	827.4	121.3	948.7	4,042	20.5	3.0	23.5
1970-71	779.4	43.7	823.1	4,090	19.1	1.06	20.1
1971-72	630.9	60.2	691.1	3,813	16.5	1.57	18.1
1972-73	426.9	61.5	488.4	4,265	10.0	1.44	11.5
1973-74	307.5	165.5	473.0	4,585	6.7	3.6	10.3
1974-75	287.3	306.4	593.7	4,509	6.4	6.79	13.2
1975-76	354.3	855.2	1,209.5	4,486	7.9	19.06	27.0
1976-77	381.2	1,120.9	1,502.1	4,385	8.7	25.6	34.3
1977-78	337.6	1,393.7	1,731.3	4,823	7.0	28.9	35.9
1978-79	357.5	1,352.0	1,709.5	5,006	7.1	27.0	34.1
1979-80	432.8	1,097.9	1,530.7	5,575	7.8	19.16	27.5
1980-81	515.8	753.8	1,269.1	6,188	8.3	12.18	20.5
1981-82	553.2	717.5	1,270.7	7,036	7.9	10.19	18.1
1982-83	582.3	684.0	1,266.3	7,646	7.6	8.94	16.6

Source : Estimated by I.B.R.D., Federal Bureau ofStatistics, Statistics Division, Government of Pakistan as reported in I.B.R.D (1984).

reached 45 percent in 1984.[6]/.

From the above information we understand that there exist small/medium/large size enterprises privately (singly/jointly) or publicly owned. Such enterprises may record different structure conduct and therefore performance. For example, first, the size of an enterprise will influence its structure and technique of production. These will in turn determine to a large extent the cost per unit of output, prices, profitability, productivity and wages. Second, type of ownership besides influencing the structure of an industry also determines its performance. The public owned enterprises are mostly concentrated but pursue objectives, different than the private owned enterprises, other than maximization of profits. Thus the relevance of size structure of manufacturing establishents and type of ownership to our analysis in the subsequent chapters cannot be ignored.

Aggregate Concentration In Pakistan Manufacturing Industry:

We have already gained a bird's eye view about the importance of the three size groups from Table 4.1. However, the percentage share of the largest size group in manufacturing value added can also be interpreted in terms of overall concentration trends over 25 years period 1959-84. In other

---

6. The relative importance of the foreign sector in Pakistan manufacturing industry can be guaged from its share in investment in the sector which was 7 percent in 1968 White [1974].

words these percentages enable us to gauge the importance of the largest size class enterprises in the manufacturing sector and the extent of market power-concentration exercised by them.

At the begining the largest size group comprised 22 establishments in manufacturing industry, controlled about 43.4 percent of its output, and employed 47 percent of the labour force. The biggest of these was textiles followed by food which had net assets of Rs.40,8955 and Rs.93,933 and employed 99,903 and 14,608 workers respectively. The share of output and employment held by the large size enterprises now 100 in 1984 is 42.19 and 43 percent. In 1984 on top of the list of large enterprises are establishments belonging to iron and steel, textiles, chemicals and food industries which owned net assets of Rs.94,11263 (iron and steel) Rs.8779040 (textiles) Rs.6903796 (chemicals) Rs.521580 (food) and employ 34086, 197252, 51575 and 61214 workers respectively.[7]/. One

7. As noted earlier the classification scheme according to ownership of fixed assets is not comparable between years. However White [1974] shows that during 1960's only 43 leading families controlled 53.1, percent of total assets of non-financial companies listed on the Karachi Stock Exchange. Of the private Pakistani controlled firms, these families controlled three quarters of assets, and within the large scale manufacturing sector, the largest forty three families controlled 38 percent of value added. Moreover of the nine commercial banks which controlled 90 percent of the total assets of private commercial banks, seven were owned by these leading families.
A large share of the assets of the insurance companies was also concentrated in a few hands. There were forty seven Pakistani insurance companies and fourteen were controlled by the monopolists and their share came to over 50 percent of the entire assets of the insurance sector Amjad [1984].
Keeping in view the concentration of capital assets with large firms, all private commercial banks and insurance

question that we may ask ourselves is has the percentage share of the large enterprises remained almost the same?. From the percentage shares mentioned in Table 4.1, and it is observed that the large size enterprises did not experience smooth growth in their market power in 1970's. So far as the number of establishments in the large size group between 1958-84, is concerned it has increased four fold. Correspondingly growth in value added in this size group did not follow the same pattern. However, it may be noted that since 1970 the number of large establishments remained more or less the same and so is the percentage share in value added in 1970 and now in 1984 but the job opportunities provided by the large size has declined. These findings indicate there are opposite forces at work, which on balance are maintaining approximately the aggregate level of concentration in manufacturing industries at the same level. Some may not take a serious note of it due to the fact that the increase in the level of aggregate concentration is marginally higher than what it was in 1970.. Others will be disappointed that the level of aggregate concentration has not decreased over the twenty six years covered by the analysis. Despite the presence of factors reducing concentration there exist forces that have at least maintained the level of concentration constant.

A Similar picture emerges when we summarize the data in Table 3.3 in terms of the four firm concentration ratio derived from the data contained in Table 3.4. For 1970, of the

---

companies were nationalized in early 1970's.

33 sectors 7 sectors carried more than 80 percent of production in their respective areas of production and employed more than 60 percent of the labour force, this number declines to 6 in 1978 and increases to 9, mainly because of the opening of four separate sectors petroleum refining, petroleum products, shipbuilding and motor cycles, by 1984. Indicating that concentration has remained on average the same between 1970 and 1984.

Individually these ratios show the same tendency, increase in the market power of some with decline or same market share in case of others overtime. Table 3.4 reports concentration in manufacturing enterprises in individual sectors, measured as the percentage share of the top four firms in value added for 1970, 1978 and 1984. It suggests that tea, alkalies, petroleum refining, rubber, pottery, non-ferrous industries, ship building, motor cycles and photographic goods industries are ranked as the highly concentrated industries followed by tobacco, Leather foot wear, paper, tyres, fertilizer and iron and steel. Out of a total of thirty seven sectors, eighteen sectors witnessed a decline in concentration ratio.[8] And in 9 industrial sectors market power on average remained the same from 1970 to 1984. Whereas in 10 sectors concentration has increased overtime.

Table 3.5 summarizes the changes in concentration which

---

8. It may be noted that despite the decline in concentration, some of these industries are still highly concentrated.

Table 3.3 : Frequency Distribution of the Four Firm Concentration Ratio in Manufacturing.

	Number of Industries					
Concentration Ratio	**1970**	**%E**	**1978**	**%E**	**1984**	**%E**
< 40	10	76	12	76	13	65
40 - 60	10	10	8	11	8	14
60 - 80	6	6	9	6	7	14
80 >	7	3.5	6	2	9	5
N	33		35		37	

E:Employment.

Derived from Table 3.4

Table 3.4 : Pakistan Four Firm Concentration in Manufacturing Industries (1970,1978,1984).

	Concentration Ratio					
	1970		1978		1984	
Sectors	**CR4 VA**	**CR4 E**	**CR4 VA**	**CR4 E**	**CR4 VA**	**CR4 E**
Food	32	13	13	10	7	10
Tea	100	100	100	100	100	100
Beverages	54	50	24	35	13	24
Tobacco	54	27	48	25	61	59
Textile	13	14	10	13	8	19
Wearing Apparel	64	46	50	46	23	39
Leather Tanning	44	30	42	41	59	35
Leather Footwear	76	75	73	66	71	67
Ginning	3	8	2	9	1	8
Wood Products	41	48	42	39	39	46
Furniture	43	42	27	33	40	39
Paper	95	66	92	87	75	75
Printing & Publishing	35	22	49	45	49	47
Drugs	60	27	25	28	21	25
Chemicals	44	47	25	31	31	29
Alkalies	100	100	80	80	90	83
Fertilizers	100	100	66	65	66	63
Other Chemicals	10	17	11	15	28	23
Petroleum Refining	-	100	100	100	100	100
Petroleum Products	-	-	70	67	64	63
Rubber	63	54	71	69	86	79

Tyres	80	73	83	56	66	61
Plastic	73	55	71	56	54	39
Pottery	95	87	98	85	82	86
Glass	75	51	52	39	49	44
Cement	58	55	48	49	54	30
Iron & Steel	51	34	30	52	61	55
Non-Ferous Metal	93	81	68	69	88	84
Fabricated Metal	22	13	26	19	26	23
Machinery	21	12	51	47	37	46
Electric Machines	23	23	18	31	20	31
Transport	31	50	65	52	49	55
Ship Building	-	-	-	-	100	100
Motor Cycles	-	-	-	-	100	100
Science Equipment	39	42	31	43	42	50
Photographic Goods	86	83	86	82	100	100
Sports	51	50	69	57	29	40

Notes :1). Typically CR4(VA) > CR4(E).

2). Decrease in CR4(VA) = 18 sectors i.e, food, beverages, textile, wearing apparel, leather footwear, ginning, paper, drugs, chemicals, alkalies, fertilizers,petroleum products, tyres,plastic, pottery, glass, non-ferous metal, sports.

3). Increase in CR4(VA) = 10 sectors i.e, tobacco, leather tanning, printing and publishing, other chemicals, rubber, iron and steel, fabricated metal, machinery, transport, photographic goods.

4). Constant CR4(VA) or marginal changes = 9 i.e, tea, wood products ,furniture, petroleum refining, cement, electric machines, ship building, motor cycles, science instruments.

Source : Calculated from Census of Manufacturing Industries 1970 - 84).Federal Bureau ofStatistics, Statistics Division,Government ofPakistan, Islamabad.

Table 3.5 : Changes in Concentration

	Changes					
	1970 - 78			**1970 - 84**		
	D	**C**	**I**	**D**	**C**	**I**
Number	17	10	8	18	9	10
% Decline & Increase						
About 5%	-	-	-	-	-	-
5% - 10%	-	-	-	6	-	-
10% and above	17	-	8	12	-	10

Notes : D = Decline, C = Constant, I = increase.

Source : Derived from Table 3.4.

enable us to give a definite answer for the four firm concentration ratio. Here it is clearly shown that the market structure remained the same after 1970. The number of increases has increased only marginally from 8 (in 1970-78) to 10 in 1970-84. Another noteable fact is that the change that occurred, both decline and increase in concentration was always very high, exceeding 10 percent in most cases.

It is of interest to enquire whether these concentrated industries are relatively more capital intensive or employ more labour, have higher labour and capital productivity and their wage bill is greater than the small size establishments in the same industries. Table 3.6 summarizes the comparison of capital/labour ratio, value added per unit of labour and capital and wages per head, between the top four large size and small size establishments in particular industries, which are reported in Annex 3.B. Out of 26 industrial sectors the largest size establishments of 8 sectors have capital/labour ratios lower than small size establishment. Whereas in case of 10 areas the large size establishments had lower value added per unit of capital and only 2 sectors recorded lower wages than the small units. Similarly in case of 6 sectors, the large size establishments employ less than 40 percent of the workers in their respective industries. In the rest of the 20 sectors the top 4 firms employ more than 50 percent of employees in their respective industries.

Thus the main conclusion drawn is that most concentrated industries are capital intensive, and were at the same time

Table 3.6 : Summary comparison of Selected Ratios of 26 Concentrated Industries (1984).

	K/L	V/L	V/K	W/L	E
		(Number of Industries)			
L	8	8	10	2	6
H	22	18	16	24	20
Total	26	26	26	26	26

Notes : L = Lower than small size establishments.

H = Higher than small size establishments.

Source : Derived from Annex 3.B.

employing more than half of the work force in their respective industries. However, it is noted that most of these large establishment although they were able to have higher labour productivity, were not able to utilize capital more efficiently. (The issue is further dealt with in chapter V and VI as well).

From the above information it is noted that the sectors showing high concentration are mostly those which are i) capital intensive and possibly dependent on imported technology and raw material. ii) import substitutes. iii) encountered with a disequilibrium in the markets for their products, where supply is deficient. Part of the reason for this is the large amount of capital required for the installation of additional establishments in these industries. iv) a mix of consumer, intermediate and capital goods. v) Owned by the public sector and where the private sector is not allowed to invest.

Besides our findings, it has been reported that concentration ratios are very high in Pakistan and may exceed in some cases by a significant margin the level of concentration found in developed countries. Merhave [1969] and White [1974]. However, this does not imply that the size of plant or enterprise is the same in both developed and less developed countries. In practice the size of plant in less developed countries is smaller than in advanced countries. Banerji [1978]. And even among the less developed countries the level of concentration will vary with the size of their domestic markets. Mueller [1978]. Some evidence on these questions is brought together in Table 3.7 to 3.10. Table 3.7 reports concentration in manufacturing enterprises as the number of establishments controlling over 40 percent of output in a selected list of industries and countries. Only Columbia and El-Salvador appear to have more highly concentrated industrial structures than Pakistan. Similarly, data contained in Table 4.8 about the concentration levels in Pakistan and United States illustrate that the general level of concentration is higher in Pakistan than in United States.

Tietal [1975] and Banerji [1978] in their studies show considerable similarity in the pattern of distribution of plant size by sector in different industries across a sample of developing and advanced countries (including Pakistan). In a similar exercise Table 3.9 shows the ranking of manufacturing industries according to two measures of size (i) average value added per establishment (ii) average number of workers per establishment for a sample of 20 industries. And our own results are in line with those of Tietal, the rank ordering according to average value added per firm shows petroleum on top followed by fertilizer, cement, tobbacco, food, beverages, paper, drugs, iron and steel, transport and rubber. At the end of the list are leather, matches, soap, printing, furniture etc. Ranking according to mean number of workers show first again petroleum followed by cement, fertilizer, tobacco, paper, textile, transport equipment, iron and steel, rubber, drugs, beverages and food. While at the

Table 3.7 : Number of Establishments Accounting for Over 40 Percent Of Output, by Industries, Selected Countries.

	Countries										
Industry	1	2	3	4	5	6	7	8	9	10	
										1970-84	
Food	426	253	1215	144	58	40	37	72	34	11	44
Textile	373	1191	407	44	2	30	35	-	15	27	51
Paper	105	90	213	3	2	7	6	-	16	3	3
Printing	161	175	498	7	4	10	10	46	22	5	5
Apparel	326	1257	2658	111	21	52	25	45	385	4	10
Wood	146	511	966	50	2	14	42	117	37	5	7
Furniture	561	606	768	12	10	42	-	51	60	5	7
Leather	13	121	457	4	7	4	33	-	7	9	6
Rubber	23	21	59	6	2	-	5	8	5	5	5
Chemicals	163	103	248	40	6	29	-	18	14	9	13
Petroleum	9	7	67	2	-	-	15	-	-	-	3
Non-Metallic	95	634	415	28	3	6	15	23	13	6*	4*
Basic Metal	153	155	194	7	1	-	4	-	5	4	6
Metalproduct	300	312	799	37	3	17	34	39	29	21	21
Machinery	170	550	501	50	2	6	34	57	6	20	4
Electric Machines	168	88	239	7	-	5	19	-	10	18	18
Transport	85	80	134	19	4	30	6	14	6	9	4

Notes : 1 Germany. 2. U.K. 3. U.S. 4. Colombia. 5. El. Salvador. 6. Ireland. 7. Israel. 8. Malayasia. 9. Pillipines. 10. Pakistan.

Source: All countries except Pakistan from Merhave. M, Technological Dependence, Monopoly and Growth (Oxford: Pergamon 1969).

Table 3.8 : Comparison of Concentration Ratios in Pakistan and United States (selected industries 1967 - 68).

	Four Firm Concentration Ratios	
Industry	**Pakistan**	**United States**
Fertilizer	100	33
Sulphuric Acid	100	54
Paper	100	26
Nylon Yarn	100	91
Cigarettes	92	81
Cement	86	28
Jute Textiles	37	70
Cotton Textile	25	30
Dyeing, Bleaching and Finishing	10	42

Source : White (1974).

bottom of the list are matches, printing, leather, soap and furniture.

Results reported by Tietal [1975] and Banerji [1978] and those reported in Table 3.8 indicate that the same kind of industries experience a concentrated structure i.e forces working for an oligopolistc structure in a particular industry are similar in all countries both developed and less developed. These forces can be technical economies of scale but the leading producers, realizing that entry is difficult, through their entry deterring practices will work for an oligopolistic structure as well. However these results do not indicate that minimum efficient size is the same in all countries. Table 3.10 compares the minimum efficient size of a few sectors with International Standards of minimum efficient size. And it is found that plant sizes in Pakistan are much smaller relative to the International Standards of minimum efficient size. Such a comparison suggests that the existence of economies of scale may not necessarily mean economies with small market will have a few large firms. Many small well below optimum size plants may be operating in such economies due to several other considerations like political and social. This does not mean we are ruling out the possibility that a number of factors prevailing in developing countries may influence average size of plant. For example import substitution policies favour large scale industries, distortion of factor prices by allowing cheap capital imports etc. As a result the average size of plants in less developed countries may be

Table 3.9 : Rankings of Selected Industries by Average Size of Firm

Industry	Average Size (VA/N) Rank	Average Size (E/N) Rank
Petroleum	1	1
Fertilizer	2	3
Cement	3	2
Tobacco	4	4
Food	5	12
Beverage	6	11
Paper	7	5
Pharmaceuticals	8	10
Iron and Steel	9	8
Transport	10	7
Rubber	11	9
Paints	12	13
Textiles	13	6
Leather	14	17
Plastic	15	16
Matches	16	14
Soap	16	19
Printing	18	15
Metal Products	19	18
Furniture	20	20

Source : Calculated from Census of Manufacturing Industries(1984-85), Federal Bureau of Statistics, Statistics Division, Government of Pakistan, Islamabad.

Table 3.10 : Pakistan and International Standards of Average Size of 5 Selected Industries.

Industry	Average size in Pakistan	Average size International Standards
Cement	450,000 tpy	900,000 tpy
Cotton Spinning	12,500 spindles	--
Polyester staple	40. tons/day	120[a]
" filament	11. tons/day	80[b]
Automotives	200,000	7 million [d]
(cars and LCV)	300,000	
Vegetable Ghee	9,500 - 20,000	30,000 and above

Source : Pakistan Industrial Regulatory Policy Report Vol. II (Draft Confidential January 6, 1988).

a. In case of individual countries it is 111 for Korea, 181 Taiwan, 97 Thailand, 115 Malaysia, 59 Philippines and 159 Japan.

b. Average size for Korea is 64, 132 for Taiwan, 20 for Thailand, 65 Philippines and 113 Japan.

c. Total Output of LCV was only 12,392 units in 1984-85.

d. It is estimated that in 1970 the World production of automotives of all types, was around 22 million, in Western Europe it was round about 10 million, U.S.A alone produced 7 million and Japan over 3 million. These estimates are made by the Motor Industry of Great Britain 1971 (society of Motor Manufactures and Traders Ltd, as reported in Mc.Gee (1973).

large and comparable to that of developed countries.

Given a few facts about some of the aspects of industrial structure in Pakistan, it is of interest to identify the factors causing first increase and then keeping constant the concentration of large enterprises in particular (see chapterIV). Our general remarks are that market power originates with the conscious policies, adopted by the then government, regarding the structure of industry. Later, the changing market and political enviornment exercised some influence on the structure of industry and concentration levels.

In short, although this chapter is incomplete in many respects, still a fair picture emerges from the data contained in various tables. We may conclude first, that monopoly in the sense of a single seller is virtually non-existent but the structure of manufacturing industry is quite concentrated which suggests that part of the industrial structure is categorised as oligopolistic. But the question is, has the structure been always oligopolistic?. Is there an observable trend towards increasing or decreasing concentration?. It is observed that growth in concentration of large enterprises has been interrupted. During the sixties concentration of large enterprises output was undoubtedly high; which remained constant or declined in some and increased in other sectors in seventies and again in eighties. Although opposite forces are at work, on balance concentration has remained constant after 1970. Individually not all industries experienced the same trend in their concentration. Factors repsonsible for difference in trends regarding concentration may vary from case to case. Ranking of industries according to average size of plant shows that the pattern of distribution in Pakistan is the same as in other countries. This suggests that similar forces are at work in creating an oligopolistic structure in different countries. However this does not imply the plant size is the same in similar industries across countries. In Pakistan the minimum optimum size of plants are substantially below the international standards of minimum efficient size.

Limitations of our approach in this chapter are, first, these concentration ratios obscure the changes in rank order of top enterprises over time, such changes are an indication of dynamic competition. Second, the importance of the forces in determining the structure of industry cannot be gauged from the modest approach adopted in this chapter. More rigorous analysis is undertaken in the next chapter.

CHAPTER-IV

DETERMINANTS OF CONCENTRATION

The purpose of this chapter is to enquire what determines the structure of manufacturing industry. In particular our aim is to find what determines concentration and change in concentration overtime. Such an enquiry is the first of its kind for of Pakistan. The merit of our investigations is that from an economic policy and planning point of view it is useful to know of importance of certain variables in influencing the structure of industry at a point of time and whether their importance changes overtime. The demerit of our enquiry is that it is limited in nature to the extent that it is based on OLS estimates which provide only average relationships; thus our results may not be relevant for particular industries. Also because of the non- availability of data we are unable to assess the importance of some qualitative factors like government regulating policies, private and public sector investment decisions, luck and uncertainity etc.

The above mentioned problem is approached in two ways. First, we adopt the traditional approach which is static in nature and explain only the levels of concentration. For this exercise we have chosen three points of time 1970, 1978, and 1984 employing Census of Manufacturing Data. Like this we are able to detect simultaneously not only the relative importance of the explanatory variables at a particular time but also the changing importance of these variables in influencing the levels of concentration at different times with the change in the economic and political scene After having obtained our results for levels of concentration, in our second approach which relates to the dynamic aspect of our analysis, we probe a little further by explaining changes in concentration, that is what factors reinforce concentration or how concentration could persist. We then compare our results with those of the first approach. Such a comparison enables us to assess whether the variables explaining the levels of concentration are also relevant in explaining the changes in concentration. Since, it is possible that the relative importance of certain variables may grow stronger or weaker over time, or some new variable may appear to be more important in influencing concentration. If so, we may get concentration not because of monopoly but because of other reasons. Thus public policy needs to be different and inferences drawn on the basis of the first approach may not remain valid any more.

Although relevant economic theory is weak, it is generally hypothesized by most writers that inter industry variation in concentration can be explained by factors like scale economies, barriers to entry (mainly capital requirement) and size of industry. Like all others we also hypothesize that the same variables exert considerable influence on the structure of industry. So we will take the same three variables and examine their relative importance in explaining the level of concentration. In addition to these variables we plan to include industry growth for all the three years and pattern of ownership and product differentation for 1978 and 1984 only. The addition of the last two variables is made to assess the influence of government ownership and product differentiation which gradually increased, on the concentration of manufacturing industry.

While explaining changes in concentration one of the constraints is that only comparable industries can be included in the sample to assess the importance of variables overtime. This is so because as economies grow new products are introduced through new activities and old products gradually disappear. Such industries will then record a different concentration behaviour compared to stable industries where comparison overtime is relatively easy. Thus due to all such reasons we could include only 33 comparable sectors of production. Before reporting the results of our enquiry, all the variables included in our models are explained briefly, as to how they are measured and what is the direction of their hypothesized relationship with the dependent variables.

Dependent Variable:

Concentration Ratio (CR4): denoted by CR4 is our dependent variable for the first approach and is measured as the percentage share of the top four enterprises in value added in their respective industries.

Static Determinants of Concentration:

Economies Of Scale (EOS) : Economies of scale was Bain's [1956] leading candidate in explaining the level of concentration in an industry i.e one condition that could lead to concentrated market structure is the existence of substantial scale economies, permitting relatively large producers to manufacture and market their products at lower average cost per unit than the small producers. Although there exist product specific, plant specific and multiplant economies of scale, we will mainly take into consideration the average size of plant making up the top 50 percent of the industry in terms of size.[1]/. It is all plants of a bigger

---

1. One of the proxies used for the measurement of minimum efficent size is mid point or median plant size which is defined as that plant size such that all large size plants added together account for 50 percent of the industry size. For example:

Size of Plant measured by (Number of employees)	Number of employees	Cumulative number of employers
600 +	3200	3200
500-599	2700	5900
400-499	3600	9500
300-399	2600	12100
200-299	800	12900
199	100	13000
	13000	

From the given data we find the plants that account for size when added together which determine the average or median plant size which in turn determines the structure of industry. More precisely the optimum size of a plant together with the size of the industry determines the optimum number of firms which in turn determines concentration. Pashigian [1968].

So the hypothesis is that industries in which either technological considerations favour large plants or technology is imported from advanced economies will tend to have higher enterprise concentration than those where small plants prevail or local technology is employed. It is also possible that for several reasons enterprises may prefer to work with more than one below optimum size plants. In that case one needs to take into account the economies of multiplant operation which implies higher concentraion and market power, but the non-availability of data about the number of plants per establishment restrict us to single plant operations.

The data available to us are at various size groups and we will base our measure of economies of scale on these data. The variable is derived by estimating the median size of plants accounting for 50 percent of industry size.

Size of Industry (INS): It is hypothesized that other things being the same, the larger the absolute size of an industry the lower its entry barriers, Bain [1956]. The simple logic is

---

13000.05 = 6500 classes 600+ and 500-599 account for only 5900, so we go below 500, to account for another 600 employees (6500-5900). 600 is 1/6 of 3600, therefore we go below 1/6 into the 400-499 class. Thus the proxy for MES is 500-16.6 = 483.3.

that if the size of a firm is determined by the optimum plant size of an industry, then the share of the top four firms in the industry output depends on the optimum plant size relative to the industry size. Therefore, the smaller the industry size there will exist fewer optimum size plants hence concentration will be high. Our measure of industry size is total employment.

Absolute Capital Requirement (K/L): Much of the literature gives the impression that certain industries must necessarily be concentrated because the fixed cost to build plants of minimum efficient size are high relative to the size of the market. Bain [1956] Gan Tham [1977].

Or in case of less developed countries foreign exchange required for the import of machinery and other inputs may be large and available to only a few influential entrepreneur s. White [1974]. Therefore absolute capital requirement can act as a barrier to entry if the ability to raise funds for entry in a particular market is limited. This is especially so in less developed countries where capital markets are relatively imperfect, and the ability of new small firms to obtain adequate finance may be limited or government may adopt foreign exchange discriminatory policies favouring large or specific enterprises at the cost of small enterprises or government may ration foreign exchange depending upon the priorities of the government.

So a positive relationship is expected between the level of concentration and the absolute capital required. The ratio of book value of fixed assets to labour for each industry is taken as a measure of absolute capital required. The capital labour ratio will also pick up the influence of import substitution industries, often capital intensive in nature, on the levels of concentration. And since the capital labour ratio is an indirect measure of import substituion we will therefore not examine the relative importance of import substituion policy in determining the levels of concentration by including it as an additional dummy variable in our models.

Industry Growth (IG): Industries that are growing slowly or are declining are likely to create a displacement problem for the new entrants. On the contrary, when an industry is growing rapidly, new firms face a less difficult problem of entry. We therefore expect this variable to change its sign over time depending upon the pattern of growth in the manufacturing industry, which was fastest in the earlier period, slowest after 1970 and again gained some momentum in 1980's. Proportioniate change in value added between 1965-70, 1970-78 and 1970-84 was used to measure industry growth for 1970, 1978 and 1984 respectively.

Effective Protection (EPR): It is widely believed that concentration depends on the extent of the market, the wider or more open a market the more is competition and lower is the concentration. In contrast the narrower or more heavily protected a market the higher is the concentration level in a country. In less developed countries import substitution industries are often heavily protected and they are unable to compete in the international markets. Thus a few large units of production are enough to meet the domestic demand. This leads to a concentrated market structure. So we would expect a positive association between effective protection and concentration. Effective protective rates are taken from two different studies. For 1970 the rates were taken from Lewis and Guisinger [1968] and for 1978 the rates used are taken from Naqvi, Kemal and Heston, [1983]

Ownership pattern (PP): It is generally believed that concentration will be high in those areas of production where government participation is large and private sector is not allowed to enter against those activities where the private sector is free to invest and produce. In contrast to this belief others may argue that government intervention is not the cause of concentration, if government intervention means more investment to increase the number of firms then concentration level will be reduced in those areas of production. However, it is quite likely that government intervention results in either failure to reduce concentration or possibly increase in concentration if, first government investment is of a limited nature i.e the increase in number of firms is slow and potential entrants from the private sector are not allowed to enter which otherwise may have led to decline in concentration levels. Second, the threat of nationalization, as in the case of Pakistan, acts as a deterrent to entry by large investors both local and foreign even in areas of production where there are no restrictions on private investment. Thus, with the presence of opposing forces it is not clear what is the direction of association between concentration and government ownership and whether on balance the effect of government ownership on concentration is negligible or significant. Therefore careful explanation of results is required. A dummy variable is used to measure the pattern of ownership with one for public ownership and a zero otherwise.

Product Differentiation (PD): Quite often it is suggested that at least in the same industries and especially in certain consumer goods industries there are significant economies of scale in many aspects of product differentiation and sales promotion. And its implication is that the advantage of size can lead to market concentration exceeding what is required to realize all production and distribution economies. Empirical studies have observed that concentration changes have followed quite a different pattern in consumer as compared to producer goods industries. Average concentration rose significantly in the former and fell in the later. Furthermore concentration ratios rose more rapidly in consumer goods industries with product differentiation and relatively intense advertising. These results suggest there is something special about industries inclined towards advertising. It could be promotional economies of scale that gave larger consumer goods sellers a cost advantage over their small rivals and especially over new entrants. In particular advertising is the most important basis of large firms' advantages Bain [1956].

Large firms are able to attain the maximum level of response from consumers at a lower advertising cost per unit sale than the small size firms. This may originate with physical diffficulties and barriers in the rapid enhancement of sales or consumers neutrality and slowness in shifting their demand. Thus given such an advantage it will have a feed back effect on concentration.

Advertising sales ratio is the usual proxy used to measure advertising intensity. This proxy is hypothesized to have a positive coefficient. However as discussed earlier not only is it difficult to relate advertising intensity to concentration but there are problems of measurement as well which means the proxy will measure the relationship between concentration and product differentiation loosely.[2]/.

---

2. The positive relationship between concentration and product differentiation is correct but it is not the whole story. Through successful product differentiation small firms maybe able to cut out for themselves a small but profitable share in some special areas of production. There, sales may be limited which does not allow them to realize the benefits of large scale, but the price consumers are ready to pay for differentiated products may be large enough to offset the cost disadvantage arising from small scale of production and sales promotion. Thus the direction of association between concentration and product differentiation may not be positive in all cases, it may vary from case to case. Another aspect of product differentiation is that rival sellers may produce poor quality and sub standard differeniated goods to shift the demand in favour of their products by charging low prices.

Determinants of Changes in Concentration

The Second Approach:

Change in Concentration: Our dependent variable of the second approach is measured as the absolute and proportional change in concentration between 1984 and 1970 defined as,

i) Absolute Change: $DCR4 = CR4_{1984} - CR4_{1970}$

ii) Proportionate Change: $dCR = \log CR4_{1984} - \log CR4_{1970}$

Similarly our right hand side variables explaining change in concentration are measured as first differences and proportionate differences in economies of scale, industry size and capital labour ratio between 1970-84. Another important variable explaning changes in concentration is initial concentration (CR4 1970), it is expected to have negative association with change in concentration.The higher the initial level of concentration the smaller is the change in concentration. Besides these variables, industry growth, ownership patterns and product differentiation have also been added as our additional explanatory variables.

LEVELS OF CONCENTRATION AND REGRESSION RESULTS:

We started our tests with the ordinary least squares by specifying the relationship between selected variables for the three points of time as such:

4.1. $CR4_{1970} = a + bEOS + cINS + dK/L + eIG + fEPR$

4.2. $CR4_{1978} = a + bEOS + cINS + dK/L + eIG + fEPR + gPP$

4.3. $CR4_{1984} = a + bEOS + cINS + dK/L + eIG + fPP + gPD$

Linear, Log linear and Semi-log linear regression results of equations 4.1 to 4.3 are recorded in Tables 4.1, 4.2 and 4.3. Since the results using different measures for concentration were similar, we, therefore, report in this and the next chapter only the regression results where concentration is measured by value added.

Table 4.1 reports three sets of regression results, for(equation 4.1) 1970. Equations 1-5, 6-10 and 11-15 contain regression results for linear, log linear and semi log linear regressions respectively. All the variables included in our regression equations have the right signs but economies of scale and industry size are the only two principal variables which exert strong influence on the structure of industry in all the three forms of our regression equations. But both these variables have very small regression coefficients in the linear form of the regression results. The independent relationship between economies of scale and concentration, reported in equations 1,6 and 11 although insignificant grows stronger when industry size is included in our regression equations in equations 2,7 and 12. Addition of capital labour ratio does not change the results it remains an insignificant

Table 4.1 : Determinants of Inter Industry Differances in Concentration Levels Between 29 Manufacturing Sectors 1970

		Variables					
Equations	**Constant**	**EOS**	**INS**	**K/L**	**IG**	**EPR**	**R^2**
Linear							
1.	48.45	0.0009					0.03
		(1.08)					
2.	48.78	0.005	-0.002				0.15
		(1.30)	(2.11)				
3.	50.38	0.006	-0.002	0.22			0.16
		(1.35)	(2.10)	(0.55)			
4.	51.18	0.006	-0.002	0.38			0.16
		(1.27)	(2.00)	(0.18)			
5.	48.08	0.006	-0.002	0.23	-0.39	0.02	0.18
		(1.26)	(2.06)	(0.41)	(0.02)	(0.08)	
Log Linear							
6.	3.16	0.09					0.12
		(1.76)					
7.	5.46	0.25	-0.39				0.48
		(2.70)	(4.78)				
8.	5.48	0.25	-0.39	0.01			0.48
		(2.61)	(4.70)	(0.07)			
9.	5.39	0.27	-0.41	0.02	-0.28		0.49
		(2.73)	(4.85)	(0.12)	(0.62)		
10.	5.47	0.27	-0.41	0.02	-0.28	0.0006	0.49
		(2.73)	(4.85)	(0.12)	(0.62)	(1.18)	
Semi Log Linear							
11.	33.30	2.59					0.12
		(1.68)					
12.	119.00	8.57	-14.78				0.59
		(3.14)	(5.96)				
13.	118.60	8.43	-14.71	1.02			0.59
		(2.96)	(5.85)	(0.24)			

14.	113.9	9.61 (3.27)	−15.13 (6.06)	4.49 (0.90)	−18.73 (1.33)		0.61
15.	117.75	9.67 (3.45)	−15.72 (6.54)	2.92 (0.60)	−15.40 (1.16)	0.02 (1.84)	0.66

variable in all the three sets of regression results. Industry growth shows negative but modest influence on the structure of industry. Finally effective protection manifest positive association with concentration. However, both industry growth and effective protection appear to be associated with concentration only in the semi-log linear regression results. The t ratios and overall goodness of fit improves impressively in the log-linear and semi log linear regression results. It is note worthy that the joint explanatory power of economies of scale and industry size alone is 0.59 (equation 12) which is remarkably high.

Table 4.2 reports regression results for 1978. As before linear, log linear and semi log linear specification of equation 4.2 were taken. Equations 1-6 report linear regression results, all the explanatory variables have the right sign and except for industry growth the rest of the variables show modest association with concentration in terms of t-ratios. However, the regression coefficient of economies of scale and industry size, in particular, is very small . The over all goodness of fit is also limited to 0.42. Equations 7-11 and 12-16 record log-linear and semi-log linear regression results and it is noted that these results show considerable improvement over the linear form of the regressions. This is evident from the improvement in both the t-ratios and regression coefficients in case of economies of scale and industry size in equations 6,7 and 12 and 13. Capital labour ratio remain as an unimportant variable.

Table 4.2 : Determinants of Inter Industry Differences in Concentration Levels Between 30 Manufacturing Sectors 1978

Equations	Constant	EOS	INS	K/L	IG	EPR	PP	R^2
Linear								
1.	41.45	0.005						.06
		(1.30)						
2.	44.99	0.005	-0.0002					.17
		(1.32)	(1.93)					
3.	36.12	0.005	-0.0002	0.24				.31
		(1.59)	(1.93)	(7.29)				
4.	36.22	0.005	-0.0002	0.13	-4.88			.31
		(1.48)	(1.84)	(0.46)	(0.41)			
5.	34.10	0.004	-0.0002	0.16	-3.90	0.03		.36
		(1.23)	(2.08)	(0.58)	(0.34)	(1.30)		
6.	34.88	0.006	-0.0001	0.31	-0.32	0.03	-16.39	.42
		(1.76)	(1.45)	(1.07)	(0.03)	(1.53)	(1.54)	
Log Linear								
7.	1.73	0.30						.16
		(2.31)						
8.	4.52	0.43	-0.43					.56
		(4.34)	(4.96)					
9.	4.30	0.42	-0.43	0.09				.57
		(4.25)	(4.95)	(0.70)				
10.	4.40	0.41	-0.41	0.004	-0.13			.59
		(4.13)	(4.70)	(0.03)	(1.10)			
11	4.72	0.40	-0.96	0.02	-0.14	0.001		.66
		(4.33)	(5.48)	(0.16)	(1.16)	(2.77)		
12.	4.45	0.42	-0.45	0.04	-0.14	0.001	-0.11	.66
		(4.05)	(4.55)	(0.25)	(1.17)	(2.21)	(0.38)	
Semi Log								
13.	5.23	8.19						.12
		(1.94)						

14.	80.66	12.18	-13.08					.49
		(3.59)	(4.41)					
15.	65.83	11.92	-13.37	6.04				.52
		(3.57)	(4.58)	(1.42)				
16.	71.59	11.29	-12.48	1.20	-7.72			.58
		(3.52)	(4.42)	(0.25)	(1.88)			
17.	83.98	10.90	-14.46	1.88	-7.85	0.04		.69
		(3.84)	(5.57)	(0.44)	(2.16)	(2.82)		
18.	60.97	12.27	-12.88	3.28	-8.23	0.04	-9.58	.70
		(3.99)	(4.58)	(0.74)	(2.27)	(2.89)	(1.12)	

Table 4.3 : Determinants of Inter Industry Differences in Concentration Levels Between 31 Manufacturing Sectors 1984

		Variables						
Equations	**Constant**	**EOS**	**INS**	**K/L**	**IG**	**PP**	**PD**	**R**
Log Linear								
1.	40.45	0.004						.04
		(1.06)						
2.	44.27	0.004	-0.0003					.21
		(1.34)	(2.44)					
3.	45.31	0.004	-0.0003	0.04				.22
		(1.26)	(2.44)	(0.48)				
4.	47.86	0.005	-0.0003	0.04	-0.11			.23
		(1.33)	(2.43)	(0.60)	(0.54)			
5.	47.62	0.006	-0.0003	0.01	-0.03	-7.0		.26
		(1.57)	(2.16)	(0.20)	(0.15)	(0.95)		
6.	50.47	0.005	-0.0003	0.01	-0.03	-6.0	-0.53	.28
		(1.35)	(2.18)	(0.21)	(0.15)	(0.79)	(0.79)	
Semi Log								
7.	61.80	2.68						.02
		(1.83)						
8.	77.51	1.41	-2.92					.06
		(0.41)	(1.04)					
9.	77.92	1.42	-2.91	0.11				.06
		(0.40)	(0.99)	(0.03)				
10.	78.12	1.81	-3.29	1.35	-0.02			.08
		(0.49)	(1.08)	(0.33)	(0.74)			
11.	78.12	1.81	-3.29	1.35	-0.02			.08
		(0.49)	(1.08)	(0.33)	(0.71)			
12.	81.77	1.83	-2.90	0.42	-0.02	-5.07		.09
		(0.49)	(0.94)	(0.09)	(0.62)	(0.70)		
13.	83.59	2.41	-2.40	0.37	-0.02	-4.60	-0.63	.13
		(0.69)	(0.75)	(0.08)	(0.67)	(0.63)	(0.86)	

Industry growth and effective protection also improve their significance in the log-linear and semi-log linear regression results. Ownership pattern show weak negative association with concentration. The over all goodness of fit, R^2, has also improved to 0.66 and 0.70 in equations 11 and 16.

Finally, Table 4.3 shows only log-linear and semi-log linear regression results for 1984 (equation 4.3). (Linear regression results are not reported for their poor explanatory power). These results suggest that not only the importance of economies of scale declines and its relationship with concentration deteriorates, it also changes its sign from positive to negative. And except for industry size all other variables also record a decline in their significance level. Industry size manifest a consistent and typically negative association with concentration, capital labour ratio, Industry growth and ownership pattern exert least influence on concentration. Addition of product differentiation does not improve the results. Obviously this also shows in the R^2, altogether the explanatory power of right hand side variables is limited to 0.28 and 0.13 percent in the log-linear and semi-log linear regression, which clearly indicate that many other forces are at work which our model cannot explain. In short, all the three regression forms confirm that economies of scale and industry size consistently appear as an important determinant of the inter-industry level of concentration. However economies of scale has lost its significance in influncing concentration ratios over the years. By 1984 its relationship with concentration had reduced to insignificance. Capital labour ratio does not perform well in all of the regressions. Industry growth shows modest influence on concentration, and the association between effective protection and concentration is strongest in 1978. Ownership pattern and product differentiation do not appear to be important variables. Generally our results are satisfactory but they are unable to provide any conclusive answers, many other forces are at work which our models particularly equation 3 cannot explain. This is hardly surprising, it is quite possible that omitted variables like changing political and economic enviornment which are difficult to measure are more important in determining the structure of industry overtime. Most authors argue that weak association between concentration and its determinants is due to the existence of multicollinearity among our explanatory variables, particularly economies of scale, industry size and capital labour ratio. If any one of these variables has large values the others also have a tendency to take up high values. And when all such variables are included in a regression equation it is often noted by researchers that one of the variable manifest sweeping importance over the others in its significance and explanatory power; while the rest appear to be statistically insignificant.[3]/. Whatever the demerit of our

---

3. Nothing much can be done about any possible existence of multicollinearity in the data. Only by obtaining precisely measured longer sample can one avoid the difficulties aris ing out of collinear explanatory variable. However the correlation matrix for our data do not indicate the existence

results, when we compare these results with those of the studies for less developed countries mentioned in Table 2.2 we note that our results are similar to these studies.

Given the results of the first approach one question posed at the beginning was, how seriously should one take results obtained for a point of time ?. Are . the inferences drawn on the basis of such results reliable and therefore the policies suggested? To be sure that the answers we provide to the questions put forth at the begining are correct we follow a simple procedure by arguing that if certain variables explain/donot explain the level of concentration in an industry at a point of time then do these variables remain important/unimportant determinants of the structure of manufacturing industry overtime as well. The procedure is based on our second approach where our regression equations take first the form of absolute differences.

4.4. $DCR4 = a + bDEOS + cDINS + dDK/L + eCR4_{1970} + fIG + gPD + hPP$

Our regression estimates for absolute differences are given in Table 4.4. Economies of scale show significant positive reltionship with concentration. Industry size exerts negative influence on concentration only modestly. But the regression coefficient of both economies of scale and industry size is close to zero and their explanatory power is limited. Addition of capital labour ratio in column 3 does not improve the

---

of strong multicollinearity among the explanatory variables.

Table 4.4 : Absolute Changes in Concentration and its Determinants (29 Sectors 1970 - 84).

Equations	Variables						
Constant	6.12	4.57	7.11	2.46	16.28	16.52	17.96
DEOS	0.004 (1.87)	0.004 (2.29)	0.005 (2.31)	0.004 (2.14)	0.005 (2.39)	0.004 (2.17)	0.004 (2.15)
DINS		-.0006 (1.39)	-.0009 (1.54)	-.0008 (1.53)	-.0006 (1.14)	-.0006 (1.13)	-.0006 (1.03)
DK/L			0.04 (0.71)	0.04 (0.71)	0.05 (0.97)	0.05 (0.99)	0.05 (0.19)
CR1970				-0.19 (1.50)	-0.21 (1.67)	-0.19 (1.56)	-0.19 (1.26)
IG					-14.5 (1.39)	-12.42 (1.26)	-13.0 (1.26)
PD						-0.82 (1.98)	-2.0 (1.82)
PP							-2.0 (0.29)
R^2	0.12	0.18	0.19	0.26	0.32	0.42	0.42

result and it manifest a weak positive relationship with concentration. Initial concentration and industry growth have the expected negative sign and explain changes in concentration in a limited manner. Product differentiation manifests negative and fairly significant relationship with changes in concentration. The last variable, ownership pattern, in column 7 has a negative sign but its explanatory power is poor. Altogether the explanatory power of the right hand side variables expressed by R^2 is as high as 0.42

The final regression equation with proportionate differences takes the following form:

$$4.5.\ dCR4 = a + bdEOS + cdINS + ddK/L + eCR4_{1970} + fIG + gPD + hPP$$

The regression estimates given in Table 4.5 manifest that in comparison to other variables economies of scale and industry size are important variables in explaining changes in concentration. Comparing the estimates of proportionate changes with those of absolute changes, the significance of the variables measuring changes in economies of scale and industry size improved and the resulting increase in the explanatory power increase to 0.34 in column 2. Addition of the remaning five explanatory variables to the regression equations increase the explanatory power of the right handside variable to 0.45 only. Capital/ labour ratio consistently remains unimportant, initial concentration has lost its importance and changed its sign from negative to positive. Industry growth and product differentiation show weak association with concentration and ownership pattern

Table 4.5 : Proportionate Changes in Concentration and its Determinants (29 sectors 1970 - 84).

Variables	Equations						
Constant	0.20	0.12	0.11	0.23	0.54	0.56	0.45
d EOS	0.90	0.21	0.21	0.22	0.22	0.21	0.23
	(1.39)	(3.00)	(2.84)	(2.80)	(2.82)	(2.75)	(2.87)
d INS		-0.49	-0.49	-0.49	-0.66	-0.63	-0.67
		(3.28)	(2.96)	(2.90)	(2.91)	(2.80)	(2.92)
d K/L			0.001	0.007	0.09	0.08	0.10
			(0.01)	(0.05)	(0.59)	(0.53)	(0.67)
CR1970				0.04	0.05	0.07	0.07
				(0.28)	(0.44)	(0.63)	(0.57)
IG					-0.44	-0.43	-0.47
					(1.09)	(1.11)	(1.18)
PD						-0.02	-0.02
						(1.47)	(1.22)
PP							-0.18
							(0.89)
R^2	.06	.34	.34	.34	.34	.37	.45

appears to have negative but insignificant influence on concentration.

Comparing the results of changes in concentration and its determinants with those obtained for the determinants of the levels of concentration at three different points of time, it is noted that both the approaches suggest that economies of scale and industry size are the two main variables that explain the inter industry variation in concentration, however, their importance has been limited overtime. Thus it is clear that the importance of our explanatory variables change over time and therefore inferences drawn on the basis of results obtained at a point of time may not necessarily be valid for all times.

Now that the results of the two approaches regarding the determinants of concentration are at hand, at this stage we can gain some insight about the structure of industry by discussing the determinants of structure according to two broad phases of development (1955-70 aand 1970-84) and relate our results to the regulatory policies adopted in these two periods. First, between 1955-70 there were several factors (as already discussed in chapter 1) which combined to lead to a concentrated structure of industry and produce results reported in Table 4.1. One important factor which most earlier writers seem to undermine is the importance of Pakistan's dependence on imported technology. Where significant economies of scale exist there would tend to exist a fundamental difference between the scales of output given by the imported technology and the initially small size of the market in the importing country so that 'the available technology puts a floor under the size of almost any plant that '------represents a significant shift from the traditional to modern technology of production'. (Merhave 1968, p.68). Moreover the adoption of foreign techniques which are suited to the larger scales of production in the countries of origin play an important role in determining the competitive structure in the importing country. Imported technology therefore makes easy the establishment of dominant market positions. Thus the important point is that the establishment of dominant market position in large sectors of manufacturing industry in a country like Pakistan is an outcome of its dependence on imported technology. Market power thus has structural and ultimately, technological origins. Reinforcing the effects of technology is the role played by other barriers to entry, two of which were of special importance: i) the regulatory policies particulary regarding licensing decisions and the allocation of foreign exchange, and ii) the large absolute volume of capital required to set up a plant of minimum efficient size. In the use of the concessions and privileges contained in the regulatory policies, the power and influence exercised by the top big families was instrumental in shaping the structure of industry. White [1974] estimates, for example, that between 1960 and 1965, these families because of their complete hold over the licensing system, managed to claim for themselves 51 percent of the total licenses issued by the government for the import of plant and equipment. Winston [1970] showed that the larger firms were equally influential in obtaining favourable treatment in the allocation of licenses for industrial raw material; furthermore by being able to purchase inputs at over valued exchange rate and selling their outputs in protected domestic markets and areas where they again managed to take most of the other privileges and incentives given by the government, the larger firms were able to generate about 40 percent extra value added out of the system of effective protection, Lewis and Guisinger [1968]. Finally not only did these families own a major share of banking assets, they also exerted strong influence on the pattern of allocation of foreign credit and on the Pakistan Industrial Credit and Investment Corporation (PICIC); an institution through which the major part of external assistance to the private sector was distributed. Seven of the thirteen Pakistan¿s on the Board of Directors were members of the top big families, and 65 percent of the permissions for new investment issued by PICIC during the period 1958 and 1970 went to 37 monopoly groups, with 13 of the larger groups getting 70 percent of all sanctions, White [1974], Amjad [1977].

Nonetheless with the changing and unpredictable political and thereupon economic environment in the seventies and eighties government regulatory policies towards the structure of industry under went unexpected and drastic changes. Although once again government policies were largely instrumental in jointly shaping the structure and performance of the industrial sector, but this time in quite a different manner. For example, first,after nationalizations the private sector was not allowed to invest in large capital intensive projects, and their past reliance on imported technology and raw material was to be considerably minimized by limits set on investment sanctions. Investment sanction policy limited private sectors access to imported technology and other industrial inputs. The investment sanction policy was tight in seventies and was gradually relaxed in eighties. The ceiling was brought down to Rs.5 million in 1978 which has been raised to Rs.500 million in 1987 thus setting limits on the size, of new investment which was also restricted to a specified list of projects and particular locations. The purpose was to avoid market concentration by ensuring that the market is divided up among two or more (below minimum optimum size) entrants rather than a single large firm. Like this the role of imported technology in influencing industry concentration was expected to be reduced to a large extent.[4]/. To reinforce the impact of investment sanctions particularly on imported technology access to foreign exchange required for the import of machinery and other inputs was limited. Unlike

---

4. Although the impact of these policies donot show in the results reported in Table 4.2, perhaps this is so because data for 1978 could not pick up the effect of policy changes. But the results mentioned in Table 4.3 for 1984 clearly indicate that through investment sanction and other policies the role of technology as a determinant of structure of industry is minimized considerably.

the first phase of development tight control was exercised on foreign exchange which was made available in accordance with the sanctioning limits of a project.At the same time labour cost was increased which left no option for firms than to delay investment. Another not-able feature of seventies and eighties was that government policies were altered at random and short notice like changes in input/output prices, taxes etc; these changes caused unforseen financial problems and frightened away the entrepreneurs from new investment and participation in economic activity.

Furthermore to disintegrate and defeat monopoly power it was necessary and imperative to disjoin the link between the monopoly group and the financial market. This connection had feed back effects and was considered as vital for the maintainance of dominant market position. In this regard the role played by two policy decisions was decisive in many ways. First, the hard handed nationalization of banks and insurance companies without compensation, deprived the leading families of the whip hand through which they acted as masters of the capital market and consequently deterred entry by potential entrants. Prior to nationalization some of these leading families were hit by the loss of assets in the former East Pakistan as well. Thus their financial power and confidence was weakened considerably. Second, devaluation of the Rupee, abolition of multiple exchange rates and other governmentally conferred benefits and privileges were with drawn which raised the cost of production and exposed the dominant producers to pressures of competition. The extent to which these policies were successful in shaping the structure of industry can be gauged from the information reported in Table 3.2. The Table indicates that the private sector appears to have revised its investment decisions by postponing and reducing investment which reached the lowest level of 6.4 percent of manufacturing value added in 1974-75 compared to 20.5 percent in 1969-70 and 38.7 percent in 1963-64. And between 1974-75 , 1982- 83 it has increased only marginally to 7.6 percent. Obviously the private sector acted in this manner due to the fact that profits which are important for investment decisions were affected by policy changes (see chapter V).

Decline in investment imply the structure of industry presumably remain to be dominated by concentrated oligopolies at least in the private sector. In contrast to the private sector, during the same time, market structure in terms of the growth of some of the public owned capital intensive enterprises was changing consequent upon the growth of market size, Demand for goods produced by capital intensive industries expanded rapidly which led to increased public investment and thereupon modification in the dominant market position of some of the large capital intensive firms overtime Table 3.2 demonstrates the fact that public investment rose sharply from a low level of 1.44 percent of manufacturing value added to 28.9 percent between 1972-73 to 1977-78 and declined gradually to 8 percent of manufacturing value added by 1982-83 due to the noncommitment of the Military government to further investment. A major part of public investment was made in the on going and some new sectors like vegtable oil, cement, fertilizers, manufacture of light engineering goods, petroleum refining and iron and steel where concentration as noted earlier in terms of the number of establishments has declined.[5]/.

Finally what is more disturbing to note is that the joint investment of both the public and private sector has continued to decline after 1977-78. It was 35.9 percent of manufacturing value added in 1977-78 and has now declined to 16.6 percent in 1982-83. Such a state of affairs have a direct bearing on the structure of industry.

It may also be mentioned that the other side of the picture is that these policies (particularly investment sanctions) were in some cases ineffective in reducing concentration because the leading influential firms would preempt licenses and let the sanction lapse. For example Table

---

5. However, it is note worthy that concentration of these industries in terms of their share in manufacturing value added has increased considerably mainly because of their high relative weight in manufacturing value added. Increase in demand for most of these goods is mainly attributable to the increase in rural income level, an important source of demand which was not taken note of in the earlier strategies of development.

4.6 and Annex 4.1 show the value of issued investment sanctions in most groups of industry annually exceeded actual private investment in the manufacturing industry. It is also widely believed that only a fraction of the annual loans sanctioned (by government) are invested and a major share of the sanctioned funds is deposited in foreign banks. The recipients of the sanctions are often political supporters who demand such favours from the governments. It is difficult to substantiate this belief with statistical evidence because somehow the documents of the recipients show consistency in the amount invested and sanctioned. And the government lacks the ability of accountability because of its urgent need for political support to remain in power. As a result investment is at its lowest level, entry of potential entrants is blocked and the private sector in general remain almost as concentrated as it was in 1960's.

Summary:

To summarize the chapter, our results manifest that among the determinants of concentration economies of scale and industry size are the strongest explanatory variables, but their explanatory power is limited and decline overtime. The importance of economies of scale as a barrier to entry and a determinant of market structure mainly stemmed from Pakistan's dependence on imported technology which at least led to the domination of the manufacturing sector by the top leading families.It must also be noted that the link between concentration and barriers to entry was not one way, barriers

Table 4.6 : Sanctioned Investment Projects (Values in billion Rupees).

	1977-78	1983-84	1984-85	1985-86
Number of Projects	n.a	419	386	431
Value of Projects: (in currentRs	4.5	19.7	11.2	17.9
(in constant 1975/76 Rs)	3.8	10.3	5.7	9.0
Realized Investment (in current Rupees).	1.0	5.8	n.a	n.a

Source : Annex 4.1

to entry created concentration and economic power which in turn gave birth to political power to facilitate the maintenance of these barriers through the capital market, licensing and trade policies. Whether economies of scale as a barrier to entry would have been of less importance if a) labour intensive technology was adopted instead of imported technology is difficult to answer. (In sectors like cement, fertilizers, iron and steel and petroleum refining perhaps it would not have made much of a difference to the scale of production but in consumer goods industries like vegetable ghee and sugar etc; labour intensive technology may have led to lower efficient scale of production). b) access to imported technology was open to all entrepreneurs rather than the top few families, (in that case economies of scale may not have acted as a barrier to entry, created deliberately by government policy ,and consequently an important determinant of the structure of industry). However, as noted, economies of scale cannot explain all of the industry concentration found in Pakistan, so we have to look at other barriers to entry to explain concentration in Pakistan's manufacturing industry. Other variables included in our regression equations were capital/labour ratio, ownership pattern, effective protection and product differentiation etc; but they showed somewhat frail relationships with concentration. It is difficult to draw simple generalizations about the factors responsible for shaping the structure of industry from our model. However one thing seems quite clear, the forces influencing concentration change over time. A fair amount depends upon the changing environment in the country through changes in government policies which are aimed at reduction in concentration, and the reaction of the entreprenurial class to such changes.For example, the regulatory policies of the 1970's and 1980's, namely nationalizations, investment sanctions, devaluation, tight control on foreign exchange and withdrawal of concessions etc; were designed to minimize the role of imported technology and break the crucial link between the monopoly and economic power. In practice these policies led to undesirable consequences in the form of decline in the private sector participation in investment in the new projects. In contrast to what the regulatory policies had aimed at such a phenomenon supported the dominance of a few large firms at least in the private sector. Even in the public sector concentration could have declined further than experienced in the seventies and eighties if the private sector was allowed to invest in the areas of production dominated by the public sector, or at least the public sector alone had commited itself to further investment.

It is important to point out that it is not only the policies of the various regimes which were important in shaping the struture of industries, the inconsistencies in policies had a more lasting and damaging impact on the structure of industry. In actual fact public policy changed inconsistently over the three regimes which provoked entrepreneurs to revise and postpone their investment descions.Although the later government realized its mistakes it could never regain the confidence of the private entrepreneurs.

CHAPTER V

THE EFFECTS OF CONCENTRATION

The concern of this chapter is to assess the influence of structure/concentration on profitability. Besides concentration we will also examine the influence of some other variables on profits. Our enquiry will be incomplete to the extent that we are unable to assess the influence of other important factors like price elasticity of demand, some of the government regulatory policies, distribution methods, future expectations and risks etc on profits.[1]/. We cannot take them into account because of the non-availability of data. We are aware that the measure of performance/profitability is not free from error and bias therefore we will also assess the influence of concentration on other aspects of performance like the ability of concentrated industries in increasing productivity of labour

---

1. It is obvious that the structure-performance hypothesis suffers from the omitted variable bais, an important variable omitted from all the studies reviewed in the previous chapter is the price elasticity of demand. Underlying this omission is the strong assumption that in case of cross section data the elasticity of demand is constant across industries. In our case due to price controls the problem is less severe. However we will deal with this problem in our exercise regarding changes in concentration influencing changes in performance. As it is fairly reasonable to assume that elasticity of demand remain constant overtime and not across industries at a point of time. Cowling and Waterson [1976]. (see Foot Note 3 stating the theoretical model setting the relationship between structure and performance).

and capital in this and the coming chapter. Finally, we also know that some researchers cast doubt on the inferences drawn on the basis of ordinary least squares estimates of Structure-Performance due to the simultaneous equation bias in the results. We deal with this problem by examining the changes in profitability and concentration. The last shortcoming of our enquiry is that because of data deficiency we are unable to take account of the small scale informal sector where a high proportion of manufacturing production takes place, to that extent there is an upward bias in our results. The importance of such an enquiry is that the government policy towards the structure and performance of the manufacturing industry must not be first based on theoretical grounds but also on some empirical knowledge. The implementation of government policies would be greatly assisted if empirical work could predict to some extent the effects on industrial performance of the structural and behavioural changes that are brought to bear by government policies.

One approach that most studies have adopted is to investigate the problem at the micro level and the question dealt with is whether there is a relationship between market structure and economic performance. Theory gives us a well known basic answer, a competitive economy leads to marginal cost pricing, whereas an imperfectly competitive market structure where a few large firms have the ability to collude, create barriers to entry and maximize their joint profits, charge price above marginal cost and display x-inefficiency.

An alternative approach is to examine a direct link between market structure and the overall performance of the economy. The question that draws attention here is how far the pricing policy of a few large firms contribute towards inflationary pressures. If such a link is true then government intervention may seem unavoidable and competition policy may be used to fight inflation, stabilize output and employment. However; in contrast to the above two theoretical views, the practical point of view also deserves attention. Whatever the merits of competition entrepreneurs favour large units in order to benefit from the economies of scale, government particularly in less developed countries aiming at rapid growth in the manufacturing sector may support a few large private enterprises with the understanding that the re-investment of high profits earned by large units will accelerate growth.[2]/. Even labourers may prefer large units because of job security and stability of wages through trade

---

2. In the earlier days, for rapid economic development the economic planners suggested the functional inequalities hypothesis as a relevant development strategy. According to which government will have tocreate an economic atmosphere that favours the establishment of concentrated oligopolies. The idea behind this development strategy was that development will not take place unless investors are ensured of excess profits which when reinvested will accelerate growth and also become a means of self- financing growth process. The advocates of this hypothsis admitted that such a development strategy may result in economic and social inequalities, but for them it is a necessary price that the society will have to pay for the formation and development of an entrepreneurial class Haq [1966].

unions. Such considertions, particularly in less developed countries may encourage a concentrated market structure. The main question dealt with in the present enquiry is whether at all there exists a relationship between market structure and economic performance. To answer this question our statistical analysis will be carried out in two stages, first, we will examine relative importance of structural and policy variables influencing the absolute level of profitability in the large scale manufacturing sector. Secondly, after having obtained our results on the absolute level of profitability we then proceed to use the model developed by Cowling and Waterson [1976] to test the effect of proportionate changes in concentration on increases in profits and see if the results obtained from the second test are consistent with those obtained from our first test measuring the effect at absolute level.[3]/. Like this our enquiry will be the first of its kind

---

3. Cowling and Waterson [1976] show that if firms are of unequal size i.e their marginal costs are different and all the firms maximize their profits, then equation 3 in Chapter 2 footnote 1 can be rewritten as,

$$\frac{d\Pi_i}{dX_i} = P + X_i f'(X)\frac{dX}{dX_i} - c_i'(X_i) = 0$$

Summing over N firms, rearranging and making the assumption that MC =AVC they obtain the following equation,

$$\frac{\Pi + F}{R} = \frac{-H\ (1+\delta)}{E}$$

Where the LHS of the equation is the ratio of profit plus fixed cost (Π+F) to revenue (R). On the RHS is H,the Herfindahl index of concentration, E is the price elasticity of demand and δ the conjectural variation term.
Finally assuming and E are constant, they take ratios of the LHS and RHS variable overtime for i industries and we have,

by examining the effect of structure on performance from both static and more importantly dynamic perspective rather than relying on static cross section approach, commonly adopted in the past, and drawing weak inferences from it.

The relevant economic theory underpinning most empirical studies of the relationship between market structure and performance is inadequate. To explain variations in performance three sets of variables are emphasized market concentration, entry barriers and demand growth. But industry in Pakistan operates under a host of controls imposed by government. We therefore wish to take into account the effect of some of these policy induced variables like tariff protection, nationalization, price controls etc on performance. We will take up almost all these structural and policy variables and examine how far they can guide us in explaining the inter-industry levels of profitability. In our second exercise we will drop most of the above mentioned variables and restrict our analysis to the association between changes in concentration and increases in profitability only. Finally we will take a sub sample of industries where concentration has increased between 1970-84 and test whether increase in concentration has led to increase in profits. The rest of the chapter will be reserved for the exercise relating concentration with labour and capital productivity.

$$\frac{\mathrm{II}/R\ (T)}{\mathrm{II}/R\ \ (T-1)} = \frac{H\ (T)}{H\ \ (T-1)} \qquad \text{where } k = 1.....M$$

industries.

Variables And Their Measurement

Performance Indicators:

For our dependent variable we will use three indicators of performance measured in the following manner.

1. Gross profit (PR): The usual measure of performance used in most of the studies is gross/net profits. The gross profit is ratio of profits to net output, measured as value added minus wages divided by net output for an industry.[4]/.

2. Labour productivity (VA/L): Our second measure of performance is measured as the ratio of value added to labour input.

3. Capital productivity (VA/K): Value added per unit of capital is our third measure of performance where capital includes both fixed assets and stocks.

Structural And Policy Variables:

The following are the explanatory variables used in our regression analysis. Since the measurement of some of these variables is already described in the previous chapter, we need not repeat the same here, only their hypothesized relationship with profits is stated below:

1. Concentration Ratio (CR_4): The ratio is used as a proxy for monopoly power and it is expected to have a direct link with profitability.

2. Foreign Trade (M/D): Instead of adjusting the

---

4. The appropriate measure of profitability is the rate of return on capital, either assets or equity, but Census of Manufacturing Industries only provide the book value of fixed assets which renders the measure of the rate of return on capital difficult.

concentration ratio for imports we account for competition from imports by adding an additional explanatory variable. It is measured as the ratio of imports to domestic sales. A high level of imports means that the sector is open to foreign competition and that the national monopolies or oligopolies are constrained to behave more competitively. In this case one should expect a negative impact on profitability.

3. Economies of scale/Average size of plant (EOS): As a measure of entry barrier it is expected to exercise a positive influence on gross profits, because entry barrier practices reduce potential competition.

4. Capital labour ratio (K/L): As a measure of capital intensity it is expected to be positively related with profits.

5. Effective protection (EPR): It is hypothesized that protection granted to domestic producers against foreign competition tends to reduce the pressures of competition and enables the large establishments to continue earning above normal profits.

6. Ownership pattern: Not only during 1970's a number of industries were closed to the private sector, large state-owned enterprises also dominated some other sectors open to the private sector. These enterprises as a matter of policy would not exploit their market power, thus their profitability would tend to be lower. A dummy variable is used with a value of 1 for the industries where state participation is dominant and zero otherwise.

7. Price Control (Pc): To account for the impact of price controls on profits a dummy variable is created with a value of one for industries whose output was subject to price controls and zero for industries free from price controls. We expect such price controls to depress profitability.[5]/.

8. Product Differentiation (PD): Most empirical studies suggest that in many consumer goods industries product differentiation raises the height of entry barriers and influences the nature of competition among the established enterprises. Such entry barriers enable these producers to set prices above costs without inducing entry Bain [1956], Scheerer [1980] etc.

The four variables used in our second test of concentration and profitability are absolute and proportionate changes in concentration and profitability,

$$DPR = PR_{1984} - PR_{1970}$$

$$DCR = CR4_{1984} - CR4_{1970}$$

---

5. Under the Price Control and Prevention of Profiteering Act of 1972 the government is authorised to exercise direct controls to keep prices under check by : a) fixing maximum prices of products which from time to time are declared "essential" and included in the schedule of the act. In 1984-85 the schedule included 66 commodities. b) establishment of a price consultation mechanism where by the producers and importers of essential commodities are required to consult the concerned authorities 30 days in advance if they wish to increase the prices of their products. Although the government can fix the prices of any of the products mentioned in the list, prices of four products are fixed by the Federal Government. These four products are vegetable ghee and oil, fertilisers, Tractor and mechanically propelled vehicles. Only one product, pepper, is subject to price consultation. The price trends are however, kept under watch and are not allowed to exceed fair limits.

$$dPR = \log PR_{1984} - \log PR_{1970}$$

$$dCR = \log CR_{4\,1984} - \log CR_{4\,1970}$$

where DPR is absolute change in profitability and DCR is the absolute change in concentration between 1984 and 1970. Similarly dPR and dCR measure the proportionate change in profitability and concentration, again between 1984 and 1970.

Regression Results on The Levels Of Concentration And Profitability (1970, 1978 and 1984)

Most studies for their qualitative investigations rely on regression analysis to test the impact of concentration on performance, but there are some who show scepticism towards quantitative studies which assume a direct link between market structure and performance, they suggest that inferences drawn on the basis of case studies are more useful. As suggested earlier, we will deal with this problem by examining the association between proportionate changes in concentration and increase in profitability in the later part of the chapter. However the data we have restricts our analysis to linear, log-linear and semi-log linear regression.

A number of linear, log-linear and semi-log linear regression were performed for the year 1970, 1978 and 1984. The specification of our models is given as such:

5.1. $PR = a + bCR_4 + cM/D + dEOS + eK/L + fETR$

5.2. PR = a + bCR + cM/D + dEOS + eK/L + fETR + gPP + hPC

5.3. PR = a + bCR +cM/D + dEOS + eK/L + fPP + gPC + hPD

Contrary to what Amjad [1977] Shirwani [1976] and Kemal [1978] found our results of equation in Table 5.1 show a fairly significant influence of concentration on profitability, but the explanatory power of concentration is very limited. Not just that, the relationship between concentration and profitability weakens overtime as is indicated by equations 1 in Table 5.2 and 5.3. This undoubtedly shows that other variables are important and need to be included in our model. We add more variables and take different combination of variables in order to detect their independent influence on inter-industry variation in profitability.[6]/.

The independent influence of foreign competition from imports was measured by including M/D as an independent variable in equation 2 and it is noticed that M/D doesnot explain the inter industry variation in profits and its regression coefficient is not different from zero. The negative sign of the coefficient is as expected. The non significant regression coefficient of M/D and the weak

6. It is often said that one of the limitations of concentration ratios is that it fails to take into account inequalities in size within the top four firms and the rest of the firms in the industry. In order to account for such inequalities in firm sizes it is suggested that additional variables may be included in the regression equation to pick up that aspect of the influence of CR on profits which the measure itself cannot pick up. Generally, Gini index is supposed to measure the inequality effect, in our case non availability of data does not permit us to conduct such an enquiry.

Table 5.1: Regression Results of Levels of Profitability on Concentration and Other Variables (29 Sectors) 1970

Equations	Constant	CR	M/D	EOS	K/L	EPR	R^2
		Variables					
Linear							
1.	18.06	0.21					.13
		(1.98)					
2.	76.86	0.21	-0.05				.13
		(1.86)	(0.41)				
3.	75.76	0.21	-0.04	0.001			.14
		(1.88)	(0.36)	(0.63)			
4.	75.38	0.23	-0.02	0.007	0.38		.24
		(2.17)	(0.20)	(0.32)	(1.78)		
5.	75.54	0.23	-0.02	0.005	0.38	-0.006	.25
		(2.05)	(0.18)	(0.25)	(1.76)	(0.48)	
Log Linear							
6.	4.59	0.11					.10
		(1.75)					
7.	4.59	0.11	-0.001				.10
		(1.70)	(0.06)				
8.	4.32	0.12	-0.001	0.04			.16
		(1.88)	(0.07)	(1.25)			
9.	4.18	0.13	-0.001	0.04	0.13		.28
		(2.05)	(0.70)	(0.77)	(2.06)		
10.	4.18	0.12	-0.001	0.04	0.14	-0.0009	.29
		(1.97)	(0.69)	(0.75)	(2.06)	(0.40)	
Semi Log							
11.	90.78	6.29					.09
		(1.69)					
12.	88.9	6.11	-0.06				.10
		(1.61)	(0.50)				
13.	75.1	6.73	-0.06	2.57			.15
		(1.76)	(0.52)	(1.13)			
14.	66.16	6.88	-0.04	1.34	8.52		.30
		(1.95)	(0.33)	(0.66)	(2.27)		
15.	65.61	6.89	-0.04	1.43	8.80	-1.50	.30
		(1.90)	(0.33)	(0.62)	(2.00)	(0.30)	

Table 5.2 : Regression Results of Levels of Profitability on Concentration and Other Variables 30 Sectors 1978

		Variables							
Equations	**Constant**	**CR**	**M/D**	**EOS**	**K/L**	**EPR**	**PP**	**PC**	**R^2**
Linear									
1.	73.08	0.06							.01
		(0.63)							
2.	72.01	0.06	-0.04						.02
		(0.61)	(0.46)						
3.	72.17	0.03	-0.07	0.001					.05
		(0.36)	(0.69)	(0.83)					
4.	72.51	0.16	-0.02	0.0002	0.17				.23
		(1.45)	(0.15)	(0.12)	(2.83)				
5.	72.41	0.17	-0.02	0.0003	0.18	0.004			.23
		(1.45)	(0.18)	(0.15)	(2.35)	(0.28)			
6.	73.85	0.21	-0.01	0.0002	0.20	0.006	-6.0		.25
		(1.64)	(0.15)	(0.09)	(2.48)	(0.47)	(0.84)		
7.	67.49	0.11	-0.60	0.0002	0.21	0.005	-8.5	-17.4	.48
		(0.98)	(0.56)	(0.12)	(2.95)	(0.42)	(1.38)	(3.08)	
Log Linear									
8.	4.44	0.06							.05
		(1.23)							
9.	4.42	0.05	-0.00008						.06
		(1.21)	(0.56)						
10.	4.44	0.05	-0.00009	0.004					.06
		(1.02)	(0.55)	(0.09)					
11.	4.17	0.06	-0.00002	0.002	0.09				.20
		(1.26)	(0.17)	(0.04)	(2.06)				
12.	4.17	0.06	-0.00002	0.002	0.09	0.00001			.20
		(1.27)	(0.13)	(0.18)	(2.05)	(0.39)			
13.	4.11	0.07	-0.00005	0.009	0.10	0.00001	-0.06		.40
		(1.35)	(0.32)	(0.18)	(2.06)	(0.49)	(0.51)		
14.	4.09	0.03	-0.00004	0.009	0.09	0.00001	-0.07	-.23	.40
		(0.72)	(0.25)	(0.22)	(1.99)	(0.42)	(0.69)	(2.59)	

Semi Log

15.	83.88	3.84							.05
		(1.18)							
16.	82.78	3.84	-0.04						.05
		(1.16)	(0.43)						
17.	89.75	2.85	-0.07	1.75					.06
		(0.77)	(0.62)	(0.59)					
18.	70.07	3.53	-0.02	1.55	7.0				.23
		(1.02)	(0.22)	(0.57)	(2.26)				
19.	70.07	3.52	-0.02	1.55	7.0	0.003			.23
		(0.99)	(0.22)	(0.56)	(2.20)	(0.03)			
20.	65.50	4.37	-0.05	0.58	7.0	0.001	-5.11		.24
		(1.15)	(0.46)	(0.18)	(2.27)	(0.01)	(0.66)		
21.	64.35	1.87	-0.05	1.77	6.95	0.001	-5.9	-14.6	.40
		(0.52)	(0.07)	(0.61)	(2.21)	(0.01)	(0.84)	(2.46)	

relationship between profitability and M/D could be because of the tariff and non tariff protection given to the domestic industry against competition from imports. To know the influence of tariff protection we add in equation 5 of Table 5.1 and 5.2 a variable ETR representing effective protection. The regression coefficient is not different from zero and the t ratio is not high.

Besides concentration, the second structural variable, economies of scale, represented by EOS is included in equation 3, but it is not significant at all. It is possible that its effect is captured by concentration and capital labour ratio which is our final structural variable. It is noted that when capital-labour ratio K/L is included in equation 4 R^2 improves considerably and the t ratios are significant. However for 1984 the regression coefficient in all the three forms of regression equations is close to zero. In Table 5.3 an additional entry barrier variable product differentiation was introduced in equation 7 and it does not manifest any influence on profitability. The regression coefficient is negative and the t ratio is low.

Among the policy variables price control, PC, and ownership pattern, PP, appear to have strong influence on profitability. Represented by a dummy variable both PC and PP have negative influence on profits and the t ratios are significantly high.[7]/.

---

7. Another variable, capacity utilization was included in the regression equations. It did not appear to be an important variable. Therefore we dropped it from our model.

From Table 5.1 to 5.3 and 5.4 to 5.5 we are able to show the complexity of the relationship between profitability and concentration.[8]/.Clearly concentration has the expected sign and some association as well, and all the variable together could at best explain only 48 percent of variation in profitability (Table 5.2 equation 7), which suggest that the residual or unexplained variation is large. However the explanatory power of our regression equations is almost the same as that of the studies mentioned in Table 2.4, whereas results about profit-concentration relationship for less

---

8. In comparison to the results based on CM1 data we are in a position to report results of similar regression equations using establishment level 1975-76 data. In Table 5.4 and 5.5 the results of linear and log linear regressions are reported. Equation 1 in both the Tables show weak positive influence of concentration on profits. The t ratio is not significant and the explanatory power of concentration is very low, R^2 is 0.07 and 0.03. Besides concentration eight more variables were included the regression equations to detect their influence on inter-industry variation in profits. Except for the variable measuring foreign trade and barriers to entry rest of the explanatory variables have the expected signs; but most of these variables didnot show strong association with profitability. Only capital labour ratio,K/L, manifest significant positive association with profits. And the addition of K/L in the regression equation further reduce the significance of concentration as an explanatory variable.
Among the policy variables price controls, PC appear to have some influence on profits. Although effective protection, EPR, does not show strong positive influence on profits, but it has the right sign and the t ratio of 1.0. Comparing the results of Table 5.4 and 5.5 with those of Table 5.1 - 5.3 we note consistency in our results, particularly in terms of the significance of concentration and capital labour ratio as the explanatory variables in the regression equations. In all the equations concentration has limited positive influence on profits and capital labour ratio dominates concentration in its significance. The explanatory power of our equations on average has remained the same around 35 percent.

Table 5.3 : Regression Results of Levels of Profitability on Concentration and Other Variables 30 Sectors 1984

Variables

Equations	Constant	CR	M/D	EOS	K/L	PP	PC	PD	R^2
Linear									
1.	80.74	0.17							0.10
		(1.80)							
2.	79.14	0.17	-0.01						0.10
		(1.68)	(0.12)						
3.	79.67	0.17	-0.008	0.0003					0.10
		(1.65)	(0.07)	(0.10)					
4.	75.97	0.15	-0.038	0.0006	0.01				0.26
		(1.57)	(0.36)	(0.36)	(2.25)				
5.	73.70	0.12	-0.02	0.0003	0.01	-4.74			0.30
		(1.25)	(0.21)	(0.19)	(2.25)	(1.60)			
6.	73.89	0.13	-0.01	0.0006	0.01	-6.30	-0.92		0.30
		(1.25)	(0.15)	(0.27)	(2.10)	(0.87)	(0.265)		
7.	74.18	0.13	-0.02	0.0007	0.01	-6.45	-0.93	-0.005	0.30
		(1.23)	(0.22)	(0.30)	(2.04)	(0.86)	(0.25)	(0.21)	
Log Linear									
8.	4.09	0.04							0.03
		(1.00)							
9.	4.06	0.04	-0.001						0.04
		(1.07)	(0.48)						
10.	4.12	0.04	-0.001	0.009					0.04
		(1.05)	(0.52)	(0.24)					
11.	4.41	0.01	-0.001	0.01	0.03				0.06
		(1.30)	(0.42)	(0.32)	(0.18)				
12.	4.76	0.07	-0.001	0.012	0.05	-0.27			0.37
		(1.37)	(0.82)	(0.38)	(1.29)	(3.44)			
13.	4.40	0.08	-0.002	0.02	0.01	-0.05	-0.15		0.46
		(1.62)	(0.99)	(0.70)	(0.38)	(0.40)	(1.95)		

14.	4.36	0.08	-0.002	0.03	0.01	-0.05	-0.15	0.003	0.43
		(1.59)	(1.07)	(0.77)	(0.35)	(0.39)	(1.92)	(0.43)	
Semi Log									
15.	80.69	2.20							0.04
		(1.16)							
16.	79.68	2.12	-0.03						0.04
		(1.06)	(0.31)						
17.	78.67	2.12	-0.02	0.26					0.05
		(1.04)	(0.25)	(0.14)					
18.	56.32	0.05	-0.04	0.53	2.80				0.09
		(1.02)	(0.39)	(0.28)	(1.10)				
19.	56.30	3.41	-0.05	0.54	2.02	-9.63			0.26
		(1.16)	(0 47)	(0.31)	(0.87)	(2.32)			
20.	52.30	3.84	-0.06	2.32	3.86	-0.32	-7.13		0.34
		(1.35)	(0.59)	(1.16)	(1.52)	(0.04)	(1.67)		
21.	51.92	3.80	-0.07	2.37	3.87	-0.33	-14.7	0.03	0.34
		(1.32)	(0.57)	(1.12)	(1.49)	(0.04)	(1.63)	(0.08)	

Table 5.4 : Linear Regression Results of Level of Profitability on Concentration and Other Variables (26 industries) 1976.

CR4	M/D	EOS	K/L	PC	CU	PP	EPR	NOE	R^2
0.55									0.07
(1.41)									
0.55	0.06								0.08
(1.46)	(0.51)								
0.81	0.06	-0.44							0.10
(1.56)	(0.47)	(0.74)							
0.43	0.06	-0.16	0.44						0.18
(0.74)	(0.47)	(0.26)	(1.39)						
0.29	0.05	-0.18	0.71	-33.5					0.25
(0.49)	(0.46)	(0.31)	(1.92)	(1.35)					
0.21	0.03	-0.30	0.65	-28.74	0.03				0.28
(0.41)	(0.27)	(0.48)	(1.74)	(1.14)	(0.77)				
	0.02	-0.27	0.61	-27.4	0.04	0.05	-0.06		0.30
	(0.17)	(0.52)	(1.71)	(1.06)	(0.98	(1.00)	(0.17)		
0.31	0.03	-0.47	0.53	-24.2	0.03	-1.98	0.05		0.31
(0.52)	(0.23)	(0.71)	(1.28)	(0.87)	(0.94)	(0.08)	(0.99)		

t - ratios are in parenthesis.

Source : Published and unpublished CMI data 1975-76.

Table 5.5: Log Linear Regression Results of Level of Profitability on Concentration and Other Variables(26 Industries)1976.

CR	M/D	EOS	K/L	PC	CU	PP	EPR	NOE	R^2
0.29									.03
(1.0)									
0.31	0.001								.05
(1.0)	(0.70)								
0.10	0.001	0.11							.06
(0.2)	(0.70)	(0.50)							
-0.17	0.001	0.12	0.48						.25
(0.35)	(0.87)	(0.60)	(2.30)						
-0.15	0.001	0.08	0.62	-0.41					.36
(0.31)	(0.92)	(0.40)	(2.55)	(1.10)					
-0.30	0.001	0.13	0.63	-0.34	-0.08				.32
(0.59)	(0.80)	(0.63)	(2.58)	(0.90)	(0.86)				
	0.001	0.13	0.63	-0.34	0.04		0.00003	-0.26	.35
	(0.94)	(0.78)	(2.52)	(0.88)	(0.48)		(0.04)	(1.09)	
-0.30	0.002	0.13	0.64	-0.28	0.09	-0.16	0.0001		.33
(0.55)	(0.89)	(0.56)	(2.38)	(0.66)	(0.85)	(0.46)	(0.12)		

NOE: Number of Establishments.
t ratios are in parenthesis.

Source: Published and unpublished CMI data 1975-76.

developed countries reported in Table 2.5 show relatively high R^2.

However, if at all strong association between structure and performance is confirmed, it is not the end of the story, because from such results we are unable to tell whether the strong positive association between profits and concentration is so due to monopolistic practices or due to larger firms gaining more of the market by their superior efficiency as reflected in their high profitability.[9]/.

Discussion about our results, and the difference in results when compared with earlier studies about the performance of manufacturing sector will be presented at the end of the chapter.

Regression results about the levels of concentration and profitability guided us to the extent that market structure has limited influence on profitability. Scepticism towards the approach adopted in identifying the causal relationship and hence the inference drawn cannot let us be content with the results obtained so far. We need to explore a little more by examining the association of absolute and proportionate changes between concentration and profitability. The hypothesis testing the relationship between absolute and proportionate changes is based on the assumption that if the levels of concentration and profitability are related then by

9. Hart and Morgan [1977] suggest that the usual regression analysis undertaken to find the extent of association between concentration and profitability are mongrel type, reduced form equations, and its structural relationship cannot be identified.

the same reason changes in concentration and profitability must also be related.

We base our model on the theoretical model explained by Cowling and Waterson [1976] showing a direct link between proportionate changes in profit margins and proportionate changes in concentration.[10]/.

It would be of interest to check the reliability of our results obtained in Table 5.1 to 5.3 by taking a sample of 33 comparable sectors and run a simple regression relating absolute and proportionate changes in profitability and concentration.

Two simple regressions were performed by taking absolute and proportionate changes in profitability against absolute and proportionate changes in concentration. The regression results are as follows:

---

10. Cowling and Waterson [1976] tested the following relationship:

$$\log\left(\frac{PR_t}{PR_{t-1}}\right) = \log\left(\frac{H_t}{H_{t-1}}\right)$$

The dependent variables, is profit margin measured as gross output minus raw material, wages and salaries all divided by gross output. For the market structure variable they used both Herfindal H index and concentration ratio, where size is ranked by employment. They tested their model for U.K in dustry and found significant relation between the two variables. However their analysis suffered from one drawback they failed to take into account the fact that in an analysis of proportionate changes the industries in the sample at two points of time must be comparable. Hence the inferences drawn and the results obtained are incorrect. The significant relationship found by them disappeared when Hart and Morgan [1977] replicated the exercise by including only comparable industries in their sample and not the industries that had changed their boundaries and definitions changed in the census between 1963 and 1968.

$$5.4 \quad DPR = 0.03 + \underset{(1.25)}{0.09} \; DCR \qquad R^2 = 0.09$$

$$5.5 \quad dPR = 3.18 + \underset{(0.78)}{0.08} \; dCR \qquad R^2 = 0.02$$

We notice that DCR has some positive influence on DPR but its explanatory power is poor as indicated by R^2 of 0.09. In our regression of proportionate changes dCR shows no link with dPR and R^2 is close to zero.

From our results of the levels of concentration on profits and those of changes in concentration on changes in profitability we understand that the complexity of the relationship between structure and performance cannot be denied. And more so when our results about levels in Table 5.1 to 5.3 are compared with the earlier studies of Shirwani [1976] and Amjad [1977].

As a third test of our analysis a simple regression of profits against concentration is performed for 13 industries experiencing increase in concentration over time, with the understanding that increase in concentration must also lead to increase in profits. Regression results for three equations are mentioned in Table 5.6. Equation 5.6, based on 1984 data represent the relationship between concentration and profitability of industries where concentration has increased overtime. Whereas regression 5.7 and 5.8 estimate the association between absolute and proportionate increase in concentration and profitability. In all the three equations the regression coefficient does not have the expected sign and except for equation 5.6 the rest of the two equations have

Table 5.6 : Regression Results of Profitability and Concentration in Case of 13 Sectors with Increasing Concentration.

---

1. Increase Overtime (1984).

$$PR = 79 - \underset{(1.20)}{0.24}\ CR4 \qquad R^2 = 0.18$$

2. Absolute Increase (1984-1970).

$$DPR = 5.92 - \underset{(0.53)}{0.32}\ DCR4 \qquad R^2 = 0.03$$

3. Proportionate Increase (1984-1970).

$$dPR = 0.03 - \underset{(1.11)}{0.23}\ dCR \qquad R^2 = 0.02$$

---

poor explanatory power.

Although our set of results exhibit declining association between profitability and concentration; it is widely believed that in the first phase of development large enterprises earned above normal profits. An explanation for such a phenomenon is that when market form is oligopolistic with high barriers to entry, a characteristic feature of these concentrated oligopolies is that, in a given situation, the size of the market, the structure of the existing technology and the elasticity of demand for the whole industry will combine to explain the level of prices; while different barriers to entry will produce differences in the levels of costs between the firms in the industry. Given the level of costs and prices, it seems reasonable to suppose that it is the largest firms which, because of their market power, will be the price setters for the whole industry. And prices will, in turn, be set in a manner to yield a given mark up, over costs.

Combined with the power over prices, our discussion of market structure in Pakistan also suggests that it is generally the largest firms in the industry that have access to certain inputs like technology, licenses and foreign exchange, and that only large firms were in a position to realize the benefits of economies of scale. Under these circumstances when these firms experience cost reductions due, for example, to exceptional improvements in productivity that are not accessible to all firms in an industry, there is no compulsion on them to reduce prices accordingly. The likelihood that this will happen is high where entry barriers are high, or where, there are barriers to spread cost reductions because access to new technologies is discontinous, that is the new technology is not made available to all producers. Prices are more likely to remain unresponsive to costs and to changing conditions of cost. In these circumstances, the discretionary power to set prices will lead to an increase in the share of profits.[11]/.

---

11. Although it is argued that in concentrated oligopolies,there will be a persistent tendency for costs to fall consequent to the introduction of new methods. This belief is not however, without controversy. Little [1970] for example, in discussing price cost tendencies in oligopolistic markets in developing countries argues that there is likely to be an important difference in the manner in which costs adjust in different market forms. It is argued that, while under competition the entry of new firms will tend to bring prices down to costs, in conditions where competition is amongst a few firms and prices are administered,

' ------- domestic competition lowers profits merely by raising costs, that is by creating competitive waste and correspondingly by diminishing the share of each in the domestic market------high profits secured by high protection often lead to the competitive establishment of too many firms, sometimes each with too small a capacity for low cost operation and very often with too small a share of the market to fully utilize even this capacity. In other words high profits in manufacturing secured by import restrictions, whether or not they are curbed eliminated by domestic competition, encourage high costs of production and wasteful use of capital------'(ibid pp 98-99).

Despite the fact that the above argument is a common view our own view differs in two respects. First, where technological innovations are not accessible to all categories of firms, new entry is greatly detered and the question of the establishment of too many small firms with high costs of production and wasteful use of capital cannot be well taken. Second, since the main purpose of the large firms is to increase profits and establish dominant market position, in that case there is no reason why these firms face less severe pressures of cost reduction. Infact it is the different barriers to entry and discontinuity in access to scarce resources that bestow on these firms comparative

A second line of thinking, not supported by our data, possibly because, in the presence of heavy protection, profits cannot be taken as a satisfactory measure of performance, is that indeed these large firms continue to earn above normal profits so long as they remain insulated from pressures of competition Kemal [1978]. In other words market structure is a necessary condition but not a sufficient condition to earn above normal profits. It is the joint influence of concentration and protection from competition that ensures high profits. These large firms were certain that high profits earned by them would not create the risk of entry either by foreign firms/products or established producers in other markets. The entry of foreign firms/products will not take place even if the potential entrant is physically able to produce just as efficiently as those existing in the market, because the established firms may exert their considerable political influence on government to prevent such entry. By pointing to the surplus and unused capacity in the industry and by arguing that any further permission for investment in the same industry will lead to capital loss. Or that the free entry of foreign products will threaten growth of domestic firms. Similarly the existence of excess profits did not provoke the entry of firms established in other markets. This

---

cost advantage compared to their rival producers. And the fact that new firms may invade their market or the existing may expand, brings to forefront the need to reduce costs faster than the rival producers to maintain their dominant market position.

was so because such producers were related, either directly or through the system of interlocking directorships, so that the behaviour of established producers in different markets was cooperative. Moreover an established producer in another market was reluctant to invade the market of other established firms for the fear that such an intrusion might have provoked similar reaction in the form of an attack on their market shares in their original markets.

For these reasons therefore one would expect that in the short run prices, being unresponsive to cost reductions and strong barriers to entry increased the share of profits of the large enterprises. But a rise in the share of profits was not a permanent phenomenon. The behaviour of the share of capitalist's income changed over time. This relates to those factors which we identified earlier, the changing political and market enviornment modified the dominant firms behaviour over time.

After 1971 concentration is as high as before but it is not surprising to note that what Amjad [1977], Shirwani [1976] and Kemal [1978] found, strong positive relationship between concentration and profits in the earlier period, did not hold in the seventies.[12]/. These earlier writers are

---

12. Earlier writers interpret high profits as the result of high concentration but for some unknown reason did not view their results in the light of the disequilibrium phenomenon. Undoubtedly concentration ratios exert strong influence on profits, but it is understood that at least in the earlier period of development concentrated market structure was greatly supplemented by a disequilibrium in the supply and demand conditions in market for manufactured goods.
It is well known that not just in the case of a concentrated

commited to the belief that a concentrated structure of industry in Pakistan has led to high profits. Underlying this argument is the supposition that firms have similar goals i.e profit maximization and they adapt passively to the economic environment and change is taken as exogeneous to the system. Such a line of thinking minimizes the role of changing market environment resulting from the emergence of several factors like greater government intervention in the form of natiionalization, price control, tariff and non tariff barriers, labour legislation and emergence of stronger trade unions, uncertainty of oil prices, world recession, devaluation of Rupee and the resulting increase in capital and raw material prices, turbulence in the country, all may

---

market structure even in perfectly competitive industries profits may be higher simply because of excess demand conditions. If demand is high without supply catching up in the period under observation then profits will include short run quasi rents. So one needs to include in the regression equations a variable measuring disequilibrium which reflects departure from equilibrium. This variable can pull up or down industry profits in a manner quite unrelated to the degree of the level of concentration in an industry at a point of time. In a regression of disequilibrium (IG) on profits it is found that the variable has the right sign, however, the t ratio and R is not high.

$$PR = 62.8 + \underset{(1.27)}{0.12}\, IG \qquad R^2 = 0.05$$

Moreover with the addition of other explanatory variables IG lose it importance. This may be so because of several reasons. Typically growth of sales or market is taken as a proxy measure of disequilibrium. The problem is how many years should one take as a measure of change in the size of the market. If a longer period is taken one would be overstating the degree of disequilibrium; the chances are adjustments period is short, two to three years. Liebowitz [1982]. In our case change in sales between 1964-1970 was taken as a measure of disequilibrium.

press on firms in different ways and influence firms' performance directly and indirectly, causing them to record different performance. Thus they ignored the fact that in changing economies the firms are actively trying to mould their industrial enviornment overtime, the entrepreneurs select objectives according to the influence that various groups like government, trade unions and consumers have.

Thus some of the factors mentioned above may have led to the weak association between market structure and performance. Either by a) moulding the behaviour of the capitalists class to be less aggressive b) depriving the capitalist of their discretionary power to set prices and ensure a given mark up over costs or c) increase in the cost of production may have squeezed the profits and share of the capitalist group.

For example, first, since government intervention was greatest, privately owned large firms may have modified their behaviour. In recognition of the the threat of nationalization they may have chosen not to maximize profits, they might have adjusted their prices (where prices were not controlled) at a level just above the marginal cost, and preferred a quiet life so as not to invite government attention in the form of nationalizations. And most of the large nationalized enterprises which were previously operating with profit earning motives were now functioning on a non- commercial basis. This change of objective by the nationalized establishments may have also dampened the effect of concentration on profits. Moreover the productive apparatus inherited by the Board of Industrial Management (BIM), under which the nationalized enterprises were operating was economically inefficient and the scope for improving efficiency was limited. BIM was unable to close plants or reduce the work force, at the same time prices were reduced or held down despite inflation and workers and share holders were given their due share. Under these conditions it is unreasonable to expect the public sector to earn the same level of profits as before.

Table 5.7 gives the profit margins of BIM units by sector for three points of time. In 1975-76 the largest profits were earned by cement followed by automotives, petroleum, fertilizers and chemicals. As a whole, the profit margins appear to have been declining. The heavy engineering sector experienced consistent loss. The profit margin of the Automotive sector declined despite an increase, between 1973-76, in import duties on motor vehicles (which ranged from 50% to 200%), an increase in capacity utilization, and a more than doubling of the value of sales. The basic problem was the small scale of production or assembly which rendered the sector economically inefficient. In light engineering too there was s sharp decline in the profit margin which was attributed to increased costs of inputs and high inventory carrying charges.

Second, amidst inflationary pressures government intervention in the form of price control, which may have

Table 5.7 : Profits and Prfit Margins of B I M Units*.
(Rs. million).

Sector	**1973**	**1974**	**1975**
Automotive			
a) Net profit before tax	48.4	91.8	34.5
b) Sales	848.8	2000.4	1942.0
c) Percentage of profit margin	5.7	4.6	1.8
Cement			
a) Net profit before tax	40.7	96.5	78.4
b) Sales	489.1	701.9	724.8
c) Percentage of profit margin	8.3	13.7	10.8
Chemicals & Ceramics			
a) Net profit before tax	31.0	15.4	33.3
b) Sales	349.2	344.0	411.5
c) Percentage of profit margin	9.0	4.5	8.1
Light Engineering			
a) Net profit before tax	30.3	57.4	10.5
b) Sales	450.8	735.1	766.4
c) Percentage of profit margin	7.0	7.8	1.4
Heavy Engineering			
a) Net profit before tax	-47.7	-40.5	-60.3
b) Sales	46.6	49.8	191.9
c) Percentage of profit margin	-	-	-
Fertilizers			
a) Net profit before tax	25.1	12.9	18.2
b) Sales	196.6	186.8	197.5
c) Percentage of profit margin	12.8	6.9	9.2
Petroleum			
a) Net profit before tax	9.0	12.5	33.4
b) Sales	332.9	622.3	712.8
c) Percentage of profit margin	2.7	2.0	4.7
PIDC			
a) Net profit before tax	22.9	16.5	15.5
b) Sales	246.2	327.1	337.9
c) Percentage of profit margin	9.3	5.0	4.6

Total BIM

a) Net profit before tax	159.8	262.5	217.7
b) Sales	2893.6	4967.4	5284.8
c) Percentage of profit margin	5.5	5.3	4.1

* : Profit after interest and depreciation but before tax.

Source : IBRD, Pakistan Development Issues Policies, Vol.1, Washington, 1978, p.115.

blanketed the effect of concentration on profits, forced the large firms to act as price followers rather than price setters. Either the dominant state owned enterprises acted as price setters or the government controlled prices of goods produced by the private entrepreneurs through price control regulations. Thus depriving the oligopoly price leaders of their discretionary power over setting prices for their products such as to ensure a given profit margin over costs. In this connection it is important to mention that in the event of price controls and protection from imports profit cannot be taken as a good indicator of performance,

There is a third reason why the behaviour of the share of capitalist income may be expected to have changed overtime. This corresponds to the changing market environment which on the one hand forced the prices down despite the resistance exerted by large enterprises. On the other hand labour unions were getting stronger, labour laws were passed to protect workers (without ensuring increases in productivity) and shifted the balance of power between labourers and capitalists thus squeezing the share of profits by the general hardening of the market,and the increase in wage bill which consequently increased the cost of production.[13]/.

---

13. This view is supported by others, for example Sylos-Labini [1969] and Irfan [1979]. It is argued by the former that in oligopolistic industries, cost reduction may not necessairly be translated into higher profits if the initially higher rate of profits arising out of new technologies stimulates successful union demands for higher wages. For this reason there would be a tendency in the economy to tolerate a slowly rising level of costs so that the rate of return on capital will tend to be closer to the competitive level.

Whereas previously structure-conduct worked to re-enforce high profits because the economic enviornment favoured them i.e the government collaborated with these monopolists/capitalists and labour unions were weak.

Table 5.8 and 5.9 gives a comparison of the real wages paid by the large scale manufacturing sector. Table 5.8 clearly indicates the weakness of the trade unions and the unfavourable labour legislation which meant that there was little increase in real wages during the sixties. However in seventies the labour reforms brought a marked increase in wages. The wages of a typical worker in the industrial area of Karachi increased in 1973 from Rs.125 to Rs.235 in 1975-76 an increase of 88 percent in two years. Since consumer price rose by 65 percent real wages of the low paid workers increased substantially. The average wage of the worker given in Table 5.9 in real terms showed an increase in real wages between 1970-75. And Table 5.10 reports the findings of Ahmed and Irfan [1985] which suggests that the real wages of workers in the large manufacturing sector increased sharply after 1976.

Then unlike the 1960's as discussed in the preceeding chapters, the cost of production increased due to the increased price of raw material and imported capital as a result of world inflation and devaluation of Rupee. Also the increase in taxes, withdrawal of concessions and tightening of foreign exchange made foreign technology and imported raw

Table 5.8 : Index of Real Wages of Large Scale Manufacturing Sector (1959-1969).

Year	Index
1959-60	100.0
1962-63	91.21
1963-64	92.94
1964-65	105.42
1965-66	109.30
1966-67	104.85
1967-68	105.78
1968-69	116.17

Source : Hamid. N,'The Burden of Capitalist Growth- A study of Real Wages and Consumption in Pakistan,' Pakistan Economic and Social Review, Vol. VII, No. 1, 1974.

Table 5.9: Real and Money Wages of Production Workers in Large Scale Manufacturing

(Rupees per worker per year)

Year	Money Rupees	Wages 1959-60 =100	Real Rupees	Wages 1959-60 =100
1969-70	1,930	177	1,351	124
1970-71	2,094	192	1,384	127
1971-72	2,389	219	1,504	138
1972-73	2,914	267	1,679	143
1973-74	4,012	368	1,775	168
1974-75	4,953	454	1,730	159

Source : Guisinger. S, Wages, Capital Rental Values and Relative Factor Prices in Pakistan , World Bank Staff Working Paper No. 287, 1978.

Table 5.10 : Real Wage Trends in Large Scale Manufacturing (1970-81)

(Percent per annum)

	1970-76	1976-81
1. Nominal wages		
All workers	15.8	17.0
Production workers	17.3	16.6
Non Production workers	14.5	19.6
2. Real Wages		
All workers	1.4	7.6
Production workers	2.6	6.5
Non Production workers	0.4	9.2

Source : Taken from Irfan and Meekal, Real Wages in Pakistan : Stucture and Trends, 1970-84, Pakistan Development Review Vol. XXIV, Nos 3 and 4 (Autmn Winter 1985).

material even more expensive.

In short, the government regulatory policies and the changing market and political environment pressed on capitalists in three important ways. First, the capitalist class prefered to live a non aggressive life and did not engage themselves in collusive and entry barrier practices to increase their profits. Second, prices were controlled by the State, and set by large nationalized enterprises. Third, cost of production increased due to increase in both labour and capital cost, along with increase in raw material prices and taxes etc. Thus the profit margin of the capitalist was squeezed considerably.

In the 1980's although the swing was towards the old policies of the sixties the pressures of political and economic uncertainty continued to prevail. The structure of industry was more or less the same. Except for a few sectors, where government investment increased the number of firms, the rest of the industries remained as concentrated as before. But a host of other factors combined to have opposing influence on the performance of large size establishments. Uptill 1984 investment sanctions, tariff and non tariff barriers and price controls were still in operation. Large enterprises nationalised in 1970's remained under government control and acted as price setters for the goods produced. These restrictions led to two peculiar phenomena.

First, tariffs and non tariff barriers like import bans and restrictions made smuggling of goods in the country and other forms of illegal trade (dumping) a profitable enterprise. Such phenomenon tend to under cut monopoly profits. Large volumes of banned goods apparently came through illegal channels, uncontrollable borders and customs. Due to smuggling, estimated to be over $ 1 billion annually, some industries are actually not protected to the extent that non-tariff barriers are meant to provide [National Taxation Return Committee Report 1978].[14]/. It may be noted that smuggled and duty free imports provide a great degree of price competition and shift demand in favour of the smuggled products which are mostly better in quality. (For example Chinese cycles which are smuggled have superior fit and finish and customers are willing to pay an extra Rs.600, almost double the domestic price). So the extent of downward price movement is limited by domestic cost structure which may exceed international production costs. The areas of production affected the most are consumer durables like light engineering, automotive and textile. However the threat of imports both legal and illegal has also worked in some cases to reniforce competitive pricing behaviour and improve quality despite high market concentration. For example in polyester yarn and fibre producers appear to behave competitively in marketing their products. Several yarn

---

14. It is very difficult to estimate the annual extent of smuggling and the demand for these goods, however it is a widely held view in Pakistan that smuggling is substantial and shift in demand is large. These smuggled goods are sold in established markets along the border area where government intervention is least.

producers have shown sensitivity to market trends by shifting their production towards finer counts than they anticipated when building their plants. Some are also considering adding machinery to produce twisted and flat yarn (which have higher value than texturized). The two fibre producers compete in each others markets rather then dividing up the market according to their respective locations in Karachi and Punjab.

Under such conditions it becomes very difficult to assert that market structure bears an important influence on the performance of manufacturing industry.

At the same time the second phenomenon of price controls led to hoarding and the emergence of black marketing in the local markets and smuggling of goods to the neighbouring countries. The price of the commodity under price control in the local black market and in the neighbouring countries tend, of course, to be substantially higher than the controlled prices. For example the price of vegetable ghee is kept well below international prices and both ghee and edible oils are smuggled to the neighbouring countries where price levels are higher. Such practices have not only masked the effect of concentration on profits but have also enabled the local producers to earn excess profits. [World Bank Report, 1988].

In addition to the above two phenomenan there are other important aspects of price control and regulatory policies related to firm behaviour and performance. For example price control has reduced the extent of direct price competition, it has minimized the incentive for cost reductions and made firms unresponsive to world market conditions and improvement in quality. In fertilizer and cement firms did not compete through pricing. Similarly quality of ghee has deteriorated as firms have substituted inferior quality oil in inputs in response to rising input prices and regulated prices on output. With higher costs through higher prices capacity utilization and output growth has declined. Capacity utilizatioin fell from 117 percent in 1978-79 to 81 percent by 1985-86. Furthermore, price control on products in highly oligopolistic industries such as cement and fertilizer may have eliminated collusive pricing behaviour, but it is not clear that government set prices were successful in eliminating monopoly profits in these industries.

During the same time a new trend of product differentiation emerged and its importance cannot be ignored in our discussion. Although, in the case of Pakistan, there is no empirical evidence available regarding the role played by advertising in influencing the structure of manufacturing industry and there upon the performance of the sector. Our results also do not give any indication of the impact of product differentiation on performance, however, other sources of information suggest that some establishments showed a tendency to non price competition by resorting to practices like product differentiation to generate monopoly profits. Such practices were most common in consumer goods industries. In this regard Table 5.11 shows the advertising expenditure of a selected number of industries, with relatively high advertising expenditures, as an evidence of product differentiation in these areas of manufacturing industry. It is noted that advertising expenditure has increased manifold in all the sectors given in Table 5.11. Highest expenditures are incurred by textile, drugs, food, industrial chemicals, other chemicals, beverages, tobacco etc. And some producers in these sectors have earned some premium through product differentiation and reputation for quality. This indicates that product differentiation is a significant source of market power for an individual establishment and also for the industry to earn above normal profits and discourage entry. Bain [1956] and Commanor and Wilson [1974]. Furthermore, if the payoff from successful product differentiation is large, established producers will have a strong incentive to differentiate its product and engage in some advertising Muller and Rogers [1980].

Table 5.12 gives some further evidence about the advertising expenditure by various media in Pakistan. It manifest that television adver tisement has grown from about Rs.9.29 million in 1972 to Rs.347.238 million in 1989, followed by Radio. This suggests that among the various advertising media Television has an increasing impact on performance. It may be so because established producers opt for those advertising media which are most effective in forming consumer preference for their product. And since the

Table 5.11 : Advertisement Expenditure of Selected Industries. (1970-84).

	Advertising Expenditure (000'Rs.)	
Industry	**1970**	**1984**
Food	35,533	20,4261
Dairy	-	9136
Vegetable oil	14,778	61,948
Sugar	5,157	16,594
Tea	7,896	49,707
Beverage	2,195	55,394
Tobacco	10,128	42,513
Textile	36,203	27,5635
Leather	1,669	21,925
Footwear	1,260	3,341
Drugs	27,359	21,0183
Industrial Chemicals	12,079	14,3288
Other Chemicals	12,163	77,719
Cement	4,823	
Rubber	1,097	54,414
Plastic	571	12,039
Electrical Goods	2,572	67,307

Source : Census of Manufacturing Industries 1970-71, 1984-85, Federal Bureau of Statistic, Statistics Division, Government of Pakistan, Islamabad.

Table 5.12 : Advertising Expenditure by Media in Pakistan (1972-73 and 1988-89).

Medium	**Million of Rupees**	
	1972	**1988**
1. Television.	Rs. 9.29	Rs. 47.23
2. Radio.	Rs. 5.28	Rs. 59.62
Total	Rs. 14.57	Rs. 406.85

Source : 1). Pakistan Television Corporation (PTV) Ltd. Facts and Figures 1988-89. The Central Sales Office PTV, Karachi.

2). Pakistan Broadcasting Corporation, Central Sales Office Headquaters, Book keeping section, Islamabad.

network of television has been extended to most parts of the country, large enterprises find it easier to create product differentiation, introduce new products and build an image for its product in the most powerful manner (reaching large number of potential buyers at minimum cost) through Television and Radio.

Finally, it would not be out of place to mention the importance of some non-economic practices, the extent of which cannot be so easily gauged, that are actively pursued for the revival of above normal profits. For example it is a common practice of the entrepreneurial class to either collaborate with some government officials and avoid payment of taxes and substantial amount of electricity and gas bills. Or they may just underreport their output and use of power by false entry in the registers and keeping down the meter readings. Many other similar under hand practices take place to ease the pressures of competition and increase profit margins. Such tactics are an easy way of increasing profit margins, practised by establishments irrespective of their size. Of course, if such practices are detected the actual cost of production in most cases can be substantially high.

In contrast, the smaller firms, as well as the more labour intensive, competitive industries found themselves in a constant state of crisis in the earlier phase of development. The very fact that new technologies were not accessible to them meant that these industries were faced with the constant threat of an erosion of markets available to them. The higher wages paid by the larger establishments meant that the smaller firms must follow if they were to retain their work force; and they must do so despite the fewer opportunities for productivity advance open to them. These firms had limited access to import licenses and frequently purchased their foreign equipment through import agents who charged high prices and even when the smaller firms purchased locally manufactured equipment, tariffs on the imported inputs used in their production increased their cost. When combined with the fact that they also lacked access to institutional sources of credit and were therefore forced to borrow in the informal market at interest rates which were substantially above those paid by the larger firms, small scale establishments were placed at a considerable disadvantage with capital costs twice as high as that paid by their large scale competitors. Guisinger [1978]. No doubt, the small received some relief from the overall expansion in demand and markets and, during the import liberalization period from the availability of equipment and raw materials and credit that might have accrued to them. They might have used this opportunity to speed up productivity gains and thereby offset the pressure of higher costs sufficient to maintain a constant share of profits in output; or else they may settle for a lower margin of profits and gradually disappear from the market altogether. Then in 1970's and 1980's these small establishments were exempt from labour and taxation laws, which meant the pressures of higher costs were released to some extent. Moreover price controls guaranteed some margin of profits. However large scale labour intensive industries mostly remained in crisis as labour costs increased while increase in productivity could not be guaranteed as technology was out dated and investment sanctions had tightened control over import of equipments.

In short, from our estimates of inter-temporal changes in performance of the manufacturing sector, we are able to make the following conclusions: first, ordinary least square estimates provide only average estimates about the association between market structure and performance. Thus inferences drawn on the basis of average estimates may not be correct for specific industries. Furthermore inferences drawn from the results obtained for a point of time may be misleading for other time periods. The importance of the structural variable may be greatly undermined by other factors that emerge overtime. For example, in the initial phase of development concentrated oligopolies were able to enhance their profit margins by influencing both the price level and cost of production relative to their rival producers. However, in the later period the structure remains concentrated but the changing market environment to a large extent limited the power of the oligopolists to set prices and keep the cost of production lower than other competitors in the market. This led to the growth of certain phenomena which had opposing effects on profits. Thus structure is a necessary but not a sufficient condition to ensure a high rate of return on capital.

Factor Productivity And Concentration:

In the first part of this chapter profitability is taken as a measure of performance of the manufacturing industries and the evidence suggest that profits of concentrated firms are small. As discussed above several factors may be responsible for the weak association between concentration and profitability, however two factors are of special interest. First, in the presence of effective protection, price controls and other regulatory policies, profit cannot be taken as a satisfactory measure of performance. Second, the x-inefficiency hypothesis may be relevant in explaning the weak relationship between concentration and profitability. It is possible, that large dominating firms are inefficient, the fact that they have large size, and pressures of competition are not confronted they may prefer a quite life without seeking continuous reductions in cost. And more so when prices are controlled. In this way concentration along with regulatory policies breed inefficiency, the potential increase in productivity that might have been the result of technological progress and capital accumulation is not realized. But from this hypothesis it is not clear whether high costs associated with concentrated enterprises arise from the inefficient use of labour or capital or both. If they are supposed to be the outcome of an inefficient use of labour then the positive correlation between labour productivity and concentration would be smaller than capital productivity and vice versa. Holterman [1974]. So for the above two reasons we would like to take up two other measures of performance i.e labour and capital productivity and asess the association between concentration and productivity.

In the case of Pakistan, the X-inefficiency hypothesis has been supported by three sources of empirical evidence. Studies of effective protection show that most industries in Pakistan are grossly inefficient. Lewis and Guisinger [1968]. The argument is that protection breeds inefficiency which shows up in high costs, prices and monopoly returns. Second, there is evidence about the wasteful use of scarce capital resources due to the low rates of capital utilization Winston [1971], and this shows up in the existence of inefficient high cost of production, and high prices, along with low capital productivity. The World Bank financed capacity utilization study by the Planning Commission [1987] concludes that the present situation in Pakistan demands new products, new technology and new organisations, but more importantly Pakistan must improve the utilization of capital to increase value added per unit of capital assets at a progressively lower economic cost. Thus in this part of the chapter we shall attempt to see whether our data allows us to infer something about the importance of X-inefficiency hypothesis in the manufacturing industries of Pakistan. We will do so first by assessing the importance of level of concentration and other variables in influencing the level of labour and capital productivity in 1970, 1978 and 1984. As a second test the importance of changes, both absolute and proportionate, in concentration and other explanatory variables in explaining changes and labour and capital productivity is also examined. According to the X-inefficiency hypothesis we should expect to find in our data a suggestion of a negative correlation between productivity and concentration. While investigating the productivity-concentration relationship we should be aware that other factors like capital intensity, and growth of industry etc also contribute towards the explanation of productivity. We have included some of these factors in our model, but we fail to include the dynamic aspect of efficiency like research and development expenditure, mainly because of the non-availability of data. However our prime concern is to measure the productivity concentration relationship for the industrial sector of Pakistan. The two models representing levels of productivity and concentration are given as below:

5.9 $VA/L = a + bCR + cK/L + dIG + ePC$

5.10 $VA/K = a + bCR + cK/L + dIG + ePC$

and the hypothesis to be tested is that

b, and e $<$ 0 where as c and d $>$ 0

similarly for 5.10

b, and e $<$ 0 and c and d $>$ 0

The models representing changes in productivity are:

5.11 $D(VA/L) = a + bDCR + cDK/L + dIG + ePC$

5.12 $D(VA/K) = a + bDCR + cDK/L + dIG + ePC$

5.13 $d(VA/L) = a + bdCR + cdK/L + dIG + ePC$

5.14 $d(VA/K) = a + bdCR + cdK/L + dIG + ePC$

where the left and right hand side variables represent absolute change, in the respective variables, between 1970-84 and proportionate change as a percentage of 1970.

The regression equation for 1970 includes only CR , K/L and IG as the explanatory variables, whereas for 1978 and 1984 we include an additional explanatory variable PC in the regression equations. Since the log-linear regressions for the models representing levels of productivity had more explanatory power than the linear regression estimates, we therefore report only the log-linear results.

Table 5.13 shows that contrary to our hypothesis, concentration exerts a positive but modest influence on labour productivity in 1970, this relationship deteriorates in 1978 and improves in 1984. The other explanatory variable, capital labour ratio and industry growth show a strong positive association with labour productivity. Price control has the expected sign but its t ratio is not very significant. Table 5.14 presents evidence about absolute and proportionate changes in labour productivity during 1970-84; and the importance of concentration in bringing these changes. In comparison to the results representing absolute changes, regression results of proportionate changes are fairly important. It is shown that concentration has the right sign and explains labour productivity only modestly. Both capital

Table 5.13 : Labour Productivity and Market Structure Log Linear Regression Results(1970, 1978, 1984)

Equations	Constant	CR	K/L	IG	PC	R^2
1970.						
1.	2.70	0.08 (0.47)				0.09
2.	1.50	0.08 (0.58)	0.49 (3.69)			0.34
3.	1.54	0.08 (0.58	0.44 (3.70)	0.22 (0.50)		0.35
1978.						
1.	3.72	0.03 (0.01)				0.00
2.	2.95	0.02 (0.13)	0.36 (2.72)			0.17
3.	3.18	0.03 (0.21)	0.30 (1.50)	0.09 (0.54)		0.18
4.	2.82	0.11 (0.80)	0.17 (1.58)	0.16 (1.05)	-0.71 (1.96)	0.31
1984.						
1.	4.38	0.02 (0.15)				0.00
2.	2.75	0.03 (0.21)	0.51 (3.10)			0.26
3.	2.83	0.11 (0.65)	0.34 (1.85)	0.27 (1.68)		0.33
4.	2.70	0.05 (0.32)	0.24 (1.37)	0.35 (2.27)	-0.72 (2.47)	0.46

Table 5.14 : Regression Results of Absolute and Proportionate Changes in Labour Productivity on Absolute and Proportionate Changes in Concentration and Other Variables (29 Sectors 1970-84).

	Equations							
Variables	**Absolute Changes**				**Proportionate Changes**			
Constant	97.80	86.46	19.46	3.17	1.60	1.50	5.24	6.37
DCR	0.39 (0.37)	0.40 (0.37)	0.65 (0.61)	0.76 (0.78)	5.76 (2.41)	5.74 (2.30)	5.52 (2.22)	5.46 (2.17)
DK/L		0.14 (0.52)	0.06 (0.02)	0.06 (0.24)		0.05 (0.02)	0.49 (0.25)	0.01 (0.06)
IG			0.55 (1.31)	0.88 (0.93)			-4.65 (1.15)	-3.93 (0.93)
PC				0.97 (2.60)				-2.18 (0.70)
R^2	0.005	0.01	0.07	0.28	0.17	0.17	0.21	0.23

labour ratio and industry growth manifest strong influence on labour productivity. The effect of price control is negative and the t- ratio is significant. Altogether the right hand side variables explain 0.57 percent of variation in labour productivity, which is quite satisfactory.

Regression results of capital productivity presented in Table 5.15 indicate that concentration has a weak negative effect on capital productivity. Whereas both capital labour ratio and price control also show negative association with capital productivity. The t-ratio for capital labour ratio is quite high and its relationship with capital productivity seems to have grown overtime. Industry growth loses its importance in influencing output per unit of capital. However the explanatory power of the regression equations explaning capital productivity is limited. Results regarding changes in capital productivity in Table 5.15 are extremely poor, all the variables together could only explain 0.08 percent of variation in capital productivity.[15]/. As suggested by the x-inefficiency hypothesis that concentrated firms fail to increase productivity, there is no such indication in our results to support the hypothesis so far as labour productivity and concentration are concerned. Concentration does not show a negative effect on labour productivity, nor is capital labour ratio which is expected to have picked up

---

15. In addition to the explanatory variables mentioned in Table 5.12 and 5.14 another variable capacity utilization was dropped from the regression equation for its poor explanatory power.

Table 5.15 : Capital Productivity and Market Structure Log Linear Regression Results (1970, 1978, 1984).

		Variables				
Equations	**Constant**	**CR**	**K/L**	**IG**	**PC**	**R^2**
1970						
1.	0.44	-0.08 (0.39)				0.005
2.	1.20	-0.07 (0.38)	-0.34 (1.78)			0.11
3.	1.26	-0.07 (0.39)	-0.45 (1.94)	0.51 (0.83)		0.14
1978.						
1.	0.32	-0.24 (1.24)				0.05
2.	0.91	-0.27 (1.53)	-0.43 (2.46)			0.23
3.	1.29	-0.22 (1.21)	-0.54 (2.62)	0.18 (1.00)		0.26
4.	1.06	-0.32 (2.00)	-0.69 (3.79)	0.27 (1.73)	0.94 (3.24)	0.48
1984.						
1.	2.0	-0.39 (1.92)				0.12
2.	1.87	-0.009 (1.00)	0.56 (2.39)			0.27
3.	2.2	-0.22 (0.92)	0.44 (2.80)	0.004 (2.87)		0.45
4.	2.0	-0.03 (0.94)	0.50 (2.30)	0.004 (2.20)	0.28 (1.28)	0.48

Table 5.16: Regression Results of Absolute and Proportionate Changes in Capital Productivity on Absolute and Proportionate Changes in Concentration and Other Variabls (29 sectors 1970-84).

	Equations							
Varables	**Absolute Changes**				**Proportionate Changes**			
Constant	0.04	0.42	0.45	0.53	0.19	0.18	0.05	0.10
DCR	-0.04	-0.004	-0.001	-0.0008	-0.12	-0.06	-0.06	-0.06
	(0.21)	(0.18)	(0.04)	(0.0003)	(0.63)	(0.35)	(0.30)	(0.31)
DK/L		-0.004	-0.006	-0.006		-0.18	-0.19	-0.22
		(0.82)	(1.07)	(1.00)		(1.22)	(1.28)	(1.33)
IG			1.04	0.92			0.16	0.19
			(0.82)	(0.30)			(0.49)	(0.58)
PC				0.42				-0.11
				(0.49)				(0.44)
R^2	0.001	0.03	0.05	0.06	0.01	0.07	0.08	0.08

the effect of concentration on productivity, negatively related to labour productivity. We do admit that labour productivity is not the best measure of efficiency and that the results derived on the basis of such a measure of efficiency are approximations. However straight forward and simple inferences as above cannot be drawn from the results reported in Table 5.15. Although our results do not confirm a strong negative association between concentration and capital productivity, the negative influence of both concentration and capital intensity on value added per unit of capital cast doubt on the rejection of x-inefficiency hypothesis regarding the use of capital by concentrated enterprises.[16]/. Table 5.14 indicates the x-inefficiency of large establishments in the use of capital. These concentrated enterprises surely failed to increase the productivity of capital. And also indicate the existence of an entrepreneurial class which lacks the readiness to take innovational investments. Perhaps the pressure of improved performance is not great, or in a less developed and politically unstable economy like Pakistan risk and uncertainties regarding demand and supply conditions tend to make management delay and postpone innovative investment to improve efficiency and value added per unit of capital.[17]/.

---

16. Holterman [1973] in a study of market structure and economic performance in UK manufacturing industry also found negative effect of capital labour ratio on capital productivity and positive on labour productivity.

17. Care needs to be taken while interpreting the relationship between capital labour and value added per unit of labour and capital,we cannot be very sure about the economic meaning

Perhaps the way the entrepreneurs perceive the risks associated with investment decisions is that they continuously strive to diversify their portfolio balance and internalize the risk and uncertainity in the imperfect factor market conditions.

In short our results suggest that large establishment have higher labour productivity and that x-inefficiency emerge out of the ineffiicient use of capital rather than labour. However, it is important to add that the relevance of our results vary from case to case and it is quite possible that different set of results may come to light in the case of different industries irrespective of their size and market power, for example some industries may be efficient in the use of either labour or capital or both and vice versa.[18]/.

---

fulness of the productivity variable because both labour productivity and capital labour ratio has employment in the denominator, and capital productivity has capital in the denominator while capital appears in the numerator of the variable measuring capital intensity. Whether the relationship revealed in the regression results is economic or a satistical artifact is not clear to us. However, our set of results are to a large extent supported by the findings of Ahmed and Irfan [1985]. They report that between 1970-76 labour productivity increased by only 1 percent per annum and capital productivity by 3.6 percent, but between 1976-81 labour productivity increased by 15 percent per annum and capital productivity was zero.

18. Although our results do not show a positive link between capital productivity and concentration, it is quite possible that in some industries positive labour productivity is sufficient to offset the negative capital productivity and so total factor productivity is associated with concentration. If that is so then on balance welfare loss from concentration may not be significant. Similar suggestion are made by Micha Gisser (1982) for Food Manufacturing Industries in U.S.

This hypothesis is tested in the next chapter.

CHAPTER VI

Concentration, Efficiency and Monopoly Profits.

In the previous chapter the most significant statistical fact that emerges from our data is that structure concentration has a limited influence on performance. However, it is well known that even if the link between concentration and performance is established it is difficult to tell whether it is so due to monopolistic practices or due to large firms gaining more of the market by their superior efficiency as reflected in their ability to earn high profits. Thus inferences made in these two situations and policies recommended would be very different. Prior to drawing any inferences about the causal link between concentration and profits it would be worthwhile if studies of this nature enquire about the source of large profits in the first place. Or case studies across individual industries could possibly be another relevant approach to issues of this nature i.e the structure-performance model may be extended to individual industries to test the relevance of the model from case to case.

It was argued in the previous chapter that increased profits stem from price and cost conditions prevailing in the market. This chapter therefore concerns itself with some tests to identify the source of profits. But we know that in the seventies and eighties prices were controlled and to obtain maximum returns entrepreneurs were left with the only choice of minimizing cost. So our enquiry is restricted to the examination of major components of cost and the use of labour and capital according to size. To do so selected estimates of profits and ratios of cost of value added, capital-labour, wage labour, value added to labour and value added to capital are examined in relation to size for all industries and selected industries of Pakistan manufacturing industries. Before doing so a brief discussion of the conflicting hypothesis about structure-performance relationship mentioned above is provided.

A central issue related to the structure-performance hypothesis is that often public policy makers suggest that if monopoly power is obtained through monopoly practices then discouraging large size of firms will reduce price and benefit the consumers. But Demsetz' [1973] main worry is that if high concentration is entirely the result of superior cost efficiency then a public policy of dismantling large sized firms would imply sacrificing the benefits of scale economies. This policy dilemma confronts most public policy makers. However,serious objections may be raised against this line of thinking,particularly the views related to the distribution effects may question the merit of efficiency hypothesis. It may be contested that it is of central importance to enquire whether the benefits of economies of scale, in terms of low average costs are passed on to the consumers in the form of low prices, or are solely enjoyed by the capitalists due to their ability to either raise the prices or at least keep them at the same level and thus ensure the target mark ups above costs. If that is true then the benefits of economies of scale will do little good to the society and labouring class in terms of prices paid by the consumers and wages received by the labourers. To remedy the situation public policy makers may suggest that prices should be administered by the State, in that case the absence of price competition may possibly do more harm than good to the society in the form of leaving little incentive for the entrepreneurs to reduce the cost of production when a given rate of return is ensured.

In order to deal with the above discussed issue, economists have approached the problem by developing different estimation techniques that can identify and separate the impact of monopoly power derived through collusion from monopoly power obtained via superior cost efficiency or profits. Generally results show that both the sources are at work. For example, most researchers have relied on the estimation of the importance of economies of scale as a determinant of market structure.Scherer [1980] does so by directly measuring firms' cost curves and his results are not sympathetic towards the efficiency hypothesis. He shows that economies of scale are exhausted long before they are capable of raising the levels of concentration. But where product specific, capital raising and procurement economies exist the industry will inevitably evolve towards a loose oligopoly. However, Mc Gee [1973] objects to the accuracy of such results undermining the importance of economies of scale as a determinant of market share concentration because the data on which these studies are based is full of measurement error.

Demsetz [1973] in his study related to the efficiency hypothesis, supposes that if less concentrated industries have lower profits, and highly concentrated industries have higher profits, the usual interpretation is that this relationship arise from the ease of collusion. His argument is that all the firms in the highly concentrated industry should have the same high level of profits because collusion would support them all. Price would be lifted above cost and all will enjoy benefits of collusion. But the evidence that only large firms in concentrated industries earn high profits suggest that significant economies of scale prevail in these industries. He used disaggregated data to see whether large firms in highly concentrated industries had higher rates of return on capital than the smaller firms in the same industry. If bigger firms had high profits this would go against the collusion explanation. Higher profits of the industry as a whole represent the above normal profits of big but efficient firms who may not be restricting output but would make up a large part of the industry. On the same basis the low concentrated industries could have low profits and all firm sizes would have roughly the same profit because there is no differential efficiency. His results manifest that in a highly concentrated industry the biggest firm group had systematically higher profit than the other firms in the same industry. Hence the efficiency explanation was to explain his findings.

However, there are problems with this type of analysis because another mechanism could generate the within industry results which Demsetz offers as support for the efficiency hypothesis i.e how is one to distinguish those situations where scale economies only have efficiency effects from those where firms enjoying such economies realize entry into the industry is difficult, for whatever reason, and thus set higher prices. In both cases industry profit is higher in concentrated industries and within these is higher among the larger firms.

A further study on similar lines was done by Carter [1978] using much better data i.e market share figures for each of the four largest firms in each of the industry and he finds that in a highly concentrated industry again the profit for the bigger firm is greater than for the remaining firms. He concludes "......the degree to which price exceeds leading firms costs in a concentrated industry is limited to the extent of the cost advantage of the secondary firm," (p441). His results support the Demsetz results in a much more refined way.

If Demsetz and Carter are correct then the implications for deconcentration policy measure are quite different. Because if the government policy broke up the largest four firms it would be sacrificing efficiency advantage even though concentration is reduced. There would be a problem between a less concentrated industry on the one hand and a less efficient on the other. The trade off is still there because even if deconcentration reduced collusion and prices the ultimate price may be higher if the elimination of the more efficient firms tended to raise cost and prices.

Another study done by Peltzman [1977] calculates for each industry a measure of productivity i.e total unit cost and he finds that where, over time, concentration in an industry had increased then average cost decreased or productivity increased, which ties in with the results of Demsetz and Carter. Peltzman, comes to the conclusion that increasing concentration reduced prices as compared with what they would have been had increase not taken place with improvement in productivity and declining costs. Further, the cost reductions achieved by higher concentration more than outweigh any disadvantage to consumers of higher collusion as a result of more concentration conditions.

Scherer [1980] replied that one should look at particular industries, which have increased their concentration significantly. He pointed out that quite a large number of industries which had experienced a significant increase in concentration were consumer goods industries in which advertising, for example, was quite important. And that one could not assume that the differential success of the biggest firms which caused concentration to increase was due to lower cost or to more successful promotion of their particular version of industry product. The results of Peltzman could not distinguish between a unit cost reduction and an increase in the product line. This leads to the problem whether it is a genuine improvement to consumers if firms adapt their product more successfully to the taste of consumers i.e. whether advertising is a good thing. The most logical point about Scherer's intervention was that one should look at individual industries and draw inferences for each industry separately.

Moreover, as pointed out earlier, at least in the short run the relevance of the notion forwarded by Peltzman to the industrial structure of Pakistan is very little. Because, when large firms experience cost reduction due, for example to exceptional improvements in productivity, there is no compulsion on them to reduce prices correspondingly.

Finally, Clarke and Davies [1982] have shown that the more efficient firms will earn higher profits than the less efficient firms by introducing the notion of differences in efficiency among the firms i.e each firm in an industry has a constant marginal cost but different firms have different levels of marginal cost. Taking Cournot model with zero collusion they show that,

$$\frac{II}{R} = \frac{1}{NE} + \frac{(1 - EN)^2 Vc^2}{NE}$$

where II is monopoly profit, R is total revenue, N is number of firms, V is coefficient of variation in cost levels and E is elasticity of demand. The first term in the above equation is the normal result if the industry consists of equal sized firms. The second term comes in because it captures the effect on profits of dispersion of marginal cost.

They also showed that:

$$H = \frac{1}{N} + \frac{(1 - EN)^2 Vc^2}{N}$$

so, the same variables which determine the profitability of an industry determine the structure of the industry, H.

In short, empirical literature suggests that large profits are the result of either high prices or low costs. It is quite possible that if a third factor affects one or both of these along with an increase in concentration and profits simultaneously, the data will support the hypothesis that increased concentration leads to increased profitability on the face of it. Such a phenomenon makes it difficult to distinguish the part of profit arising due to the external factor and the part due to concentration.

For some unknown reason up till now no attempt is made in Pakistan to answer and clarify some of the doubts cast above. Therefore in the rest of this chapter we undertake a few exercises which will be first of its kind.

As discussed above there is no entirely satisfactory procedure or test through which it is possible to separate the effects of economies of scale and concentration on profits. Therefore we will rely mostly on the techniques of estimation which are simple to interpret and require the type of data available to us. Instead of relying on complicated models which are too difficult to interpret it would be worthwhile if we start by examining the basic relations like the behaviour of profit rates, cost and productivity in relation to size in sub. section 6.1-6.3.

Such an approach may perhaps pick up the over all scale effect in a static sense or limited nature and the inferences drawn may be mere approximations. The analysis carried out is based on grouped Census of Manufacturing data for three points of time 1970, 1978 and 1984; which includes all industries in an aggregated sense, and also a sample of selected industries. The data is grouped by one measures of size, namely employment. The selected variables are profitability, cost, factor productivity and size. The measurement of these variables is already explained in earlier chapters except for cost measurement which is described in sub section 6.2. The statistical operations carried out are restricted to averages, various ratios and the rank correlation coefficients.

6.1 Average Profits and size:

In this sub section we first calculate average profits then examine the differences in profits across various size groups and its behaviour overtime. The hypothesis is that higher profits are associated with large establishments. Table 6.1 presents the average profit for each size group for the years 1970-84 and also the average for all size groups. Figures mentioned in the Table when inspected column wise shows the differences associated with firm size. It is observed that size and profit rate do not show any systematic relationship and this is confirmed when rank correlation coefficients are calculated between profit rates and size groups, these correlation coefficients are mentioned at the end of each column, they are positive for 1970, 1978 and become negative for 1984. However all the correlation coefficients are not highly significant which suggests that size does not exert a strong influence on profits, in fact between 1970-84 profit rate tend to decrease with the size of firm. The second last row of the Table provide average profit rate for all the three years. Comparison of average profit rate with each size group reveal that except for 1970, the profit rate of the largest size groups are rather less than the average profit rate for 1978 and 1984. In contrast, the small and medium size groups seem to have profit rates higher than the average profit rate particularly in 1978 and 1984.

When size is measured by Rupee value of fixed assets, Table 6.2, it is noted that higher profits are associated with the smaller firms and this association is confirmed by the rank correlation coefficients all of which are negative suggesting that the profit rate tends to decrease the larger the size of firm. All the rank correlation coefficients are significant at the 5 percent level. Similar results were found by Samuel [1968] and Whittington [1980] for U.K. data. On the contrary Hall and Weiss [1967] suggest that size tend to result in high profits because of the capital requirement barriers, large firms have not only all the options of the small firms, they have an additional benefit of investing in a scale of production, not open to the small firms. Reading the same Table by rows gives the annual mean rate of profit of different size groups in successive

Table 6.1: Average Profits, Size and Rank Correlation Coefficients (Size Measured by Employment) 1970-84

Size Group	1970		1978		1984	
	A	B	A	B	A	B
Upto 9 persons	29	23	51	35	64	52
From 10 to 19 persons	88	58	21	13	96	63
From 20 to 49 persons	66	39	156	88	91	57
From 50 to 99 persons	90	48	123	67	96	56
From 100 to 249 persons	35	20	69	46	99	53
From 250 to 499 persons	70	42	145	63	99	62
From 500 to 999 persons	83	50	76	44	88	51
From 1000to1999 persons	95	62	187	92	110	74
From 5000to4999 persons	72	38	63	25	68	31
50000 and above persons	107	64	24	14	5	4
average profit	79	47	98	52	76	48
rank correlation coefficient	.57	.42	.10	.05	-.13	-.41

A: VA - wages/Fixed assets

B: VA - wages/Fixed assets + stocks.

Source: Calculated from Census of Manufacturing Industries 1970-71,1978-79, 1984-85, Statistics Division, Government of Pakistan.

Table 6.2: Average Profit Size and Rank Correlation Coefficients. (Size measured by capital assets 1970-84).

Size Group	1970	1978	1984
Upto Rs. 250,000	1.1	1.82	3.00
Rs. 250,000 - 500,000	0.96	3.04	1.60
RS. 500,001 - 1000,000	0.88	3.20	1.80
Rs. 1000,001 - 2000,000	-	1.28	1.90
Rs. 2000,001 - 2500,000	-	0.92	0.77
RS. 2500,001 - 5000,000	1.10	1.99	1.53
RS. 5000,001 & above	0.84	0.82	0.69
Averages (n = 7)		1.87	1.67
Rank correlation Coefficients (profit rate & size group)	- 0.20	- 0.57	- 0.76

Source: Calculated from Census of Manufacturing Industries, Federal Bureau of Statistic, Statistics Division, Government of Pakistan, Islamabad. (1970, 1978, 1984).

Table-6.3: Rank Correlation Coefficient Between Size And Average Profit For Selected Industries (1970-84)

Industry	Rank Correlation Coefficient 1970	1978	1984
All Industries	0.70	0.78	0.83
Beverage	0.80	-0.30	1.0
Tobacco	0.78	1.0	0.79
Textile	0.82	0.70	0.60
Wearing Apparel	-0.80	-0.75	-0.88
Leather	0.65	0.37	0.74
Footwear	0.74	0.50	0.80
Ginning	0.42	0.43	0.38
Furniture	0.60	0.80	0.16
Paper	-1.00	0.80	-1.0
Printing	0.66	0.68	0.82
Drugs	0.32	0.68	0.82
Industrial Chemicals	0.80	0.32	-0.48
Other Chemicals	0.33	0.36	0.92
Rubber	0.65	0.61	0.71
Plastic	0.58	0.47	0.49
Pottery	1.00	1.0	1.0
Glass	-0.35	-0.25	-0.14
Non Metallic Mineral	0.16	0.95	0.74
Iron and Steel	0.24	-0.47	-0.07
Fabricated Metal	0.15	0.43	0.09
Non Electrical	0.95	0.15	0.29
Electrical Machinery	0.38	0.39	-0.04
Transport	-0.34	0.25	-0.65
Science Instruments	-0.80	-0.50	-0.80

Source: Calculated from Census of Manufacturing Industries 1970-71,1978-79,1984-85. Statistics Division Government of Pakistan.

years. It is found that the profit rate tend to rise in case of small/medium size and fall or remain constant in case of large size establishments. Thus the first two size classes tend to survive best. The annual rank correlation coefficients also suggest that in general the differential profit between large and small firms is becoming stronger. To confirm this hypothesis rank correlation coefficient between the six annual rank correlation coefficients and time is calculated. A value of 0.61 which is significant at 5 percent level is obtained, thus supporting the hypothesis.

Average annual profit rates were also calculated for a sample of twenty five concentrated industries for 1970, 1978 and 1984. The performance of the largest size group of most industries is poorest against the medium and small size groups reporting highest mean profit rates. Rank correlation coefficients mentioned in Table 6.3 are also calculated for each of these industries. The majority of the rank coefficients are positive except for wearing apparel, paper, glass, iron and steel and scientific instruments which showed negative rank correlation coefficients between size and average profit rate. Although out of twenty five industries about half of the cases have rank correlation coefficients significant at the 5 and 10 percent level of significance. And out of the significant cases only two to three cases show a negative rank correlation coefficient. In contrast to our earlier findings particularly those mentioned in Table 6.2, it is noted that uniformity of results between size and profit rate is not found for individual industries. Largest size of all concentrated industries do not show higher profit rate. The size profit relationship varies from industry to industry. Thus the importance of size is minimized in determining profit rate when other forces exercise important influence on profits. Similar results are found by Marcus [1969] for U.S, data, that size of firms tend to influence profits in some but not in all industries. Because several forces like product prices factor cost production function etc influence profits, and the association of these prices with firm size vary from industry to industry.

In this respect it is of particular importance to examine some of these other forces in relation to size, for example it is of interest to enquire about the cost and value added size relationship. It is quite possible that either various components of cost like fixed assets, stocks, wages, industrial and other costs or value added are substantially higher or lower in the case of some of the large sizes which result in low-high average profit rates in those industries relative to other industries and small size in the same industries. Sub sections 6.2 and 6.3 deal with these exercises.

6.2 Cost-Size Relationship:

In this sub-section we examine total and various components of cost, considering first the differences associated with size for all industries and then for related industries. Our measure of total cost include fixed assets, stocks, wage, raw material and fuel costs. A priori it is assumed that cost per unit of output declines with size because of the scale economies and other advantages associated with size.

Total cost-value added ratios were calculated for all industries for 1970-84 and Table 6.4 report only the rank correlation coefficients between the ratio of total cost to value added and size for all industries. In support of our hypothesis the coefficients are negative but insignificant except for 1970. Obviously no firm conclusions can be drawn about cost-size relationship unless we undertake a similar exercise for individual industries and enquire whether cost-size relationship differ from industry to industry. Table 6.5 report rank correlation coefficient for the same ratios for selected industries. It is observed that out of twenty five industries about half of the industries show negative rank correlation coefficient, the rest manifest either positive or zero rank coefficients. The rank coefficients for 16 industries are significant, out of which 8 are positive and 8 are negative at 5 and 10 percent significance level. This suggests that cost size relationship vary from industry to industry. However it is too early to suggest that the industries showing negative rank coefficients do so simply because their large units are able to operate at lower unit costs. It is quite possible that the small have high total cost value added ratio not because they have high costs but because they have low value added.

It is therefore important to examine separately and in

Table 6.4: Rank Correlation Coefficient Between Size And Ratios of Total Cost And Various Components of Cost (All Industries) 1970-84

Rank Correlation	1970		1978		1984	
Coefficient Between	**E**	**K**	**E**	**K**	**E**	**K**
Size and TC/VA	-0.78	-0.60	-0.25	-0.22	-0.23	-0.41
Size and K/L	0.97	1.0	0.79	1.0	0.53	1.0
Size and W/L	0.73	0.90	0.30	0.93	0.87	1.0
Size and IC/VA	-0.67	-0.60	-0.85	-0.42	-0.87	-0.39

E: Size measured as employment

K: Size measured as book value of fixed assets.

Source: Calculated from Census of Manufacturing Industries Statistics Division Government of Pakistan 1970-71,1978-79,1984-85.

detail the various components of cost associated with size for all industries and for selected industries. To gauge the importance of various components of cost three major ones were selected for our analysis, These were fixed capital and stocks, employment cost and industrial cost which includes raw material, fuel and repair costs. First the ratios of fixed capital plus stocks to labour, wage-labour and industrial cost of value added are calculated and rank correlation coefficients are estimated for all industries. Table 6.4 present these rank correlation coefficients for two measures of size between 1970-84. The first hypothesis tested is that size and capital-labour ratio/technology are positively related. The data confirm the hypothesized direction of association. The rank coefficient is significant at 5 percent level. The relationship between wage- labour ratio and size measured again by the rank coefficient and reported in the same Table also manifest that employment cost is significantly high in large size units of production.The same Table records the rank coefficient for industrial cost per unit of value added and size as well, and it is noted that the large establishments have lower industrial cost per unit of value added relative to the small size groups. The coefficients are negative and significant particularly for employment as a measure of size. Although it was not possible to separate the fuel cost from raw material cost but it can be stated with confidence that large units have higher fuel costs than the small.

Table-6.5: Rank Correlation Coefficient Between Size And Total Cost or Selected Industries (19970-84)

Industries	Rank Correlation Coefficients 1970	1978	1984
All Industries	-0.81	-0.75	-0.23
Food	-0.40	-0.80	-0.81
Beverages	0.25	0.30	-0.51
Tobacco	-0.90	-1.0	1.0
Textile	-0.74	0.0	0.30
Wearing apparel	0.80	0.30	0.94
Leather	0.12	0.60	-0.44
Footwear	0.60	1.0	1.0
Ginning	-0.31	-0.03	-0.83
Furniture	0.40	0.80	1.0
Paper	0.10	1.0	0.31
Printing	-0.25	-0.18	0.57
Drugs	-0.65	-0.40	-0.89
Industrial chemicals	-0.48	-0.82	0.32
Other Chemicals	0.03	-0.86	-0.77
Rubber	0.60	0.0	-0.37
Plastic	-0.21	-0.37	-0.77
Pottery	0.0	0.0	0.0
Glass	-0.37	0.0	-0.43
Non Metallic Mineral	-0.14	-0.65	-0.60
Iron and Steel	0.0	-0.36	0.07
Fabricated Metal	0.0	0.0	-0.71
Non Electrical	0.32	0.42	0.07
Electrical	0.0	-0.14	0.64
Transport	0.53	0.35	0.68
Scientific Instruments	0.10	0.75	0.60

Source: Calculated from Census of Manufacturing Industries 1970-71,1978-79,1984-85. Statistics Division; Government of Pakistan.

From the above it is clear to some extent that the small establishments have i) Lower fixed assets and stocks per head. This may be because they mostly employ local and simple technology, and do not keep large stocks. By contrast the larger units of production have higher capital plus stocks per head, mainly because they use imported technology and are capital intensive. (ii) Smaller wage bill. Some of the small establishments may not even be constrained by wage legislation. Whereas the large units pay higher wages. Besides that they also provide other benefits which the small establishments do not pay. iii) Larger industrial cost per unit of value added than the large establishments. It is possible that the economies of bulk buying particularly the raw material enable the large units to have a cost advantage. However their fuel repair and other costs are substantially larger relative to the small size establishments.

Thus our earlier finding that the ratio of total cost to value added and size shows a negative but weak rank correlation coefficient is not consistent with the findings reported above when the various components of cost are examined separately across various size groups. However, these results do not imply that all large establishments have higher costs and all small units have lower cost. It is possible that cost-size relationships differ from case to case. It is therefore worth while to extend the same exercise by calculating the same cost ratios across selected industries for 1970-84.

Table 6.6 reports the rank correlation coefficients between size and the three components of cost. And it is observed that except for beverages, ginning and plastic industries all other industries show a positive rank coefficient between size and capital plus stocks per head. But the coefficient is zero for leather and fragile in the case of textiles, ginning, rubber, plastic and scientific instruments. The rank coefficients for wage labour ratio and size are also reported in the same Table. These coefficients also manifest that, except for ginning, large establishments in all industries pay higher wages. The rank coefficient is significant in all industries except beverages, textiles and leather. It is interesting to note from the wage-labour ratio that the largest establishments in textiles pay almost the same wage per head as the small size establishments. This may be so because of the competitive nature of the textile industry. The rank coefficients for industrial cost, and size are negative but non significant in the case of nine industries. This may be so because there large units depend in some cases on imported raw material and the advantage of bulk buying is minimized.

Thus results reported in Table 6.6 confirm our belief that different industries experience different cost size relationship. And with a few exceptions large units in all the industries experience relatively high capital labour and wage-labour ratios, but this may not be so regarding industrial cost value added ratio, which vary from case to case and may not necessarily be high in all

Table 6.6 Rank Correlation Coefficients Between Selected Components of Cost and Size for Selected Industries (1970-84).

Industry	Rank Correlation Coefficients								
	1970			1978			1984		
	K/L	W/L	IC/L	K/L	W/L	IC/L	K/L	W/L	IC/L
All Industry	0.17	0.73	-0.72	0.09	0.30	-0.85	0.54	0.87	-0.87
Food	0.64	0.48	-0.39	0.20	0.91	-0.88	0.78	0.83	-0.88
Beverages	-1.00	-1.00	-1.00	-0.90	-0.70	0.30	-0.80	0.70	-0.20
Tobacco	0.96	-0.64	-0.68	0.50	0.50	0.50	0.70	1.00	-0.60
Textile	-0.67	-0.35	0.66	0.01	-0.28	0.27	0.23	0.21	0.20
Wearing Apparel	0.80	0.46	0.60	-0.70	-0.80	0.81	0.88	0.71	0.42
Leather	0.95	0.02	-0.77	-0.20	0.38	0.69	0.00	1.00	-0.43
Footwear	0.80	0.30	0.00	1.00	1.00	1.00	1.00	0.40	1.00
Ginning	-0.82	-0.77	-0.37	-0.94	-0.74	-0.03	-0.43	-0.98	-0.66
Furniture	-0.62	-0.40	-1.00	0.40	0.60	0.00	-0.80	0.80	0.40
Paper	0.40	0.50	0.00	-0.60	1.00	-1.00	0.54	0.65	0.14
Printing	0.77	0.97	-0.64	0.15	0.61	-0.17	0.57	0.78	-0.60
Drugs	0.68	0.97	-0.64	0.86	0.90	-0.39	0.78	0.92	-0.92
Chemicals	1.00	0.82	0.48	0.75	0.81	-0.85	0.70	0.92	-0.10
Other Chemicals	0.50	0.83	0.48	0.43	0.94	-0.02	0.71	1.00	-0.78
Rubber	0.14	0.37	0.60	-1.00	0.43	0.13	0.08	0.82	-0.49
Plastic	0.00	0.80	0.00	0.77	0.77	-0.28	-0.09	0.71	-0.66
Pottery	-	-	-	0.80	1.00	-0.80	1.00	0.70	-0.60
Glass	0.39	0.72	0.25	-0.10	0.70	-0.10	0.60	0.77	-0.49
Non Metallic Mineral Prod	0.62	0.73	0.74	0.52	0.76	-0.54	0.66	0.82	-0.79
Iron & Steel	0.64	0.82	0.03	0.54	0.97	0.21	0.92	0.94	-0.67
Fabricated Metal	0.83	0.66	0.03	0.66	0.95	0.18	0.77	0.94	-0.32
Machinery	-0.08	0.54	0.88	0.74	0.35	0.91	0.82	0.75	-0.55

Electric Machinery	0.86	0.96	0.53	0.63	0.97	0.18	0.53	0.80	-0.27
Transport	0.93	0.89	0.54	0.78	0.93	0.50	0.71	0.96	0.68
Science	-0.90	0.50	-0.25	-0.90	0.93	0.75	0.20	0.90	0.60

Source : Calculated from Census of Manufacturing Industries 1970- 84 Statistics Division, Federal Bureau of Statistics, Government of Pakistan, Karachi, Islamabad.

large establishments.

6.3 Factor Productivity and Size:

From the previous sub-section it is learned that in general large size establishments have higher capital cost and larger wage bill. It is therefore of interest to investigate the use of capital and labour force in the production of industrial output, first in the aggregate sense and then in individual industries. For this purpose labour and capital productivity is measured by the ratios of value added to labour and value added to capital for all industries and a sample of twenty five industries. And the direction of association between size, examined value added per unit of labour and capital is examined. Besides the measure of size used in the previous sub-sections another measure of size is also used where size is defined as the share of each industry in the total sample value added using only 1984 data.

The hypothesis tested in this sub-section is that the direction of association between size and labour productivity is positive. Where as according to x-inefficiency hypothesis it is expected that size and capital productivity are negatively related.

Value added/labour; value added/capital and capital/labour ratios are calculated for all industries and selected industries across various size groups. But only the rank correlation coefficients are reported. Taking the all industries case, values of the rank correlation coefficient between labour productivity and size are mentioned in Table 6.7. The hypothesis that size and productivity are positively related is not confirmed for 1970 and 1978, as indicated by the rank correlation coefficient which is almost zero for 1970 and negative but insignificant for 1978. However the hypothesis is accepted for 1984 at 10 percent significance level. Rank correlation coefficient between size and ratio of value added to capital are also reported in the same Table. The evidence does not support the hypothesized relationship. It is positive for 1970 and 1978 and negative but weak for 1984. Table 6.8 provides evidence regarding labour and capital productivity in relation to size across a sample of selected industries. It is observed that the hypothesis of positive association between size and labour productivity is supported in most of the cases, however, the rank correlation coefficients are significant at 5 and 10 percent level of significance only for 18 industries. Column 4-6 records the rank correlation coefficient between size and the ratio of value added to capital. The hypothesized negative association is not confirmed in most cases. Out of a total of 24 industries only 7 show negative association at 2.5 and 10 percent level of significance.[1]/.

---

1. In a study; for India, Sandesra [1960] undertakes a similar exercise by testing the relationship between (i) productivity of labour and capital and size (ii) technology and productivity of labour and capital and other variables. He finds that productivity of labour is high in large size establishments, whereas it is not so in case of productivity of capital. The evidence for the relationship between productivity of labour and technology was conflicting and the data did not support the hypothesized positive relationship.
However he finds a negative relationship between productivity of capital and technology. Generally his

Table-6.7: Rank Correlation Coefficient Between Productivity And Size, Productivity And Technology.

All Industries 1970-84

	Rank Correlation Coefficient		
	1970	**1978**	**1984**
V/L and size	0.05	-0.11	0.50
V/K and size	0.19	0.31	-0.37
V/L and K/L	0.50	0.09	0.40

Source: Calculated From Census of Manufacturing Industries 1970-71,1978-79,1984-85. Statistics Division; Government of Pakistan.

Table 6.8: Rank Correlation Coefficient Between Labour, Capital Productivity and Size for Selected Industries(1970-84)

	Rank Correlation Coefficients					
	V/L and Size			V/K and Size		
Industry	**1970**	**1978**	**1984**	**1970**	**1978**	**1984**
All Industries	0.05	-0.11	0.50	0.19	0.31	-0.37
Food	0.38	0.43	0.78	0.21	0.48	0.38
Beverage	0.50	0.90	0.70	0.50	0.90	1.0
Tobacco	0.75	1.0	0.70	0.36	1.0	0.60
Textile	0.11	-0.54	0.35	0.72	0.01	-0.69
Wearing Apparel	0.80	0.0	0.05	-0.12	0.30	0.54
Leather	0.70	-0.14	0.60	-0.08	-0.14	0.34
Footwear	0.40	-1.0	0.40	0.20	0.50	-1.0
Ginning	-0.60	-0.83	-0.88	-0.30	-0.05	0.43
Furniture	0.30	0.20	0.80	-0.60	-0.40	-0.40
Paper	0.70	0.80	0.76	0.40	0.80	-0.60
Printing	0.0	0.61	0.03	0.77	0.84	-0.57
Drugs	0.85	0.75	0.92	0.92	0.86	0.50
Chemicals	0.60	0.78	0.59	0.60	0.21	0.21
Other Chemicals	0.66	0.43	0.94	0.11	0.94	0.89
Rubber	0.89	0.42	0.83	0.14	0.45	0.65
Plastic	0.90	0.54	0.77	0.20	0.26	0.37
Pottery	-	-	-	-	-	-
Glass	0.02	-0.10	0.77	0.20	-0.50	-0.11
Non-Metallic	0.70	0.94	0.83	0.23	0.83	0.12
Iron and Steel	0.10	0.58	0.54	-0.57	-0.25	-0.07
Fabricated Metal	0.89	0.18	0.83	0.02	0.77	-0.14
Machinery	0.83	0.92	0.86	0.89	-0.40	-0.70
Electrical Goods	0.68	0.60	0.14	0.30	-0.16	-0.64
Transport	0.71	-0.28	0.61	0.25	-0.59	-0.17
Science Instruments	0.40	-0.70	0.10	0.30	-0.20	-0.80

Source: Calculated from Census of Manufacturing Industries 1970-71,1978-79,1984-85. Statistics Division; Government of Pakistan.

At this stage the three setsof results at hand provide an interesting comparison of the significance of our three key variables, average profits, cost and labour productivity in relation to size across 25 industries grouped according to employment. Such a comparison helps in drawing approximate inferences about the performance of the manufacturing sector. Table 6.9 records the comparison of the three sets of results and manifest that both monopoly power and efficiency are at work which enable large firms to earn higher profits. This suggest that higher profits may not always stem from lower cost of production. In a

---

results do not indicate that size and technology determine the productivity of labour and capital.

Lydall [1960] believe that only efficient and promising small size enterprises have an important role to play in the Indian Economic Development. To test the hypothesis he calculates output-capital ratio in small and large factories. Statistical evidence confirm that very small firms have a more favourable output capital ratio, which is disturbing for the author. He also calculates wages per employee in different sizes of factories in four countries, India, Japan, U.K and U.S.A and find that average payment is less in small than in large firms.

Another Indian author Banerji [1978] examine the hypothesis that small scale units of production have a greater potential for faster growth of production and that the gains of such growth ensure better distribution. She finds that the basic assumptions on which these hypothesis are based and their consistency with the Indian situation are not true. Her findings do not support the argument that small size units are better or have faster growth and that the gains of fast growth are better distributed.

For Japanese manufacturing industries Ishikawa [1979] reports that '.....technologies chosen in the smaller size groups were characterized by lower capital labour ratios and lower labour productivities than those in the large size groups, and side by side with it the wages of labour available to the smaller size groups were lower than those for the larger size groups while the reverse was true for the prices of capital equipment; (p.108). In contrast, he finds that wage rates and productivities are uniform across all size groups in U.S.A and the case of India appear to be similar to Japan.

Table-6.9: Comparison of Rank Correlation Coefficients Between Selected Variables And Size Across Selected Industries (1984-85)

Industry	Rank Correlation Coefficients					
	Profits	TC	K/L	W/L	K/V	VA/L
Food	0.83	-0.81	0.78	0.83	-0.88	0.78
Beverage	1.0	-0.51	-0.80	0.20	-0.20	0.70
Tobacco	0.79	-1.0	0.70	1.0	-0.60	0.70
Textile	0.69	0.30	0.23	0.21	0.20	0.35
Wearing Apparel	-0.88	0.94	0.88	0.71	0.42	0.05
Leather	0.74	-0.44	0.0	1.0	-0.43	0.65
Footwear	0.80	1.0	1.0	0.40	1.0	0.40
Ginning	0.38	-0.83	-0.43	-0.95	0.66	-0.88
Furniture	0.16	1.0	-0.80	-0.80	0.40	0.80
Paper	-1.0	0.31	0.54	0.65	0.14	0.76
Printing	0.82	0.57	0.57	0.78	-0.60	0.03
Drugs	0.82	-0.89	0.78	0.92	-0.92	0.92
Chemicals	-0.48	0.32	0.70	0.92	-0.10	0.59
Other Chemicals	0.92	-0.77	0.71	1.0	-0.78	0.97
Rubber	0.71	-0.37	0.08	0.82	-0.48	0.83
Plastic	0.49	-0.77	-0.09	0.71	-0.66	0.77
Pottery	1.0	0.0	1.0	0.70	0.60	-
Glass	-0.14	-0.43	0.60	0.77	0.49	.77
Non-Metallic	0.74	-0.60	0.66	0.82	-0.79	0.83
Iron and Steel	-0.07	0.07	0.92	0.94	-0.67	0.54
Fabricated Metal	0.09	-0.71	0.77	0.94	-0.32	0.83
Machines	0.29	0.07	0.82	0.75	-0.55	0.86
Electrical Goods	0.04	0.64	0.53	0.80	-0.27	0.14
Transport	-0.65	0.68	0.71	0.96	0.68	0.61
Scientific Instruments	-0.80	0.60	0.20	0.90	0.60	0.10

E: Efficient, IE : Inefficient, M: Monopoly.

Source: Derived from Tables 6.3, 6.5, 6.6 and 6.8.

number of cases like leather, footwear, printing, pottery etc it is noted that the rank correlation coefficient between profits, total cost and its components, labour productivity and size is mainly positive and also significant, which indicates that the force of monopoly is at work enabling large firms to earn higher profits despite higher costs of production. In contrast large firms in food, beverages, tobacco, drugs, other chemicals and non-metallic industries experience higher profits but lower costs. For such cases our results are sympathetic towards the efficiency hypothesis. A third feature of the data contained in Table 6.9 is that large firms also experience losses due to higher costs in an over all sense and also regarding different components of costs. Some, such examples are paper, glass, iron and steel, electrical machinery, transport and scientific instruments. Their inefficiency may arise from the use of inappropriate technology in terms of obsolete or advanced technology which in most cases result in lower productivity or higher costs of capital and labour.

Employing our second measure of size that is the share of a sample of 35 industries in total sample output, ratios of value added to labour and capital are calculated for individual industries using only 1984 data: These ratios are compared to the sample averages of the two ratios to identify the relatively more efficient industries in their use of labour and capital resources from the least efficient. And to relate these industries with size, concentration and cost. Industries showing values 100 percent greater than the sample average may be taken as an indication of their relative efficiency. Table 6.10 report the six industries which showed a value added per unit of labour more than 100 percent of the sample average value of 91 given in the last row of the Table. One would expect that workers in heavy capital using industries produce value added significantly greater than the sample averages. For example normally cement and fertilizer industries should be among the leaders it is some what surprising to see cigarette and paint manufactures in the top few.

Table 6.11 compares the value added assets ratio of selected industries to the average for the total sample average which is 1.67 as mentioned in the last row of the Table. Once again using the 100 percent as the criteria for efficiency some 7 industries are included.[2]/. Except for fertilizers, all other industries on the list in Table 6.10 are included in Table 6.11 as well. For fertilizer it would be suggested that while it uses labour to advantage, it does less well with its capital, though it is reported as the industry with the highest capacity utilization.[3]/. It may be reported that industries reported in Table 6.10, and 6.11 are quite concentrated industries, as a few large firms produce the total market output. However, the relative size of these large firms may not be large in a general sense as well. Table 6.12 compares the ranking between

---

2. Except for cement and hydrogenated oil rest of the industries have fairly low capital-labour ratios.

3. Table 6.10, 6.11, 6.13 and 6.14 also report the percentage of capacity utilized by each of the industries mentioned in the Table.

Table-6.10: Value Added Per Worker As Percentage of Sample Average of 36 Industries (1984)

Efficient Industries (VA/L 100% of Sample Average)

Industries	**Value**	**Rank**	**CU**	**CR/4(1984)**
Tobacco	479	1	62	61
Cement	323	2	95	54
Paints	258	3	58	-
Fertilizers	253	4	112	66
Beverages	202	5	-	13
Hydrogenated Oil	193	6	68	-

Sample Average: 91

CU : Capacity utilization, is defined as

$$CU = a/t = \frac{\text{(actual hours per year of plant operation)} \times 100}{8760}$$

=actual time utilization over potential time.

CR : Four Firm Concentration Ratio

Source: 1. Calculated from census of Manufacturing Industries 1984-85. Statistics Division, Government of Pakistan.

2. "Capacity Utilization in Pakistan's Manufacturing Sector"; Robert Nathan and Associates and United Consultants (PVT) LTD March 1987.

Table-6.11: Value Added to Fixed Assets Ratio As a Percentage of Sample Average of 36 Industries (1984-85)

Efficient Industries (VA/K 100% of Sample Average)

Industry	**Value**	**Rank**	**CU**	**CR/4(1984)**
Cigarettes	5.9	1	62	61
Beverages	4.3	2	-	13
Cement	4.15	3	95	54
Hydrogenated Oil	3.1	4	68	-
Paints	2.9	5	58	-
Tyres	2.7	6	63	66
Batteries	2.2	7	68	-

Sample Average: 1.67

Source: 1. Calculated from Census of Manufacturing Industries 1984-85 Statistics Division, Government of Pakistan.

2. Capacity Utilization in Pakistan's Manufacturing Sector, Robert N, Associates, and United Consultants (PVT) LTD, March (1987).

most efficient industries with respect to their size and concentration ratio. The figures show where each industry is placed with respect to size within the sample. For example paints and varnishes etc which is number 2 in Table 6.10 an 5 in 6.11 is ranked 21 in value added (VA) out of the 36 industries, only 33 in the number of workers employed and in the Rupee value of its assets. Yet it is ranked among the relatively very efficient industries. By contrast, the manufacture of cigarettes is placed on top in Table 6.10 and 6.11 is ranked as the largest contributor in the sample value added, it is the 8th largest employer,it has also the 8th ranked volume of fixed assets. Inspite of its largest size and the fact that it has relatively fewer assets per worker, its use of capital and labour is highly efficient. Furthermore, except for vegetable oil, fertilizers and cement industries which are public enterprises, the rest of the industries reported in Table 6.10 and 6.11 belong to the private sector. One reason why cement and fertilizer industries have high value added per labour and capital is that they work at almost full capacities, due to market disequilibrium, and investment sanctioning policies which discourage excess capacity.[4]/.

Industries like tyres and batteries are more competitive as they face tough competition from foreign products. Paints on the other hand is doing well because

---

4. The column reporting capacity utilisation rates shows that fertilizer and cement industries are already working at full capacity. however,it is suggested that industries like cigarette, paints, hydrogenated oil, tyres, and batteries can attain even higher productivity per labour and capital if they produce at full capacity which they are not doing currently.

cement and paints are to some extent complimentary goods (particularly in the construction of houses and plazas). Therefore, a boost to the cement industry indirectly lead to increased demand for paints as well.

Analysing the capital and operating costs of these industries it is noted that cement, fertilizer, tobacco, paints and beverage industries depend on local technology and equipment and their repair or replacement costs are relatively low. Similarly except for fertilizers, hydrogenated oil, batteries and tyres the rest of the industries utilize locally produced raw material. High costs for the relatively large import content of raw material in these industries might have been compensated for by low electricity and fuel charges and other factors (except in case of hydrogenated oil, where the fuel and electricity bill is relatively high).

In general these results tend to be similar to those reported in Table 6.9 where food includes hydrogenated oil, beverages, tobacco, drugs, other chemicals (include paints) and non-metallic mineral products (which include cement manufacture) were also outlined as efficient industries.

Results reported in Table 6.13 and 6.14 are a repetition of the above exercise in an effort to identify the least efficient industries in the sample. The cut off point was 50 percent of sample average. Table 6.13 indicates that the cycles industry is the lowest in the sample, although a total of industries qualified. It is followed very closely by glass, textile machinery, spinning and weaving and

Table 6.12: Ranking of 8 Leading Industries in Sample Value Added(VA) Employment (E) and Fixed Assets (K) 1984.

	% of total				
Industry	**VA**	**E**	**K**	**CR**	**NOE**
Hydrogenated oil	5	6	10	-	35
Beverages	10	18	17	13	42
Cigarettes	1	8	8	61	20
Fertilizers	7	15	4	66	8
Paints	4	33	33	-	25
Tyres & Tubes	29	30	34	66	8
Cement	4	11	5	54	11
Batteries	30	28	29	-	11

NOE = Number of establishments.

Source : Derived from Census of Manufacturing Industries, Federal Bureau of Statistics, Statistics Division, Government of Pakistan, Islamabad. (1984-85).

Table-6.13: Value Addded Per Worker Ratio As Percentage ofSample Average of 36 Industries (1984)

Inefficient Industries (VA/L 50% of Sample Average or Less)

Industry	Value	Rank	CU	CR/4 1984
Spinning Weaving of Wool	48	1	55	-
Iron and Steel	46	2	53	61
Spinning Weaving of Silk	45	3	-	-
Ship Building	38	4	-	100
Spinning Weaving Cotton	34	5	55	-
Spinning Weaving of Jute	32	6	79	-
Textile Machinery	30	7	63	-
Glass	27	8	73	49
Cycles	26	9	79	-

Sample Average: 91

Source: 1) Calculated from Census of Manufacturing Industries 1984-85. Statistics Division. Government of Pakistan.

2) Capacity Utilization in Pakistan's Manufacturing Sector, Robert.N, Associates and United Consultants (PVT) LTD, March (1987).

Table-6.14: Value-Added Assets Ratio As Percentage of Sample Average of Industries (1984).

Inefficient Industries (50% of Sample Averages Or Less)

Industry	Value	Rank	CU	CR/4 (1984)
Motor Vehicles	0.78	1	75	-
Tea	0.76	2	-	100
Carpets	0.67	3	58	-
Iron and Steel	0.65	4	53	61
Petroleum	0.26	5	-	100

Sample average: 16

Source: 1) Calculated from Census of Manufacturing Industries 1984-85 Statistics Division's Government of Pakistan.

2) Capacity Utilization And Pakistan Manufacturing Sector, Robert. N., Associates and United Consul tants (PVT) LTD March (1987).

finishing of jute, cotton, silk and wool. Except for ship building and iron and steel they are all fairly labour intensive industries. As mentioned earlier, productivity in the textile industry was low because of increase in labour and raw material cost and the imposition of an other restriction which did not ensure increase in productivity.[5]/. In case of other industries either their cost of the imported raw materials is high, or their fuel, electricity and repair charges are high. Table 6.14 reports the value added assets ratio comparison, only 5 industries qualify. In the list of least efficient industries iron and steel and petroleum refining are placed as lowest followed by tea and motor vehicles. Except for tea they are dependent on both imported technology and raw material. The fuel and electricity bill of petroleum, and iron and steel refining, is also high. It may be noted that most of the industries mentioned in Table 6.13 and 6.14 have excess capacity which means that their efficiencies can be improved if they utilize their capacity fully or if required modernize production.

It may further be added that large investment has been made in iron and steel and petroleum refining and the large effect of investment may be realized in the form of increased output in the years to come. It is again noted that industries showing lowest value added-labour and

---

5. Annex 1.B shows that out of a total of 223 textile mills, 89 (or 40 percent) were out of production at the end of 1986. These mills have been closed for years due to financial problems in the industry. Many of these would require complete replacement of plant and equipment to resume, as their assets have deteriorated to the point of being of only scrap value.

value-added assets ratios are among the most concentrated industries like iron and steel, ship building, and petroleum refining textiles. Table 6.15 compares the size, inefficiency and concentration, again contrasts appear. The cycle industry is one of the smallest sectors in terms of value added, employment and fixed assets yet the least efficient. Conversely iron and steel and spinning; weaving and finishing of textiles are among the very largest industries. Iron and steel is largest in assets, third largest employer, sixth in value added and spinning weaving and finishing of cotton is the largest employers, third in assets and in sample value-added yet they are the least efficient industries .Furthermore inefficiency may exist in both the private and public sector industries. For example , glass, iron and steel, petroleum refining, textile machinery, ship building industries are owned by the public sector whereas the rest of the industries mentioned in Table 6.15 belong to the private sector.

Summary:

From the above results we may conclude that both the forces of monopoly and efficiency determine the performance of the manufacturing industries. And except for efficient industries it cannot be generalized that the cost of all large size establishments is relatively lower. The monopoly firms may manage to earn higher profits perhaps due to higher prices. Besides that a third group of large size establishments exist which are inefficient and have least profits. We may add that capital or labour intensity or size and concentrated structure of an industry may not

Table-6.15: Ranking of 13 Lowest Industries In Terms of Their Share In Manufacturing Value Added (VA) Employment (E) And Fixed Assets (R) 1984.

	% of Total Sample Value				
Industry	VA	E	K	CR	NOE
Tea	16	24	29	-	4
Spinning Weaving Cotton	3	1	3	-	166
Spinning Weaving Silk	8	10	15	-	207
Spinning Weaving Wool	20	14	14	-	51
Spinning Weaving Jute	15	5	16	-	8
Carpets	33	26	19	-	26
Glass	24	20	20	49	30
Iron and Steel	6	3	1	61	184
Petroleum	13	17	5	100	3
Textile Machinery	36	34	35	-	25
Motor Vehicles	11	12	8	-	45
Ship building	32	19	28	100	4
Cycles	35	23	32	-	17

Source: Derived from Census of Manufacturing Industries 1984-85. Statistics Division, Government of Pakistan.

always indicate efficiency and inefficiency. In fact our results do not support such a hypothesis of efficiency. It is observed that a mix of capital/labour intensive, large/small size, concentrated/unconcentrated and privately/publicly owned industries are listed among both the efficient and inefficient industries. This suggests that besides technology, size, and structure other forces may also be exerting their influence on the efficiency/inefficiency of the manufacturing sector. These forces may be systematic or random like government regulatory policies, both economic and political uncertainty, internal/external shocks that affect specific industries and the system in general receives. Of course, the importance of these forces may vary from case to case.

Thus it is suggested that small size may not always be beautiful, but neither can large size be considered totally lacking in virtue.

CHAPTER VII

CONCLUSION

The central task at hand was to first measure the extent of market power in Pakistan manufacturing industry and enquire what determines market concentration. And secondly, To establish the relationship between structure and performance as suggested by the "structure conduct performance" classificatory scheme. In addition we also made some attempt to cover a few related topics

Although it was convenient to start with estimating simple average relationships as we have done, but both on economic grounds, and in practice, matters are more complex. Keeping in view all such problems we extended our analysis to the measurement of proportionate changes in concentration and performance and their determinants. Still some caution is warranted in the interpretation of results about market power, measured through concentration ratios, the direction of association between structure and performance and the effects of market power on profits. Such studies suffer from several shortcomings and need to take account of the fact that concentration ratios are influenced by market size, openness of the economy, changing economic environment (particularly due to government regulatory policies) and the resulting impact on entrepreneurial decision making. Second, a limitation of the structure-conduct-performance paradigm is that even if the researcher is able to detect a strong relationship between structure and performance it is not clear whether the high profits are the result of monopoly practices or of superior efficiency i.e efficient management and low cost per unit of output. This ambiguity in the results haunts most policy makers whether to encourage or discourage large size establishments. To clarify the ambiguity it is suggested by writers that even if high profits are due to low operational costs it may be of little use if reduced costs are not passed on to the consumers in the form of reduced prices hence the welfare implications of a concentrated structure are clear. However, our contention is that in the seventies domestic producers were encountered with world wide inflationary reassures, increase in oil and raw material prices, increases in labour cost and investment sanction policies, thus limiting the chances for an absolute reduction in domestic prices. Moreover in a regime of price controls and competition from smuggled goods entrepreneurs have little control over price determination to influence profits. Third, more recently the criticism is made that the structure conduct performance paradigm suggests one way causation between structure and performance, it undermines the probability of a joint determination of structure and performance by some third outside factor. If that is so, inferences based on ordinary least square estimates become invalid. Fourth, the structure-performance paradigm is a static model which establishes relationships between market concentration and performance for one point of time. It fails to consider the problem from a dynamic perspective. Hence inferences drawn on the basis of a static approach may be weak and invalid for other points of time.

Given the above cautions and pitfalls related to the study of structure and performance we set out to address the following issues:

1. What is the distribution of firms by size and type of ownership?

2. Is the structure of Pakistan manufacturing concentrated, and has concentration increased over time, both in an aggregate and disaggregated manner?

3. What is the average size of an establishment? Is it approximately equal to the international standards of average size?

4. What determines the level and changes in concentration?

5. Does structure affect profit/performance, if so, how strong is the association between concentration and performance?

6. Is high profit a result of monopoly practices or superior efficiency?

The importance of undertaking this exercise is that studies in the past examined the structure-performance relationship from a static point of view and were Thus limited in nature and scope. Earlier authors suggest that the structure of Pakistan industry is concentrated and that large firms earn above normal profits because they had access to investment licenses, credit and other facilities which their rival producers had difficulty in achieving. However, they failed to leave any room for the influence of changes taking place over time. The nature of data available to us in published and other sources mainly determined our approach in analysing the above stated queries. It is noted that our results differ from the previous writers for several reasons. Nevertheless, it was not easy to match our findings with the previous studies and the interpretation of the results is not so straightforward.

Main findings of our enquiry are that although in general the manufacturing sector is concentrated, there is a tendency of increase in market power of some while decline in market share of others over time. But the plant sizes tend to be smaller relative to international standards of optimum scale of production because of the use of older technology with lower m.e.s. And the informal sector mainly uses local technology with even smaller m.e.s. However, it is noted that the same industries have a concentrated market structure in both developed and less developed countries; which indicates that similar factors are responsible for establishing an oligopolistic market structure irrespective of the level of economic development of a country.

In the next exercise attention was focused on the factors responsible for a concentrated market structure. It is argued that a large part of concentration is a direct result of dependence on foreign technology. And in this respect government policies regarding factor pricing, tariffs, foreign exchange regulations, and bank lending have an important bearing on the choice of technology in the private sector in the sixties. These policies were directly instrumental in shaping the structure of industry. However our results do not lend support to the belief that concentration is an inevitable result of technological need for larger plants, and the above argument cannot be put forward with equal force for all industries. It may be more important in one industry and less in others. In the following years attempts were made through government regulatory policies to reduce Pakistan industry's dependence on imported technology and raw materials. But there has been little change in the overall structure of industry, perhaps because of the changes in the economic and political environment both internally and externally which led to changes in investment decisions of the entrepreneurial class. For example, government's decision to nationalize and the manner in which it was carried out had a lasting negative impact on both domestic and foreign private investment; so much so that even in the eighties government could not regain the confidence of the investors at home and aboard. Other policies like investment sanctions, withdrawal of concessions, increase in labour cost etc, also contributed to the entrepreneurs, preference for a quiet life. In other words unpredictability and inconsistencies in policies of the three regimes led to strong reactions by the entrepreneurs. Another factor responsible for the postponement of new investment in manufacturing was political instability both internally and on the borders.

Whether the policies of the government were consistent with the industrial strategies and whether these policies pursued since independence are consistent and compatible with many of the government's stated objectives for national economic development are questions open to extensive criticism. The use of capital and import intensive technology in some areas of production has probably caused a serious waste of scarce capital and foreign exchange. As a result, it is likely that the rate of growth of industrial employment and output and therefore national income is less than what it would have been if the policies actually pursued by the government had more closely resembled its objectives regarding the achievement of national economic development.

Furthermore our results suggest that not only the importance of the explanatory variables changes but new variables may also emerge as significant determinants of concentration overtime.

The more important point of the thesis was to assess the influence of concentration on profits and productivity of labour and capital. The main question dealt with was whether there exists a relation between structure and economic performance, if so, then what is the effect of proportionate changes in concentration on increases in profits? And how far are the two results consistent? In the first test of levels of concentration on levels of profits we were unable to derive orthodox results like previous studies suggesting that structure is an important variable in influencing performance. Our results manifest that the relationship between concentration and profits has declined over time. Variables exerting significant influence on profits are capital/labour ratios, price controls and ownership pattern. The rest of the variables have poor explanatory power. For proportionate changes, the results indicate that changes in concentration has limited positive influence on changes in profits and the explanatory power is poor.

Besides econometric and statistical reasons our explanation for differences of results, when compared with earlier writers is first, the importance of variables in explaining performance of industry may vary over time. For example, in the sixties concentration combined with effective protection and favourable economic environment created by the government policies ensured high profits. The oligopolists used their power to set prices such as to ensure a given rate of return. The price policy remained insensitive to cost and changing conditions of cost experienced through access to technology and credit facilities. Thus the scene was all set for oligopolists to earn above normal profits. Second, our results show that concentration alone does not explain the performance of the manufacturing sector in terms of profits, which suggests that concentration is a necessary but not a sufficient condition to ensure high profits. Since 1970 the structure of industry has remained as concentrated as before but the relationship between structure and performance is weak possibly because the conditions favouring oligopolist to earn high profits, such as the economic and political environment, changed. As a result capital and operational costs increased, price controls and smuggling together undermined the importance of the structure performance relationship. Under such circumstances it is difficult to assert that structure exerts a strong influence on performance when profit itself cannot be taken as a satisfactory measure of performance.

The effect of concentration on labour and capital productivity was also tested. And it was found that concentration exerts a weak positive influence on labour productivity and is negatively associated with capital productivity. Generally it appears that large size establishments are efficient in the use oflabour but not so in case of capital.

Our task attempt was to separate the influence of monopoly practices from superior efficiency on profits followed by medium size enterprises. This may be so because of the cost advantage that the small units enjoy. They use local technology and raw material, they do not come under labour and taxation laws. On the other hand cost per unit of output is high in large size establishments mainly because of their dependence on imported technology and raw material, and increases in labour cost over time. Along with these, price control left little room for these entrepreneurs to pass increased cost per unit to consumers in the form of increase in prices or to use monopoly practices to earn above normal profits.

However our results hide differences in performance so far as individual industries are concerned. A more disaggregated view of the data reveal that the strength of association between size and economic characteristics like profits, cost and value added etc may vary from industry to industry. This suggests that the relevance of the structure performance model may vary from case to case and it cannot be generalized that all large, or all small, establishments are virtuous. In fact the data manifest that a mix of large and small size establishments are listed among both efficient and inefficient industries, which suggests that the manufacturing sector has both an element of monopoly/oligopolistic power and superior efficiency.

Our overall view in the aggregate sense is that in the earlier period of development, oligopoly market power has structural and technological origins and specific trade policies were designed to buttress oligopolistic market power. Technological discontinuities led to insensitivity of prices to cost reductions which were translated into higher profits and ultimately economic and social inequalities. These increases in profits above normal level were partially reinvested. However, in the process it was not realized that if the benefits of reduced cost were passed on as increases in wages it would have been a lesser evil than an increase in profits because the labourers' propensity to consume is much higher than the entrepreneurs. When wages rise the danger of stagnation or disequilibrium is less, but it is high when profits rise, particularly when a large part of the profits is spent on the consumption of imported luxuries. Afterwards, government intervention designed to control the market power of the oligopolistic group and to modify its consequences was prescribed. Tight regulatory policies, price controls and strong trade unions and a couple of external factors, the labour, capital and raw material costs which altogether increased, were translated into a substantial decline in private investment. Thus the structure remained as concentrated as before and the growth of manufacturing income and the absorption of unemployment either did not take place or happened more slowly and within narrow limits. It would therefore be an illusion to place so much hope on policies of this nature. Particularly when government intervention policies provoke entrepreneurs' reaction in the form of decline in investment and shift from industry to trade and commerce. Furthermore, policies aimed at reducing market power which has structural and technological origins, are of limited value. Thus our policy recommendations must reflect at least two realities, the planning authorities need to first relate the industrial development strategy with the resource endowment of the country, i.e increasing labour force and scarce capital and foreign exchange. Second, bring and maintain consistency in industrial development strategy over time and with national objectives regarding economic development. Any deviations of one from the other may aggravate the situation and lead to serious economic inefficiencies and loss of national output and capital. In this respect clarity regarding the choice of technology is urgently required. a) If the government wants to avoid renewed pressures of cost and a shift towards labour displacing technology, it will have to ease the pressure of increase in real wages b)) It is often suggested that large size leads to a concentrated structure and X-inefficiency in the use of resources therefore, small size is better. However, White [1979] warned the reader, "......Appropriate technology is currently a fashionable topic of research and interest. There is, though, a serious risk. Appropriate technology is sometimes suggested as a quick and easy way of raising LDCs'incomes to developed country levels. Five or ten years from now, after some (but not all) measures to encourage appropriate technology have been taken, many current enthusiasts will look around and notice most of the people in LDCs are still very poor by developed country standards. They may then decide that appropriate technology was a fraud and will search for some other quick and easy solution. This, would be unfortunate. .....But appropriate technology can mean an improvement in the allocation of resources in LDCs, Perhaps a slightly higher growth rate, a better distribution of capital resources across the economy and probably a slightly more equitable internal distribution of income, and more and better employment opportunities. The game should not be oversold, but it is definitely worth the candle. [p.329-330].

Keeping in view the above statements it may be stated that if both small and large are so risky and virtueless then it would be worthwhile to adopt policies favouring medium size establishments (depending on the type of industry) and vertically integrate the small size with the medium size units of production so that both labour and capital are utilized efficiently and distribution of income is fair.And the government regulatory and investment policies do not have to be biased in favour of the large scale industry only.

So far as consistency in government policies is concerned it should help create a more predictable and conducive environment for entrepreneurs' decision making. As noted in the earlier chapters the inconsistency, unexpected and random policy decisions to alter ownership patterns, prices of inputs and outputs, and concessionary policies regarding foreign exchange and taxes etc led to unforseen financial problems and frightened entrepreneurs away from making new investments. It must be remembered that if such inconsistency prevails then the system may evolve towards a more concentrated structure because it is the highly prosperous and well-connected firms that generally have the internal and external resources to enable them to financially adjust to these unforseen financial problems. Finally it would be worthwhile if efforts were made to increase production efficiencies so that the competitive position of producers in the domestic and export markets improve; among other benefits this will discourage smuggling and reduce the demand for imports and hence foreign exchange.

In the end a disturbing question remains to be answered, i.e given the relatively abundant and cheap labour at hand, why Pakistan could not emerge as the regions most powerful industrial nation. Would it be unfair to remark that in LDCs it largely depends on the will and determination of the governments and the politicians. If they will, they can remedy the situation to a large extent through a change in priorities and objectives in the larger interest of the people rather than seeking the well-being of a few.

TECHNICAL APPENDIX

The aim of this appendix is to provide a satisfactory discussion about the data sources and measurement of some of the important variables of this enquiry. The appendix is therefore divided into two parts. As planned,part one deals with the coverage of CMI and its limitations. The second part is reserved for a review of issu. es and their remedies in estimating our principal variables and relationships.

Coverage and limitations of CMI:

The Census of Manufacturing Industries is undertaken by the Provincial Directorates of Industries and Mineral Development and Industries Statistics Act 1942. Data is compiled by the Punjab Bureau of Statistic for Punjab and NWFP, by the Sind Bureau of Statistics for Sind and by the Federal Bureau of Statistic in the case of Baluchistan and Federal Capital Territory of Islamabad. The Federal Bureau of Statistics acts as a coordinator among the Provincial Directorates and prepares Tables for all Pakistan. This enquiry is mainly conducted through mail and supplemented with field trips where necessary. Although the enquiry is supposed to be conducted each year, the latest survey available at the time of our enquiry was for 1984-85 published in June 1988.

The census report basically provides data about such variables as fixed assets, inventories, employment and employment costs, industrial cost, value of production and value added. It includes those establishments that are operating full time or part time and are registered under section 2(i) and 5(j) of the Factories Act, 1934. Section 2(i)refers to establishments employing 20 or more workers during the year and using power in their operations; Section 5(j) on the other hand, refers to establishments wherein a manufacturing process is carried out or is ordinarily carried out whether with or without the use of power whereever ten or more persons are working therein or have worked there on any day of the 12 months immediately proceeding, (CMI,1970-71, p.IX). The defence and government workshops though engaged in manufacturing activities and registered under the said Act, are however, excluded.

The reporting unit in the CMI is a registered factory, with single or joint ownership where the main economic activity is manufacturing. If, however, an establishment is engaged in more than one activity and separate accounts are maintained by the establishments for each activity, then seperate returns are collected for each such activity. All CMI returns are classified in a particular industry on the basis of value of major products and by porducts or services rendered, falling within the scope of the manufacturing activity according to Pakistan Standard Industrial Classification code (PSIC).

Although the CMI provide the most comprehensive industrial statistics in Pakistan, they are not free from limitations,the severity and importance of which depend on the type of research work undertaken. These shortcomings are i) coverage of establishments ii) Valuation problems iii) Continuity of reports iv) Change of definitions of variables over years.

The first limitation of CMI data is that of coverage; term used to convey the inaccuracies in the data arising from non- response, nonregistration or misreporting. Non-response means that a registered factory engaged in production fails to return the census questionare,or responds irregularly overtime. Non- registration takes place when factories eligible for registration are not registered.And misreporting means costs are overstated and output is understated to evade,or minimize the tax burden. So it is understood that CMI reports are incomplete and undoubtedly inexact. Whether this problem has become less severe over the years is difficult to tell.However quite a large number of factories do not respond to the CMI questionaire because they have gone out of operation and have not informed the chief inspector of industries ,of their respective provinces,about it. Some idea about the extent of gross and net coverage in the CMI over the years can be made from Table 1 and 2 below. It is noted that in Table 1the difference between coulmn 1 and 2 is not entirely due to the non-response of establishments. As the CMI of 1984-85 reports of the 8083 factories on the mailing list during the year, returns are received from 5150 factories (63.71 percent)of these, 1211 (14.98 percent) remained closed during the year or had ceased to exist as reported by the Provincial Directorates of industries. A further 727 (8.99 percent) returns were rejected in editing due to non manufacturing activities and defective data. (CMI,1984-85 P xii).Thus column 3 and 4 of Table in a way show the gross coverage of the CMI data.

As noted earlier of the 8083 factories on the mailing list 1984-85 1211 estblishments were untraceable, if adjustment is made for establishments that were untraceable, the net coverage of CMI might be higher as shown in Table 2.However, both the criteria show that non-response is large and varies overtime.

Second, and most troublesome shortcoming of the CMI data is that the output data are published in terms of current market prices. This makes the measurement of certain variables, particularly changes in productivity difficult. Besides that the available prices indexes are classified by commodity, with a coverage too restricted to permit the construction of indexes for deflation purposes at the industry level. We know that there are other sources of information on the level of manufactoring activity in Pakistan : Estimates of volume of output are prepared by the statistics division for selected items, data on phsyical production are received by the Central Board of Revenue for mainly excisable commodities. The provincial bureau of statistics also collect and publish data on physical production and employment for about 15 major commodities based on monthly returns submitted by manufactoring establishments located in those provinces. But the problem with all these other sources is that they are restricted to selected commodities and it far to difficult to relate them to the industrial level figures. So our productivity variable is measured in current prices.

Third, and less serious problem in the use of CMI data is that they are non-continuous. CMI reports for certain years are not conducted and this creates a problem of discontinuity in the series. However, for the present work, we were mainly concerned to estimate the relationships at almost the end points of the three regimes, 1970, 1978 and 1984, an absolute and proportionate changes in variables by comparing the end points 1970,-1984 data in these years is available for our purpose.

The last problem with CMI data stems from changes in the definitions of some key variables over the years. For example, 1959-60 CMI difines data on fixed assests as book value at the end of the year i.e. original costs less acumalated depreciation. From 1962-63 onwards the CMI reports original costs plus editions, alternations and loses due to fire etc, it does not mention deduction of depreciation. The definition of employment has also changed. In 1959-60 it is measured as the annual average computed from a twelve month average. In 1967-68 CMI report employment as number of persons on the payroll as on the 31st December, whereas 1969-

70 and onwards record an average employment figures, but it is not stated how that average is calculated. The measurement of industrial output is also not consistant over the years. In 1959-60 output is measured as the ex-factory value of final products only; in 1965-66 output is equal to the value of finished products plus the value of work in progress at the end of the year, the CMI report of 1969-70 uses the same definition of output as used in 1959-60 report but adds sale proceeds from industrial waste and value of electricity sold. Lastly there are problems with the computation of value added. In 1959 CMI it is measured as the value gross output less the cost of fuels and raw materials consumed. Other costs such as depreciation, maintenence and repair allowances, advertisment costs etc do not seem to have been deducted. From 1964-65 onwards, the CMI defines value added as gross value of output plus sale proceeds from industrial waste and electricity, plus value of work in progress at the end of the year, minus cost of raw materials, minus payment to others for work done, minus cost of fuel and electricity.

The above mentioned changes in definitions of variables over time do not affect our analysis because the definitions of CMI from 1970 onwards have remained consistent.

Concentration Ratios (CR):

The central variable of our enquiry is the CR, the purpose of which is two fold, a) to measure the degree of entry barrier in an industry and b) to suggest the extent to which the price in a particular industry departs from its competitive level. More generally, it places an industry along the line of possibilities from monopoly/ oligopoly to many firms.

Thus a reasonable measure of concentration needs to be a combination of two characteristics:

a) the number of firms in the industry; other things being equal, the bigger the number of firms in the industry, the more competitively the industry is likely to behave.

b) the size distribution of firms in the industry, i.e the more unequal firms' sizes are the more likely one would expect to find non-competitive pricing and profits.

Literature on industrial economics suggests a number of indexes that measure industrial concentration. In such a situation a researcher is faced with the difficult task of choice of one measure of concentration for purpose of anaylsis. Review of the literature reveals that various authors have adopted three different approaches to determine the choice of a particular measure. All the three aproaches and their limitations are discussed below separately.

First, numerous studies have shown that the ranking of industries by CR is very robust with respect to a) the alternative values of the number of firms and b) other indexes of concentration.

For example of a CR3 would rank a 100 industries almost indentically with a CR4 or CR5. Although there is no agreed CR,most economists conclude that the choice of CRmeasure does not matter. In practice the choice of a particular index would depend upon the availability of data. However a few points regarding this approach about the choice of CR are noted:

i) The fact that various measures are correlated with each other does not mean that any one of them is good enough. If they all fail to capture what one is looking for, the fact that two measures are correlated may also mean that they are as bad as each other.

ii) There is a further doubt from this glim approach, it has been shown by House[1977] that the higher the concentration the worst the fit between CR and Herfindhal index (H) of concentration. He plots H against CR4 and finds that for low values of concentration the deviations are very little, and at higher values the scatter is bigger. This tendency may bias the results.

iii) It is suggested that even if CR4 and H are highly correlated, provided they are not perfectly correlated, one can get quite different results if the two measures are used in the same regression analysis alternatively Kwoka [1981]. It is sometimes said that concentration ratios i) are adhoc measures, but because of the robustness of the rankings it does not really matter. ii) lack theoretical underpinnings and are therefore inapppropriate iii) do not take into account the size distribution within the top four groups and within the rest of the group. For example,

Industry A	Industry B
Share of firm 1 = 0.3	Share of firm 1 = 0.2

"	2 = 0.25	"	2 = 0.2
"	3 = 0.15	"	3 = 0.2
"	4 = 0.10	"	4 = 0.2
	0.80		0.80

these figures show the CR is same in both the cases, but the structure of the two industries is not the same. It may be said that CR4 assumes that each of the leading four firms is of equal importance in determining industry performance, profits or price. But the CR is highly correlated with other indexes that do take into account the size distribution of industries. In our case we deal with this problem by including among the explanatory variables a measure of inequality of size. Others have suggested that the H index should be used because it takes into account the size distribution of firms in an industry. The problem with the calculation of H is that the size or market share of each firm is needed, most publicly available statistics about industries do not give details of every single firm in the industry, they are grouped together. Thus very often the choice of index is determined by the data availability. In our case the census of manufacturing does not even give CR4 separately, it just so happens that the largest size class in most of the sectors has only four firms, and where the largest size class constitute number of firms greater than four we calculate the average share of the top four establishments.

A second kind of approach, regarding the choice of concentration ratios, adopted by a few researchers like

Kilpatrick [1967], Miller [1972] and Lamm [1981] suggests that one should take that measure of concentration which has the highest coefficient in a regression in which profits are the dependent variable. The weakness of this approach is that it is not a rigorous way of testing and one is inverting the issue. Nevertheless it is quite a common way of going about the subject. A third approach takes the various alternative indices and examines their statistical properties Hall and Tidman [1967], House [1977] and Davies [1979]. But this is not a good criterion either because the statistical properties do not necessarily reflect an economic relationship and we do not go much further unless we can relate these properties to the properties of the theoretical models of competition and monopoly.

Third, a number of studies have tried to derive the measure of concentration from economic analysis, the trouble is again there is no nicely developed and generally accepted theory of oligopoly. There are a number of alternative theories with different descriptions of concentration like, Stigler [1964] and Cowling and Waterson [1976].

Given the above problems regarding the choice of a measure of industrial concentration, a more difficult problem is that even if an ideal measure of concentration is available, we would have to apply it to the concept of industry which may not be the same as required by an economist i.e how does one demarcate the relevant market for purpose of analysis. For example, on the demand side, ideally one would define an industry X such that it includes all products among which the cross elasticity of demand is high and exclude the ones which are not close substitutes of the main products in X. But it is very difficult to determine what are the cross elasticities of demand between different kinds of products. In any case one, would have to decide how high is high. On the supply side, we should include all suppliers of the included products, but what do we do about a firm X10 which does not make any of the included products but has the capacity to make one or other of these products at very low adaptation costs i.e X10 may be canning fish and it may be easy for it to can fruit, the two products are not close substitutes; nevertheless these might be so on the supply side. Furthermore, if one does include all substitutes in one industry in the strict sense, then how widely should one spread one's net. In practice one has to use data prepared by census authorities and their classifications are not strictly based on the idea of cross elasticities on both the demand and supply sides.

In the same context, typically census of industries classify data at 4 digit level and one is often forced to use the figures at the given level of classification. Obviously finer sub-classification of an industry is bound to give much more non-substitutes than a higher digit classification. A 3 digit classification is more realistic in terms of economic criteria. Census of Manufacturing classification is comparable at 3 digit level of International Standard Industrial

Classification. Another related problem is that as economies grow new industries come up, and old ones decline. The industry classification scheme expands and gets refined to accomodate changes within the manufacturing sector of the different activities and the introduction of new products and methods. If we do not take into account such changes they impart serious bias to results obtained. This is not a serious problem so far as our industrial cl assification scheme is concerned, except for a few new sectors since 1970 no marked changes have taken place.

A few more issues about census of manufacturing data also need to be dealt with. For example, census of production refers to the national industry, it is concievable that for some industries the relevant geographical market is smaller than the country itself. In such cases the CR for the whole industry will be lower than the CR for a region. At the other extreme there may be cases where the national goegraphical area is smaller than the economically relevant market in which case the CR for the whole country would probably understate the true measure of concentration in the wider relevant market.These problems can be dealt with by making some adjustments for the regional markets and for actual imports. But there is no satisfactory procedure of particularly adjusting for imports because the methods of adjustment are mere approximations.

The most difficult prblem is with product differentiation, where products of the same kind are included in the same industry classification but are not close substitutes for each other e.g very cheap pens and expensive pens or phamaceuticals of different qualities.

Measures of concentration are very often criticised as being imprecise proxies for the presence of monopoly or competitive forces. Clearly this coul d be a perfectly valid criticism because any proxy is approximate any way and we do not have a particularly good theory from which to derive the specification of an index which would be ideal.These kind of criticisms are not helpful because they simply refer to points which cannot be picked up by concentration measures of any kind. If there are certain aspects of behaviour or structure which an index of concentration does not pick up then one can simply add another explanatory variable which picks up the omitted aspect of behaviour if any.

Given the above problems, it is often criticised that 1) a high concentration does not mean much if entry into the industry is easy and a concentration measure does not pick up an indication of entry barriers 2) the CR does not tell us anything about the stability or instability of market shares or ranks over time. 3) CR assume that firms are independent, in practice some firms may not be independent, there may be collusive aggreements or common directorship etc. 4) CR would overstate the level of effective concentration in so far as some of the big firms allow some degree of internal competition 5) sometimes vertical integration can bestow additional market power on big firms this would not be taken care of in CR 6) Lastly, the CR does not allow for the possibility that some of these firms may be diversified into other unrelated industries.

Economies of Scale:

Although there are direct methods of estimating the minimum efficient size (MES) of a firm or plant, all thes methods have their difficulties and are sometimes fairly complicated to apply. Instead most cross section studies have used proxy measures. These measures cannot be strictly justified in terms of theory but pick out the right effect. Since these proxies are used as indexes of barriers to entry of a technological kind, the bigger the barrier the higher the ratio is supposed to be, and the more difficult the entry would be. Clearly it would be a mistake to use such proxies as direct or absolute measures of minimum efficient size plant. They are proxies and not direct measures, but they stand in place of the direct measures in a ranking context. Provided the ranking of the proxies is much the same as the ranking of the direct measures, then one could use the proxies fairly confidently in cross section studies, however one should be careful about a few things. For example, i) there must be some reason to suppose that the proxies are fairly closely correlated with the direct measures ii) the errors in proxies should be randomly distributed in relation to the dependent variable. Where the error would be a proxy measure minus the direct measure. iii) the nature of the proxy measure should be such that it is not definitionally related to the dependent variable. Because if there is an identity relationship between the proxy and the dependent variable then obviously one is explaining nothing at all. Unfortunately most commonly used proxies do not satisfy these conditions well, especially where concentration in industry is the dependent variable.

Doubt has been cast by Davies [1980] on the use of proxies and the following points are made:

1. The proxy measures tend to overstate the MES, however this does not mean they are not good proxies.

2. For certain kinds of size distributions the proxies are definitionally related to concentration measures. This renders the use of the proxies very doubtfull indeed. While it is so ----, they are not, of course, a reason for rejecting the proxies themselves. After all, it could be that 'true' MEP is also related in some tautological way to the degree of plant concentration. Davies [1988].(P 294).

However , it has been shown that when the size distribution of firms and of plants are approximately log normal within each industry then concentration ratios are determined inversely by the number of firms and positively by their variance Hart [1980].

Our regression results of Table 4.1-4.2 do not in the first place give very high R^2s to reflect near identities and cast doubt on the nature of economic relatioship between our variables. In particular our regression results of Table 4.3 give values of R^2s very low for a near identity. Furthermore, the regression results of changes in concentration and the explanatory variables once again give values of R not very high and that the estimated relationship between concentration and the explanatory variables is not just the result of near identity.

We are less confident about the negative and significant relationship between CR4 and INS. Wether it is a statistical artefact is not known, although the dependent variable CR4 is measured in terms of value added and industry size in terms of employment and apparently both the variables do not have any statistical relationship what so ever even in the log form of the variables i.e the log CR4 is measured as:

$$\text{Log CR4} = \text{Log} \sum_{i=1}^{4} \text{VA} - \text{Log} \sum_{i=1}^{n} \text{VA}$$

and $\quad \text{Log E} = \text{INS}$

where VA is the value added of the ith firm in an industry with i=1----n. And E is the employment of the ith firm in an industry i=1----n. The denominator or the numerator of the dependent variable is not one of the explanatory variables, which is the case if CR is also measured in terms of employment. Even in this case if the simple correlation between logCR and logINS is very low, the other explanatory variables will not be affected by logINS.

Another point is that these proxies imply that half the output of any industry is produced by some optimal sized plants. Whereas studies like Bain [1956] and Weiss [1964] using direct measures have shown that the share of industry output accounted for sub-optimal size plants is often less than a half and in any case varies greatly from one industry to another. So the fit in rankings between direct measures and the proxies would be pretty inexact. This introduces measurement error which varies greatly from one industry to another. Therefore it cannot be assumed that the variation in error is random with respect to CR.

Given the above criticism the author himself has no new suggestions to make, however he suggests that in both the Survivor and Lyon's [1980] methods the problem of measurement error to be corrrelated with the CR is less severe. In our case the later method cannot be computed because it require information regarding number of plants in each size class which is not available to us. However, the regression equation using the survivor methods, of estimating MES, mentioned below, shows

1. $$\text{Log CR4} = 3.36 + \underset{(0.50)}{0.05} \log \text{EOS} \qquad R = .009$$

2. $$\text{Log CR4} = 4.10 - \underset{(0.70)}{0.08} \log \text{SV} \qquad R = .02$$

3. $$\text{Log CR4} = 2.60 + \underset{(2.72)}{0.26} \log \text{EOS} - \underset{(4.79)}{0.40} \log \text{INS} - \underset{(3.30)}{0.80} \log \text{K/L} - \underset{(0.20)}{0.001}\, \text{IG} + \underset{(1.10)}{0.0006}\, \text{EPR} \qquad R = .50$$

4. $$\text{Log CR4} = 6.52 - \underset{(1.45)}{0.19} \log \text{SV} - \underset{(3.76)}{0.39} \log \text{INS} - \underset{(1.31)}{0.32} \log \text{K/L} - \underset{(1.06)}{0.006}\, \text{IG} + \underset{(1.39)}{0.0009}\, \text{EPR} \qquad R = .40$$

that unexpectedly it has a negative coefficient. Thus we do not stress much on the use of survivor method because of a great deal of subjective judgement, based on certain assumptions, is indeed to assess the efficiency of the size class that survived best overtime, but clearly any statistical method has to make some assumptions otherwise one cannot generate inferences or conclusions ,the method is simple and data is available. For example if we know for certain industries the size of firms in terms of labour and the percentage of sales accounted for by each size class at different time periods (T). We identify which size class has survived best in terms of sales. For example the data given below identify that size class 2 as the most efficient size of plant, it has increased its sales over time. To have a single size point as the range as the MES i.e 101.

No	Size (employment)	Time T1	T2	T3
		(percent of sales)		
1	1 - 100	30	15	15
2	101 - 300	25	55	55
3	301 - 750	30	20	20
4	751 - 1250	15	10	10
		100	100	100

The assumption one makes is that there is a continuous process of change of which we are observing the begining and the present part. But the problem is one should not infer from this information that plant size 2 will continue to be the most efficient because we have no particular reason why the past changes should repeat. But that would be true of other methods also, once one knows the MES plant that would remain true whatever the market conditions and factor prices.

However some points about the survivor method are note worthy: First, what one has observed may simply be not relative efficiency across plant or firm sizes. May be small plants happen to be in regions which have suffered declines or smaller increases in demand, such changes have nothing to do with efficiency. Or alternatively that by chance size 2 firms happen to be in regions of the country where labour cost have gone down compared to other regions, so again it has no direct relation with efficiency. Second, it is quite possible that a large number of plants belonging to vertically integrated or diversified firms happen to be concentrated in size class 2, due to which there is an increase in participation of this size class. this may not reflect efficiency within the industry, but may reflect the fact that this size class happens to fit in with the requirements of vertically integrated or diversified firms. Third, possibility is that the percentage of output of smallest size class may be fairly stable overtime. It suggests that smaller size class is efficient but that may be due to the fact that many firms try

Table 1:Pakistan: Gross Coverage of The CMI

Year	Number of factories on the mailing list	Number of factories tabulated	Gross coverage (2) as a % of(1)	Gross undercoverage 100 minus (3)
	(1)	(2)	(3)	(4)
1959-60	3,011	2,758	91.6	8.4
1963-64	5,532	2,978	53.8	46.2
1965-66	5,438	3,252	59.8	40.2
1966-67	5,098	3,508	68.8	31.2
1967-68	5,556	3,289	59.0	41.2
1970-71	5,691	3,549	62.3	37.6
1975-76	5,336	3,248	60.8	39.1
1978-79	5,515	3,715	67.3	32.6
1980-81	5,668	3,815	67.3	32.7
1982-83	6,164	3,931	63.7	36.2
1983-84	7,858	4,047	51.5	48.5
1984-85	8,083	4,423	54.7	45.2

Source:1). Taken from Kemal [1978] for 1959-60 to 1967-68.

2). Calculated from various issues of CMI for 1970-71 to 1984-85.

Table 2: Pakistan: Net Coverage of The CMI.

Year	Number of factories on the mailing list	Number of untrace-able factories	Number of factories actually reached	Number of factories tabulated	Net coverage (4)%(3)
	(1)	(2)	(3)	(4)	(5)
1959-60	3,011	nil	3,011	2,758	91.6
1963-64	5,532	1,458	4,047	2,978	73.5
1965-66	5,438	987	4,451	3,252	73.1
1966-67	5,098	463	4,635	3,508	5.7
1967-68	5,556	745	4,811	3,289	68.3
1970-71	5,691	1,319	4,372	3,549	81.2
1975-76	5,336	514	3,607	3,248	90.0
1978-79	5,515	437	4,188	3,715	88.7
1980-81	5,668	468	4,301	3,815	88.7
1982-83	6,164	1,631	4,533	3,931	86.7
1983-84	7,858	875	4,604	4,047	87.9
1984-85	8,083	1,211	5,150	4,423	85.8

Source: 1). Taken from Kemal [1978] for 1959-60 to 1967-68.

2). Calculated from various issues of CMI for 1970-71 to 1984-85.

to enter this industry at a small scale, most of them drop each year but there are enough of them to keep the number stable. Those who suceed move to the higher size class, but the lower size class will show a stability is misleading to associate with efficiency.

From the above considerations some of the attraction of the method seems to be reduced. Nevertheless it uses simple data, it is often used and may provide a cross check on other methods, bearing in mind that unlike the direct measures of MES like engineering and statistical cost methods which are related to the static concept of efficiency, it relates to the overall concept of efficiency.

Annex 1.A :Percentage Share in Manufacturing Value Added Employment and Capital Assets 1959-84.

Industry	% share				
Consumer Goods	**1958**	**1970**	**1976**	**1978**	**1984**
1. Food					
Value Added	8.3	14.8	22.14	19.0	20.62
Employment	6.7	9.1	8.93	10.91	13.17
Capital	-	21.02	15.91	11.95	17.61
2. Vegetable Ghee					
Value Added	2.1	3.8	8.34	6.87	5.35
Employment	1.6	1.7	1.84	2.25	2.23
Capital	-	-	3.89	3.58	2.80
3. Sugar					
Value Added	2.8	8.27	9.46	7.36	10.85
Employment	1.9	4.80	4.27	5.0	6.71
Capital	-	12.24	9.61	3.35	9.06
4. Beverage					
Value Added	0.4	0.6	1.51	1.72	2.38
Employment	1.3	0.5	0.59	0.77	0.94
Capital	-	0.53	0.65	0.25	0.76
5. Tobacco					
Value Added	5.6	9.0	8.28	12.04	13.19
Employment	1.0	2.6	1.49	2.05	2.21
Capital	-	6.0	0.77	2.98	3.63
6. Textile					
Value Added	40.2	31.4	24.23	17.79	16.13
Employment	50.0	45.2	44.70	45.26	38.17
Capital	-	28.73	25.17	23.19	16.47
7. Cotton Spinning					
Value Added	32.6	26.2	9.93	7.17	7.83
Employment	41.5	37.0	17.89	19.13	18.17
Capital	-	6.96	9.56	8.73	6.86
8. Cotton Weaving					
Value Added	-	9.15	9.93	7.17	7.83
Employment	-	13.89	14.32	19.13	18.17
Capital	-	12.08	5.72	8.73	6.86

9. Woolen Textile					
Value Added	-	1.0	1.09	0.88	0.97
Employment	-	1.24	1.35	1.60	1.57
Capital	-	2.11	1.47	1.37	1.27
10.Silk & Synthetic					
Value Added	3.5	2.40	3.23	1.31	1.07
Employment	3.8	3.6	4.19	2.27	1.88
Capital	-	2.57	3.13	1.45	1.18
11.Carpets					
Value Added	-	0.27	0.52	0.49	0.28
Employment	-	0.72	0.68	0.61	0.45
Capital	-	0.65	0.41	0.51	0.68
12.Jute Textile					
Value Added	-	-	1.08	0.98	1.18
Employment	-	-	2.55	3.29	2.93
Capital	-	-	0.85	1.42	1.15
13.Footwear					
Value added	2.59	0.32	0.13	0.15	0.11
Employment	1.81	0.65	0.36	0.34	0.24
Capital	-	0.20	0.12	0.36	0.10
Intermediate Goods					
14.Leather					
Value Added	1.48	1.18	1.05	2.38	1.60
Employment	1.24	0.85	2.59	0.80	0.98
Capital	-	0.39	0.98	2.19	1.37
15.Paper					
Value Added	1.70	1.30	1.64	1.32	1.30
Employment	1.0	1.2	1.67	1.28	1.59
Capital	-	4.40	4.57	0.99	1.37
16.Printing & Publishing					
Value Added	2.3	1.2	1.13	1.09	1.17
Employment	1.6	1.7	1.67	2.01	2.17
Capital	-	1.59	0.81	1.52	1.85
17. Drugs					
Value Added	2.3	3.5	3.08	3.87	3.93
Employment	1.3	1.9	3.58	2.30	2.57
Capital	-	4.51	2.22	4.44	3.91
18.Industrial Chemicals					

Value Added	2.3	3.7	4.89	5.27	7.3
Employment	1.3	2.2	2.25	3.04	3.11
Capital	-	6.2	10.83	6.06	8.58
19.Fertilizers					
Value Added	-	2.2	1.92	3.07	4.49
Employment	-	0.7	0.88	1.19	1.42
Capital	-	2.05	7.51	18.61	5.98
20.Alkalies					
Value Added	-	0.99	1.45	0.76	0.66
Employment	-	0.41	2.25	0.57	0.39
Capital	-	0.85	1.53	0.56	0.80
21.Plastic Products					
Value Added	-	0.15	0.19	0.43	0.55
Employment	-	0.23	0.20	0.51	0.80
Capital	-	1.84	1.02	0.73	0.84
22.Other Chemicals					
Value Added	2.6	1.4	1.92	5.27	2.60
Employment	0.9	1.4	4.43	3.03	1.57
Capital	-	3.74	1.23	6.07	9.18
23.Soap					
Value Added	-	0.49	0.96	0.44	0.61
Employment	-	0.78	1.18	0.37	0.51
Capital	-	1.49	0.57	0.47	0.58
24.Petroleum Refinning					
Value Added	-	-	-	4.92	1.5
Employment	-	-	-	0.66	0.95
Capital	-	-	-	7.16	6.26
25.Rubber					
Value added	0.34	1.32	1.25	1.93	1.62
Employment	0.37	1.59	1.95	2.11	2.09
Capital	-	1.24	0.92	0.35	1.32
26.Tyres & tubes					
Value Added	-	0.14	0.25	0.67	0.48
Employment	-	0.17	0.29	0.29	0.35
Capital	-	0.43	0.22	0.35	0.28
27.Glass & Products					
Value Added	0.5	0.30	0.24	0.39	0.62
Employment	1.3	0.70	0.48	0.80	0.85
Capital	-	0.73	1.15	0.53	0.66

Capital Goods

28.Non Metals					
Value Added	5.9	4.0	3.57	4.69	8.97
Employment	2.5	3.1	5.35	2.66	4.06
Capital	-	4.10	5.91	3.79	4.78
29.Cement					
Value Added	4.0	3.50	3.23	4.27	7.43
Employment	1.6	1.90	1.83	1.99	1.86
Capital	-	2.61	5.53	3.04	6.77
30.Iron & Steel					
Value Added	3.1	2.4	3.31	4.80	5.15
Employment	3.2	3.4	3.72	3.78	7.33
Capital	-	3.63	5.65	6.12	12.82
31.Metal Products					
Value Added	2.5	1.20	1.59	1.52	1.17
Employment	3.5	2.40	2.39	2.27	1.89
Capital	-	2.87	1.11	1.42	1.68
32.Machinery					
Value Added	2.5	1.2	2.90	2.13	2.38
Employment	3.2	3.1	2.99	3.49	3.37
Capital	-	0.87	5.76	5.15	3.17
33.Agricultural Machinery					
Value Added	-	0.04	0.26	0.41	0.55
Employment	-	0.42	0.37	0.64	0.64
Capital	-	0.25	0.15	1.21	0.40
34.Textile Machinery					
Value Added	0.20	0.17	0.33	0.05	0.11
Employment	0.30	0.48	0.27	0.19	0.26
Capital	-	0.10	0.20	0.06	0.20
35.Electrical Machinery					
Value Added	-	1.10	3.15	1.05	3.15
Employment	-	1.00	3.16	0.73	3.58
Capital	-	0.87	2.26	1.34	5.04
36.Wires & Cables					
Value Added	-	0.04	0.07	0.13	0.33
Employment	-	0.05	0.10	0.10	0.18
Capital	-	0.04	0.26	0.20	0.52
37.Electric Bulbs					

Value Added	-	0.30	0.48	0.34	0.51
Employment	-	0.17	0.31	0.20	0.32
Capital	-	0.18	0.24	0.27	0.38
38.Batteries					
Value Added	-	0.67	0.31	0.67	0.44
Employment	-	0.26	0.12	0.41	0.41
Capital	-	0.34	0.39	0.59	0.32
39.Transport					
Value Added	0.90	2.59	6.41	3.96	2.71
Employment	2.00	3.66	4.25	4.46	3.75
Capital	-	3.40	3.68	9.26	4.60
40.Motor Vehicals					
Value Added	-	0.66	4.90	2.56	1.73
Employment	-	1.02	1.45	1.53	1.60
Capital	-	2.32	0.68	8.03	3.61
41.Ship Building					
Value Added	-	-	0.47	-	-
Emnployment	-	-	1.32	-	-
Capital	-	-	1.33	-	-
42.Cycles					
Value Added	0.22	0.52	0.56	0.19	0.24
Employment	0.46	1.0	0.08	0.57	0.70
Capital	-	2.32	0.11	0.24	0.28

Source : Calculated from Census of Manufacturing Industries, Statistucs Division, Government of Pakistan, Karachi, Islamabad (various issues).

Annex 1.B : Pakistan List of Closed Textile Mills Dec.1986

Catagory	Number of firms	Number Spindles	Number Rotours	Number Looms
A. Sind Province	25	411,016		1,252
Punjab Province	13	192,172		126
N.W.F.P.	3	37,580		621
Total A.	51	640,768		1,999
B. Sind Province	9	131,643	2,400	498
Punjab	5	90,616		126
N.W.F.P.	2	99,980		2,200
Total B.	16	322,239	2,400	2,824
C. Sind Province	14	80,112	1,391	
Punjab	8	45,832	100	228
Total C.	22	125,944	1,491	228
Grand Total	89	1088,951	3,891	5,051

A. Units which cannot be revived without complete replacement.

B. Units which can be revived with new machinery but closed due to financial problems.

C. Units which are partially closed.

Source : Textile's Commissioner's Organization as reported in Pakistan Industrial Regulatory Policy Report Vol.II World Bank January (1988).

Annex 1.C : Pakistan Share in World Trade in Textiles

Period	Cotton Yarn World export	Cotton Yarn Pakistan export	Cotton Yarn Pakistan share in world exports	Cotton Cloth World export	Cotton Cloth Pakistan export	Cotton Cloth Pakistan share in world exports
1971	388,423	109,557	28.2	680,793	48,397	7.1
1972	510,096	160,703	31.5	774,393	48,086	6.2
1973	536,175	146,920	27.4	778,300	73,813	9.5
1974	497,025	74,567	15.0	760,075	77,460	10.2
1975	545,918	152,972	28.0	741,774	56,199	7.6
1976	622,180	95,914	15.4	873,469	48,812	5.6
1977	547,506	46,716	8.5	819,043	36,986	4.5
1978	630,040	74,883	11.9	856,968	51,646	6.0
1979	673,424	88,759	13.2	939,004	58,707	6.2
1980	707,767	97,212	13.7	884,453	66,560	7.5
1981	677,720	84,625	12.5	746,690	75,075	10.1
1982	697,010	112,534	16.1	830,920	84,020	10.1
1983	783,770	141,600	18.1	913,520	104,160	11.4
1984	779,860	93,930	12.0	995,560	94,910	9.5

Figures in Metric Tons

Source : Textile's Commisioner's Organization as reported in Pakistan Industrial Regulatory Policy Report No.II World Bank (January, 1988).

Annex 3.A : Size Distribution of Manufacturing Establishments and Value Added (Percentages 1959-84).

	Establishments					Value Added				
Labour	**1959**	**1970**	**1975**	**1978**	**1984**	**1959**	**1970**	**1975**	**1978**	**1984**
9 persons	-	12.3	17.4	20.7	19.2	-	0.4	0.70	0.52	0.40
10-19	44.2	24.3	30.6	29.7	29.0	4.5	2.3	1.90	0.94	1.78
20-49	32.8	35.4	24.8	23.2	24.4	12.8	6.6	5.27	7.22	4.66
50-99	10.1	11.1	9.5	9.5	10.2	7.3	6.9	5.20	5.56	6.03
100-249	6.0	8.3	7.5	7.2	7.3	8.7	6.8	9.9	13.7	10.8
250-499	2.6	3.5	4.0	4.3	4.0	13.8	13.5	16.7	17.7	15.0
500-999	1.7	2.6	3.0	2.8	2.7	9.2	21.2	19.2	20.5	18.9
1000-199	2.3	1.2	2.0	1.7	1.8	43.4	21.4	22.1	21.6	31.6
2000-4999	-	1.0	0.9	0.4	0.7	-	15.7	14.0	7.8	7.7
5000& above		0.1	0.4	0.1	0.1	-	15.2	5.1	2.8	2.9
Total	100	100	100	100	100	100	100	100	100	100
Value of Fixed Assets(Rs.000)										
upto 250	-	64.7	43.2	49.3	35.3	-	7.2	4.7	2.3	1.51
250-500	-	11.3	11.3	14.1	14.9	-	4.3	2.4	1.4	1.3
500-1000	-	9.1	8.4	11.0	13.7	-	5.9	3.1	2.3	2.44
1000-2000	-	n.a	6.0	7.2	10.0	-	n.a	5.4	2.9	3.6
2000-2500	-	9.6	2.1	2.1	2.8	-	20.8	3.3	1.2	0.78
2500-5000	-	n.a	4.6	5.1	6.6	-	n.a	9.9	5.7	5.0
5000& above	-	5.3	8.5	10.5	16.1	-	61.7	65.4	84.1	85.3
Rented etc	-	n.a	15.7	0.4	0.4	-	n.a	5.2	0.4	0.01
Total		100	100	100	100		100	100	100	100

Source : Census of Manufacturing Industries, Federal Bureau of Statistics, Statistics Division, Government of Pakistan, Islamabad, various issues.

Annex 3.B : Comparison of Selected Ratios Between the Small and Top Four Establishments in 26 Sectors 1984.

Ratios

Sectors		**K/L**	**W/L**	**V/L**	**V/K**	**IC/V**	**E(%)**
All Industries	Average	133	17	81	0.60	2.19	-
Tea :	Average	23	18	130	6.0	0.98	100
	Small	-	-	-	-	-	-
	Large	23	18	130	6.0	0.98	100
Tobacco :	Average	105	16	479	4.6	0.34	
	Small	38	10	51	1.4	0.21	
	Large	84	17	498	5.9	0.03	55
Leather :	Average	134	14	132	0.98	2.04	
	Small	81	8	38	0.47	4.15	
	Large	93	14	179	1.93	1.17	49
Footwear:	Average	56	13	37	0.66	3.60	
	Small	10	9	19.6	1.93	0.65	
	Large	61	12	35	0.58	4.30	49
Ginning :	Average	24	8.6	37	1.50	12.50	
	Small	31	10	48	1.5	13.00	
	Large	8.5	3.6	11	1.28	15.00	12
Paper:	Average	98	19	66	0.66	1.53	
	Small	116	15	79	0.68	1.76	
	Large	96	19	63	0.68	1.46	78
Printing:	Average	93	19	43	0.46	1.44	
	Small	60	16	47	0.78	1.67	
	Large	92	21	40	0.43	1.37	51
Drugs :	Average	115	27	123	1.06	1.28	
	Small	66	16	76	1.10	1.87	
	Large	85	29	111	1.30	1.27	25
Wearing:	Average	74	19	52	0.69	3.29	
	Small	90	18	73	0.81	2.07	
	Large	56	18	36	0.64	4.20	49
Fertilizer	Average	751	0.36	254	0.33	0.88	
	Small	-	-	-	-	-	
	Large	564	37	67	0.11	3.50	63

Petroleum: Refining	Average	724	0.35	119	0.16	47	
	Small	-	-	-	-	-	
	Large	724	35	119	0.16	47	100
Rubber :	Average	48	17	63	1.3	1.52	
	Small	60	12	32	0.53	2.20	
	Large	48	19	69	1.45	1.39	78
Tyres :	Average	56	23	109	1.98	1.50	
	Small	28	6.60	17	0.58	3.2	
	Large	60	2.60	124	2.06	1.5	86
Plastic :	Average	107	18	56	0.52	1.96	
	Small	116	16	42	0.32	2.95	
	Large	95	17	73	0.76	1.20	37
Pottery :	Average	72	11	36	0.49	1.78	
	Small	57	17	48	0.84	0.63	
	Large	80	7.80	29	0.36	1.90	61
Glass :	Average	170	15	58	0.34	0.94	
	Small	128	11	41	0.31	1.44	
	Large	65	13	45	0.70	1.16	33
Other Non:	Average	304	30	246	0.81	0.51	
Mettalic	Small	74	15	41	0.55	0.30	
Minerals	Large	301	40	353	1.17	0.45	41
Iron & :	Average	362	25	56	0.15	2.2	
Steel	Small	69	14	78	1.10	4.10	
	Large	425	26	47	0.11	1.50	80
Non-Ferous:	Average	32	17	39	1.21	0.93	
	Small	-	-	-	-	-	
	Large	29	19	43	1.50	0.75	82
Fabricated:	Average	70	14	50	0.71	1.45	
Metal	Small	45	11	38	0.84	2.40	
	Large	57	20	45	0.78	1.24	23
Machinery:	Average	106	18	57	0.54	1.57	
	Small	52	11	34	0.64	2.80	
	Large	128	23	73	0.57	1.21	40
Electric:	Average	119	18	71	0.59	1.80	
Goods	Small	144	14	79	0.55	2.40	
	Large	84	16	50	0.59	1.67	40
Ship :	Average	94	21	38	0.40	0.42	
Building	Small	-	-	-	-	-	
	Large	94	21	38	0.40	0.42	100
Motor :	Average	578	10	136	0.23	1.28	
Cycles	Small	-	-	-	-	-	
	Large	94	21	38	0.40	0.42	100
Scientific:	Average	45	15	26	0.58	2.40	

Instrument	Small	49	13	110	2.20	0.71	
	Large	43	16	23	0.53	2.30	62
Photograp-:	Average	45	16	42	0.92	4.30	
Instrument	Small	-	-	-	-	-	
	Large	45	16	42	0.92	4.30	100

Notes: K/L = Capital labour ratio, W/L = Wage per head, V/L = Value added per head, V/K = Value added capitalratio, IC/V = Industrial cost value added ratio, E = Employment.

Source : Calculated from Census of Manufacturing Industries 1984,Federal Bureau of Statistics, Statistics Division, Government of Pakistan, Islamabad.

Annex 4.A : Pakistan : Investments Sanctioned Current and Constant 1975-76 Rupees and Actual Investment, 1977-84 by Industry Group (Rs. millions).

	1977	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**
1.Food,Tobacco & Beverages.									
a.S.cur	334	930	593	567	1148	2066	2067	1692	662
b.S.con	279	734	424	368	722	1222	1083	871	334
c. Rzd	219	137	331	322	342	423	1055		
d. c/a	0.66	0.15	0.56	0.57	0.30	0.20	0.51		
2.Textiles									
a.S.cur	397	1260	1400	1458	1175	1333	1868	1854	1904
b.S.con	331	995	1001	947	738	788	979	955	962
c.Rzd	447	397	776	972	971	686	525		
d.c/a	1.13	0.32	0.55	0.67	0.83	0.51	0.28		
3.Leather & Leather Goods									
a.S.cur	17	9	89	172	2	13	1	61	77
b.S.con	14	7	64	112	1	8	1	31	39
c.Rzd	28	4	8	23	196	5	7		
d.c/a	1.65	0.44	0.09	0.13	98	0.38	7		
4.Rubber & Rubber Products									
a.S.cur	1	2	274	1310	232	69	132	42	2
b.S.con	1	2	196	850	146	41	69	22	1
c.Rzd		1		2	83	189	49		
d.c/a		0.50			0.36	2.74	0.37		
5.Paper & Pulp.									
a.S.cur	116	276	398	482	1102	108	873	1218	277
b.S.con	97	218	284	313	693	64	458	627	140
c.Rzd	19		50	89	591	8	68		
d.c/a	0.16		0.13	0.18	0.54	0.07	0.08		
6. Chemicals, Pharmaceuticals, & Petroleum Products.									
a.S.cur	2887	1232	717	3608	2377	5608	6197	2532	4718
b.S.con	2408	973	512	2342	1494	3317	3248	1304	2383
c.Rzd	66	270	1314	1632	648	872	991		
d.c/a	0.02	0.22	1.83	0.45	0.27	0.16	0.16		
7. Cement & Other Non Metallic Mineral Products.									
a.S.cur	252	2181	2813	1145	1703	1360	3270	1023	634
b.S.con	210	1722	2011	743	1070	804	1714	527	320
c.Rzd	78	250	25	16	581	761	2135		
d.c/a	0.31	0.11	0.01	0.01	0.34	0.56	0.65		
8. Basic Metals.									
a.S.cur	4	28	8	12	96	75	1559	99	401
b.S.con	3	22	6	8	60	44	817	51	203

c.Rzd		222	4	42	10	90	13	98	
d.c/a		7.93	0.50	3.50	0.10	1.20	0.01		
9. Metal Products									
a.S.cur	66	68	99	40	186	225	1127	370	107
b.S.con	55	54	71	26	117	133	591	191	54
c.Rzd	15	2	4	29	49	74	40		
d.c/a	0.23	0.03	0.04	0.73	0.26	0.33	0.04		
10.Machinery									
a.S.cur	11	9	13	170	436	487	178	609	7194
b.S.con	9	7	9	110	274	288	93	314	3634
c.Rzd	5	1			165	83	438		
d.c/a	0.45	0.11			0.38	0.17	2.46		
11.Electrical Machinery.									
a.S.cur	45	241	50	338	256	147	469	274	259
b.S.con	38	190	36	219	161	87	246	141	131
c.Rzd	20	11	46	115	157		115		
d.c/a	0.44	0.05	0.92	0.34	0.61		0.25		
12.Electronics									
a.S.cur	1		20	11	17	22	207	225	157
b.S.con	1		14	7	11	13	108	226	79
c.Rzd	7				21	14	54		
d.c/a	7.00				1.24	0.64	0.26		
13.Transport									
a.S.cur	86	51	19	116	207	140	812	392	258
b.S.con	72	40	14	75	130	83	426	202	130
c.Rzd	4		2	20	12	197	39		
d.c/a	0.05		0.11	0.17	0.06	1.41	0.05		
14.Service Etc.									
a.S.cur	295	1196	379	89	483	545	982	771	1251
b.S.con	246	944	271	58	304	322	515	397	632
c.Rzd	61	19	151	99	715	25	290		
d.c/a	0.21	0.02	0.40	1.11	1.48	0.05	0.30		
TOTAL									
Current Rs.	4512	7483	6872	9518	9420	12198	19742	11162	17901
Constant Rs.	3763	5907	4912	6179	5920	7214	10347	5749	9042

a: current (cur) Rupees
b: constant (con) 1975-76 Rupees
c: Realized

Source : Taken from Pakistan Industrial Regulatory Report Vol. II, World Bank January (1988).

BIBLIOGRAPHY

Aaronovitch. S. and Malcolm. C. Sawyer., 'Mergers, growth and concentration', Oxford Economic Paper, 27, 1 (March 1975).

Ahmed. M.A., 'Employment and Economic Growth: A Correlation', Pakistan Development Review, XIV (Spring 1975).

Ahmad. M.A., and Irfan. M., 'Real Wages in Pakistan: Structure and Trends 1970-84,' Pakistan Development Review. Vol.XXIV No.3 and 4 (Autumn-Winter 1985).

Ahmad. V. and Amjad. R., 'The Management of Pakistan's Economy 1947-82', Karachi Oxford University Press 1984.

Ali. K., 'Short-term Employment Functions in Manufacturing Industries in Pakistan', Pakistan Development Review, XVII (Autumn 1973).

Amjad. R., 'Investment Behaviour in Pakistan', Pakistan Development Review, XV (summer 1976).

Amjad. R., 'Profitability and Industrial Concentration in Pakistan', Vol.13, No.3 (April 1977).

Apte. P.G and Vaidyanathan. R., 'Concentration Controls and Performance in 29 Manufacturing Industries in India', Indian Economic Review, Vol XVII, Nos, 2-4 (April-December 1982).

Armstrong. A. and Silberston. A., 'Size of Plant Size of Enterprise and Concentration in British Manufacturing Industry', 1935-58, Journal of The Royal Statistical Society, Series A, No.128 (1965).

Bagchi. Banerji., 'Change and Choice in Indian Technology', Delhi University Press (1981).

Bain. J.S., 'Barriers to New Competition', Harvard University Press,Cambridge (1956)

Bain. J.S., 'International Differences in Industrial Structure', Yale University Press (1966).

Bain. J.S., 'Barriers to New Entry', Harvard University Press (1967).

Banerji. R., 'Average Size of Plants in Manufacturing and Capital Intensity : a Cross-Section Analysis by Industry', Journal of Development Economics, Vol. 5. (1978).

Baran. P. and Sweezy. P., 'Monopoly Capital',Harmondsworth, Penguin, (1968).

Barthwal. B.R. and Nair. K.N.S, 'The Cost Structure of Indian Industries: Some Empirical Evidence', The Indian Economic Journal Vol.27. No.2 (October-November 1979, Special Number in Industrial Economics).

Blake. I and Helmberger. P., 'Estimation of Structure-Profit Relationships with Application to the Food Processing Sector', American Economic Review, 61, (September 1971).

Boyle. S.E., 'The Average Concentration Ratio: An Inappropriate Measure of Industry Structure', Journal of Political Economy 81, (March 1973).

Brozen. Y., 'Bain's Concentration and Rates of Return Revisited', Journal of Law and Economics, 14, (October 1971).

Carter. J.R., 'Collusion, Efficiency and Antitrust', Journal of Law and Economics. 21, (October 1978).

Caves. R.E and Porter. M.F., 'The Dynamics of Changing Seller Concentration',Journal of Industrial Economics XXIX (September 1980).

Cha. B.K., 'Import Substitution and Industrialization', Asian Economics., No.3 (December 1972).

Chandra. N.K., 'Monopoly Legislation and Policy in India', Economic and Political Weekly, Vol.12, No.33/34 (1977).

Charles. W.L., 'Market Concentration in Philippine Manufacturing 1970', The Philippine Economic Journal., No.34, Vol XVI (1977).

Chung. B.S and Lee. C.H., 'The Choice of Production Techniques by Foreign and Local Firms in Korea', Economic Development and Cultural Change., Vol.29, No.1 (October 1980).

Clarke. R and Davies. S.W., 'Market Structure and Price-cost Margins', Economica, No.195, Vol.49, (August 1982).

Collins. N.R, and Preston. L.E, 'Price-cost Margins and Industry Structure', Review of Economics and Statistic, 51 (August 1969).

Commanor and Wilson. T.A., 'Advertising, Market Structure and Performance', Review of Economic and Statistics (1967).

Cowling and Waterson., 'Price-cost Margins and Market Structure', Economica, No.171, Vol.43, (August 1976).

Curry. B and George. K.D., 'Industrial Concentration: A Survey', Journal of Industrial Economics, Vol. XXX 1 No.3 (March 1980).

David. K.R., 'The Determinants of Profits and Tariffs in Australian Manufacturing', Malaysian Economic Review, (October 1980).

Davies. S., 'Choice Between Concentration Indices: The Iso-Concentration Curve',Economica Vol.46 No.8 (February 1976).

Davies. S., 'Minimum Efficient Size and Seller Concentration: An Empirical Problem', Journal of Industrial Economics Vol. XXVIII., No.3 (March 1980).

Demsetz. H., 'Industry Structure, Market Rivalry and Public Policy', Journal of Law and Economics.,(April 1973).

Dong. Ho.L., 'The Case Study of Korean Textile Industries', Asian Economics., No.32 (March 1980).

Donges. J.B., and Riedel. J., 'The Expansion of Manufactured Exports in Developing Countries', Welwirtschaffiches Archives', Band 113 (1977).

Duchesneau. T.D., 'Barriers to Entry and The Stability of Market Structures: A Note', The Journal of

Industrial Economics, No.4. Vol. XXII.,(June 1974).

Encaona. D., and Jacquemin. A., 'Degree of Monopoly, Indices of Concentration and Threat of Entry', International Economic Review., Vol.21, No 1 (February 1980).

Evans. P.B., 'Foreign Investment And Industrial Transformation:A Brazilian Case Study', Journal of Development Economics.,Vol.3, (1976).

Evans. P.B., 'Direct Investment and Industrial Concentration',Journal of Development Studies, Vol.13, No.4, (July 1977).

Evely and Little. I.M.D., Concentration in British Industry, Cambridge University Press, Cambridge, Massachusetts, (1960).

Fuch. V.R., 'Integration, Concentration and Profits in Manufacturing Industries', Quarterly Journal of Economics, Vol. LXXV No.2 (May 1961).

Gan. W.B. and Tham. S.Y., 'Manufacturing Structure and Price-Cost Margin in Malaysian Manufacturing Industries', The Developing Economics, Vol. XV. No.3 (September 1977).

Gan. W.B. 'The Relationship Between Concentration And

Profit In Malaysian Manufacturing Industry', Malaysian Economic Review., (April 1978).

George. K.D and Curry. B., 'Industrial Concentration: A Survey., The Journal of Industrial Economics', Vol. XXXI, No.3 (March 1983).

Ghosh. A., 'Concentration And Growth of Indian Industries .,1948-68., Journal of Industrial Economics (March 1975).

Ghosh. P.K., 'Industrialisation And Development. A Third World Perspective', Green Wood Press (1984).

Gilani, K and Iqbal., 'Labour Migration from Pakistan to the Middle East and its Impact on the Domestic Economy', Resaerch Report Series No.126, Pakistan Institute of Development Economics., (June 1981).

GoldSchmid. H.J., Mann. H.H. and Weston. J.F., 'Industrial Concentration The New Learning', (1973).

Government of Pakistan, Ministry of Finance, National Taxation Return Committee Report., (1986).

Government of Pakistan, Planning and Development Division, First Five Year Plans 1955-60 (Karachi 1955).

Government of Pakistan, Planning and Development Division, Second Five Year Plan, 1960-65 (Karachi 1960).

Government of Pakistan, Planning and Development Division, Third Five Year Plan 1965-70 (Karachi 1965).

Government of Pakistan, Planning and Development Division, Annual Development Plans,(1970-71,1971-72, 1972-73, 1973-74, 1975-76, 1976-77).

Government of Pakistan, Planning and Development Division, Sixth Five Year Plan 1983-84 (Islamabad 1983).

Government of Pakistan, Planning and Development Division, Seventh Five Year Plan 1988-92 (Islamabad 1988).

Government of Pakistan, Ministry of Finance, Economic Survey (Islamabad 1983-84, 1986-87, 1987-88).

Government of Pakistan, Statistics Division, Census of Manufacturing Industries (Karachi, 1958-59, 1965-66, 1970-71,1975-76, 1976-79, 1980-81, 1982-83, 1983-84, 1984-85).

Government of Pakistan, Statistics Division, Twenty Five Years of Pakistan Statistics (Karachi, 1974).

Gratton. C and Kemp. J.R., 'Some New Evidence on Changes in U.K Industrial Market Concentration 1963-68', Scottish Journal of Political Economy, Vol.24, No.2, (June

1977).

Greer. D.F., 'Advertising and Market Concentration', Southern Economic Journal, 38 (July 1971).

Griffin. K.B., 'Financing Development Plans in Pakistan', Pakistan Development Review, V (Winter 1965).

Guisinger. S.E and Irfan. M., 'Real Wages of Industrial Workers in Pakistan', Pakistan Development Review, XII (Winter 1974).

Guisinger. S.E., 'Wages, Capital Rental Values and Relative Factor Prices in Pakistan', World Bank Staff Working Paper, No.278 (1978).

Guth. Z.S., 'Advertising and Marketing Structure Revisited', Journal of Industrial Economics, 19 (April 1971).

Haldi. J. and Whitcomb. D., 'Economies of Scale in Industrial Plants', Journal of Political Economy (1967).

Hall. M and Tideman. N.,' Measures of Concentration', Journal of American Statistical Association ,62. (March 1967).

Hall. M,and Weiss. L., 'Firm Size And Profitability', The Review of Economics And Statistics., (August 1967).

Haq. M., 'The Strategy of Economic Planning ',Oxford University Press (Karachi, 1963).

Hannah. L and Kay. J.A., 'Concentration In Modern Industry: Measurement and the U.K. Experience', Macmillan, London, (1977).

Hart. P.E and Morgan. E., 'Market Structure and Economic Performance in the U.K', The Journal of Industrial Economics, Vol.XXV No.3 (March 1977).

Hart. P.E and Clarke. R., 'Concentration in British Industry 1935-75', Cambridge (C.U.P. 1980).

Holtermann. S.E., 'Market Structure and Economic Performance in U.K. Manufacturing Industry', Journal of Industrial Economics Vol.22 (1973-74).

Horowitz. I., 'An International Comparison of The International Effects of Concentration on, Industry Wages, Investment and Sales', Journal of Industrial Economics, No.2 (1971).

Horowitz. I., 'Employment and Concentration in the Common Market.' 'Journal of the Royal Statistical Society, Series A, 133,3 (1970).

House. W.J., 'Market Structure and Industry Performance: The case of Kenya', Oxford Economic Papers, Vol.25, No.3 (1973).

Hymer. S. and Pashigian. P., 'Firm Size and Growth Rates', Journal of Political Economy, (December 1962).

I.B.R.D., 'Pakistan: Development Issues and Policies', Report No.Pak-1924, Vol.I., Restricted Circulation (Islamabad 1978).

I.B.R.D., 'Pakistan: Economic Development and Prospects', Report No.2860-Pak. Restricted Circulation (April 1980).

I.B.R.D., 'Pakistan:Economic Development and Prospects., Report No. 4754 Restricted Circulation (Islamabad).

I.B.R.D., 'Pakistan: Development Issues and Policies: Report No. Pak-2102, Vol 7 Restricted Circulation (Islamabad 1988).

Irfan. M., 'Effect of Unionization, Product Market Concentration And Foreign Trade on Inter Industry Wage Structure', The Pakistan Development Review. Vol.XVIII, No.1 (Spring 1979).

Ishikawa. S., 'Economic Development In Asian Perspective', (1967).

Ishikawa. S., 'Appropriate Technologies: Some Aspects of

Japanese Experience, in Appropriate Technologies for Third World Development', Proceedings of a Conference held by the International Economic Association at Teheran, Iran, Edited by Austin Robinson (1979).

Islam. N., 'Comparative Costs of Factor Proportion and Industrial Efficiency in Pakistan',Pakistan Development Review, Vol. VII No.2 (Summer 1967).

Islam. N., 'Foreign Assistance And Economic Development: The Case of Pakistan', The Economic Journal, 82 (March 1972).

Jacquemin. A.P and Corden. M., 'Size Structure, Stability and Performance of the Largest British and EEc Firms', European Economic Review, No.4 (1973).

Jacquemin. A. and Saez. W., 'Compared Performances of the Largest European and Japanese Industrial Firms', Oxford Economic Papers (July 1976).

Jacquemin. A.P and De Jong. H.L., 'European Industrial Organisation', Macmilan London (1977).

Jean. B., 'Monopoly and Price Revisited',in Yale Brozen (ed) The competitive Economy (U.S.A 1975).

Jenny. F., and Weber. A.P., 'Profit Rates and Structural

Variables in The French Manufacturing Sector', European Economic Review, (January 1976).

John. A and Iqbal., 'Exports, Politics, and Economic Development Pakistan 1970-82', West View Press (1983).

John. C., Hughes. H and Wall. D., 'Policies for Industrial Progress in Developing Countries', Oxford University Press (1980).

Johnston. J., 'Statistical Cost Analysis', Mac Graw. Hill Book Company, (1960).

Kalecki,. M., 'On the Gibrat Distribution', Econometrica 13, (January 1945).

Katrak. H., 'Industrial Structure, Foreign Trade and Price-Cost Margins in Indian Manufacturing Industries', Journal of Development Studies, Vol.17, No.1. (1980).

Kemal. A.R., and Tallat. A., 'Capacity Utilization in Manufacturing Industries of Pakistan', Pakistan Development Review. (Autumn 1974).

Kemal. A.R., 'An Analysis of Industrial Efficiency in Pakistan, 1960-70' (Manchester University, Ph.D thesis, 1978).

Khan. A.R., 'Import Substitution, Export Expansion and Consumption Liberalization', Pakistan Development Review, III (Summer 1963).

Khan. A.R., What Has Been Happening to Real Wages in Pakistan', Pakistan Development Review, VII (Autumn 1967).

Khan. A.R., 'Capital, Intensity and the Efficiency of Factor Use', Pakistan Development Review, X (Summer 1970).

Khalilzadeh. J. Shirazi., 'Market Structure and Price cost Margins in U.K Manufacturing Industries', Review of Economics and Statistics, Vol.56. No.1 (1974).

Kilpatrick. R.W., 'The Choice Among Alternative Measures of Industrial Concentration': Review of Economics and Statistics. No. 49 (May 1976).

Kirlpatrick. R.W., 'The Validity of the Average Concentration Ratio As a Measure of Industry Structure', Southern Economic Journal, Vol.42. (April 1976).

Kim. K.S., 'Enterprise Performance in the Public and Private Sectors: Tanzanian Experience, 1970-75', Journal of Developing Areas, Vol.15, (April 1981).

Kirkpatrick. C.H. Lee. N and Nixon. F.I., 'Industrial Structure and Policy in Less Developed Countries', George Allen and Unwin (1984).

KirkPatrick. C.H. and Nixon. F.I. The Industrialization of Less Developed Countries; Manchester University Press(1983).

Knight. J.B. and Sabot. R.H., 'The Role of the Firm in Wage Determination: An African Case Study', Oxford Economic Papers, Vol.35, No.1 (March 1983).

Kumar. S.D., 'Economies of Scale and Implications for Policy: A Study of the Electrical Ceiling Fan Industry.

Kwoka. J.E., 'Does the Choice of Concentration Measure Really Matter', Journal of Industrial Economics. Vol.XXIX. No.4 (January 1981).

Lall. S. 'Financial and Profit Performance of MNC's in Developing Countries: Some Evidence from an Indian and Colombian Sample', World Development, Vol,4. No.9 (1976).

Lamm. R.M.'Prices and Concentration in the Food Retailing Industry', Journal of Industrial Economics, (September 1981).

Lee. S.Y., 'Public Enterprise and Economic Development in Singapore', The Malayan Economic Review, Vol.21, No.2. (October 1976).

Leff. N., 'Entrepreneurship and Economic Development The Problem Revisited', Journal of Economic Literature, XVIII (March 1979).

Leibenstein. H., 'Aspects of the X-inefficiency theory of the Firm', Bell Journal of Economics, Vol.6, No.21,(Autumn 1975).

Lewis. S.R., and Guisinger. S.C., 'Measuring Protection, in a Developing Country: The Case of Pakistan', Journal of Political Economy, LXXVI (December 1968).

Lewis. S.R., 'Economic Policy and Industrial Growth in Pakistan', London, George Allen and Unwin, (1969).

Lewis. S.R., 'Industrialization and Trade Policies', London, Oxford University Press, (1970).

Lewis. S.R., and Soligo. R., 'Growth and Structural Change in Pakistan', Pakistan Development Review, V, (Spring 1965).

Liebowitz. S.J. 'Measuring Industrial Disequilibria', Southern Economic Journal, (July 1982).

Little. I., Scitovsky. T. and Scott. M.F.G., 'Industry and Trade in Some Developing Countries', London, Oxford University Press, (1970).

Lydall and Dhar., 'The Role of Small Enterprises', Institute of Economic Growth, Delhi (1961).

Lyons. B., 'A New Measure of Minimum Efficient, Plant Size in U.K Manufacturing Industry', Economica, 47, (February 1980).

Mc Gee. J.S., 'Article in Harvey. J. Goldschmid et al (eds.) Industrial Concentration: The New Learning,(1973).

Mc Gee. J.S., 'Economies of Size in Auto Body Manufacturing', Journal of Law and Economics, No.16,(october 1973).

Mansfield. E., 'Size of Firm, Market Structure and Environment', Journal of Political Economy, No.6,(December 1963).

Marcus. M., 'Profitability and Size of Firm: Some Further Evidence', The Review of Economics and Statistic ,51,No.1 (February 1969).

Martin. S., 'Advertising Concentration and Profitability: The Simultaneity Problem', Bell Journal, Vol. 10,(1979).

Meller. P., 'The Pattern of Industrial Concentration in Latin America., Journal of Industrial Economics', Vol. 27, No.1, 1978).

Merhav. M, 'Technological Dependence, Monopoly and Growth', NewYork, Pergamon Press (1969).

Micha. G., 'Welfare Implications of Oligopoly in U.S Food Manufacturing', American Journal of Agricultural Economics,(November 1982).

Miller. R.A., 'Number Equivalents, Relative Entropy and Concentration Ratio: A comparison using Market Performance', Southern Economic, Journal Vol. XXXIX. No.1, (July 1972).

Mueller. W.F. and Rogers. R.T., 'The Role of Advertising in Changing Concentration of Manufacturing Industries', The Review of Economics and Statistics, 62,(February 1980).

Mueller. W.F. and Hamm. I.G., 'Trends in Industrial Market Concentration 1947-70.' The Review of Economics and Statistics., 56, (November 1974).

Nam. W.H., 'The Determinants of Industrial Concentration The Case of Korea', Malaysian Economic Review, (April

1975).

Naqvi. S.N.H., Kemal. A.R., Heston. A., ' The Structure of Protection in Pakistan, 1980-81', Restricted Circulation, Pakistan Institute of Development Economics, (1983).

Needham. D., 'The Economics of Industrial Structure Conduct and Performance', Great Britain (1978).

Nelson. R.L., 'Market Growth Company Diversification and Product Concentration,1947-54, Journal of the American Statistical Association, 55, No. 292, (December 1960).

Packard, P.C., 'A Note an Concentration and Profit Rates Within the Manufacturing Sector 1963 and 1965', Nigerian Journal of Economic and Social Studies, Vol.2, No.3, (1969).

Page. J.M., 'Technical Efficiency and Economic Performance: Some Evidence From Ghana', Oxford Economic Papers, Vol. 32, No.2 (July 1980).

Papaneck. G., 'Pakistan's Development: Social Goals and Private Incentives', Cambridge, Harvard University Press (1967).

Paranjape. H.K., 'New Statement on Industrial Policy', Economic and Political Weekly, Vol.15, No.38, (1980).

Paranjape. H.K., 'The Vanishing MRTP act,' Economic and Political Weekly, Vol.17, No.23, (1982).

Pashingian. B.P., 'Markets Concentration in the U.S and Great Britain', Journal of Law and Economics., XI (1968).

Pashigian. B.P., 'The Effects of Market Size on Concentration', International Economic Review, 10 (October 1969).

Peltzman. S., 'The Gains And Losses from Industrial Concentration', Journal of Law and Economics. Vol.20 (1977).

Perkins. F.C., 'Technology Choice, Industrialization and Development Experiences in Tanzanian', The Journal of Development Studies, Vol.19, No.2 January 1983).

Philips. L., 'Effects of Industrial Concentration: A Cross Section Analysis for the Common Market', Amsterdam. North Holland, (1971).

Porter. M.E., 'Consumer Behaviour Retailer and Market Performance in Consumer Goods Industries', Review of Economics and Statistic, 56, (November 1974).

Power. J.H., 'Industrialization in Pakistan: A Case of Frustrated Take Off', Pakistan Development Review, III (Summer 1963).

Pratton. C.F., 'Economies of Scale in Manufacturing Industry,Department of Applied Economics, Occasional Paper No,28,Cambridge, (1971).

Preston and Collins., 'Concentration and Price-cost Margins in Manufacturing Industries', University of California Press (1970).

Primeaux. W.J. 'An Assessment of X-inefficiency Gained Through Competition', Review of Economics and Statistics, Vol.59, No.1 (1977).

Proyer. F.L., 'The Size of Production Estimates in Manufacturing', The Economic Journal (June 1972).

Qureshi. S.K., Malik. S.J., and Siddiqui. A.N, 'Agriculture Pricing and Taxation in Pakistan: Some Policy Issues', Pakistan Institute of Development Economics, (1987).

Ranis. G., 'Industrial Efficiency and Economic Growth: A Case Study of Karachi', Pakistan Institute of Pakistan Development Economics Monograph No.5., (Karachi, Ferozsons Ltd, 1961).

Rees. R.D., 'Optimum Plant Size in United Kingdom

Industries: Some Survivor Estimates', Economica, No.40, (November 1973).

Robert. N., Associates and United Consultants (Pvt) Ltd, 'Capacity Utilization in Pakistan's Manufacturing Sector',(March 1987).

Robinson. J., 'The Accumulation of Capital', London, Mac Millan, (1956).

Samuels. J and Smyth. D.J., 'Profits, Variability of Profits and Firm Size', Economica, (May 1968).

Sandesra. J.C and Lakdawala. D.T., 'Small Industry in a big city: A Survey in Bombay', (Bombay 1960).

Sandesra. S.C;. 'Size of the Factory and Concentration in the Factory Sector in India 1951-70', The Indian Economic Journal Vol. 27 No.2 (October-November 1979) Special Number in Indian Economics.

Sandesra. J.C., 'Small Industry Production in 1982-3; A Quick Comment', Economic and Political Weekly (1984)

Sandesra. J.C., 'The Small Industry Question: Issues Evidence and Suggestions', in Bagchi. A and N. Banerji. N., eds., Change and Choice in Indian Industry (1981).

Saving. T.R., 'Estimation of Optimum Size of Plant by the Survivor Technique', Quarterly Journal of Economics, LXXV, 4, (November 1961).

Sawyer. M.C., 'Concentration in British Manufacturing Industry', Oxford Economic Papers, (November 1971).

Sawhney. P and Sawhney. B., 'Capacity Utilization, Concentration and Price-cost Margins',. Journal of Industrial Economics: Vol.XXI, No.2 (1973).

Scheerer. F.M., Industrial Market Structure and Economic Performance., (1980).

Schwartzman. D., 'The Effect of Monopoly an Price', Journal of Political Economy Vol LXVII-No.4. (August 1959).

Schwartzmen. D., 'The Burden of Monopoly', Journal of Political Economy Vol. No. (December 1960).

Sen. A.K., 'Choice of Techniques', Oxford Basil Black well (1975).

Shirwani. K., 'Some Evidence on Concentration and Profitability in Pakistan Large Scale Manufacturing Industries', Pakistan Development Review; Vol Xv., No.3 (Autumn 1976).

Sheperd. W.G., 'Changes in British Industrial Concentration

1951-58', Oxford Economic Papers 18, 1 (March 1966).

Sheperd. W.G., 'What Does the Survivor Technique Show About Economics of Scale?', Southern Economic Journal (1967).

Sheperd. W.G., 'Structure And Behaviour in British Industries with U.S Comparisons', Journal of Industrial Economics, XXI.I (November 1972).

Siddharthan. N.S., 'Industrial Structure Non Price Competition and Industrial Development',Economic and Political Weekly, Vol.XIX Nos.31,32,33 (August 1984).

Silberston. A., 'Economies of Scale in Theory and Practice', The Economic Journal, 82 (1972).

Simler. N.J., 'Unionism and Labour's Share in Manufacturing Industries', Review of Economics and Statistics (November 1961).

Singh. A and Whittington. G., 'Growth Profitability and Valuation', Cambridge University Press, (1968).

Soligo. R., and Stern. J., 'Tariff Protection, Import Substitution and Investment Efficiency', Pakistan Development Review ,V. (Summer 1965).

Stern. J., and Falcon. W., 'Growth and Development in

Pakistan',Centre for International Affairs, Harvard University Occasional Paper No.23 (1970).

Stigler. G.J., 'The Division of Labour is Limited By The Extent of The Market', Journal of Political Economy., Vol LIX.No.3. (June 1951).

Stigler. G.J., 'Capital and Rates of Return in Manufacturing Industries, Princeton University Press for NBER, (1963).

Stigler. G.J., 'A Theory of Oligopoly', Journal of Political Economy, 72 (February 1964).

Strickland. A.D and Weiss. L., 'Advertising Concentration and price-cost Margins', Journal of Political Economy. Vol. 84. No.51 (1976).

Sylos. Labini., 'Oligopoly and Technical Progress', (Cambridge; Harvard Univesity Press, 1967).

Teitel. S.; 'Economics of Scale and Size of Plant', Journal of Common Market Studies, XII (1975).

Tyabji. N., 'Nature of Small Enterprise Development', Economic and Political Weekly, Annual Number, (August 1984).

Tyler. W. G., 'Brazilian Industrialization and Industrial

Policies: a Survey', World Development, Vol. 4, No.10/1, (October-November 1976).

Vanlommel. E., Bra bander. B.D., and Liebaers. D., 'Industrial Concentration in Belgium: Empirical Comparison of Alternative seller Concentration Measures', Journal of Industrial Economics, Vol.XXVI No.1 (September 1977).

Weiss. L.W., 'Factors in Changing Concentration', The Review of Economics and Statistics, 45 (February 1963).

Weiss. L.W., 'The Survival Techniques and the Extent of Sub-Optimal Capacity', Journal of Political Economy, 72, (June 1964).

Weiss. L.W., 'Quantitative Studies of Industrial Organisation', art in M.D. Intriligator (eds), Frontiers in Quantitative Economics, (1971).

White. L., 'Industrial Concentration and Economic Power in Pakistan', Princeton (1974).

White. L., 'Appropriate Technology, X-Inefficiency and a Competitive Environment: Some Evidence from Pakistan', Quarterly Journal of Economics. Vol XC, No.2 (May 1976).

White. L., 'Appropriate Factor Proportions for

Manufacturing in Less Developed Countries: A Survey of the Evidence:', in Austin Robinson (ed.), Appropriate Technologies for Third World Development (1979).

Whittington. G., 'The Profitability and Size of U.K. Companies 1960-74', Journal of Industrial Economics. Vol.XXVIII No.4 (June 1980).

Winston. G.C., 'Capital Utilization in Economic Development', The Economic Journal, (March 1971).

World Bank. 'Pakistan: Industrial Regulatory Policy Report', Vol.I Restricted Circulation (January 1988).

World Bank. 'Pakistan Industrial Regulatory Policy Report', Vol.II. Restricted Circulation 9 January 1988).

Wright. N.R. 'Product Differentiation Concentration And Changes in Concentration', The Review of Economic and Statistics, LX, (November 1978).

Yamey. B.S., 'Economics of Industrial Structure', Penguin Modern Economic Readings Great Britain (1973).