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INVESTMENT, TECHNICAL CHANGE AND THE
DIFFERENTIAL PERFORMANCE OF FIRMS IN
THE COTTON-TEXTILE INDUSTRY IN INDIA

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IN INDIA

Despite its earlier position as the leading factory industry in India, the cotton-mill sector attracts much attention today for being a backward and ailing industry. After a period of relatively good performance in the nineteen fifties the industry has been characterised by a deceleration in the rate of growth of its output and investment. This process which is manifested most clearly since the mid-sixties culminated in the recession that set in around late 1974 and saw the exit from production of a large number of firms afflicted by 'sickness'. Needless to say, this performance of the textile industry has to be seen as part of the generalised recession and tendency towards stagnation in the economy as a whole. However, one aspect of the crisis affecting the industry, namely, its unequal distribution across firms in the industry, resulting in the coexistence of firms with widely varying levels of productivity and technical advance on the one hand, and wide variations in financial performance on the other, has received much attention.^{1/}

In its most obvious form this differential performance is reflected in the fact that while a large number of firms ^{have} turned 'sick' or are on the verge of 'sickness', the industry includes some of the leading and most successful firms in India's industrial sector as a whole. In fact, there are 151 firms in the industry which were forced out of production, while another 143 continue in production though they have been declared technically non-viable because of the obsolescence of their equipment.^{2/} On the other hand, if we look at the Economic Times ranking of the top 101 industrial giants in 1976-77, we find that it includes ^{one} ~~five~~ ^{ten} ~~fourteen~~ firms

from the textile industry (Table I). Of these ~~fourteen~~^{five} firms one (Calico Mills) is included among the 10 companies which have seen the highest rate of growth of sales over 1976-77. Most of these firms have diversified either into the production of sophisticated fabrics or into wholly new avenues totally unrelated to textiles. However, the rather stark contrast in performance seen here should not be attributed purely to the differences in product composition, though the latter exaggerate the differentials in the industry. Table I gives the percentage distribution of firms belonging to different product groups according to their levels of value productivity (value added per worker). It brings out clearly the wide differentials in the productivity of firms even within any one product group.

Undoubtedly, a whole range of factors both external and internal to the industry go to explain these differentials in performance. Firms may fail to grow for reasons varying from inefficient management and errors of judgement to lack of access to capital and an unfavourable environment. This however, is not our concern here. Rather we are concerned with the factors that facilitate or allow for the coexistence of firms with wide variations in technical and financial performance in an industry normally understood as a competitive one. Our attempt is to try and explain this co-existence in terms of the trends in investment, prices, costs and profitability, and hence in terms of the context and nature of the industry's development. Thus the paper does not attempt to explain why particular firms grow and sustain profitability while others do not. Rather starting from the structure of the industry and the process through which firms have grown we attempt to draw its implications for the growth of 'sickness' and of differentials in financial performance.

Table I

Ranks of Some Textile Companies among the Top 101
giant Companies in the private Sector

Name of the Company	Rank based on	
	Total Assets	Total Sales
1. Delhi Cloth Mills	9	4
2. Century Spinning	20	13
3. Calico Mills	14	19
4. Bombay Deying	45	28
5. Madurai Coats	37	37
6. Mafatlal Fine <i>Standard Mills</i>	56	42
7. Mafatlal Fine	67	46
8. Jeeyajee Iao	65	49
9. Kesoram Industries	70	52
10. Modi Spinning	105	59
11. Shri Arbika	91	62
12. Swadeshi Cotton	111	72
13. Hindustan Spinning	96	76
14. Mafatlal Industries	62	77

Source: Economic Times Research Bureau "Industrial Giants - I", The Economic Times, Bombay, Wednesday, April 5, 1978.

Table II

Percentage Distribution of Firms According to the Level
of Value Added Per Workers (Rs.'000) -
Average for the years 1970-75

	Number of firms	Low Productivity (10)	Medium Productivity (10-15)	High Productivity (15)
Group A	20	52.6	26.3	21.1
Group B	11	20.0	80.0	-
Group C	56	65.6	31.3	3.1
Group D	17	23.5	70.6	5.9
Group E	21	25.0	30.0	45.0

Note: i) Low Productivity - Value added per work per
annual : Rs.10,000/-
Medium productivity .. -do- : Rs.10-15,000/-
High Productivity - -do- : Rs.15,000/-

ii) Group A : Cotton spinning only.
Group B : Spinning only - cotton and non-cotton.
Group C : Cotton spinning and weaving with basic
processing.
Group D : Cotton/non-cotton spinning and weaving
and/or sophisticated processing (such
as tebilising, secowa finishing etc.)
Group E : Cotton/non-cotton spinning and weaving
and wholly new avenues.

In this context, it is necessary to maintain that in the analysis we keep distinct and treat separately the related problems of differentials in technology and productivity, on the one hand, and differentials in profitability on the other, for the latter are influenced by a far greater number of factors, all of which are not easily accommodated in a single analytical frame. The paper itself is in three parts. In Part I we study the structure of the industry and its relation with the growth of demand for textiles. In Part II we try to see the impact of these trends on investment, prices and profitability and on the composition of output of textile firms. This leads to an understanding of the reasons why despite the delay in the introduction of new techniques on the part of certain firms they display an ability to survive and continue in production. Finally, in Part III we examine whether the same factors allowing for the existence of differentials in technology between firms also explain the differentials in profitability. To the extent they do not an attempt is made to indicate the possible reasons for such differentials and to delineate the areas of further study.

I

The Demand for Textiles

Most studies relating to the textile industry point to the decline in the per capita consumption of cloth since the mid-sixties to be one of the principal problems facing the industry. Apparent per capita consumption or per capita availability of cotton and blended cloth reached a maximum of 16.85 metres in 1964-65 and subsequently declined slowly to reach 14.5 metres in 1975-76, despite the increase in per capita real incomes over this period (Table III). Besides this decline

in per capita consumption, two factors relating to the changing pattern of availability of cloth have also been noted: First, there has been a shift in production in favour of the finer varieties, so that while the availability of the coarser varieties has declined absolutely that of fine and super fine varieties has in fact increased; secondly, there has been a rapid increase in the availability of non-cotton fabric and cotton/non-cotton blends.^{3/}

The changes observed in the pattern of availability have provided the basis for two arguments regarding the possible factors behind the decline in per capita consumption of cloth. The asymmetry involved in increase in the availability of fine cotton, non-cotton and blended fabrics (consumed mainly by the upper income groups) and a decrease in the availability of coarse and lower medium cotton varieties (consumed by the lower income groups) lends credence to the view that the decline in per capita consumption has to be explained in terms of a shift in distribution of income in favour of the upper income groups. The decline in the consumption of the lower income groups arising from such a process, it is argued, cannot be balanced by the increase in the upper income ranges, for the market in that range is rather narrow and relatively saturated; hence the decline in overall per capita consumption. The shift in income distribution itself is a result of the shift in terms of trade in favour of agriculture in the post mid-sixties, consequent to the sharp increase in foodgrain prices - a phenomenon which has provided the basis for an explanation of the overall trend towards stagnation in the demand for industrial products in India.^{4/}

TABLE III

PER CAPITA AVAILABILITY OF CLOTH AND PER CAPITA
REAL INCOME

	Per Capita Availability of Cotton & Blended cloth(metres)	Per Capita Real Income (1960-61 prices)
1951-52	10.99	254.2
1952-53	13.46	257.8
1953-54	14.03	269.2
1954-55	13.83	271.6
1955-56	14.35	276.3
1956-57	14.71	285.8
1957-58	14.50	275.2
1958-59	15.20	291.0
1959-60	14.87	291.1
1960-61	15.00	305.6
1961-62	15.91	309.2
1962-63	15.52	308.2
1963-64	15.93	318.3
1964-65	16.85	335.1
1965-66	16.45	311.0
1966-67	15.60	307.4
1967-68	15.31	325.4
1967-69	16.27	327.0
1969-70	15.60	340.6
1970-71	15.55	353.0
1971-72	14.57	349.0
1972-73	15.13	337.1
1973-74	13.94	349.1
1974-75	14.60	343.2
1975-76	14.56	365.9

Source: Baskhar G. Kakatkar: "Fall in Per Capita Cloth Consumption", ICMF Journal, December 1977.

While the above argument undoubtedly explains in part the decline in the per capita demand for cloth it appears insufficient for the following reasons: (i) Since the poorest 30 per cent of the population (expenditure-wise) consume only 7.49 per cent and 4.75 per cent of the cloth consumed in rural and urban areas respectively, while the richest 10 per cent consumes 34.94 per cent and 44.89 per cent, the decline in consumption is not easily explained purely in terms of a decline in consumption in the lower expenditure classes; and (ii) it fails to take into consideration the implications of the increase in the durability of cloth, consequent to the improvements on existing varieties and the increase in availability of non-cotton and blended textiles.

The data on the distribution of the consumption of blended textiles according to the level of income (Table IV) indicate that it is concentrated in the upper income groups; this is only to be expected given the fact that the price of such textiles is two to three times that of cotton cloth. But the wear life of these textiles is also two to three times that of cotton fabrics. The greater durability of such cloth combined with its wash and wear properties makes it possible for any individual to make do with much less cloth in terms of linear metres in a given period of time. Thus the growth in the consumption of more durable cloth in those ranges of income where consumption is concentrated would, it is argued, lead to a decline in the quantity demand for cloth per capita.

It needs to be noted here that the trends described above, not only led to a decline in the overall consumption of cloth per capita but in particular to a decline in the consumption of cotton cloth.

Table IV

Estimated Purchase of Textiles per Household at Different
Income Levels (1975)

(in metres)

Income Group	All Textiles	Cotton Textiles	Other Textiles
Rs. 1500	45.00	42.50	2.50
Rs. 1500 - 2,999	68.36	63.60	4.76
Rs. 3000 - 5,999	104.59	92.66	11.91
Rs. 6000 - 9,999	121.37	103.03	18.34
Rs. 10000 - 19,999	150.62	126.56	24.06
Rs. 2000	150.00	111.22	38.78
Average	90.23	79.49	10.74

Source: quoted in Bhaskar G. Kakatkar, "Fall in per capita cloth consumption," ICMF Journal, December 1977.

This stagnation in the demand for cotton textiles, combined with the changes in the pattern of consumption influences both the composition of output of textile firms and also their direction of expansion. The exact nature of this influence and its implications for the structure of the industry is what we come to in the discussion that follows.

Structure of the Industry

At the beginning of 1975, the cotton-mill industry in India consisted of 691 units in operation, of which 403 were purely spinning units and the remaining 288 composite units. However, of the total spindlage installed (18,847,000) only 6,539,000 (that is 34.7 percent) were with the spinning mills while 12,318,000 were with the composite units.^{7/}

This unequal distribution of the spindlage combined with the governmental regulation that a certain proportion of the yarn produced in the composite sector should be sold as 'free yarn' in the open market implies that the spinning and composite sectors of the industry compete with each other both in the market for raw materials and in that for finished yarn. Further the two sectors together face the threat of entry of potential competitors into the yarn market for there exists no restriction on the creation of new spinning capacity.^{8/}

The situation with respect to inter-sectoral competition and competition from new entrants in the production of cloth appears to be different. This for the following reasons: Firstly, since there is a restriction on the expansion of loomage in the mill sector, there is no threat from potential competitors to the existing composite mills, either due to the entry of existing spinning mills into weaving or due to the establishment of new composite mills;^{9/} secondly, since the government reserves certain varieties of cloth largely for the decentralised sector, the competition between the mill and decentralised sectors is muted to a certain extent. However, the existence of complete freedom for both the sectors in the production of non-reserved varieties implies that competition in respect of this category of products should be intense.

Taking the productions of yarn and cloth together, there is reason to believe that the mill industry as a whole would be

largely a competitive one, for it has certain other attributes which endow it with a competitive character. Firstly, unlike in the "oligopolistic industries" as traditionally defined, the industry consists of a large number of firms with no marked concentration of output in the hands of a few producers. Thus the Monopolies Inquiry Commission found the level of concentration in the industry to be 'nil'. Secondly there are wide variations in the size of firms in the industry which result in substantial cost differentials arising out of the 'economies of scale.' In fact the industry consists of a spectrum of producers varying from those earning the highest profit to the 'marginal producers' who earn almost no profits above operating costs. This would mean that a reduction in price by any of the low-cost producers would lead to the exit of the 'marginal producers' from production. If this were not true there would be a tendency on the part of firms not to reduce prices relative to costs for fear of retaliatory action by equally strong competitors - a tendency which would reduce the extent and also alter the nature of competition in the industry.^{11/} Thus, on the whole, the above structural characteristics of the industry would make it a competitive one.

However, even here, the competitive structure of the industry is to a certain extent modified by the wide variations in the composition of output of what are generally termed 'textile firms.' Variations in the composition of output arise due to the following four factors:

(i) cotton cloth or yarn is not a homogenous product but includes different counts of yarn and varieties of cloth distinguished in terms of their fineness, besides of course differences in widths, types, etc.

(ii) the growing importance of cotton and viscose/polyester blends such of which is produced on the cotton spinning and weaving system itself and which are known for their durability, better appearance, anti-crease properties and so on; (iii) the differences in processing facilities^{and the availability of} very sophisticated finishing processes such as mobilising and Hecowa finishing with certain producers enabling a substantial degree of product differentiation; and (iv) the tendency for many firms, which started like with textiles as their main activity to diversify into wholly new avenues like synthetics, chemicals, fertilisers, engineering goods, vanaspathi, electronics, and so on (Appendix) which provides a picture of the product composition of those firms with fixed assets greater than 1000 lakhs for which data are available in the latest issue of the Bombay Stock Exchange Directory, shows clearly the extent to which this practice has evolved.

The differences in the composition of output arising from the above factors have significant implications for the structure of the industry. The product differentiation made possible by the developments in processing and the production of blended fabrics have introduced substantial elements of imperfection into the market. A concomitant of such a process is the increasing role of quality competition (accompanied by higher selling costs) as opposed to price competition in the

industry.^{12/} The importance of this factor can be judged from the fact that labour engaged in 'spinning and related activities' has declined from 327,000 to 292,000 and that in 'weaving and related activities' from 294,000 to 262,000 between 1956 and 1973, while that in 'other activities including processing' has grown from 186,000 to 230,000.^{13/} However, this trend should not be seen merely in terms of a tendency towards increasing competition through differentiation. Since many of the more sophisticated fabrics involving new processing techniques and blends constitute an extremely costly range, they cater exclusively to the upper income groups in the population. Further, since the techniques (especially processing) used in the production of such fabrics involve higher levels of investment and even collaboration agreements with foreign producers who hold the patents for such products, they are accessible to very few producers who increasingly concentrate on such product as part of a programme of diversification.^{14/} These producers hardly compete with many of the firms in the industry (especially the marginal and sub-marginal firms), since their fabrics hardly constitute substitutes for the products of the latter. Thus some of the most innovative firms at the frontier of technical change in the industry are in fact not competitive with many of the firms less sophisticated in terms of technology. On the other hand, there exists a virtual oligopoly in the production of certain types of luxury fabrics. Typical examples of firms producing such a range of fabrics are Bombay Dyeing, Delhi Cloth Mills, Phatau, Gwalior and so on. Thus there exists, a 'structural break' in the

industry with a few oligopolistic producers concentrating on a range of exclusive fabrics and a large number of producers competing in the production of the more ordinary fabrics.

Besides the tendency of concentrating on the production of more sophisticated fabrics on the part of certain firms, we have noted that many 'textile firms' have diversified into wholly new avenues of production. Thus an analysis of the industry based on the output it produces (as is implicit in all demand studies) will be insufficient to explain the performance of the firms constituting the industry, and therefore also the differentials in technical and financial performance. The importance of this trend of diversification is clear from the following quotation from an IBI study on the textile industry:

"The uncertainty of earning regular profits from the manufacture of cotton textiles has forced many companies to divert their funds to other activities like the production of steel, chemicals, etc. and also to invest in companies/subsidiaries manufacturing products other than cotton fabrics which fetch better prices in the open market. Of the 261 companies covered in the series for 1965-66 to 1970-71 the available data indicate that only 57 companies are spinning pure yarn and 115 companies are engaged in the production of pure yarn and cloth. The remaining companies had resorted to the production of synthetics. In addition, as many as 39 of the 261 companies had undertaken subsidiary activities like the manufacture of chemicals, steel, sugar, electronic equipment, rayon and silk, machinery, etc. There are some 8 companies which are having either fully owned subsidiaries or companies controlled by them engaged in activities other than the manufacture of cotton textiles." 15/

There are many factors that could explain this trend towards diversification. To start with, the pattern of growth in the demand for textiles we had discussed earlier and in that for manufactures in general noted by other economists, on the one hand sets limits to the possibilities of expansion within the traditional textiles and provides new productive opportunities in the production of blended

and luxury fabrics and in avenues like consumer durables and activities related to it. This provides a powerful external inducement to expand in new directions, especially for firms capable of overcoming obstacles like ~~bar~~ barriers to entry, the need for initial staying power, and so on.^{16/} Secondly, there are factors internal to the firm such as the availability of particular types of unused managerial services, new innovations in industrial research, the technological base of the firm, and so on which generate the pressure for diversification.^{17/} Thirdly, since about the late fifties profits (both margins on sales and returns on capital - see Table V) in sectors like silk and rayon, chemicals and engineering have been almost double that in the textile industry. Thus the search for higher and more regular profits might itself warrant diversification. Finally, since in Indian industry the needs of the business house rather than that of particular firms have a significant influence on the behaviour of firms, diversification might be necessitated by the overall strategy of the business house. Thus Hazari in his study on the Corporate Private Sector noted that Tata, Martin Burn and Shri Jan among the larger groups preferred to concentrate most of their assets in a few large companies - Tata and Martin Burn because of their preponderant interest in capital intensive industries and Shri Jan out of deliberate choice. As for many of the other groups, including Birla, Dalmia Sahu Jain, Bird Heilgor, Bangur and J.K., though they displayed a tendency to disperse industrial, trading and financial activity, they diversified many of their leading companies.^{18/} Whatever the exact motivation for the diversification of their activity by some of the leading firms in the textile industry, it is an aspect of the structure of the industry which has significant implications for developments within

TABLE 1. FINANCIAL PERFORMANCE OF INDUSTRIES

Period	Number of Companies					Gross profits as Percentage of Sales			Gross Profits as Percentage of Total Capital employed				
	Cotton	Silk & Engi- neering	Chemicals	All Industries		Cotton	Silk & Engi- neering	Chemicals	All Industries	Cotton	Silk & Engi- neering	Chemicals	All Industries
1950-56	145	14	57	36	505	6.5 (2.0)	8.88 (4.2)	8.12 (0.63)	7.02 (1.6)	8.23 (2.7)	4.87 (2.9)	6.53 (1.7)	5 (1.3)
1955-61	211	12	91	45	790	6.18 (2.5)	16.2 (5.2)	9.7 (0.83)	10.6 (3.2)	8.27 (3.5)	11.9 (5.8)	10.0 (.77)	8.7 (2.2)
1960-66	256	11	187	91	1077	7.68 (2.0)	18.1 (3.0)	11.4 (0.56)	16.52 (0.86)	5.27 (2.5)	12.93 (3.0)	11.62 (0.86)	12.92 (0.92)
1965-71	261	16	290	130	1240	5.58 (0.85)	20.88 (1.6)	10.22 (1.4)	14.38 (1.7)	5.43 (1.9)	19.1 (1.7)	9.28 (1.7)	14.1 (1.3)
1970-71	249	18	410	135	1650	7.64 (1.89)	18.38 (2.59)	11.04 (0.38)	14.78 (1.05)	10.76 (2.65)	20.28 (2.35)	11.16 (0.38)	14.62 (2.42)

Note: Figures in brackets relate to the standard deviation around the average.
 Source: Reserve Bank of India: "Finances of Joint Companies."

the industry - an influence we shall come to in the subsequent section.

II

Nature of the Competitive Process

The overall saturation in the growth of demand for the products of the mill sector has reflected itself in the high levels of unutilised capacity in the industry.^{19/} Given the structure of the industry described earlier, and the tendency of firms to sustain a certain 'normal' level of utilisation, this underutilisation of capacity should lead to a situation where the more progressive firms productivity-wise, either pass on the benefits of their increased productivity to the consumers in the form of lower prices or utilise them for increasing selling costs or indulging in quality competition.

If this occurs, it would affect the cost price relationship of all producers making it impossible for the marginal producers (whose unit operating costs equals price) to continue in production. The consequent exit from production of the less technologically advanced producers (the number depending on the extent of the price cut) leads to a redistribution of the existing market between those who continue in production and therefore to an increase in the utilisation of capacity.

Undoubtedly, in the textile industry both forms of competition (price and quantity competition) have played a role. Given rising costs over time, the attempt to pass on productivity increases to the consumer should reflect itself in a faster rate of growth of costs relative to prices. In fact between 1964 and 1975 the index

numbers (1961-62 = 100) of raw cotton and wage costs have increased at the rate of 10.45 per cent and 7.3 - 8.4 percent (in different centres) respectively, while that of cotton yarn and manufactures rose at 9.79 per cent and 6.57 per cent respectively.^{21/} As for the growth of quality competition, while it has been on the increase as is clear from the proliferation of varieties and blends, the shift to better and more durable varieties of cloth and the increasing importance of the processing side of the industry indicated earlier, it is extremely difficult to measure the extent to which this factor has played a role in the competitive process in the industry.

The net effect of the competitive process has been the exit from production of 151 firms^{by} about 1977-78.^{22/} While numerically this is quite significant this should not be seen one-sidedly. What is interesting is that besides these 151 firms, there even today exist in production about 143 firms which have been identified as unviable on the basis of the criterion of technical obsolescence. Further, even those 151 firms when taken over by the NTC and the State Governments were characterized by a high degree of obsolescence and the use of decrepit machinery. Since modernisation is not a one-time process but rather involves a continuous process of maintenance and the updating of different processes in a given plant,^{23/} it remains a puzzle how these firms continued in production even without undertaking a minimum of maintenance, repairs or modernisation. This despite the existence of firms in the industry with high levels of productivity. What is the mechanism which permits these firms to remain economically viable despite their observed technical obsolescence?

Investment Performance

From our description of the competitive process it should be clear that what needs to be looked at is the rate at which productivity increases occur in the industry and the extent to which they affect or influence the different firms in the industry. Since productivity increases imply some form of technical change, they are either due to the replacement of existing machinery with new and better equipment or the creation of new capacity - that is, they depend on the rate of gross fixed assets formation or gross investment.^{24/}

A study of the annual rate of growth of gross fixed assets over five year intervals, for those firms covered by the FBI studies of the finances of Joint Stock companies,^{25/} shows that it increased between the years 1950-51 and 1965-66 from 7.4 per cent (1950-55) to 10.9 per cent (1960-65). Subsequently, we see that the rate of gross fixed assets formation fell sharply to 6.63 per cent in the period 1965-66 to 1970-71 and then rose to 8.5 per cent in the seventies. As for net fixed assets formation, after rising sharply from 6.61 per cent per annum in 1950-55 to 12.25 per cent in 1955-60, a process of deceleration set in with the value for 1970-75 being much less than that for the period 1955-60 (See Table VI). Since this process has occurred during a period of general inflation and since the values of gross assets are in current prices the actual deceleration would be much more than can be discerned from these figures. As for the trends in new investment some idea can be obtained from the stagnation in the rate of growth of capacity in the mill sector. Thus between 1956 and 1975 the index number of spindles installed grew at the rate of 1.13 per cent per annum and that of the number of looms installed at the rate of 0.12 per cent.^{26/} Undoubtedly, the slow rate



Table VI: Annual Compound Growth Rates of Net And Gross Fixed Assets

Period	Net fixed Assets	Gross fixed Assets
1950-55	6.61 (0.997)	7.36 (.998)
1955-60	12.25 (0.958)	9.00 (.985)
1960-65	10.73 (0.985)	10.89 (.9997)
1965-70	4.99 (0.924)	6.63 (.965)
1970-75	7.23 (0.955)	8.50 (0.994)

Note: Growth rates are computed on the basis of fitted trends. Figures in brackets give the value of the R^2 .

Source: Calculated on the basis of the figures obtained from IBI studies on the Finances of Joint Stock Companies.

of growth of loomage capacity is related to the restriction imposed on its expansion. However, what is interesting to note is that even when the government did liberalise its policy and permit an increase in the number of looms installed the offer was largely unutilised. Thus when a departure was made from the policy of restriction in October 1963, when a 10 percent increase in the loomage of composite mills was sanctioned and spinning mills were allowed to set up 100 looms each, it was noted that "this permission was not largely utilised. The net effect of this stagnation in the rate of investment would be the slow rate of technical change and a low rate of productivity increase in the industry.

The Distribution and Direction of Investment

However, this is not all. In fact the figures on the rate of gross fixed assets formation quoted above are no clear indication of the extent to which productivity increases occur in the industry and therefore, of the competitive pressure on other firms in the industry. To understand this we need to go back to our earlier statements regarding the structure of the industry. Firstly, we had argued that there exists, what we termed, a structural break in the industry with a few firms producing for a highly exclusive market and therefore not competing with the majority of producers. Secondly, we had indicated that most of the larger and more rapidly growing firms in the industry had diversified their activity and entered wholly new areas of production.

These two factors are significant, for productivity increases arising from such a diversion of investment obviously do not generate the type of competitive pressures we had discussed earlier. Now the size distribution of firms according to their product composition, (Table VII), shows clearly that most of the firms which have undertaken such changes in their product composition are the bigger firms in the industry. Thus to the extent that investment is undertaken by these firms it is not likely to generate the type of pressures which lead to the exit of the more technically backward firms from the market. An idea of the extent of such investment can be obtained by comparing the performance of the large cotton textile companies (with a paid-up capital of over a crore of rupees) with that of the large and medium companies (paid up capital greater than 5 lakhs), covered in the RBI studies on the finances of Joint Stock Companies, for the years 1970-71 to 1973-74 (Table VIII). The data indicate that the large companies which cover about 13-15 percent of all the

companies included in the IBI sample, held about 60 percent of the reserves and surpluses and undertook about 54-57 percent of the investment in fixed assets. This indicates that the bulk of the investment in the industry is undertaken by the larger firms and consequently is likely to be either in the more exclusive textiles not competitive with the products of a majority of producers or in the production of wholly new products. This combined with the stagnation in investment and the creation of new capacity, reduces the competitive pressure on the technically backward firms reducing their rate of exit from production and ensuring the economic viability of many of them. The slow rate of technical change is reflected most clearly in the fact that though the adoption of automatic looms had begun in the immediate post-independence period, by 1973 only 18.36 per cent of the looms in the industry were automatic; a clear indication of the tremendous delay in the introduction of new techniques in the industry.^{28/} Further, while by 1951 it had been estimated that about 50 per cent of the looms and over 20 per cent of the spinning frames needed replacement, around 1973 the Working Group on Textiles notes that "about 60 per cent of the installed capacity in the industry is more than 30 years old (the normal life-span) and another 20 percent pertains to weak and marginal units which require modernisation at an accelerated pace."^{29/} This to a large extent may explain the observed economic viability of the smaller firms despite their technical obsolescence. In other words, the stagnation of the industry in terms of output and investment and the consequent direction of expansion of the firms that do grow, reflects itself in a chronic problem of technical obsolescence.

Table VII

Size distribution of Sample Firms According to
Product Composition

Size of Total Assets in Rs.lakhs Commodity Group	0-150	150- 250	250- 350	350- 500	500- 650	650- 800	800- 1000	1000
A	8	7	4	1	-	-	-	-
B	3	2	5	-	1	-	-	-
C	4	5	13	11	9	6	8	6
D	-	-	-	1	2	4	3	7
E	-	-	-	2	-	3	1	15

the

Note: For the basis of categorisation see note on Table V.
Source: Bombay Stock Exchange Directory, 1977.

Implications for the Industry

The slow rate of technical change in the industry has undermined the competitiveness of the mill sector vis-a-vis the decentralised sector on the one hand and the man-made fabrics on the other. Karski in his study on the changes in value added per person in selected industries in India has noted that for the period 1946 to 1969 the textile industry saw an annual rate of growth of value added at constant (1948-49) prices of only 1.3 per cent which was much lower than the average rate of growth of productivity in many other industries.^{30'} In practice this has meant that the industry has not been able to neutralise cost increases through increases in productivity to any significant extent, leading to a continuous rise in the price of cotton manufactures. For an industry which is competing with the handloom industry, whose absolute price per unit is much lower, and the man-made fabric industry whose prices are rising less faster,^{31'} this has meant

TABLE VIII: COMPARATIVE STUDY OF FINANCIAL AND INVESTMENT DATA OF LARGE AND MEDIUM PUBLIC LIMITED COMPANIES IN INDIA

Fig. Lakhs

	1970-71		1971-72		1972-73		1973-74	
	Large	Medium and Large	Large	Medium and Large	Large	Medium and Large	Large	Medium and Large
1. Number of Companies	37	271	37	271	37	271	42	27
	(13.6)		(13.6)		(13.6)		(15.4)	
2. Paid-up Capital	75,45	162,38	84,59	155,36	88,36	174,86	88,76	180,4
	(48.9)		(50.0)		(50.5)		(49.1)	
3. Reserves and Surpluses	76,78	121,61	71,63	110,99	74,90	126,36	122,87	155,8
	(62.1)		(54.8)		(59.2)		(62.7)	
4. Gross Fixed Assets	345,65	740,16	373,89	784,79	412,54	852,14	452,77	922,1
	(47.2)		(47.6)		(48.4)		(49.0)	
5. Change in Gross fixed Assets over previous year			24,04	44,63	38,65	67,35	40,23	70,0
			(3.9)		(57.4)		(57.5)	
6. Net Fixed Assets	156,34	337,37	152,19	347,53	175,57	370,20	193,71	397,6
	(45.3)		(46.6)		(47.4)		(48.7)	
7. Change in Net Fixed Assets over previous year			5,85	10,16	13,35	22,67	18,14	27,4
			(57.5)		(59.0)		(66.1)	

Note: Figures in brackets are percentages of the corresponding Large and Medium figures.

Sources: 1. Finances of Large and Medium Public Limited Companies 1970-71 to 1973-74, RBI Bulletin, September 1974

2. -do- Large Public Limited Companies 1970-71 to 1972-73, -do- December 1974

3. -do- -do- 1973-74 -do- January 1976.

a continuous loss in demand as a result of substitution away from mill products at both ends of the existing income range.^{32/} Such a process has placed the industry in a state of cumulative disequilibrium, as it were, with demand decelerating rapidly over time. Thus the per capita consumption of cotton mill cloth has declined at the rate of 2.48 per cent per annum over the period 1951 to 1972.

From the point of view of the profitability of the industry the implications of the above trend are clear enough. The average rate of return on capital for those textile firms covered in the BI studies has seen an almost continuous decline for a period of over 10 years following a peak reached in 1961-62.* The same holds true for the margin obtained on sales. However, it should be clear from our discussion on the differentials in the levels of productivity and the composition of output that this would not be true of all firms in the industry. In fact, we should expect substantial differentials in financial performance. It is to a study of these differentials and the possible reasons for their existence that we turn our attention in the following section.

III

Investment and Profitability

From the preceding analysis of technical change in the industry it would appear that the two principal factors responsible for differentials in financial performance in the industry are the differences in productivity and the differences in product composition. We had argued earlier that differentials in productivity over time depend on technical change and hence on the rate of investment.

*This is reflected in a sharp decline in the five-yearly average rate of profit shown in Table V; for yearly data see BI studies on Finances of Joint Stock Companies.

The same would hold true for changes in the product mix for, despite the flexibility of equipment used, beyond a point such changes would necessitate investment either in new equipment or in the modification of existing equipment.^{33/} Hence, we should expect that improvements in financial performance would be related to the rate of investment - that is, firms which undertake a higher rate of investment would also reap a better profit. In order to study the extent and nature of the relationship between investment and the financial performance of firms we selected a sample of 25 firms classified as 'spinning firms' in the Bombay Stock Exchange Directory, but which include firms which have diversified into other avenues including weaving. The choice was based on the availability of continuous data for the period 1964-75. An analysis of the financial statistics of these firms brought out the following: (1) There existed a high degree of correlation between the rate of growth of investment of firms and the rate of growth of their sales and gross profits;^{34/} (ii) While there was no significant relationship between the rate of growth of fixed assets of firms over the period 1964-75 and the average level of their profit margins (gross profits as a percentage of sales) in the period 1964-70, the former is very clearly related ^{to} the average level of the profit margin in the period 1970-75 - that is, profits seem to follow investment rather than vice-versa;^{35/} and (iii) while there seems to be no relation between the rates of growth of investment sales and profits and the size of firms, these variables seem to be related to the product mix of the firms concerned (Tables IX and X) - the more diversified firms showing a higher rate of increase of these variables.^{36/}

Table IX: Average rate of Growth (1964-67 to 1973-74)
of Selected Variables of 25 firms classified
by Size of Fixed Assets

Size Class (Gross Fixed Assets)	Gross fixed Assets Formation	Rate of Growth of Net fixed Assets	Rate of Growth of Net sales	Rate of Growth of gross profits
< 50 lakhs	8.57 (2.22)	8.89 (4.82)	15.96 (3.64)	12.76 (6.85)
50-80 lakhs	7.91 (3.17)	5.05 (5.89)	11.39 (3.10)	11.14 (6.57)
80-120 lakhs	9.07 (4.34)	10.14 (5.63)	14.19 (5.91)	12.22 (5.36)
>120 lakhs	7.56 (2.38)	6.90 (5.49)	11.18 (3.80)	10.48 (5.80)

Note: (i) Figures in brackets indicate standard deviations.
(ii) Averages relate to the weighted averages of the rate of growth where the weights are the actual values of the concerned variable in the base period.

Source: Calculated from data provided in the Bombay Stock Exchange Official Directory, Stock Exchange Foundation, Bombay, 1976.

Table X

Average Rate of Growth (1964-67 to 1973-75) of
Selected Variables of 25 Firms Classified
Product-wise

Product Category	No. of Firms	Rate of Growth of Gross fixed Assets	Rate of Growth of Net fixed Assets	Rate of growth of Net Sales	Rate of growth of gross Profit
Cotton yarn < 40s	(4)	5.45 (2.99)	2.13 (6.85)	9.42 (4.92)	8.30 (10.05)
Cotton yarn > 40s	(5)	7.25 (2.96)	6.78 (3.41)	10.44 (1.86)	8.79 (3.05)
Cotton and Staple fibre yarn & Processing	(9)	7.37 (2.64)	5.75 (6.13)	13.12 (3.67)	12.46 (5.24)
Spinning, Weaving & Allied activities & wholly new avenues	(7)	10.24 (2.85)	11.36 (3.88)	13.12 (5.95)	11.89 (6.68)
Spinning, Weaving & Allied activities & wholly new avenues	(5)	11.15 (2.56)	13.24 (1.74)	15.12 (5.67)	14.84 (6.25)

Note: (i) Figures in brackets indicate standard deviations around the weighted mean.

(ii) Average calculated by weighting the rates of growth of the different variables for each firm by the actual value of the variable in the base period.

(iii) Row (5) in the table is obtained by omitting 2 firms from those in row (4) which have diversified either into weaving or wholly new lines of production. The two firms omitted are Janakiram Mills Limited, and Jaghuvanshi Mills Ltd. both of which though diversified are obviously not in the profitable lines of production. For example, though Janakiram Mills has diversified into weaving from spinning, it spins only yarn of counts 20s - 40s and weaves only grey cloth.

The above results are interesting for they bear out our expectations regarding the relationship between investment and financial performance; secondly, they tie up with our earlier understanding that, given the limits to expansion within textiles, the principal form of growth in the industry is through a process of diversification.

Diversification and Profitability

To assess the extent to which this process of diversification itself leads to differentials in profitability in the industry, we calculated the average level of profits for the period 1970-75 of 125 firms classified into groups, according to their product composition. The sample of firms consisted of all those firms quoted in the Bombay Stock Exchange for which data are available in the latest Official Directory of the Exchange.^{37/} Table XI provides the data for the purely spinning mills and the composite and diversified mills respectively. From the tables it appears that while the degree of diversification definitely does play a role in explaining the differentials in profitability in the case of the composite mills this does not hold true in the case of the purely spinning mills. In fact the spinning units show even a higher profit than the composite and diversified mills. Further, even within the spinning sector while the margin on sales of firms involved in the production of cotton yarn is greater than that of firms involved in non-cotton spinning, their return on capital is lower. However, these discrepancies in the behaviour of the spinning sector are partly explained by the bias in the sample itself. Since most of the spinning units are rather small units, they are either private limited companies or are not quoted in the Stock Exchange. As a result the sample of spinning mills included

Table XI

Commodity-Group wise Profitability in the
Textile Industry

Commodity Group	Number of firms	Gross Profits as a % of Sales	Gross Profits as % of Total Capital employed
Group A	20	14.22	11.33
Group B	11	12.94	12.3 12.34
Group C	56	11.08	9.38
Group D	17	11.00	10.72
Group E	21	17.67	11.30

Source: Calculated from data provided in the Official Stock Exchange Directory, Vol. 7 and 8, Bombay Stock Exchange, 1977.

Notes: Group A: Cotton Spinning only.
 Group B: Spinning only - Cotton and non-Cotton.
 Group C: Cotton Spinning and Weaving with basic processing.
 Group D: Cotton non cotton spinning and weaving and sophisticated processing (such as tebilizing, Hecowa finishing etc.)
 Group E: Spinning and/or weaving and wholly new

in the Stock Exchange Directory would be much more biased towards the larger and more productive units than in the case of the composite mills. Hence, the spinning sector sample would display a much higher average rate of profit than is actually true of the spinning mills in the industry. Such a view is particularly corroborated by the fact that while the spinning mills constituted about 58 per cent of the total number of mills in the country, they only cover 25 per cent of the sample units.

The Influence of Size

The question of the bias involved in the sample brings into focus another factor which could explain the differentials in profitability between firms, viz., the size of firms. Size can lead to differentials in profitability for two reasons. First, there could exist economies of scale arising either out of technical economies or managerial and financial economies. The former relate to the reduction in unit costs which can be achieved through larger scale of plant which permits increasing specialization, introduction of automatic machinery and so on, while the latter relates to the reduction in unit costs derived from managerial reorganisation and the benefits of bulk purchase and sale.

In the case of the textile industry since raw material costs constitute a very significant proportion of total costs in the industry, economies arising from the bulk purchase of raw cotton can be very significant. ^{138/} The larger mills have the advantage of being able to purchase the right mix of cotton varieties (depending on relative prices) at the right time (when prices are low), because of their better liquidity position. On the other hand, since the smaller firms very often have to buy raw material on credit they end up paying a higher price for raw materials. That the lack of sufficient working capital can make a significant difference to cost is clear from the following observation of the Committee which studied the relationship between the prices of Kapas, mill gate prices of cotton and cotton manufactured

"It has been observed that a number of textile mills have to depend on merchants for supplying cotton on credit to them, the terms of credit varying between the individual mills and the supplier. Though a number of mills avail themselves of this facility due to reasons beyond their control, the terms on which such raw cotton is made available in the market and

....

the prices at which it is sold on credit is enormous. It is because of this that the weak mills have to pay a higher price for cotton particularly, in areas where cotton is not grown" 39/

Such differences, naturally, provide the bigger mills with a cost advantage.

Secondly, profitability can be related to size because of the fact that diversification presupposes an increase in size. This is clear from the fact that the larger firms in the industry are also the more diversified ones. Thus the benefit of profitability deriving from diversification would reflect itself in a tendency for the larger firms to show a higher rate of profit. 40/

In order to differentiate partially at least between the effect of these two factors we calculated the average profitability of firms classified both according to product composition and size (see Tables XII and XIII). Here again, in the case of the purely spinning mills while size does seem to have an influence on the level of profitability the relation is not quite clear, in the lowest two size groups of non cotton spinning firms. However, in the case of the composite and diversified mills the following results emerge: First, size does have a significant influence on the levels of profitability in the case of those mills which have not entered the production of non-cotton or sophisticated fabrics or wholly new products; secondly, it is clear that the more diversified firms are the larger firms and they in general display a higher margin on sales and return on capital; and, finally, while in each size group the diversified firms display a higher margin on sales, the result is not so obvious when looked at from the point of view of return on capital employed, though even here it holds true in the largest size group, which has a

a substantial chunk (15 out of 21) of the firms diversified into new avenues.

Table XII
Profitability of Spinning Mills by Size and Product Composition
Gross Profits as a Percentage of Sales

Total Assets in million Rs.	0-150	150-250	250-350	350-500	500-650	All firms
<u>Commodity Group</u>						
Group A	11.87 (8)	12.84 (7)	15.56 (4)	22.67 (1)	-	14.22 (20)
Group B	10.32 (3)	16.08 (2)	12.68 (5)		13.67 (1)	12.94 (11)

Gross Profits as a Percentage of Total Capital
Employed

Group A	8.38	8.28	14.41	21.08	-	11.33
Group B	15.35	10.15	10.82	-	16.11	12.34

Notes: 1. Group A: Cotton Spinning only.
2. Group B: Spinning only - Cotton and non-cotton.
Figures in brackets refer to the number of sample mills in the relevant group.

Source: Same as Table IV.

The lack of a clear result in the case of the more diversified firms, arises undoubtedly because of the differences in the direction of diversification between firms. Certain firms enter more lucrative avenues in terms of the return on capital, while others, enter avenues where the improvement in margins are more than absorbed by the increase in capital costs. On the whole, however, the evidence seems to indicate

that economies of size do play a significant role in ~~determining~~ profitability differentials in the industry. But, since factors like productivity, product composition and size substantially overlap, the influence of each factor cannot be seen independently of the rest.

Conclusions

In particular it needs to be noted that besides the differentials in productivity and product composition which were the starting points of this paper, there exist a number of factors, including the position of firms in the raw materials market, which result in differentials in profitability. But what emerges clearly from the analysis is that while the textile industry as a whole appears to be in a state of 'crisis', given its agro-based nature, its dependence on a demand extremely sensitive to changes in food prices and the composition of output and its structure and position relative to other industries, the impact of the situation of crisis varies significantly over firms. While it forces some to go out of production it provides an incentive to others to expand, to diversify their activities and to consolidate their position vis-a-vis the markets for raw materials and finished goods. This explains the fact that while the textile industry is considered to have had the most fluctuating fortunes and to have been severely affected by the recession in the industrial sector, some of the largest and most successful firms in India belong to this industry. The most comfortable sectors consist of those firms which have gone in for large scale diversification and have entered wholly new fields.

Table XIII: PROFITABILITY OF COMPOSITE MILLS BY SIZE AND PRODUCT COMPOSITION

Gross Profits as a Percentage of Sales

Total Assets in Million Rs.	0-150	150- 250	250- 350	350- 500	500 - 650	650- 800	800- 1000	1000	All firms
Group C	4.10 (4)	4.97 (5)	9.53 (13)	10.94 (11)	13.23 (9)	3.16 (6)	10.50 (8)	11.67 (6)	11.03 (56)
Group D	-	-	-	12.57 (1)	15.03 (2)	15.06 (4)	15.82 (3)	14.29 (7)	14.59 (17)
Group E	-	-	-	13.50 (2)	-	18.74 (3)	11.83 (4)	17.82 (15)	17.67 (21)

Gross Profits as Percentage of Total Capital
Employed

Group C	3.63	3.27	7.86	9.79	10.49	10.49	10.87	8.08	9.38
Group D	-	-	-	16.80	11.26	12.76	10.70	10.52	10.72
Group E	-	-	-	11.77	-	11.92	10.91	11.28	11.30

Notes: Figures in brackets refer to the number of sample mills in the relevant group.

Group C: Cotton Spinning and Weaving; with basic processing

Group D: Cotton/Non-cotton spinning and weaving and/or sophisticated processing/ such as .. etc.

Group E: Cotton/Non-cotton spinning and weaving and wholly new avenues.

Source: Same as 14 and 15.

In conclusion it needs to be said that this paper has at various points taken certain trends in the industry as given without seeking explanations for them. Thus much of the evidence quoted above raise a whole host of questions. What explains the fact that certain firms modernise their machinery, diversify and grow while others do not? What determines the rate and direction of expansion of those firms that do grow? And, finally, what are the determinants of the rate of investment in the industry as a whole? Though we have hinted at the possible answers to some of these questions, a complete answer to them lies outside the scope of this study. They constitute areas for further study.

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Appendix I

The size of the cross-bred milch animal stock is estimated by using the following method.

Let B the size of the cross-bred milch stock in the year t and n be the average life span of a cross-bred cow.

Then

$$B = \sum_{i=1}^n b_i \dots\dots\dots(1)$$

Where b_i = cross-bred population in the i th age group.

If M_{t-i} , is the number of cross-bred female calves born in the year $t-i$ and if r_i is the survival rate of cross-bred female cattle,

Then $b_i = (M_{t-i})r_i \dots\dots\dots(2)$

- 3/ Between 1961 and 1973 production of coarse and medium cloth in the mill-sector declined by 22.2 per cent, while that of fine and superfine varieties has increased by 30.2 per cent. As for cloth production as a whole while coarse and medium output has increased by 0.6 per cent, that of fine and superfine cloth has increased by 79.7 percent, See Mridul Eapen, "Emerging Trends in Cotton Textile Consumption," Social Scientist, 54-55, January-February, 1977. For the increase in the availability of non-cotton fabrics see, Bhaskar G. Kakatkar, "Fall in per capita Cloth Consumption", ICMF Journal, December 1977.
- 4/ See Mridul Eapen, op.cit, for the argument and also P.U.Sastry, "An analysis of demand for mill-cloth in India" (mimeo.), Institute of Economic Growth, Delhi, who poses the argument in terms of an increase in foodgrain prices. For the nature of the relationship between income distribution and the terms of trade, See Ashok Mitra "Industrial Growth and Income Distribution," Social Scientist, 54-55, January-February, 1977.
- 5/ See Bhaskar G. Kakatkar, op.cit, for an exposition of this argument. Mridul Eapen partly incorporates this aspect into her paper by taking value changes as incorporating quality changes and showing that demand has not kept pace with income at a rate warranted by the income elasticity of demand in value terms. See Mridul Eapen, op.cit.
- 6/ See Bhaskar Kakatkar, op.cit. Such a possibility particularly holds in a situation where the availability of consumer durables of all sorts is on the increase. The growth in the consumption of such consumer durables will be at the expense of an increase in the per capita outlay on the consumption of cloth and would therefore restrict the quantum of cloth consumed per capita in the relevant range of income. This naturally significantly affects the overall per capita demand for cloth. In one sense, this is a part of the rapid diversification in demand characteristic of underdeveloped countries. At an economy wide level it reflects itself in a decline in the demand for mass consumption goods while that for consumer durables and luxury articles are on the increase.
- 7/ Handbook of Statistics on the Textile Industry, Indian Cotton Mills Federation, Bombay, 1975, p.14.

- 8/ Besides the textile industry in general is one which require a lower level of investment for entry into or expansion within the industry. This rules out the possibility of barriers to new investment as a result of the 'scarcity of big capital'. This has been noted as a characteristic of the industry by a wide variety of writers including economic historians. See for example, S.D. Chapman, The Cotton Industry in the Industrial Revolution, Macmillan, 1972, Chapter 3.
- 9/ Despite the fact that the restriction on the expansion of loomage capacity were partially lifted after 1963, there were certain conditions which had to be met by all mills which wanted to undertake such expansion. In a situation where the market for textiles was not growing even these partial restrictions could act as a serious deterrent on investment.
- 10/ See Monopolies Inquiry Commission, Report, Vol. 1 and 2, New Delhi, 1965. The MiC defines concentration as 'high' if the top 3 firms account for 75 per cent of the output, it is 'medium' when the share varies between 60 and 75 per cent and 'nil' when it is less than 50 per cent.
- 11/ For the importance of cost differentials and the existence of marginal producers with zero profits in the determination of the competitive pressure in the industry see Josef Steindl, Maturity and Stagnation in American Capitalism, Monthly Review Press, 1976, pp.37-4
- 12/ For the complementary nature of increased quality competition and higher selling cost see Steindl, op.cit, pp.55-56.
- 13/ Data obtained from National Productivity Council, Productivity Trends in the Cotton Textile Industry, New Delhi, 1976, Table 33, p.50.
- 14/ For example, the technical know-how for crease resistant and minimum ironing processing (tebilizing) is patented by Broadhurst Lee Co., Ltd. Manchester while that for hecowa finish on processed goods is patented by Hberlein and Co. Wetzil, Switzerland. It need not be that a particular set of firms produce only such products. What is crucial is that certain firms are increasingly concentrating on the production of such products as part of a programme of diversification. A firm may sell in a variety of different markets even though it has only one production base. Markets from this point of view are .

conveniently classified according to the kind of buyers they serve, since some of the most important opportunities for diversification arise as a result of the relation between the firm and its customers. Each group of customers which the firm hopes to influence by the same sales programme is called a 'market area', regardless of the number of products sold to that group.' Edith T. Penrose *The Theory of the Growth of the Firm*, Basil Blackwell, Oxford, 1968, p.110.

- 15/ "Trends in the Finances of the Cotton Textile Industry", Reserve Bank of India Bulletin, January, 1977.
- 16/ "A very few of the older and larger firms in the economy have continued to produce the same type of product throughout their lifetime, even when the demand for that product has risen substantially over that period. Conversely, where demand for the original products has fallen or disappeared, firms have still continued to expand. The growth of almost all large firms has been accompanied by far-reaching changes in the composition of the 'demand' which the firm has considered relevant for its operations." E.T. Penrose, op.cit. p.83.
- 17/ For a complete discussion of the economics of diversification see, E.T. Penrose, op.cit. chapter VII.
- 18/ See I.K. Hazari, The Corporate Private Sector, Concentration, Ownership and Control, Asia Publishing House, 1967, p.306.
- 19/ The National Productivity Council in its study on the textile industry has estimated that "on the average, while spindles are worked at 75 per cent utilisation during the years between 1950 and 1974, looms registered a still lower utilisation ratio, about 68 per cent during the same period. See, National Productivity Council, op.cit. pp.27-28.
- 20/ The assumption being made here is that enterprises have some conception of 'normal' capacity utilisation. When utilisation falls below this level there would be a tendency to restore the normal level of utilisation by increasing their market share through price or quality competition. For a discussion of the mechanism

by which the supply side adjusts to shifts in demand in a competitive industry, see Steindl, op.cit., Chapter V. However, Steindl assumes that no investment takes place outside the industry - an assumption that obviously does not hold in our case.

- 21/ These figures are calculated from the indices of wholesale prices of raw cotton, cotton yarn and cotton manufactures and the data on wages available in the FBI Bulletin (various issues), the FBI Reports on Currency and Finance and the ICMF Journal, January 1977.
- 22/ See Economic Times, Bombay, Wednesday, April 5, 1978.
- 23/ See Salter, op.cit. p.83.
- 24/ See Salter op.cit, for a discussion of the importance of gross investment in the determination of the delay in the introduction of new techniques.
- 25/ The RBI studies on the finances of the medium and large Public Limited Companies, have increased in coverage over time. However, data for five year intervals, from 1950-51 have the same coverage. The data used here are taken from:
- a) For 1950-51 to 1960-61 - Reserve Bank of India: Financial Statistics of Joint Stock Companies, 1950-51 to 1960-61, RBI Bombay,
 - b) For 1960-61 to 1970-71 - Reserve Bank of India: Financial Statistics of Joint Stock Companies, 1960-61 to 1970-71, Bombay,
 - c) For 1970-71 to 1974-75 - Reserve Bank of India: Financial Statistics of Joint Stock Companies in India, 1970-71 to 1974-75.
- 26/ Figures obtained from National Productivity Council, op.cit. Tables, 1.6 and 1.7 pp.16-17.
- 27/ Ministry of Commerce, Government of India, Report of Study Group on Handlooms, New Delhi, p.48.
- 28/ Figures obtained from "Handbook of Statistics on Cotton Textile Industry," I.C.M.F. Bombay 1975, Table 2, p.14.
- 29/ The figures for 1951 are obtained from Ministry of Commerce and Industry, Report of the Working Party for the Cotton Textile Industry, GOI Press, Simla 1973. Those for 1973 are from Ministry of Industrial Development, Government of India, Guidelines for Industries, 1973-74, quoted in National Productivity Council op.cit.

- 30/ S.M. Kansal, "Changes in Value added per person in selected Industries in India:1946-69", Economic and Scientific Research Foundation, New Delhi, 1975.
- 31/ See Mridul Eapen, op.cit. pp.22-24
- 32/ Under clause (3) of the Textile Commissioner's Notification with regard to the reservation of production for the decentralised sector, a maximum limit has been placed on the quantity of dhoties and sarees that can be produced by mill, the limit being 120% of the quantity produced during the year 1963 or 1965 or 1966. However, the production of dhoties in the mill sector which was 404 million metres in 1960 has progressively gone down and in 1976 it stands at 162 million metres, including about 104 million metres of controlled dhoties which are outside the quota. Similarly, the production of sarees has fallen from 488 million metres in 1960 to 66 million metres in 1976, including 47 million metres of controlled sarees which are outside the quota. This possibly because of the inability of the mill sector to compete with the decentralised sector in the production of these types of fabrics. See Economic Times, June 1, 1978, Bombay.
- 33/ The coarse man-made yarns and fibres can be woven on cotton looms of modern types; for the finer yarns, modified cotton looms or or silk looms are required. See Dharma Kumar "Import Substitution in the Indian Textile Industry," in Dharma Kumar, et. al. Resource Allocation in the Cotton Textile Industry, Institute of Economic Growth, Delhi, 1965, p.8, fn.1, Improved Processing obviously requires new equipment.
- 34/ Rank Correlation Coefficients between Selected Variables^{*} for 25 companies:
- | | | |
|--|---|------|
| Rate of growth of gross fixed assets
and rate of growth of net sales | : | 0.68 |
| Rate of Growth of gross fixed assets
and rate of growth of gross profits ^(a) | : | 0.62 |

Notes: *The Variables here are the rates of growth of the concerned items for a 9 year period with the base and final values being the 3 year average for the years 1964-66 and 1973-75.

(a) This relates only to 23 firms as two have been omitted for reasons provided below.

For the relationship between the rate of growth of gross fixed assets and the rate of growth of profitability we have omitted two of the firms from the sample as exceptional cases, viz. The Heralatha Textiles Limited and the Moradabad Spinning and Weaving Mills, Limited. The former has been omitted because of a rather dismal performance in the year 1964-65 as a result of which the three year base 1964-66, used for calculating growth rates falls substantially leading to very high growth rate of profits (24.39 percent). Thus if we take the average of 1963-64 and 1965-66 the growth rate of profits falls by 50 per cent. As for the Moradabad Mills, the company resumed operation in January 1967 after suspending manufacturing activity for 13 years, which resulted in a need to sustain high rates of investment to replace, old machinery, buy new machinery etc. Further, the company set up a cold storage in 1960 which went into full operation in 1965 raising profits. Finally, 1975 was an extremely bad year for the Mills. All this resulted in a situation where the rate of growth of Investment was high but the rate of growth of profits were on the lower side because of a high base value and low end period value. On the other, if one looks at the level of profits it was distinctly higher in 1970-75, when compared to 1964-65.

35/ Rank Correlation Coefficients between Selected Variables for 24 Companies:

Rate of growth of gross fixed assets 1964-75 and the average profit margin for the period 1964-69:	0.23
Rate of growth of gross fixed assets 1964-65 and the average profit margin for the period 1970-75:	0.56

Note:- One company was omitted as the profit data is not available for the period 1970-75.

- 36/ Since the product mix of individual firms are taken from the Stock Exchange Directory which does not provide any clear indication of the nature of the products or the quantum of each product produced, there would necessarily be some overlap especially in the case of firms falling in rows (2) and (3) of Table IX.
- 37/ The Stock Exchange Official Directory, The Stock Exchange Foundation, Bombay, Volumes 7 and 8.
- 38/ "Where raw materials or components are a large element in total costs, savings in buying costs may be more important for achieving low costs than the processing of these materials in a plant of minimum efficient scale." See Aubrey Silberston "Economies of Scale in Theory and Practice", in Leslie Wagner and Nikos Baltazis (ed.) Leadings in Applied Micro Economics, Clarendon Press, Oxford, 1973.
- 39/ Ministry of Commerce, Government of India, Report of the Committee appointed by the Ministry of Commerce to go into the present relationship between prices of Kapas, millgate prices of cotton and prices of yarn/cloth, 1976.
- 40/ For a discussion on the economies of Size see E.T. Penrose, op.cit. pp.89-99.

APPENDIX I: COMBINED OPERATIONS OF SOME PRINCIPAL COTTON MILL COMPANIES AS OF 1976 (GROSS REVENUE ASSESMENT, APRIL 1976, LAHORE)

	(1) Cotton Spinning and Cotton Weaving	(2) Dyeing, Bleaching and Processing	(3) Sophisticated Finishing	(4) Miscellaneous	(5) Rayon Staples and weaving	(6) Chemical Fibres	(7) Other avenues
1. Delhi Cloth Mills	@	@	@	Turkish towels, Rayon tyre cord.	@	@	Vanaspoti, sugar, alcohol, fertilizer, soap, active earth, caustic soda, PVC, HCL, Bleaching powder, Sulphuric Acid & other chemicals.
2. Khatau Makanji	@	@	@	-	-	-	Dyes of Fibres through a subsidiary, Fashion prints Ltd. was a subsidiary of the Co.
3. Madura Coats	@	@	@	Sewing and Embroidery threads, Tyre Cord, Conveyor & Transmission Belting, Duck Fabrics etc.	-	-	-
4. Modi Spinning and Weaving	@	@	@	Knitting factory, Garments.	@	-	Oils, oilcakes, liquors, carpets, Tyres, Tents, caustic soda, Chlorino, HCL, Cement, Graphite, Electrodes.
5. Swadoshi Cotton Mills	@	@	@	Umbrella Cloth, Canvas, Flannel knitted fabrics.	@	-	Sugar and Coal

6. Ahmedabad Advance	@	@	@	-	-	-	Colled Rolled Steel strips, Special Alloy Steels.
7. Arvind Mills	@	@	@	-	-	-	
8. Bombay Lyeing	@	@	@				Blended synthetic & Superfine fabrics & Towels
9. Century Spinning & Manufacturing	@	@	@		@		Umbrella cloth, cotton waste, blankets, towels, and Tyre yarn
10. Shree Jan Mills	@	@	-		@		Embroidery, Sewing thread, staple fibro, cloth.
11. Sri Ambica Mills	@	@	@				Synthetic and blended Fabrics.
12. Ahmedabad Cotton Manufacturing Calico Printing	@	@	@		-	@	Sewing thread, and yarns, synthetic fabrics, ready-made Garments, Mosquito nettings, Blended fabrics, Stretch nylon.
13. Hindoostan Spg. & Weaving Mills	@	@	-		-	-	Tracing cloth
							Steel tubes, Textile machinery, Chemicals for textiles, Gas Cylinders, Arbudu Mills is a Subsidiary
							Caustic Soda, HCL etc. Calcium chloride, PVC, Plastic compounds, processed goods such as pipes, leather cloth, electric wires and cables. Bank of India was amalgamated with the Co. in 1951.
							Steel rods, wire heads, pigment

Bombay Stock Exchange Official Directory. Note: @ indicate that the firm is involved in the concerned activity.