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The Competitive Advantage of Pakistan
Empirical Analysis of the Textile/Apparel Industry

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Preface

There is a general belief that industrialization implies economic growth and development. Unless countries industrialize, they will continue to remain underdeveloped. The progress of countries like South Korea, Taiwan, and other East and South –East Asian countries, called the Newly Industrialized Countries (NICs), only endorses this view. In Pakistan the extraordinary growth in industry in the 1950s and 1960s suggested that Pakistan might be one of the few countries at that time to join the developed world. However the historical perspective reveals that the industrialisation that has taken place in Pakistan, failed to help the economy to expand and grow. Industrial investment in Pakistan remains import-dependent and ignores backward and forward linkages thus restricting opportunities for development and growth. The perverse characteristics of industrialisation in Pakistan have contributed little to the eradication of poverty in the country. Pakistan after five decades of independence still remains one of the poorest countries of the world.

This study sets out to analyse Pakistan's industries and their ability to broaden and upgrade their competitive positions to cope with increasing international competition. It suggests a conceptual framework of organisational characteristics influencing the process and formation of clusters. After the general analysis of Pakistan's competitive industries, the research limits itself to Pakistan's textile/apparel industry because of the time constraint. The textile/apparel industry is the dominant export industry in the

manufacturing sector of Pakistan.

Clusters are a driving force in increasing exports and magnets for attracting foreign investment. The phenomenon of clusters in one form or another has been recognised and explored in a range of literatures. Intellectual antecedents of cluster theory date back at least to Alfred Marshall[1] who included a fascinating chapter on the externalities of specialised industrial locations in his 'Principles of Economics' (originally published in 1890). During the first 50 years of this century, economic geography was a recognised field with an extensive literature. With the mid century advent of neo classical economics, however, location moved out of the economic midstream. More recently, increasing returns have started to play a central role in new theories of growth and international trade, and interest in the field of economic geography is growing (Porter, 1996, p.206).

Knowledge about cluster theory has advanced and continues to spread since publication of 'The Competitive Advantage of Nations', (1990) by Michael Porter. The cluster concept now represents a new way of thinking about national, state, and city economies, and points to new roles for companies, governments, and other institutions striving to enhance competitiveness.

[1] See Porter, (1996), p.206

The Research Strategy

Objectives

Four objectives of the study were set out

1) To provide an insight on strengths and weaknesses of Pakistan's economy by examining the international competitiveness of its export sector.

2) To examine and understand the nature of competition and sources of advantage and disadvantage of Pakistan's most dominant export sector industry i.e textile/apparel industry.

3) To examine the institutional context with which the firms of this industry operate and examine and analyse the local linkage pattern and cluster formation process of the textile/apparel industry within the study area.

4) To consider some policy implications for the growth and sustained competitiveness of this industry in Pakistan.

Structure of the Study

The study is divided into seven chapters. Chapter one assesses Pakistan's economic performance. It provides information on the macro-economic trends and the manufacturing industry of Pakistan. This information is essential for understanding the analysis of Pakistan's competitive position in later chapters.

Chapter two summarises the essence of the cluster approach and its development over the

years. It analyses Porter's framework of competitiveness and discusses some of the criticisms levied against his model. It also provides an overview of some of the studies based on the cluster approach and discusses how the current study differs from and builds upon the previous work.

The third chapter describes Pakistan's position in international trade. It discusses determinants of national advantage for Pakistan's industry in general.

Chapter four contains case study on the textile/apparel industry of Pakistan. This study makes extensive use of Porter's framework of the 'diamond' discussed in chapter two.

Chapter five and six are based on empirical analysis of the organizational characteristics and intra-cluster interchange in the textile/apparel industry of Pakistan. These chapters present the results obtained from the information collected from 39 establishments by a structured questionnaire. Chapter five also describes in detail the analytical framework and statistical tests that have been used in these chapters.

Chapter seven summarises the main findings and brings out the policy implications and conclusions of the study.

Chapter 1

Introduction to Pakistan's Economy

1.0 Introduction

This chapter is based on analysing Pakistan's economic performance. It gives an overview of the macro economic performance as well as the performance of the manufacturing industry of Pakistan. Here I have tried to analyse the economic trends of Pakistan dating back to as far as possible to highlight the evolution of Pakistan's industries. The objective here is to provide the needed background for the coming chapters in which the competitive position of Pakistan's industries is discussed in detail.

1.0.1 Economic History of Pakistan

Pakistan inherited an agrarian economy with virtually no industry or attendant services. In the words of Gustav Papanek[1],

'At independence, Pakistan simultaneously created and disrupted by the partition of British India was widely considered an economic monstrosity. The country was among the poorest in the world and had no industries to speak of, almost no industrial or commercial groups. It was difficult to see how Pakistan's economy could grow more rapidly than its population. Economic chaos and political disintegration was more likely'

(Papanek, 1967, p.1).

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[1] Gustav Papanek was a professor from Harvard University who played an important role as advisor to the Pakistan Planning Commission from 1954-1960.

Agriculture was the most dominant sector at the time of independence. It accounted for approximately 60% of the GDP. Manufacturing sector's contribution at that time was no more than 5% (Makhdoomi, 2000, p.48). When Pakistan became independent in 1947, it had only three large-scale manufacturing units. Most of the total of 1414 industries, which came in the share of Pakistan, were totally dependent on the import of machinery and spare parts from Britain. Among them only 335 industrial enterprises belonged to West Pakistan (now Pakistan)[2]. These industries were mostly in the light-inanufacturing category like textile and jute mills. Not a single engineering or chemical industry was there (Malik, 1996).

The per capita income at the time of independence in 1947 was only Rupees 316 (US$115) (Makhdoomi, 2000, p. 48). The first 10 years of the Islamic country's history were absorbed by immediate problems of rehabilitation and reconstruction. Economic development was limited. The main issues during this period were settling the massive inflow of Muslim migrants from India; building up from scratch the machinery of government both at the central and provincial levels; and dealing with the problems created by the fact that the geographical area constituting Pakistan had to function independently from the single economy of Indian subcontinent.

Like most developing countries, the government of Pakistan embarked on industrialisation proclaimed as a shortcut to eradicate poverty and reduce unemployment

[2] East Pakistan, now Bangladesh became a separate country in 1971.

(Hijazi, 1995, pp.1081-1092). Its industrial policies have always been largely geared towards the substitution of costly imports and adding value to the products of the land. Most of the development has been in the consumer goods sector, especially textiles, while the basic capital goods industry essential for the development of the agricultural sector has remained neglected. The exports continue to be dominated either by the agricultural sector or the products that are largely dependent on this sector[3]. While industrial growth has occurred it has been sluggish. The absence of forward and backward linkages has restricted opportunities for industrial expansion (Hijazi, 1995, p.1081).

The next section of this chapter discusses in some detail the macro economic performance of Pakistan. It highlights the developments in macroeconomic indicators such as GDP growth rate, employment, saving and investment. Structural transformation of the economy is also analysed. The third section of this chapter deals with the performance of the manufacturing sector of Pakistan with respect to its growth and structural changes.

1.1.0 Macro Economic Performance of Pakistan

1.1.1 Growth (GDP and GNP)

Despite a low industrial base, Pakistan's economic progress has been quite impressive. It has experienced an average growth rate of 5.3 percent per annum. But because of very high population growth (3.0% p.a) GNP per capita grew only at a rate of 2.3 percent per

[3] See Chapter 3, table 3-1

annum[4] (Saeed, 1999, pp. 47-49). However the relatively rapid growth in Pakistan has not managed to solve the structural problems faced by the country as will be discussed in the later sections. After five decades Pakistan is still considered to be among the poorest countries of the world.

Pakistan's GNP growth rate has followed an uneven path mainly because of the changing political conditions and economic policies. In the fifties GNP grew approximately at an average rate of around 3%. This slow growth rate was partly attributable to gigantic problems faced by the country during its initial years and partly to the inexperienced policy makers. In the sixties it took an upward swing and reached an average growth rate of about 7% p.a. This was because of the high growth in manufacturing and trade sectors. GNP in these sectors (at constant factor costs / prices of 1959-77) grew by 157 and 111.7% respectively (Saeed, 1999, p.48). Since 1986 the growth rate has been fluctuating around 5%. The following table shows the GDP growth rates of Pakistan for different years.

[4] These rates are based on official statistics reliability of which is highly questionable. But because of non-availability of any other source of data we have no other option except to take these official statistics as they are.

Table 1-1

GDP Average Annual Growth Rates (Percentage)

Period	*Growth Rates*
1950-58	5.2
1958-66	6
1966-77	5.2
1977-85	7.1
1985-94	5
1994-95	5.2
1995-96	6.8
1996-97	1.9
1997-98	4.3
1998-99p	3.1

Source: Pakistan Economic Survey (various issues including 1998-99) GOP, Finance Division, Islamabad and Annual Report 1997-98 of State Bank of Pakistan.
Note: p = provisional

It is interesting to note from the above table that Pakistan has experienced higher growth rates during its two martial law regimes (1958-67 and 1977-87). This does not imply that martial law is good for the country. However it very strongly indicates that political stability is a prerequisite for better and rapid economic growth.

The following table reflects the structural changes that have been undertaking in Pakistan's economy.

Table 1-2

Percentage Share of Different Sectors in GDP

Year	*Agriculture*	*Manufacturing*	*Trade*	*Others*	*Total*
1949-50	53.2	7.8	11.9	27.1	100
1959-60	45.8	12	12.5	29.7	100
1969-70	38.9	16	13.8	31.3	100
1979-80	30.6	17	14.3	38.1	100
1989-90	25.8	17.6	16.5	40.1	100
1993-94	23.9	18.6	16.3	41.2	100
1995-96	24.7	18.7	16.2	40.4	100
1994-95	24.8	18.1	16.4	40.7	100
1996-97	25.3	17.7	15.8	41.2	100
1997-98	25.2	18.3	15.6	40.9	100
1998-99p	24.5	18.6	15.4	41.5	100

Source: Economic survey of Pakistan (Various issues) GOP, Finance Division Islamabad as reproduced in Saeed, 1999, p.36.
Note:
p = provisional
'Others' include various commodity producing sectors like mining & quarrying ,construction, electricity& gas distribution and services sectors like transport, storage & communication, finance and insurance, ownership of dwellings ,public administration &defence, services.

Agriculture was the most dominant sector in the early years constituting up to 53% of the GDP. However the above table shows a gradual but significant decline in its contribution to the GDP over the years. In spite of this decline it is still considered a crucial sector and is described as the backbone of the economy. It constitutes approximately 25% of the country's GDP (1998-99). Chapter 3 shows that much of Pakistan's light manufacturing sector is also directly or indirectly tied to the agriculture sector. The above table shows that the manufacturing sector had the lowest contribution to the economy in the early years. However its contribution has significantly increased over the years from 7.8% in 1949-50 to approximately 19% in 1998-99.

The analysis of the manufacturing sector reveals that Pakistan managed to develop a substantial industrial base within a short span of time. From 1949-58 the growth rate of

the industry in Pakistan was amongst the most rapid for any country in the world[5] (Zaidi, 1999, p.85). The high growth rate of the manufacturing sector in the initial years is mainly attributable to the low industrial base of the infant country. During the sixties the government pursued the policy of export expansion. As a result of this policy the manufacturing sector grew annually at 16% during the first half of the decade. However during the second half, it slowed down to 8% due to war with India (Saeed, 1999, p.105).

The seventies were a decade of slow economic growth. From period 1969-70 to 1976-77, GDP and GNP grew only at 4% per annum. The main contributing factor was the large-scale nationalisation[6] in Pakistan by the Bhutto regime that particularly affected the growth of manufacturing sector.[7] The growth of manufacturing sector during 1969-70 to 1976-77 was only 3.8% compared to 9.9% during the sixties (Makdoomi, 2000, p.53). During the eighties the change in the government brought a change in the industrial policy. Amongst the earliest steps taken by the Zia government (which followed the Bhutto Regime) was the denationalisation of a number of industries with special emphasis on employment generation; export promotion and increased efficiency of production units. As a result of this policy the manufacturing sector grew annually at a rate of 7.3%. It further rose to 8.26% in 1991-92 (Saeed, 1999, p.106 and Zaidi, 1999, pp.107-109).

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[5] In united Pakistan, large-scale manufacturing grew at a phenomenal rate of 23.6 per cent between 1949 and 1954, and afterwards, by the still very impressive 9.3% up to 1960 (Zaidi, 1999, p.85).

[6] The 1970s were the most difficult years for the manufacturing sector. The new government (Bhutto Regime), which came to power in the early 1970s, decided to carry out a program of income redistribution in the country. The first step towards this end was the nationalisation of major industries in 1972 (Makdoomi, 2000, p.73).

[7] The global recession caused in part by 1973 oil crises also contributed to the slow growth of the manufacturing sector during this period.

1.1.2 Employment

An important indicator of the economic and social conditions prevailing in the country is the distribution of employed persons in its various sectors of the economy. Pakistan's employment structure is characterised by disguised unemployment[8]. Open unemployment rate (number of workers who can and are willing to work but are not finding suitable jobs) is estimated to be around 5.37% as 2 million labour-force is unemployed out of a total of 38.18 million for 1997-98 (Saeed, 1999, p.60). The following table gives the distribution of employed persons by major industry division.

Table 1-3

Distribution of Employed Persons by Major Industry Division
(Percentage)

Years	*Agriculture*	*Manufacturing*	*Construction*	*Transport*	*Trade*	*Others*
1963-64	60.47	13.60	1.44	2.04	7.60	14.50
1968-69	55.79	15.66	3.70	4.84	10.33	9.32
1971-72	57.32	12.92	3.41	4.84	9.89	11.25
1978-79	52.65	14.66	4.92	4.73	11.08	11.22
1989-90	51.15	12.84	6.38	4.89	11.93	12.22
1990-91	51.15	12.84	6.38	4.89	11.93	12.22
1991-92	51.15	12.53	6.33	5.51	13.10	13.48
1992-93	48.27	10.89	6.94	5.52	13.31	14.95
1993-94	50.04	10.12	6.50	4.95	12.78	15.56
1994-95	46.79	10.50	7.21	5.07	14.50	15.12
1995-96	46.79	10.50	7.21	5.07	14.50	15.12
1996-97	46.79	10.50	7.21	5.07	14.50	15.12
1997-98	44.10	11.20	6.80	5.07	14.60	16.78
1998-99	44.10	11.20	6.80	5.07	14.60	16.78

Source: Economic Survey of Pakistan 1998-99, Islamabad, GOP, Finance Division, table 12.11, Statistical Appendix p.14.
Note: 'Others' include sectors like electricity & gas distribution, finance & insurance, public administration and defence sectors.

[8] The disguised unemployment is defined as the extent to which the worker is working less than 35 hour a week.

The above table indicates that the agriculture sector is the most dominant sector in terms of providing employment to the labour force. It absorbs 44.10% of the total labour force of the country (1998-99). The structure of employment has been changing overtime. The share of employment in agriculture has declined over the years whereas the share of employment in other sectors like construction, electricity, transport and trade has generally increased. Manufacturing sectors share in employment reached its peak in 1968-69 when it absorbed around 15.66% of the labour force. In 1998-99 its share had declined to 11.20. The major reason for this decline of employment in the manufacturing sector is the use of capital-intensive techniques especially by the large scale manufacturing industry. On one hand it is a sign of technological advancement but on the other hand its low employment generation ability is a major concern for the government.[9]

1.1.3 Income Distribution

Pakistan is a country with unequal distribution of wealth. The rich are very rich and the poor very poor. Concentration of wealth and income leads to economic and social polarisation. Growth with equity enhances social welfare, which is ensured when the gains of growth filter down to masses (Saeed, 1999, p.62).

[9] Capital-intensive technology was indirectly encouraged during the seventies by the formulation of labour policy and the associated high cost of labour (Makhdoomi, 2000).

The Gini Coefficient [10] can be used as a measure for analysing the income inequality prevailing in the country.

Table 1-4

Household Income Distribution in Pakistan

		Household Income Shares			
Year	*Gini Co-efficient*	*Lowest 20%*	*Middle 60%*	*Highest 20%*	*Ratio of Highest 20% to Lowest 20%*
1963-64	0.386	6.4	48.3	45.3	7.1
1966-67	0.355	7.6	49.0	43.4	5.7
1968-69	0.336	8.2	49.8	42.0	5.1
1969-70	0.336	8.0	50.2	41.8	5.2
1970-71	0.330	8.4	50.1	41.5	4.9
1971-72	0.345	7.9	49.1	43.0	5.4
1979	0.373	7.4	47.6	45.0	6.1
1984-85	0.369	7.3	47.7	45.0	6.2
1985-86	0.355	7.6	48.4	44.0	5.8
1986-87	0.346	7.9	48.5	43.6	5.5
1987-88	0.348	8.0	48.3	43.7	5.5
1990-91	0.407	5.7	45.0	49.3	8.6
1992-93	0.410	6.2	45.6	48.2	7.8

Source: Economic Survey of Pakistan 1996-97, Government of Pakistan, Finance Division p.6

According to the above table, from 1963-71 the inequality gap narrowed from 0.386 to 0.330. During 1971-79 the value of Gini coefficient increased suggesting the widening of income inequality. There has been a consistent upward trend in the Gini coefficient since 1985.

[10] Gini ratio is one of the several but most commonly used measures of income disparity because of convenience and understanding. Its value ranges from 0 to 1. At zero it represents perfect equality (each percentile of household getting the same income) while at one it indicates perfect inequality (one income class has all the income and everyone else has nothing). It is computed from relevant household income economic surveys (Saeed, 1999, p.62).

1.1.4 Savings and Investment

The low rates of savings and investments continue to be a major impediment to economic development in Pakistan. As mentioned earlier, Pakistan's economic structure is characterised by a dual structure i.e the rich being very rich and the poor very poor. This leads to a very low saving rate. The rich class of Pakistan spends prodigally on luxuries and has relatively low saving. The poor class cannot afford to save. As a result the saving rates in Pakistan are among the lowest in the world (Saeed, 1999, p.55).

Table1-5

Investment and Saving as Percentage of GNP

Year	*Investment*	*Saving*
1970s	17.41	11.74
1980s	17.47	13.81
1988-89	18.25	13.59
1989-90	18.15	13.61
1990-91	18.52	13.86
1991-92	19.94	16.9
1992-93	20.55	13.47
1993-94	19.37	15.61
1994-95	18.27	14.23
1995-96	18.9	11.7
1996-97	17.18	11.73
1997-98	17.26	14.2
1998-99	14.91	11.15

Source: Economic Survey of Pakistan 1998-99, GOP Islamabad, Finance Division as reproduced in Saeed, 1999, p. 55.

The above table shows that Pakistan's national savings rate during the 1970s was a mere 11.74 per cent, rising slightly to 13.81 per cent during the 1980s. This is considered to be a very low rate by the standards of comparable economies, where a rate of around 20 per cent is common (Zaidi, 1999, pp.288-289). This lack of savings is supposed to be 'one of the basic structural macroeconomic problems' faced by the country (Naqvi, 1993, p.46).

The Gross Domestic Investment in Pakistan during 1998-99 was only 14.91%. This is far lower when compared to 32% and 25% for low (including India and China) and middle income economies respectively (World Development Report, 1997, p.238).

1.1.5 Foreign Trade

The foreign trade gap in Pakistan has recently crossed the 3 billion US$ mark figure (Economic Survey 1995-96). Except for the years' 1947-48, 1950-51 and 1972-73, Pakistan's export surplus bill has always fallen short of its imports. During the first year of its existence (1947-48), Pakistan was preoccupied with huge economic and rehabilitation problems as a result of which little attention was paid to its industrial sector. Even with an extremely small magnitude of exports the trade balance at that time was positive. The positive trade balance of 1950-51 was attributable to the Korean War boom, which led to 140% increase of Pakistan's exports. In 1972-73 Pakistan once again had a surplus balance of trade. The success achieved in 1972-73 was the result of deliberate policy action including devaluation and export promotion measures.[11] The surplus was achieved partly as a result of a sharp increase in the volume and value of exports and partly due to slower increase in imports (Aslam, 1997, p.308). The following table indicates Pakistan's exports, imports and trade balance over the years.

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[11] In 1972 the PPP government devalued Pak rupee by about 58% with respect to US dollar.

Table 1-6

Exports, Imports and Trade balance
(US$ million at Current Prices)

Year	*Exports*	*Imports*	*Balance*
1947-48	138	96	42
1950-51	406	353	53
1960-61	114	457	-343
1961-62	114	470	-356
1970-71	420	757	-337
1972-73	817	797	20
1980-81	2958	5409	-2451
1990-91	6131	7619	-1488
1993-94	6685	8685	-2000
1994-95	7759	10296	-2537
1995-96	8311	12015	-3704
1996-97	8096	11241	-3145
1997-98	8434	10301	-1867
1998-99 p	5653	6844	-1191

Sources: Economic Survey of Pakistan 1992-93.Islamabad: Government of Pakistan, Finance Division, p.138 (Statistical Appendix).
Economic Survey of Pakistan 1998-99.Islamabad: Government of Pakistan, Finance Division, table 8.2, p. 83.

The structure and composition of Pakistan's exports and imports have changed over the years and can be analysed by the following table.

Table 1-7 Economic Classification of Imports and Exports
(Percentage)

EXPORTS				*IMPORTS*			
Year	*Primary Commodities*	*Semi-manufactures*	*Manufactured Goods*	*Capital Goods*	*Industrial raw material for capital goods industries*	*Industrial raw material for consumer goods industries*	*Consumer Goods*
1969-70	33	24	44	52	11	26	11
1979-80	42	15	43	36	6	42	16
1989-90	20	24	56	33	7	41	19
1990-91	19	24	57	33	7	44	16
1991-92	19	21	60	42	7	38	13
1992-93	15	21	64	42	6	38	14
1993-94	10	24	66	38	6	43	13
1994-95	11	25	64	35	5	46	14
1995-96	16	22	62	35	6	45	14
1996-97	11	21	68	37	5	43	15
1997-98	13	17	70	32	5	45	18
1998-99P	12	18	70	31	6	47	16

Source: Economic Survey of Pakistan 1998-99: Islamabad: Government of Pakistan, Finance Division, Statistical Appendix Table 8.6, p.86.
Note: The above figures are represented in terms of percentage share and not in absolute values. In absolute terms the imports for both capital and consumer goods have increased overtime. The change in their percentage share is actually the result of the difference in their rate of growth.

The above table shows a positive trend in the structural changes in Pakistan's exports. In 1969-70 the primary commodities constituted 33% of the total exports whereas semi-manufactured and manufactured goods constituted 24% and 44% of exports respectively. There has been a fairly steady and substantial decrease in the exports of primary commodities whereas the exports of manufactured goods have shown a relatively increasing trend. By 1997-98 primary commodities constituted only 13% of the exports while the export of manufactured goods reached a peak of 70%. The international prices of manufactured goods are more stable as compared with the prices of primary products, which are prone to severe price shocks. And if quality products are produced, then there is a large market for manufactured products.

However when we analyse the structural changes that have been taking place in the imports of Pakistan the result is not very optimistic. We know that for long-term sustained growth, capital goods are a prerequisite. However the above table indicates a decline in the import of both capital goods as well as industrial raw material for capital goods industries. Whereas the import of consumer goods (including industrial raw material for consumer goods industries) has been increasing over time, the imports of capital goods have declined from 52% in 1969-70 to 32% in 1997-98. Similarly the imports of industrial raw material for capital goods have also declined from 11% in 1969-70 to 6% in 1997-98.

1.1.6 Foreign Direct Investment (FDI)

Foreign Investment has a significant role in the promotion and diversification of economic growth, importation of new technology, efficient management and marketing techniques (GOP 1998c, p.18). The following table highlights the trends of FDI in Pakistan since 1970s.

Table 1-8

Year	*Foreign Direct Investment (million US$)*	*Foreign Direct Investment (% of total investment)*
1969-70 to 1979-80	21.25	0.8
1980-81 to 1989-90	119.10	2.2
1990-91 to 1995-96	792.00	4.8

Source: GOP (1998C) p.19 as reproduced in Makhdoomi p.69

One of the main contributing factors to the low percentage of FDI in total investment during the 70s was the wide spread nationalisation by the Bhutto regime (see section 2.1). There has been a rapid increase in FDI since 1970s both in terms of US million $ as well as a percentage of total investment. According to GOP, (1998c, p.19) the upward trend in FDI was basically due to the flow of investment to power sector because of the 'tailored incentives designed to attract investment to this area'.

However compared to the other Asian developing countries, Pakistan's position in terms of inward FDI is extremely weak. The following table reports the annual FDI inflows in Asian countries, including Pakistan.

Table 1-9 Annual FDI Inflows (US $ million)

Country	*1984-89*	*1990*	*1995*
Hong Kong	1422	1728	2100
Singapore	2239	5575	5302
Korea	592	788	1500
Chinese Taipei	691	1330	1470
Indonesia	406	1093	4500
Malaysia	798	2333	5800
Thailand	676	2444	2300
China	2282	3487	37500
India	133	162	1750
Pakistan	136	244	639

Source: Makhdoomi, 2000, p.70
The figures are simple annual averages.

Table 1-9 shows that Pakistan has not been able to attract FDI comparable to its Asian competitors, despite its liberal foreign investment policies.[12] The inability of Pakistan to attract foreign investment in relation to its competitors can be blamed on the political unstability of the country (Malik, 1994, p.301 & Makhdoomi, 2000, p.70).

1.2.0 Manufacturing Sector of Pakistan

1.2.1 Structure of the Manufacturing Sector of Pakistan

The industrialisation process that started immediately after independence has brought many drastic structural changes in the manufacturing sector of Pakistan. Pakistan's industrial experience is shown mainly in terms of large scale manufacturing[13] which contribute almost 75% share of total manufacturing (Saeed, 1999, p.113). The following table highlights the growth rates in the manufacturing sector of Pakistan.

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[12] For details on foreign investment policies see Saeed, 1999, pp. 426-430.
[13] Large scale manufacturing is defined as units employing more than ten people and using power in its operations Saeed, 1999, p.113.

Table 1-10

Growth Rates in Manufacturing in Pakistan

(Percentage)

	Annual Compound Growth Rate (%)	
Years	*Large-scale*	*Small-Scale*
1949-50 to 1959-60	15.4	2.3
1959-60 to 1969-70	13.3	2.9
1969-70 to 1979-80	4.7	7.6
1979-80 to 1984-85	9.8	8.4
1983-88 (6^{th} Plan)	7.5	8.4
1988-94	4.9	8.4

Source: Economic Survey of Pakistan *1993-94* Islamabad: Government of Pakistan, Finance Division p22 (statistical appendix) as reproduced in Saeed, 2000, p.86

During the 1950's the large- scale manufacturing sector grew at an annual rate of 15.4%. A major reason for the rapid expansion of this sector during this time was the post-Korean war era of 1952-56. Moreover depressed prices of raw materials and liberal import policies led to high returns on investments. During 1960's again very high growth rates of 13.3% in the large-scale manufacturing sector were recorded. These high rates of growth were mainly attributable to the economic policies adopted by the martial law government of that time. Manufacturing was accorded highest priority by the then government. The government introduced the export bonus scheme and a host of other new incentives for exporting. A multiple exchange rate system was put into operation that on one hand depressed the prices of industrial raw material and on the other hand inflated the prices of industrial output. The 1970's proved to be particularly bad for the manufacturing sector. The eruption of the war with India and the subsequent break up of the country, increase in the oil prices and international recession were contributing factors. The new government adopted the policy of distributive justice (nationalisation) as discussed earlier, which brought private investment to a standstill. The growth rate of the

large scale (LS) manufacturing sector dropped to 4.7%. However it is worth noticing that the small-scale (SS) industries growth rate, which had been quite nominal i.e 2.3% during the 1950's, rose to 7.6%. This reversal in trend seems to have taken place due to the conscious efforts of the government to encourage small industries. The Small Industries Development Corporation was also set up during this period (Makhdoomi, 2000, p.61).

During 1980's the growth rate of the LS manufacturing industry again accelerated because of the assurance from government of no further nationalisation. The SS sector also maintained its high growth rate at 8.4%. The following table can be used to analyse the structural changes in the manufacturing sector in terms of its contribution in GNP.

Table 1-11

Structure of Manufacturing Sector

(Rupees in millions)

Years	Contribution of Manufacturing Sector in GNP	Contribution of LS Manufacturing Sector (in GNP)		Contribution of SS Manufacturing Sector (in GNP)	
		Total	% Share	Total	% Share
1950-51	1042	342	32.82 (2.66)	700	67.18 (5.94)
1955-56	1727	942	54.55 (6.39)	785	45.45 (5.25)
1960-61	2278	1394	61.19 (7.91)	884	38.81 (5.01)
1965-66	3816	2796	73.27 (11.15)	1020	26.73 (4.07)
1970-71	5521	4293	77.76 (13.14)	1228	22.24 (3.76)
1975-76	6588	4843	73.51 (11.55)	1745	26.49 (4.16)
1980-81	9739	7153	73.44 (12.33)	25.86	26.55 (4.46)
1985-86	14872	11002	73.98 (13.60)	3870	26.02 (4.78)
1990-91	78969	56577	71.64 (11.11)	22392	28.36 (4.40)
1994-95	97487	N.A		N.A	
1995-96	102170	N.A		N.A	

Source: Economic Survey of Pakistan, 1995-96. Islamabad: Government of Pakistan, Finance Division, p.29 (Statistical Appendix) as reproduced in '*Economy of Pakistan*' by Saeed, 1999, p.113.

Note: The values in parenthesis show share of LS and SS manufacturing as percentage to GNP.

During the first year of 1950 the share of SS manufacturing Sector to total manufacturing sector was 67.18% while the share of LS manufacturing sector was 32.82%. However rapid industrialisation of the 1950's reversed the situation by increasing the share of LS sector to 54.55% and reducing the share of the SS sector to 45.45%. The above table indicates that the percentage share of LS manufacturing has risen much more rapidly than SS manufacturing sector due to its high productivity. The share of LS manufacturing rose from 2.66% of the GNP to 11.11%. When we look at the SS manufacturing its share to GNP fell from 5.94% in 1950-51 to 4.40% in 1990-91.

1.3.0 Conclusion

Pakistan's economic performance, despite the inconsistency in its economic policies has been quite impressive in terms of GDP growth rates. Pakistan experienced a structural change in the move from the agrarian to manufacturing or mixed economy as would be expected from a steadily developing economy. Manufacturing sectors percentage share in GDP increased from 7.8 per cent in 1949-50 to 18.6 percent in 1998-99 (table 1-2).

However in spite of Pakistan's ability to achieve high growth rates it still suffers from several fundamental structural weaknesses. Pakistan has been experiencing a consistently large balance of payments deficit (table1-6). It has failed to boost exports of its industrial products. The main factor for the disturbing export performance is stated to be its heavy dependence on primary commodities like cotton and rice and semi-manufactured goods etc that are subject to frequent price fluctuations in the world market. The inability of its

exports to match the increasing prices of its imports has become a major structural impediment to the overall growth of the economy.

Moreover Pakistan's saving rate of around 15% is also considered to be a key deterrent to economic expansion, especially since most East Asian economies have saving rates almost double Pakistan's (Zaidi, 1999, p.290). Low per capita income, real interest rate and foreign capital inflows are a few of the factors negatively influencing overall national saving in Pakistan.

This chapter has given an overall view of Pakistan's macro economic conditions and provided the basis for understanding the competitiveness of Pakistan's major industries discussed in the later chapters. The next chapter reviews the literature on competitive advantage as defined by Porter. It provides a theoretical framework on which the conceptualism of this dissertation is based.

Chapter 2

International Competitive Advantage Theoretical Framework

2.0 Introduction

This dissertation is fundamentally concerned with Porter's theory of competitiveness as defined in his book 'Competitive Advantage of Nations' (1998). In this book, Porter embraces the real complexity of economic reality to explain how industries and nations' competitive advantage arise, decline and shift overtime on a global scale. The simple logic behind his theory is that nation's competitiveness depends on the competitiveness of the industries and companies forming its industrial clusters. This chapter aims to summarize the essence of the cluster approach to competitiveness as presented by Porter and explain the ways as to how this approach has been applied in the empirical research of the current study.

The objective of this study is two-fold. Firstly the study aims to provide an insight on the process by which Pakistan's competitive industries are formed and also analyze the basis of their success. Secondly it aims to assess the potential of Pakistan's most important export oriented textile/apparel industry to grow to become a self-sustaining cluster of economic activity. Keeping these objectives in mind, Porter's theory of competitive advantage is thought to provide an appropriate base for developing the study.

2.1 Clusters and Related Concepts

Industry clusters are geographical concentrations of competing, complementary, or interdependent firms and industries that do business with each other and/or have common needs for talent, technology, and infrastructure. The firms included in the cluster may be both competitive and cooperative. They may compete directly with some members of the cluster, purchase inputs from other cluster members, and rely on the services of other cluster firms in the operation of their business (The H.Humphery Institute, 1999). Some of the examples of industry clusters include Hollywood's film industry; technology along route 128 in Massachusetts and Silicon Valley, California, Hartford, Connecticut's insurance and finance markets, etc.

The concept of cluster-based industrial development is not a recent one. Industrial agglomerations and clusters have been the focus of scientific research as long as modern national economics have existed. Over a century ago Alfred Marshall developed his idea of industrial districts. Other related concepts that have now become significant to the cluster approach are Ronald Coase's theories of the boundaries of the firms, first published in the 1930s (as quoted in Viitamo, 2001), and Joseph Schumpeter's views of the dynamics of competition also presented at that time.

Michael Porter popularized the concept of industry clusters in his book 'Competitive Advantage of Nations (1990). Based on his research in several countries he developed the 'Diamond Framework', a model that offers insight into clusters and competitiveness. His diamond framework is explained in section 2.3. Porter contends that regions develop a

competitive advantage based on their firms' ability to continually innovate, and that economic vitality is the direct product of the competitiveness of local industries.

Jacobs and De Man (1996) and Rosenfeld (1997) present an in depth discussions of different definitions of industry clusters. Jacob and De Man (1996) argue that 'there is no one correct definition of the cluster concept..... different dimensions are of interest.' They include key dimensions like geographical or spatial clustering of economic activity, horizontal and vertical relationships between industry sectors, use of common technology, the presence of a central actor (i.e., a large firm, research center etc.), and the quality of firm network, or firm cooperation (Jacobs and De Man 1996).

Rosenfeld (1997) emphasizes the role of social interaction and firm cooperation in determining the dynamic nature of a cluster. According to him an industry cluster is a geographically bounded concentration of similar, related or complementary businesses, with active channels for business transactions, *communications and dialogue* that share specialized infrastructure, labor markets and services, and that are faced with common opportunities and threats.

There are many common themes in the definition of an industry cluster according to the literature cited above. Firstly industry clusters are dynamic entities. They may change as the industries within them change. For example, as the computer hardware industry changed, the Twin Cities and Boston hardware cluster lost prominence in their states' economies and nationally. Both areas are trying to rebuild their information technology

clusters around new firms and new technologies (The H.Humphery Institute, 1999). Secondly, most of the definitions of industry clusters reference the geographical scope of the cluster, and the importance of spatial proximity. Rosenfeld (1997) and Jacobs and De Man (1996) argue that although geographical scope is important in defining clusters there is no uniform definition of an appropriate geographical scope. This is because every cluster has different geographical requirements. Thirdly a common theme in the literature is the importance of looking beyond individual industries and recognizing that individual firms are part of a much larger industrial system. It includes government, non-profit organizations, educational institutions, and other infrastructure and service providers whose presence is key strength to the cluster. The California wine cluster provides a good example of the complex nature of an industry cluster. The cluster includes 680 commercial wineries and several thousand independent grape growers; suppliers of grape stock, irrigation and harvesting equipment, barrels and labels; public relation firms and advertising agencies; world-renowned programs at the University of California; the Wine institute; and special committees of the California senate and assembly. Lastly, the role of social infrastructure in defining industry clusters is a theme prevalent in the literature. Rosenfeld (1997), in particular argues that information flow, is critical in an effective industry cluster, and, in order to facilitate information exchange, a social infrastructure is required. He emphasizes the importance of *trust* and a *shared vision* in order to create a dynamic nature of a cluster (Le Veen, 1998).

2.2 A Porterian Cluster Chart

To outline the internationally competitive industrial clusters, Porter presented cluster charts that assumed a standard form consisting of primary goods, specialty inputs, machinery for producing the primary goods and associated services. The visualization of cluster charts has been regarded as one of Porter's main contributions to cluster research. These charts have been used in chapter three of this study to outline the existing clusters in Pakistan's economy. Appendix A explains the methodology involved in creating the cluster charts.

The main criticism levied against Porter's cluster charts is its presentation. This includes the arbitrariness of locating the activities in different boxes and the lack of clear principle determining which activities to include in the cluster. Since clusters are not isolated entities, the activities and industries may belong to several clusters.

In short, it can be said that the cluster chart is an approximation and legitimate disagreements are possible as to how and where the industries are placed on the cluster chart. In this study the placement of the industries on the cluster chart was based on the discussions of the author with various industry officials. Nonetheless legitimate disagreements are possible.

2.3 Porter's Diamond Model

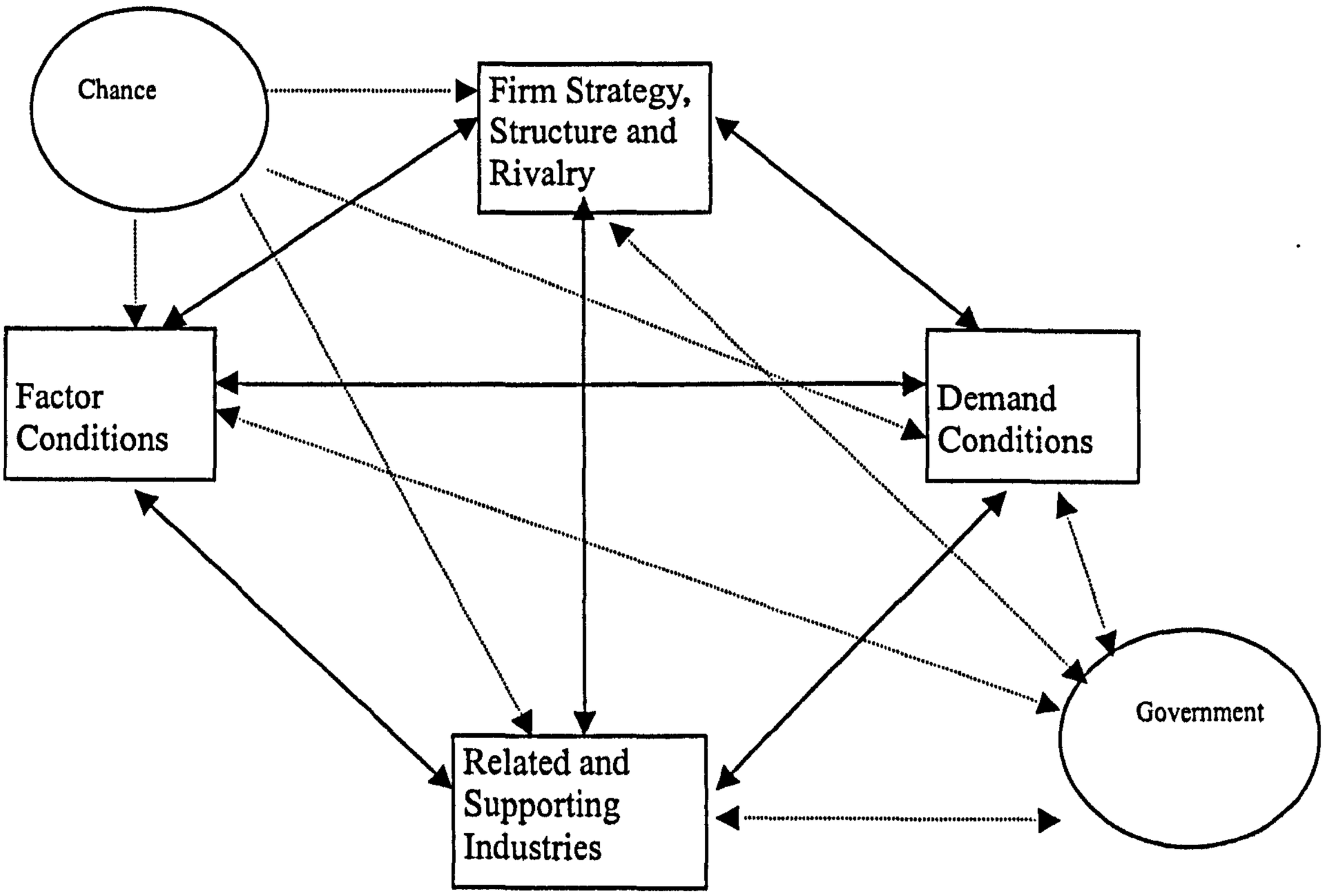
According to Porter 'the only meaningful concept of competitiveness at the national level is *national productivity*' (Porter 1998). In other words, Porter equates national advantage

with growth in GNP, based on the creation of competitive advantage in clusters of firms in high value added industries, success being measured in terms of share of world market rather than in terms of profitability.

Starting with industry as his fundamental unit of analysis, Porter proposes a very simple model, what he calls the 'diamond' of national competitive advantage. His case is argued on the basis of the nature and interactions between the four elements of this diamond, shown in the following diagram.

Figure 2-1

The Determinants of National Advantage



Source: Porter (1998), p. 127

2.3.1 Factor Conditions:

Porter poses a qualitative difference between 'basic factors' and 'advanced factors'. This is a key departure from standard neo classical theory that assumes that all factors are homogenous. Basic factors include physical resources like climate, geographical location, the size of the semi-skilled workforce, etc., while advanced factors are more specialized, and include highly trained personnel with special human capital, and 'knowledge resources' such as government and private research institutes, leading universities and industry associations, and modern communication infrastructure etc. According to Porter (1998), the stock of factors at any particular time is less important than the rate at which they are created and upgraded. In particular, continuous investments in the advanced and specialized factors are most important for sustaining competitiveness. There are three main rationales for this view: advanced and specialized factors are more difficult for the competitors to imitate; technological change transforms advanced factors into basic factors; and, to a certain extend advanced factors can compensate for the disadvantages in basic factors like lack of natural resources.

2.3.2 Demand Conditions

Despite the globalization of markets, Porter emphasizes the position of domestic customers as a core component of competitiveness in demand conditions. His main propositions here are that firms are better off when they face 'sophisticated demanding buyers' and when home demand composition is 'anticipatory' of buyer needs abroad. This is because firms are most sensitive of their spatially and culturally close customers

and also because understanding of the needs of such customers is also least costly for them. Furthermore Porter asserts that homebuyers form the most important source of pressure to innovate and to continuously improve products. He also argues that the size of the home market is only of secondary importance; it is the quality of home demand that is more important than the quantity (size) of home demand.

In case of developing countries 'demand' conditions are generally not advanced. But a possibility of consideration is that the potential home market demand for 'appropriate' modern but more labour intensive technology could be the basis for the development of an industry oriented toward exports to other developing countries.

2.3.3 Firm Strategy, Structure and Rivalry:

The third determinant in the diamond model is firm strategy, structure and rivalry. This determinant consists of a collection of relatively disjointed attributes associated with horizontal competition within the industry. It is partly a non-cluster specific element, because it embraces potential market entry of companies in other industries and competition caused by substituting products (Viitamo, 2001).

Porter asserts that no one managerial system is universally acceptable. There are various aspects of a nation that influence the ways in which firms are organized and managed, such as, attributes toward authority, norms of interpersonal interaction and attributes of workers towards management and vice versa. Although the goals of different stakeholders and the way incentive mechanisms work are of great importance, the driving

force in this determinant is the rivalry between domestic competitors. The logic here is that since domestic rivals operate within the same system of factor endowments *per se* are nullified. Domestic firms therefore must compete on the basis of higher order factors if they are to achieve sustainable competitive advantage against one another. This encourages innovation.

2.3.4 Related and Supporting Industries:

The final element of Porter's model of national competitive advantage is the development and clustering of related and supporting industries. The supporting industries are vertically linked input and machinery providers, as is shown in the cluster charts (see appendix A & chapter 3). Internationally competitive domestic suppliers are very important in providing state-of-art technology to customer industries.

Related industries are those that share common resources such as technology, production processes, marketing etc. or those that produce complementary products. Again, it is better that these supplier/related industries are in close geographic proximity because this would not only facilitate free and open information flow but also reduce transaction costs.

Finally, Porter points out two external factors that influence the basic determinants i.e 'chance' and 'government'. 'Chance refers to the factors that are more or less beyond the control of nations. These include factors like external political conditions, wars, pure inventions and breakthroughs in technologies etc. They can create discontinuities that can

nullify the advantages of previously prevailing competitors' hence providing opportunity to one nation's firms to supplant another's.

Government's role, Porter argues, is not as a fifth determinant, but in influencing the competitiveness enhancing character of the first four determinants, in particular through education and training, capital market regulations, and through its status as a major buyer. In short, the ideal role for the government is that of a background actor ensuring favorable conditions for business activities.

The 'diamond' operates as a dynamic system in which all elements must function in a more or less cohesive way for it to be effective. The effect of one determinant is contingent on the state of others. Reaping the maximum utility of the system usually requires the presence of all elements, but to some extent the inadequacies of one element can be compensated for by an abundance of the others.

2.4 Stages of National Competitiveness

Part of the dynamism of national competitive advantage, Porter argues stems from the fact that nations evolve over time through four distinct stages:

The factor driven stage in which 'virtually all internationally successful industries in the nation draw their advantage almost solely from basic factors of production'. Almost all developing countries are in this stage.

The investment driven stage in which national competitive advantage is 'based on the willingness and ability of a nation and its firms to invest aggressively, for example Korea.

The innovation driven stage in which the full and sustainable national comparative advantage emerges as all elements of the diamond are at work. Firms not only appropriate and improve technology and methods from other nations, but also create them, for example Japan.

The wealth driven stage a sort of decline stage in which the economy is carried along by the inertia of a time when the nation was more dynamic. The focus of such economies is on wealth preservation rather than wealth creation; for example Britain in 1980s.

The first three stages identified by Porter involve successive upgrading of a nation's competitive advantages and will normally be associated with progressively rising economic prosperity. The fourth stage is one of drift and ultimately decline. However, Porter acknowledges that these trends are generalizations; it is not axiomatic for every country to go through each of these stages especially the last.

2.5 Assessments and Criticism

Porter's pursuit of creating a general framework for analyzing national competitiveness has been criticized mainly for its excessive generalizations. Moreover the simplicity of Porter's 'diamond' has also been criticized. In fact, one reviewer describes it as 'just a pedagogic device for expanding a simple idea into hundreds of pages, dividing its four parts and four related 'stages' of development' (Clark, 1991).

Another general line of debate concerns the geographical area where competitive advantage is really created. Porter's model stresses the importance of home country and

competition between domestic companies as the main sources of competitive advantage. Thus it ignores the impacts of international business activities i.e. the strategies of multinational enterprises (MNEs). In reality, competitive clusters are usually transnational, concentrated especially in neighbouring countries. This demonstrates that some key determinants may be located outside national borders, and that national diamonds in fact exploit the strengths of various countries in many ways (Viitamo, 2001).

Porter does not seem to consider whether ownership (foreign or domestic) is an important factor. When Japanese automakers set up factories in Britain and beat home grown firms at their own game using the same factors of production, is it an indication of British competitive advantage or disadvantage, or of Japanese competitive advantage? Is the fact that major ownership and strategic control of an apparently domestic company reside outside its borders an important fact in assessing competitive advantage of nations?

The whole question of the transnationalism of companies is an important issue that Porter seems to have overlooked (Clark, 1991).

Many authors have also criticized Porter's view on 'blessedness' of rivalry as too simple. Intensive rivalry, especially between domestic companies, does not always guarantee efficient markets and a competitive advantage. Empirical cases show that fierce price competition may lead to the decline of companies, even in high-tech industries, implying that the means of competition do matter. Contrary to Porter's argument, history demonstrates that international success is possible through collusive behaviour, with

Germany and Finland providing good examples (see Viitamo 2001). Efficient inter-firm market behaviour can be a combination of rivalry and co-operation.

Another weakness of Porter's theory comes from the management perspective. His theory is frankly weak on how firms should structure their internal organizations to foster competitive advantage i.e. it emphasizes inter-organizational perspective, inter-firm rivalry, at the expense of an intra-organizational perspective. What is the role of the management in the diamond? How are firms to change themselves to move in the direction that he sees necessary?

Despite the widespread criticism and some obvious shortcomings of the diamond model, it still seems to provide a workable framework for analyzing industries and their competitiveness. The main advantage of the model is its genuine attempt to systematically identify the determinants of competitiveness and show how they are interrelated.

2.6 Identification of Industry Clusters

The varying definitions and dimensions of industry clusters outlined in the earlier sections explain the differing arguments regarding the methods and techniques used in its empirical research.

As for the methodologies, the main distinction can be made between hard (i.e. quantitative) and soft (i.e., qualitative) methods that have been used in varying

combinations. In the studies based on quantitative approach, industrial statistics and various statistical techniques are used for mapping clusters. The qualitative approach used in industry case studies relies more on information provided by company interviews etc.

An input-output (I-O) analysis is especially useful in the analysis of vertically integrated cluster, when the buyer-seller linkages are more obvious. However, the quantitative analysis does not address whether relationships really exist between the individual firms, and it does not account for other factors beyond the product-market relationships, such as industry collaboration and information flow (Doeringer& Terkla, 1995; Jacob & De Man 1996; Rosenfeld, 1997; Le Veen, 1998). 'Although inter-industry transactions incorporated within production channels can sometimes be detected in input-output tables, neither the character or relationships among firms nor the benefits of clustering can be discerned in this way (Doeringer and Terkla, 1995, p.228; Le Veen, 1998). There is a general consensus in the literature that in order to truly identify industry clusters it is necessary to conduct a qualitative analysis in addition to quantitative analysis. Surveys and interviews of key industry representatives will expand an understanding of the buyer-supplier relationships, as well as further identifying commonalities between industries (i.e. workforce or infrastructure needs, or technologies used) (Doeringer and Terkla 1995, Jacobs and De Man 1996, Sterberg 1991, Le Veen 1998).

The explicit objective in Porter's (1998) case studies has been to identify internationally competitive clusters. The standard technique used by him has been to calculate revealed

competitive or comparative advantage using trade statistics. The logic here is that relatively large market shares of international trade indicate competitiveness, which is then explained qualitatively in Porter's diamond framework. This second phase rests heavily on researcher's insight and ability to identify the actual determinants of competitiveness (Viitamo, 2001). Since the objective of the current study is to analyze the international competitiveness of Pakistan's industries in general, and the competitiveness of its textile/apparel industry in particular, the procedure used has been based on Porter's methodology. The qualitative industry information was collected from 39 establishments through company interviews and surveys. The emphasis of analysis of this study is therefore more on intuitive reasoning.

In undertaking such a task, we should acknowledge that a basic criticism against Porter's methodology has been its qualitative nature (Penttinen 1994; Viitamo 2001). The looseness in the methodology gives researchers degrees of freedom to draw conclusions. Furthermore, because of the unsystematic techniques, the results maybe difficult to compare across industries and countries.

Also using export market shares as an indicator of competitiveness as suggested by Porter, is not without its problems. International trade is increasingly internal transfer of intermediate products within multinational companies, which may be explained by factors with only weak connections to the real competitiveness of the industry in a country. To conclude, there can be many other complementary indicators of

competitiveness such as productivity, profitability, prices, quality of factors of production, etc that should ideally be taken into account.

2.7 Factors Driving Industry Cluster Growth and Development.

The factors that drive industry cluster development and growth are also subject to debate in the literature. In general, businesses locate where it makes the greatest economic strength, either in terms of accessing the market for their product, the labor pool, or required resources (Le Veen, 1998). The basic factors that drive industry clustering are very similar to the factors that encourage urban or locational agglomeration economies. As stated by Doeringer and Terkla (1995), 'the presence of positive externalities explains the clustering process whereas specific location sites for each cluster depend on either 'historical accident' or the cost advantages provided by immobile factors that attracted the firms anchoring the cluster' (Doeringer and Terkla 1995, p.226, Le Veen,1998). While there is consensus among the researchers that firms will cluster because they receive some type of benefit, the factors that create those benefits are debated. Some economists have cited face-to-face interaction as a critical factor in cluster development (Doeringer and Terkla 1995, Rosenfeld 1997). This interaction is most beneficial to small, specialized firms that have the flexibility to fill emerging niche markets as final demand or technology changes (Doeringer and Terkla 1995). Local proximity to firms in all aspects of the production process, such as the suppliers, machine builders, assemblers, distributors, and final customers allows the cooperating firms to adopt new technology and innovations rapidly, therefore increasing the overall efficiency of the production process. The firms *collaborate* to provide specialized services; through this collaboration,

clusters develop (Rosenfeld 1997). The social infrastructure within the cluster helps facilitate technology and knowledge transfer, which strengthens the cluster and promotes future growth. The importance of face-to-face interaction is cited in Rosenfeld's case studies of the future industry in Mississippi and the apparel/hosiery industry in Northern Italy (Rosenfeld 1997). Contradictory to this view, Michael Porter (1990) argues that *competition* is the driving force behind cluster development. He points out that competition influences the cluster development through its direct effect on productivity growth, innovation and new business formation.

Although researchers differ on *how* different factors promote cluster development, there is widespread consensus on the fact the cluster development is attributable to several key factors. Porter (1996) presents a number of factors that promote productivity growth, innovation and new business expansion that consequently leads to the development and growth of the cluster at large. The following sections summarize his arguments.

2.7.1 Clusters and Productivity (Porter 1996, pp.214-216)

Access to specialized inputs and employees

Locating within a cluster can provide superior or lower-cost access to specialized inputs such as components, machinery, business services, and personnel, as compared to the alternatives – vertical integration, formal alliances with outside entities, or importing inputs from distant locations.

Sourcing inputs from cluster participants ('local' outsourcing) can result in lower transaction costs than those incurred when using distant sources ('distant' outsourcing).

Sourcing within the cluster eases communication, reduces the cost of tailoring, and facilitates the joint provision of ancillary or support services, such as installation, debugging, user training, trouble-shooting and timely repair.

Access to Information

Extensive market, technical, and other specialized information accumulates within a cluster in firms and local institutions. This can be accessed better or at lower cost from within the cluster, thus allowing firms to enhance productivity.

Proximity, supply and technological linkages, and the existence of repeated, personal relationships and community ties fostering trust facilitate the information flow within clusters.

An important special case of the informational benefits of clusters is the availability of information about current buyer needs. Sophisticated buyers are often part of clusters, and other cluster participants often gain and share information about buyer needs (Porter 1996, pp.215-216).

Complementarities

A cluster enhances productivity not only via the acquisition and assembly of inputs but by facilitating complementarities between the activities of cluster participants. The parts of cluster are often mutually dependent. Bad performance by one part of the cluster can undermine the success of the others. Complementarities across products to create buyer value are pervasive, not only in service delivery but also in product design, logistics, and after sale service. Co-ordination and internal pressures for improvement among parts of a cluster, made possible by co-location, can substantially improve its overall quality or efficiency.

Marketing provides another form of complementarily within clusters. The presence of a group of related firms and industries in a location offers efficiencies in joint marketing (for example, firm referrals, trade fairs, trade magazines, and marketing delegations). It can also enhance the reputation of a location in a particular field, making it more likely that buyers will consider a vendor or manufacturer based there.

Access to Institutions and Public Goods

Clusters make many inputs that would otherwise be costly into public or quasi-public goods. The ability to recruit employees trained in local programs, for example, eliminates or lowers the cost of internal training. Firms can often access benefits, such as specialized infrastructure or advice from experts in local institutions at very low cost. Public investment in specialized infrastructure, educational programs, information, trade fairs, and other forms that benefit a cluster is encouraged by the number and visibility of

cluster participants and by the number of firms likely to experience spillover benefits from such investment.

Incentives and Performance Measurements:

Clusters improve the incentives within companies for achieving high productivity for several reasons. Foremost is the competitive pressure. Rivalry with locally based competitors has particularly strong incentive effects because of the ease of constant comparison and because local rivals have similar general circumstances (for example, labour costs and local market access), so that competition must take place on other things. Pride and the desire to look good in the local community motivate firms in their attempts to outdo each other. Clusters also facilitate measurement of the performance of in-house activities because, often, other local firms perform similar functions. Managers gain wider opportunities to compare internal costs with arms length transactions, and lower employee monitoring costs by comparing employee performance with them locally.

2.7.2 Clusters and Innovation (Porter 1996, pp. 220-224)

Some of the same cluster characteristics that enhance current productivity are even more important to innovation. Firms within a cluster are often able to more clearly and rapidly perceive new buyer needs. Firms in a cluster benefit from the concentration of firms with buyer knowledge and relationships, the juxtaposition of firms in related industries; the concentration of specialised information-generating entities, and buyer sophistication.

A firm within a cluster often can more rapidly source the new components, services, machinery, and other elements needed to implement innovations, whether a new product line, a new process, or a new logistical model. Local suppliers and partners can get closely involved in the innovation process, thus ensuring that the inputs they supply better meet the firm's requirements. New, specialized personnel can often be recruited locally to fill gaps required to pursue new approaches. The complementarities involved in innovating are more easily achieved among nearby participants.

2.7.2 **Clusters and New Business Formation** (Porter 1996, pp. 224-227)

Many if not most new businesses (that is head offices, not branch offices or ancillary facilities) form within existing clusters rather than at isolated locations. This occurs for a variety of reasons. First, clusters provide inducement to entry through better information about opportunities. The existence of a cluster in itself signals an opportunity. Individual's workings somewhere in or near the cluster more easily perceive gaps in products, services, or suppliers to fill. Having had this insight these individuals more readily leave established firms to start new ones aimed at filling the perceived gaps.

Opportunities perceived at cluster locations are pursued there because barriers to entry are lower than elsewhere. Needed assets, skills, inputs and staff, often readily available at cluster location, can be assembled more easily for new enterprise. Local financial institutions and investors, already possessing familiarity with the cluster may require a

lower risk premium on capital. In addition the cluster also represents a significant local market. All these factors lower entry barriers hence, leading to further cluster growth.

2.8 Cluster-based Approach_ Evidence and Results

In the effort to increase competitiveness, the cluster approach serves two general purposes. First, it helps enterprises to see their position and significance in a context beyond their day-to-day business environment. An increased awareness of cluster linkages broadens the scope of actual business opportunities, contributing to networking and knowledge spillovers between actors in the cluster. Second, and more important, cluster studies serve as a tool for policymakers trying to enhance the competitiveness of industrial clusters. By acknowledging the central role of the government, the cluster approach indicates strong policy orientation.

Since the publication of 'Competitive Advantage of Nations' Porter (1990) there have been a substantial number of studies based on the cluster approach to competitiveness. The book has helped motivate important national projects or studies in a number of countries, regions and states, for example California, Arizona, Morocco, Scotland etc.

The application of the cluster-based approach to the developing countries is also on the rise. A number of national projects based on the cluster approach have been undertaken in Bermuda, Peru, Venezuela, Bulgaria and Columbia among others (Porter 1990). However information on these studies is more difficult to access. Moreover the initiatives resulting from these studies are also still obscure. Nonetheless

it is hoped that the overview of the study undertaken in Venezuela provides a good insight on the nature of the studies carried out in the developing world.

Most of the studies based on the cluster-approach have been carried out with the objective of identifying clusters and understanding specific needs of the industries within these clusters, so that planners can build on the existing strengths in the region and provide more appropriate assistance to business. However since the countries and regions differ in their initial economic conditions and therefore cluster interpretations, they arrive at different policy priorities. In general, Boekholt and Thuriaux (1999) have distinguished four policy regimes, grouped as models for the cluster approach. *The national advantage model* that follows directly from the Porterian line of reasoning, aims to improve the competitive conditions of clusters based on certain criteria important to the country. *Small and medium sized enterprises model* _ aims to promote networking between SMEs. Here public agencies initiate collaboration that is usually a prerequisite for enterprise innovation. *The regional policy model*_ here the initiatives to stimulate clustering are mostly dependent on, among other things the distribution of decision-making power between the central and local authorities. *The research- industry relations model* where the principal objective is to stimulate collaboration between industry and research institutes to make better use of knowledge resources. Here the focus is on creating networks within spatially concentrated centres of excellence, especially around emerging technologies. To implement these models different countries/states may employ different set of actions of tools. For example some countries/states may influence the *framework conditions* by providing

specialized facilities like R&D, technology centres etc with the objective of altering the competitive conditions of a cluster. Some studies have indicated the use of *strategic actions* for clusters through the provision of strategic information (market information, benchmarking), by facilitating communication within or outside the cluster. Some researchers have projected the use of policy programs as mechanisms for allocating support to collaboration projects. Overviews of some indicative studies are discussed below. Also at the end of the section some useful references are provided for attaining information on some other studies.

Arizona

In 1988, The Enterprise Network in Arizona formed a task force to design a strategic planning effort for the economic development for the State. In 1989, the Arizona Legislature enacted the Omnibus Economic Development Act directing the department of Commerce (DOC) to assess Arizona's business climate and draft the first state wide strategic economic development plan. In 1990, Arizona Strategic Planning for Economic Development, or ASPED was formed. In the first phase of the ASPED process, Arizona's key clusters were identified. The second phase dealt with the formulation of the Strategic Plan for the development of the state.

The final phase of the ASPED process was designing the Strategic Plan's implementation that was completed in June 1992. This implementation process is known as the *Governor's Strategic Partnership for Economic Development*, or *GSPED*. GSPED is a public/private partnership that operates to enhance the competitiveness of the state's economy through export-driven industry clusters.

However it is important to mention here that while the state serves to coordinate their agencies efforts, it's the industry leaders that actually drive the cluster. In Arizona, the state does not provide the cluster groups with any money, nor does it limit the clusters with which it works. Instead it encourages the self- identification of clusters. For example an initial study of the state's key industries did not include the optics cluster. But when the industry leaders came forward and showed their value to the economy, it was added to the list of clusters with which the state continues to work[1].

Minnesota

In Minnesota, the State and Local Policy (SLPP) identified several key clusters in its different regions. SLPP'S analysis of these clusters revealed that many participants of the identified clusters were either using or could benefit from an industry cluster approach to their work. Some of the initiatives undertaken in Minnesota under the cluster approach are as follows;

Minnesota State Colleges and Universities (MnSCU) initiated a *Targeted Industry Partnership Project*, which involves five key industries and educational institutions. The program is an effort to develop a curriculum that meets industry standards and to address other related issues.

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[1] *Creating a 21st Century Economy: Arizona's Strategic Plan for Economic Development* (ASPED) 1992. Arizona Strategic Planning for Economic Development as discussed in The H.Humphery Institute *Preliminary Report, Industry Clusters* January 1999.

The Department of Trade and Economic Development created five '*industry specialists*' positions to increase the understanding of and facilitate the delivery of services to specific industry clusters in the state. These clusters include computer and electrical components; heath care and medical products; printing and publishing; tourism; and wood products, plastics, and composites. The industry specialists provide technical assistance and information to business on financial services, supply sources, trade opportunities and strategic partners.

The Minnesota Department of Transportation (MnDOT) is working with four key industry clusters (medical devices, computing, printing and publishing, and meta working and machinery) to address their transportation needs.

The examples above indicate that the industry in Minnesota is willing to work in cluster groups with government and educational institutions. However their efforts are not generally coordinated with a team of industry leaders or across public agencies as was the case in Arizona's GSPED program.

Massachusetts

With the assistance of Michael Porter, the author of Competitive Advantage of nations, Massachusetts engaged in a state-wide analysis of its economic base. Clusters were identified regionally and the specific context that may have produced the cluster in the region was carefully assessed. This intensive research led to the state wide initiative, *Choosing to Compete.* The Massachusetts study focused heavily on the base

economy (export-oriented) of the state, specific regional economies, and what economic development efforts can be pursued to improve the state's export industries[2].

Greater Tucson Area

A Strategic Plan has been formulated in the greater Tucson area that encourages recruitment, retention, and expansion of specific clusters of industries in the area and overall community development. The Plan aims on recognizing the importance of collaborating with the state- wide cluster-based strategy.

Other examples include *Collaborating to Compete in the New Economy*: A state-wide strategy with a regional focus in California and *Oregon Shines* also a state-wide strategy that identifies key industries to the 'vitality, diversity, and competitiveness of Oregon's economy.

Venezuela

A nationwide project was carried out in Venezuela under the title of 'Venezuela Competitiva' in November 1992 and proceeded throughout 1993 and the first half of 1994. The methodology and the overall conceptual framework of the study were based on the concept of international competitiveness as defined in Porter's book of 'Competitive Advantage' of nations.

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[2] *Choosing to Compete: A Statewide Strategy for Job Creation and Economic Growth.* 1993. The Commonwealth of Massachusetts. Also see http://www.massmac.org/industry_clusters.htm

The project was designed to be a comprehensive and exhaustive study of Venezuelan economy. The 14 'key issues' examined by this project included: education, training, foreign investment, technological development, new business formation, the informal economy, domestic rivalry, state-owned enterprises, international trade agreements, energy, environmental regulation, transportation, communication, and productivity growth. The goal was to understand the impact that each of these areas has had on the competitiveness of Venezuelan firms in both a general and a specific sense. The 13 industries subject to study were chosen to provide a representative cross-section of the Venezuelan economy. This cross-section included several resource-based industries (oil, petrochemicals, steel, and aluminium), agricultural sectors (rice, cocoa, and pulp and paper), a service industry (tourism), two import substitution industries (automotive vehicles and parts, and textiles) and several other 'talent-based industries (engineering, software, and telenovelas_ (a form of soap opera). The overall objective of the project was to study a representative set of industries to determine the sources of advantage and disadvantage, as well as the key leverage points, in the Venezuelan environment. The study pointed out the potential, as well as obstacles for development in the Venezuelan environment. It provided a framework and recommendations for the government and firms in Venezuela to find its path to economic prosperity based on the cluster approach. However the initiatives taken by the government based on this study are still not clear (Enright, 1996).

A significant number of other studies of similar nature have been carried out in the developing countries like Columbia, Bolivia, Peru and India etc. It is believed that

these studies have created awareness in the third world of the concept of competitiveness as a key to economic success. However the extent to which these nations can put into practice the principles outlined in these studies varies with the capacity of each nation. In some countries progress has been made in this regard. For example the Chamber of Commerce in Bogotá (Columbia) has appointed a vice president for competitiveness. The key responsibility of this person is to keep competitiveness at the forefront of discussions in business and public meetings. Nonetheless it seems that the developing world has yet to adopt policies and initiatives geared towards the cluster approach to development (Fairbank, 1997)

Some useful work using cluster-based analysis also includes

1) *Prospects for Marine Biotechnology in Maine* (Colgan & Baker, 2000) _ this study analysis the competitiveness of the marine biotechnology industry in Maine under the diamond model using industry (meso) level data. It makes recommendations based on the cluster approach for enhancing the growth of the industry. The general conclusions drawn from this study emphasize the importance of R&D, research funding and education to the development of the cluster and are broadly consistent with the Porter's approach to cluster development.

http://www.muskie.usm.maine.edu/csc/homepage/Maine%20Biotech%20Report.pdf

2) *Cluster Analysis and the Forest Sector* (Viitamo, 2001)_ This study illustrates how the cluster approach can be used to investigate the competitiveness of the forest industries at the EU level, taking into account the impacts of future EU enlargement. Although the results of the study are broadly consistent with the Porterian line of

reasoning, this study emphasizes the importance of a more holistic and systematic methodology based on quantifying variables to supplement the diamond model. http://www.iiasa.ac.at/Publications/Documents/IR-01-016.pdf

3) *'The Competitive Advantage of Singapore'* Porter (2001)

http://www.people.hbs.edu/mporter/caon%20singapore%2008-02-01%20ck.pdf

This study uses macro (country) level data and makes extensive use of the diamond model to assess the transition of the Singaporean economy into the innovation driven stage.

4) Humboldt County, Oregon, *The North Coast Strategy* (Prosperity Journal 2001-2002) _ this website identifies cluster based strategies and action plans for enhancing the global competitiveness of the North Coast.

http://www.northcoastprosperity.com

5) Cairns and Tropical North Queensland, Australia_ *Industry Cluster Program*_ This website gives overviews of the industry cluster programs undertaken in Queensland, Australia.

http://www.credc.com.au/cluster.htm

Most of the studies cited above either use macro (country) or meso (industry) level data in their analysis of the cluster study. The current study differs from the previous work and makes certain advances using micro level data for the analysis of the cluster promoting mechanisms in the industry. It supplements the diamond model by using statistical methods to incorporate strategic issues into its analytical framework.

2.9 Significance of the Study

A major contribution of this present study will be the empirical evidence gathered from the most significant export oriented textile/apparel industry of Pakistan. It is expected that the findings of the impact of various cluster- promoting mechanisms upon the competitive behaviours of individual firms as well as the industry at large will add empirical evidence to the existing literature on cluster approach and competitive advantage.

Secondly since the research uses micro level data, it is, in itself a methodological contribution to the existing knowledge of the cluster phenomenon. As mentioned earlier there have been a large number of empirical works devoted to the analysis of macro (country) and meso (industry) data on the cluster approach.

Thirdly, the existing literature in the fields of cluster approach in the LDC's tends to focus primarily on analysing the weaknesses and problems associated within their diamond model. It is anticipated that this empirical research will build upon the existing literature by analysing how the mechanisms that create an imbalance between the external environment and the competitiveness of the industry at large may be redressed.

Lastly as the importance of 'competitiveness' spreads in the LDC's more and more companies are likely to become interested in the cluster- based approach. The findings of this research will make a useful contribution to government policy makers in

formulating macro policies towards prominent clusters and assisting firms as well as public institutions in making relevant investments towards the infrastructure.

2.10 Conclusion

This chapter summarizes the essence of the cluster approach and its development over the years. Since the publication of Porter's pioneering studies on the competitiveness of nations, the cluster approach has been adopted as a general framework in formulating industrial policy in the majority of industrialized countries in the West. This study attempts to illustrate how the cluster approach can be used to investigate the competitiveness of the less developed countries (LDCs) like Pakistan with particular emphasis on its textile/apparel industry.

Although Porter's approach to cluster development has been criticized on a number of issues, it is believed that his 'diamond' model would provide an appropriate base to develop this study.

The next chapter outlines the competitive industries of Pakistan using Porter's methodology of export market share as an indicator of competitiveness. It develops cluster charts and analyzes the competitiveness of Pakistan's industries under the 'diamond' framework.

Chapter 3

The Genesis and Evolution of Competitive Industries of Pakistan

3.0 Introduction

This chapter aims to explain the patterns of national advantage in Pakistan and how they have been changing over time. We know that a healthy pattern for national income growth is a shift toward more sophisticated and productive segments and expanding positions in industries involving more advanced technology and more skilled human resources. Although rising national world export share can be a sign of upgrading, the type of industries that are gaining and losing competitive position are more indicative of a healthy upgrading in the economy (Porter, 1990, pp.6-12).

In this chapter, the presence of competitive advantage in industries has been measured by a significant and sustained share of world exports. Those industries have been identified as competitive industries in which Pakistan's share of world market economy exports equalled or exceeded its average share of world trade in the particular year[1].

The pattern of success and failure in the economy sheds light on the fundamental determinants of productivity in the nation, because it bears on the capacity of a nation's industry to compete in sophisticated industries and segments. National economic prosperity depends not only on the pattern at any point in time, but also especially on the capacity of the nation's industry to upgrade over time (Porter 1998). In this chapter I have identified every industry in Pakistan in which there was evidence of international

[1] A fuller description of how the profiles were developed is explained in Appendix A.

competitive advantage at two points in time: 1985 and 1996 (the most recent year for which data was available) so as to analyze the changing trade pattern of the economy.

In this chapter I would use the 'cluster chart' to better illustrate the patterns of Pakistan's advantage. I will use Michael Porter's framework of the 'diamond' to analyse the competitive advantage and the existing clusters in Pakistan's economy.

3.1 Patterns of Pakistan's Competitive Advantage

An initial understanding of the patterns of competitive success in Pakistan's industries can be gained by analysing its top industries[2] in 1996 in terms of share of world exports.

[2] Industries in which Pakistan's share of world market economy exports equaled or exceeded its average share of world trade in the particular year.

Table 3-1
Pakistan's Competitive Industries in Terms of World Export Share 1996

Serial Nos	Code	Commodities	World Export	Pak Exports	Pak Export
			Share %	US$000	Share%
1	O42	Rice	7.18	500657	5.37
2	658	Textile Articles nes	6.88	929274	9.97
3	652	Cotton fabric wovn	6.49	1403068	15.05
4	651	Textile yarn	4.94	1672574	17.94
5	848	Non txtl clothing	3.27	438237	4.7
6	263	Cotton	3.12	458658	4.92
7	659	Floor covering	2.38	238495	2.56
8	847	Clothing Assessories	2.23	160985	1.73
9	611	Leather	1.69	263112	2.82
10	653	Wovn manmade fib fabric	1.66	519113	5.57
11	844	Undergarments non knit	1.56	204540	2.19
12	846	Undergarments knitted	1.48	398033	4.27
13	655	Knitted etc fabric	0.92	93500	1
14	842	Mens outerwear non knit	0.9	279931	3
15	291	Crude animal materials nes	0.79	28602	0.31
16	845	Outerwear knit non elastic	0.66	238336	2.56
17	O75	Spices	0.6	11971	0.13
18	872	Medical instruments	0.56	104884	1.13
19	894	Toys, sporting goods etc	0.54	223358	2.4
20	O36	Shell fish,fresh, frozen	0.54	95216	1.02
21	843	Womens outerwear non knit	0.51	220900	2.37
22	656	Lace, ribbons,tulle etc	0.49	20957	0.22
23	696	Cutlery	0.49	19893	0.21
24	O35	Fish salted dried smoked	0.46	13253	0.47
25	O61	Sugar and Honey	0.36	51887	0.56
26	292	Crude vegetable materials	0.36	54662	0.59
27	269	Waste of txtl fabric	0.33	5221	0.06
28	268	Wool (excl tops) anml hair	0.33	16791	0.18
29	899	Other manufactured goods	0.31	58913	0.63
30	223	Seeds for oth fixed oils	0.26	2137	0.02
31	657	Special txtl fab pdts	0.24	41587	0.45
32	271	Fertilizer crude	0.21	3600	0.04
33	612	Leather etc manufactures	0.2	12155	0.13
34	O34	Fish fresh chilled frozen	0.17	33973	0.36

Source: Calculated from International Trade Statistical Yearbook 1996, volume II
Note:
1)All the above identified industries are those in which Pakistan's share of the world market exports has exceeded its average share of world exports in the year 1996.This is referred to as the cut-off point.
2) Pakistan's total exports in 1996 were 9321 US$ Million
World 's total exports in 1996 were 5149910 US $ Million
Pakistan's average share of world exports or cut-off point was 0.18 percent
3) Conversion of values from national currencies into United States dollars is done by means of currency conversion factors based on official exchange rates.
4) In case of exports, the transaction value is the value at which the goods were sold by the exporter, including the cost of transportation and insurance, to bring the goods on to the transporting vehicle at the frontier of the exporting country (a f.o.b valuation)

Figure 3-1

Potential Clusters of Internationally Competitive Pakistan Industries 1996

Primary goods	Materials/Metals	Forest Products	Petroleum/chemicals	Semiconductors computers	Multiple Business Other Manufactured Goods
Machinery					
Speciality Inputs					***Crude animal material*** *Crude vegetable material*
Services					

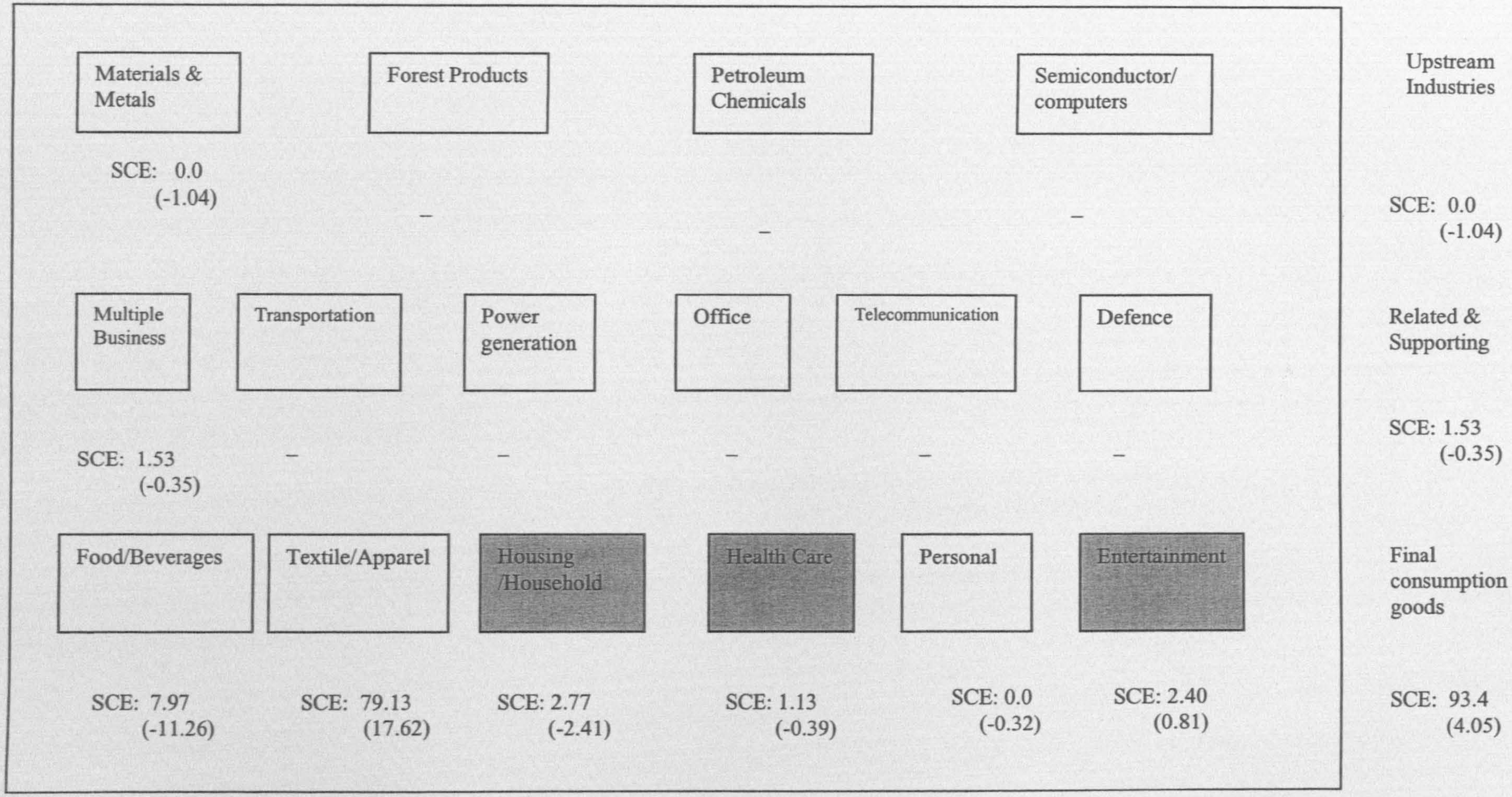
Primary Goods	Transportation	Power generation	Office Products	Telecommunication	Defence
Machinery					
Speciality Inputs					
Services					

Continuation of Figure 3-1

Primary Goods	Food/Beverages Basic Food ***Rice*** Fish fresh, chilled, frozen *Sugar & Honey* *Fish Salted dried* *Shell fish fresh* *Spices* Edible oils Seeds for other fixed oils	Textile /Apparel ***Cotton fabric woven*** ***Woven fib man-made fabric*** ***Knitted etc fabric*** ***Waste of textile fabric*** Apparel/articles ***Textile articles NES*** ***Non textile clothing*** ***Undergarments non-knit*** ***Undergarments knitted*** ***Men's outerwear non-knit*** *Outerwear knit non elastic* *Women's outerwear non knit* Special textile fabric products Leather manufactures Accessories ***Clothing accessories*** *Lace ribbons, tulle etc*	Housing/household ***Floor coverings*** *Cutlery*	Health Care *Medical instruments*	Personal	Leisure *Toys sporting goods etc*
Machinery						
Speciality Inputs	Fertilizer crude	***Cotton*** ***Textile yarn*** ***Leather*** Wool (excl tops) animal hair				
Services						

Key:
Roman = 0.18% world export share or higher
Italics = 0.36% world export share or higher but less than 0.72%
Bold Italics = 0.72% world export share or higher
Note: The cluster chart shows all the 34 competitive industries of 1996. See Table 3-1

Figure 3-2 Percentage of Pakistan's Exports of Competitive Industries by Broad Cluster 1996



Note: The numbers in parentheses are changes between 1985_96
Exports are those of competitive industries not all industries

Identifies broad sectors in which nations international competitive positions are related to each other.
Key: SCE= Share of country exports (i.e share of Pakistan's exports in relation to its total exports)

Figure 3-3 Percentage of Pakistan's exports by Cluster and Vertical Stage 1996

	Materials & Metals		Forest Products		Petroleum/ chemicals		Semiconductors/ computers		Upstream Industries	
	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE
Primary goods	0	-0.09	0	0	0	0	0	0	0	-0.09
Machinery	0	0	0	0	0	0	0	0	0	0
Speciality Inputs	0	-0.95	0	0	0	0	0	0	0	-0.95
Total	0	-1.04	0	0	0	0	0	0	0	-1.04

	Multiple Business		Transportation		Power generation		Office		Telecommunication		Defence		Industrial Supporting Functions	
	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE
Primary Goods	0.63	0.37	0	0	0	0	0	0	0	0	0	0	0.63	0.37
Machinery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speciality Inputs	0.9	-0.72	0	0	0	0	0	0	0	0	0	0	0.9	-0.72
Total	1.53	-0.35	0	0	0	0	0	0	0	0	0	0	0.9	-0.35

	Food & Beverages		Textile / apparel		Housing/household		Health		Personal		Entertainment		Final Consumption gds	
	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE	SCE	^SCE
Primary Goods	7.93	-8.11	53.27	23.91	2.77	-2.41	1.13	-0.39	0	-0.32	2.40	0.81	67.50	13.49
Machinery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Speciality Inputs	0.04	-3.15	25.86	-6.29	0	0	0	0	0	0	0	0	25.9	-9.44
Total	7.97	-11.26	79.13	17.62	2.77	-2.41	1.13	-0.39	0	-0.32	2.40	0.81	93.4	4.05

Note: Totals may not add due to rounding
Key: Share of Pakistan's total exports 1996 (SCE)
Change in share of Pakistan's exports 1985-96 (^SCE)

The above table shows that the range of competitive industries in Pakistan is quite narrow. The thirty-four commodities shown in table 3-1 altogether constituted approximately 95% [3] of Pakistan's exports in 1996. In fact a close analysis of the above table shows that Pakistan's exports are heavily concentrated in few categories. Five commodities leather, rice, textile yarn and sports goods (ISIC 263, 611,042,651,894) alone constituted 33% of Pakistan's exports in 1996[4]. More interestingly cotton group alone accounted for more than 61% of the export earnings of Pakistan in 1996[5]. High degree of concentration in exports of few items can be major source of instability in the export earnings. A poor cotton crop alone can seriously affect the overall export earnings.

The cluster charts[6] shown in figure 3-1 and 3-2 better illustrate the patterns of national advantage in Pakistan's industries. Porter has assigned great importance to vertical relationships among industries in stimulating competitive advantage. Accordingly the industries are grouped in the chart by end-use application. Across the top row are the broad sectors containing industries whose primary products are inputs in many industries; they are termed upstream sectors. Across the middle row are the broad end-use sectors involving industrial or supporting functions. Along the bottom row are end-use sectors most associated with final consumption goods. Within each broad sector, internationally successful industries are grouped into primary goods, machinery (and other equipment) used in making them, specialised inputs to the goods, and services associated with the goods or their production. This allows the examination of the vertical relationships among

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[3] Calculated from table 3-1
[4] Total exports of these five commodities amounted to 3118359 US$ Million (table 3-1)
[5] 11 commodities in table 3-1 were included in the cotton group. Their ISIC codes are 658,652,651,263,844,846,655,842,843,657,269.
[6] It is important to mention here that the cluster chart is an approximation and legitimate disagreements are possible as to how and where the industries are placed on the cluster chart. However in this dissertation it is hoped that the cluster chart provides a useful picture of the economy.

successful industries and the depth of national clusters[7]. How Pakistan's internationally successful industries are distributed by end-use sector and level in the chart is an interesting analysis for understanding Pakistan's competitive position.

Figure 3-1 profiles all the competitive industries in Pakistan's economy. Figure 3-2 gives percentage of Pakistan's exports of competitive industries by broad cluster. It provides summary calculations of the patterns of exports by competitive Pakistan industries. The cluster chart shown in figure 3-1 and 3-2 indicate that by far the most important cluster is in the textile/apparel related industries where competitive industries accounted for nearly 80% of the total Pakistan exports in 1996[8]. A second significant cluster is in food and beverages industries that accounted for approximately 8% of the country's total export earnings[9]. Other more isolated historical positions include a range of final consumption goods such as cutlery, medical instruments, baby carriages and sports goods etc. Figure 3-2 shows that in Pakistan upstream industries and related and supporting sectors are almost non-existent in terms of export competitiveness. Almost all the competitive industries lie in the final consumption goods sector. In fact final consumption goods constitute 93% of the total exports of Pakistan. Important links among clusters are illustrated by shading in figure 3-2. Pakistan's position in household products (cutlery), health care (medical instruments) and entertainment (sports goods, toys etc) are all connected by the history of

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[7] See appendix A for further details on the computations of trade patterns.
[8] The calculations are based on table 3-1.
[9] Calculations are based on table 3-1. ISIC codes included in food and beverages industries are 042,075,036,035,061,223 and 034.

high quality of craftsmanship of the country. The economies resulting from the strong link of craftsmanship are evident from the fact that all these industries are closely located in the city of Sialkot which is famous for its craftsmanship.

Porter (1998) has emphasised the importance of vertical linkages among industries in stimulating competitive advantage. Figure 3-3 gives percentage of Pakistan's exports by cluster and vertical stage. It shows that Pakistan's industries have virtually no position in specialised machinery associated with its clusters like leather working machinery, spinning machines or tractors. Apart from its textile related cluster, its position in speciality inputs is also negligible. The textile apparel related cluster tends to contain a wide range of final products as well as competitive industries producing intermediate products (finished leather, woven cloth etc). Even in this most important cluster that constitutes approximately 80% of export earnings, Pakistan's position in machinery is non-existent. Pakistan's export share (in terms of its total exports) in food and beverages has declined by approximately by 12% from 1985-1996[10]. In spite of the fact that this sector constitutes the second most important cluster in the economy, Pakistan's position in most areas of food and consumer packaged goods, unprocessed food etc. is too weak to show up or make a significant contribution in its exports.

Pakistan's position, in terms of export earnings have increased by more than 17% in the textile/apparel cluster. In this sector the exports of primary goods have increased by approximately 24% while the exports of speciality inputs have decreased by 6.29% (see figure 3-3). This signifies the increasing utilisation of speciality inputs by this sector, for the production of value added consumer goods.

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[10] See figure 3-2

The above discussion has attempted to reveal the existing potential clusters in Pakistan's economy. The next section uses Porter's framework of the diamond to analyse these clusters and their pattern of competitive advantage.

3.2 Factor Conditions

3.2.1 Favourable Land and Climatic Conditions

Pakistan's growing conditions are very favorable for certain type of crops especially rice, cotton, sugarcane, maize and wheat. Rice and cotton are the two main export items of Pakistan.[11] The performance of the agriculture sector depends to a large extent on the vagaries of the nature. Adverse climatic conditions affect the output of various crops. For example wheat is the main staple food of Pakistanis and is the largest grain crop of the country. But often the spell of dry season mars the production of wheat and Pakistan ends up importing this crop to supplement its domestic production.

Although Pakistan is endowed with favorable climatic conditions and huge quantity of arable land, it is still not self-sufficient in food[12]. The process of mechanization and modernization in the agriculture sector of Pakistan is extremely slow. This is not surprising considering the fact that Pakistan's firms hold virtually no position in specialized machinery associated with even its most important clusters as shown in cluster charts 3-1 and 3-2[13]. Figure 3-1 shows that in spite of the agrarian economy, Pakistan's food and beverages cluster has a narrow range. Pakistan's position in most areas of food and consumer packaged goods processed and unprocessed food etc. is too weak to show

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[11] Rice constituted 5.37% of Pakistan's total exports in 1996. Pakistan's world export share in rice was 7.18% in 1996. Cotton related cluster constituted more than 60% of Pakistan's exports. See table 3-1.

[12] Pakistan spends millions of rupees each year on the import of grains, pulses and flours. In 97-98 it spent 31761 million rupees on the imports of these articles (Economic Survey 1998-99). Also see appendix A table 3-2A for major imports of Pakistan.

[13] Pakistan has now recently started producing some spare parts for the tractors.

up or make a significant contribution in its exports.

3.2.2 Natural Resources

The fishing industry of Pakistan harvests various species of fish that figure predominantly in the food/beverages related cluster of Pakistan (see figure 3-1). The fishing industry contributes substantially to the foreign exchange earnings through the export of fish and shrimps. During the period (July-March) 1998-99, Pakistan's export of fish and fish preparations was $89.8 million (Economic Survey 98-99, p.21). The Government of Pakistan is making efforts to improve fisheries sector. Presently sub standard aqua culture techniques are being used in Pakistan. The competitive position of Pakistan in fish and fish products can be enhanced by the strengthening of infrastructure facilities and improvement in extension services.

Minerals are of great importance for a developing economy like Pakistan. Pakistan contains reasonably large deposits of minerals like marble, limestone, chromites and natural gas. Other minerals found in Pakistan are iron ore, salt, brine, gypsum, clay, glass sand, copper and zinc. However Pakistan's potential of mineral exploration has not yet been exploited fully. A private sector that holds 85% of the total leaseholds is shy to invest capital in mineral development. This is mainly because of the lack of infrastructure facilities like electricity, roads, water, telecommunications etc. in the mining areas. The share of minerals in GDP is only 0.5% (Economic Survey 98-99, p.32). Figure 3-2 indicates that in 1985 Pakistan was exporting some of the minerals like iron ore, precious

metal, stone, sand etc in the crude form[14]. However in 1996 its position in minerals was too weak to show up on the chart.

3.2.3 Human Resources

Pakistan faces fundamental human resource challenges. It has not invested aggressively in creating the pools of human-resource skills essential for sustained competitiveness even in most prominent of its clusters. The profile of Pakistan's competitive industries indicates that Pakistan's success is only in those industry segments that require low level of technology and skills. The cluster charts show Pakistan's negligible position in machinery and services sectors associated with its most significant clusters.

3.2.3.1 Education

In Pakistan like other less developed countries the expenditure on the expansion of education is quite small as compared to the other sectors of the economy. The total expenditure on education was only 2.2% of the GNP in 1998-99 (Economic Survey 1998-99, p.113). The literacy rate in Pakistan is estimated to be around 45% during 1998. The participation rate at primary stage is estimated to be at 77%, at middle stage it is estimated to be at 51% and at high stage it is 36% (Economic Survey 98-99, p.111-113).

According to the World Development Report (1997, p.227), Pakistan's male literacy rate is 50% while female literacy rate is 34%. In comparison India's literacy rate is 65% for both males and females. It is because of this high illiteracy rate that Pakistan has not managed to fully tap the large stock of human capital it possesses. Consequently, semi-

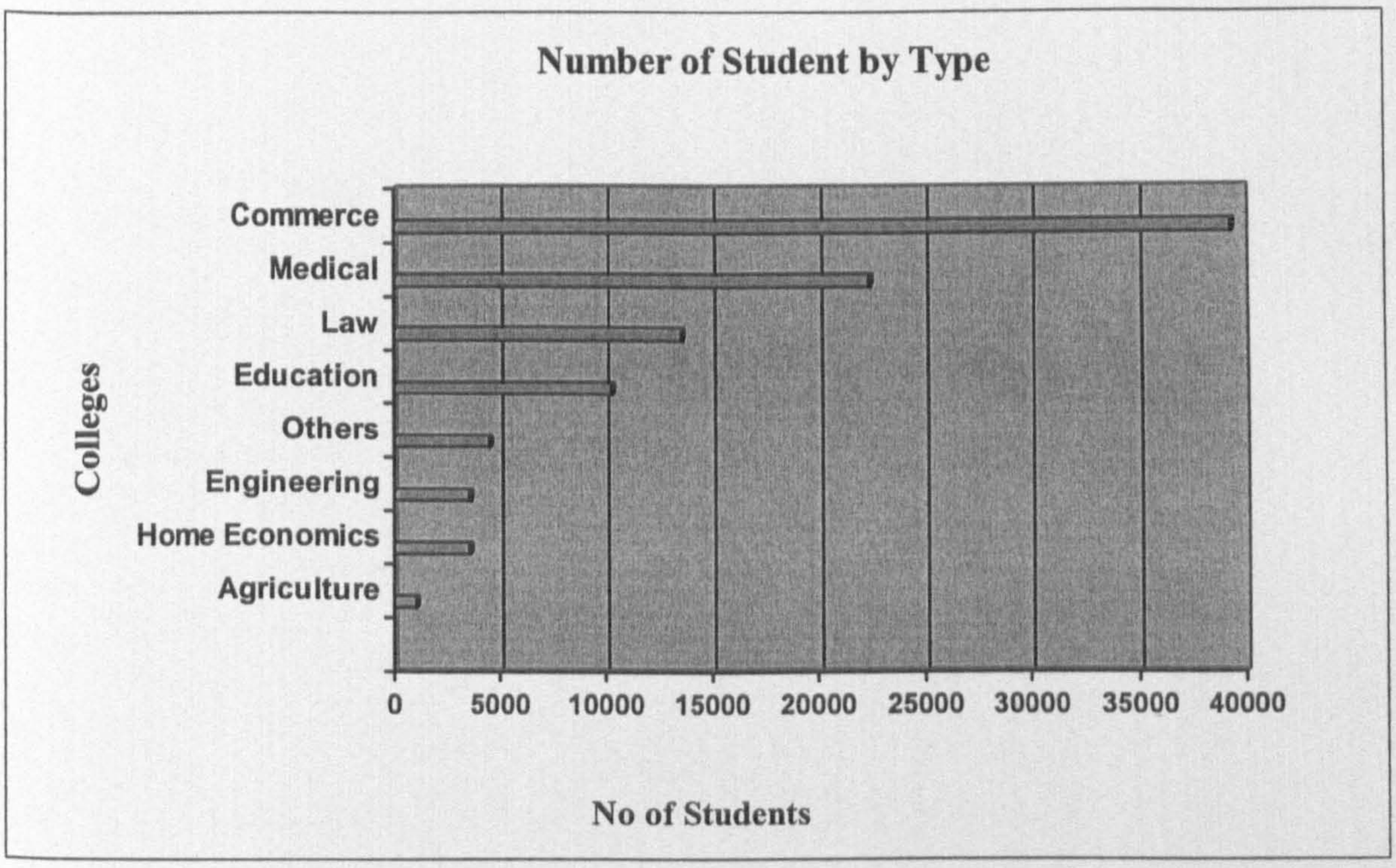
[14] See appendix A table 3-1A.

skilled and unskilled labour is in abundance in Pakistan, while technicians, high skilled specialists and marketing managers are relatively scarce (Saeed, 1999, p.256). This is strongly reflected in the nature of Pakistan's competitive industries and the type of products being produced by these industries. We know that in all the developed countries universities have played a crucial role in providing leadership of high calibre and research as well as innovations in all spheres of life. There are only twenty-six public sector universities in Pakistan including one recently established women university. At present less than 3% of the age group (17-23) have an access to higher education (Economic survey 98-99).

University research is modest and malpractices in the examination system are one of the basic causes of low standard of education. Pakistan's institutions of higher learning do not focus on skill areas critical to upgrading the economy. They provide limited training for the industries Pakistan is competitive in. For example the number of students enrolled to study agriculture and related fields are low compared to other subjects (see figure 3-4). At present there are only four Agriculture colleges in the entire country (GOP, 1995). The following figure shows the number of students enrolled to study various subjects in Pakistan in 1997-98. The number of students enrolled in engineering colleges is also very low[15].

[15] The number of students enrolled to study agriculture was only 1016 in 1996-97. In comparison the number of students studying in commerce, medical and law were 39,357, 22,381 and 13,533 respectively. Computed from '50 Years of Pakistan in Statistics', GOP, (1982-97), p.387, volume IV.

Figure 3-4



Source: Computed from "50 *Years of Pakistan in Statistics*", (1882-97), GOP, p. 387 volume IV.

The education system has a distinct academic and theoretical bias. Many of the graduates like engineering and computer science have a theoretical focus poorly suited to the industry. The status of theoretically inclined universities is far higher than that of our more vocationally oriented polytechnics[16]. The educational system does not promote technical, scientific and managerial skills adequately. Hence the students of these institutions face serious difficulties in competing with the competitive world.

[16] Field Research

3.2.3.2 Pakistan's Labour Force and its Productivity:

Pakistan has a labour force of 38.6 million. The overall participation rate in Pakistan is only 27.87% of total population (Economic Survey 98-99, p.134). This low participation rate is attributed not only to non-availability of job opportunities but also to the fact that Pakistanis lack the skills to be able to support themselves in productive and rewarding work in the economy where skills are paramount. There is also lack of motivation and commitment to work because of joint family system and socio-cultural values (Malik, 1996).

The traditional view of Pakistan's labour is of poor work ethics. Unions play a powerful role in state-owned companies. However these companies do not represent the essence of Pakistan's international success. Unionization is less prevalent in small and medium-sized private firms that dominate Pakistan's competitive industries.

The quality of relationships between management, employees and firms is critical to upgrading skills and improving productivity and thereby competitiveness. Many of Pakistan's labour disputes have occurred in the textile sector of Pakistan which is most critical to the export earnings. During 1990-95 the total number of recorded disputes in the textile sector was 108. This is followed by transport and food sectors which recorded 29 and 20 disputes respectively[17]. Lack of proper training and education is also a strong contributing factor to the low efficiency level in Pakistani companies.

[17] Computed from "50 Years of Pakistan in Statistics", GOP, (1982-97), Finance Department, table 3.8, volume IV.

Productivity growth is one of the important factors in obtaining and maintaining international competitiveness. The following table compares Pakistan's labour productivity with some of the other countries.

Table 3-2

Nominal and Real* Labour Productivity in Manufacturing

(US $ Dollars)

Pakistan	1980	1985	1987	1990
Productivity (Nominal)	6407	6758	8199	7959
Productivity (Real)	5474	7120	8199	7107
Turkey				
Productivity (Nominal)	39345	11203	14814	26436
Productivity (Real)	354459	28506	14814	6870
Singapore				
Productivity (Nominal)	14043	19295	25022	34031
Productivity (Real)	16900	20000	25022	31900
South Korea				
Productivity (Nominal)	9688	12830	16712	34353
Productivity (Real)	13569	13000	16712	29898
Egypt				
Productivity (Nominal)	2584	6000	8014	12611
Productivity (Real)	3957	7792	8014	7184

Source: Makhdoomi, 2000, p. 120

Notes:* at constant prices of 1987
Nominal Productivity =Nominal Gross Manufacturing Value Added/ Number of employees
Real Productivity =Nominal Productivity/Wholesale price index for Manufacturing

Note: High real productivity means that the same numbers of workers are able to produce more (keeping other factors constant).

Although the labour productivity in real and nominal terms has increased during the eighties, its level of growth lags behind the South Asian countries. The above table shows that apart from Turkey, Pakistan's real labour productivity was lowest among the five South Asian countries. This is not surprising considering the conditions of science and technology in Pakistan. Labour productivity in Pakistan is generally higher in the public sector industries such as petroleum refining, petrochemicals fertilisers, petroleum and coal products etc (Makhdoomi, 2000, p.121). This is mainly because of the capital-intensive nature of these sectors. In the successful export oriented industries like textile and apparel, leather and leather product, sports goods and steel basic industries like surgical

instruments and cutlery the productivity is lowest. This is because of the lack of mechanisation in these industries and their labour intensive nature. Most of these industries are cottage-based industries that lack capital to import machinery from abroad.

3.3.3.3 Cultural Values and Gender Inequalities

Most of the developing countries are characterized by gender disparities in education, employment opportunities and access to productive resources including finance and skill upgrading opportunities. This is a major hindrance in the implementation and effectiveness of their economic polices. In Pakistan due to various social beliefs and cultural bias women's access to property, education, employment etc. remains considerably lower compared to men's. This is strongly reflected in the low labour participation rate of the country. Although Pakistani women particularly in the rural areas play a major role in the agricultural production, live-stock raising and cottage industries, their economic activity often goes unreported or is credited to the male head of the family. Although Islamic laws do not deny equality between sexes, women receive differential treatment due to misinterpretations of religious teachings. The social stigma about independent women clearly discourages any tolerance for acknowledging women as breadwinners. Even in the most educated families it is socially unacceptable for a woman to lead her life independently without any restrictions on her mobility. This discrimination against women is reflected in the labour markets where there is very little opportunity for them to compete with their comparatively more literate male counterparts. Since Pakistan is mostly competitive in labour intensive cottage based industries, these cultural and social norms are a major constraint in its economic development.

3.2.4 Infrastructure Facilities

National infrastructure in Pakistan has stood in the way of its gaining higher competitive advantage in many industries. Major markets[18] of Pakistan's competitive industries like textile/apparel and sports goods etc are USA and various European nations. Hence Pakistan is at a natural disadvantage that has been accentuated by the inadequate infrastructure facilities. Pakistan is characterized by poor ports, poor airports, poor telecommunications and an archaic financial payment system. Given that roughly 90% of our exports are transported by sea, it is difficult to overestimate the importance of Pakistan's ports to economic prosperity. Similarly frequent strikes make other vital services uncertain as well. Frequent delays in shipments has marred Pakistan's image abroad. Moreover because of severe shortage and load shedding of electricity, manufacturers' costs per unit of production are correspondingly high.

The government of Pakistan is now making strenuous efforts to develop an efficient transport and communications network so as to meet the growing need of the country. It is now encouraging private sector to complement the efforts of the government in accelerating the development of transport and communications network and bringing about improvements in accessibility and delivery of services provided. For example a selective open skies policy has been adopted with a number of countries (Economic Survey 1998-99, p.153). Moreover the privatization policy formulated in 1990 has pushed the private sector to enter into air travel services. There are now three private

[18] For Pakistan's major markets see appendix A table 3-3A.

airlines namely Shaheen Air lines, Aero Asia and Bhoja Air line operating successfully on local and international routes (Economic Survey, 1998-99 p.158).

3.2.5 Research and Development

Pakistan is very weak in formal research, either in universities, government laboratories, or firms. Pakistan universities lack doctoral programs that are usually the core of much university research. Research and development activities are mostly concentrated in government institutions that lack commitment. Total expenditure on research and development in Pakistan is very low. During 1987, the average allocation of expenditure on research and development was only 0.9% of GDP (Makhdoomi, 2000, p.126). Countries like Japan, which have competed successfully in a wide range of industries, invest at least 2.85% of GDP in R&D each year. However, the huge difference in R&D expenditure from developed countries may be attributed to the fact that Pakistan's success has generally been in industries like textiles, leather products that do not require large R&D outlays. Nonetheless the low R&D expenditure has not only inhibited the expansion of existing clusters but also marred the growth of new industries essential to sustain competitive position in the international market.

The institutional structure under which R&D is performed is usually more important than the quantity of research expenditure. The institutional structure often influences the extent to which research is focused on commercially valuable areas. In Pakistan R&D activities are mostly concentrated in government institutions that lack commitment. Hardly any exporters make any commitments to in-house research and development. As the majority of Pakistan's exports are products where we compete on price, much of the research that

has taken place has been targeted at improving the cost position rather than developing new products or entering downstream or related industries.[19] This has served to reinforce the focus on cost-based strategies rather than development of differentiation strategies. As a result Pakistan is competitive in only those industry segments that are (see table 3-1) very vulnerable to international competition.

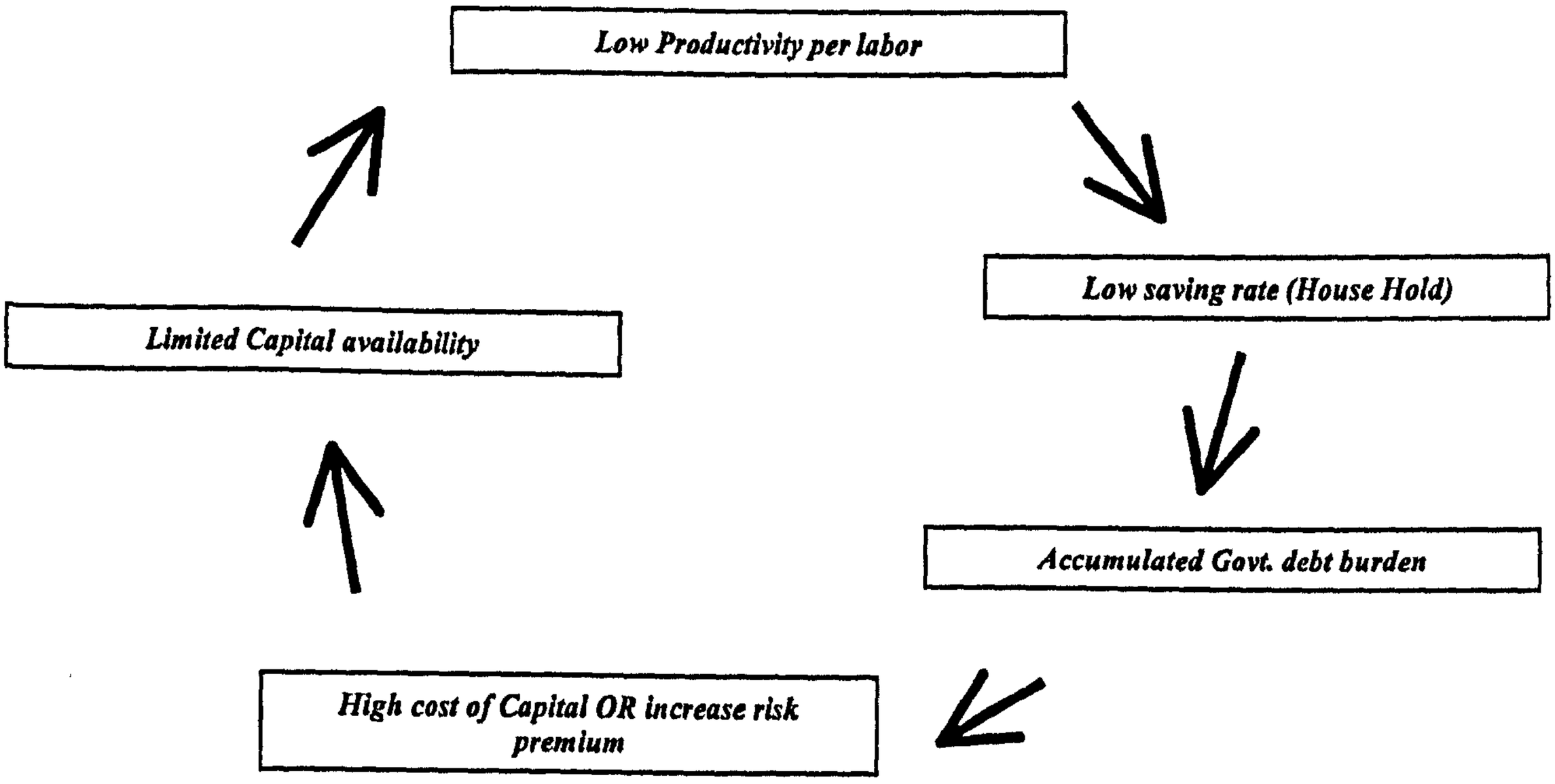
3.2.6 Capital Resources:

Pakistan's businesses particularly export oriented firms of textile/apparel, sports goods and surgical instruments industries etc face capital constraints that limit their ability to develop sustainable competitive advantage. The level of household savings (see chapter 1, section 1.1.4), government demands on national capital resources, poor capital productivity and limited capital markets all influence the accessibility and cost of capital. The following figure shows how the industries that form the essence of Pakistan's competitive advantage are caught up in the vicious circle of capital constraint.

[19] Field Research

Figure 3-5

Pakistan's Vicious Circle of Capital Constraints



Source: Author

3.3 Demand Conditions

Pakistan represents a significant home demand with approximately 115 million inhabitants. However according to Porter the quality of home demand is more important than the quantity of home demand (Porter 1990, pp. 91-95). There are hardly any pockets of world-class demand conditions in Pakistan. As a result, the demand conditions, as a determinant of competitive advantage, provide little stimulus to Pakistan's competitive industry.

3.3.1 Consumer Demand:

Although Pakistan's home market is large, it comprises mostly of unsophisticated buyers. This can be attributed to its low per capita income and general low level of education. Because of these factors utilitarian products of mediocre quality have become widely acceptable.

The competitive industries of Pakistan are basically driven by export demand and are less sensitive to domestic demand. A look at these industries indicates that there are hardly any sectors in which Pakistani buyers can be termed as sophisticated and advanced. The quality of products sold by these industries in the home market, are unacceptable in the international market. In fact key export varieties are not even available in the local market. Only seconds or items that are rejected by foreign buyers on quality grounds are locally available[20].

[20] Field Research

Pakistan's natural disadvantage of being located far away from important foreign markets along with unfavourable demand conditions have inhibited its firms from making product innovations and serving emerging industry segments. This is reflected in the thinness of its clusters. However this is not unique and most countries in the factor driven stage are faced with this dilemma.

One major factor contributing to the unsophisticated home demand conditions is unequal distribution of wealth in Pakistan[21]. Income inequality leads to cultural heterogeneity that makes market penetration and saturation a slow process hence adversely affecting the local demand conditions.

3.3.2 Industrial Demand

Even in the case of industrial products a certain number of defects are accepted and poor quality service is tolerated. Such unsophisticated domestic demand mars companies' potential to meet and anticipate its foreign buyer needs. Pakistan's businesses face little pressure to innovate or target the high quality end product lines. For example in the case of leather products, although Pakistan possesses excellent quality of hides and skins its firms still target medium to lower segments in the international market.

3.4 Related and Supporting Industries

A close look at the Pakistan economy reveals that some of Pakistan's export industries have benefited from interaction with world class related and supporting industries. The

[21] See section 1.1.3 chapter 1.

cluster charts and the industry study reveals that there is a certain amount of clustering present in Pakistan. However the major clusters seem to be in cotton and leather related industries.

3.4.1 Supplier Industries:

In most of the cases the competitive advantage in the successful industries of Pakistan has grown out of resource dependent supplier industries. Most of these supplier industries are dependent on the agricultural sector. In fact it can safely be said that the genesis of competitive industries of Pakistan is basic factor conditions. This is common in many developing countries. According to Porter (1990, pp.60-65) 'to sustain advantage, the basis for advantage in the industry must normally broaden and accumulate, particularly where the initial advantage is basic factors of production.'

The most important cluster in Pakistan's economy is cotton based. Pakistan's success in downstream textile industries is mainly because of the presence of internationally competitive supplier industries of fabric and yarn. These supplier industries owe their competitive success to world-class quality of cotton being produced in Pakistan. Similarly the leather products being produced in Pakistan owe their success to the high quality of finished leather. Pakistan's tanning industry is well developed and produces world-class quality of skin and hides leather. The tanning industry however owes its initial success to the good quality of hides and skins from the livestock of the country.

Despite the success in these industries Pakistan remains a net importer of most agriculture and leather related machinery. Virtually all textile-related machinery and leather processing machinery is imported.

3.4.2 Related Industries:

Historical analysis reveals that some of Pakistan's successful industries have grown out of related industries. For example Pakistan's sports goods industry grew out of the leather industry. Both of these industries are concentrated in the city of Sialkot. This city inherited the skills to process leather and make equestrian equipment from the times of Mughal rule in 1870. Later on these inherited skills of craftsmanship gave birth to the sports goods industry. Similarly, based on these skills surgical instruments industry also originated in Sialkot. The koftgars of Sialkot had developed the technique of making the blade of a dagger as fine as a scalpel. This technique was utilised in the early twentieth century to amend some broken instruments in the American Mission Hospital, Sialkot thus opening new vistas of recognition for the potential of craftsmanship of this town. Sialkot is now producing 95% of the country's total production of surgical instruments[22]. Another industry that merits recognition is the cutlery industry. This industry is also concentrated in Sialkot and benefits from the skills of craftsmanship in this city. All these three industries are labour intensive and depend on traditional methods of production. Most of the processes are done manually because of the lack of machines and modern techniques.

The above examples illustrate that although related and supporting industries are present in Pakistan; their cluster is not very deep. This is mainly because the firms in the

[22] Source: Pakistan's Surgical Instruments Buyers Guide, International Business Publications (1992-93).

successful industries of Pakistan have not made much investment to create advanced and specialized inputs (see chapter 5 and 6).

The industrial clusters lack both breadth and depth, making it difficult to develop new industries. This eventually weakens the competitive position of base industries. The development of related and supporting industries is one way that sources of expertise can ripple through the economy and move forward. However the absence of such industries in Pakistan means that so far this avenue for further growth and prosperity has not played a major role.

3.5 Firm Strategy, Structure, and Rivalry

In Pakistan, almost all successful international competitors are relatively small-medium-sized firms that are privately owned. The following table shows the size as well as ownership structure of Pakistan's successful industries. It compares the size in four size groups measured in terms of number of workers.

Table: 3-3

Size Distribution in Successful Industries of Pakistan

(Percentages)

Industry Codes	Industries	Number of Employees <100 workers	100-249 workers	250-499 workers	>500 workers
3	**All Industries**	**79**	**9.6**	**5.6**	**5.9**
31	**Food, beverages & tobacco**	82.3	6.4	5.1	6.3
311 & 312	Food manufacturing	83.7	5.5	4.5	6.3
32	**Textile, Apparel & Leather**	**75.9**	**9.4**	**6.7**	**7.9**
320 &321	Manufacture of Textile	71.2	9.5	8.3	11.01
322	Wearing Apparel	65.4	21.6	9.2	3.8
323	Leather & leather products	70	16.3	6.3	7.5
38	**Metal products, equipment**	**83.4**	**9.8**	**3.5**	**3.3**
385	Scientific & measuring Instruments	84.2	10.5	3.5	1.8
392	Sports & athletic goods	64.9	13.5	8.1	13.5

Note: The above values are expressed in percentage form. For example 79% of all industries in Pakistan had less than 100 employees. Computed from Census of Manufacturing Industries of Pakistan 1990-91, Federal Bureau of Statistics, Government of Pakistan. table 2.0, pp. 9-21 & pp.54-62.

Table: 3 -4

Ownership Structure in Successful Industries of Pakistan

(Percentages)

Industry Codes	Industries	State/public ownership	Private ownership	FCE
3	**All Industries**	**4.6**	**94.9**	**0.4**
31	**Food, beverages & tobacco**	5.2	94.6	0.1
311 & 312	Food manufacturing	5.4	94.6	0.1
32	**Textile, Apparel & Leather**	**2.5**	**97.5**	**NIL**
320 &321	Manufacture of Textile	3.3	98.7	NIL
322	Wearing Apparel	1.3	98.7	NIL
323	Leather & leather products	NIL	100	NIL
38	**Metal products, equipment**	**3.9**	**95.4**	**0.6**
385	Scientific & measuring Instruments	NIL	100	NIL
392	Sports & athletic goods	NIL	100	NIL

Note: The above values are expressed in percentages. For example 4.6% of all industries in Pakistan had State/public ownership. Computed from Census of Manufacturing Industries of Pakistan 1990-91 Federal Bureau of Statistics, Government of Pakistan. table 2.0, pp. 9-21 & pp.54-62.
FCE= Foreign Controlled Enterprise
State/public ownership includes public firms with foreign collaboration.
Private ownership includes private firms with foreign collaboration.

The above table shows that in most of the internationally competitive industries of Pakistan[23] public ownership is almost non-existent. Food manufacturing industry is the only sector in which public / state ownership is more than 5 per cent. In the rest of the internationally competitive successful industries public/state ownership is insignificant. The public sector is mainly engaged in basic industries like edible oil, petrochemicals fertilizers, pesticides, petroleum refining, non-metallic mineral products, cement, iron and steel etc. The reasons that Pakistan has international success only in small and medium size firms are several. One most important reason is poorly developed capital markets.

Especially in the case of cottage–based units (sports goods, leather and surgical instruments industries) there is intense scarcity of finance. The smaller units have difficulty in raising the resources to extend their competitive advantage, invest abroad or diversify into related fields requiring significant capital. Hence poorly developed financial markets not only constrain progress in existing fields but also limit success in newer capital-intensive industries that could absorb labour freed up by rising productivity. Another is the management style and organisational approach that exists in its companies. Firms are often managed by a commanding leader involved in virtually all of the firm's activities. Below the leader the organisation is mostly unstructured or even chaotic. Large Pakistani firms are also believed to be of similar character. Professional management systems and structures necessary in large companies are not found.[24] In Pakistan especially in the case of leather garments and manufactures, surgical instruments and sports goods, firms operate without "real" production techniques and with little concern to improve productivity. They apply the rule of "one piece-one man" instead of assembly line method.

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[23] Competitive industries here refer to the industries with export share greater than the cut off point.
[24] Field Research

If the unit needs to double its production it doubles the number of its employees without rather wanting to improve its productivity. This is particularly true in the case of Sialkot where the number of workers in the factories varies with the number of orders received. This system tends to be harmful over the long term, to the profitability of the firm, the quality of its products and to the social role the companies play in their respective regions. As a result Pakistani products are placed on the 'average' scale in the international market. It is mainly because of these reasons why Pakistan exhibits competitive advantage in fragmented industries or segments of industries.

Large company groups in Pakistan have very strong political links (Zaidi, 1999, pp.119-120). These links provide them with various benefits through subsidy, protection and preferential treatment in the capital market. Defaulting of loans is very common by these company groups. Political manoeuvring and an inward focus often distract the drive for international success and hence innovation is stifled. Moreover the successful manufacturing industries of Pakistan including textiles companies depend heavily on sample design, catalogues etc sent to them by their foreign importers for designing their products. Fashion in most Europe markets is controlled by fashion designers who do not find any incentives to visit Pakistan and display their designs. As a result the design capability of Pakistani craftsman is not enhanced. They simply copy the designs received from abroad. Moreover lack of proper training also contributes to the limited product diversification.

Family ties are very strong in Pakistan and situations where family members all work in the same place are also very common[25]. Pakistani business groups are not very diversified. In most cases rather than enlarging the existing firm beyond a certain level, new firms are created for sons and daughters. Typically the large Pakistani private sector business groups owned and controlled by a single family have interests in three or four key sectors. It may have its origins in textiles, for instance, but also hold assets in the power sector, to fuel its textile plants as well as banking, to ensure funds availability.

3.5.1 Rivalry

Domestic rivalry has been affected by various structural aspects of the manufacturing sector of Pakistan. Private companies have tended to focus on a few key fields which have been highly profitable, and there has been very limited investment in key growth areas such as that of high technology, where long term plans need to be laid before returning a profit. In most countries at a factor driven stage firms compete solely on the basis of price. The dependence of successful industries of Pakistan on imported machinery/ spare parts combined with the limited finances available to the firms in these industries has put a damper on the ability of the firms to compete with one another. Lack of capital goods and other inputs does not allow these firms to expand and diversify their products. Hence they cannot indulge in constructive and beneficial competition.[26]

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[25] Family entrepreneurship may be conservative about taking risks, innovating and delegating authority. Paternalistic attitudes in employer-employee relationships prevail, and family-owned firms are often reluctant to hire professional managers. And we must add that paternalism and authoritarianism are feudal legacies characteristic of many developing countries and not unique to family businesses (Wayne, pp. 287-289).

26 Also see Rauf,1994, p.1381

3.6 Role of Government

The analysis of Pakistan's competitive industries indicates that so far the government of Pakistan has not been able to play a significant role in creating appropriate environment for upgrading its competitive advantages. Public institutions that play a vital role in developing and sustaining competitive advantages of industries have not worked well in Pakistan. In fact there is a very obvious and growing disillusionment with the state and its institutions. The general feeling is that the state has failed to deliver on basic issues, that it can no longer govern, administer justice, provide essential and basic social services, or collect taxes. Corruption is noticeably rampant and affects all institutions of the State (Zaidi, 1999, pp.345-350).

According to Porter (1998) "government has the greatest direct influence on national advantage in the factor and investment driven stages. The tools at its disposal, such as capital, subsidies, and temporary protection, are most powerful at these stages in the nation's competitive development".

The government of Pakistan has played a prominent role in the economy. It has extensively used various tools of commercial policy such as tariffs, import quotas, export duties and exchange controls etc to influence the growth and composition of output and exports. I briefly analyse some of the policies adopted by the government of Pakistan and their influence in shaping its competitive industries.

The exchange rate has played a critical role in the trade regime and the process of industrialisation in Pakistan on many occasions. Pakistan pursued the policy of fixed

exchange rates until January 1982, when it shifted to managed floating exchange rate. As a result of the fixed exchange rate policy the currency was overvalued during the 50's and the 60s, which encouraged the choice of capital intensive techniques of production and also served as means to encourage import substitution (Zaidi, 1999). On the recommendation of IMF, the old system of pegging the rupee was replaced by a flexible exchange rate mechanism on 7th January 1982[27]. Important considerations behind this change in policy were ensuring international competitiveness of Pakistan's exports by bringing realistic exchange rate with its trading partners, thus trimming the overvalued position of rupee, bringing about a smooth balance of payments adjustment process and further, saving foreign exchange revenues to sufficiently high level so as to finance at least 10 weeks of imports (Makhdoomi, 2000). However these considerations overlook the fact that the continuing and substantial depreciation of Pakistan's rupee in recent decades has not improved its competitive position. Since 1982, the government has resorted to persistent devaluation of rupee which has not however managed to improve BOP position (see chapter 1, section 1.1.5). Since January 1982, Pakistan rupee has depreciated by 71% against the US dollar (from Rs 9.9 per US dollar to 33.56 per US dollar in 1995-96). On August 1997 the rupee was again devalued and was around 41.50 against US dollar. In 1998 the official exchange rate was fixed at Rs 46.00 per US dollar (Saeed, 1999, p.455). The analysis of the cluster charts indicates that the devaluation policy adopted by the government of Pakistan has reduced the pressures on the Pakistan's firms to upgrade their competitive position and differentiate their products. The quantity of exports has increased since 1980s but this has not been accompanied by the relevant up gradation and

[27] Under the managed floating exchange rate system, the rupee is not going to float freely in the open market. State Bank of Pakistan (SBP) announces the rupee's exchange rate against all the major currencies almost daily. Pakistan does not follow a specific policy with respect to either real or nominal exchange rate. Under the system, variations in exchange rates are made by taking into account variations in the exchange rate of dollar serving as an intervention currency against a basket of currencies. The currencies in the basket and their weights are not disclosed (Saeed, 2000).

differentiation of products essential for sustained competitiveness. Pakistan needs to import critical technology and machinery to upgrade its economy. Devaluation has made these imports expensive reducing the probability of firms making these investments as is indicated by the empirical research in later chapters.

The unstable political situation of Pakistan has led to the inconsistency in its economic and trade policies. There have been many shifts in the policies according to the different political regimes in different time periods. During the 1960s, emphasis was on industrialisation through import substitution and encouragement of the private sector to achieve rapid growth and development. The consequences of the Import Substitution Industrialisation (ISI) policy on the nature of Pakistan's competitive industries can be summed up in the words of Stephen Lewis who explains how the ISI works. According to Stephen Lewis (1969) ISI encourages the domestic production of consumer goods only, and it does so both because there is a relatively protected market for consumer goods and there is a relatively cheap source of imported capital goods and raw material on which to base the production of consumer goods. Industries are established which have little incentive to develop local capital goods and intermediate goods industries to serve them... (as quoted in Zaidi, 1999). In the 1970s there was a shift towards nationalization[28] of industry and an increased role of public sector. During 1980s particularly since 1988 after the adoption of Structural Adjustment Program (SAP) there has been a shift towards more market oriented reform strategy. Under the SAP program there is more emphasis towards export orientation, decentralisation and directing the economy towards market mechanism. Until recently Pakistan was extensively using import prohibitions, import licensing and

[28] see chapter 1, section 1.1.1.

other non-tariff measures to control import flows. In the last few years Pakistan has made substantial progress in eliminating or reducing non-tariff barriers to trade. For example the number of Tariff lines included in the Negative List has been reduced from more than 300 to 75. Similarly under the SAP a number of policy instruments have been designed to promote exports. For example the income tax rebate scheme for exporters has been overhauled, with higher value added items being given higher rebates (Makhdoomi, 2000)[29]. However the analysis of Pakistan's competitive industries indicates that SAP has so far not been able to make a significant difference in the up gradation and diversification of Pakistan's competitive exports. The increased commitment on part of the government of Pakistan in improving its export competitiveness has been mostly focused on the macro economic policies. The important non-price factors such as human resource development, development of managerial capabilities and R&D remain largely neglected by the government (see section 3.2.3). A focus on these factors is vital for Pakistan's ability to produce higher value added products and compete successfully in the more competitive international environment.

3.7 Pakistan in a Perspective

The pattern of Pakistan's exports sheds light on the rapid erosion of the competitive advantage in the successful industries in Pakistan. Many of Pakistan's competitive industries have experienced losses in terms of their export share since 1985. This is particularly striking in the Food related cluster in which Pakistan's exports have decreased by almost 12% since 1985. Other losses have tended to occur mostly in resource sensitive

[29] Thus, since 1988-89, differentiated rates of income tax rebates are introduced to encourage the export of higher value added products, for example, 75% on leather, textile, engineering and electrical goods, 25% on cotton yarn and 50% of other manufactured goods. For more details see Makhdoomi, 2000, pp.140-148.

industries (precious metals, ores, stone, sand, gravel etc). Pakistan's position in health care and housing sectors also seems to be declining. The gains have been prominent only in the textile/apparel related cluster of Pakistan. In this sector Pakistan's exports have increased by almost 18% since 1985. One other strong limitation of Pakistan reflected by the charts (figure 3-2) is that Pakistan's position in industrial and supporting sectors along the middle of the cluster chart is negligible and it has more or less remained unchanged over the period from 1985-96. Pakistan holds absolutely no position in machinery associated even with its most prominent clusters. The gains associated with speciality inputs have also not been prominent.

The next chapter presents the case study on the textile/apparel industry of Pakistan.

Chapter 4

The Textile Industry of Pakistan

4.0 Introduction

The aim of this chapter is to attain an understanding of the current competitive position of the textile/apparel industry of Pakistan. The textile industry occupies a very significant position in the economy of most of the developing countries. This is mainly because it supplies one of the basic commodities and is a significant source of employment generation.

The textile industry has been one of the spearheads of Pakistan's export thrusts contributing approximately 79% of Pakistan's total export earnings in 1996 (see table 4-1). Various factors are responsible for the prominent position of this industry in Pakistan's economy:

- Firstly, cotton is the main cash crop of Pakistan and provides the basic raw material to the local textile industry.
- Secondly textile industry absorbs a large proportion of Pakistan's skilled and unskilled labor force. It employs 41.5% of the total industrial labor force (Makhdoomi, 2000, p.263).
- Thirdly the production technology used in this industry is fairly standard and mostly labor intensive which suits the prevailing conditions of the country.
- Fourthly the scale economies particularly in case of the garment- manufacturing sector are not very significant.

Following the introduction, the next section briefly analyzes the textile industry with respect to other Asian economies. Section 4.2 discusses the products and processes involved in the industry. Section 4.3 gives an overview of Pakistan's textile industry while the remaining of the chapter analyzes the competitive position of the industry under Porter's framework of the diamond.

4.1 Textile Industry and the Asian Economies

The textile industry holds a prominent position in many Asian countries. It is an industry well suited to the early stage of industrialization. It requires neither a high level of technology nor a large amount of capital. Its labor-intensive nature means that the less industrialized countries can make the most of their low wages and develop their own textile industry.

The Asian economies can be roughly divided into three groups on the basis of their domestic textile industry (The World Bank Report, 1990).

1) Low income countries like Sri Lanka and Bangladesh that can provide yarns and fabrics for products in the domestic market, but are not proficient enough to support the country's garment production, which relies primarily on imported fabrics and yarns.

2) Countries like Pakistan, India, Philippines and Malaysia that are capable of exporting relatively low value and simple textiles (gray fabrics and yarns).

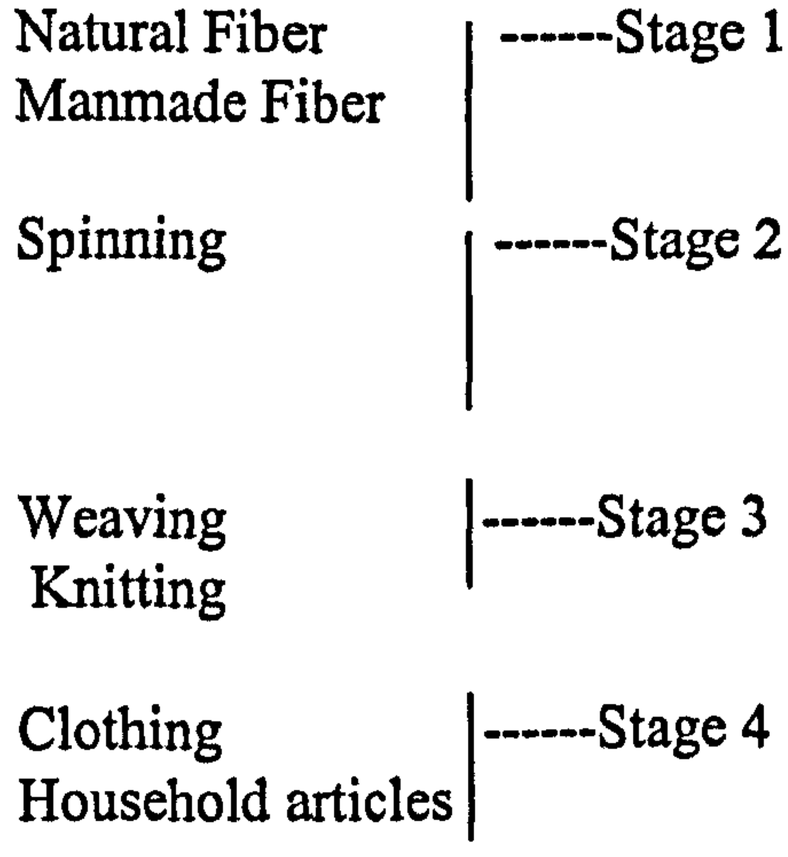
3) Major East Asian suppliers, Korea, Taiwan, Hong Kong and China that are capable of producing and exporting finished fabrics and garments on their own account.

4.2 Products and Processes

The following diagram shows the various stages involved in the manufacture of the final products from textile materials.

Figure: 4-1

Stages involved in the Manufacture of Textile Products



Stage 4 represents a wide range of products such as various types of garments as well as household products including bed sheets, curtains, etc. Some of the production processes do not involve spinning or weaving (for example non woven), whereas articles made from woven or knitted fabrics involve all four stages. Individual items in each stage use materials, capital and labor in varying proportions. Although, the

textile industry is generally termed as a labor-intensive industry there is considerable variation in the capital intensity of this industry on the international level. The clothing industry's capital intensity is significantly lower than that of other textiles. As a consequence, technological innovation and increase in productivity has been less dramatic in the clothing sector (The World Bank, 1991, pp.7-9). This has also led to a more rapid shift of clothing production from the industrial to the developing countries

In this case study the sectors related to textile/clothing manufactures are distinguished as follows

Upstream sectors: raw cotton and spinning

Midstream sectors: weaving & knitting, dyeing, finishing and textile related machinery

Downstream sectors: clothing/garment and household items

Related Services: wholesale and retail trade, fashion industry etc

4.3 An Overview of Pakistan's Textile Industry

The textile industry is the mainstay of Pakistan's export trade and lies at the heart of its economy. It occupies an important position in generating profits in terms of foreign exchange earnings for the country. The Cotton group accounted for more than 61% of the export earnings of Pakistan in 1996 (also see table 3-1, chapter 3). The textile and clothing manufactures together constituted 78.74% of Pakistan's total exports in 1996 (see table 4-1).

Table 4-1

Competitive Industries Related to Textile/Clothing Sector: Pakistan

SITC	Description	World Export Share % *1996*	Pakistan Export Share % *1996*	World Export Share % *1980*	Pakistan Export Share % *1980*
658	Textile Articles	6.88	9.97	3.24	4.74
652	Cotton Fabric Woven	6.49	15.05	3.53	9.09
651	Textile Yarn	4.94	17.94	1.59	8.2
848	Non textile clothing	3.27	4.7	0.67	0.84
263	Cotton	3.12	4.92	6.89	17.84
659	Floor covering	2.38	2.56	4.68	8.95
847	Clothing Accessories	2.23	1.73	0.51	0.31
653	Woven man-made fabric	1.66	5.57	0.65	2.38
844	Under garments non knit	1.56	2.19	0.41	0.36
846	Undergarments knit	1.48	4.27	0.5	0.68
655	Knitted etc fabric	0.92	1	*	*
842	Men's outerwear non knit	0.9	3	*	*
845	Outerwear knit non elastic	0.66	2.56	*	*
843	Women outerwear non knit	0.51	2.37	0.34	1
656	Lace, ribbons, tulle etc	0.49	0.22	*	*
269	Waste of textile fabric products	0.33	0.06	*	*
657	Special Textile Fabric products	0.24	0.45	0.99	0.18
266	Wool	0.33	0.18	0.2	0.32
261	Silk	*	*	0.2	0.003

Note:

All the above industries are those in which Pakistan's share of the world market economy exports has exceeded its average share of world exports in a particular year. This is referred to as a cutoff point.

In 1980 Pakistan's total exports were 2818 US million dollars. The total world exports in 1980 were 2001086 US million dollars. The cutoff for 1980 was 0.14.

*** represents the uncompetitive industries. Uncompetitive industries are defined as those industries that had the world export share less than the cut-off point in a particular year. See Appendix A for more details.**

Source: **Computed from United Nations International Trade Statistics Yearbook 1983 and 1996**

Although resource based and agricultural products (see table 3-1) still constitute a large proportion of exports in Pakistan, textile and clothing products are by far the largest of country's manufactures. Table 4-1 shows that Pakistan's share in the world export of textile articles (SITC 658) and cotton fabric (SITC 652) had almost doubled from 1980 to 1996. Pakistan's share in the world export of textile yarn was only 1.59% in 1980. It increased to almost 5% in 1996. On the other hand Pakistan was contributing almost 7% to the world export of cotton (SITC 263) in 1980. Its

world export share decreased to approximately 3% in 1996. This indicates the utilization of the raw cotton by the upstream and midstream sectors of the industry.

Sub-sector Analysis

The textile and garments industry comprises of three fairly distinct sub-sectors, ranging from the capital intensive spinning and synthetic fiber sub-sectors, through to weaving and fabric production, and then highly labor intensive garments industry.

The upstream and midstream sectors are the oldest sectors of this industry in Pakistan. These sectors have 50 years of experience dating back from independence. However in spite of their experience the export items of these sectors are confined to only few particular items such as

Spun yarn: Coarse to medium count

Fabric: Gray cloth, printed cloth for home textiles.

There are two basic reasons for the concentration of exports on such items:

i) Low/medium staple raw cotton being produced in Pakistan which limits the range of products

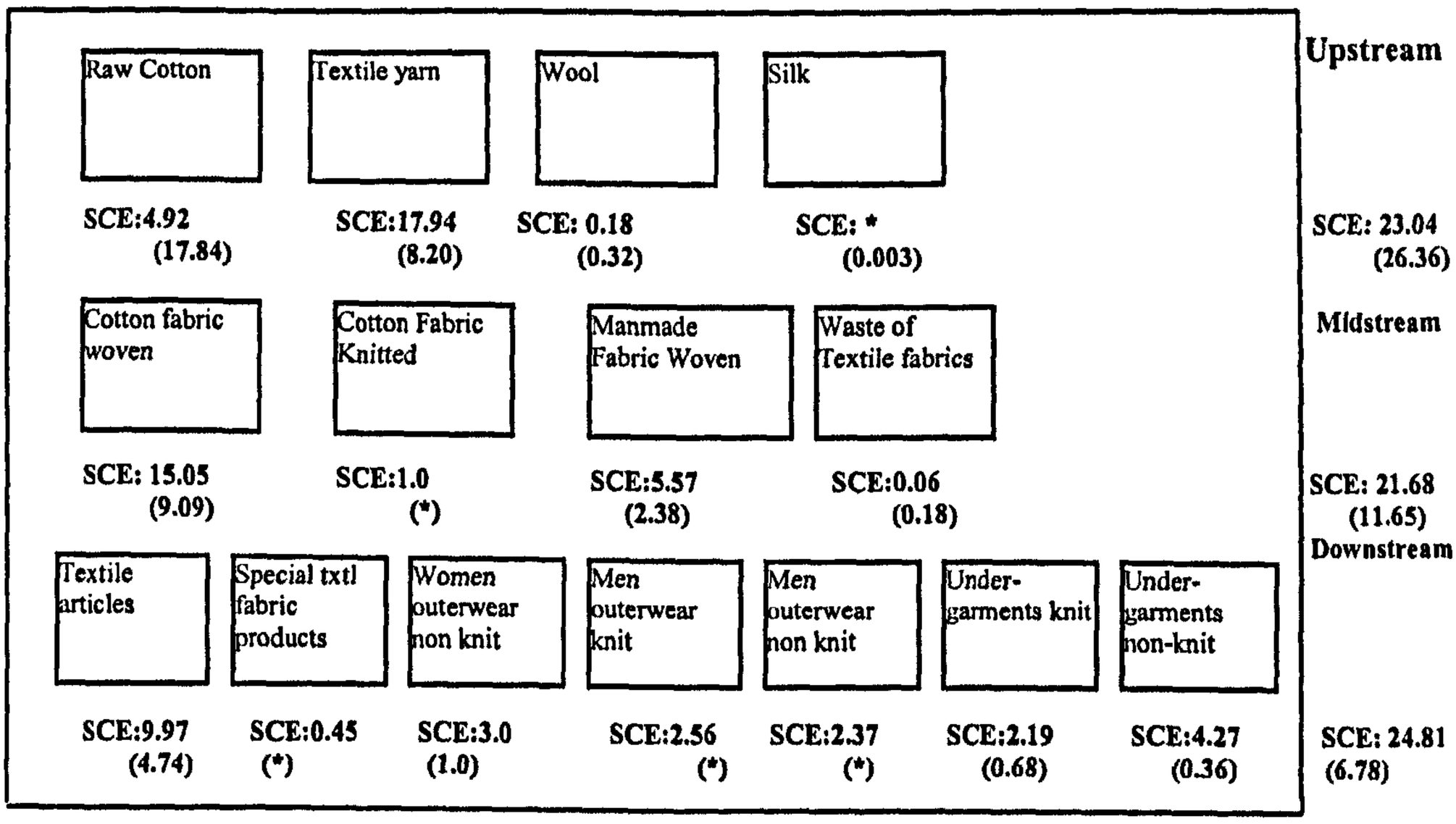
ii) The present capability of Pakistan's industry in general favors only low price / quality products.

The firms in this sector therefore have based their competitive strategies on offering basic products of a limited range at a lower price (see figure 4-6).

The following figure separately analyzes the export competitiveness of the three sub-sectors of the industry, and also shows how these sectors are changing their competitiveness over time.

Figure 4-2

Competitiveness of the Textile -clothing Industry (1996)



Note: The figures in brackets represent SCE in 1980
*** = signifies that the industry was not competitive in a particular year**
SCE= Share of Pakistan's total exports
Those industries are included in the chart that were competitive in their respective years[1].
Source: The above figures have been computed from United Nations International Trade Statistics Year book 1996 and 1983, volume II.

The downstream sector that comprises of the knitwear and garment industry constitutes approximately 25% of Pakistan's total exports. In 1980 it constituted only 6.78% of Pakistan's exports (figure 4-2). This tremendous development in the exports of the downstream sector are in accordance with the structural changes taking

[1] Competitive Industries are described as those industries in which Pakistan's share of world market economy equaled or exceeded its average share of world trade in the particular year. See chapter 3 for more details.

place internationally in this industry. There has been a worldwide shift of the clothing production from the industrial to the developing countries (World Bank, 1991, pp. 5-7). This shift is attributable to the low capital requirement and the labor-intensive nature of this sub-sector. The increase in the exports of this sub-sector in Pakistan also signifies the fact that the industry is moving towards the production of value added items. However the range of products being produced by this sub-sector is very limited as can be seen from table 4-1. This is mainly because

a) The main raw materials used by this sub-sector are the domestic cotton yarn and fabrics which are low priced /quality items, capable of being used in a limited range of products.

b) The domestic demand is next to non-existent for the industries of this sub-sector, which are growing as export industries. This has a limiting effect on the range of products the sub-sector can produce. Porter has emphasized that the exports can grow for a time, based on low–cost local labor or natural resources, but such an approach is ultimately limiting (Porter, 1990, pp.86-100).

The above figure shows that midstream sector of the textile industry has doubled its exports since 1980. The exports of this sector now contribute almost 22% in Pakistan's total exports. Cotton fabric (woven) comprises the bulk of fabric exports in this sub-sector. This increase in the exports of the cotton fabric is attributable to the investment incentives given to the spinning and weaving sectors by the government. Many companies have substituted their shuttle looms with shuttle-less looms that have three to four times more capacity (Zaidi, 1999, p.153)

The textile yarn exports have also increased twice fold since 1980. The spinning capacity of the industry increased rapidly in the early 90's after the government announced significant concessions for the import of textile machinery[2]. The high percentage of yarn export can be explained by the fact that the weaving sector of the industry is still incapable of accommodating the large output of the spinning sector. Despite recent increases in the consumption of yarn on account of growing demand stemming from power loom sector and the knitters, the country still exports over 45% of its yarn[3].

4.4 Competitive Advantage of Pakistan's Textile Industry

This section is based on analyzing the textile industry of Pakistan under Porter's framework of the diamond (see chapter 2, section 2.3). The objective here is to analyze the strengths and weaknesses of the industry as they exist today. This is essential to identify the key issues facing the industry as well as to meet the challenge of international competition in the future.

Technological developments, protectionism (discussed in section 4.5) in the industrial country markets as well as changing market structure of the world textile industry are both, a source of opportunity and threat for Pakistan. Pakistan's response to these changes occurring worldwide has been constrained by its own structural weakness.

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[2] The Herald, November 1994.
[3] Dawn, Economic and Business Review, 31st August_6th September 1996.

The overview of the Pakistan's textile industry indicates that improvements in quality and the development of the downstream products that are essential for the progress and sustainability of the industry's competitive position are not taking place fast enough to sustain Pakistan's competitive position vis-à-vis its competitors.

4.4.1 Factor Conditions

4.4.1.1 Availability of basic raw materials.

Cotton is the main cash crop of the country and has been accepted as the basic raw material for the industry. In theory this should provide the industry with a substantial benefit in terms of access to its raw material. However, the cotton crop currently being grown in Pakistan is of a short /medium staple variety, only suitable for use in coarser count yarns and fabrics. This consequently limits the range of downstream products to low quality made-ups of woven and knitted fabric[4]. In fact ninety-five percent of the current cotton production has a fiber length above 1_1/32 inches and it is possible to manufacture only 30-40 count class cotton yarns using this raw material. On the other hand, India, that is Pakistan's main competitor in the textile industry, has started production of different staple categories of cotton group. Unlike Pakistan, it is now producing long and extra long staple varieties and therefore is capable of making 10's to 100's count cotton yarns. This is bound to give Indian

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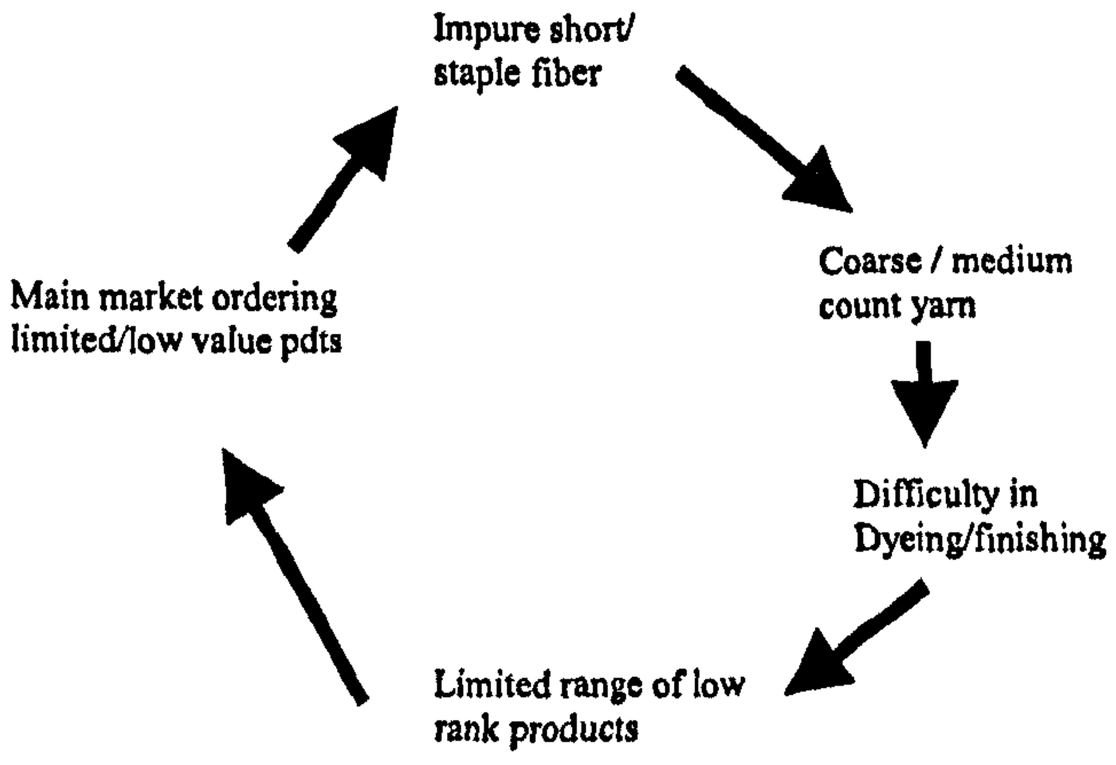
[4] Dawn, Economic and Business Review, 31st August _ 6th September 1996.

industry a major competitive edge in fine count yarn and fabrics in the international markets (GOP and JICA, 1991).

Another major disadvantage of the domestic raw cotton of Pakistan is that it has a large impurity content with a high level of foreign matters i.e. trash and water. These impurities are a major cause of imperfect dyeing. They reduce the rating of yarn and fabric in the international market. Consequently the knitwear and garment industries that depend on these locally produced yarn and fabric also suffer. They are prevented from entering the production of high value added final products.

The following figure shows how impure/ short staple fiber has sent the entire industry into a vicious constraint.

Figure 4-3 **Vicious Circle of Constraint Textile/Apparel Industry: Pakistan**



Source: Author (Case Analysis)

4.4.1.2 Synthetic Fibers

Globally there has been shift of production from pure cotton based textiles to blended and synthetic textile products. The following table shows how the percentage share of different manmade fibers is increasing worldwide.

Table 4-2 Estimated World Production of Major Fibers

(Percentage)

Year	Cotton	Wool	Cellulosic	Synthetics	Total
1960	67.7	9.87	17.8	4.7	100
1970	54.1	7.35	16.5	22.1	100
1980	47.3	5.34	11.8	35.6	100
1987	49.1	4.65	7.2	39.1	100
1989	50.2	5.2	5.4	39.2	100

Source: Textile Organon, June 1990, and the International Wool Secretariat as reported in World Bank, 1991, p.38.

In Pakistan domestic production of man-made fiber falls primarily into nylon, polyester and acetate filament yarns. This production is used in the manufacture of fabrics and garments for exports. Man-made fiber yarns are usually not exported (Gherzi, 1992, p.256). The consumption of man-made fiber is very low in Pakistan. For spinning only 18% of the total spindle capacity is used for man made fibers in Pakistan, whereas in India 40% of the total spindles are run on man made fibers. A very low proportion of Pakistan's textile exports comprises of pure synthetic products, whereas the market for these products is much bigger than that of cotton and blended textile products (GOP and JICA, 1991).

A close look at Pakistan's competitors reveals that most of them have a strong position in the man-made fiber industry. In fact their strong export-oriented textile industry is based on the indigenous supply of man-made fiber. This is bound to give them a competitive edge over Pakistan in the near future.

Table 4-3

Competing Country Profiles as regards to the Indigenous Fiber

Country	Cotton	Man-made Fiber
China	5	5
Hong Kong	1	1
India	5	4
Indonesia	2	5
S. Korea	1	5
Malaysia	1	2
Pakistan	5	3
Taiwan	1	5
Thailand	2	5

Source: Gherzi, (1992)
Notes: Ratings: one country relative to another

5 = very high
4 = high
3 = medium
2 = low
1 = very low or none

The above table shows that Pakistan, India and China have a very strong position in the indigenous cotton industry. However China's position in the man-made fiber industry is also very strong along with Thailand, Taiwan, S. Korea and Indonesia. India has also made effort to develop its man-made fiber industry. Pakistan's position in this industry is still relatively weak.

4.4.1.3 Labor Force/ Productivity

Pakistan with a population of over 115 million has an advantage of a vast, low cost source of labor, with wage rates among the lowest in the world. The following table shows the wage rate comparison with some of the other competing countries.

Table 4-4

Labor Rate comparisons by Competing Countries

Country	Population (Millions)	Average Labor Cost / hour (US$/hour)
Taiwan	20.3	6.00
S. Korea	43.1	3.60
Hong Kong	5.8	3.39
Malaysia	18.3	0.95
Thailand	56.7	0.87
India	865.0	0.55
Pakistan	115.6	0.38
China	1150.1	0.34
Indonesia	181.4	0.28

Source: Gherzi, (1992), p.53.
Note: Data 1991.

It is important to mention here that nominal labor expenses alone do not determine the competitiveness of the textile industry. The factor of labor productivity must be added to gain more meaningful understanding of labor expenses. The potential benefit of low cost labor can be fully realized only if productivity levels are improved, especially in the more labor intensive garment manufacturing sector. However the above table still expresses a small aspect of overall competitiveness of the textile industry.

4.4.1.4 Lack of Education and Training

One of the key factors for industrial development in any country is the level of education and vocational training. Textile and clothing companies in East and South East Asia are generally able to recruit literate workers, albeit at a higher wage, and this reflects in the ability of companies to train their work force, resulting in higher levels of quality and productivity.

The level of education and training in Pakistan is particularly low when compared to its major competitors like Hong Kong, S. Korea, Taiwan etc (Gherzi, 1992). This is reflected in the limitations of the domestic textile industry, at all levels from management to machine operators. There is a general shortage of high skilled labor and good management personnel particularly at the middle management level (see chapter 5, section 5.8.2). This likewise has inhibited product development, innovation and fashion design in Pakistan (see figure 4-5). These areas are very crucial to the development of value added products for export. Most competing countries have fashion and design institutes to assist their industries. Pakistan up to now does not have these facilities.

At present there are two main types of schemes for vocational training relevant to textiles industry. They are

i) in technical colleges under the control of the Ministry of Labor (or other government authorities)

ii) the apprenticeship training system which is combined with on job training.

About 80% of all firms carry out training in accordance with the Apprenticeship Training Ordinance of 1962. Candidates who have received less than two years of such training are generally classed as operatives, those having completed the two years are known as certified level, and are of supervisor class in factories. Operatives who have completed ten years of schooling followed by three years of training in

Government-controlled technical colleges are classed as diploma level. The training courses for apprentices are a six- month job entry course, a one year semi-skilled course and a two year skilled course (GOP and JICA, 1991).

The main educational institutes giving education in textile field are as follows

i) National College of Textile Engineering (Faisalabad)

ii) Government College of Technology Karachi

iii) Government College of Technology Multan

iv) Pakistan -Swedish Institute of Technology (Karachi)

v) Government Weaving and Finishing Institute (Shahdra, Lahore)

vi) Pakistan Knitwear Training institute (Karachi)

In addition to the above, the TIRDC (Textile Industry Research and Development Center) is an important institute with educational functions.

Many aspects of the education and training activities of these institutes are insufficient. Their common problems are

i) Insufficient teaching equipment and facilities

ii) Lack of instructors. Many instructors are enticed away by the private industry.

iii) Inadequate textbooks and curriculum.

In short the level of education in these institutes lags behind international standards. Unlike Pakistan, countries like Indonesia, Malaysia and Philippines have successfully developed relatively low cost labor force into quite efficient work forces through their relevant training programs.

4.4.1.5 Equipment and Capital

The spinning sector of the textile industry in Pakistan is the most developed. First class equipment even by international standards is installed for the production of coarse to medium quality spun yarn. Compared to the spinning sector, modernization of equipment in the weaving sector is belated and weaving capacity expansion is low. This trend is changing now with the recent investments by the private companies in shuttle less looms that have three to four times capacity of the shuttle looms (Zaidi, 1999, p.153).

The direct impetus for modernization of the spinning and weaving sectors has been the desire on the part of the Government of Pakistan to increase exports with a view to expanding foreign currency revenue. However this stimulus has had no impact on the domestic downstream industries[5]. For example in the dyeing-finishing sectors, emphasis has been placed in modernization installation of printing equipment that is largely of rotary screen printing type. This is because of the bias in export demand to

[5] Dawn, Economic & Business Review, 31 August_6 September 1996.

printed cloth. On the other hand the 'piece dyeing' facilities that are required for the production of garment raw material by the local downstream industries have not been upgraded (GOP and JICA, 1991).

However in spite of the recent investments there is still a large amount of obsolete equipment in the upstream and midstream sectors. The main problems regarding equipment can be summed up as

a) the insufficient maintenance system for the newly installed facilities and

b) the lack of investment in equipment needed for supplying raw materials required by the domestic downstream sectors.

There are clear disparities in the stage of modernization and upgrading achieved between sectors. This has led to a market structure where forward linkages cannot function sufficiently.

4.4.1.6 Research and Development

The analysis of the research institutions in Pakistan for the textile industry reveals that the institutes that are administered by the *Ministry of Food, Agriculture & Co-operatives* have, to some extend, made progress towards improving the quality of raw cotton in Pakistan. These institutes are concerned with technical development in areas ranging from cotton plant cultivation to quality control of raw cotton. The two main research institutes working under the Ministry are

i) Pakistan Central Cotton Committee (PCCC)

ii) Pakistan Cotton Standards Institute (PCSI)

Traditionally Pakistan's cotton was of short fiber. However, now Pakistan has become capable of producing medium length fiber cotton. These institutes are currently undertaking more projects that will develop new cotton strains of longer staple length and finer quality. These are long-term projects that are crucial for the overall development of the industry.

The areas of the textile industry concerned with spinning and subsequent processing fall under the scope of the Ministry of Industries. The Government controlled institutes for research and development relating to this processing are

i) Textile Industry Research and Development Center (TIRDC)

ii) Pakistan Standard Institution (PSI)

iii) Central Testing Laboratories (CTL)

The research and development work being done by these institutions is not sufficient and lags behind in quality. This can partly be blamed to the fact that the technology relating to production processing is still in the stage of technology transfer from the industrial nations.

Further, it appears that the private companies do not effectively participate in the research and development work[6].

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[6] Field research. See chapter 5, section 5.10.0.

4.4.2 Demand Conditions

The textile and clothing industry of Pakistan is characterized by segmented structure of demand i.e. demand for particular varieties. I try to analyze the demand conditions of this industry in Pakistan as they exist today and also find out how they can shape the environment conducive to innovation and upgrading in this industry.

The size and pattern of growth of home demand is important in reinforcing national advantage in an industry provided its composition is sophisticated and anticipates international as well as domestic needs.

Domestic demand '---- shapes the rate and character of improvement and innovation by nation's firms' (Porter, 1998).

4.4.2.1.1 Domestic Demand

Upstream & Midstream sectors

The main domestic consumers of the industry are

a) The domestic garment Industry

b) Institutions such as hospitals, hotels, and enterprises in the corporate sector, and

c) The household sector.

At present the household sector is the dominant sector because of the size of its market. Pakistan supplies the clothing needs of the nation in general. The domestic market for fabrics is for sale by cut length. Customers buy fabric directly from the retailers. The traditional national costume of Shalwar Kameez is generally preferred.

In particular, women, even in the large cities, seem to wear only traditional national costume that is suited to the climatic conditions, terrain and culture of the country. Domestic demand comprises mainly of printed fabric that does not require high count yarn. Moreover the quality of fabric along with the colors and patterns sold domestically is low by international standards. Pakistanis are not sophisticated buyers because of their low per capita income (see chapter 1), therefore there are few complaints. In short the local demand does not pressurize the upstream /midstream sectors into upgrading of their products.

Downstream sector

The domestic demand for the products of garments and knitwear industry is almost non- existent. In big cities like Karachi, Lahore and Islamabad there are large sections of population who wear western type clothing, but the demand generated by them is not sufficient enough to promote the garment /knitwear industry domestically. Lack of domestic demand is a major hindrance in the upgrading of the downstream sectors and constrains the overall development of the industry.

4.4.2.2 Foreign Demand

Upstream and Midstream Sectors

The upstream/midstream sectors are presently being supported by the strong overseas demand for their low-grade products of coarse and medium count yarn / fabric. Price competitiveness is the only selling point of these products. This is evident from the following table which shows the price of Pakistan's products vis-à-vis its competitors.

Table 4.5

Price Comparison

Supplier Country	Cotton Yarn Japan US$/kg	Cotton Fabric Japan US$/kg	Woven Garments EC ECU/kg	Knit Garments EC ECU/kg	Cotton knit shirts USA US$/kg
Average Market Price	**2.62**	**4.76**	**24.24**	**19.36**	**81.26**
Pakistan	2.3	3.19	7.75	7.15	42.97
China	2.83	3.4	18.39	11.85	84.24
Hong Kong	N/A	N/A	19.25	23.71	122.65
India	5.27	8.24	18.16	10.66	53.39
Indonesia	3.98	4.8	16.12	12.09	70.7
S. Korea	3.71	9.17	25.14	16.07	104.42
Malaysia	N/A	5.87	18.22	13.6	105.39
Taiwan	N/A	N/A	23.79	18.23	104.35
Thailand	N/A	N/A	18.8	15.63	82.65

Source: Gherzi, 1992, p.60
Note: This table is based on the volume and value of imports by product and country.

This price competitiveness is based on the comparative advantage given to this industry by the indigenous supply of the basic raw material i.e. cotton. The competitiveness that relies solely on price is likely to be lost sooner or later to nations newly entering the scene like Indonesia and Turkey. The present demand by foreign nations for the low quality products is however sufficient enough *not* to push the sector to upgrade or differentiate its products.

Downstream Sectors

The downstream knitwear and garment industries are 100% export oriented. In fact many are subcontract companies receiving orders from the buyer countries mainly USA and Europe. The raw material used by the garment industry is provided by the local spinning and weaving industries.

Although the garment industry of Pakistan has experienced a tremendous increase in the exports since 1980 (see figure 4-2), its products are of poor quality designed for the lower end of the market. This is because of the low/grade raw materials being used by this industry. Now with the increasing competition from countries like India and Indonesia this industry needs to upgrade itself in order to maintain its competitive position. For this it requires finer and higher count yarn/fabric. Since the domestic demand for this industry is almost non-existent, the overall pressure generated on the spinning/ and weaving industries to improve the quality of their products is not sufficient. This amounts to structural impediment to the operation of forward and backward linkages.

The following diagram summarizes the current demand situation of the industry.

Figure: 4-4 **Demand Influence**

	Demand: Domestic	Demand: Foreign	
Upstream/Midstream	Low grade coarse to medium count yarn and fabric. Suitable for printing material used domestically	Low grade coarse to medium count yarn/fabric. Suitable for rotary type printing used for limited lower end market	not conducive to upgrading
Downstream	NON EXISTENT	Finer quality yarn fabric for piece dyeing garments. Low count fabric not suitable for dyeing.	Can stimulate upgrading
	not conducive to upgrading	Can stimulate upgrading	

Source: Author (Case Analysis)

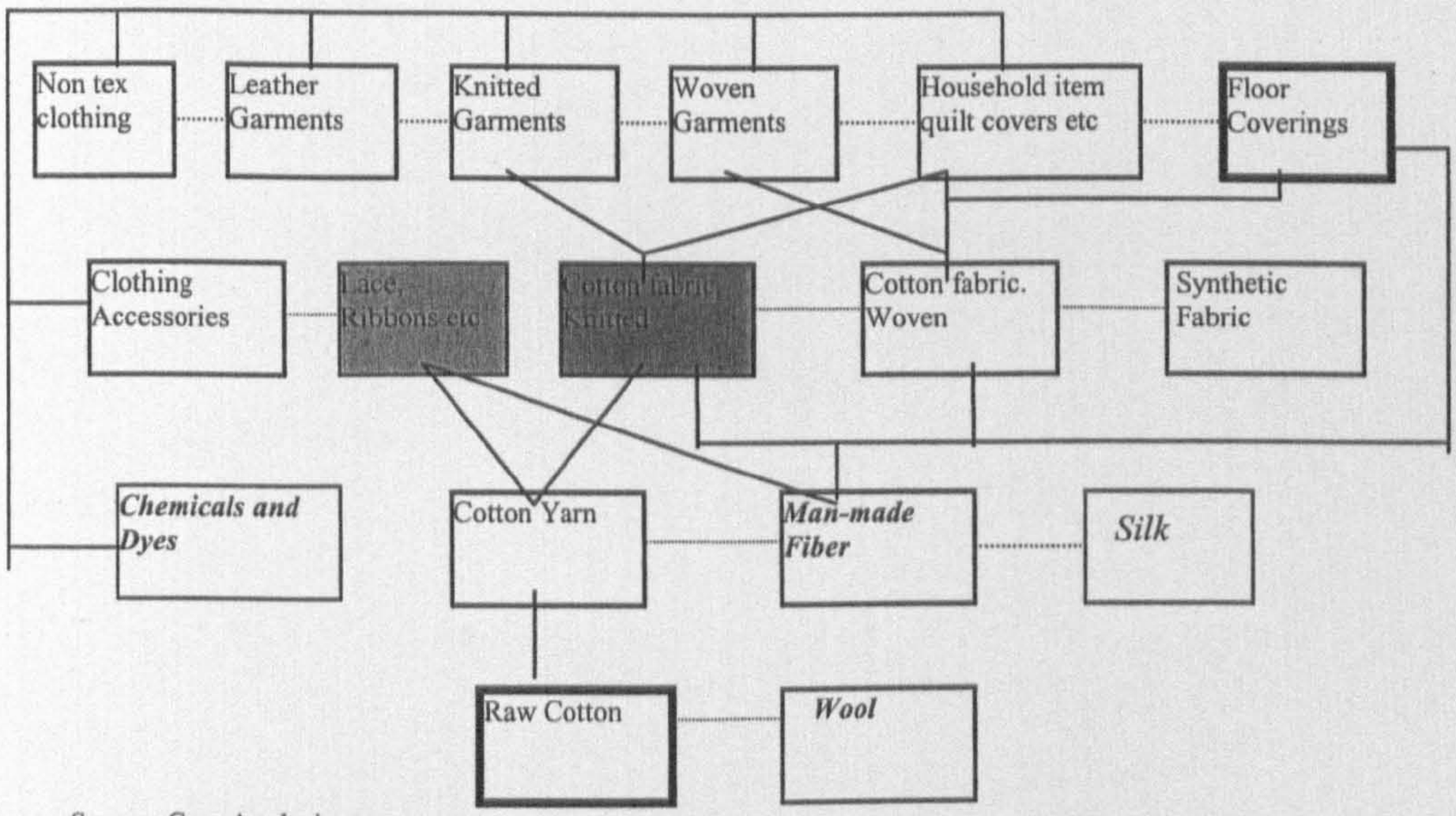
The prevailing market distortion can be blamed to an extent on the government policies that provide export incentives to the upstream/midstream sectors amid strong global demand and financial demerit of selling domestically.

4.4.3 Related and Supporting Industries

The cotton-based cluster is the most prominent cluster in the economy of Pakistan. Its importance can be gauged from the fact that this cluster (table4-1) constituted almost 79% of Pakistan's exports in 1996.

Figure: 4-5

The Cotton-based Textile/ Clothing Cluster- Pakistan



Source: Case Analysis

Key: .....related industries

_____ supplier industries

new competitive industry since 1980

exports have declined by more than 50% in terms of value since 1980-1996

Italics weak sectors (not Competitive) in 1996

Benefits originating from clusters

Backward Benefits: sophisticated and demanding buyers stimulate suppliers

Forward Benefits: Entry of superior firms technology

Horizontal Benefits: Economies of scope resulting from marketing channels and design services etc.

Note: Page 98, figure 4-2, separately analyzes of the export competitiveness of the three sub-sectors of the textile/clothing industry and shows the changes that have taken place in these sub-sectors over the period 1980-1996.

Despite the fact, that textile clothing cluster is the major cluster in Pakistan's economy; it is still shallow when compared to those of industrialized nations. The empirical analysis in the later chapters indicates that the firms in this industry have not been able to take advantage of the benefits of clusters to speed up the process of upgrading and innovation. Relationships with buyers (garment industry) and suppliers (yarn & fabric industries) have tended to be opportunistic and at arm's length. Skill transfer and sharing of market insights among the clustered industries is not taking place at all. This represents a major vulnerability in the competitive advantage of this industry in Pakistan.

Lack of interchange (see chapter 5 and 6) among the clustered industries can be blamed to an extent on the influence of other determinants. For example the segmented demand structure of this industry has hindered the mechanism of forward and backward linkages. The garment industry cannot benefit from the presence of world class spinning and weaving sectors because of the different and conflicting interests between them.

In the industrial world, the expansion of textiles & clothing industries has been accompanied by the expansion and stability of closely related sectors such as man-made fibers, textile machinery & dyestuffs etc. In Pakistan although the exports of the textile /clothing industries have increased tremendously in terms of their percentage share in the total exports[7], this has not been accompanied by the relevant

[7] From 53% in 1980 to 79% in 1996. See table 4-1.

expansion of the industry into important related sectors. The above figure shows that Pakistan's position in man-made fiber and chemical industry is still weak. As far as the textile related machinery is concerned, Pakistan has virtually no position in this sector. The above figure shows complete absence of this sector from the cluster chart. This has made it difficult for Pakistan to compete in differentiated industry segments or to stimulate the process of innovation.

Similarly the complete absence of trading companies has made it difficult to penetrate the foreign markets, unlike S. Korea which is one of the major competitors of Pakistan in the textile/clothing industries and has large general trading companies that have well-established international networks of offices. These networks have helped Korea to enter foreign markets (Gherzi, 1992). Another important sector of paramount importance to the industry that is absent from the above cluster is the design services. Pakistan has no position in the fashion industry and depends entirely on the design patterns provided to it by the importing countries.

The importance of strengthening the textile/clothing cluster is still not really understood by the firms in this industry. The later chapters show that at present these firms do not find it cost effective to invest in sponsoring specialized research institutes at universities, or to improve the pool of human resources available to them and their entire domestic industry. This work is mostly left on the shoulders of government institutions that lack efficiency and enthusiasm.

4.4.4 Firm Structure, Strategy and Rivalry

Structure: In Pakistan, the textiles industry has a complex structure. It is made up of a large number of companies in every sector, from cottage based manufacturing units to large scale firms using modern equipment and technology.

Upstream/Midstream Sectors:

The companies in the spinning and weaving industries may be divided into a) the mill sector b) the non mill sector.

The mill sector comprises of integrated mills which are engaged in spinning, weaving and sometimes even dyeing and finishing processes as well as factories which are engaged exclusively in spinning.

The non mill sector is made up of independent weaving mills dominated by small scale enterprises. These individual mills are structurally suited to multi-type, small lot production and are in a position to play a role of material suppliers to the garment sector. It is estimated that this non mill sector accounts for approximately 90% of all cotton fabric production (GOP and JICA, 1991). These firms are mostly family operated small businesses. Their finance raising ability is weak, and except for few firms, they mostly lag behind in the modernization facilities. Their major problems are obsolete equipment resulting in poor quality and low productivity. This situation is improving with the recent incentives given to this sector by the government.

Downstream sectors:

In the knitwear sector, small enterprises account for about 60% of production. They are mostly integrated firms with knitting, dyeing and sewing processes. The garment sector is also concentrated with small household units having no more than 50 machines.

In short the textile & clothing industry of Pakistan can be broadly divided structurally into three main strata.

At the top end are few large, vertical operations that have usually grown from spinning mills into downstream operations weaving, dyeing, finishing and garmenting. These companies have the size and resources to be at the vanguard of the industry, and therefore ought to take the lead in pushing forward with the necessary improvements in all areas.

Then there are a very large number of medium sized companies, often family owned, with activities in more than one sector. They are also in a position to play a significant role in the future development of the industry however they may lack financial resources to do so.

Finally there are enormous numbers of small units in garment manufacturing as well as weaving. These units are fragmented and disorganized. Whilst they are an

important source of employment today, it is envisaged that as the industry develops, and as organized companies grow larger and working conditions improve, employment will move away from this sector. These units have basically sprung up because of the low level of investment required in setting up garment and weaving units.

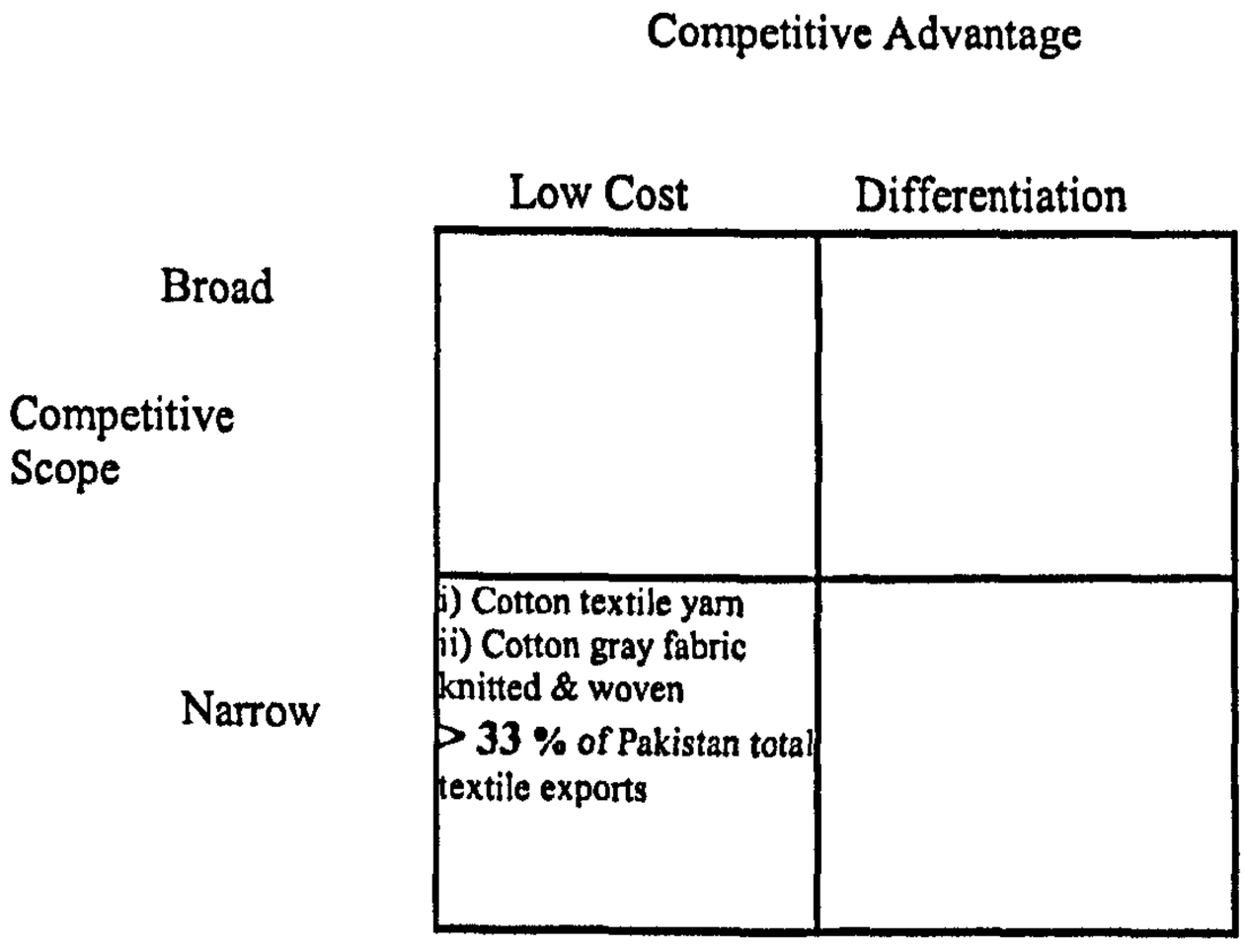
Strategy: The complex and layered structure of the textile industry of Pakistan has led to sharp differences within the industry in the goals that firms seek to achieve. This has strongly constrained the overall development of the industry.

Upstream/Midstream Sectors: In the spinning and weaving sectors of the textile industry there are basically two groups of companies. One group has adopted dynamic industrial strategies while the other has confined itself to its present level of activity. The former group undertakes active equipment investment with the aim of exporting product (mostly as direct export), and directs efforts to opening up new markets. Managers of such companies take a keen interest in news concerning foreign markets and equipment development. The second group of companies comprises of managers who do not make any efforts to upgrade themselves and are satisfied with the present level of their companies. Such companies would be driven out of the industry as the industry upgrades itself and loses its price competitiveness to new entrants like Bangladesh and India.

However the economic challenge of the firms in the spinning and weaving sector has traditionally been on increasing production. Their cost advantages, the ability of foreign and domestic markets to consume all that they produce and their reliance on foreign companies to distribute the goods means that these firms have little incentive to develop new products, marketing skills or distribution systems. Instead of focusing on gaining a sophisticated understanding of buyer needs and targeting segments where they might offer differentiated products at premium prices, these firms have focused on offering basic products at a lower price than the competitors. Their export items are confined to products like a) spun yarn: coarse to medium count-inferior quality b) gray cloth, (printed cloth for home textiles).

Figure 4-6

Spinning and Weaving Exporters use Cost-Based Strategies



Source: Case Analysis

The equipment investment (encouraged by government policies) and expansion of direct exports by the spinning and weaving industry should eventually result in greater diversification of products. This through its forward linkage effect is likely to lead to the provision of better quality of raw material to the garment sector. In view of such a projected development it is believed that the above strategy adopted by the firms is desirable as it may lead to the balanced development of the industry at large.

Downstream Sector: As mentioned earlier, the downstream sector that comprises knitwear and garment industries is 100% export oriented. Presently these firms are engaged in sub-contractual production for American and European markets. Since these firms are dependent on the domestic raw material for the production of their products, they produce only low priced/quality goods. Their strategy is so far based on low cost production of a range of end use products.

Figure 4-7

Downstream Sector Exporters use Cost-Based Strategies

Competitive Scope	Low Cost	Differentiation
Broad	Men /women wear, etc knit &non knit, non textile clothing, Household articles etc < 25 % of Pakistan's textile exports	
Narrow		

Source: Case Analysis

Some of the firms in this sector are making moves to free themselves from the current predicament and move towards higher value added products. This could lead to qualitative upgrading and eventually quantitative expansion. This could also stimulate backward linkage. However currently the number of firms using imported raw material is not sufficient enough to push the upstream/midstream sectors to upgrade itself.

Rivalry: The presence of domestic rivalry can stimulate competition and promote efficiency (Porter, 1998). Competition among final output producers and input suppliers is an essential component of a dynamic industry. The prevailing business environment in the textile industry of Pakistan does not promote rivalry among spinning/weaving sectors and the garment industry. This is because the small size of the garment industry forms an insignificant market for the supplier industries compared to the strong international demand for their products.

In the recent years there has been a large increase in the spinning capacity[8]. This, along with the fact that many other competing countries are bringing similar yarn to the international yarn markets has resulted in the saturation level being achieved for these yarns. Hence the competition has increased not only between one supply country and another but also between Pakistani companies. This has pushed some

[8] Dawn, Economic & Business Review, September 1996.

spinning firms to start production of value added yarns such as combed, sliced yarns[9]. However, so far the progress in this direction has not been very significant.

4.4.5 Role of Government in the Textile and Clothing Industry of Pakistan[10]

Pakistan's fundamental policy for the textile industry was historically based upon import substitution. The objective of this policy was to make Pakistan self sufficient in its textile needs. Today, the textile industry not only satisfies the domestic needs of the country, but also is a major source of foreign exchange earnings. Now there is an urgent need to develop policies and institutional programs that can help scale down the uncompetitive industrial activities and introduce and reshape those that can promote international competitiveness.

The restructuring required in this industry will not take place automatically to changes in macro economic policy or rapid shifts in global conditions. The above analysis of the textile industry has revealed major structural impediments that need to be addressed at the firm level. Prudent macroeconomic targets, proper sequencing of policies and attention to institutional and infrastructure bottlenecks are needed to restructure the industry. The policies and schemes adopted by the government of Pakistan particularly since April 1989 have aimed at promoting competition and overall

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[9] They have been encouraged by government regulations of reduced import duties on selected machines.
[10] Most of the material in this section has been derived from 'Market based strategy for Pakistan's Textile and Clothing Industry' Gherzi Textil Organisation and 'The study on the Textile Industry Development Program in the Islamic Republic of Pakistan' GOP and JICA (1991).

development of the industry. However, often these policies have been found to be inconsistent with the fundamental objective of shifting to higher value added products. Some of the measures adopted by the government and their impact on the industry as a whole are discussed below.

Historically a series of fiscal measures adopted by Pakistan government have favored the spinning sector. This has resulted in higher profitability in this sector. Consequently investment has tended to concentrate in the spinning industries only leading to over capacity in this sector. These fiscal measures have not only led to an unbalanced growth but are also inconsistent with the policy of giving priority to the higher value added sectors.

A price policy of raw cotton comprises the central part of Pakistan's raw material policy. This policy is designed to secure raw materials for the local textile industry and add value to raw materials so that they are exported in added form rather than in the form of raw cotton. This encourages the producers to sell cotton in the domestic market. As a result the spinners have the advantage of purchasing locally produced cotton at prices below international price levels. However instead of passing this advantage to the downstream sectors, they have made the most of these characteristics by specializing in yarn of medium and coarse count. This has hindered the product diversification at weaving, and garment stages.

As for policies aimed at the promotion of export, there is the income tax exemption on export whereby export income tax is exempted at the rate of 25% for cotton yarn, 50% for fabric and 75% for garment exports. The exemption rate is higher the more downstream the sector is. This reflects the policy of the government to promote the value added exports. Moreover a system for bonded imports of raw materials and machinery and an import duty exemption scheme for machinery are now being provided. These policies so far have not made impact on the industry to their full potential.

To summarize we can say that the government of Pakistan has so far failed to provide a conducive business environment for the upgrading of the industry at large. Its macro economic policies of frequent devaluation and fluctuating exchange rates, have slowed the upgrading of the competitive advantage, particularly in this industry and has directed firms to less sustainable, price sensitive market segments of low/priced quality products. Moreover the government has failed to ensure that the investments in this industry are channeled into products that are promising in terms of demand projections such as finer count yarns, fabrics and synthetic textiles. It has so far not addressed problems of institutional services and infrastructure that would aid firm level restructuring. It still needs to develop policies that would stimulate backward and forward linkages within the industry.

4.5 Implications of Agreements on Textiles and Clothing (ATC) on Pakistan's Textile/Apparel Industry

4.5.1 Multi-fiber Agreement

A distinctive feature of the world textile industry has been its intense international regulation. Much of the world trade in textiles has been governed by the Multi-fiber agreement that came into operation in 1974[11]. The MFA operates through a complex system of quotas to restrict LCD's exports of clothing and textiles to quota countries. The purpose of these multi fiber agreements was to remove the textiles and apparel trade from Most Favored Nation (MFN) principles of the GATT, allowing or even promoting discriminatory restrictions by (importing) developed countries against low wage, low cost textile and apparel exports of the LCD's. These restrictions were in addition to the relatively high rates of duty applied to these textile apparel imports[12].

The following tables show the distribution of textiles exports of Pakistan between quota and non-quota countries and MFA quota utilization rates.

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[11] Under the MFA, Pakistan has bilateral and restrained agreements with Canada, European Union, Finland, Norway and United States.

[12] In the case of United States, the average duty rate on apparel imports is equivalent to 19% of the reported Customs value. For the non-apparel textile products, the average rate of duty is equivalent to approximately 12% of the reported customs value. This compares with an overall average duty rate applied for all the US imports of approximately 3%. Thus, it is evident that the domestic US textile and apparel industry enjoy protection through relatively high duty rates, in addition to the quantitative restrictions (QRs) allowed under various agreements (Makhdoomi, 2000)

Table 4-8

The Distribution of Textile Exports between Quota and Non Quota Countries

(Percentage)

Textiles	Non-Quota Countries	Quota Countries	Quota Utilization Rates
Yarn	95	5	99.4
Fabrics	72	28	99.8
Made-ups	29	71	98.1

Source: ADB, 1996, p.59 as reproduced in Makhdoomi, 2000, p.265

Table 4-9

Pakistan's Average Weighted MFA Quota Utilization Rate in US and European Union

(Percentage)

	1985	1986	1987	1988	1989	1985-89	1993
United States	87.3	82.2	96.1	88.1	94.2	89.6	90
European Union	114.7	106.1	90.8	105.3	119.2	107.2	100

GOP (1998 a) as reproduced in Makhdoomi, 2000, p.265

Table 4-8 shows that the category of made-ups that comprises of higher value added items is concentrated in the quota countries. Table 4-9 shows a very high quota utilization rates in the restricted markets. They suggest that the MFA has been a binding constraint on Pakistan's textile exports. They further suggest that, without the MFA, potentially Pakistan may have wider choice to export the products (Makhdoomi, 2000, p.265). The existence of quotas in major countries has necessitated complex quota administration and allocation in Pakistan, which have certainly imposed hidden costs on the economy. For instance, quotas are allocated on the basis of quantity instead of quality value basis. Moreover, the bulk of the quota is

allocated to established exporters that make it difficult for new exporters to 'break into' the quota allocation system. Hence potentially competitive producers find themselves shut out of picture.

4.5.2 The World Trade Organization (WTO)

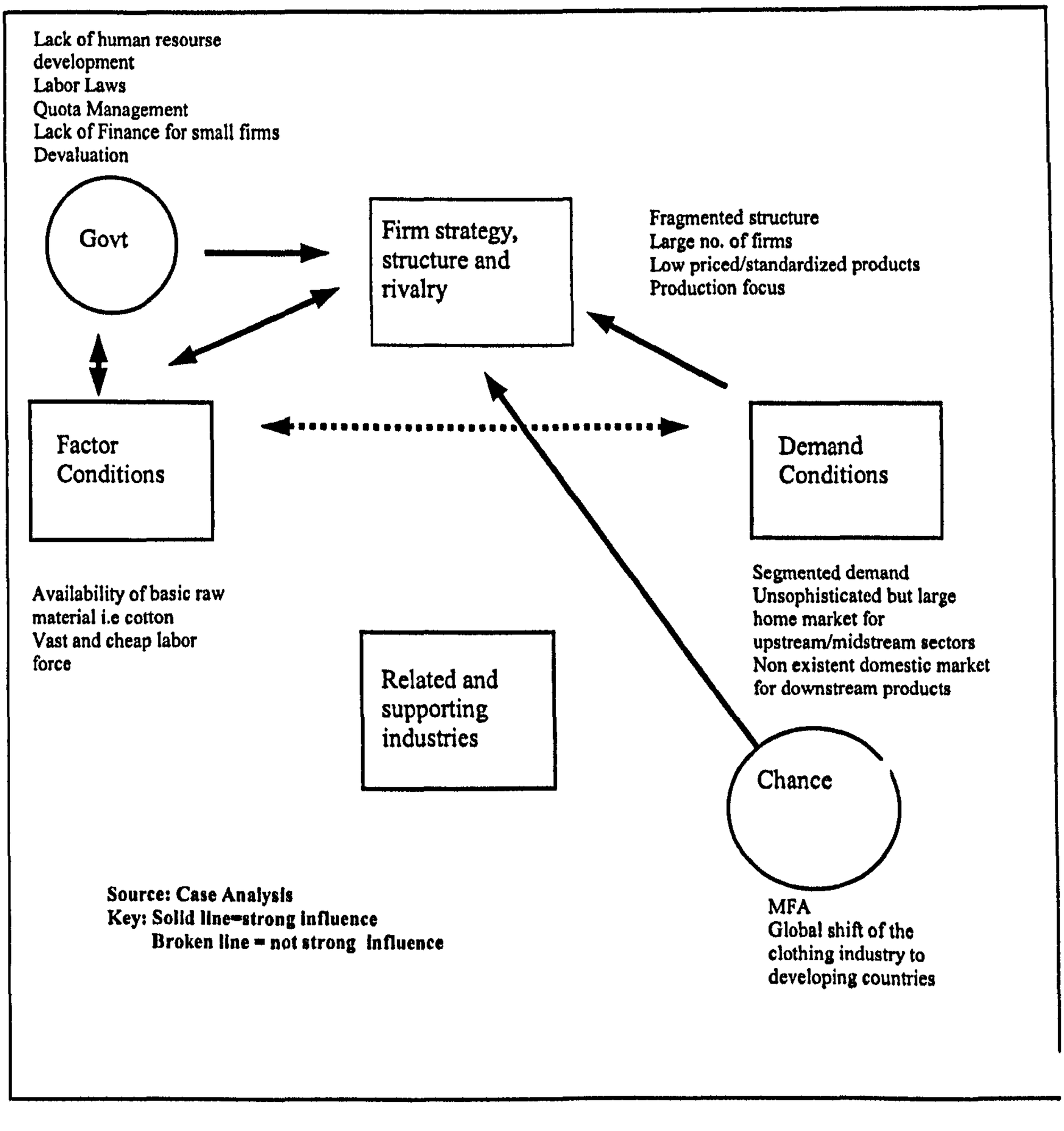
On January 1, 1995, a new organization came into existence_ the World Trade Organization (WTO). This new organization replaces the General Agreement on Tariffs and Trade (GATT) and will supervise and over see the most ambitious trade accord ever. According to the WTO agreement, developed nations which were restricting the import of textiles and clothing have to phase out the Multi-fiber Agreement (MFA) - quantitative restrictions on the import of fiber, textiles and apparel. Quotas are to be totally lifted over a staggered period of ten years. This will mean that Pakistani apparel exporters can sell as many T-shirts in America as US buyers want. However, restrictions on importing T-shirts from India, Bangladesh and Hong Kong will also be removed and Pakistani exporters will have to be competitively priced (EPB, 1995). In short with the phasing out of MFA, the pressure of Pakistani firms to upgrade themselves would be intensified if they want to remain competitive in the world market.

4.6 Conclusion

Figure 4-8 shows the sources of competitive advantage as they exist today in the textile and clothing industry of Pakistan.

Figure: 4-8

Sources of Advantage in the Textile/Clothing Industry of Pakistan



Source: Case Analysis
Key: Solid line=strong influence
Broken line = not strong influence

The above figure indicates how the relationships between different determinants of the diamond operate in this industry. *'Advantages in the entire 'diamond' are not always necessary for competitive advantage in simple or resource-intensive*

industries and in standardized, lower-technology segments of more advanced industries (Porter,1990, p. 144). Factor conditions are the decisive force in the competitive advantage of this industry. The factor costs have a strong influence on the strategies adopted by the establishments in this industry. It is therefore essential that the cotton- growing sector is made aware of its part in the production chain, and is encouraged to provide the raw material its industry needs (see section 4.4.1.1, figure 4-3). Closer links are needed between the growers, ginners, spinners and the research development agencies. Pakistan like India possesses favourable climatic conditions for the production of good quality cotton. This can become its major strength, if properly exploited.

The local demand conditions have also strongly influenced the establishments in this industry towards their current strategy; which does not stimulate the upgrading of factor conditions (see section 4.4.2, figure 4-4). It is necessary to nurture a healthy internal demand in some way. There are clothing items for which the national costume (shalwar kameez) is not the most appropriate choice as in the case of police uniforms, army clothing or factory overalls. By targeting such segments of the local market domestic demand may be stimulated. Efforts in this regard are essential for the development of the industry at large (see section 4.4.2, figure 4-4).

The above figure shows the absence of any influence on related and supporting industries. Since the domestic demand for the garment industry is non-existent, it does not stimulate the growth and upgrading of supplier industries. Similarly lack of

domestic rivalry in this industry has stifled the formation and expansion of related industries. While a nation's firms may initially draw their competitive advantage from just one determinant, sustaining it will usually be difficult unless advantages expand to include others (Porter, 1995, p.148).

A closer link needs to be established between the industry at large and the educational institutions' to build up a social infrastructure which encourages informational interchange and accelerates the R&D process (see section 4.4.1.4). Owing to the significant position of the textile industry in the national economy it is essential that foreign countries are requested for their assistance in strengthening the facilities of educational and R&D organizations of Pakistan.

The speed and efficacy with which the entire diamond develops depends upon number of factors like the geographical proximity of customers and suppliers as well as the fluidity and responsiveness of the institutions, individuals and firms that relate a particular industry in a nation. The next two chapters are based on the empirical analyses of these cluster promoting mechanisms that influence the effectiveness of the interactions within the diamond.

Chapter 5

Empirical Analysis of the Organizational Characteristics and Intra Cluster interchange in the Textile/ Apparel industry of Pakistan.

5.0 Introduction

Porter has emphasized the importance of clusters in attaining sustainable competitive advantage. The following two chapters focus on the development of cluster formation in this industry of Pakistan.

The scope of research concerned with industrial linkages and intra cluster interchange varies widely from worker to worker. Here the analysis of the cluster formation development is based on the information collected from 39 establishments by a structured questionnaire.

Industrial linkages both material as well as information play an essential role in the promotion of clusters. This study has been divided into two parts. The first part of the study (chapter 5) focuses on various organizational attributes of this industry in Pakistan. The objective is to analyze whether these attributes encourage intra cluster interchange that enhance the individual determinants in the 'diamond' and their mutual reinforcement (see chapter 2, section 2.3). This is essential for the sustainability of the competitive advantage. Intra cluster interchange refers to active channels for business transactions, communications and dialogue, sharing of specialized infrastructure, services, R&D etc, within the establishments of an industry.

The second part of the study (chapter 6) focuses more on informational linkages within the industry. It analyzes the social mechanisms that facilitate informational interchange within the horizontally and vertically linked firms in this industry.

Following the introduction, the next section is based on developing indicators that would represent various organizational attributes that influence the productivity of the establishments. These organizational attributes are later on examined for their influence on the local linkage pattern of the industry. Section 5.2 focuses on matters relating to population target, sample size, sampling procedures and the implementation of the survey in the study area. Section 5.3 discusses the structure of the questionnaire, which indicates the range and content of data that was collected through the questionnaire survey. Sections 5.4 and 5.5 are concerned with the explanation of the selected variables and the major propositions that have been put forward. Section 5.6 deals with the statistical tests used in this study. The remainder of the chapter is mainly concerned with the results of the survey findings and their implications for the cluster formation process of the industry.

5.1.0 Productivity of firms and Competitive Advantage

Empirical research on Competitive Advantage under the framework of the 'diamond' is well documented in Porter's book of 'Competitive Advantage of Nations' (1998). He has reviewed a number of industries based in different nations that have achieved international leadership. His work reveals that every industry is unique, with its own sources of competitive advantage and its own evolutionary path. Porter emphasizes the importance of analyzing competitive advantage of an industry from a number of

dimensions rather than relying on a single overarching one such as labor costs or economies of scale. The behavior of firms in shaping their environment conducive to upgrading and innovation forms an integral part of Porter's theory.

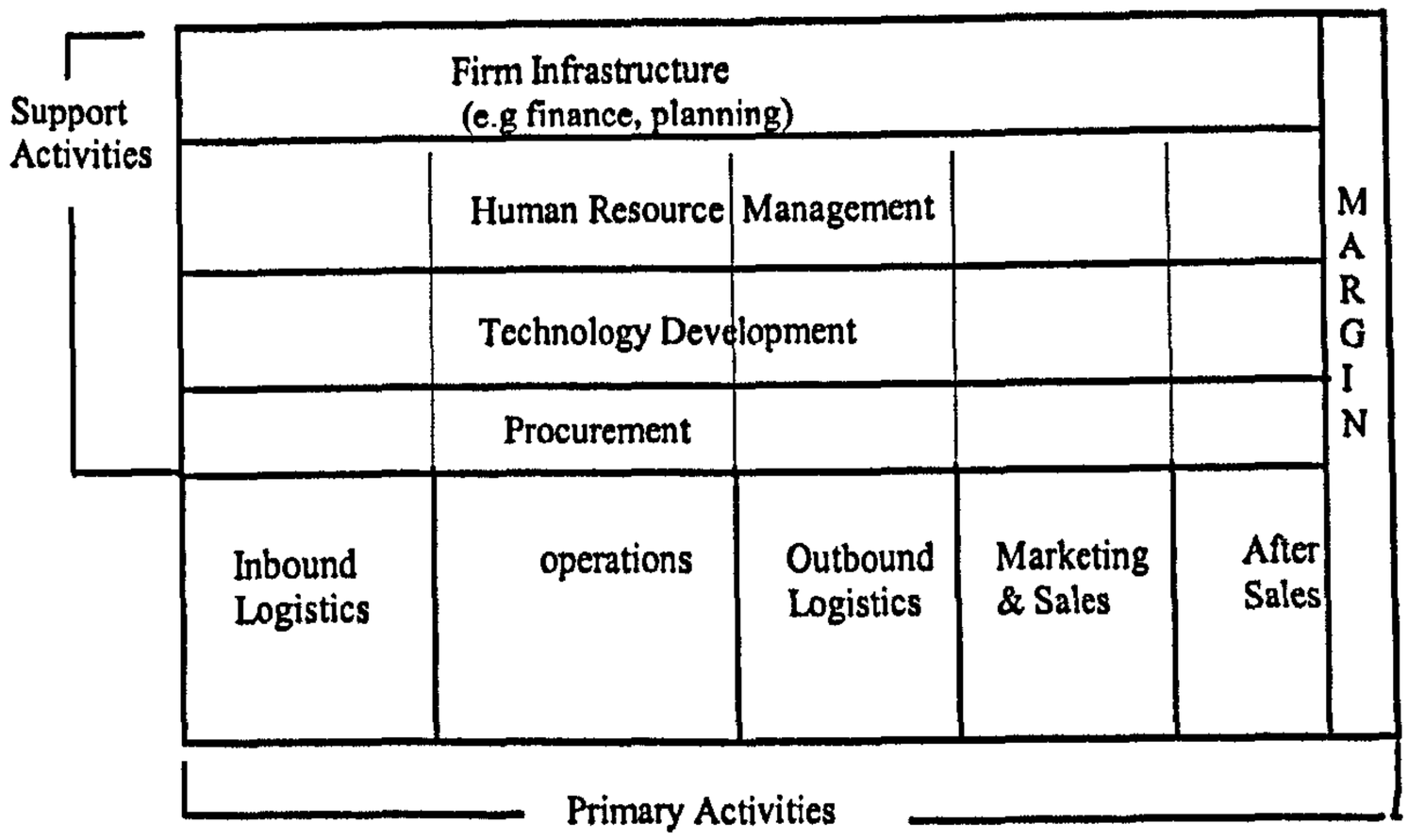
In this chapter I have relied on the micro-approach based upon direct data collected from interviewed establishments in the textile/apparel industries to analyze the behavior of firms and their environment in this industry. This approach has a number of limitations and shortcomings concerning the collection and analysis of data. Firstly this approach is more costly in time and effort than the collection of published and other data that has been used in chapter 3 and 4. Secondly the unstable political situation of the country has been a major hindrance in convincing the personnel of the establishments to provide relevant information. Finally the statistical analyses are very much constrained because of the small sample size and precaution must be taken while interpreting the results.

5.1.1 Developing Indicators:

The competitiveness of the industry depends upon the ability of its firms to produce efficiently and to discover new and better ways to compete[1]. There are a number of activities performed by the firms in order to compete in a particular industry. Porter describes these activities as the value chain of the firms.

[1] See Chapter 2, section 2.3.

Figure :5-1 **The Value Chain**



Source: Porter, (1998)

According to the above figure, the activities performed by the firms are broadly divided into two groups

i. Primary activities which include the on going production, marketing, delivery and servicing of the product.

ii. Support activities which include technology, human resources, provision of input materials and overall firm infrastructure (e.g. finance, planning etc).

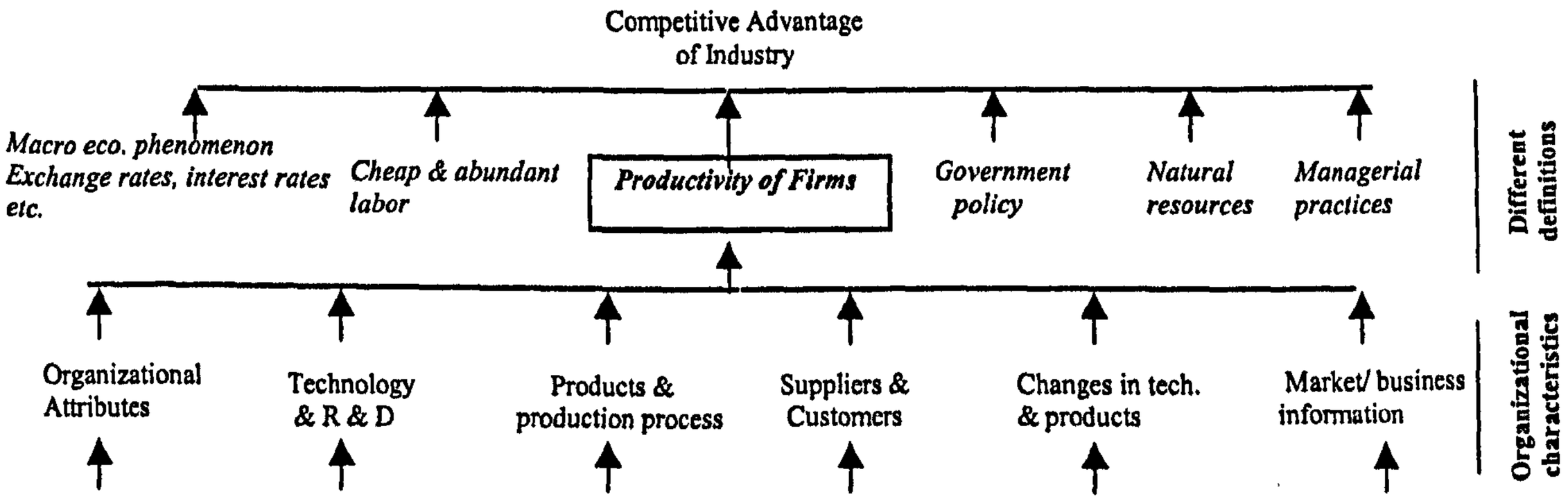
Activities vary in their importance to competitive advantage in different industries. (For example in the textile/ apparel industries product development and marketing skills are crucial while the level of technology required is not very high.) After sale service is almost non existent.

Industries likely to succeed in a nation are those whose firms have based their competitiveness on strategies that are suited to national environment.(National attributes)such as the nature of home demand, the availability of certain types of skilled personnel, the goals of the investors, the level of technological know how etc. influence the strategies adopted by the firms of a particular industry.

In order to develop indicators to analyze the organizational characteristics of a particular industry we need to focus on all those factors that influence the productivity of its firms.

Figure 5-2

The Model for Competitiveness[2]



Source: Author

The above figure shows a number of factors that influence the productivity and capacity of the establishments to upgrade overtime. These include organizational characteristics such as the structure of the establishments, nature of products/production processes, technology, R&D etc. Productivity of firms

[2] Based on the theoretical background discussed in chapter 2, section 2.3.

can be manifested in product changes, process changes, and new conceptions of scope. A number of variables have been developed (see figure 5-3) to analyze the above mentioned range of factors influencing the productivity of the firms in textile/apparel industries of Pakistan. How these variables are used to analyze whether the organizational characteristics of the establishments in textile/apparel industries are conducive to sustainable competitive advantage is discussed in later sections. Figure 5-3 shows the variables that have been selected to represent various factors influencing the organizational characteristics of the establishments.

5.2.0 Population Target

The textile/apparel industry in Pakistan has a complex structure comprising of an enormous number of small units particularly in garment manufacturing and weaving sectors to large-scale firms using modern equipment and technology.

The objective here is to target those companies that have the size and resources to bring about the necessary changes required for pushing forward the industry at large. Consequently the cottage-based units which do not have the financial resources but have basically sprung up because of the low level of investment required in the garment/weaving sectors have been ignored. These cottage-based units mostly fall in the unorganized sector of the industry. Only the establishments falling within the size group of 50-999 workers have been targeted in this study.

Figure 5-3 Variables Representing Various Organizational Attributes

Structure of the industry	1. Size	1. No of employees 2. Composition of Workforce
	2. Internal and External Structure	3. No of major departments under the head office control 4. No of production units 5. Ownership structure 6. Group ties
Products and Production process	1. Products	7. No of products 8. Types of products
	2.Production process	9. Type of production process
	3. Changes in Products	10. No of new products/ businesses entered
Technology & R&D	1.Technology	11. % of imported equipment 12 . Use of scientific equipment 13. No. of times machinery upgraded
	2. R&D activities	14. % of R&D workers 15.contact with foreign organizations for R&D
Behavioral Aspects of Managers	1. Factors affecting attitudes	16. Location of the head office 17. Location of major competitors 18. Birth town of owners
Dynamic Aspects of establishments	1. Changes in Products	19.New products or businesses entered
	2. Innovative Activities	20.No. of times machinery upgraded
External links	1. Characters	21. Size of major customers
	2. Suppliers and customers	22. Location of major suppliers 23. Location of major customers

5.2.1 Study Area:

The study area was confined to the province of Punjab. Pakistan is divided into four provinces. Two of its provinces Punjab and Sindh are highly industrialized whereas the other two provinces Baluchistan and NWFP are far less industrialized and are regarded as backward regions of the country. The textile/apparel industry is concentrated in the province of Punjab. 54% of the registered establishments belonging to this industry are situated in the Punjab province. 36% are located in the province of Sindh while only 9% and 1% are located in NWFP and Baluchistan respectively[3]. The selection of Punjab province makes it possible to build up an adequate industrial base for the study of the linkage pattern of this industry.

5.2.2 Sample Size

It was initially decided that the sample size should be around 65 establishments owing to the limited time and resources. The samples accounted for approximately 25 per cent of the total number of establishments in the textile/ apparel (ISIC 32) industries in the province of Punjab[4].

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[3] Computed from 'Census of Manufacturing Industries of Pakistan', GOP,(1990-91), Table 2.0, p.10.
[4] The population size was taken from the 'Census of Manufacturing industries of Pakistan', GOP, (1990-91), Table 2.2. The population size includes only those establishments that have been registered with the government and belong to the size group of 50-999 employees. Small manufacturing cottage based units falling in the unorganized sector have been ignored.

Table 5.1> **The Textile/Apparel Industries**

ISIC	Population	Samples
32	253	64

5.2.3 Sampling Procedures

A stratified sampling technique was used to ensure accuracy of samples. (*In a stratified random sampling, variation between strata does not enter into the standard error at all, because one ensures that this component of variation in the population is exactly reflected in the sample. Sampling and therefore the play of chance only takes place within the strata* (Moser & Kalton, 1985). The size of the establishment is closely associated with organizational structure, the scale of production and the technology of establishment, therefore the size of the firm was decided to be the stratifying variable so as to ensure inter-establishment variation in a range of characteristics. Consequently the establishments in textile /apparel (ISIC 32) industries were stratified in four different size groups based on the number of employees. The first sub-group consisted of establishments having workers between 50 to 99. This group here is termed as small sized establishments. The second and third sub-groups comprise of establishments with less than 250 and 500 workers. These are considered as medium sized companies. The final group consists of large size establishments having more than 500 but less than 1000 workers. It is believed that the establishments belonging to these four groups play the significant role in the development of the industry and have therefore been targeted for this study.

As mentioned earlier it was initially decided that the sample size should be around 65 establishments owing to the time constraint and the resources. Table 5.2 shows that most of the establishments in the study region fall into the first sub group. The fourth sub group comprises of least amount of establishments. Since the total number of establishments falling within the size group of 50-999 employees were 253 in the study region, the sampling fraction was 1/4[5].

Table 5.2

The Number of Samples

Size of Firms	Population (N)	Population %	Samples (n)	Samples %
50>99	98	39	25	39
100>249	66	26	17	26
250>499	61	24	15	24
500>999	28	11	7	11
Total	253		64	

Note: Sampling fraction: n/N=64/253 = 1/4 (approximately)

The uneven distribution of population size between sub-groups seems to suggest that the populations in some sub groups may be more variable than others and therefore proportional or equal sampling may not represent different subgroups adequately. However according to Moser and Kalton (1985), if the stratum percentages all lie within the range of 10 per cent to 90 per cent, the optimum sampling fraction will have less than two fold variation (Moser & Kalton, 1985, p.95). In this case it is therefore worthwhile not to depart from the simplicity of proportionate allocation.

[5] 65/253 = 0.257

The individual establishments from all the four sub groups were selected through a systematic sampling technique. For example there are 98 establishments in the first sub group. 25 of these 98 establishments were randomly selected from the list of that sub group. The same procedure was repeated for the remaining sub- groups.

5.2.4 Implementation

Initially the survey was conducted through the normal mail channel. However due to lack of response, interviews with various sample firms had to be conducted. These interviews were held at a mutually arranged time with mostly the senior/middle managers of the sample establishments. The support of local chamber of commerce and some government officials also greatly contributed to the overall response rate. Among the sub-groups, relatively small size establishments tended to be less accessible than the large sized establishments. The low response rate by the smaller sized establishments can be blamed to an extent on the unstable political condition of the country as a result of which many establishments did not want to provide written information of any sort. The large size establishments were more readily persuaded. The following table shows the response rate of the firms in different size groups.

Table 5.3

The Response Rate of Survey

Size of Firms	No in Samples (a)	No of Responses (b)	Response Rate %
50>99	25	7	28
100>249	17	10	59
250>499	15	15	100
500>999	7	7	100
Total	64 (25.3)	39	

Response rate = (b/a)*100

The response rate of establishments with 50-99 workers and 100-249 workers was 28% and 59% respectively whereas the response rate of establishments with more than 250 workers was 100%.

5.3 The Structure of the Questionnaire

The questionnaire consists of various different sections to cover the range of necessary data that is difficult to obtain in any other way. Its main sections include questions on

I. Organizational characteristics of the establishments, such as its size, ownership structure and the composition of its workforce. These questions will help us in analyzing whether the present structure and strategies adopted by the firms in this industry are supported by the country circumstances.

II. Questions on products and production processes. These questions relate to analyzing the level of diversification and vertical integration of the interviewed establishments.

III. Questions on technology and R&D. These questions relate to finding out whether effective mechanisms are being created for upgrading factors that are advanced and specialized.

IV. Questions regarding major customers and suppliers, these questions relate to analyzing the depth of existing clusters i.e. local material backward and forward linkages.

V. Questions on behavioral aspects of linkages for example frequencies of contacts with major suppliers and customers as well as the importance of various factors in selecting them etc.

VI. Questions regarding methods of attaining business and market information as well as questions on the proximity of rivals. These questions relate to information flow that provides an essential mechanism to facilitate interchange within clusters.

5.4.0 Explanation of the Variables

5.4.1 Organizational Attributes

In this group a number of variables have been used to analyze the complexity of the organizational structure of the textile apparel and leather industry of Pakistan such as the size of the establishments, composition of its employees as well as the ownership structure of the establishments. Organizational structure not only determines the potential of the organizational and managerial capabilities of the establishments but also analyzes their ability to cope with external environment hence influencing the local linkage pattern.

a) Size of the establishments; in this study the size of the establishments has been measured in terms of the number of employees.

b) Composition of employees; the employees of the establishments were categorized into four groups 1) engineers 2) skilled workers and technicians c) manual workers d) others (not belonging to any of the above three categories). The composition of the employees in each of the interviewed establishments has been analyzed both in regards to the size of the establishments as well as the type of products being produced by the firms.

c) Internal and External Structure; the complexity of the organizational structure is also examined in terms of the internal and external structure of the organization. The internal structure of the firms was represented by the number of departments directly under the control of the head office. The complexity of the external

structure is represented by the number of plants or production units as well as the number of establishments belonging to a group of industries.

5.4.2 Products and Production processes:

1. Products: In this group two variables have been used to analyze the products being produced by the surveyed establishments a) the number of products being produced by the establishments b) the type of products i.e. finished consumer goods or intermediate or component goods.
2. Production Process: The establishments were divided into two groups 1) those using standardized mass production process and 2) those using batch or jobbing process. When the products were standardized and produced through automatic system, they were defined as mass production system. When the products were not being produced through a standardized system they were included in the category of 'jobbing or batch production. The type of production processes used by the establishments relates to their ability to adjust to market changes. For example establishments using standardized mass production process would be slower in adjusting to market changes as compared to the establishments using jobbing or batch production process.

5.4.3 Technology & R&D

The following variables have been selected to analyze the level of technology and innovative activities of the establishments in the textile/apparel and leather industry of Pakistan. 1) Level of technology is represented by the use of scientific equipment as well as the proportion of imported machinery used by the interviewed establishments. 2) R&D activities are measured in terms of the number of times the

establishments have contacted foreign organizations for R&D programs as well as the proportion of full time employees directly involved in R&D activities. Competitive advantage is a function not of factors but the ability to create and apply knowledge and technology to industry competition. The ability to employ and improve upon imported technology powerfully influences the national 'diamond' (Porter, 1990, p.165).

Porter has emphasized the importance of technological development to attain sustainable competitive advantage. These questions help us to analyze whether the firms in this industry are investing to create mechanisms for sustainable competitive advantage and how the level of technology influences the local linkage patterns.

5.4.4 Behavioral Aspects of Managers

Owners/managers attitudes and perception of the local area influences the linkage pattern of the industry. Three variables were selected to analyze the perception of the owners /managers and their attitude towards the study region a) birth town of the owners b) location of the head office in the industrial complex c) location of major competitors.

5.4.5 Dynamic Aspects of the Establishments

Dynamic aspects are largely concerned with the growth performance and the level of the innovative activities among the establishments.

1) In this study the growth performance has been measured in terms of the changes occurring in the size of the firms (number of employees) as well as the number of new products or businesses entered during the last ten years.

2) Innovative activities have been measured in terms of the number of times the machinery has been upgraded over the last ten years.

5.4.6 External Links

External links with other organizations constitute an important element of clustering.

The size of the major customer was selected to analyze the extent of influence the external environment had on the decision making power of the surveyed establishments.

5.5.0 Major Propositions

In order to develop major propositions the (intra cluster interchange) has been examined as a product of i) geographical concentration and ii) the decision making power of the establishments.

i) Intra cluster interchange as a product of geographical concentration. This includes the issues such as the distance of major customers/suppliers/rivals and how they influence the local linkage pattern.

Geographical concentration plays a paramount role in (intra cluster interchange). It enhances the individual determinants in the 'diamond' and their mutual reinforcement. For example rivals located close together promote competition and informational interchange through direct observation. Suppliers located nearby are best positioned for regular interchange and cooperation with industry research and development efforts. Sophisticated customers located nearby offer the best possibilities for transmitting information, engaging in regular interchange about

emerging needs and technologies, and demanding extraordinary service and product performance.

ii) Intra cluster interchange as the product of decision making. This involves different organizational and environmental factors which condition the decision making power of the firms in textile/apparel industries of Pakistan. The decision making power of the establishments strongly influences the local linkage pattern and hence the cluster formation process of the industry.

The following propositions have been put forward to analyze (whether the organizational attributes of the surveyed establishments are conducive to local clustering of the industry.)

5.5.1 Organizational Structure

The establishments with simple organizational structure are associated with higher local linkages (industrial linkages within close geographical proximity) mainly because they have less potential to search for buyers and suppliers from a vast geographical area (Taylor, 1978,). The larger sized establishments are believed to have less local linkages than small size establishments mainly because of their ability to have concessionaire freight rates for bulk flows (Lever, 1974).

5.5.2 Products and Production Processes:

The production process is closely related to the nature of products being produced by the establishments and their organizational strategies. The impact of products and production processes can be analyzed from following aspects

Products:

Establishments producing a range of products are believed to have less local linkages. This is because multi products are regarded to represent the organization's ability to expand their market space. Establishments producing intermediate goods are regarded to have higher local linkages because the nature of their products represents greater need for external contacts than establishments producing finished goods.

Production Processes:

a) Firstly the small and labor intensive units producing unstandardized goods are likely to have higher local linkages because their unit cost of transaction in terms of communication and transport is likely to be higher as compared to establishments using standardized process and requiring inputs in bulk quantities.

b) Secondly the establishments producing standardized products and using a stable production process may be stimulated to vertically integrate and attain internal economies of scale. On the other hand establishments producing unstandardized differentiated products are likely to depend more on external local linkages (see Marshall 1979). Williamson (1975) regarded the mechanism that leads firms to engage in strategies of integration as the desire to minimize transaction costs. The existence of these costs was seen as being essentially the result of inadequacies of information resulting from such factors as the lack of candor of the participants in exchanges between un-integrated activities. Moss (1981) has criticized this view

and argues that it is the technological factors determining the two productive activities which will in turn determine the transaction costs of the participants, and not the informational costs.

5.5.3 Technology and R&D

The level of technology used by the establishments in their production process is believed to have a negative impact on the level of local linkages. The establishments using high level of technology are likely to have less local linkages mainly because the local market lags behind in technology and is not in a position to meet their advanced requirements. In case of the textile industry of Pakistan the establishments using higher level of technology were engaged in the production of intermediate goods and were using standardized mass production process.

5.5.4 Behavioral Aspects of Linkages

The level of awareness on the local area and the frequency of contacts with other entrepreneurs (which is judged by the location of the head office) positively influences the local linkages in a way that managers / owners have a higher perception of the local industries which promotes local linkage pattern.

5.5.5 External Links:

External links with other organizations influence the decision making power of the establishments. The characteristics of major suppliers or customers and the relationships between them represent one of the major organizational attributes affecting decision making and the organization's ability to cope with external environment. It can be assumed that establishments with large sized customers may

act like subsidiaries. This will result in the low decision making power of the establishments which might consequently lead to less local linkages. Similarly, establishments with closely located suppliers and customers have more frequent contacts with them which provide an important mechanism for intra cluster interchange.

5.6.0 Selection of Statistical Tests

In this study two types of statistical tests have been used

i) Tests for Independence i.e Chi-square and Likelihood Ratio tests

ii) Tests for estimating the difference between two population means i.e. Paired t-tests and Pooled t-tests

i) Tests for Independence

a) Chi-square Independence Test

Chi-square independence test is the most commonly used statistical test for analyzing the independence for two characteristics of a population. 'Two characteristics of a population are called statistically independent (or non-associated) if within the categories of one of the characteristics, the distributions of the other characteristics are identical. If two characteristics of a population are not statistically independent then we say that they are statistically dependent (or associated) (Weiss, 1995, p.699).

In this study a number of variables have been selected to represent the organizational characteristics of the surveyed establishments (see figure 5-3).

Chi-square independence test is used here to analyze the association between these selected variables and the nature of the establishments[6]. For example in section 5.8.3a (see table 5.8.3a statistical appendix A) the association between the establishments having group ties and the type of products produced by them is analyzed. If the distribution of the establishments having group ties are identical in the 'nature' category (i.e. are identical for finished goods and intermediate goods establishments) then 'group ties' and the nature of the establishments are statistically independent.

The idea behind the chi-square independence test is to compare the observed frequencies with the frequencies that would be expected if the null hypothesis of statistical independence is true. In the above stated example we want to use the sample data to decide whether there is association between the establishments having group ties and the type (nature) of the products being produced by them.

In other words we want to perform the hypothesis tests

Ho: Group ties and the type (nature) of products being produced by the establishments are statistically independent (not associated).

Ha: Group ties and the type (nature) of the products being produced by the establishments are statistically dependent (i.e. there is association between the type of products being produced by the establishments and their having group ties.

The test statistic employed is

$$\text{Chi-square} = \sum (O - E)^2 / E$$

'O' represents observed frequency and 'E' represents expected frequency.

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[6] Nature of the establishments refers to the type of products being produced by the establishments.

Where Expected frequency (E) = R*C / n

R= Row Total

C= Column Total

n = sample size

degrees of freedom (df) = (r-1)(c-1)

where r and c are the number of rows and columns in the contingency table.

The Chi-square Independence test has two basic assumptions

1) All expected frequencies are at least 1.

2) At most 20% of the expected frequencies are less than 5.

A 'correction for continuity' or Yates correction is sometimes applied on the 2x2 contingency tables to avoid distortions arising from the binomial distribution of a 2x2 matrix. This correction reduces the value of chi-square thereby increasing the rigor of the statistical analysis. In this study no continuity corrections have been made in the 2x2 tables. A few statisticians have argued that the Yates correction is not necessary for the 2x2 tables, because it tends to be overly conservative (Conover, 1999).

b) Likelihood Ratio (LR) Test

Likelihood ratio test has been used where the data does not satisfy assumption (2) of the chi-sqaure model i.e. where more than 20% of the expected frequencies are less than 5.

The SPSS program is used for the computation of chi-square test statistic. This program automatically provides with the LR value. LR value is used where more than 20% of the expected frequencies are less than 5. Asymptotically LR test follows the Chi-square distribution.

ii) T-tests

T-tests have been used where the data has been in the continuous measurement form. For example t-tests have been used to analyze those questions that deal with 'degree' of importance given to various variables by the establishments (chapter 6).

a) Paired T-test

Paired T-test is an estimation procedure for the difference of two means when the samples are not independent and the variances of the two populations are not necessarily equal. This will be true if the observations in the two samples occur in pairs so that the two observations are related. For instance in section 6.3.1 we run a test on the importance given to 'market research and analysis' as a selection method by the surveyed establishments for the selection of both suppliers and customers. Observations in the two samples are made on the same establishment and are related, hence they form a pair. To determine if there is any difference in the importance given to this method when selecting customers and suppliers we must consider differences d_i, of the paired observations. These differences are the values of a random sample $d_1,d_2,d_3\ldots,d_n$ from a population that we shall assume to be normal with mean μ_D and unknown variance σ_D^2.We estimate σ_D^2 by s_d^2, the variance of the differences constituting the sample. Therefore s^2_d is a value of the statistic S^2_d that fluctuates from sample to sample. We want to perform the hypothesis test

Ho: $\mu_{customer} = \mu_{supplier}$

The test statistic is $t = \dfrac{\bar{d}}{s_d/\sqrt{n}}$

where s_d^2 of the sample differences is

$$S_d^2 = \frac{n\sum d_i^2 - \left(\sum d_i\right)^2}{n(n-1)}$$

In short the paired t-test is simply a one sample t-test with null hypothesis

Ho: $\mu_D = 0$, applied to a population of paired differences.

b) Pooled t-test

Pooled t-test is the estimation procedure for the difference of two means when random samples of size n_1 and n_2 are taken from two *independent* normally distributed populations with means μ_1 and μ_2 respectively. If the standard deviations of the two populations are equal, the random variable

$$t = \frac{(\overline{X}_1 - \overline{X}_2) - (\mu_1 - \mu_2)}{s_p\sqrt{(1/n_1)+(1/n_2)}}$$

has a t-distribution with df = $n_1 + n_2 - 2$

where

$$s_p^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1 + n_2 - 2}$$

The null hypothesis states that the two population means are equal. For example in section 6.4.1 the hypothesis is

Ho: No significant difference was found in the importance given to 'Direct Observation' by the establishments producing finished goods and intermediate goods (i.e. $\mu_1 = \mu_2$ thus $\mu_1 - \mu_2 = 0$).

Ha : Significant difference was found in the importance given to 'direct observation' by the establishments producing finished goods and intermediate goods.

The equal-standard-deviations assumption is sometimes checked by performing a formal hypothesis test, called an F-test for the equality of two standard deviations. F-test is extremely non-robust to deviations from normality: unless the populations are very close to normally distributed, the F-test may yield unreliable results (Weiss, p.588). As the noted statistician George E.P. Box remarked: ' to make a preliminary test on variances (standard deviations) is rather like putting to sea in a rowing boat to find out whether conditions are sufficiently calm for an ocean liner to leave port' (as quoted in Weiss,1995, p.588).

In this study no F-test has been performed to test the equality of variances. Although in theory, the pooled t-test requires that the population standard deviations, σ_1 and σ_2 be equal. However according to Weiss (p.603) if the population standard deviations are unequal but not too unequal and the sample sizes n_1 and n_2 are nearly the same then using the pooled t-test will not cause serious difficulties.

P-value

The P-value can be interpreted as the *observed significance level* of a hypothesis test. The P- value of a hypothesis test is equal to the smallest significance level at which the null hypothesis can be rejected, that is, the smallest significance level for which the observed sample data results in rejecting Ho (Weiss, 1995, p.527). If the P-value is less than or equal to the specified significance level, then we reject the null hypothesis; otherwise we do not reject the null hypothesis.

5.7.0 Empirical Analysis of the Organizational Characteristics of the Surveyed Establishments

The objective here is to analyze the structure of the surveyed establishments. The structure of the surveyed establishments has been analyzed from two aspects; the nature of the products and the number of the full time employees (size of the establishments). The Chi square test statistic has been used to test the association between the nature/size of the establishments and the various variables described in section 5.4.1. The establishments have been divided into two categories according to the nature of their products

i) Establishments producing finished consumer goods

ii) Establishments producing intermediate goods like textile yarn, fabric, processed leather etc.

The establishments have been divided into four categories according to the number of full time employees

i) Small sized establishments with 50-99 full time employees

ii) Medium sized establishments with 100-249 full time employees

iii) Medium sized establishments with 250-499 full time employees

iv) Large size establishments with 500-1000 full time employees

The null hypothesis tests the independence between the nature/size of the establishments as regards to the various variables tested.

5.8.0 Organizational Attributes:

5.8.1 The size of the Establishments

The interviewed establishments were chosen on the basis of proportionate stratified sampling technique. 44 percent of the interviewed establishments tended to be small or medium sized with less than 250 workers whereas the establishments with 250 to 1000 workers accounted for 56% of the total. The following table shows the proportion of interviewed establishments by size

Table 5.4

Proportion of Interviewed Establishments by Size

Size of firms	50 - 99	100 - 249	250 - 499	500 - 1000	Total response
	7	10	15	7	39
Proportion	17.9	25.6	38.5	17.9	100

5.8.2 The Composition of Employment

In each establishment the employees were divided into four groups; i) engineers and management ii) skilled workers and technicians iii) manual workers iv) others (not belonging to any of the above three categories).

Engineers and managerial staff are defined here as professionals at the minimum level of college graduates. Skilled workers or technicians are defined as those who were either trained in vocational institutes or had relevant amount of on job training experience. Manual workers included mainly those who did not have any special job training but were mostly engaged in daily routine jobs that did not require special skills. The distinction between skilled and manual workers was quite confusing on many occasions but it was mostly left for the interviewees to decide.

The following table shows the composition of the employment by size of the firms.

Table 5.8.2a

Composition of Employment by size of firms

(percentage)

	Management & Engineers	Skilled Workers Technicians	Manual Workers	Others
Average	10.19	53.85	23.27	12.69
50 - 99	6.82	28.5	48.9	15.8
100 - 249	10.1	48.1	32.2	9.6
250 - 499	7.03	50.31	27.52	15.14
500 - 999	13.79	61.1	14.48	10.63

Computed from table 5.8.2a Statistical Appendix A

The skilled workers constituted more than 53 per cent of the total employment in the interviewed establishments. This was followed by manual workers at 23 per cent. The employment of engineers and managerial staff was only 10 per cent. Large scale enterprises tended to employ more engineers and managerial staff as compared to the small scale establishments. The manual workers comprised almost 50 per cent of the employment in the small scale establishments. This is not surprising owing to the fact that these establishments were mainly in the garment manufacturing sector, engaged in producing simple end use products that did not require very high skills or training.

The composition of workforce is more dependent on the nature of products being produced by the establishments than their size. It was believed that the establishments producing intermediate goods like yarn, fabric etc may have a higher proportion of engineers and managerial staff as compared to the establishments producing simple finished goods. Nonetheless the null hypothesis[7] was accepted

[7] The null hypothesis states that the composition of workforce and the nature of the establishments are statistically independent.

indicating that there was no significant difference between the nature of products produced by the establishments and the number of their engineering /managerial staff (see statistical appendix table 5.8.2c)

The contribution of female employees was almost negligible in the industry. The female workers accounted for only 2 per cent of the work force of the interviewed establishments. Out of the 37 surveyed establishments who responded to the question, 23 establishments did not have any female workers. Female workers tended to be employed mostly by medium sized companies engaged in the production of textile articles like bed sheets, aprons, pillows etc. For example Immi Garments, Ehsan Yousaf Textiles and A.R.S textiles had approximately 10 per cent of the work force comprising of women. Since small- scale establishments are mostly engaged in garment manufacturing it was believed that women participation rate would be higher in these companies. However in the interviewed establishments the small scale enterprises had only around 3 per cent female work force. Large size establishments like Ibrahim Textile mills and Appollo textile mills that are mostly engaged in the production of cotton yarn and synthetic fibers etc had none or extremely few female workers. The following table shows the proportion of female workers by size.

Table 5.8.2d

The proportion of Female Workers by Size

(percentage)

Size of Firms	50-99	100-249	250 - 499	500 - 999	Average
Female Workers	2.9	2	3.9	0.2	2.1

Computed from table 5.8.2d Statistical Appendix A

5.8.3 Ownership Structure

Meaningful statistical analysis could not be carried out because of the homogeneity in the ownership structure of the surveyed establishments. Out of the 39 establishments none had foreign ownership or were a subsidiary of a large external conglomerate. 33 interviewed establishments were private Pakistani companies while only 5 establishments had public ownership. Only one of the interviewed establishments was a joint venture. This implies that foreign companies have not played any significant role in the development of this industry in the study region.

The group ties seemed to be considerably important in the interviewed establishments. Approximately 44 per cent of the interviewed establishments belonged to a group of industries (see table 5.8.3a). For example Zaineb Textile Mills, A.A Textile Ltd, Ibrahim Textile Mills, Ibrahim Fibre Ltd all had more than 500 employees and belonged to Ibrahim Group of Industries. Similarly Firhaj garments, Faisal Spinning Mills and Blessed Textile mills belonged to Umer group of industries. Although they were producing a range of products from garments, shoes to cotton yarn and synthetic fibers, the group ties were significantly stronger in the establishments engaged in the production of intermediate goods like cotton yarn/synthetic fibers. 61% of the surveyed establishments engaged in the production of intermediate goods belonged to group of industries as compared to the 29% of the establishments producing finished goods. The null hypothesis[8] was rejected at 0.05 level of significance. A strong association was found between the establishments belonging to the group of industries and the nature of their products (see table 5.8.3a statistical appendix A).

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[8] The null hypothesis states that there is no association between the establishments having group ties and the type of products being produced by them.

5.8.4 Complexity of Internal and External Structure

All the surveyed establishments had a very simple internal and external structure. All the departments were directly under the control of the owner. In other words internal structure was totally centralized. The external structure was measured by the number of production units. All the establishments had just one production unit that was directly under the control of the owner. Because of the homogeneity in the internal and external structures of the surveyed establishments meaningful statistical analysis could not be carried out.

Summary

The findings of the above analysis show that most of the organizational attributes of the surveyed establishments were conducive to local linkages. There were no significant differences in most of the organizational attributes of establishments between the different size groups and the nature of their products. The following points summarize the results.

1. The surveyed establishments were basically owner controlled with simple internal and external structure. This had a limiting effect on their ability to search for buyers /suppliers from a vast geographical area hence promoting local linkages.
2. The analysis of the composition of the workforce indicates that the surveyed establishments were mainly engaged in producing simple products that did not require high engineering or managerial skills. This indicated the fact that the local supplier market was capable of meeting their input requirements. This on the one hand promoted local linkages but on the other hand indicated the inability of the establishments to promote mechanisms for sustainable competitive advantage.

Although the firms engaged in the production of intermediate products had comparatively higher proportion of engineers and managerial staff the difference was not significant at 5% level of significance.

3. Group ties provide an important mechanism to facilitate information flow on technology and markets. However they are believed to negatively influence the local linkage pattern of the industry by providing the establishments with a larger geographical market base. Group ties were strong in the surveyed establishments particularly those producing intermediate goods.
4. The role of foreign enterprises in the development of the industry was found to be negligible.

5.9.0 Products and Production Processes

5.9.1 Products

The interviewed establishments were approximately evenly divided between those producing finished or consumer goods and those producing intermediate products. 54% of the interviewed establishments were engaged in the production of finished goods and 46% were producing intermediate products.

Table 5.9.1a

The Type of Products (percentage)

Size of establishments	Finished Goods	Intermediate Goods
50-99 employees	57	43
100-249 employees	80	20
250-499 employees	53	47
500-1000 employees	14	85
Total	54	46

Computed from statistical appendix 5.9.1a

Table (5.9.1a) shows that the establishments with 50 -249 workers were more engaged in the production of finished goods whereas larger sized establishments with

more than 500 workers were mostly producing intermediate products. The medium sized establishments with 250-499 workers were approximately evenly divided into the production of finished and intermediate goods (see table 5.9.1a statistical appendix A).

The number of products being produced by the establishments was more dependent on the nature of the establishments and their production processes than their size. There was a marked difference between the number of products being produced by the establishments engaged in finished goods and those engaged in intermediate goods.

Table 5.9.1b

Number of the products by the Nature of the Establishments

(Percentage)

	Number of Products		
Type of Products	1	2	>=3
Finished Goods	19	48	33
Intermediate Goods	78	11	11

Likelihood ratio value: 14.417 **d.f: 2** **p: 0.001**

(Likelihood ratio was used when the expected frequency in any one cell was less than 5)

Computed from statistical appendix 5.9.1b

78% of the surveyed establishments producing intermediate products had limited themselves to one product only. On the other hand 81% of the firms producing finished goods had diversified into two or more products. The null hypothesis[9] was rejected indicating that there was a strong association between the number of products being produced by the firms and their nature (see table 5.9.1b).

[9] The null hypothesis states that the nature of the establishments and the number of products being produced by them are statistically independent.

Input Materials

The interviewed establishments were asked to name their major inputs which were being produced internally by them. None of the interviewed establishments had integrated into the production of major inputs. For example all the leather and textile garment/articles producing firms were purchasing finished leather and fabric from the market. Similarly the interviewed firms engaged in the production of gray/dyed cloth like Talha international and Anam Cleaving mills etc. were purchasing yarn from the market. It was anticipated that large firms producing intermediate products and using the standardized production process may have integrated into the production of major inputs in order to reduce transaction costs. These transaction costs were seen essentially as the result of inadequacies of information between the participants of un-integrated activities (Williamson, 1975). However none of the interviewed establishments had done so. This confirms the view point of Moss (1981) who argued that it is the technological factors that motivate the firms to engage in strategies of integration and not information costs.

5.9.2 Production Processes

As far as the production processes are concerned, they varied significantly with the nature of the establishments. The null hypothesis[10] was rejected indicating a strong association between the production processes adopted by the establishments and the nature of their products. The establishments producing finished goods were approximately evenly divided between the two types of production processes: 11 out

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[10] The null hypothesis states that the type of production processes used by the establishments and the nature of their products are statistically independent.

of 21 surveyed establishments producing finished goods were using jobbing or batch production process while 10 of them were using standardized production process. However almost all the surveyed establishments producing intermediate goods were using standardized production processes.17 out of the total of 18 were using standardized production processes.

Table 5.9.2a

Production Process (percentage)

Types of Products	Standardized Production	Jobbing/ others
Finished goods	48	52
Intermediate goods	94	6

Chi-square value: 9.976 **d.f:1** **p: 0.002**
Computed from statistical appendix 5.9.2a

Summary

The survey findings show two distinct features of the Textile/Apparel industry in Pakistan.

1) Diversification among the surveyed establishments significantly depended on the nature of their products. The establishments producing finished goods had diversified into the production of a range of products whereas the firms producing intermediate goods had mostly constrained themselves to one product. This was in accordance with the type of production processes being used by these establishments. Since the establishments producing intermediate goods were using standardized mass production processes they had mostly constrained themselves to one product only.
2) Another distinct feature that has come forward through the survey findings is the absence of backward and forward integration among the surveyed establishments.

Even the establishments producing intermediate products and using standardized mass production process had not integrated backwards into the production of any of the major inputs. Moss (1981) has argued that the transaction costs are dependent on the technological factors determining the two productive activities. The establishments are only likely to engage in strategies of integration if technological factors of the two productive activities are such that economies of scale can be gained by internalizing the activities.

Multi products can be regarded as the ability of the establishments to expand their market space. However the above findings indicate that the particular structure of the establishments in the study area was such that only small sized establishments using an unstandardized production process were mainly engaged in producing a range of products. This confirms the findings of Scott (1983) who has argued that the small and labor intensive firms producing unstandardized goods tend to have short distance or local linkages while large capital intensive firms producing standardized goods have less local linkages. He emphasizes that the unit cost of transactions in terms of their transport and communication costs tend to be higher when the products are small in quantity and unstandardized than when the products are large in quantity and standardized.

5.10.0 Technology and R&D

5.10.1 Technology

The level of technology is represented here by the amount of scientific equipment used in the production process and management, the proportion of imported machinery and the intensity of R&D activities. Scientific equipment basically

referred micro-processors and other computerized systems being used in the management and production processes of the surveyed establishments. Larger sized establishments, particularly those engaged in the production of intermediate goods tended to use more semi automatic systems as well as computers in the production process compared to small sized establishments. Computers in the management were the most commonly used scientific equipment by the surveyed establishments (see statistical appendix 5.10.1a).

No significant[11] difference was found between different size groups or the nature of the establishments and the number of scientific equipment used by them[12].

The overall use of imported machinery among the surveyed establishments was quite high. Almost 50% of the surveyed establishments were using more than 75% of imported machinery. The use of imported machinery was more dependent on the nature of products being produced by the surveyed establishments than their size. The proportion of imported machinery was significantly different among the establishments producing finished goods and those producing intermediate goods. The table shows that only 29% of the establishments engaged in the production of finished goods were using more than 75% of the imported machinery. On the other hand 72% establishments engaged in the production of intermediate goods were using more than 75% of the imported machinery. The null hypothesis[13] was rejected

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[11] The null hypothesis states that the amount of scientific equipment used by the establishments and the nature of their products are statistically independent.

[12] See statistical appendix (5.10.1b). Because of the limited use of different scientific equipment the establishments were divided into two categories ; those using one or less than one scientific equipment and those using more than one scientific equipment in the production process)

[13] The null hypothesis states that the nature of the establishments and the proportion of imported machinery used by them are statistically independent.

indicating a strong association between the nature of the establishments and the level of imported machinery used in their production processes.

Table 5.10.1c

Proportion of Imported Machinery (percentage)

Types of Products	<25%	25%-50%	50%-75%	>75%	None
Finished Goods	24	19	24	29	5
Intermediate Goods	11	-	17	72	
Total	18	10	21	49	2

Chisquarevalue[14]: 6.064 **d.f:1** **p: 0.014**

The level of R&D activities were measured by the number of employees solely engaged in R&D activities of the establishments as well as the number of times the establishments had contacted foreign organization for R&D purposes. Twenty-one of the twenty-nine establishments who responded to the questions did not have any employees solely engaged with R&D activities. Similarly thirty, out of thirty-eight respondents had not contacted any external organization for R&D activities over the last 10 years. The R&D activities were found to be almost non existent in the interviewed establishments (see statistical appendix tables (5.10.1f) & (5.10.1.e).

[14] To make statistical analysis meaningful, the data was merged into two crude categories; establishments using <50% of the imported machinery and the establishments using >50% of the imported machinery. See statistical appendix A, table 5.10.1d.

Summary

The following points summarize the findings

i) The overall usage of imported machinery is high in the industry in general.

This is mainly because locally produced machines are confined to few hand tools or very simple machinery.

ii) The proportion of imported machinery used is significantly higher in the establishments engaged in the production of intermediate products like cotton yarn/synthetic fibers etc as compared to those engaged in producing simple finished goods. This is in accordance with the fact that the establishments using a standardized mass production process have a higher proportion of imported machinery.

The level of technology is believed to negatively influence the local linkages because it is believed that the local market may not be capable of meeting advanced input requirements associated with higher technology. The establishments like Apollo textile mills that were using a higher proportion of imported machinery also tended to import a higher percentage of their raw materials[15].

iii) R&D activities are negligible in the industry. Even the establishments producing intermediate goods using a high proportion of imported machinery have very limited R&D activities. These firms have based their competitive advantage on low grade standardized products for the domestic as well as foreign markets. R&D activities essential for upgrading of products are just not taking place among these firms.

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[15] Appollo Textiles were producing synthetic fibers.

5.11.0 Dynamic Aspects of the Establishments

The dynamic aspects of the establishments were described in terms of the changes occurring in the size of the establishments (number of employees) as well as the number of new products produced or businesses entered during the last 10 years. The innovative activities among the surveyed establishments were measured in terms of the number of times the machinery was upgraded over the last 10 years

5.11.1 Changes in Size

Table 5.11.1a

Changes in size of the Establishments (percentage)

Types of Products	Decrease or No change	Increased <25%	Increased >25%
Finished goods	10	19	71
Intermediate goods	50	28	22
Total	28	23	49

Chisquarevalue[16]: 7.842 df: 1 p: .005

There has been an increase in the size of the surveyed establishments in the last ten years. 49% of the surveyed establishments had increased more than 25% in size. The establishments engaged in the production of finished goods were significantly more dynamic in nature as far as the increase in size was concerned than the firms producing intermediate goods. According to the above table 71% of the establishments producing finished goods had increased more than 25% in size as compared to 22% of the establishments producing intermediate goods. The null

[16] To make statistical analysis meaningful the data was merged into two crude categories i.e the establishments that had increased in size and the establishments that had decreased or not changed in size (see table 5.11.1b, statistical appendix A).

hypothesis was rejected indicating the strong association between the changes occurring in the size of the establishments and the nature of their products.

5.11.2 New products or businesses

However this increase in the size of the establishments was not accompanied by an increase in new products or businesses. 29 out of 38 establishments had made no change in their products or businesses. 33% of the firms engaged in the production of finished goods had entered new businesses as compared to 12% in the firms producing intermediate goods; however the difference between them was not significant at the 5% level (see table 5.11.2a).

Table 5.11.2a

New Products or Businesses Entered (percentage)

Types of products	No change	New products /businesses
Finished Goods	67	33
Intermediate Goods	88	12
Total	76	24

Likelihood ratio: 2.555 df:1 p=0.11

5.11.3 Number of times machinery upgraded

Table 5.11.3a

Number of times Machinery Upgraded (percentage)

	None	1-2 times	3 or more
Finished Goods	19	29	52
Intermediate Goods	38	56	6
Total	27	41	32

Chi-square value: 8.819 df:2 p: 0.012

The innovative activities of the establishments were measured by the number of times their machinery had been upgraded over the last ten years. The null hypothesis was rejected indicating a strong association between the nature of the establishments and their innovative activities. 52% of the establishments producing finished goods had upgraded their machinery three or more times as compared to only 6% of the firms producing intermediate goods (see table 5.11.3a).

For most aspects of the analysis the establishments engaged in the production of finished goods were significantly more dynamic in nature.

Summary

The survey findings indicate that

i. The industry has expanded in terms of output (which is indicated by the increase in size) over the last ten years.

ii. The expansion of industry has not been accompanied by appropriate advancement in technology or the diversification or upgrading of products.

iii. The establishments engaged in the production of finished goods are significantly more innovative as compared to the establishments producing intermediate goods. This is in accordance with the fact that they are more diversified than the establishments producing finished goods.

iv. The results indicate that establishments, particularly those engaged in the production of intermediate goods, have simply based their competitive advantage on low quality products. The impetus essential for the sustainability of competitive advantage in this industry is not taking place fast enough.

5.12.0 Behavioral/Managerial Aspects of Linkages:

Three variables were selected to analyze the attitude as well as the perception of the managers towards the local area i) birth town of the owner ii) location of the head office in the industrial complex iii) proximity of major competitors. 78% (see statistical appendix 5.12.0a) of the surveyed establishments had owners with local origins. There was no significant difference in the origins of the owners with respect to the nature of their products.

As far as the location of the head office was concerned only 4 out of the total of 39 surveyed establishments had their head offices located in the industrial complex[17]. This is mainly because the surveyed establishments had a very simple internal and external structure. They were mainly single plant production units with their head offices located on the production site (statistical appendix 5.12.0b).

50% of the interviewed establishments had most of their competitors situated within the same city as their establishment (statistical appendix 5.12.0e). This is because the industry as a whole is concentrated in the study area. It is important to mention here that although only 50% establishments had most of their competitors located in the same city, the field research shows that a large percentage of them had their major competitors located within the same province.

[17] Industrial complex was defined as a building or complex where number of head offices of different establishments is situated.

5.13.0 External Links:

The character of external links is represented by the size of the major customer. Establishments were divided into three categories, those linked to large establishments with 300 or more employees, those linked to medium sized enterprises with 50-299 employees and those linked to enterprises with less than 50 employees. The establishments engaged in the production of intermediate goods tended to have more links with large sized customers as compared to the firms engaged in the production of finished goods. 67% of the surveyed establishments producing intermediate goods had links with large size customers as compared to the 42% of establishments producing finished goods. However no significant difference was found between them at the 5% level of significance. In total 54% of the establishments had links with large sized customer firms (see statistical appendix 5.13.0a).

Establishments maintaining links with large size enterprises are believed to negatively influence the local linkage pattern. This is because they are likely to be influenced by external organizations in making their decisions. Most of the surveyed establishments had their major customers situated in foreign countries. Since major customers located abroad lack information on the local markets, the linkage pattern of the industry is not influenced by their size.

5.14.0 Suppliers and Customers

5.14.1 *Customers*

Proximity of major suppliers and customers was measured in terms of their location.

Table 5.14.1b

Location of Major Customers (percentage)

Types of Produce	Same city	Other parts of Pakistan	Foreign country
Finished Goods	29	10	62
Intermediate Goods	33	22	45
Total	31	15	54

Computed from table 5.14.1b Statistical Appendix A

As far as the major customers were concerned, more than half of the surveyed establishments had their major customers located in a foreign country. 31% had their major customers within the study area while only 15% had their major customers in other provinces of Pakistan. The establishments producing finished goods were more export oriented with 62% of them having major customers located abroad. The establishments producing intermediate goods were more evenly divided between foreign and domestic markets although the difference between them was not significant at 5% level (table 5.14.1b). This shows that the industry in Pakistan is mainly an export-oriented industry and particularly in the case of establishments producing finished goods the forward local material linkages are considerably weak.

5.14.2 ***Suppliers***

Table 5.14.2b

Location of Major Suppliers (percentage)

Types of products	Same city	Other parts of Pakistan	Foreign country
Finished Goods	86	14	-
Intermediate Goods	44	44	11
Total	67	28	5

Computed from table 5.14.2b Statistical Appendix A [18]
Chi-square value: 7.429 d.f: 1 p: 0.006

[18] For meaningful statistical analysis the location of suppliers was merged into two categories 1) same city and 2) other parts of Pakistan/foreign country. Since the objective was to analyze the extent of backward linkages within

67% of the surveyed establishments had their major suppliers located within the study region. While only 5% had their major suppliers located in a foreign country. There was a significant difference in local backward linkages of the establishments producing finished goods and those producing intermediate goods. 86% of the establishments producing finished goods had their major suppliers located within the study region as compared to only 44% of the establishments producing intermediate goods.

Summary

Proximity of suppliers and customers of the industry plays a significant role in the cluster formation process. It facilitates interchange of information on technology, products and markets. The following points summarize the findings.

1) The interviewed establishments had strong local backward material linkages in terms of the location of their major suppliers. The establishments producing finished goods had significantly stronger local backward linkages as compared to the establishments producing intermediate goods.
2) The industry was export oriented. Even the establishments producing intermediate goods had weak local forward material linkages within the study region.

5.15 Conclusion

This chapter has tested various hypotheses in respect to the relationships between the organizational attributes and the local clustering of the establishments in the textile/apparel industry of Pakistan. The selection of the organizational attributes was based on the theoretical framework discussed in chapter 2. Those organizational

attributes were selected that were believed to directly influence the productivity and consequently the competitiveness of the industry. The hypotheses were formulated on the basis of the major propositions suggesting that cluster interchange was positively affected by the geographical proximity of the establishments as well as their decision making power. The hypotheses were grouped into different categories of the organizational attributes. The objective was to analyze the impact of these attributes on the cluster development of this industry. Chi-square test was used to analyze whether there was any association between the nature of the establishments and the organizational characteristics.

The findings of the analysis suggest that for most of the organizational attributes, the structure of the industry in Pakistan was largely supportive of local linkages. The findings of the chi-square tests do show some association between the nature of the establishments and the impact of organizational attributes on local clustering.

The two most distinct features of this industry that have come forward through the survey findings are i) the homogeneity and simplicity of ownership as well as the internal /external structure of the establishments ii) strong local material linkages. This has positively influenced local clustering of the industry. However the impact of these attributes on the cluster development process strongly depends on the number of other factors like company goals and the attitude of the owners/managers towards innovation and upgrading. The survey results show that the prevailing goals of the owners /senior managers do not appear to lend themselves well to the upgrading of the industry. For example the establishment of independent R&D unit is crucially important for technological mastery. R& D activities within the firms strongly

influence the preferences of the owners towards innovation and product / process development. The survey results show that R&D activities in the interviewed establishments were almost non existent (5.10.1).

The survey shows that the overall usage of imported machinery was very high in industry. This was particularly true in case of the establishments producing intermediate goods. However the extremely small percentage of engineers and managerial staff employed by these establishments indicates the lack of ability of these establishments to assimilate and improve upon the imported technology. This is also evident from the lack of innovative activities (5.11.3) and limited product diversification (5.11.2a) by the establishments producing intermediate goods.

In short the above findings indicate that the industry has so far not been able to reap the benefits associated with local clustering. The next chapter focuses on analyzing the mechanisms that facilitate free flow of information within the industry. Exchange and flow of information about the needs, techniques, and technology among buyers, suppliers and related industries form the basis of the benefits associated with the phenomenon of clustering.

Chapter 6

Empirical Analysis on Informational Interchange within the Textile/Apparel Industry of Pakistan

6.0 Introduction

The structure and the organizational characteristics discussed in chapter 5 provide an important insight on the linkage pattern and cluster formation process of the textile/apparel industry in Pakistan. However Porter (1998) has emphasized that underlying the operation of the diamond and the phenomenon of clustering, is the *exchange* and *flow of information* about the needs, techniques, and technology among buyers, suppliers and related industries. Personal relationships, face to face communications and interaction among networks of individuals and institutions influence and accentuate the benefits associated with geographical concentration (Rosenfeld, 1997; Porter,1998). This chapter focuses on various formal and informal organizing mechanisms that play an essential role in the development and functioning of clusters.

The objective here is to understand the social environment under which this industry operates in Pakistan.

6.1 Methodology

A large number of factors influence the organizational and relationship-building mechanisms that bind the cluster participants together in a relationship essential for value added transactions.

These factors have been divided into four groups. In each group, the establishments were asked to rate the importance they give to the particular factor on a given scale.

The four group of selected factors relate to

a) Methods by which customers and suppliers are selected

b) Factors that influence the selection of suppliers

c) Methods of attaining business information

d) Major sources of business information.

6.2 Statistical Tests

The questions have been designed to determine the 'degree' of importance given to various factors by the establishments. T-tests have been used here. These tests are discussed in detail in chapter 5, section 5.6.0.

The first group of factors tries to analyze the most commonly used methods for the selection of customers and suppliers. 'Paired' t- test has been used to determine whether the establishments differ significantly in the importance they give to a particular factor when selecting their customers and suppliers. In other words we test the hypothesis

Ho: No significant difference is found in the importance level given to a particular method when selecting customers and suppliers.

Ha: The establishments differ significantly in the importance they give to a particular method when selecting customers and suppliers.

The establishments producing intermediate and finished goods are analyzed separately.

For the remaining three groups of factors 'Pooled' t- test has been used. The null hypothesis here, tests the indifference between the nature of the establishments (finished goods and intermediate goods) and the level of importance given to the particular factor.

In other words we test the hypothesis

Ho: No significant difference is found in the importance given to the particular factor between the establishments producing finished goods and those producing intermediate goods.

Ha: The importance level given to the particular factor varies significantly with the nature of the establishments.

6.3 Methods for the Selection of Suppliers and Customers

Three methods for the selection of suppliers and customers were analyzed i) Market research or analysis ii) family or personal relationships iii) business relationships. The interviewed establishments were asked to rate the importance they give to these methods, for selecting their customers and suppliers. They were given a scale of 1 to 4 (1 being not important at all and 4 being critically important).

The establishments producing intermediate goods and finished goods were analysed separately.

6.3.1 Market Research or Analysis:

a) Intermediate Goods

(Percentages)

Scale	1	2	3	4
Customers	0	5.56	22.22	72.22
Suppliers	11.11	5.56	11.11	72.22

Computed from table 6.1.1 a Statistical appendix B
Scale: 1=Not important at all
4=Critically important

More than 72% of the establishments producing intermediate goods considered this method to be critically important both in case of customers and suppliers. No significant[1] difference was found between customers and suppliers and the level of importance given to this method of selection (see table 6.1.1a, Statistical appendix C).

b) ***Finished Goods***

(Percentages)

Scale	1	2	3	4
Customers	**28.57**	**19.05**	**19.05**	**33.33**
Suppliers	**14.29**	**19.05**	**28.57**	**38.10**

Computed from table 6.1.1b Statistical appendix B

Scale: 1=Not important at all
4=Critically important

$t_{critical}$: *2.086*
$t_{computed}$:- *3.16*
df: 20

Market research and analysis was less popular in establishments producing finished goods. Less than 40% of these establishments considered this method to be critically important. This method was considered significantly more important by these establishments in their selection of suppliers (see table 6.1.1b statistical appendix C).

6.3.2 Personal or Family Relationships:

a) ***Intermediate Goods***

(Percentages)

Scale	1	2	3	4
Customers	**50**	**27.78**	**22.22**	**0**
Suppliers	**44.44**	**27.78**	**27.78**	**0**

Computed from table 6.1.2 a Statistical appendix B

Scale: 1=Not important at all
4=Critically important

[1] The null hypothesis states that the establishments are indifferent between customers and suppliers in the importance they give to marketing research and analysis.

Personal or family relationship was not considered a critically important method for the selection of customers and suppliers by any of the interviewed establishments producing intermediate goods. In fact approximately 50% of these establishments regarded this method to be unimportant both in the case of customers and the case of suppliers. No significant difference was found between customers and suppliers and the importance given to this method of selection (see table 6.1.2a, statistical appendix C).

b) *Finished Goods*

(Percentages)

Scale	1	2	3	4
Customers	14.29	38.10	23.81	23.81
Suppliers	19.05	28.57	38.10	14.29

Computed from table 6.1.2b Statistical appendix B
Scale: 1=Not important at all
4=Critically important

Approximately 24% in case of customers and 14% in case of suppliers considered this method to be critically important. No difference was found between customers and suppliers and the level of importance given to this method by the surveyed establishments producing finished goods (see table 6.1.2 b statistical appendix C).

6.3.3 Business Relationships:

a) Intermediate Goods

(Percentages)

Scale	1	2	3	4
Customers	0	11.11	5.56	83.33
Suppliers	5.56	11.11	22.22	61.11

Computed from table 6.1.3a Statistical appendix B
Scale: 1=Not important at all
4=Critically important

$t_{critical}$: 2.11
$t_{computed}$: 2.915
df : 17

More than 80% in case of customers and 60% in case of suppliers considered this method to be critically important. This method was significantly considered more important in case of the selection of customers by the surveyed establishments producing intermediate goods (see table 6.1.3a statistical appendix C).

b) Finished Goods

(Percentages)

Scale	1	2	3	4
Customers	14.29	9.52	9.52	66.67
Suppliers	5.56	5.56	38.10	52.38

Computed from table 6.1.3b Statistical appendix B
Scale: 1=Not important at all
4=Critically important

More than 66% in the case of customers and 52% in the case of suppliers considered this method to be critically important. No difference was found between customers and suppliers and the overall level of importance given to this method of selection (see table 6.1.3b statistical appendix C).

6.3.4 Summary

The above findings can be summarized as follows

1. Establishments producing intermediate goods depended more on market research and analysis than the establishments producing finished goods. This is in line with the industry structure. The establishments producing finished goods fell more in the unorganised sector of the industry. They were small to medium sized labour intensive units that often lacked the resources to conduct meaningful research (see chapter 5, section 5.9.0). This was particularly true in the case of

customers. The establishments producing finished goods were exporting most of their products. These establishments lacked awareness of their foreign markets. This had stifled innovation and development of the industry at large.

2. Business relationships were found to be very strong particularly in case of the selection of customers. This is in line with the fact that the industry is export oriented with major customers mostly located in European and American markets.

3. Since most of the surveyed establishments had a simple internal and external organisational structure i.e. were centralised / owner controlled (see section 5.8.3 chapter 5), it was believed that family or personal relationships may be playing a dominant role in the selection of suppliers and customers. However the survey findings show that family relationships were considered to be least important in the selection of customers and suppliers by the surveyed establishments particularly those producing intermediate goods. Establishments producing finished goods tended to give more critical importance to this method than establishments producing finished goods. This is in line with the organizational structure of the finished goods establishments.

6.4 Factors influencing the Selection of Suppliers

Five factors have been analyzed for their influence on the selection of suppliers. The establishments were asked to rate the importance they give to these factors on the scale of 1 to 5 (1 being not important at all and 5 being critically important).

'Pooled' t- test has been used to determine whether the establishments producing finished goods and intermediate goods differ in the importance they give to these

factors. The five factors are i) price of the products ii) quality of the products iii) delivery in time iv) credibility of the owner v) distance between firm and supplier.

6.4.1 Price of the Products

(Percentages)

Scale	1	2	3	4	5
Finished Goods	5.88	0	5.88	35.29	52.94
Intermediate goods	0	0	5.56	16.67	77.78

Computed from table 6.2.1 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Price was considered to be one of the most important factors influencing the choice of suppliers. More than 77% of the establishments in the case of intermediate goods and 52% in the case of finished goods considered 'price' to be critically important when selecting their suppliers. Although there was no significant difference between the nature of the establishments and the importance given to this factor (see table 6.2 statistical appendix C), the establishments producing intermediate goods tended to give more critical importance to this factor. As discussed in chapter 3 and 4 the establishments in this industry of Pakistan tend to compete on price. The establishments producing intermediate goods have particularly confined themselves to few low -priced commodity products. Moreover the establishments producing intermediate goods are also larger in size as compared to finished goods establishments, and therefore require inputs in bulk quantities. As a result 'price' is considerably important for them when selecting their suppliers.

6.4.2 Quality of the products (inputs):

(Percentages)

Scale	1	2	3	4	5
Finished Goods	5.88	0	35.29	35.29	23.53
Intermediate Goods	0	0	5.56	0	94.44

Computed from table 6.2.2 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t-value: -4.353
df: 33
p-value: 0.000

Quality of the input materials was considered significantly more important by the establishments producing intermediate goods (see table 6.2 statistical appendix C).

More than 90% of the establishments producing intermediate goods considered quality to be a critically important factor in the selection of their suppliers. Although the establishments producing intermediate goods had confined themselves to only few of the low priced products (see 5.9.1 b) like spun yarn: coarse to medium count and gray cloth (see chapter 4), they were conscious of the quality of their low priced input materials. Section 5.9.2 shows that these establishments were mostly using standardized production processes. The level of machinery used in the production processes by these establishments was also significantly higher than the establishments producing finished goods. As a result they were more able to monitor the quality of their low priced products.

Only 23.53 % of the establishments producing finished goods considered quality to be a critically important factor in the selection of suppliers. The surveyed establishments producing finished goods were mainly small production units

producing a range of products for the lower segment of the foreign markets. The quality of their products varied highly with the craftsmanship of their workers.

6.4.3 Delivery in time:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	11.76	5.88	41.18	17.65	23.53
Intermediate Goods	0	0	0	27.78	72.22

Computed from table 6.2.3 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t-value: -4.283
df: 33
p-value: 0.000

72% of the establishments producing intermediate goods considered delivery of inputs in time to be critically important as compared to 23% of the establishments producing finished goods. The establishments producing intermediate goods were mostly larger in size and were using a standardized production process. They required their inputs in bulk quantities. Moreover (table 5.14.2) indicates that most of the major suppliers of these establishments were located outside their city. On the other hand establishments producing finished goods were small to medium sized production units producing a range of products. They did not require input materials in bulk quantities. Moreover most of them had their major suppliers located within the boundary of their city (section 5.14.2b). As a result 'delivery in time' was significantly less important for them than the establishments producing intermediate goods (table 6.2 appendix C).

6.4.4 Credibility of the Owner:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	6.25	18.75	18.75	12.50	43.75
Intermediate Goods	5.56	5.56	22.22	11.11	55.56

Computed from table 6.2.4 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Credibility of the owner was found to be an important factor influencing the selection of the suppliers. More than half of the interviewed establishments producing intermediate goods were found to give critical importance to this factor.

No significant difference was found in the importance given to this factor and the nature of the establishments (see table 6.2, statistical appendix C).

6.4.5 Brand Reputation

(Percentages)

Scale	1	2	3	4	5
Finished Goods	5.88	29.41	17.65	11.76	35.29
Intermediate Goods	0	16.67	16.67	33.33	33.33

Computed from table 6.2.5 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Brand reputation was not found to be a very strong influencing factor in the selection of suppliers. No significant difference was found in the nature of the establishments and the importance given to this factor (see table 6.2, statistical appendix C).

6.4.6 Distance between Firm & supplier:

(Percentages)

Scale	1	2	3	4
Finished Goods	23.53	41.18	17.65	17.65
Intermediate Goods	77.78	11.11	11.11	0

Computed from table 6.2.6 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t value: 3.076
df: 33
p-value: 0.004

The survey findings indicate that distance was one of the least important factors for the surveyed establishments particularly those producing intermediate goods in the selection of their suppliers. In fact none of the interviewed establishments producing intermediate goods gave critical importance to this factor when selecting suppliers. More than half of these establishments regarded 'distance from suppliers' to be totally unimportant.

Although only 18% of the establishments producing finished goods regarded distance to be critically important, there was a significant difference in the importance given to this factor and the nature of the establishments (see table 6.2 appendix C).

6.4.7 Summary

The survey findings indicate that the selection of suppliers was primarily based upon the competitive nature of products by the interviewed establishments. The quality and price of products were considered to be a critically important factor by a majority of the interviewed establishments for selecting suppliers. This was

particularly true in the case of establishments producing commodity products of intermediate nature. Delivery of products in case of the establishments producing intermediate goods was also a critically important factor for majority of the interviewed establishments. This was mainly because these establishments required inputs in bulk quantities. Among various factors, distance was ranked as one of the least important factors in finding suppliers. The establishments producing intermediate goods were found to be more competitive in nature as far as price and quality were concerned.

6.5 Methods of Attaining Business Information

Information plays a paramount role in the interchange within clusters. Five factors have been selected to analyse how the informational interchange within the establishments in this industry takes place. These five factors are a) direct observation b) informal contacts c) family or personal relationships d) joint ventures or collaborative agreements e) conferences and seminars.

The establishments were asked to rate the importance they give to these factors on the scale of 1 to 5. The null hypothesis here states that the relative importance given to a factor does not differ with the nature of the establishments.

6.5.1 Direct observation:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	10.53	0	5.26	10.53	73.68
Intermediate Goods	0	0	5.56	11.11	83.33

Computed from table 6.3.1 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Direct observation was considered to be one of the most important method in obtaining business information by both the establishments producing finished goods and those producing intermediate goods. This was in line with the fact that the industry was highly concentrated in the study region.

No significant difference was found between the nature of the establishments and the importance given to this method of attaining business information (see table 6.3 statistical appendix C).

6.5.2 Informal contacts:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	5.26	21.05	26.32	31.58	15.79
Intermediate Goods	33.33	27.78	5.56	27.78	5.56

Computed from table 6.3.2 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t value: 2.084
df: 35
p-value: 0.045

This method was significantly more important for the establishments producing finished goods. This is in line with the structure of the industry in Pakistan. The establishments producing finished goods lacked the resources to conduct market research and analysis. Moreover family/personal relationships were also significantly stronger in these firms (see table 6.3 statistical appendix C).

6.5.3 Family or personal relationships:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	15.79	36.84	21.05	26.32
Intermediate Goods	33.33	22.22	16.67	5.56	22.22

Computed from table 6.3.3 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t- value: 2.195
df: 35
p-value: 0.035

Family or personal relationships were significantly considered more important by the establishments engaged in the production of finished goods. This is in line with their organizational characteristics as discussed in earlier (see table 6.3 statistical appendix C).

6.5.4 Joint venture or other collaborative agreements:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	21.05	31.58	31.58	15.79
Intermediate Goods	50	16.67	16.67	5.56	11.11

Computed from table 6.2.6 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t- value: 3.255
df: 35
p-value: 0.003

Joint ventures and other collaborative agreements were significantly considered more important by the establishments producing finished goods. This is line with the type of products being produced by these establishments. The establishments producing finished goods were engaged in the production of a range of consumer items for

foreign markets. They heavily depended on the design services provided by the foreign establishments. Whereas the products produced by the intermediate goods were low quality standardised products which had the ability to be consumed by the domestic as well as foreign markets. Hence they lacked the drive to improve the competitiveness of their products through collaborative / agreements (see table 6.3 statistical appendix C).

6.5.5 Conferences and Seminars

(Percentages)

Scale	1	2	3	4	5
Finished Goods	10.53	15.79	15.79	15.79	42.11
Intermediate Goods	22.22	22.22	33.33	5.56	16.67

Computed from table 6.3.5 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

t-value: 1.954
df: 35
p-value: 0.059

Owing to the nature of products, establishments producing finished goods tended to consider it more important a method for attaining business information then establishments engaged in the production of intermediate goods, but the difference was not significant at the 5% level of significance.

6.5.6 Summary

- Direct observation was the single most prominent method of attaining business information.

- Family/personal relationships play an essential role in the functioning of cluster linkages. Since most of the surveyed establishments had a simple organisational structure it was believed that personal relationships may be an important facilitator in the informational interchange in this industry. The survey findings indicate that these relationships were still underdeveloped in this industry cluster.

- Neutral facilitators like conferences and collaborative agreements etc can be an efficient source of communication where family or trust relationships are lacking. Nonetheless the survey indicates that a high proportion of interviewed establishments did not consider collaborative agreements or joint ventures an important method of attaining business information. Conferences were considerably considered more important than collaborative agreements.

6.6 Sources of Information

Seven factors were analysed to understand the social environment under which the informational interchange takes place in the industry. The establishments were asked to rate the importance they give to these factors on the scale of 1 to 5. T- test statistic was used here to analyse whether the importance given to these factors differed with the nature of the establishments.

6.6.1 Rivals:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	10.53	0	5.26	84.21
Intermediate Goods	33.33	11.11	27.78	0	27.78

Computed from table 6.4.1 Statistical appendix B

Scale: 1=Not important at all
5=Critically important

t- value: 4.251
df: 35
p-value: 0.000

Rivals were a significantly more important source of business information for the establishments producing finished goods (see table 6.4 statistical appendix C).This is in accordance with the structure of the industry discussed earlier. The establishments producing intermediate goods had confined themselves to a few low-priced products that had the potential to be consumed in the local and foreign markets. Strong rivalry essential for upgrading of the products was almost non existent in this sector of the industry.

Establishments engaged in the production of finished goods were producing a range of products for foreign markets. Rivals were an important source of market information for them.

6.6.2 Customers:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	10.53	15.79	15.79	57.89
Intermediate Goods	0	0	11.11	0	88.89

Computed from table 6.4.2 Statistical appendix B

Scale: 1=Not important at all
5=Critically important

Customers were found to be the most important source of information for the surveyed establishments. This is in accordance with the nature of the industry in Pakistan. Since it was an export oriented industry with main markets located in USA and European countries, customers provided an important source of market information to the surveyed establishments. No significant difference was found between the nature of the establishments and the importance given to this source of information.

6.6.3 Suppliers:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	5.26	26.32	42.11	26.32
Intermediate Goods	5.56	0	16.67	33.33	44.44

Computed from table 6.4.3 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Only 26% of the establishments producing finished goods and 44% of the establishments producing intermediate goods considered suppliers to be critically important source of information. No significant difference was found between the nature of the establishments and the importance given to this source of information (see table 6.4 statistical appendix C).

6.6.4 Equipment suppliers:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	0	31.58	47.37	21.05
Intermediate Goods	0	0	11.11	11.11	77.78

Computed from table 6.4.4 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

T value: - 3.292
df: 35
p-value: 0.002

Equipment suppliers were a significantly more important source of business information for the establishments producing intermediate goods. This is in line with the fact that these establishments were using higher level of technology in their production processes (see table 6.4 statistical appendix C).

The establishments producing finished goods were mostly labour intensive units. The level of technology used by these establishments was significantly lower (see table 5.10.1c) and therefore equipment suppliers were not a critically important source of information for majority of these establishments.

6.6.5 Banks and financial institutions:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	0	10.53	5.26	42.11	42.11
Intermediate Goods	0	11.11	5.56	5.56	77.78

Computed from table 6.4.5 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

The survey findings indicate that banks and financial institutions were an important source of business information for the establishments in this industry. Approximately 77% of the establishments in case of intermediate goods and 42% in case of finished goods regarded this source of information to be critically important. No significant difference was found in the importance given to this source and the nature of the establishments.

6.6.6 News/ media:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	11.11	0	11.11	55.56	22.22
Intermediate Goods	0	5.56	33.33	5.56	55.56

Computed from table 6.4.6 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Only 22% of the establishments in case of finished goods and 55% in case of intermediate goods regarded this source of information to be critically important. No significant difference was found in the importance level given to this source and the nature of the establishments (see table 6.4 statistical appendix C).

6.6.7 Colleges universities:

(Percentages)

Scale	1	2	3	4	5
Finished Goods	21.05	21.05	26.32	10.53	21.05
Intermediate Goods	23.53	11.76	29.41	17.65	17.65

Computed from table 6.4.7 Statistical appendix B
Scale: 1=Not important at all
5=Critically important

Universities and colleges were the least important source of business information for the surveyed establishments. This is not only because of the low percentage of students enrolled in professional colleges and universities but also the fact that these institutions mostly have a theoretical approach which is not in line with the needs of the industries of the country (see chapter3). This strongly relates to the low R&D activities of the firms themselves.

6.6.8 Summary

The survey results indicate that customers were the most important source of information for the surveyed establishments. This is in line with the fact that the surveyed establishments were mainly export oriented firms that relied primarily on foreign machinery, technology and marketing services. Rivals were significantly a more important source of information for the establishments producing finished goods. This is according to the local linkage pattern and organisational attributes of these establishments as discussed in chapter 5. In short, the survey results indicate that customers/equipment suppliers provided an important mechanism for informational interchange in the industry. Communication and linkages between the surveyed establishments and other institutions like colleges/universities, news/media etc were limited. However banks and financial institutions provided an important platform of informational interchange to the surveyed establishments.

6.7 Conclusion

Examination of the structure of the network under which the textile/apparel industry operates reveals that the social relationships associated with the geographical concentration of firms have not developed in this industry. For example table 5.14.2 reveals strong backward material linkages. 67% of the surveyed establishments had their major suppliers located within the boundary of their city. However section 6.6.3 shows that suppliers of input materials were one of the least important sources of information for these establishments. In other words the presence of local suppliers has failed to trigger value- added interaction between the locally concentrated establishments.

The process of cluster development depends heavily on the efficacy of the 'diamond's arrows[2], for example how efficiently the local educational institutions respond to the cluster needs.

Table 6.6.7 reveals that the collages and universities were not an important source of information for the surveyed establishments[3].

Since the cluster advantages rely heavily on linkages and connections among individual's and groups, relationship building mechanisms like informal contacts and personal /family relationships become integral to cluster development. Section 6.5.2 and 6.5.3 indicates that the local concentration of the industry has not managed to trigger close and ongoing relationships within the firms of this industry.

The next chapter summarizes the main findings of the study.

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[2] See chapter 2, section 2.3. Also see section 4.6, figure 4-8, chapter 4 for how the diamond looks in this industry.

[3] For more information, see section 4.4.1.4, chapter 4.

Chapter 7

Conclusion

This study sets out to analyse the competitive advantage of Pakistan's textile/apparel industry. An empirical assessment has been carried out to analyse the impact of organizational attributes and social environment on the ability of the establishments in this industry to attain sustainable competitive advantage. The findings of the study reveal that this industry has so far not been able to reap the benefits associated with local clustering. In fact cluster participation seems to have retarded innovation and development in this industry. The study also reveals that the establishments in this industry seem to have a uniform approach to competing, a sort of 'group think' that has suppressed new ideas and created rigidities that are proving to be a major impediment to improvements.

Some Qualifications

A number of issues need to be kept in mind when interpreting the findings of this study. First, the data was collected from a limited geographical base. This means that the findings of the analysis do not necessarily represent the industry in the other regions. However it is important to mention here that the results of the empirical findings are largely supported by the case study in chapter 4.

Secondly, the number of cases was limited for some aspects of organisational attributes due to the small size of the sample and the high degree of homogeneity in technological and organisational attributes among the manufacturing establishments. Due to the limited number of cases, some facets of organisational attributes had to be collapsed into rather crude categories.

Finally, the investigation of the dynamic aspects of industrial linkages was limited because most historical data on industrial linkage was based upon personal recollection rather than records.

Despite these problems, the findings of the analysis are largely supported by those of the case studies. This suggests that they are not totally isolated and have broad implications for a wider context.

The next section summarises the major findings of the research. Based upon these findings, some policy implications are considered and issues for further studies are identified.

Main Findings

The main findings of the study are summarised below

i) The analysis of Pakistan's export sector indicates that Pakistan's economy faces serious difficulties, as the future competitiveness of most of its industries is uncertain. The pattern of gains and losses (figures 3-1 & 3-2) makes clear the rapid erosion of competitive advantage in many successful industries in Pakistan[1]. This is particularly true in case of the food/beverages related cluster. The share of this cluster in Pakistan's total exports declined by approximately 12% between 1985-96 (figure 3-3). Pakistan's position in health care and housing also seems to be declining. The gains have been most prominent in the textile/apparel-related cluster of Pakistan. However one

[1] successful industries are referred to those industries with export share greater than the cut-off for that particular year. See appendix A.

striking limitation that is reflected by the cluster charts (chapter 3) is that Pakistan's position in industrial and supporting sectors along the middle of the cluster charts is negligible and it has remained more or less unchanged over the period 1985-96. Pakistan holds absolutely no position in machinery associated even with its most prominent clusters. The gains associated with speciality inputs have also not been prominent.

ii) The commodity composition (table 3-1) of Pakistan's exports shows that Pakistan has based its competitiveness on basic factor conditions like natural resources and low labour costs. Pakistan's situation is not unique. Conventional wisdom suggests that cheap labour and basic factor advantages should be the main source of comparative advantage in manufacturing for developing countries. Labour-intensive exports such as garments, footwear, toys and other light consumer goods, have led to the initial export thrust of Asian NIEs. However the point of concern for Pakistan is *the lack of expansion and growth* of industries associated with its important clusters. Table 3-1 showed that Pakistan remains dependent on a handful of goods for export earnings. The 34 industries shown in table 3-1 constituted 95% of Pakistan's total exports in 1996. Although Pakistan's total exports have increased tremendously in terms of quantity, it has not been accompanied by industrial diversification of products. The commodity composition of Pakistan's exports has not changed since 1985. The manufacturing sector of Pakistan still remains largely concentrated in the sectors of food and beverages and textiles. The successful deepening and broadening of clusters that is integral to successful economic development has not accompanied the

increase in exports. Figure 3-2 showed that almost all the competitive industries of Pakistan lie in the final consumption goods sector and this situation has not changed between 1985-96.

iii) The establishments in most of the competitive industries of Pakistan employ explicitly or implicitly, cost based strategies involving commodity products that exploit basic factor advantages (see section 4.4.4). They have yet to move towards strategies that will allow Pakistan to compete on quality, features or service rather than price. Even in most traditional industries of Pakistan like sports goods, textiles etc, Pakistan has yet to explore the opportunities for branding, advances in marketing and distribution, and developing new products. The economic system operating in Pakistan does not drive forward the creation of new technologies, products and strategies and does not provide the basis for sustained competitive advantage.

iv) The analysis of the textile/apparel industry reveals that most of the organisational attributes of the establishments of this industry are conducive to local clustering. Although this has created potential for economic value, the industry has so far failed to ensure the full realisation of this potential. Proximity of suppliers (table 5.14.2) and strong backward material linkages have not been able to facilitate valuable information flow within the cluster[2].

[2] Less than 30% of the establishments in case of finished goods and less than 50% in case of intermediate goods considered suppliers to be a critically important source of information (table 6.6.3, chapter 6).

Personal and family relationships have also failed to foster trust and open communication within the cluster participants. The paucity of the textile/apparel cluster can be blamed to an extent on the rigidities associated with the efficacy of the diamonds' arrows (see figure 4-8). A uniform approach to competing, a sort of 'group think' is found to prevail in the industry that has suppressed new ideas and innovation.

An essential ingredient to sustain competitive advantage lies in the ability of the establishments to become technically efficient. Technological development at this stage can be referred to as the ability of firms to efficiently use imported technology. The survey findings indicate that the level of technological/managerial staff (section 5.8.2) is extremely low in this industry in spite of the fact that the establishments are using a high proportion of imported machinery (section 5.10.1). This has limited the capability of the establishments to upgrade and master the technologies they have imported or diversify into new products/ businesses as conditions change. For example, section 5.11.2 reveals that the establishments producing intermediate goods and using high proportion of imported machinery have limited themselves to mostly one product. The level of innovative activities is also found to be very much limited in these industries.

However section 4.4.4 discusses that the lack of innovative activities among the establishments producing intermediate goods can be blamed to an extent on the prevailing mindset of the senior/manager and owners who have focused their strategies on offering basic products because of the ability of the domestic and foreign markets to consume what they produce.

v) Pakistan's economy continues to suffer from several fundamental weaknesses that have resulted in macro economic policies that do not support long-term upgrading of its industry. The chronic deficits (see section 1.1.5) in Pakistan's balance of payments have resulted in repeated devaluations of Pakistan's currency[4]. This has not led in any significant improvement in Pakistan's competitive position since 1985. It has reduced the pressure on Pakistan's firms particularly those in the textile/apparel industry to upgrade their competitive position and differentiate their products. In fact it has actually reinforced the tendency of the establishments in this industry to compete on cost in simple end-use commodity sectors.

vi) The government of Pakistan at national level has so far not been able to create significant advantages for its industrial environment. It has failed to make appropriate investments in factor creation. This has resulted in its inability to broaden and expand its clusters. For example Pakistan's total expenditure on education was only 2.2% of GNP in 1998-99 (see section 3.2.3.1). Similarly the average allocation of expenditure on R&D was also extremely low in comparison to the other developing countries (see section 3.2.5). This has resulted in limiting Pakistan's success to only those industries that require low level of technology and skills. It has also stifled Pakistan' ability to enter into

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[4] Pakistan first devalued its currency in 1956 by 30% in relation to pound sterling. Further in May 1972, the multiple exchange rates system and Export Bonus Scheme was abolished by almost 58% with respect to US Dollar. In October 1993 Pak Rupee was again devalued by over 12%. In February 1994, the rate of Pak Rupee in relation to 1 US $ was 30.35. This represents a depreciation of 206.6% since January 7, 1982. In short, there has been persistent depreciation in Pak rupee particularly since 1982 when the new system of managed float was adopted by the Government. In August 1997, the rupee was around 41.50 against US dollar. See Zaidi, 1999, pp. 192-194 & Saeed, 1999, pp. 453-455.

machinery and services sectors associated with its most prominent clusters (see tables 3-1 & 3-2). An important tool for encouraging cluster growth is by attracting foreign investment. Section 5.8.3 reveals the negligible role of foreign companies in the textile/apparel industry of Pakistan. A prerequisite for foreign investment is the macro-economic and political stability in the country. The unstable political situation in Pakistan has resulted in the inconsistency and unsustainability in its economic and trade policies.

Some Policy Implications

Although the research was limited in both geographical and sectoral scope, its findings are largely supported by the case study. This suggests that the findings may have considerable planning implications for the companies as well as the government.

Pakistan's government has played a prominent role in the economy, but frequently it has been a wrong one. Pakistan's industrial and economic policies have generally been geared towards short term perspectives of improving its balance of payments situation (see section 3.6, chapter 3). As a result the government has failed to set up a stage for Pakistan's firms to achieve high and rising levels of productivity. In order to stimulate such dynamism, government and the private sector need to work together to create an environment in which firms can upgrade competitive advantages in established industries and enter new industries where higher productivity can be achieved. The objective should be the creation of long term competitive advantage for Pakistan rather than to shore up profits or reduce short term market pressures.

In Pakistan there is a tendency to nurture those industries or industry segments that have strong political connections. Political uncertainty, frequent reversals of policies, and tailor-made incentives to support particular industrialists with political links has distorted the industrial environment and made the investment climate insecure (see chapter 3, section 3.5). This in turn has limited the capacity to upgrade the economy and has constrained Pakistan's standard of living.

The economic policy debate in Pakistan has mostly focused on devaluation (see chapter 3, section 3.6). Although attempts to boost 'competitiveness' through devaluation has increased the volume of Pakistan's exports it has failed to improve the living standard of its people. In fact it has hampered the capacity of the firms to innovate and upgrade. To increase the productivity of the firms, the policies should go far beyond devaluation and exchange rates.

The overall view of Pakistan's competitive position in the global economy provides a starting point for a coherent framework that can form the basis for action. The systematic nature of the 'diamond' makes discrete policies interdependent to national competitive advantage. Porter asserts that government has the greatest influence on the national advantage at a factor driven stage. Keeping this in mind below I provide recommendations for the issues most in need of change. Although most of these recommendations are geared towards the textile apparel industry of Pakistan, they provide a coherent framework to form basis of action in most of Pakistan's competitive industries.

Stability in Macroeconomic Policies

What Pakistan urgently needs is a stable macroeconomic framework. Macroeconomic policy should be such that it supports long-term upgrading in Pakistan industry rather than work against the process as it has always done. Devaluation has always provided a simple solution to Pakistan's complex and difficult economic problems. This has retarded the development of the industry by reinforcing cost-based strategies within its firms. Moreover devaluation has led to an increase in the cost of capital goods essential for the development and sustainability of the industry. To accelerate investment and growth Pakistan needs to pursue tight fiscal policy based on a higher tax-to-GDP ratio resulting from expansion of the tax base and better collections (as opposed to higher tax rates); higher and more effective public expenditures geared towards the infrastructure and skill development relevant to its competitive industries and a monetary policy that avoids excessively high real interest rates and an active exchange rate policy to encourage exports.

Pakistan's agricultural and industrial sectors have often been damaged by numerous micro-level interventions by the state. The government of Pakistan through a complex net of protectionism, tax exemption, guarantees, and subsidized credit and inputs has weakened competition and consequently the development of its industries at large. This is particularly true with respect to the textile/apparel industry where the spinning sector has unnecessarily been benefited to suit the objectives of certain political groups (see chapter 3, section 3.6 and chapter 4, section 4.4.5). The government needs to avoid these micro-level interventions and focus towards removing obstacles hampering the growth and development of the industry. Its objective should be to

transform the micro-level structure of the economy rather than distorting competition by targeting particular segments of industries.

Business in Pakistan complains of pervasive harassment and bribe-taking by numerous government agencies that regulate their activities. This constitutes a significant burden on the private sector and a disincentive for investment. Pakistan is not an exception in this regard as developing countries have always found it difficult to reform public sector institutions. Nonetheless the business environment coupled with political instability has pushed Pakistan far below in terms of inward foreign investment when compared to other Asian developing countries (see chapter 1, section1.1.6). In spite of the fact that textile industry is the most dominant industry in terms of its export share Pakistan has failed to attract foreign investment (see chapter 5, section 5.8.3).

Human Resource development

Improvement in the Educational System

The research indicates almost complete absence of innovative activities among the establishments (see chapter 5, section 5.11.2). Innovation requires an appropriate skill base and education system forms the basis of skill development. The public school system in Pakistan is a characterized by corruption and backwardness. It needs immediate attention on part of the government. According to the Human Development in South Asia's 1998 report, 70 percent of schools in Pakistan have no toilets, 68 percent no drinking water, 92 percent no playgrounds, 60 percent no boundary walls and 16 per cent are without a building. There is extreme dearth of desks, books, blackboards, electricity. Moreover the phenomena of 'ghost schools'

(institutions which receive government grants but do not exist) is common knowledge. The government expenditure on education, allotted for 2001-2002 was a little above 2% of the GDP which can provide very little relief to Pakistan public schools. Because of all these factors these schools have failed to provide Pakistanis with skills necessary to become productive members of the society. Many of Pakistan's major competitors have offset Pakistan's comparative advantage of cheap labour by increasing the productivity and efficiency of its labour force. This has made Pakistan a less attractive place for foreign investment. The continuous trend of this situation can have a very unfavourable impact on the competitiveness of Pakistan's textile/apparel industry particularly in the absence of quota systems.

Elimination of Gender inequalities and cultural discrimination

The gender issues in Pakistan are complex and multi dimensional. There is a low status for women in all sectors and aspects of life particularly in education and employment opportunities and skill. Women play a significant role in the textile/apparel industry of many of Pakistan's major competitors. This is particularly true with respect to the garment manufacturing sector. Women participation in the textile/apparel industry of Pakistan is almost negligible. This could be attributed to the cultural norms existing in the country (see chapter 3, section 3.2.3.3). The number of vocational institutes for women in Pakistan is very few. Unlike Pakistan, Korean women can apply to any vocational institute according to their interest and competency. In fact 46% enrolled in the Korean vocational institutes are women. Considering that almost half of Pakistan's population comprises of women, it is essential that the government encourages their participation by providing them with increased opportunities to acquire skills. Gender inequalities existing in Pakistan need

to be addressed immediately. The government can play an important role towards the elimination of these inequalities by increasing the opportunities for women both in employment and education.

Improve Vocational Training

Pakistan is stuck in a low skill and low technical competence trap. The East Asian economies were able to achieve a successful transition to higher value added production by focusing on the vocational and technical skills required to meet the needs of its industry. Primary and secondary education in Pakistan should be accompanied by an expansion of vocational training to provide skilled labour for its export oriented industries. This can be an appropriate alternative to the bulk of Pakistanis who are unable to acquire academic qualifications for their working careers. The status and resources of polytechnics should also be improved so that they provide a true alternative to universities for both students and educators. Curricula should be developed with input from appropriate industry associations to ensure that relevant skills are being developed. Korea managed to improve the quality of its workforce through the establishment of the Economic Planning Board (EPB). The main task of this EPB has been to work closely with ministries of education, labour and science and technology and to coordinate the education and training requirements of the economic development strategy. In Pakistan there are no close links between schools and industry. There is an urgent need for a similar type of linking mechanism that could encourage schools, universities and industries to work closely together.

Upgrade Workforce Skills

In the integrated global economy, workforce quality drives national competitiveness. A major determinant of a country's competitiveness is its people. The global structural transformation taking place in the textile/apparel industry requires Pakistani firms to free themselves from the current cost-based strategies and move towards higher value added and differentiated products. This requires a revolutionary new approach in the training and development of the workforce. Since it is an export oriented industry it is essential that this approach is based on the identification of customers and their requirements. Government should carry out studies of skills levels in this industry in Pakistan and compare them to those of its international competitors. The industry association should also be involved in this sort of studies. This can prove to be a good motivator to improve local skill levels.

Upgrade the Technological Base

The research indicates that the technical base particularly in the garment manufacturing is considerably weak. These establishments face capital constraints that limit their ability to develop and upgrade. Pakistan needs advanced specialized capital markets with intimate knowledge of the industry. Moreover the development of professionally organized venture-capital markets can play an important role in the development of agricultural technology. This is essential for the overall upgrading of the industry which demands a steadily rising standard of technology and technological expertise.

The R&D activities within the establishments were found to be negligible (see chapter 5, section 5.10.1). Pakistan should ensure that government research institutes and

programs are focused on the important technologies affecting the industry as a whole. Also these institutes should be jointly funded by the industry and not solely be paid for by the government. The participation of the government, universities and the private sector is jointly needed to help the industry break away from its current predicament. Also considering the present social environment under which the industry is operating explicit dissemination mechanisms will be required to ensure that scientific knowledge is available throughout industry.

Stimulate Domestic Competition

The government needs to address the following questions when formulating policies for the textile apparel industry

What industry structure would be most conducive to the rapid upgrading of this industry in the long run given the fundamental changes taking place in this industry worldwide?

What structural impediments existing in this industry need to be tackled in order to stimulate a healthy competition within the industry?

The research highlights the static view of competition in this industry which has resulted in very limited investment for human resource development by the establishments in this industry (section 4.4.1.4). Pricing policy with respect to raw cotton has traditionally favoured the spinning sector. This sector has thus enjoyed relatively large cost advantages over textile mills around the world. However the findings of the research indicate that the Pakistani yarn spinners did not utilize this

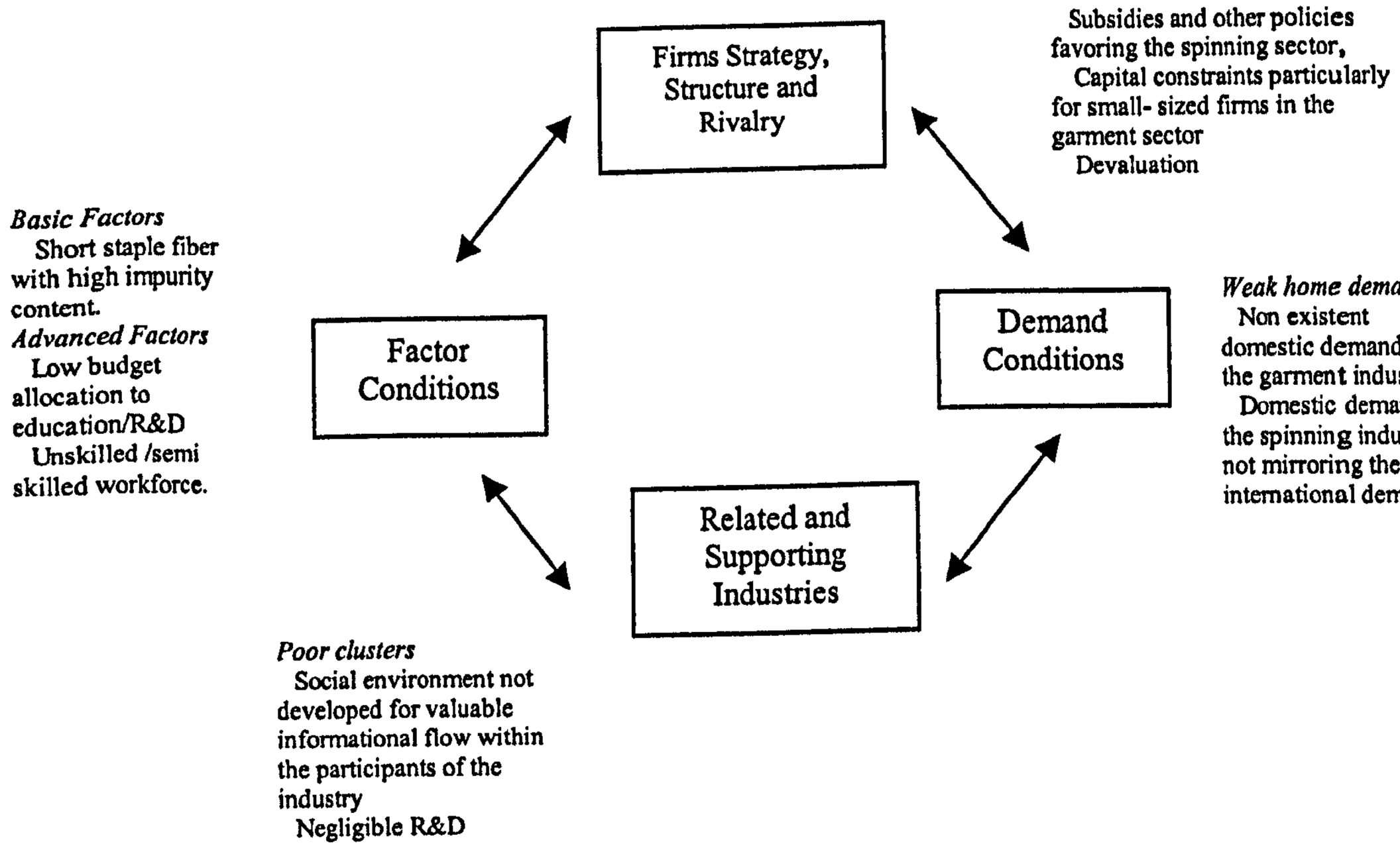
cost advantage to benefit and upgrade the industry at large. A policy is now urgently needed to encourage competitiveness by creating a level playing field rather than supporting the spinning sector. Only this could stimulate competition within the industry to upgrade itself. The objective may seem difficult to achieve. The biggest hurdle is changing the mindset of the local influential entrepreneurs. They have become used to the incentives that have made them sluggish and inefficient and resulted in the production of coarse cloth and inferior quality made-ups.

Change in the Managerial Approach

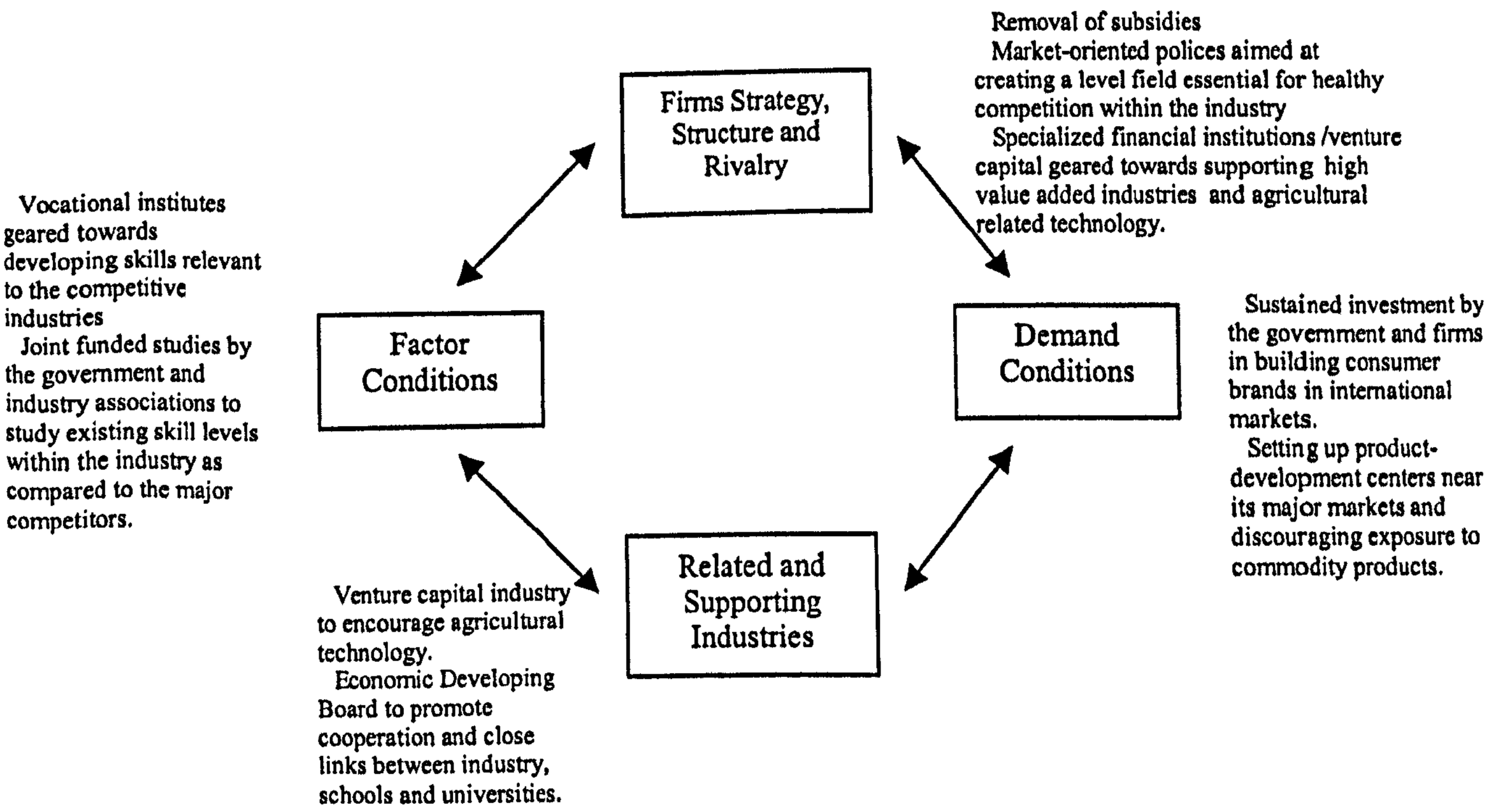
The research findings indicate that the firms in this industry have failed to divorce ownership from management. Rigid command and control structures are in place. Initiatives are frowned upon and individuals have little incentive to excel. This has hindered the development and expansion of the product base in this industry. There is a desperate need for the firms to upgrade their intellectual capital by hiring the right people and encouraging them to rise to their maximum potential.

In short the study findings indicate that the textile apparel industry is caught in a state of arrested development where the determinants of the weak diamond are reinforcing each other negatively. The following two diagrams summarize the study by indicating some of the problems associated with the diamond and their recommended solutions.

Problems



Solutions



Appendix A

Appendix A *(Chapter3)*

Methodology for Preparing the Cluster Charts

The basic source of data for preparing cluster charts came from United Nations Trade Statistical Year book. The cluster chart was constructed by identifying all the industries (service industries were not included) in which Pakistan has achieved success in international competition.

International success was measured by the presence of significant exports. Foreign direct investment draws on strengths or skills created in the home country is also a measure of international success. However in this dissertation this aspect was ignored mainly because of lack of data available on foreign direct investment and scarcity of time.

The starting point for preparing the charts was the UN trade statistics. For simplicity purposes, in this dissertation only three-digit SITC industries were identified in which Pakistan's share of world market economy exports in the industry equalled or exceeded Pakistan's average share of world trade in the year (referred to as the cut off point). In Pakistan, for example the cut off point in 1996 was only 0.18 percent of world exports. The use of this cut off is equivalent to selecting those industries in which the nation has revealed comparative advantage, in the parlance of the literature on international trade (see Porter 1998).

This list of industries provided the basic raw material for the cluster charts. All those industries were left out not showing up in the UN trade statistics. Although this procedure has the tendency of ignoring some of the important industries in the nation, however after a close analysis of the list of industries showing up in the UN trade statistics, it was believed to be an acceptable method of including the industries in the cluster chart by the author. Nonetheless there are no doubt errors and omissions have been made.

The Cluster Chart

The cluster chart represents an effort to display all the industries in which a nation has competitive advantage in a way that highlights the pattern of competitive industries and the connections among them. Since Porter's theory places strong emphasis on demand conditions as well as vertical linkages among industries, the basic classification system in the chart, illustrated in Figure A-1, is based on end use application.

Within the broad end-use categories, the chart highlights the vertical connections among industries. The primary goods themselves are listed first, divided as appropriate as self contained components and end-products. Then the machinery used to make the primary goods is listed. Next, any specialised inputs that go into them are displayed. Where its end use application was not clearly linked to one of the broad sectors, the industry was assigned to the multiple business heading.

To indicate visually those industries with particularly strong positions, industries were listed on the cluster charts in three different typefaces. Industries with a world export share from the cut off value to twice the cut off value are listed in roman type. Industries with export shares from two to four times the cut off are listed in bold italics.

The basic classification system in the chart cannot possibly capture all connections among the industries, particularly those with the horizontally related industries. Shading employed in the cluster chart signifies some of the most important of these connections.

The cluster chart is necessarily an approximation, and legitimate disagreements are possible about the headings, subheadings, and classification of particular industries. Nonetheless, the cluster chart in this dissertation is hoped to provide a useful picture of the economy.

Cluster charts were prepared for 1985 and 1996. Most of the analysis of changes in position employed the comparison between 1985 and 1996 data.

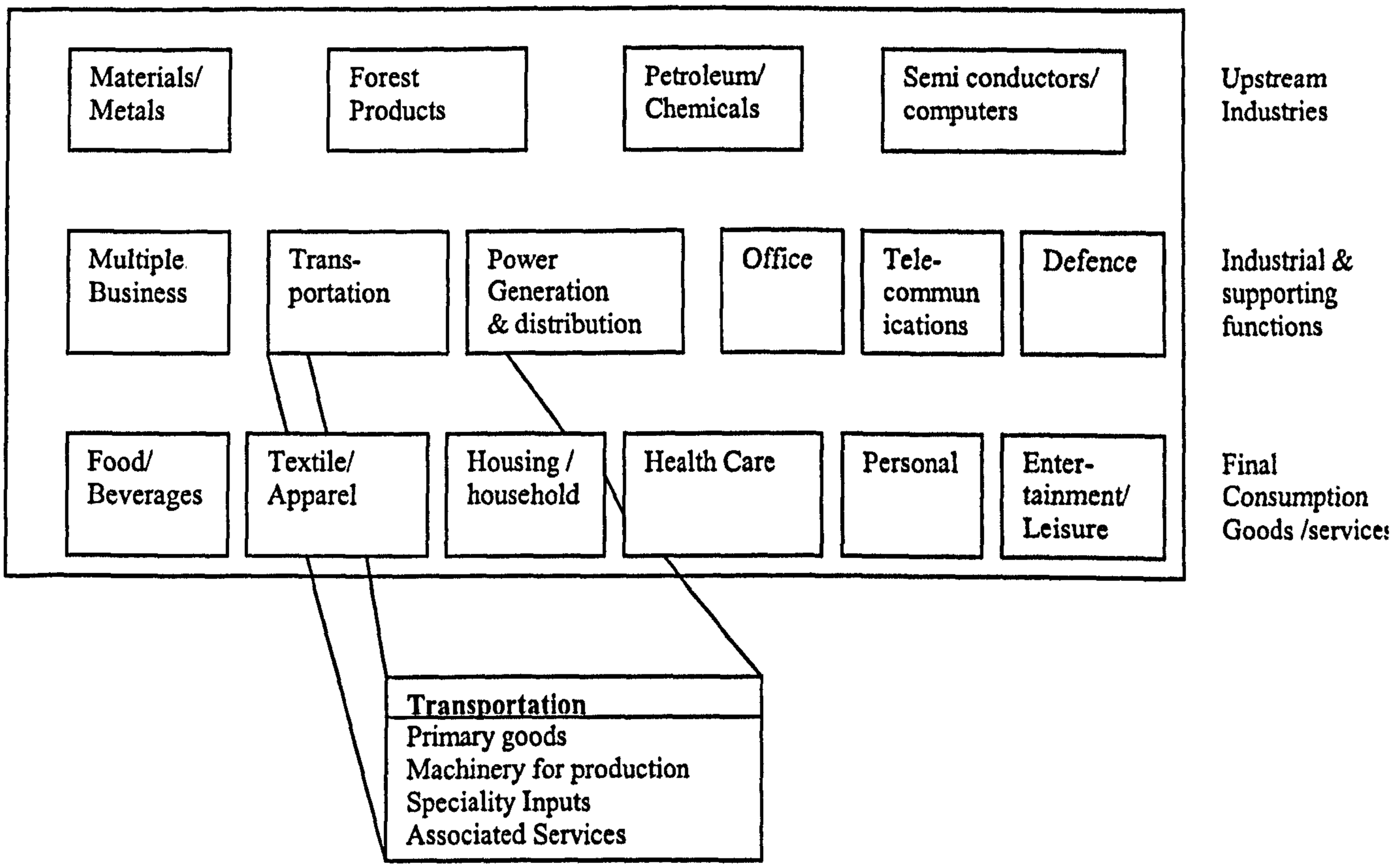
Computations of Trade Patterns

In analysing trade patterns, a number of measures were used to compare Pakistan's relative position in a given industry or cluster. The first is export share, or the Pakistan's share of world market economy exports. For example 4.94 percent export share in textile yarn signifies that Pakistan exported just below five percent of the total value of textile yarn exports in 1996.

The second measure was share of total country exports, which is the absolute share of a nation's total exports represented by a given industry or industry cluster. The comparative analysis within Pakistan began with a look in these basic measures overtime. The changes in the export share between 1985 and 1996 were analysed to see how different vertical stages were gaining or losing position as well as to analyse the changing positions of industries at the three levels in the overall cluster charts.

Figure A-1

The Cluster Chart



Source: Porter (1998)

Table: 3-1A

Competitive Industries of Pakistan in Terms of World Export Share, 1985

Serial Nos	Code	Commodities	World Export Share %	Pakistan Exports US $million	Pakistan Export Share %
1	001	Livestock for food	0.25		0.37
2	034	Fish fresh chilled frozen	0.17	10090	0.35
3	035	Fish salted dried smoked	0.7	9726	0.25
4	036	Shell fish fresh frozen	1.22	6729	2.26
5	042	Rice	11.76	61996	9.93
6	056	Vegetables etc prepared	0.32	272089	0.29
7	057	Fruit nuts fresh dried	0.26	8082	1.09
8	061	Sugar & honey	0.58	29950	1.02
9	075	Spices	1.03	28076	0.4
10	122	Tobacco manufactures	0.22	10922	0.32
11	223	Seed for oth. Fixed oils	0.43	8719	0.08
12	261	Silk	0.69	2275	0.03
13	263	Cotton	8.42	729	15.63
14	268	Wool (excl tops)animal hair	0.45	428185	0.69
15	271	Fertilizers Crude	0.3	19006	0.17
16	273	Stone, Sand & Gravel	0.21	4641	0.09
17	277	Natural Abrasive	0.16	2476	0.03
18	289	Pres. Metals, ores waste	0.27	826	0.09
19	291	Crude animal material	0.77	2493	0.34
20	292	Crude vegetable material	0.52	9321	0.99
21	562	Fertilizer manufactures	1.09	27020	3.02
22	611	Leather	3.57	82652	5.79
23	612	Leather etc manufactures	0.43	158695	0.18
24	651	Textile yarn	2.05	4805	10.01
25	652	Cotton fabric woven	4.53	274275	10.98
26	653	Woven, manmade fib fabric	0.34	300743	1.18
27	656	Lace ribbons,tulles etc	0.32	32315	0.12
28	658	Textile articles	6.41	3408	7.99
29	659	Floor coverings	3.57	218814	4.81
30	663	Mineral manufactures	0.14	131675	0.19
31	671	Pig iron etc	0.48	5309	0.67
32	696	Cutlery	0.8	18430	0.37
33	842	Men outerwear non knit	0.43	10029	1.08
34	843	Women outerwear non knit	0.62	29587	2.44
35	844	Undergarments non knit	1.39	66733	1.45
36	846	Undergarments knitted	0.73	39656	1.03
37	847	Clothing accessories	1.26	28195	0.8
38	848	Headgear non textile clothing	1.53	21913	2.11
39	872	Medical instruments	1.01	59896	1.52
40	883	Developed Cinema film	0.2	41717	0.01
41	894	Toys, sporting goods etc	0.51	394	1.42
42	899	Other manufactures	0.18	38996	0.26
43	941	Zoo animals	3.55	7015	0.16
				4338	92.09

Source: Calculated from International Trade Statistical Yearbook 1996, volume II

Note: All the above identified industries are those in which Pakistan's share of the world market exports exceeded its average share world exports in the year 1985. This is referred to as the cut off point.

Pakistan's Total exports in 1985 were 2740 US $ million.

World's total exports in 1985 were 1921014 US$ million.

Pakistan's average share of world exports or cut off point was 0.14.

Table 3-2A

Major Imports of Pakistan

(Million rupees)

Serial No.	Items	1985-86	1995-96
1	Chemicals	6610.2	45897.6
2	Drugs & medicines	2252.5	11007.2
3	Dyes & colours	728.5	4981.9
4	Chemical Fertilizers	2079.1	11766.5
5	Electrical Goods	3114.4	14814.9
6	Machinery (non electrical)	14955.1	71125.0
7	Transport equipments	9177.9	18748.6
8	Paper, board & stationary	1626.4	5411.8
9	Tea	2175.2	5706.7
10	Sugar-refined	929.7	54.3
11	Art-silk yarn	1320.7	1961.9
12	Iron, steel & manufactures	4355.0	20554.5
13	Non-ferrous metals	861.9	6130.7
14	Petroleum & products	16775.4	67337.8
15	Edible oils	6129.3	29243.3
16	Grains, pulses &flours	5067.0	18603.9
17	Other imports	12788.0	64228.3
	Grand Total	**90946.3**	**397574.9**

Source: Economic Survey of Pakistan *various issues* Islamabad: Government of Pakistan, Finance Division.

Table 3-3A

Major Export Markets

(Thousand rupees)

Country/area	1985-86	1995-96
Grand Total	**49592156**	**294741162**
North America	**5632910**	**50170013**
USA	5138747	45691843
Central America	**47921**	**922286**
South America	**647094**	**4218664**
EEC	**11235240**	**83078232**
Italy	2174728	8227116
U.K	2730772	18811206
Germany	2984340	20066306
E.F.T.A (excl UK)	**2665044**	**5965034**
Eastern Europe	**2990350**	**4710384**
Middle East	**8971709**	**36687301**
Asian Countries	**7791857**	**27622664**

Source: Economic Survey of Pakistan *various issues* Islamabad: Government of Pakistan, Finance Division.

Figure 3-1A

Clusters of Internationally Competitive Pakistan Industries 1985

Primary goods	Materials/Metals Stone, sand gravel etc	Forest Products	Petroleum/chemicals	Semiconductors computers	Multiple Business Other Manufactured Goods
Machinery					
Speciality Inputs	Precious metals, ores waste Pig iron Mineral manufactures				Crude animal material Crude vegetable material Natural Abrasive
Services					
Primary Goods	Transportation	Power generation	Office Products	Telecommunication	Defence
Machinery					
Speciality Inputs					
Services					

Continuation of Figure 3-1A

Primary Goods	Food/Beverages Basic Food Live Stock for Food Fish fresh chilled frozen Fish salted dried smoked Shell fish fresh frozen Rice Vegetables prepared Fruits nuts, fresh dried Sugar& Honey Spices Edible oils Seeds for other fixed oils	Textile /Apparel Cotton Fab-woven Woven manmade fib fabric **Apparel/Articles** Mens outerwear non knit Textile Articles Undergarments non knit Undergarments knitted Head gear non textile clothing Women outer wear non knit Leather manufactures **Accessories** Clothing accessories Lace ribbons tulles etc	Housing/household Floor coverings Cutlery	Health Care Medical instruments	Personal Tobacco Manufacture	Leisure Toys,sporting goods etc Developed Cinema film Zoo animals
Machinery						
Speciality Inputs	Fertilizer crude Fertilizer manufacture	Cotton Textile yarn Leather Wool (excl tops) animal hair Silk				
Services						

Note: The above cluster chart shows all the 43 industries that were competitive in 1985. See Appendix A, table 3-1A

Appendix B

Letter of Introduction

Dear Sir/ Madam

I am writing to you in the hope that you would help me in the study of 'Competitive Advantage of Industries of Pakistan' that is being undertaken at the University of Strathclyde, Glasgow. I am enclosing a more detailed description of the project with this letter on a separate sheet.

For the purpose of this study, around sixty to seventy firms from the province of Punjab are being approached to take part in this questionnaire survey. Such a survey is necessary, as the information required cannot be obtained any other way.

I would be most grateful if, during the next few weeks, either yourself or another member of your management team would spare some time to fill in the questionnaire. I enclose a stamped addressed envelope.

Finally, Sir I would like to point out that information concerning sales, costs and revenues is not required, and the details recorded will be treated as strictly confidential. I hope you would find it possible to take part in this survey.

Yours sincerely,

Khadija Bari

University of Strathclyde ____ Department of Economics

Project Title ___ International Competitive Advantage of Pakistan

This project is designed to analyze the pattern of Pakistan's competitive advantage and provide ways of thinking about how its economy can progress in competitive terms.

I wish to analyze the vertical integration as well as horizontal integration (diversifying) in various industries of Pakistan. However special emphasis would be laid on textile/apparel related industries.

This research has many implications for the firms in general. The agricultural based industries have traditionally occupied a very important position in the industrial life of Pakistan. There is intense need to publicize the conditions and environment under which the firms in Pakistan are currently operating and to highlight the ways and means through which Pakistan can broaden and upgrade the competitive advantage of its existing firms.

We know that nations succeed not in isolated industries but in clusters of industries. This project aims to show how these clusters can be deepened and widened by deploying the natural resources in increasingly productive ways. It also highlights the potential of Pakistan's firms to enter into multi-product activities in terms of economies of scope.

The issues that surround this research project are therefore of considerable importance and it is hoped that the results would be viewed with interest not only by the government planners and economists but also by the individual firms in general.

If you are interested in obtaining a brief summary of work, please tick the box below.

☐

Questionnaire

Date _____

Respondent

Name_____ Department_____

Position_____

The number of years working in the company? ☐☐ years ☐☐ months

Company Name, location & major activities

1-Name of your company?_____

2- Address (head office)_____

3- Is your company (main office or main factory) located in an industrial complex?

Yes (name of the complex)_____

No ☐

4- Are the head offices of most of your competitors (rival firms) situated in the same city as yours. Please tick as appropriate.

Yes ☐

No ☐

5- What kind of products does your company produce? (If several kind please answer for one major product). Tick as appropriate.

1) Finished goods ☐

2) Component or intermediate good for another firm ☐

Ownership and Entrepreneurs

6- What is the ownership structure of your company? Please tick as appropriate

Pakistani Public Firm ☐

Pakistani Private Firm ☐

Joint Venture ☐

Foreign Controlled Enterprise (FDI) ☐

7- Does your company belong to a larger business group?

Yes (name of the group)_____
No ☐

8- Where is the birth town and the present residence of the owner of your firm? (Please answer only when the firm is primarily run by one person or one family owns more than 50% of capital share of the firm.)

a) Town of birth_____
b) Present residence_____

Production and Technology

9-What percentage of the equipment and machinery used in your company is imported? Please tick the appropriate box.

a) Less than 25% ☐

b) 25% _ 50% ☐

c) 50%_75% ☐

d) More than 75% ☐

e) None ☐

10- Please name up to four products produced by your company in terms of their sale value (in descending order)

a)_____
b)_____
c)_____
d)_____

Question 11 & 12 are designed for the firms in the leather and textile industries respectively. Please answer only if relevant otherwise move to question 13.

11- Which of the following products are produced by/ supplied to your firm? Please tick as appropriate

Products	Produced by your firm	Supplied to your firm
Tanned Leather	____	____
Leather Garments	____	____
Leather Footwear	____	____
Shoe Uppers	____	____
Leather Gloves	____	____

12- Which of the following products are produced by/ supplied to your firm. Please tick as appropriate.
(For firms in the textile industry)

Products	Produced by your Firm	Supplied to your firm
Readymade garments	____	____
Cotton fabric	____	____
Cotton yarn	____	____
Synthetic textile	____	____
Raw cotton	____	____
Clothing accessories (textile)	____	____
Clothing accessories (non -textile)	____	____

13- What was the proportion of your total sales between domestic and export market in 1998-99? Please refer to the products specified in question 10.

Products	Domestic market %	Export market %
a)		
b)		
c)		
d)		

Organizational Structure

14- Does your firm have any employees solely concerned with R&D?

Yes ☐ If so, how many. ☐☐☐☐

No ☐

15- Please indicate the location of your firms different production units?

a) plant 1_____

b) plant 2_____

c) plant 3_____

d) plant 4 _____

16- Please identify the major organizational units your head office is directly responsible for such as marketing, research, purchasing, sales etc.

a) _____

b) _____

c) _____

d) _____

17- What kind of production system does your company have? Please tick as appropriate.

1) Standardized mass production

2) Unit production
3) Jobbing or small batches

4) Others, please specify _____

18- Does this firm use any of the following scientific equipment for the production of its major products? Yes ☐ No ☐

If yes, please tick the appropriate box/s

a) Microprocessors or computers in designing or developing products. ☐
b) Computers in the production process. ☐
c) Full automatic systems on production lines. ☐
d) Semi automatic systems on production lines. ☐
e) Computers in management ☐

Changes in Organization and Production

19-What has been the nature of change in the employment of your company over the last 10 years or since its establishments if later? Please tick as appropriate

	Increased	Decreased
Less than 25%	____	____
25% _ 50%	____	____
50% _ 75%	____	____
75% or more	____	____

20-Please state any new products or businesses your company has entered during the last 10 years or since its creation if later?

a) _____
b) _____
c) _____
d) _____

21- How many times over the past ten years has your main machinery and equipment been upgraded? ☐☐

Major sources of Technological Improvement

22-Has your company contacted external organizations or firms during the last 10 years in relation to its R&D activities?

Yes ☐ how many ☐☐

No ☐

23-What are the main sources of technological development or improvement for your firm? You may tick more than one box?

1) Foreign technology ☐

2) In-house development with the help of domestic external organization ☐

3) In-house development with foreign expertise ☐

4) Joint venture R&D with other firms ☐

5) In-house development without external help ☐

6) Parent firm, the group R&D or others ☐

Characteristics of the input materials

24- What approximate percentage of the following materials of your firm (by value of their costs) came from different cities of Pakistan or were imported?

	Same city	Other parts of Pakistan	Imported
Raw material			
Intermediate Products			
Machinery & equipment			

Characteristics of your major suppliers and customers

25- Approximate what % of the value of your sales go to

1- large firms with 300 or more workers ☐☐ %

2- medium size firms with 50 –299 workers ☐☐

3- medium size firms with 20-49 workers ☐☐ %

4- small size firms with less than 20 workers ☐☐

5-Others such as retail stores etc- specify _____

26- Approximately what % of your sales (by value) go to customers in

1) Same city or province as your firm ☐☐ %

2) Other cities or provinces of Pakistan ☐☐ %

3) Foreign country ☐☐ %

27) Approximately what % of your inputs (by value) come from suppliers in

1) Same city or province as your firm. ☐☐ %

2) Other cities or provinces of Pakistan ☐☐ %

3) Foreign country ☐☐ %

28- In the scale of 1-4 how would you rate the following factors in selecting a customer for your firm (1= not important at all and 4= critically important).

	1	2	3	4
1) Market analysis or research	____	____	____	____
2) Personal or family relationships	____	____	____	____
3) Business relationships	____	____	____	____

4) Others please specify _____

29- In the scale of 1-4 how would you rate the following factors in selecting a supplier for your firm (1= not important at all and 4= critically important). Please tick as appropriate

	1	2	3	4
1) Market analysis or research	____	____	____	____
2) Personal or family relationships	____	____	____	____
3) Business relationships	____	____	____	____

4) Others please specify _____

30- The following are the factors considered in the selection of suppliers. Please answer on the scale of 1 to 5, with 1= no importance and 5= critically important.

a) Price of products _____

b) Quality of products _____

c) Delivery in time _____

d) Credibility of the owner _____

e) Brand equity _____

f) Distance between your establishment and supplier/customer (transport costs) _____

Size and composition of employment

31- What was the total number of full time employees in your establishment in 1997?

32- What was the composition of your work force as in 1997?
Please give approximate percentage for each of the following categories totalling to 100 %.

	Percentage of workers	
a) Engineers & management	☐☐	%
b) Skilled workers or technicians	☐☐	%
c) Manual workers	☐☐	%
d) Others	☐☐	%

33- What is the approximate percentage of female employees in your company?

☐☐ %

Sources of information

34- How does your firm value the following methods of attaining business information?
Please answer on scale 1 to 5 (1= no importance at all, 5= critically important).

	1	2	3	4	5
a) Direct observation	___	___	___	___	___
b) Informal contacts/ friendship	___	___	___	___	___
c) Family	___	___	___	___	___
d) Joint ventures or other collaborative agreements	___	___	___	___	___
e) Conferences/ seminars	___	___	___	___	___

f) Others specify _____

35- How do you rate the following sources of information to your company? Please answer on the scale of 1 to 5, with 1= no importance at all and 5= critically important (Tick the appropriate number).

	1	2	3	4	5
a) Rivals	____	____	____	____	____
b) Customers	____	____	____	____	____
c) Suppliers	____	____	____	____	____
d) Equipment suppliers	____	____	____	____	____
e) Banks/ financial institutions	____	____	____	____	____
f) Consulting firms	____	____	____	____	____
g) Newspapers/ media	____	____	____	____	____
h) Collages/ universities	____	____	____	____	____

Appendix C

Names and Addresses of the Interviewed Establishments

Names	Workers	Addresses
1. Farooq Brother	150	Norgate Street, Sialkot.
2. Talha Enterprises	200	N.A
3. Kuwait Tanneries	170	Sialkot
4. Aarzoo Textiles	200	Faisalabad
5. Noroze	220	Vehari Road, Multan
6. Firhaj Garments	100	31-K Gulberg
7. Amtex	200	Faisalabad
8. Mehr Dastgir Textile Mills	230	N.A
9. Magna Textile	249	Faisalabad
10. Ibrahim Textile Mills	999	Club Road, Faisalabad.
11. Ibrahim Fibers Ltd	803	15 Club Road, Faisalabad
12. Zainab Textile Mills	850	Vehari Road, Multan
13. A.A Textiles Ltd	799	Fazalabad Vehari Road
14. Allah Wasaya Textile & Finishing Mills	969	Club Road, Faisalabad
15. Hussain Mills Ltd	900	Faisalabad
16. Appollo Textile Mills	800	Fazlabad, Vehari Road, Multan
17. Sun Rays Textile Mills	480	M.Garh State Life Building Opposite Hotel Silver Sand Multan
18. Immi Garments(Pvt) Ltd	452	LCCHS, Lahore 58-West Warf Rd. K.D.L.B Building.
19. Indus Dyeing & Manufacturing Co.	450	Walton Road, Lahore.
20. ARS Textiles	478	Faisalabad.
21. Ehsan Yousaf Textile	400	31.K Gulberg II. Lahore.
22. Blessed Textiles Ltd	490	Sadpur Road Raheenpur, Kitian
23. Jam Enterprises	498	Sialkot

Names and Addresses of the Interviewed Establishments

Names	Workers	Addresses
24. Faisal Spinning Mills Ltd.	492	Gulberg II Lahore.
25. Silver Textile	400	Lahore
26. Muhammad Textile Mills Ltd.	300	Mehr Mazal, Lohari Gate Multan.
27. Forest Sweaters	98	4th Floor Rehman Plaza, Queens Road Lahore.
28. Zulfiqar Brothers	50	Norgate Street, Cant Road
29. Mecca Tanneries	450	Sialkot.
30. Green House Spinning Mills Ltd.	400	D.O Gohadpur Head Marla Rd. Sialkot
31. Firhaj Industries	350	Sajanpur Multan
32. Annam Cleaving Mills Ltd	422	6-K Main Boulavard Gulberg.
33. Fazal Cloth Mills	50	Ferozepur Road Lahore
34. Asphodel Int'l	240	Fazalnagar M.Garh Sialkot
35. Ismail Fibers Ltd	300	Shekhpura Road. Faisalabad.
36. Medina Garments	70	N.A
37. Mehr Garments	99	N.A
38. Satara Industries	50	N.A
39. Palha International		Shabaz Colony Puramnagar.

Statistical Appendix A

Statistical Appendix A
(Chapter 5)

Table 5.8.2a

The Composition of Employees

(number of employees)

Size of Firms	Management & Engineers	Skilled workers & technicians	Manual Workers	Others	Total
50-99	35	147	252	82	516
100-249	152	726	487	145	1510
250-499	447	3201	1751	963	6362
500-999	844	3739	886	651	6120
Total	1478	7813	3376	1841	14508

Note: The original question was asked in the percentage form. The percentages were then converted into numbers for each category.

Table 5.8.2c

Proportion of Engineers and Managerial Staff

Nature of Products	<=10% engineers/managers	>10% engineers/managers	Total
Finished Goods	15	6	21
Intermediate Goods	12	5	17
Total	27	11	38

One cell (25%) have expected count less than 5.The minimum expected count is 4.92

Likelihood Ratio: 0.003 d.f:1 p-value:0.955

Table 5.8.2d The Number of Female Workers by Size

Size of Firms	50-99	100-249	250-499	500-99	Total
Female Workers	15	30	248	12	305
Total Employees	516	1510	6362	6120	14508

Note: The number of female workers has been calculated by multiplying their percentage employment with the total number of workers.

Table 5.8.3a Group Ties

Types of Products	Group Ties	No Group Ties
Finished Goods	6 (9.165)	15 (11.817)
Intermediate Goods	11(7.856)	7(10.162)
Total	17	22

0 cells (o%) have expected count less than 5. The minimum expected count is 7.85. The values in parenthesis are expected frequencies of each cell.

Chi-square value: 4.174 d.f:1 p value:0.041

Solution
Formula (see section 6.6.0 chapter 6)
Chi-square = $\sum(o_i - e_i)^2 / e_i$

$= (6-9.165)^2 / 9.165 + (11 - 7.856)^2 / 7.856 + (15 - 11.817)^2 / 11.817 + (7 - 10.162)^2 / 10.162 = 4.174$

Table 5.9.1a Type of Products

Size of Firms	Finished Goods	Intermediate Goods	Total
50 – 99 employees	4	3	7
100 – 249 employees	8	2	10
250 – 499 employees	8	7	15
500 – 1000 employees	1	6	7
Total	21	18	39

Table 5.9.1b

Number of Products

Types of Products	One	Two	Three or more	Total
Finished Goods	4	10	7	21
Intermediate Goods	14	2	2	18
Total	18	12	9	39

2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.15.
Likelihood ratio: 14.417 d.f:2 p value: 0.001

Table 5.9.2a

Production Process

Types of Products	Standardised Process	Jobbing/batches
Finished Goods	10	11
Intermediate Goods	17	1
Total	27	12

0 cells (0%) have expected count less than 5. The minimum expected count is 5.54.
Chi-square value: 9.976 d.f: 1 p-value: 0.002

Table 5.10.1a

Uses of Scientific Equipment

(Number of Firms)

Size of Firms	Response	Micro processors	Computers in Production	Full auto systems	Computers in management	None
50-99	7	1	1	0	7	0
100-249	8	2	3	2	6	2
250-499	15	3	7	5	10	1
500-999	7	0	4	1	7	0

Table 5.10.1b
Number of Scientific Equipment Used

Nature of Products	<=1	>1
Finished Goods	9	12
Intermediate Goods	8	10
Total	17	22

0 cells (0%) have expected count less than 5. The minimum expected count is 7.85.
Chi-square value: 0.010 d.f: 1 p value: 0.921

Table 5.10.1c

Types of Products & Proportion of Imported Machinery

(Number of Firms)

Types of Products	<25%	25% - 50%	50% - 75%	>75%	None
Finished Goods	5	5	5	6	21
Intermediate Goods	2	0	3	13	18
Total	7	5	8	19	39

Table 5.10.1d

Types of Products & Proportion of Imported Machinery

(Number of Firms)

Types of Products	<=50%	>50%
Finished Goods	10	11
Intermediate Goods	2	16
Total	12	27

0 cells (0%) have expected count less than 5. The minimum expected count is 5.54.

Chi-square value: 6.064 d.f:1 p value: 0.014

Table 5.10.1e

Contact with External Organisation for R&D

Nature of Products	1 Firm	2 Firms	3 Firms	None
Finished Goods	1	1	5	14
Intermediate Goods	0	1	0	16
Total	1	2	5	30

Table 5.10.1f

R&D Employees

Nature of Products	None	<=10%	>10%	Total
Finished Goods	14	3	3	20
Intermediate Goods	7	1	1	9
Total	21	4	4	29

Table 5.11.1a

Changes in Size of the Establishments

(Number of Firms)

Nature of Products	Decrease or no change	Increas e <25%	Increased >25%	Total
Finished Goods	2	4	15	21
Intermediate Goods	9	5	4	18
Total	11	9	19	39

Table 5.11.1b

Changes in Size of the Establishments

(Number of Firms)

Types of Products	Decrease or no change	Increased
Finished Goods	2	19
Intermediate Goods	9	9
Total	11	28

0 cells (0%) have expected count less than 5. The minimum expected count is 5.08.
Chi-square value: 7.842 d.f: 1 p value: 0.005

Table 5.11.2a

New Products or Businesses Entered

(Number of Firms)

Types of Products	No Change	New Products/ Businesses Entered
Finished Goods	14	7
Intermediate Goods	15	2
Total	29	9

2 cells (50%) have expected count less than 5. The minimum expected count is 4.03.
Likelihood ratio: 2.555 *d.f:* 1 p value: 0.110

Table 5.11.3a

Number of Times Machinery Upgraded

(Number of Firms)

Types of Products	None	1-2 times	3 or more times
Finished Goods	4	6	11
Intermediate Goods	6	9	1
Total	10	15	12

1 cell (16.7%) have expected count less than 5. The minimum expected count is 4.32.
Chi-square value: 8.819 d.f: 1 p value: 0.012

Table 5.12.0a

Birth Town of the Owners

(Number of Firms)

Types of Products	Same	Different	Total
Finished Goods	14	3	17
Intermediate Goods	11	4	15
Total	25	7	32

2 cells (50%) have expected count less than 5. The minimum expected count is 3.28.
Likelihood ratio: 0.379 d.f: 1 p value: 0.538

Table 5.12.0b

Location of the Head office in the Industrial Complex

Types of Products	Industrial Complex	Not in the Industrial Complex	Total
Finished Goods	1	20	21
Intermediate Goods	3	15	18
Total	4	35	39

2 cells (50%) have expected count less than 5. The minimum expected count is 1.85.
Likelihood ratio: 1.532 d.f: 1 p value: 0.216

Table 5.12.0e

Location of Competitors

Types of Products	Same City	Different Cities	Total
Finished Goods	11	8	19
Intermediate Goods	7	10	17
Total	18	18	36

0cells (0%) have expected count less than 5. The minimum expected count is 8.50.
Chi-square value: 1.003 d.f: 1 p value: 0.317

Table 5.13.0a

Size of Major Customers

(number of Firms)

Types of Products	Large sized customers > 300 workers	Medium sized customers 50 – 299 workers	Small sized customers < 50 workers
Finished Goods	8	2	9
Intermediate Goods	12	2	4
Total	20	4	13

2 cells (33.3%) have expected count less than 5. The minimum expected count is 1.95.
Likelihood Ratio: 2.752 d.f: 2 p value: 0.259

Table 5.14.1b

Location of Major Customers

(number of Firms)

Types of Products	Same City	Other Provinces	Foreign Country	Total
Finished Goods	6	2	13	21
Intermediate Goods	6	4	8	18
Total	12	6	21	39

2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.77.
Likelihood Ratio: 1.651 d.f: 2 p value: 0.438

Table 5.14.2b

Location of Major Suppliers

(number of Firms)

Types of Products	Same City	Other Provinces	Foreign Country	Total
Finished Goods	18	3	0	21
Intermediate Goods	8	8	2	18
Total	26	11	2	39

Table 5.14.2c

Size of Major Suppliers

(number of Firms)

Types of Products	Same City	Other parts of Pakistan/ Foreign Countries	Total
Finished Goods	18	3	21
Intermediate Goods	8	10	18
Total	26	13	39

0 cells (0%) have expected count less than 5. The minimum expected count is 6.
Chi-square value: 7.429 d.f: 1 p value: 0.006

Statistical Appendix B

Statistical Appendix B
Chapter 6
Frequency Tables

6.1 Methods for the Selection of Customers and Suppliers

6.1.1a Market Analysis & Research (Intermediate Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	0	1	4	13
Suppliers	2	1	2	13

Total no. of respondents:18
Scale : 1 = Not important at all
4 = Critically important

6.1.1b Market Analysis & Research (Finished Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	6	4	4	7
Suppliers	3	4	6	8

Total no. of respondents:21
Scale : 1 = Not important at all
4 = Critically important

6.1.2a Personal and Family Relationships (Intermediate Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	9	5	4	0
Suppliers	8	5	5	0

Total no. of respondents:18
Scale : 1 = Not important at all
4 = Critically important

6.1.2b Personal and Family Relationships (Finished Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	3	8	5	5
Suppliers	4	6	8	3

Total no. of respondents:21
Scale : 1 = Not important at all
4 = Critically important

6.1.3a Business Relationships (Intermediate Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	0	2	1	15
Suppliers	1	2	4	11

Total no. of respondents:18
Scale : 1 = Not important at all
4 = Critically important

6.1.3b Business Relationships (Finished Goods)

(Number of Firms)

Scale	1	2	3	4
Customers	3	2	2	14
Suppliers	1	1	8	11

Total no. of respondents:21
Scale : 1 = Not important at all
4 = Critically important

6.2 Factors Influencing the Selection of Suppliers

6.2.1 Price of the Products

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	1	0	1	6	9
Intermediate Goods	0	0	1	3	14

6.2.2 Quality of Products

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	1	0	6	6	4
Intermediate Goods	0	0	1	0	17

6.2.3 Delivery in Time

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	2	1	7	3	4
Intermediate Goods	0	0	0	5	13

6.2.4 Credibility of the Owner

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	1	3	3	2	7
Intermediate Goods	1	1	4	2	10

6.2.5 Brand Equity

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	1	5	3	2	6
Intermediate Goods	0	3	3	6	6

6.2.6 Distance

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	4	0	7	3	3
Intermediate Goods	10	4	2	2	0

6.3 Methods for Attaining Business Information

Table 6.3.0 (Number of Firms)

Scale	1	2	3	4	5
Direct Observation	2	0	2	4	29
Informal Contacts	7	9	6	11	4
Family Relationships	6	7	10	5	9
Joint ventures	9	7	9	7	5
Conferences	6	7	9	4	11

6.3.1 Direct Observation

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	2	0	1	2	14
Intermediate Goods	0	0	1	2	15

6.3.2 Informal Contacts

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	1	4	5	6	3
Intermediate Goods	6	5	1	5	1

6.3.3 Family Relationships

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	3	7	4	5
Intermediate Goods	6	4	3	1	4

6.3.4 Joint Ventures and Collaborative Agreements

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	4	6	6	3
Intermediate Goods	9	3	3	1	2

6.3.5 Conferences

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	2	3	3	3	8
Intermediate Goods	4	4	6	1	3

6.4.0 Sources of Business Information

(Number of Firms)

Scale	1	2	3	4	5
Rivals	6	4	5	1	21
Customers	0	2	5	3	27
Suppliers	1	1	8	14	13
Equipment Suppliers	0	0	8	11	18
Banks/ Financial institutions	0	4	2	9	22
Newspapers /media	2	1	8	11	14
Collages/ universities	8	6	10	5	7

Total no of respondents : 37 except for newspapers/media & collages/uni for which the total no of respondents were 36
Scale : 1 = Not important at all
5 = Critically important

6.4.1 Rivals

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	2	0	1	16
Intermediate Goods	6	2	5	0	5

6.4.2 Customers

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	2	3	3	11
Intermediate Goods	0	0	2	0	16

6.4.3 Suppliers

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	1	5	8	5
Intermediate Goods	1	0	3	6	8

6.4.4 Equipment Suppliers

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	0	6	9	4
Intermediate Goods	0	0	2	2	14

6.4.5 Banks and Financial Institutions

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	0	2	1	8	8
Intermediate Goods	0	2	1	1	14

6.4.6 News/Media

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	2	0	2	10	4
Intermediate Goods	0	1	6	1	10

6.4.7 Collages and Universities

(Number of Firms)

Scale	1	2	3	4	5
Finished Goods	4	4	5	2	4
Intermediate Goods	4	2	5	3	3

Statistical Appendix C

Statistical Appendix C
Chapter 6
T-Tests

Section 1

$H_0: \mu_{customer} = \mu_{supplier}$

$$t_{computed} = \frac{\left(\bar{d}_{customer-supplier}\right)-\left(\mu_{Customer}-\mu_{supplier}\right)}{S_d/\sqrt{n}}$$

$$= \frac{\bar{d}_{customer-supplier}}{S_d/\sqrt{n}} \quad \text{when } H_0 \text{ is true.}$$

$$\bar{d} = \frac{\sum d_i}{n}$$

$$S_d^2 = \frac{n\sum d_i^2-\left(\sum d_i\right)^2}{n(n-1)}$$

6.1 Methods for the Selection of Customers and Suppliers

6.1.1a

Factor	Intermediate Goods S.no	Cus rank	Sup rank	di difference
Mkt Analysis	1	2	1	1
	2	3	1	2
	3	3	2	1
	4	3	3	0
	5	3	3	0
	6	4	4	0
	7	4	4	0
	8	4	4	0
	9	4	4	0
	10	4	4	0
	11	4	4	0
	12	4	4	0
	13	4	4	0
	14	4	4	0
	15	4	4	0
	16	4	4	0
	17	4	4	0
	18	4	4	0

Average $\bar{d}$ = 0.2222
Standard Deviation S_d =0.548319
$t_{computed}$ =1.67

Solution
$\bar{d}$ = 0.2222
S_d =0.548319
1-α = 95%
$\alpha/2$ = 2.5%
$t_{0.025}$ at α = n-1 = 17
$t_{critical}$ = ± 2.11

Ha : $\mu_{customer} \neq \mu_{supplier}$

Ho : $\mu_{customer} = \mu_{supplier}$ (for intermediate goods respondent is indifferent between customer and supplier)

$$t_{computed} = \frac{\bar{d}}{S_d/\sqrt{n}}$$

$$= \frac{0.2222}{0.548319/\sqrt{17}}$$

$$= 1.67$$

Result: We accept Ho

6.1.1b

Factor	S.no	Finished Goods Cus Rank	Sup rank	df difference
Mkt Analysis	1	1	1	0
	2	1	1	0
	3	1	1	0
	4	1	2	-1
	5	1	2	-1
	6	1	2	-1
	7	2	2	0
	8	2	3	-1
	9	2	3	-1
	10	2	3	-1
	11	3	3	0
	12	3	3	0
	13	3	3	0
	14	3	4	-1
	15	4	4	0
	16	4	4	0
	17	4	4	0
	18	4	4	0
	19	4	4	0
	20	4	4	0
	21	4	4	0

Average $\bar{d}$ = - 0.3333

Standard Deviation S_d = 0.483046

$t_{critical}$ = 2.086

$t_{computed}$ = - 3.16

6.1.2a

	Intermediate			
Factor	s.no	cus rank	sup rank	difference
Personal/ Family	1	1	1	0
	2	1	1	0
	3	1	1	0
	4	1	1	0
	5	1	1	0
	6	1	1	0
	7	1	1	0
	8	1	1	0
	9	1	2	-1
	10	2	2	0
	11	2	2	0
	12	2	2	0
	13	2	2	0
	14	2	3	-1
	15	4	3	1
	16	4	3	1
	17	4	3	1
	18	4	3	1

Average $\bar{d}$ = - 0.11111
Standard Deviation S_d = 0.582983
$t_{critical}$ = 2.11
$t_{computed}$ = 0.7857

6.1.2b

	Finished			
Factor	S.no	cus rank	sup rank	difference
Personal/ Family	1	1	1	0
	2	1	1	0
	3	1	1	0
	4	2	1	1
	5	2	2	0
	6	2	2	0
	7	2	2	0
	8	2	2	0
	9	2	2	0
	10	2	2	0
	11	2	3	-1
	12	3	3	0
	13	3	3	0
	14	3	3	0
	15	3	3	0
	16	3	3	0
	17	4	3	1
	18	4	3	1
	19	4	4	0
	20	4	4	0
	21	4	4	0

Average $\bar{d}$ = - 0.095238
Standard Deviation S_d = 0.436436
$t_{critical}$ = 2.086
$t_{computed}$ = 1.000

6.1.3a

	Intermediate			
Factor	s.no	cus rank	sup rank	difference
Bus relation	1	2	1	1
	2	2	2	0
	3	3	2	1
	4	4	3	1
	5	4	3	1
	6	4	3	1
	7	4	3	1
	8	4	4	0
	9	4	4	0
	10	4	4	0
	11	4	4	0
	12	4	4	0
	13	4	4	0
	14	4	4	0
	15	4	4	0
	16	4	4	0
	17	4	4	0
	18	4	4	0

Average $\bar{d}$ = 0.33333
Standard Deviation S_d = 0.485071
$t_{critical}$ = 2.11
$t_{computed}$ = 2.915

Section 2

T-test for Equality of Means

H_o : $\mu_1 = \mu_2$

$$t_{computed} = \frac{(\overline{X_1} - \overline{X_2}) - (\mu_1 - \mu_2)}{S_p\sqrt{(1/n_1 + 1/n_2)}}$$

$$= \frac{(\overline{X_1} - \overline{X_2})}{S_p\sqrt{(1/n_1 + 1/n_2)}}$$ when H_o is true.

Where

$$S_p^2 = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

6.2 Factors Influencing the Selection of Suppliers and Customers

Variables	Type of Products	N	Mean	Std deviation	t-value	Significance
Price of Products	Finished Goods Intermediate Goods	17 18	4.2941 4.7222	1.0467 0.5745	-1.512	0.140
Quality of Products	Finished Goods Intermediate Goods	17 18	3.7059 4.8889	1.0467 0.4714	-4.353	0.000
Delivery in Time	Finished Goods Intermediate Goods	17 18	3.3529 4.7222	1.2719 0.4609	-4.283	0.000
Credibility of the Owner	Finished Goods Intermediate Goods	16 18	3.6875 4.0556	1.4009 1.2590	-0.807	0.426
Brand Equity	Finished Goods Intermediate Goods	17 18	3.4118 3.8333	1.4168 1.0981	-0.987	0.331
Distance from Supplier	Finished Goods Intermediate Goods	17 18	3.0588 1.7778	1.3906 1.0603	3.076	0.004

Solution (example)

H_a : $\mu_1 \neq \mu_2$

Price of Products

$$t_{computed} = \frac{(\overline{X_1} - \overline{X_2}) - (\mu_1 - \mu_2)}{s_p\sqrt{(1/n_1 + 1/n_2)}}$$

$$= \frac{(4.2941 - 4.7222) - 0}{0.8374\sqrt{1/17 + 1/18}}$$

$$= -1.512$$

6.3 Methods for Attaining Business Information

Variables	Type of Products	N	Mean	Std deviation	t-value	Significance
Direct Observation	Finished Goods Intermediate Goods	19 18	4.3684 4.7778	1.300 0.5483	-1.235	0.225
Informal Contacts	Finished Goods Intermediate Goods	19 18	3.3158 2.4444	1.1572 1.3815	2.084	0.045
Family	Finished Goods Intermediate Goods	19 18	3.5789 2.6111	1.0706 1.5770	2.195	0.035
Joint Ventures/ Collaborative Agreements	Finished Goods Intermediate Goods	19 18	3.4211 2.1111	1.0174 1.4096	3.255	0.003
Conferences/ Seminars	Finished Goods Intermediate Goods	19 18	3.6316 2.7222	1.4610 1.3636	1.954	0.059

6.4 Sources of Business Information

Variables	Type of Products	N	Mean	Std deviation	t-value	Significance
Rivals	Finished Goods Intermediate Goods	19 18	4.6316 2.7778	0.9551 1.6290	4.251	0.000
Customers	Finished Goods Intermediate Goods	19 18	4.2105 4.7778	1.0842 0.6468	-1.919	0.063
Suppliers	Finished Goods Intermediate Goods	19 18	3.8947 4.1111	0.8753 1.0786	-0.672	0.506
Equipment Suppliers	Finished Goods Intermediate Goods	19 18	3.8947 4.6667	0.7375 0.6860	-3.292	0.002
Banks and Financial insti.	Finished Goods Intermediate Goods	19 18	4.1579 4.5000	0.9582 1.0432	-1.040	0.306
Consulting Firms	Finished Goods Intermediate Goods	19 18	3.2632 4.1111	1.5579 1.0226	-1.945	0.060
Newspaper media	Finished Goods Intermediate Goods	19 18	3.9474 4.1111	1.3529 1.0786	-0.406	0.688
Collages/universities	Finished Goods Intermediate Goods	19 18	2.8947 2.9412	1.4489 1.4349	-0.096	0.924

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