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**MARKET-RESURGENCE, DEREGULATION, AND INDUSTRIAL RESPONSE:  
INDIAN COTTON TEXTILES IN THE 1990s**

Tirthankar Roy

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**Comments are welcome and should be addressed to the author:**  
Indira Gandhi Institute of Development Research,  
Film City Road, Bombay 400 065, INDIA  
(fax: 91 22 840 2752, e-mail: roy@agni.ernet.in)

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**Market-resurgence, Deregulation and Industrial Response:  
Indian Cotton Textiles in the 1990s**

Tirthankar Roy, ISS/IGIDR Bombay

**Abstract**

The cotton mill industry in India suffered sustained low profitability from the 1970s until recently, usually attributed to stagnation in home demand for cotton cloth, labour market segmentation, and unfriendly policies. Since about 1987, exports and deregulation eased some of these problems, with the result that average profits and investment rates have improved, though the extent and nature of the revival continue to be influenced by structural constraints such as labour-market segmentation and shortage of resources.

The paper reviews the transition, and interprets what it might mean for the industry, and for industrial growth, in the medium-term. The paper concludes that the main positive features of the transition are that, it is intensive in cotton, a fibre in which India has a long-term advantage, it has diversified and strengthened demand for cotton textiles at home, raised prospects for a solution of sickness in older industries, and represents a growth-trajectory in textiles favourable to rise in wages and productivity. The main negative features, on the other hand, are that the transition is intensive in scarce resources, and likely to induce concentration in some markets.

**Note**

This is draft report on an ongoing project. A version of the paper was presented in a seminar at the Institute of Social Studies, The Hague, in November 1995. I would like to thank the participants, especially Prasannan Parthasarathi, for helpful comments on the paper.

Cotton textiles is one of India's major industries, and India is one of the world's largest cotton textile producers, reflecting a comparative advantage in cotton and semi-skilled labour. But, traditionally, the Indian industry has been characterized by low and stagnant labour productivity, and carried the reputation of being technologically backward and slow to adapt. A considerable literature exists trying to explain why large size and poor average performance co-existed in India. Examples come from economic history and contemporary policy analysis. One example of the former is the comparison of India and Japan in the 1890s, seeking an answer to the question why the much younger cotton spinning industry in Japan out-competed India from its overseas yarn markets in a stunningly short period of time. Related to this question is a famous problem in choice of techniques in spinning, ring spindles versus the mule.<sup>1</sup> Another example from history deals with the crisis in the Bombay mills in the 1920s, the context in which protective tariffs were introduced in British India for the first time. A recent example of the literature addressing inefficiency, and one that concerns us more directly, is around the observation that the cotton mills have suffered sustained low profitability from the early-1970s, accompanied by serious obsolescence of equipments, a state of near-bankruptcy for several mills, and permanent bankruptcy for many others, which was and still is being baled out by budgetary support.

For about a decade, however, there are signs of change, and indications that labour productivity is rising. Productivity has been rising visibly within a relatively small segment of the composite mills, possibly in a more subdued way in the spinning mills, but these are strong enough tendencies to show up in industry averages. Rise in productivity is partly induced by improved capacity utilization. But more recently, investment rates have improved too. Such a trend would have been unthinkable six or seven years ago, but it is undoubtedly happening today.

In this paper, I ask: What has changed? Or, what features of the macroeconomic environment made rise in productivity, new investments, and technical change easier in the 1990s? This is followed up with two further questions. What do these trends mean for cotton textiles, industrialization, and the ongoing economic reforms? And, how stable or sustainable will the transition be? That is, can it include the mills in general or be restricted to those which have so far been the main beneficiary?

The paper proceeds in three stages: background information and received wisdom about the mill crisis until 1985, main findings on the revival from 1985, and an assessment of the main findings. Section 1 deals with background material. Sections 2-5 state the main findings, the detailed topics being, demand (Sec. 2), market-shares (Sec. 3), relative price movements (Sec. 4), and technical change (Sec. 5). Finally, Section 6 draws together some of the empirical findings in an attempt to interpret what they mean in general terms.

## **1. The pre-1985 Background**

India's industrialization began in the mid-19th century with cotton textiles, and India was a major producer and exporter of cotton textiles in the third world until the 1950s. The industry lost this eminence in the next three decades or so, but has been steadily regaining it in the 1990s. Textiles, probably the biggest industry, now occupy one-fifth of industrial production in value, possibly a quarter of factory employment; textile exports account for a third of total exports; on most indices, it seems to have recorded higher average annual rate of growth than manufacturing as a whole in the first few years of the 1990s. Economic growth in the next decade or more can be expected to be influenced by textiles to an extent not seen in the recent past.

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<sup>1</sup> See, for example, Otsuka, Ranis and Saxonhouse (1988)

Interestingly, the resurgence today contrasts with the most optimistic prognosis that could be made about cotton textiles, especially the integrated mills, as recently as 1985. For at least 15 years before that, the corporate sector in the industry was seen to be in an endless crisis, leading to erosion of India's presence in the world market, even as the world market grew as never before. This crisis is usually attributed to three factors, adverse state intervention mainly to protect small weavers,<sup>2</sup> labour-market segmentation and the rise of small-scale powerlooms,<sup>3</sup> and substitution of cotton by manmade fibre fabrics in the home market.<sup>4</sup> We shall argue, to start with, that neither policy nor demand can be seen as compelling reasons behind the crisis. And while labour-market segmentation explains it, it does so in a manner more complex than recognized in the literature.

The trend in demand, a statistic cherished by Indian underconsumptionists, did not seem to hurt the powerlooms.<sup>5</sup> The mills themselves cited adverse intervention as the most important reason for the crisis, which in any case sounded hollow considering their historical renown as inefficient producers. Fiscal discrimination itself is a negligible handicap if mills had tried to improve productivity in response. Policy, in principle, did not rule that option out. A home market constraint should encourage the mills to look for export-outlet, which option implies enhanced capability and new investments because export and home markets consume different goods. Labour-market segmentation too should encourage the high-wage segment to raise productivity, change technology, and become competitive with low wage.

The interesting question, then, is not what caused low profitability, but, what caused low rates of investment. Or, why did the mills not re-equip? Admittedly, the macroeconomic regime was indifferent to modernization - e.g. a protected machinery sector, restricted capital goods imports, high cost of capital, or intractable organized labour, etc.. But all industries faced these constraints, and not just the textile mills.<sup>6</sup>

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<sup>2</sup> For an overview of major areas of intervention, see Misra (1993).

<sup>3</sup> There are many studies which have investigated the effect of wage-disparity on choice of techniques in Indian cotton textiles. See Mazumdar (1984) for a formal treatment using segmented labour markets. In 1993-4, there are an estimated 3.9 m handlooms, 1.2-1.4 m powerlooms, .17 m looms in the mills. Powerlooms supplied about 5-10 per cent of the market in cotton cloth in the 1950s, today they supply about 75 per cent.

<sup>4</sup> Chandrasekhar (1984) attributes fall in mill capacity-utilization, and Khanna (1989) technological stagnation to aggregate demand for cotton.

<sup>5</sup> Per capita purchases of cloth in the aggregate has grown slowly or not at all between 1975 and 1990. However, there has been substitution of cotton by, first polyester, then blended fibre fabrics. Relatively, this favours the powerlooms, as they weave most of the manmade fibres. Changes in fibre-share have been strongly preference- or income-induced, for they happened despite high price of polyester in India relative to either cotton, or world prices, attributable to protection granted to the raw materials and fibres, and monopolistic production. Both conditions relaxed from 1985.

<sup>6</sup> One prevalent scholarly position in the 1980s argued that re-equipment was not the answer to the mills' problem because (a) the two structural constraints, demand and wage-spread, went too deep, and (b) re-equipments were labour-displacing and made some mills 'elitist'. The answer was operational efficiency. See Shanbhag (1984), contributions in Padaki and Shanbhag, eds. (1984) and Khanna (1989). It was not demonstrated, nor obvious, that at given wages, operational efficiency alone could make any mill competitive. Even as operational efficiency went, some labour-shedding

As a matter of fact, technical change was not ruled out even in cotton textiles. Investments did occur, but in a few mills which could afford the costs, and influence the government for concessions or licenses. Significantly, these mills also diversified, that is, tended to move out of areas where powerloom competition was severe. Both these features were noticed by perceptive scholars writing in the mid-1980s, especially C.P. Chandrasekhar (1984).

Diversification indeed is not an easy option because typically it involves investments in marketing systems as well. But, what we really need to ask is: why didn't the mills re-equip in existing lines of production? Or, why must investment and diversification be correlated? This correlation cannot be understood in terms of what the government did or did not do. My hypothesis is that investment without diversification carried excessive risk. For, (a) most cost-benefit estimates show that in looms, the best-practice is only precariously better than older vintage, at comparable cloths and at existing wage-disparity, and (b) while machine outputs were known and given, being engineering parameters, potential wage-spread was neither known nor stable. In other words, for the majority of the mills with relatively weak finances, modernization might promise positive nominal return, but negative expected returns. It is important to note this, because the correlation between diversification and modernization has been strengthened in the post-1985 experience, for reasons that must be seen as structural and with nothing directly to do with policy.

In this bleak backdrop, some momentous changes happened. First, the 1985 textile policy did away with restrictions on the cotton mills, and reciprocally, on the powerlooms as well. Subsequent statements reinforced the reform. Second, devaluations of the rupee initiated a surge in textile exports. Aggregate demand began to increase. Third, the failure of the Bombay textile strike (1982-3), credibly claimed to be the biggest strike in history,<sup>7</sup> heralded tranquil industrial relations in textiles, which made plant restructuring that much more feasible. And finally, limited concessional finance was introduced, and machinery imports moved from quota to tariff regimes, with cut in tariffs in the 1990s.

If these conditions eased the policy- or demand-constraints, they yet did not change wage-disparity. The result was a mixed one: (a) many mills did return to short-term profits, via cloth, and probably more than cloth, via yarn, as a result of the boom, (b) but the long-term prospects depended on their ability to invest in new ways of doing new things.

There are two sets of issues involved in assessment of long-term prospects. On the supply side, one needs to investigate the preconditions for further rise in investment rates. More mills than before have made investments, but they still form a small club relative to total physical capacity. On the demand side, one needs to investigate the possibilities of diversification within cotton fabrics, whether by utilizing the world market, or otherwise. The promise of world market further underscores the need to examine the bases for existing or potential competition between some of the developing world's major fabric makers, especially India and China, being similar in terms of resources and industry size (see Table 1 for a comparison of India and China on cotton fabric). The issue of international competitiveness, however, has to be the subject of a separate study.

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was inevitable at given machine-productivity, but this option was sacrilegious in the mid-1980s ideological climate.

<sup>7</sup> On the strike itself, and the state of textile economy in the 1970s which led to it, see the detailed work by Wersch (1992).

**Table 1. Cotton Woven Fabrics in Production and Export, India and China**

	India		China	
	1985	1990-1	1985	1990-1
Production: b sq. m. % of world	12.6 (17.1)	16.2 (18.1)	15.2 (20.6)	22.6 (25.2)
Export: b US\$ % of world	.35 ( 5.1)	.6 ( 3.9)	n.a. (..)	2.0 (12.5)
% of export	3.7	3.6	n.a.	2.8

**Notes:** ISIC 652 in 1985, and 3211-28 in 1991. While the share of apparels in exports are higher than in the case of fabrics, both countries are relatively specialized in cotton fabric exports, in terms of Balassa's specialization index, defined as percentage of product in country export as ratio of percentage of product in world export.

**Source:** Trade and industrial production statistics of the United Nations, see References.

## 2. Demand

Every piece of research work or report on textiles published since c.1980 notes alarmingly the low level and slow growth in per capita household consumption of apparel. Converted into kgs. per capita, India's 2.4 compares poorly with developing country average of 3.8, and the world's 7.3 in 1987. Not only are the levels low, from the early 1970s, cotton cloth consumption has been either stagnant, or fallen successively in episodes each lasting a few years (Tables 2 and 3 both capture the latter part of the decline). During the greater part of these two decades, per capita consumption of cloth as such increased, but a little, due to growth in polyester in the early-1980s, and in polyester-cotton blends in the late-1980s.

The market 'resurgence' in the title of this paper can be given a precise sense with reference to Table 2. The table presents constant-price growth rates of textile purchases in value, between 1985 and 1992, when exports accelerated. It shows (a) substitution of cotton by manmades in the home market, and (b) the relative decline of home market vis-a-vis exports. Given that cotton and the home market overwhelmingly dominated final demand in the early-1970s, the scenario we have is one of stagnation followed by a revival, of cotton. Among exports, fabric more than doubled in quantity between 1985 and 1992, nearly doubled in value, and much of it has been cotton. Apparel exports also accelerated from 1981-2, has been larger, and again mainly cotton.

**Table 2. Final Demand by Fibre, 1985-92**  
(b Rs. 1981-2 prices)

	Cotton			Manmade and Blends			Home	Export	Export/ demand (%)
	Home	Export	Total	Home	Export	Total			
1985	66.3	12.3	78.7	122.8	.5	123.4	189.2	12.8	6.3
1986	71.7	13.1	84.9	144.2	.7	144.9	215.9	13.8	6.0
1987	77.0	18.5	95.5	160.4	1.5	161.9	237.4	20.0	7.8
1988	68.4	20.6	88.9	165.3	2.4	167.7	233.7	23.0	8.9
1989	63.9	22.9	86.9	198.8	4.6	203.5	262.8	27.6	9.5
1990	57.7	28.4	86.1	199.9	14.8	214.7	257.6	43.2	14.4
1991	60.2	49.8	110.0	214.1	17.7	231.8	274.4	67.5	19.7
1992	63.0	60.4	123.4	209.0	20.1	229.1	272.0	80.5	22.8
annual average growth (%)	- 0.4	27.2	7.2	8.2	79.9	9.5	5.5	31.4	

**Notes:** Exports include fabrics and garments. All cotton values deflated by WPI cotton cloth (millmade), noncotton values by WPI cloth made of wool, silk, or synthetic fibres. The figures do not include knitwear (hosiery).

**Source:** Mainly the Textile Commissioner's data, published in various official and association reports (see References). Home market size was estimated by multiplying per capita purchases with mid-year populations. Value figures were unavailable for the recent year, unit-values of previous years were updated by using WPI, and applied to quantity purchases. Export figures are available in value and quantity for fabrics, but only in value for apparel. An alternative route is to convert yarn availability into cloth, this is followed by the Association of Manmade and Synthetic Fibre Industry. The results, expectedly, vary for blended fibre fabrics.



**Table 3. Cotton in Final Demand**  
(% of current price values)

	Home	Export	Total
1985	37.7	96.5	41.6
1986	36.6	95.6	40.5
1987	35.3	93.3	40.1
1988	32.2	90.7	37.8
1989	26.8	84.9	32.7
1990	25.5	69.6	32.3
1991	26.4	78.2	37.7
1992	27.9	79.4	40.9

Source: See below Table 2.

Tables 2 and 3 suggest that, from about 1990, cotton is making a return, in absolute terms and relative to manmades. This is expected since an overwhelmingly large part of exports is cotton, but in fact, cotton cloth purchases have improved in the home market as well. Add to this two further changes, to strengthen the return of cotton. First, blends continue to grow very rapidly, both in consumption and exports, and reinforce the demand for cotton as an input into blends. Second, polyester seems to be losing its lustre, at least from the early-1990s.

Can the 1990s reversal be explained by the factors that explained fibre-choice in the 1970s, or the 1980s? The probable answer is 'no'. The long-term decline in per capita cotton consumption has been seen as driven by purchasing power.<sup>8</sup> For many reasons, this is a contrived view, and if accepted, makes it difficult to explain both the 1990s reversal and its timing. Short-term variations in fibre-proportions are usually estimated by income as well as relative price. But, if the cotton reversal continues, a re-estimation of a typical 1980s demand equation will yield poor results today. Price elasticities for most kinds of cloths carry expected signs for the 1980s.<sup>9</sup> But in the 1990s, if cotton cloth does stage a recovery, it will do so despite adverse price-ratio (Table 4).

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<sup>8</sup>. On the role of demand in the 'industrial stagnation' of the 1970s, see contributions in Nayyar, ed. (1993).

<sup>9</sup>. See for an exercise and review of the literature on textile demand, Suryanarayana, Roy, and Parikh (1993). Major earlier works on demand simulations were by Goswami (1990) and Murty (1983).

**Table 4. Relative Prices: Cotton-Manmade  
(indices)**

	Mill cloth	Powerloom cloth
1981-2	100.0	100.0
1982-3	102.8	94.4
1983-4	105.8	99.0
1984-5	105.3	98.2
1985-6	111.8	95.9
1986-7	116.1	100.5
1987-8	113.5	103.8
1988-9	114.0	111.1
1989-90	114.0	118.9
1990-1	118.9	132.3
1991-2	127.6	137.6
1992-3	128.5	146.3

**Notes:** The prices are cotton WPI (millmade), cotton WPI (powerloom), and WPI of wool-silk-synthetics.

What might we conclude from these data? Plausibly, that a major shift in preferences is taking place, a shift contrary to historical trends. Why might there be such a change? I hypothesize that the rise of cotton in exports, and the return of cotton in the home market, or the second and the third columns in Table 3, are causally related. Briefly, exports created new capacity which in turn induced change of taste.

This tendency consists of two elements. First, exports introduced new products. Prior to the export boom, the basic composition of the output of the cotton mills had been stagnant for many decades, and served a limited range of apparel-usage. It is not surprising that demand would eventually taper off, or consumers look for diversity in manmade fibres. The export boom, on the other hand, has not only expanded the apparel-usage of cotton fibre immensely, but enforced improvements in the average quality of the Indian fibre itself. It is to be expected that consumer interest in cotton revives. Second, exports cheapened new products. Apparel exports have created capacity which supplies the home market as well, and equally, created a taste for garments. Till the early-1990s, a lot of these garments - cotton T's, trousers, denims - were 'export-rejects' or surplus production, and sold very cheap in the city bazaars. It is likely that the increased cotton consumption at home is a reflection of demand for new apparels. It is possible that this was a price-driven shift. Traditionally, demand equations use fibre-price-ratios. What we need, however, is apparel-fabric ratio. The hypothesis is that this has declined, because (a) apparel prices are influenced by world prices and, therefore, have been stable despite cotton inflation, and (b) the high labour-intensity of apparel-making suggests a further source of (wage) price-stability. If the foregoing is broadly correct, what we are seeing is the emergence of a demand for goods of exportable quality consumed at home.

### 3. Market-shares

Does the return of cotton imply a different relative economy of weaving? Does it imply that the cotton mills, with wider range of output, and being vertically integrated, are relatively better-off against the powerlooms? The answer, at least in the short run, seems to be 'yes'.

Before I take up this question, it is necessary to add a note on new entry. Exports, home preferences, and deregulation, have had two distinct effects on the corporate producers. In official sources, the only corporate producer recognized is the integrated 'mill sector'. But it is manifest that, (a) all through the late-1980s and the 1990s, new corporate entities have entered textiles in the form of specialized spinners or weavers, and (b) divisions within the mill sector, between obsolete and efficient, profitable and bankrupt, private and public, have hardened with the transformation of a small set of mills into premier fabric exporters. Official data on market-shares tell us little on the magnitude of the first type of change. Press reports suggest that three areas - texturizing filament yarn, cotton spinning, and knitting - witnessed a burst of medium-scale enterprise in the 1980s. In a few cases, successful firms integrated into weaving. Further, some plants which must still be classified as powerlooms have become public companies. But there being no data whatever on the extent, we must assume it does not lead to serious mis-classification (too many formal and informal enterprises clubbed together), and treat the mills as the only corporate supplier.

Conventional market-shares in the domestic market are shown in Table 5. These shares are in metreage of cloth, whereas converted into value (on which data are incomplete), cotton-shares are likely to be higher for the mills who produce higher-valued products, and the overall shares are likely to change in favour of the powerlooms because polyester, which mainly the powerlooms weave, are costlier. Mills, however, have a growing presence in blended cloths, which reflects the facts, that blends use cotton yarn or staple fibres spun in the mills, that mills which invested in efficient blending of fibres can enjoy an implicit premium, and blends can be more standardizable cloths.<sup>10</sup> It is well-known that market-shares in metreage are traditionally calculated by a procedure which predicts mill-share quite accurately, but the division between powerlooms and handlooms ambiguously. In 1988-9, the Textile Commissioner adjusted the data to correct for the biases, so the Table shows only the last six years.

Shares in exports are shown in Table 6. These, unlike in home market, had to be estimated in value. The values can be converted in some instances into estimated quantities, where that was possible, the quantity-shares are also shown.

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<sup>10</sup> The shift to the blends, authorized by a multifibre policy adopted in the early-1980s - is a major theme in the 1980s scholarship and policy documents. See for example, Chandrasekhar (1984), India (1985), India (1990).

**Table 5. Market-shares, Domestic Market for Cloth (quantity)**  
(percentages, rows add to 100)

	Cotton				Blended				Total			
	M.	P.	H.	K.	M.	P.	H.	K.	M.	P.	H.	K.
1988-9	15	42	14	29					14	55	11	20
1989-90	14	43	16	28					13	56	12	19
1990-1	12	45	16	27					11	58	12	19
1991-2	11	44	17	28					11	59	13	18
1992-3	9	45	18	29	20	74	0	7	8	58	13	21
1993-4	8	45	18	29	18	76	0	6	8	59	13	21

Notes: M. = Mills, P. = Powerlooms, H. = Handlooms, K. = Knitwear.  
Source: See under Table 2, and References.

**Table 6. Market-shares in Exports, 1993-4**

	Mill	Powerloom	Handloom
Fabric:			
b. Rs.	9.5	9.3	2.8
m. metres	415	620	..
Percentage	43.9	43.1	13.0
Apparel:			
b. Rs.	3.3	9.5	10.6
m. metre equivalent	716	..	..
Percentage	14.4	41.4	44.2
Total:			
b. Rs.	12.8	18.8	13.4
Percentage	28.7	42.3	29.0

Notes: Row percentages add to 100.

The two tables show that:

(a) The mills as a whole have lost ground, but the 1990s may have seen a slow down in the erosion of their market-share. The shares will be higher in value, because mill average unit-value in the home market is approximately 10-25 per cent higher than that of the powerlooms, and in exports

approximately 50 per cent higher.<sup>11</sup> The fall in shares will be speedier in home market, because mill-powerloom price-ratio has fallen in the home market, but the fall will be slow or absent in the export market because the price-ratio in exports has been rising (Table 7).

(b) In exports alone, mills do have a larger presence (Table 6). In fabric exports, mills are dominant in value (but not in metreage), but this dominance is closely challenged by the powerlooms. In 'made-ups', powerloom-handloom combine has larger and increasing share.

(c) Mills specialize in fabric exports, and in higher-valued fabric exports, basically in different products (see the price-ratio in export, and the real unit-value ratio of Table 7). This, reportedly, indicates the different markets in which the two sectors operate, Europe and north America with the mills, and the middle east or southeast Asia with the powerlooms.

Underlying these long-term tendencies are three questions, (1) what constitutes competitiveness in the domestic market in contrast with the export market?, and (2) what influences competitiveness in the short run as opposed to the long run? Both at home and exports, manufacturers should be mainly price-takers. But while the home market can be assumed to be relatively more price-sensitive, the exports should be more quality-sensitive. On the other hand, short-run profitability depends more on demand or supply fluctuations causing price ratios between inputs and outputs to change, whereas the long-run one must depend on productivity. I, therefore, first take up price-movements, which implies a focus on the home market and the short-run. And next, I consider quality and productivity, which imply a shift of focus towards exports and the long run.

#### 4. Competition at Home: 1990s Price Movements

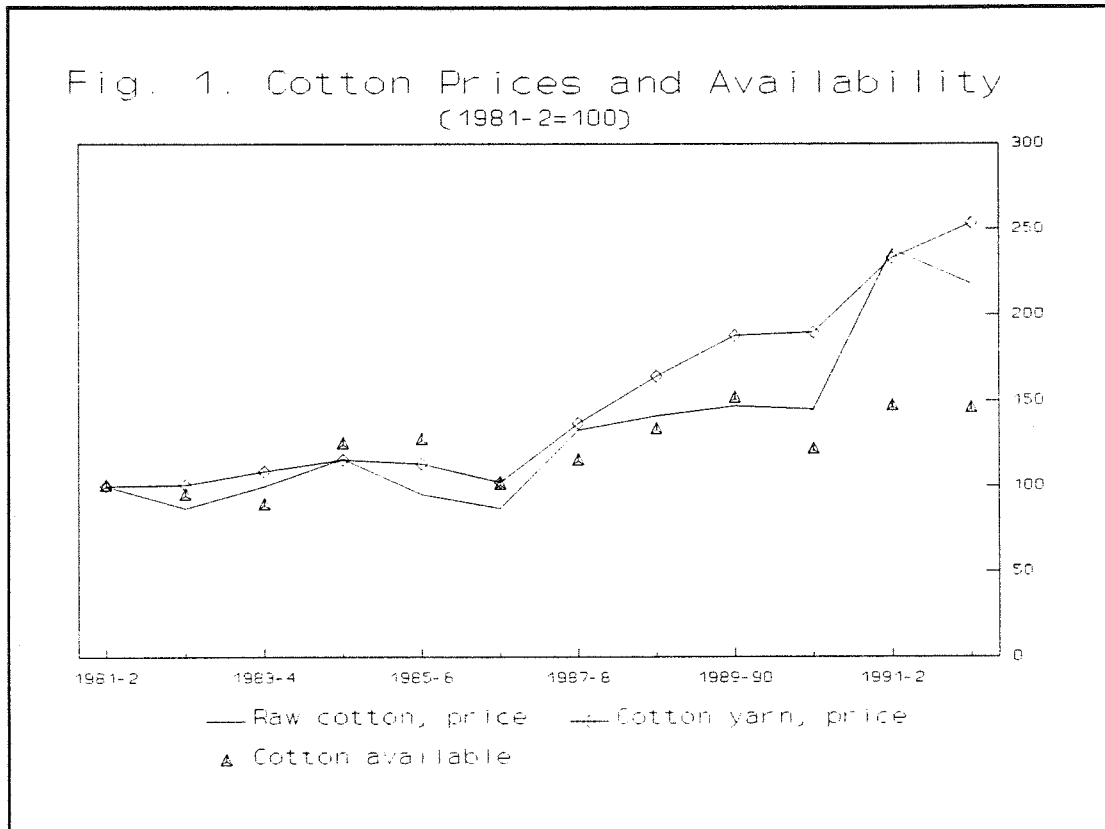
Aggregate profits in the mills turned positive, after long spell of negative figures, from about 1987. This can be seen from the average profit per worker of the sector called 'cotton spinning and weaving' factories in the ASI, and in the profit-sales ratio in the consolidated accounts of the 100 odd public companies listed in the Bombay Stock Exchange (BSE). There is a possibility that the ASI sample, consisting of all registered factories, is dominated by spinning mills, who may have performed better than the composite mills. However, the spinning mills are not dominant in the BSE sample of public limited companies. The improvement cannot be wholly attributable to cloth exports, because exporting mills are few in number, and profitability remains positive when their accounts are separated out.

Relative price of mill cloth at the home market has steadily declined from 1987 (Table 7). The three short-term factors influencing this ratio are: raw cotton price, price of yarn, and relative wage rates. Since the composite mills are manufacturers and net sellers of yarn, they can appropriate a specific profit, or afford to hold cloth prices better, when there occurs an increase in yarn price relative to cotton price. Now, cotton price is fundamentally weather-driven, whereas yarn price is relatively demand-driven. As Fig. 1 shows, in nearly all pre-1987 episodes of bad crop, cotton price rose faster than yarn price. But from 1987, the reverse has been the case. Since 1987, export market resurgence has caused a sustained rise in yarn price relative to cotton price, except in one bad year. There is no parallel to the late-1980s trends in the last 20 years or so, a section of which appears in the graph.

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<sup>11</sup> Mills' share also increases if knitwear is excluded, and if handlooms are excluded on the ground that they mainly manufacture apparels.

The other apparent cause of decline in mill-powerloom cloth price is a mild fall in relative mill wage from 1988, but substantial rise in relative productivity (Table 7). In fact, 1990 is the first time that productivity-ratio, till then consistently less than wage-ratio, rose above the latter. A look at the levels show further that mill average wages have been relatively stagnant, whereas powerloom wages have risen since 1987. This piece of statistics occurs from the ASI sample, which deals with 'factories', and not companies, and hence is a more inclusive category. If not wholly an effect of changes in the composition of the ASI sample, the finding is significant. It conforms with a well-known macroeconomic 'stylized fact' that the post-strike era witnessed a new political economy of organized labour which made productivity negotiations easier. On the other hand, it is possible that, with maturity and decades of growth, powerlooms are closing in on some sort of skilled labour supply barrier.



**Table 7. Mill-Powerloom Relative Economy, 1981-92**

	Price-ratio cotton		Real unit- value ratio, export	Wage- ratio	Product ivity- ratio	Investment-rate (%)		Average size	
	Home	Export				Mill	Power	Mill	Power
1981-2	100.0	100.0	139.1	2.51	2.09	44.6	16.3	556	17
1982-3	108.9	112.1	143.2	..	..	..	..	..	..
1983-4	106.8	116.1	151.2	2.39	2.10	6.2	36.2	584	17
1984-5	107.2	96.1	124.7	2.42	0.85	64.8	7.2	503	16
1985-6	116.6	103.2	123.2	2.53	1.29	83.7	26.6	439	16
1986-7	115.6	102.8	123.8	2.64	1.48	51.5	24.6	430	16.5
1987-8	109.4	96.7	123.1	2.65	1.35	69.0	30.5	402	18
1988-9	103.2	103.1	139.1	2.55	1.49	59.6	91.6	378	16
1989-90	95.9	91.2	132.9	2.40	2.26	51.1	..	383	19
1990-1	89.9	100.3	155.3	2.34	2.55	65.1	22.4	360	17
1991-2	92.8	107.1	160.6	2.37	1.34	106.6	41.3	330	17
1992-3	87.9	112.5	178.2						
1993-4		128.2							

**Notes:** All ratios have mill-figures in numerator. Cotton prices are WPI (for home), and unit-values (for export). Export unit-values were extrapolated for 1990-2 based on adjacent-year values. Real unit-value ratio is a ratio of each sector's export unit-value in cotton deflated by that sector's WPI in cotton, in percentages. Investment-rates are gross fixed capital formation as percentage of value-added. Wage-ratio takes wage per worker, productivity value added per worker, average size shows worker per factory. Value added is calculated as wages plus profits.

**Source:** For all price data see Notes to Table 2. All operational data from ASI, Factories Sector.

To sum up, the mills as a whole have experienced better profits, two identifiable causes of which are, manageable labour (Table 7), and yarn inflation (Fig. 1). It is also apparent that they have seen a steady rise in relative productivity (Table 7). Better capacity utilization can have that effect. But, undoubtedly, investment rates have accelerated as well. To this we now turn.

### **5. Competitiveness: Technology**

Despite the return of good times for some mills, continued bankruptcy in many others confirms that long-term competitiveness at the present average levels of technology, at generic product-lines and corresponding marketing systems, is adverse to the mills. Indeed, the experience of successful mills does indicate the existence of a long-term integrated strategy, dominated at the core by technological modernization. In this section, I shall first briefly describe the nature of the technological problem, and next try to outline the basic features of the integrated strategy, based mainly on press-reports on companies in the post-strike period, descriptive information available from the annual reports, and to a small extent on interviews.

## The Technological Problem

Textile production consisting of separable processes, the notion of 'best-practice' is usually process-specific. Best-practice is also not always the most productive in the conventional sense, it can attempt, say, better systems of control than more output. In the completely separable-process scenario, the aggregate capital-labour ratio can vary in a wide range consistent with notions of economic efficiency. Nevertheless, as the average speed increases in some critical equipments, textiles may approach the model of a continuous-process industry, in which case factor-proportions tend to become rigid and typically more capital-intensive. It would be fair to generalize that the best Indian mills are somewhere in between these two paradigms.

Assuming reasonable discreteness of processes, the usual practice is to focus on weaving, the issue being competition between mills and powerlooms. Two general points need a restatement. In weaving, the move to high-speed shuttleless loom simultaneously implies smaller labour component (not only by raising direct productivity, but also by means of automated repair, and weft-changes), as well as distinctly different levels of standardization that derives from longer production runs and longer weft. Secondly, there is a difference between the engineering notion of best-practice in a standard cloth, and realizable productivity, the intervening factor being operational efficiency. Equipment-choice, in other words, is not the sole means to raise productivity, and it is mediated by product-mix. In India, however, the peculiar problem of equipment-choice in the older mills is not one of being behind the best-practice, but of being behind it by many years and intermediate stages.<sup>12</sup> The problem is of overhauling delayed too long. Some form of equipment-replacement programme had thus become imperative in the 1980s, and remains so in many mills.

The relevant technological problem for a 1990s mill is having to replace shuttle-looms with an airjet loom, seemingly the most preferred in India of the four major types at work globally: airjet, waterjet (which is not suited for sized cotton yarn, but have been installed in large silk factories), the rapier, and an automatic shuttle loom. The decision to replace a shuttle loom with an airjet, however, is many-sided. The airjet enables more standardization, but perhaps greater specialization to better utilize capacity. Both these conditions - the switch to a quality-sensitive market, and full utilization - imply market-targeting. A mill operating on shuttleless looms is far removed from the historical prototype of cotton mills in India, making a diverse menu of garments and fabrics, from yarns of 6s to 120s counts. In turn, market-targeting involves shifts in distribution/trade networks, from the wholesale cloth markets to contractors in specific market-channels that cater to identifiable customers. In short, both production and sale moves away from 'generic' to 'dedicated' lines. The close correlation between exports and new looms arises because fabric exports to the developed economies presuppose (a) large market-segments, (b) targeted markets, (c) contracts and franchise, and (d) compliance with quality in the senses in which fabric quality is understood.<sup>13</sup> Interestingly, all four conditions characterize branded garments for the richer consumers inside the country. This fact suggests that exports and branded garments are likely to expand simultaneously, converge at many points, and served by, for the time being at least, a relatively small number of manufacturers.

Spinning modernization can be driven by improved looms because higher speed requires hardier yarn. But, of course, it can also be induced by preferences in the yarn export market. There

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<sup>12</sup> Loom-vintage as it stood in the mid-1980s is a well-known statistic, see for example, Khanna (1989).

<sup>13</sup> This compliance is taken to the point where prospective buyers are said to insist on shuttleless looms as a precondition for market-entry.



is, therefore, no fixed sequence in which the two phases of modernization tend to happen. In general, spinning has changed sooner in India, and yarn exports risen earlier than fabrics, because the former is a less expensive process. Finishing processes also need to change as a result of shuttleless looms, because the output, being destined for branded markets, tend to be more intensive in finishing.

Can saving on labour-costs alone induce installation of airjet looms? This question has been examined from time to time, and the answer is usually a qualified 'no'. Since the method, the assumptions, and the stylized alternatives, can vary, I examined the question afresh by comparing four technological-institutional configurations: an old mill on shuttle looms; a powerloom shop on shuttle looms, the difference being in wages; a mill on automated shuttle looms; and a mill on airjet. The conclusions from a comparison of prices for a standard cloth are: (a) the old mill implies uniformly higher prices, (b) powerlooms are nearly price-competitive to automated or airjet looms, (c) airjet is uniformly superior to an old mill, but the difference between an airjet and a faster shuttle loom is too narrow, and the indifference-band too wide, to generalize. If the assumption of equal capital cost between sectors is relaxed, and capital cost rises exponentially with the size of required funds, for after all capital is scarce, the marginal advantages enjoyed by faster looms will quickly disappear. Further, since modernization is usually a package, actual investments may be rising function of loom-cost.

The basic conclusion is a fairly robust one. Modernization is essential in mills which utilize equipment too far behind the best-practice, but the best-practice itself is only precariously better than the low-wage shuttle-loom factories. Modernization to recreate competitiveness, in other words, might imply not only an increasingly bipolar distribution of firms against average fixed investments, it might also at the same time imply a search for markets where a premium for the better quality returned by faster looms can be recovered. It is this tie-up between technology and consumption which has induced the profitable mills to depart from convention at several fronts while raising investment rates.

I divide the resultant strategy into three aspects: (a) technology and investment, (b) product-lines and marketing system, (c) labour and location policy, and (d) finance and timing. It must be mentioned at the outset that there are great variations between profitable mills in all respects, but there are also broad overlaps.

## Technology and Investment

According to ASI data, investment (gross fixed capital formation) in the mills as a whole was about 30 per cent of value added in the three years preceding the textile strike in 1982, improved to about 50 in 1983-86, to over 60 in 1987-90, and has exceeded 100 in 1991-2. The most expensive modernization has taken place in mills which are trying to expand export-share in sales, and trying to entrench themselves in a segment of domestic market quite removed from the old lines of production. This segment, branded garments, is at the moment so highly concentrated that it would not be wrong to say that the largest mills are veritably creating this market.

Of the two tendencies, only export-inducement is somewhat measurable. Since more mills than ever before are trying to raise this share, exports can be taken as the most important inducement, on the demand side, for investment. Nevertheless, it is a costly reorientation. The mills who are well on their way to implementing it are more numerous than a decade ago, but few in relation to the loomage and employment locked up in the bankrupt mills. Out of 281 composite mills, of which 176 are in operation, 11 top corporate exporters between them accounted for one-twentieth of weaving capacity,<sup>14</sup> but one-fifth of production. Of the 91 companies included in the consolidated industry balance sheet of BSE, these 11 accounted for one-third of profits or dividend payments, well over half of sales. Their share in total mill exports in 1992-3 was over two-third, only four of them accounted for half of exports. Correlated with such concentration, the share of these 11 mills in investments has been about half that of industry (91 companies, BSE sample). Table 7 shows the relative position of these mills in the industry.

Firms which have significantly modernized display some features consistent with the generalizations drawn in the sections above about induction of new technology. The most important are: (a) sequential and staggered modernization, (b) specialization and alteration in product-mix, (c) systematic differences based on firm-size, (d) downsizing, and (e) timing investments with favourable market movements as financial strategy. The rest of this subsection elaborates on (a)-(d). Finance will be taken up further on.

Broadly speaking, the most extensive installations seem to have been in the blowroom, in high-speed cards and draw-frames essential for efficient fibre-blending, and new ring spinning systems. These are less expensive compared to airjet looms, and in most spinning and pre-spinning equipments, the domestic machinery industry has upgraded its capability sufficiently. Less common is the mainly imported open-end spinning systems, the reason probably is, while it improves productivity, in quality of output or average cost, the advantages of open-end against ring spinning do not seem decisive. Open-end spinning typically appears in the largest mills, and in the export-oriented pure spinning mills, but even here its diffusion is uneven. In processing, again, changes have been common irrespective of size. Workshop and communication systems have changed more selectively, and in the larger mills. Weaving appears to present several contrasts. It is a more recent modernization. The nature and timing of loom-replacement have been variable by mill size. Domestic capability in shuttleless looms is as yet limited, so that equipments are as a rule imported. It so happens that shuttleless looms are costly enough to ensure that only those mills with secure finances can access them.

There are notable differences between larger and smaller mills. In the former, modernization has been broader, costlier, and more prolonged. Bombay Dyeing leads the few mills that re-equipped steadily, and was one of the earliest in India to operate on shuttleless looms. In general, investments peaked in the mid-1980s, and in some cases had begun earlier. The mid-1980s indeed

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<sup>14</sup> in loom numbers, unadjusted for differences between looms.

was a time when some big mills tended to diversify both away and within textiles. Century, Standard, Bharat Vijay, Bombay Dyeing, are examples of the former. But new investments returned to textiles in the next few years, and reached a second peak in 1992-3. In both peaks, re-equipment has been correlated with, in some cases dictated by, diversifications.

Despite economies of scale, mills are not just replacing old equipment, but downsizing in the aggregate. There are three possible factors behind downsizing: (a) reorientation of market renders part of the old capacity redundant, (b) the enormous fixed costs of reorientation towards exports is both directly, and indirectly by raising risks, an encouragement to reduce capacity, and (c) one of the ways higher capital-intensity does so is by means of the high opportunity cost of space in the heart of the big cities, where the oldest textile mills have their plants, together with the fact that the new looms use more shopfloor space than old looms. At the level of the industry, the strategic loom-scraping in the modernizing mills combine with scrapping due to enforced idleness. Between 1990 and 1993, 20,400 shuttle looms have been scrapped, and about 1150 shuttleless looms have been installed. The approximate productivity ratio is 1:4. The percentage of shuttleless has of course gone up, but neither is the absolute rise dramatic, nor has it compensated for the capacity lost. This process has been taking place from the mid-1980s, but accelerated of late.

**Table 8. Major Exporters in relation to the Mill Sector**

	Industry	11 Mills (% of industry)	4 Mills (% of industry)
Capacity, '91-2:			
Spindles (m)	27.3	1.45 ( 5.3)	0.5 ( 1.8)
Looms	168,000	12,774 ( 8.7)	5,370 ( 3.2)
Production, '92-3 (m m)	1990	548 (27.5)	192.8 ( 9.7)
Sales, '92-3 (b Rs)	68.3	38.8 (56.8)	19.9 (42.2)
Export, '92-3 (b Rs)	11.3	7.9 (70.1)	5.7 (50.1)
Export/Sales (%)	16.5	20.4	28.4
Profitability, '92-3:			
% of Industry:			
Gross profits		27.1	17.2
Net profits		42.05	28.0
Dividend payments		36.3	25.8
% of Sales:			
Gross profit	26.8	12.8	15.8
Net profit	6.4	4.7	6.1
Dividend/Net profit	36.9	36.9	34.0
Investment, '92-3:			
% of industry		54.0	34.5
Investment/sales (%)	9.9	8.5	11.8
Range		0.15-10.8	3.0-11.2

**Notes:** 1. The group includes publicly owned mills which consistently earned profits, and reported export figures, in BSE Official Directory. This is not a random sample, but should cover a substantial part of the profitable mill sector. The mills are: Arvind (Ahmedabad), Standard, Morarjee Goculdas, Bombay Dyeing, Century, Hindoostan, Jam Shri Ranjitsinghji (Solapur), Ruby, Coats Viyella (Bangalore/Madura), Simplex, Rajasthan (Banswara). Except where otherwise indicated, all are in Bombay. 2. The last row, range in investment-sales ratio, excludes Arvind Mills, an outlier. 3. Production refers to about 180 units that constitute the mill sector, all financial data refer to the 90 odd mills whose aggregated accounts appear in the BSE source.

The mill sector as a whole, therefore, appears to be shrinking rapidly, in capacity-share, in employment, and in market-share in physical output. But, note the qualifications. Short-term profit has been good, thanks to cotton, investment-rates have been higher, and attempts to globalize operations limitedly successful. Specific niches at home are being created and maintained better than before. The fall in market-share, therefore, is not the whole truth. Underlying, are at least two tendencies, (a) increasing concentration, and (b) an attempted stability in export market-share in value, by the creation of new capital-intensive options where only the mills can operate.

Observe, however, that investment rates have improved in the powerloom factories as well, in the late-1980s (Table 7). Does this reflect (a) misclassification of new corporate entrants in weaving?; or (b) that some of the powerlooms may be expanding to be able to compete in the mill enclaves?; or (c) that subcontracting between modernized mills and powerlooms still exist, but involve reequipment of the powerloom shop?; or (d) that export of generic fabrics too, which many powerlooms do export, calls for reequipment? None is implausible, especially because many factories classified as powerlooms are in fact large factories with sufficient experience in the industry. But it is hard to generalize on this point without a survey, official data fail to make distinctions within the powerloom sector.

### Product and Marketing

The mills typically describe their diversification as a move towards 'high-value-added' fabrics. This being a catch-all term, I try to give some specific examples of new product-lines. In formal wear, there has probably been a shift from women's to men's garments, and within it, from cotton to blended fibres. Blends, for solid technical reasons earlier mentioned, have been popular with the mills. There is, further, a shift from grey cloth to finished cloth, a different finish, and therefore, investment in in-house processing. Cotton usage, however, has revived via a new casual-wear market, which once again, induces a shift from grey to finished cloth, and a shift from low to higher counts. Another field has been, cloths involving different weaves, like various kinds of twills such as drills, denims or corduroys. Yet another is wider-width fabrics. Typically, the above represent markets where entry is difficult, and competition is on quality represented by trade-marks.

A move out of generic products and into branded ones implies a parallel move in marketing. In the home-market, this has meant a withdrawal from the dominant wholesale cloth market of Bombay, towards multiple contracts with what mills call 'semi-wholesalers' in different town, and for the better-off mills, establishment of exclusive outlets. This tendency was initiated by the 1982-3 strike, when powerloom cloth entrenched itself in the Bombay market. Export is a different case. During the 1980s, several reviving mills reported indirect exports, or sale of fabrics to garment exporters. This continues, but has been supplemented by direct export of fabrics and garments. Without a survey, it would be hard to generalize whether direct export is dominated by consuming country agents, supplier country agents, warehouse/stores purchases, or specific contracts with global apparel brands. Direct exports have of late been trying to reorient from quota to non-quota markets, but here again there are variations between mills.

### Other Aspects

Several profitable mills have established new units far away from Bombay, and/or trying to revive ailing mills, purchased or belonging to the group, in remote locations. The tendency has two important implications, that urban property represents an increasingly critical factor in investment decisions, and that, as far as market-prospects are concerned, the 1990s is possibly a suitable time for privatization of bankrupt government mills. But, then, at the existing political climate, demand is probably a minor consideration in the decision to privatize NTC affiliations.

Any sustained modernization involves restructuring the labour force. This aspect, in some sense the most important, is the hardest to comment on, because none of the usual sources of information including press-reports seem willing or able to comment on labour. Nevertheless, informal interviews suggest a few generalizations. How did profitable mills shed redundant labour? It is common knowledge in Bombay that most mills reopened after the 1982-3 strike with considerably reduced labour force. This was facilitated by several factors, among which was the fact that the strike ended in a disorganized chaos, rather than a planned, negotiated withdrawal. It is also

evident that bargaining-process partially decentralized into mill-level, informally if not formally, after the strike. Judging by result, this must have implied at the same time negotiations on productivity. What does modernization imply for contractual systems? In principle, one should expect some amount of retraining, efficiency-wage, investment in workers, and hence a tendency towards employment of stable rather than temporary work-force. But reports of temporary and casual employment continue. In one opinion, its proportion may have increased rather than fallen. The other side of creating a core skilled work-force is an effective retirement scheme. Press reports suggest the existence of VRS in several mills, but seemingly more successful with managerial than shopfloor cadre. One must admit, however, a complete lack of good data on any of these subjects.

### Finance and Timing

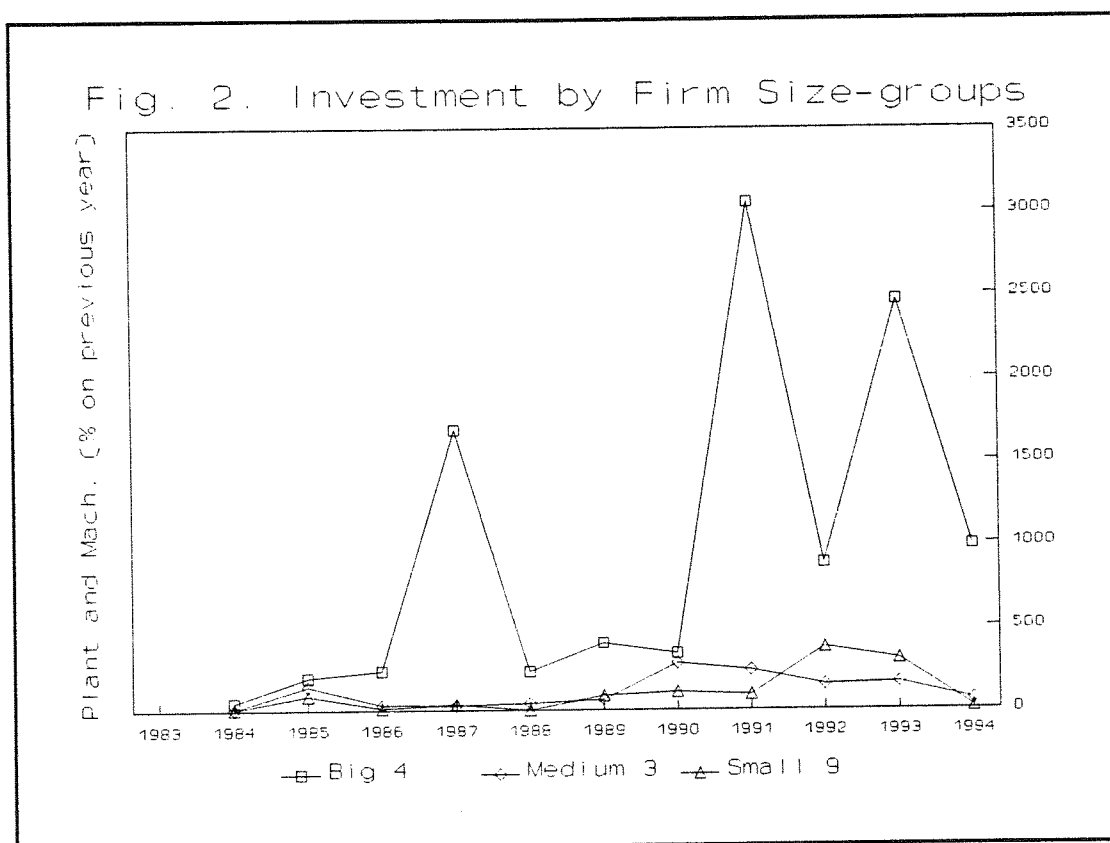
We shall argue in this section that, consistent with what one would expect in a capital-scarce economy, investment plans have not been very well-planned, but been sensitive to supply of funds. Textile modernization loan is treated as a priority by financial institutions under a special fund, subsidized between 1986 and 1990. 1986-7 did see new investment, in the larger mills. By some rule of thumb, the sums disbursed under this scheme (approximately Rs. 100-150 m a year on average) might be one-third to half of the average annual spending of the profitable mills, but very small relative to the needs of the industry. Apart from that, loans by themselves cannot meet demand for finance, for there are limits to which the debt-equity ratio can be stretched in a high-cost credit market. Therefore, episodes of investment boom have had to coincide with ease in the money market.

Before I elaborate that point, let us also observe that, if access to funds is hypothesized to vary by size, one would expect a correlation between investment and firm-size. In fact, between profitable mills, scale of investment is strongly correlated with net sales, with  $r^2$  around 0.7. Given that a part of this investment went into modernization, and not routine depreciation, and that size of investment might be correlated with quality of machinery, it is possible to suggest that access to finance influences concentration. More directly, investment rates (investment-sales ratio) are also correlated with size for the 1990s boom, though the fit of this correlation ( $r^2$  .3, variables in logs) is not strong enough to assert a relationship. These results are based only on the accounts of the profitable mills in the BSE Directory, they exclude the depressed segment which is likely to be dominated by smaller firm-size measured in sales.

The timing and scale-effects are jointly observed in Fig. 2, which present the investment series by three size-groups in which the BSE sample roughly cluster around: the big 4, or mills with annual net sales in the range Rs. 4-5 b; the medium 3, companies with sales Rs. 1.5-2 b; and small 9, those with sales less than Rs. 1 b. The graph shows that investments in the large mills have been consistently high and accelerating. For example, Bombay Dyeing's modernization involved over a decade; and Arvind's involved sustained high rates over seven to eight years. However, both companies also responded to the two discrete booms. Further, there is a leader-follower lag between large, medium and small firms, revealed in the successive occurrence of their investment peaks. The mid-1980s boom was weak for the medium-sized, and weaker still for the smaller mills.

It was the coincidence between good market and finance boom in the 1990s, which gave a decisive push to modernization in the small-sized mills. To see the difference between the two booms, it is necessary to introduce patterns of investment finance. Five sources are distinguished: net change in long-term loans, net change in equity, net change in debenture, profit retained, and depreciation allowances. Since investment as well as financing plans stretch over several years, Table 9, which reports the results, shows only the aggregates for two-three years in the course of an investment boom, nearly all of which years yield outliers for one or more of the variables. Even

so, net finances secured may not fully exhaust net investment, but be only correlated with it. Stretches of time, rather than annual data, are important for another reason. Sources of finance are strategically related, so that their dynamics are not strictly separable. For example, large increases in long-term loans and debentures, which have fixed pay-back periods not quite negotiable by the firm, tend to be followed by large net contraction, seemingly financed by increases in some other more flexible and inexpensive sources. In the typical instance during the 1990s boom, equity seems to be routinely used to retire debts. Over a stretch of time, these dynamics more or less resolve themselves, leaving us with a better idea about which sources dominated investments in the net.



**Table 9. Financing of Investments, 1985-7 and 1991-3**  
(values in Rs. m.)

Big 4					
Investment	Long-term Loans	Equity	Debenture	Profit retained	Depreciation
1985-7: 2116	663 (33.6)	83 ( 4.2)	205 (10.4)	387 (19.6)	560 (28.4)
1991-3: 6395	1767 (31.3)	668 (11.9)	3564 (63.2)	2188 (38.8)	1805 (32.0)
Medium 4					
Investment:	Long-term loans	Equity	Debenture	Profit retained	Depreciation
1985-7: 143	40 (28.0)	0 (0.0)	37 (25.9)	15 (10.5)	39 (27.3)
1991-3: 516	187 (36.2)	31 (6.0)	- 5 (-1.0)	190 (36.8)	312 (60.5)
Smaller 9					
Investment	Long-term loans	Equity	Debenture	Profit retained	Depreciation
1985-7: 88	20 (22.7)	0 ( 0.0)	20 (22.7)	- 11.5 (-13.1)	44 (50.0)
1991-3: 678	394 (58.1)	172 (25.4)	749.5 (110.5)	219 ( 32.3)	239 (35.3)

**Note:** 1. Each source expressed as percentage of investment in brackets. Totals do not necessarily add to hundred. 2. Investment is measured as net change in 'plant and machinery', from balance sheet. Profit-retained and depreciation allowance are flows from the P-L account. Loans, equity and debentures are net change from balance sheet. 3. To the 11 mills cited under Table 8, this table includes Arvind Polycot, Phoenix, Svadeshi, Victoria, Laxmi, and Piramal.

The Table shows that (a) both the investment booms involved large net changes in all the sources, and thus, an integrated financing strategy, (b) use of internal sources, profits and depreciation, is substantial in both episodes, (c) reliance on the capital market, especially debentures, was strong for the four largest firms, during both peaks, and (d) relatively, the capital market became a major source for the smaller mills in the second. In fact, in the 1990s, nearly every profitable smaller mill expanded capital. Together, the findings reinforce three points that relate to the general arguments in the paper: short-term profitability is important for investments, large mills have generally better access to cheaper finance, and that times of excess supply of funds have excessive influence on investment rates.



That much investments coincided with one such episode of excess supply is of considerable interest. The greater equity finance cannot be seen as determined by the demand for finance, for investments were delayed in most cases until the early-1990s. Besides, even in those instances where substantial internal funds could be raised, equity-base expanded anyway, which seemingly enabled easier retirement of debt. What seems to have happened in 1991-3 was the coincidence of three factors: an independent capital market boom, the staggering of the modernization process, and good profitability for about three years. The 1992 capital market boom, much maligned by opponents of financial liberalization, had a strong positive externality, it channelled a part of the excess supply of funds onto productive investments which are ordinarily perceived as high risk by the small investor. Cotton mill stocks as a rule are not coveted even at the best of times, partly reflecting the genuine risks associated with the cotton prices. It needed a speculative surge to enable or facilitate delayed investments, which can be enormous burden for a mill of average size. But having said that, it remains arguable that reliance on speculations to raise funds carries some social costs, for it implies a tendency to grab money when the going is good, and possibly some wastage thereafter. Redeployment of internally generated funds in modernization, therefore, must remain the best hope.

Until 1990, only the largest mills at least a decade into the business of overhauling could claim to have decisively improved labour-productivity (wage-share in total cost from the P-L account, steadily declined for the big mills 1985-93). The smaller and the medium-sized mills were yet to show a long-term impact of investments, whether in terms of fluctuations in wage-share according to market-conditions, or of a steady fall in the share.

## **6. Conclusion: An Assessment**

The transition in the Indian mill industry displays some, though not all, the characteristic features of textile restructuring under pressure from low-wage suppliers. These features, seen in Europe in the 1960s and especially between the oil-shocks, and in east Asia in the 1980s, include (a) modernization of fabric manufacture, (b) concentration induced by investments, and to meet environmental regulations, (c) concentration intensified by desire or enforced choice of high leverage, (d) closer contacts between textiles and apparel, fashion industries, occasionally forward integration, (e) reliance on large retailers, (f) closer collaboration between government and industry, (g) internationalization via FDI and contractual arrangements, and (h) changes in demographic profile of workers, towards younger, more female, and more diverse work-force. These features, of course, appear in varying extent between regions and countries. The Indian transition, however, raises some specific issues, mainly because the industrial context and resource-endowments in India are quite different from that in Europe or east Asia. Besides, it is an ongoing change, and much of what we can generalize must be speculative in nature. Given these qualifications, I try in this section to see what the foregoing might mean in the medium term, for the industry, and for industrialization. Towards that goal, I highlight, first, some positive features of the transition, which seem to make new investments desirable, inevitable and sustainable; and second, some negative features which might make the transition unstable or restricted.

### Return of Cotton

At the heart of the transition is a market-resurgence in cotton cloth, and in cotton India has a secure long-term comparative advantage. The return of cotton has occurred in exports, but interestingly, in the home market as well from the early-1990s, which is striking because it cannot be explained either by purchasing power or by price-ratios, and must be seen as induced by preferences, and in turn, by the new capacity created by apparel exports. It is premature to say whether the trend will sustain intense pressures on cotton price. What will sustain is the new

capacity, the expanded choice for the consumers, and a convergence between exports and home markets. That the two can converge in the course of rising export-participation, is an important generalization, and has been illustrated in other contexts,<sup>15</sup> but rather neglected in developmental discourse beset by a long habit of seeing an either/or choice between the two. The convergence may make new investment less risky. For it is easier for weaker entrants into modernization to operate and access the home market than the export market.

### End to Bankruptcy?

While the mills that have gained from market-resurgence are still relatively few, they do raise the prospect that others can perhaps follow this road out of a sickness syndrome. In other words, the market holds out better promise for the solution of one of the most serious problems created by industrial transition, depressed industry, which institutions have largely been unable to resolve. Depressed industry has remained a chronic problem for several structural reasons, for example, the difficulty of formal legal exit, because retrenchment is politically infeasible, and because pervasive asymmetric information creates too many claimants to assets of sinking firms; endemic capital scarcity, such that firms operating in high-risk areas have high probability of being rationed out of the money market, or temporary losses increase the probability of permanent bankruptcy; and exposure of depressed firms to local politics and rent-seeking. One must qualify, however, that recovery is dependent not just on markets, but on a host of real and financial plant-level inputs in which most mills are seriously deficient.

### A New Road to Industrialization?

A third positive feature is that the century-old character of inefficiency of Indian mills seems to be ending. Recent technical change can be interpreted in alternative ways. A 'neoclassical' explanation would stress on wage-disparity, as the factor that forced investments, while trade-liberalization reduced some of the costs of investment. Alternatively, it can be argued that trade-liberalization created access to a new product, high-quality cloth, in which India has a comparative advantage, and in which technology-choice is limited. Either interpretation signifies a departure from the dominant paradigm of growth for many decades, based on surplus labour and fixed wages, or the so-called 'classical' Lewisian trajectory. The great example of this trajectory is the powerloom sweatshop, and the older-vintage mills. From this, there is movement towards a scenario which in principle promises higher wages, trained labour, and higher rates of wage-increase, and of savings and investment.

One implication of this transition is that it demands a redefinition of 'large' and 'small' in Indian industry. In the two-goods view, an ideal-type 'sweatshop' specializes in one good, the one whose qualities are relatively consumer-invariant, such that demand is sensitive to price than quality, whose technology is standardized and relatively labour-intensive, and which offers small economies of scale, limited barriers to entry. The ideal-type 'corporate firm', on the other hand, produces a different good, one going to an identifiable set of consumers who demand specific quality attributes.<sup>16</sup> In fabrics, which is an intermediate, the situation usually implies capital-intensive technique and vertical integration. The relatively new apparels that are created by using these fabrics require investment in retailing, and cannot rely on wholesale markets specialized in generic goods. Mills, in this view, lost out to powerlooms not because they were high-cost producers as such, but

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<sup>15</sup> See, for an example from cotton knitwear, Cawthorne (1995), p. 50.

<sup>16</sup> The terms generic-dedicated are from Salais and Storper (1992). The sense in which it is used by me intersects, but is not identical with that in which it appears in this interesting survey.

because both were initially making generic fabrics. On the other hand, large producers exist at all because they outcompete the small in branded markets. Finally, this view interprets the typical dynamics inside the textiles as a move from generic to high-quality. While its specific form in exports may be a costly option, in a general sense, this move may happen along a wider front. The sweatshop itself may not be untouched by expanding range of products in demand. Accumulation in the powerlooms can, and seemingly do create entrepreneurs who tend to break out of the sweatshop paradigm, and try to set up brands.

A further implication is that, being a patently trade-induced move towards industrial maturity, the transition calls for a fresh look at the literature relating trade and industrial capability. Empirical works on revealed comparative advantage suggest why trade induces diversification: accumulation of capital - human and physical - can drive developing countries towards capital-intensive exports, in the absence of policy-distortions.<sup>17</sup> In particular, it is possible to see a sequence whereby a land-labour-abundant developing country starts by exporting resources, switches to export of labour-intensive manufactures (with exhaustion of resources, and/or increased savings and knowledge of alternative opportunities), further switching to capital-intensive industry (with exhaustion of surplus labour, and/or further increases in savings and knowledge). The switch from the second to the third stage is significant in several disciplines: in growth theory as a transition from Lewisian to neoclassical model, in trade as an evolution of dynamic comparative advantage, in economic history as transition from 'extensive' to 'intensive' growth.

The centrality of textiles in industrialization derives from the facts that (a) fibres constitute a basic industry irrespective of stages of development, and therefore, (b) textiles can mirror the above process of industrial maturity particularly well. To integrate textiles into the above story, we need to distinguish three types of revealed comparative advantages in textiles: raw cotton, 'generic' apparels/intermediates/machinery, 'high-quality' apparels/intermediates/machinery. Roughly, the distinction is, the former implies cloth markets which are relatively price-sensitive, and the latter markets which are quality-sensitive. Factor-substitutions can, under a realistic spread of wage-rental ratio, leave prices invariant. But rarely do they leave quality invariant.<sup>18</sup> Or, price-sensitive markets offer wide choice of techniques, but the quality-sensitive markets offer few options. In general, the way 'high quality' is understood in the world today, intermediates and machinery in that class must necessarily be highly capital-intensive, and fashion garments intensive in skilled labour and information technology. In the post-war decades, the industrial economies retreated from generic goods, east Asian NICs too did so, but after an initial accumulation based on generic goods, leaving more space in generic goods to newer developing country textile producers.<sup>19</sup> Not all of

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<sup>17</sup> See, for one example, Balassa (1979). Pure theory of trade and development, by contrast, is less interested in diversification, and mainly deals with price- rather than accumulation-effects. This is an area where a range of special models with contradictory outcomes co-exist, though more general treatments, like Findlay's depiction of an 'open dual economy', can be used to infer answers to the above question. On this (pp. 218-21), and for a survey of trade in development, see Findlay (1984).

<sup>18</sup> Cotton yarn of similar fineness can be woven on looms of 1950s vintage or of the 1990s vintage to produce cloths similarly-priced, but the market could as a rule distinguish them by quality. This happens because looms of different vintage imply short or long production runs, more or less breakages, levels of integration of processes, complementary investments in processes, and in the case of integrated mills, usually more or less standard quality in the yarn as well.

<sup>19</sup> Consequently, the trend in global trade-pattern in the recent decades display increasing intra-industry trade, see Anderson (1992).

the latter, however, are well-placed to make it to the third stage. What I wanted to demonstrate in this paper was the attempt by one old cloth-maker to now enter the third stage, from competitiveness in generic apparels to one in high-quality intermediates.

But is India well-placed to make that move? Is this path consistent with relative factor-endowments? Note that it is highly capital-intensive, and in an aggregate sense, neither is capital abundant nor labour scarce in India yet. If by 'capital' we mean many textile specific resources - mill premises, human capital, networks, contacts, brand-names, etc - then yes, the transition does use a resource in which India has an undoubted advantage. But if 'capital' means finance, the transition has some costs.

### High Cost of Capital

Finance is both rationed and expensive in India, cotton textiles is not a strong candidate in the money market in the best of times, and loom-modernization is an extremely costly process. High cost of capital, risk, and requirements, have made investment-financing dependent on internal funds and short-term profits, dependent on money market cycles, and disproportionately easier for the bigger mills which have better access to both internal and external funds. That, in turn, has increased concentration. Why worry about concentration? The Indian transition can make but small impact on the extremely competitive world market, and in the home market for what we called 'generic' cloths, mills must tread in fear of powerlooms. However, it may be suggested that brand-rents exist in the markets for high-quality cloth at home, where export and home preferences converge.

### Input Supply Constraints

The industry is evidently supply-constrained today, if it ever had been anything else. Strains in the cotton market and queues with machinery suppliers display this feature. At the current yield which is low by global standards but improving, and at average levels of stocks, India has reached a state of excess demand for raw cotton. The months before the 1994 harvest witnessed a dramatic inflation, without either preceding bad crops, or estimates for one. The factor that seems to work increasingly behind cotton prices is estimates of mill demand, which is growing at a faster rate than the crop, and possibly cotton export prospects. In either case, it is the farmers' and ginners' rational expectations of prices that seem to fuel inflation, breaking with the pre-1987 price-dynamics wherein weather and pests determined cotton prices. This is exactly how one would expect an efficient market to behave, no matter the mills' outrage at the events of 1994. Paradoxically, reforms and accent on exports have weakened an old barrier to export of raw cotton, which does not necessarily mean actual exports, but a closing of the world and domestic prices of cotton. If this situation continues, several conclusions of this study will need to be qualified very soon. Two types of intervention, however, might take shape: import of cotton and staple fibres, and direct contracting between mills and cotton growers.

### An Aside on Data-base

Finally, and as an aside, I would like to point out that the post-1985 transition calls for some adjustments in data-base on textiles. Internal changes seem to have gone so far beyond the capacity of the official information system that, precisely at the time when the most extensive changes are under way, the data-base offer little more than clichés. Let me briefly state the problem. The standard taxonomy of cloth weavers - mill, handloom and powerlooms - which had been the basis for regulating intersectoral competition, for collection and reporting of official statistics, and for both reasons, been an organizing principle in discourses on textiles and textile policy, is

becoming obsolete because of segmentation within the mills and the powerlooms. Market-shares data, in other words, are impossible to make sense of unless further segregation and more details are introduced. The most critical recent changes in cotton textiles have been firm-specific. Macroeconomic changes have elicited response which are essentially microeconomic. But this is precisely the element missing from nearly all available data-base on the industry.

### Conclusion

The study highlighted three recent tendencies in Indian cotton textiles: recovery of demand for fabrics that use cotton and of cotton as raw material, increased segmentation and specialization among producers, and the emergence of capacity in high quality fabrics. The paper further drew a connection between fabric-exports, new products, new technology, and corporate revival. Some exportable goods, it was argued, are mimicked by the home market. This leads us to hypothesize that the home and foreign markets may converge at a gradually widening front.

The main question for the future is, what are the chances that more factories will join the group which now operate at this front? On the whole, the existing institutional problems - high capital-cost, uneven distribution of plant-level resources - are likely to work towards an increasingly concentrated corporate sector. On the other hand, continuation of the market-revival can enable more mills to undertake investments, by generating short-term funds, and perhaps by creating demand for products which a partially modernized mill can serve.

### Appendix: Relative Profitability of Loom Options

To substantiate the argument that the decision to install a new loom can either imply different products, or differences in productivity, I need to show how these options compare in pure productivity terms, at current levels of technology and operational efficiency. This is illustrated by means of some benchmark estimates.

If price per yard is defined by an average-cost pricing rule, and constant mark-up rates are assumed, price per yard of cloth varies with the average cost per yard, which can be expressed as

$$[1/T.(P_k(1+r)^T) + (ppm/ppi).w.l + (ppm/ppi).m.p_m]/(ppm/ppi)$$

where ppm: picks per minute, ppi: picks per inch, ppm/ppi: productivity of loom per machine-time in metres, T: measure of machine-life, including obsolescence and depreciation,  $P_k$ : cost of loom, r: cost of capital, w: wage rate, l: labour required per machine-time, m: yarn consumed per unit of cloth,  $p_m$ : price of yarn. The crucial technical indicators of productivity are the last two, ppm, and ppi, which varies between cloth woven, and thus defines the cloth being compared between loom-types. If T, r,  $p_m$ , m, ppi, are assumed invariant to equipment, then price-per-yard changes according to productivity (ppm), cost of capital ( $P_k$ ), wages (w), and labour requirement (l), and can be written as

$$A + B.(P_k/ppm), \text{ where } A = w.l + m.p_m, \text{ and } B = 1/T.P_k(1+r)^T.ppi$$

The condition that two systems are technologically competitive is, that the price-ratio is unity, or

$$A_1 + B_1 \cdot (P_k/ppm)_1 = A_2 + B_2 \cdot (P_k/ppm)_2$$

The B's are assumed here to be equal (=B). If labour costs are also equal,

$$(P_k/ppm)_1 - (P_k/ppm)_2 = 0$$

Otherwise

$$(P_k/ppm)_1 - (P_k/ppm)_2 = (A_2 - A_1)/B$$

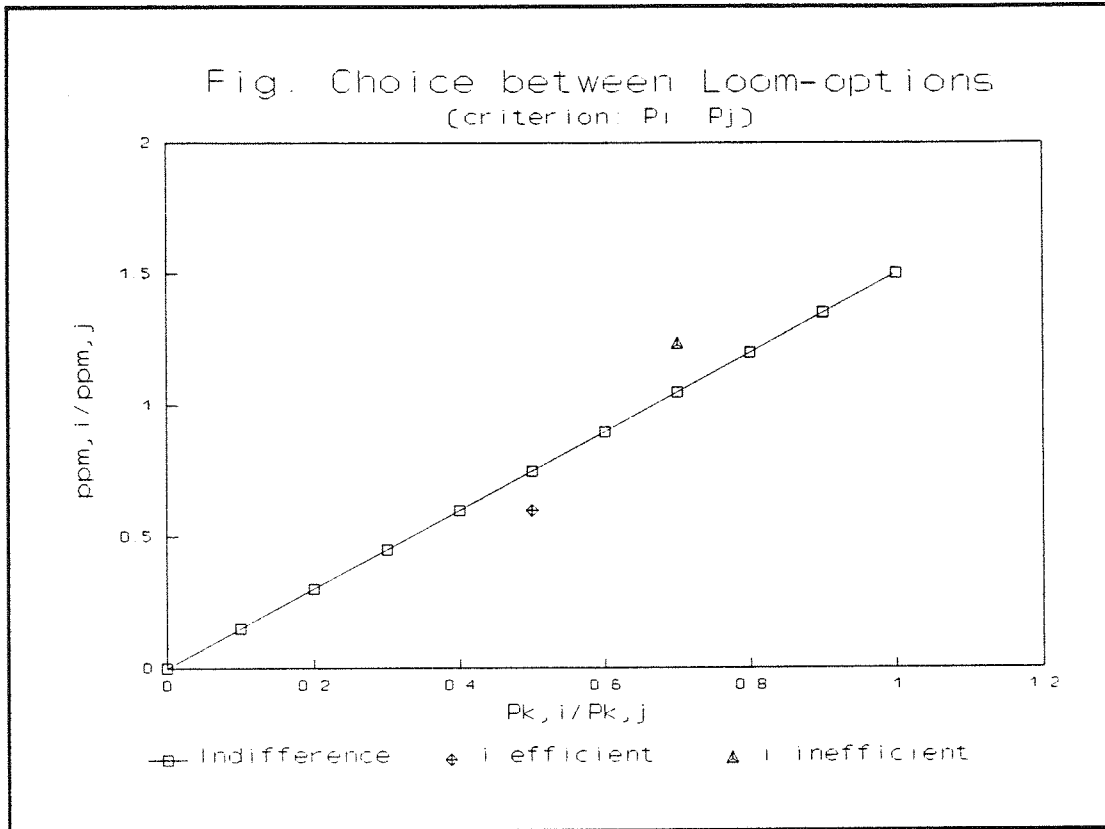
If 2 involves more labour relatively, that extra must enter as an overhead in 1's machine-cost, for prices to be equal. In either case, we obtain a linear relationship between the two critical variables, machine-cost and ppm, which equates prices. The Table below, which presents the results of the comparison, shows, in the four left-hand columns, the best-practice parameter-values, and the actual price-ratios.

Now, the productivity parameter varies widely in practice, though the engineering best-practice as of 1987-1990 are relatively well-defined.<sup>20</sup> Relative capital cost, too, can vary according to whether machinery are imported or produced at home, the existence or otherwise of a second-hand machinery market, the competitiveness of the domestic machinery sector in the presence of import-restrictions, etc. To be sensitive to these variations, The Table distinguishes between the actual parameters and outcome, and the possible parameter-ranges at which the outcome may be an indifference between loom-options. We define this band as that which corresponds to a price-ratio between 0.9 and 1.1, or the price-per-metre from one loom stays within  $\pm 10\%$  of that from its rival. After all, ex-factory price-ratio does not have to be exactly unity for production-systems to be competitive, for relative transport and sales costs can absorb some of the difference. The ratios are, for convenience in comparison of looms,  $(P_{k1}/P_{k2})$  and  $(ppm_1/ppm_2)$ , rather than  $(P_k/ppm)_{1,2}$ . The band in parameter values is shown in the figure below in relation to the line that equates prices. Parameter-values anywhere within this band are likely to imply an indifference between pairs of looms compared, in the existing line of production. The band makes the concept of loom-choice more flexible, stretches the engineering notion of best-practice, and allows for the possibility that the choice becomes keener only at significantly different parameter-values, which of course is a more realistic situation.

The Table defines the following contexts. The cloth is a 40sx40s, or roughly 70 picks per inch of constant ends and width. There are four institutional alternatives: (a) a best-practice shuttle loom mill, (b) a mill with airjet looms, (c) a mill with automatic shuttle looms, and (d) a powerloom factory, with technical coefficients identical with that of a shuttle loom mill, but wages at the ratio 1:2.5 vis-a-vis mill wage. We get this ratio from the average wages of mills and powerlooms represented in the ASI, Factories Sector. The ratio has not been too variable in the 1980s. In practice, for a large number of non-factory powerlooms, wages should be even lower, but equally, powerloom factories may also include enterprises where wages are much higher.

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<sup>20</sup> See, for a discussion on the engineering best-practice, Pack (1987).



**Table. Comparison of Pairs of Looms**

The first option in each case is i, the second j	Base Case			Band in which $P_i$ is within $\pm 10\%$ of $P_j$	
	$ppm_i/ppm_j$	$P_{k,i}/P_{k,j}$	$P_i/P_j$	$ppm_i/ppm_j$	$P_{k,i}/P_{k,j}$
Powerloom-Shuttle	1.00	1.00	.93	.69-1.00	.94-1.00
Shuttle-Airjet	.23	.21	1.15	.26- .37	.14- .19
Powerloom-Airjet	.23	.21	1.07	.22- .32	.13- .22
Powerloom-Automatic	.35	.31	1.02	.30- .45	.23- .37
Shuttle-Automatic	.35	.31	1.10	.35- .51	.22- .31
Automatic-Airjet	.67	.68	1.05	.60- .90	.48- .75

Notes: 1. Wage-ratio .40 for powerlooms against any of the other options.





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