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**The Issue of Small versus Large
in the Indian Textile Industry**

An Analytical and Historical Survey

Dipak Mazumdar

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ABSTRACT

This paper attempts a comprehensive review of the development of the handloom, powerloom and factory (mill) sectors of the Indian textile industry. Estimates of production in the three sectors are made. The evolution of economic policy towards increasing protection of the small-scale sector is outlined and the relevance of policies toward man-made fibres for the small-large issue is studied. The relative profitability of weaving cloth in the three sectors is studied in Part II within the framework of cost-benefit analysis. It is shown that while at prevailing market wage rates the powerloom sector appears to be profitable over a wide range of interest rates, at reasonable social prices of labor the profitability of this sector is much reduced. Finally, in Part III an attempt is made to evaluate some aspects of the impact of the Indian textile policy on employment, consumption of cloth exports and technological change in the large-scale factories.

EXTRACTO

En este trabajo se procura hacer una reseña general de la evolución de tres sectores --telares manuales, telares mecánicos y fábricas (tejedurías)-- de la industria textil de la India y se presentan estimaciones de su producción. Se describe la evolución de la política económica, cuya tendencia ha sido a incrementar la protección del sector de pequeña escala, y se analiza la importancia que tienen las políticas relativas a las fibras sintéticas en lo que se refiere a las operaciones de gran escala frente a las de pequeña escala. En la Parte II se examina la rentabilidad relativa del tejido de telas en los tres sectores, dentro del marco del análisis de costos-beneficios. Se demuestra que a los salarios de mercado actuales el sector de los telares mecánicos parece ser rentable si los tipos de interés se sitúan dentro de una cierta gama amplia, pero que su rentabilidad disminuye considerablemente cuando los precios sociales de la mano de obra son razonables. Finalmente, en la Parte III se procura evaluar algunos aspectos de los efectos de la política textil de la India sobre el empleo, el consumo de telas, las exportaciones y el progreso tecnológico de las fábricas de gran escala.

Le présent document tente de faire le point de la situation dans les différents secteurs de l'industrie textile indienne (métiers à tisser à bras et électriques et usines textiles) et il fournit des estimations concernant la production de chacun d'eux. Il décrit par ailleurs l'évolution de la politique économique dans le sens d'une protection accrue du secteur artisanal et examine la portée des politiques favorisant les fibres synthétiques du point de vue des rôles respectifs de la production artisanale et industrielle. La rentabilité relative des trois secteurs est étudiée dans la Deuxième partie, dans le cadre d'une analyse coûts-avantages. Il apparaît que, compte tenu des niveaux de salaires actuels sur le marché, le secteur des métiers à tisser électriques semble rentable dans les limites d'une large fourchette de taux d'intérêt mais que cette rentabilité diminue fortement si les coûts sociaux de la main-d'oeuvre atteignent un niveau raisonnable. Enfin, la Troisième partie tente d'évaluer certains effets de la politique suivie par l'Inde en matière textile sur l'emploi, la consommation de tissus, les exportations et les innovations techniques dans les grandes usines textiles.

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INTRODUCTION

The Indian policy of protection of the small-scale sector in the national economy in the post-Second World War era has been a topic of great interest to students of economic development. In this general area of policy the protection of the small scale (or "decentralized" sector, as it is called in India) in the textile industry takes pride of place, both because of importance of the industry to the Indian economy, and because it provides points of comparison with textile industries in other developing countries.

In spite of the importance of the subject, however, a compact but reasonably comprehensive review of the Indian experience on textiles does not exist. The purpose of this paper is to fill this gap.

Plan of the Paper

The paper is divided into three parts. In Part I, starting with a review of the historical evidence of the role of the small-scale sector in the Indian textile economy, an attempt is made to bring together the various elements of government policy which have had a profound impact on the development of the decentralized sector. It is shown that these effects are only partly due to the explicit policy of protection of the small scale; equally important has been the parallel but distinct policy with respect to man-made fibers. The study provides an estimate of production in the large scale and decentralized sectors - and within the latter in the two distinct branches, the handlooms and powerlooms. Part II is concerned with a static cost-benefit analysis of the weaving technology in the three sectors. The analysis makes use of a special survey of handloom and powerloom units in a textile town of Uttar Pradesh, called Mau. The importance of the wage

differential between the three sectors is stressed in the finding that the powerloom sector shows higher private profitability in the weaving of medium-grade cloth. The social profitability of powerlooms appears to be much less when we use shadow wages.

Static cost-benefit analysis does not help us to evaluate the welfare aspects of changes over time of key economic variables like consumption, employment, exports, etc. Nor does it throw light on the response of the large-scale textile mills to government policy of protecting the small-scale. The approach here has to be much more ad hoc in the absence of a simple theoretical framework like that of project evaluation. Some of the more important aspects are discussed in Part III.

The Three Sectors

The handloom industry is the oldest industry of the country, and provides employment to a large number of people. Different types of handloom are used, but the most common is the fly-shuttle pit loom. Although some factories or karkhanas accommodating a large number of handlooms exist, the vast majority of handlooms are small units mostly located in the household premises of the weavers. Generally they have relationships with master weavers who provide them with the raw material (yarn), and help with the marketing of the product.

The powerloom industry started in the early part of the century when some handloom weavers set up small factories with second hand non-automatic looms sold off by the mills. But the rapid growth of the powerloom industry is really a post 1950 phenomenon. It has been in response to the textile policy pursued by the Government of India which is discussed in greater detail below. Some powerloom units are operated solely by household labor, but this

is rather a rare form of organization. Much the most common type is for powerlooms to be operated by hired labor with members of the owners' family sometimes participating in the production process. Some instances of powerlooms being rented out to a group of workers have also been known.

Legally, powerlooms are distinguished from mills because they enjoyed exemption from excise taxes provided the number of looms in a single unit did not exceed four. However, this maximum limit has been widely violated. In any event, although powerlooms are supposed to obtain license from the government before they can operate, unauthorized powerlooms have mushroomed in recent years. Although the number of looms in a powerloom enterprise generally tends to be much less than in a factory, a few powerloom units might have a similar capacity in terms of loom size as small factories. For such units, the only distinction between powerlooms and factories would be that the latter are legally covered by the Factory Act (which applies to all units employing 10 or more workers and using power).

Another point to emphasize is that although powerlooms make use of second-hand looms, in recent years non-automatic looms are being produced extensively specifically for the powerlooms. They range in their degree of sophistication, but have generally less automatic features than looms produced for the factories.

The large-scale textile industry has had a difficult history in the last two decades and a large number of mostly smaller mills went into bankruptcy. They were in many cases taken over by the government and have been subjected to a policy of retooling and modernization. Such mills (now under the umbrella of the National Textile Commissioner) came to be known as

sick mills which accounted for around 20 percent of the entire large-scale sector of the Indian textile industry.

It should be remembered that the three sectors referred to above are only concerned with the weaving industry. Technology in spinning has made much greater progress in the mechanical age, so that there is very little of spinning done in the small-scale sector (in spite of some attempts at helping domestic spinning in parts of the country). The handlooms and powerlooms as much as the mills obtain their supply of yarn from the large-scale spinning or composite spinning-weaving mills.

PART I

THE EVOLUTION OF THE THREE SECTORS OF THE INDUSTRY
AND THE POLICY OF PRODUCTION OF THE SMALL-SCALE

SECTION 1

Production in the Small and Large Sectors, 1900-39

There are no direct data on the amount or value of cloth produced in the three sectors. They have to be estimated from statistics on the production of yarn. The amount of yarn produced each year in the country is known by the nature of its use -- consumed by large scale mills for further production, exported, and available for "civil consumption." The last item gives a measure of the amount of raw material used by the small-scale or "decentralized" sector including handlooms and powerlooms. The Indian Textile Bulletin has been providing estimates of cloth produced in the decentralized sector on the assumption that (a) 90 percent of civil yarn deliveries are consumed by handlooms and powerlooms and (b) on an average one (1) kg. of yarn is used to produce 10 meters of cloth. Before the Second World War the powerloom sector was not of much importance, hence the output from the decentralized sector was that of handlooms.

The figures on the quantities of cotton cloth consumed in India in the four decades before the Second World War are brought together in Table I.1. The outstanding fact revealed by these figures - which could be of some surprise to non-specialists -- was the importance of handlooms in the supply of cloth to the Indian economy through out this period. It is not just that handlooms held their own against competition both from imports and the expanding domestic mill-industry. Handlooms continued to grow, and provided a significant share of the increase in cotton cloth consumed by the Indian population.

Table I.1: PRODUCTION AND AVAILABILITY OF COTTON CLOTH, 1900-39
(Million Yards)

Years	Indian Mills	Handlooms	Imports	Total	Exports
1900-1903	482.8	792.8	1,967.7	3,243.3	113.3
1912-1915	1,187.0	1,048.5	2,738.7	4,974.2	121.7
1918-1920	1,575.8	712.4	1,132.0	3,420.2	220.0
1927-1930	2,195.6	1,155.5	1,916.3	5,267.4	171.7
1936-1939	3,629.6	1,420.5	654.7	5,704.8	173.3
<u>Change in Production between:</u>					
1900-1915	+704.2	+255.7	+771.0	+1,730.9	+8.4
1917-1939	+2,058.8	+708.1	-477.3	2,284.6	-46.7

Sources: A.K. Bagchi, Private Investment in India, 1900-1939, Cambridge, 1975, Table 7.1, pp. 226-7. The original sources for the figures of production in mills and handlooms are derived from Report of the Fact-Finding Committee (Handloom and Mills), Delhi, 1942. The estimates of production of cloth in the two sectors have been made on the basis of conversion factors of yarn into cloth: one lb. of yarn = 4 yds. of cloth (handloom) = 4.78 yds. of cloth (mills).

The original sources for the figures on Imports and Exports are from the Indian Tariff Board, Reports on the Cotton Textile Industry, (Delhi: 1972, 1932 and 1936), and Government of India Commercial Intelligence and Statistics Dept., Statistics of British India, (Calcutta, annual).

In the period up to the First World War the very large increase in the consumption of cotton cloth in India (rather more than 50 percent of the level at the beginning of the century) was satisfied by imports, the mills and the handlooms to the extent of 44, 40 and 16 percent, respectively. Handlooms in this period did enjoy a small amount of (unintended) fiscal protection. In 1896 an excise duty of 3-1/2 percent on Indian mill-made cloth was imposed to offset the duty of 3-1/2 percent imposed on imported cotton price goods for revenue purposes. (This duty was abolished in 1925). On the other hand, efforts at improving the technology of handloom weaving were confined largely to private organizations. For example, it was generally recognized that fitting a fly-shuttle sley to the ordinary pitloom increased the productivity of handlooms by 50-100 percent. But as late as 1942 the Fact Finding Committee of 1942 found that out of a total of two million handlooms in India, about 64 percent were throw-shuttle looms, and only 35 percent fly-shuttle looms. 1/

The nature of direct competition between handlooms on the one hand, and mills and imports on the other, in the first decades of the 20th century have not yet been researched. But it is likely that the specialization of handloom in coarse cloth (using yarn of less than 10s count) which we notice in later years (see below) probably accounts for a good proportion of the factors responsible for this sector playing a significant role in the increase in cloth consumption of this period.

1/ Government of India, Report of the Fact-Finding Committee (Handloom and Mills), Delhi, 1942, p. 31.

The First World War and the years immediately following it saw a remarkable drop in the availability of cloth in India, such that the level of consumption (in quantity) in 1917-20 nearly fell back to the level of the years at the beginning of the century. The years of the Second World War saw a similar marked fall in cloth consumption. Such adjustments in consumption are spectacular features of the war economy of a country like India. As can be seen from the figures of Table I.1, while imports took the brunt of the fall in cloth consumption, handlooms also shared in (or contributed to) the decline. It is only the mill sector which increased its supply of cotton cloth to the Indian market -- and it did so very strikingly with a 40 percent jump in production between the years 1912-15 and 1917-20. In 1917-20, handlooms accounted for 22 percent of total cloth consumption, mills 50 percent, and imports 28 percent.

In the absence of detailed research we can again only speculate about the decline of handloom production during the war years. Most likely the crucial factor was the supply of raw materials -- viz cotton yarn. The war-induced fall in the import of yarn in the higher counts clearly affected the class of handloom products directly which made use of finer yarn. (The Indian spinning mills in the first three decades of the century were heavily specialized in the production of coarse yarn of under 20s count). At the same time the shortage of cloth in the economy meant that it became more profitable for composite mills to make more use of the yarn in their own weaving sheds rather than sell it to the handloom sector.

The period of recovery and growth of cloth consumption in the inter-war years again showed that handlooms had a significant role to play in the supply of cloth to the Indian economy -- though a quantitatively smaller role

than the mill sector. A new actor entered the scene in this period -- protection against imported cotton cloth. The major factor in the policy of protection gradually accorded to the Indian textile industry was the rise of Japan as a big exporter of cotton cloth. Import of piece goods from Japan started during the war years and became increasingly important in the 'twenties, accounting for a third of total imports in 1928-9. Initially the import duty was used as a budgetary weapon rather than a protectionist device against the growing Japanese imports. By the end of the 'twenties, however, protection of the Indian textile industry became a declared objective of tariff policy. Import duties were increased several times in 1930 and 1931 ending up at the end of 1931 at rates of 25 percent and 31.25 percent, respectively, on British and non-British goods. The depreciation of the Japanese yen in the 'thirties threatened to overcome this tariff policy, so that quantitative restrictions had to be resorted to by the Government of India following a trade conference involving the Japanese.

The upshot of these developments was that, as shown in Table I.1, the quantity of cloth imports into India fell by 477 million yards. Of the total increase in cloth production of 2,300 million yards by the Indian industry in the inter-war years, as much as 30 percent was supplied by the handloom, and the remaining 70 percent by the mills. It is clear that the handlooms benefitted from the policy of protection from imported piece goods along with the mill industry, though the latter took the bigger share of the market created by the trade barriers. The relatively low productivity (and higher labor costs) of the Indian mill-industry, which made it incapable of survival in open competition with Japanese factories, also allowed the handlooms to continue to play a substantial role in the Indian weaving industry. It might

be mentioned in this connection that Japan also had a substantial handloom sector until after the First World War. It was the spectacular increase in productivity in the Japanese mills, particularly in the latter half of the 1920's, which caused the handlooms in Japan to go into rapid decline after the War.

SECTION 2

Outline of Government Policy on Cotton Textile After World War II

As during the First World War availability of cloth in the Indian economy was severely reduced during World War II. As can be seen from Table I.1, the import of cloth in India in 1936-39 accounted for a little more than 10 percent of the total of 5.5 thousand million yards consumed. The virtual shutting out of this import together with some fall in domestic production led to a reduction of nearly one thousand million meters of cloth consumed in 1951 compared to the level of the pre-war years. After Independence, the Indian government pursued a policy of import substitution in the textile industry, with quantitative restrictions on the import of cloth. The immediate post-Independence years, therefore, saw a rapid expansion of cloth production in India. It is seen from the figures given in Table I.2 that cloth production in Indian mills increased by more than a thousand million meters in the five-year period 1951-56. That is to say, the void left by the cut-off of imports, and the shortages of the World War II period, was more than made up by increased production in the early 'fifties in the mill sector. The handlooms also shared in the increased production. While the proportion of production in the decentralized sector had gone down from 24 to 21 percent between the late 'thirties and 1951, it had bounded back to 25.5 percent in 1956.

Protection of the Handloom Industry

The post-Independence textile policy, however, introduced for the first time the reality of the protection of the small-scale in India vis-a-vis

Table I.2: TOTAL PRODUCTION OF COTTON CLOTH, 1951-81

Calendar Year	Mill Cloth (million meters)	Percentage of total cloth production	Total cloth production (million meters)	Percentage of cloth production in handloom and powerlooms
1951	3,727	78.6	4,740	21.4
1956	4,852	74.5	6,515	25.5
1961	4,701	66.4	7,073	33.6
1966	4,239	57.8	7,336	42.2
1971	3,957	53.8	7,356	46.2
1976	3,881	48.9	7,945	51.1
1979	3,206	42.5	7,540	57.5
1981	3,147	38.8	7,973	61.2

Source: Handbook of Statistics of Cotton Textile Industry, Indian Cotton Mills Federation, Bombay, 1982, Table 14, p. 31.

the large scale (as opposed to the conception which had been in the air for sometime). The two principal instruments in the policy of protection are: (i) the physical restriction on the output of the mill sector and (ii) the excise duty imposed on this sector.

(i) The suggestion that certain fields of production should be reserved for the handlooms was made as early as 1932 in the case presented to the Tariff Board Enquiry favoring the grant of protection to the textile industry. The Tariff Board gave reasons to show that the issue of reservation was full of difficulties but recommended that the large-scale industry should "regard it as an essential obligation arising from the grant of protection to refrain from entering into unfair competition with the handloom industry so as not to impair its relative position." 1/

No action was taken, but the issue was a constant element in the discussion of public policy during the ensuing years. It was after Independence that the Government of India directed the reservation of certain areas of production for the handloom and prohibited their manufacture by mills from June 30, 1950. The reservation was on a generous scale. 2/

The policy of protecting the handlooms was further developed at the initiation of the Second Five-Year Plan. It took a theoretical justification from a model of industrialization which was articulated by Professor P.C. Mahalonobis in particular. The crux of the "model" was that

1/ Government of India, Report of the Indian Tariff Board Regarding the Grant of Protection to the Cotton Textile Industry.

2/ It covered a variety of commonly used fabric ranging from dhoties and sarees to bedcovers and towels. See V.B. Kulkarni, History of the Indian Cotton Textile Industry, Bombay, 1979, p. 178.

investment resources should be heavily devoted to building up heavy industry (e.g. steel) while the need for consumption goods during the period of growth of capital goods industries should be met by the existing capacity in the small-scale sector which was presumably underutilized. In this way scarce resources for new capital formation would be saved for strengthening the industrial infrastructure of the economy. The build up of the capital goods sector of large scale industry would, however, make sense only if it provided opportunities for increased supply of machines to produce consumer goods (including textiles) sometime in the future. The models of planned development in the Indian discussion of this period did not directly address the question how and when the transition from small to large scale production in the consumer goods sector was supposed to take place.

Be that as it may, the Government of India banned the installation of new looms by large-scale factories in 1956. Since then mills have been allowed to buy looms only for replacement or for export production.

(ii) A second instrument of discrimination against the mill sector has been the excise duty. The handlooms are exempt from this duty, as are powerlooms units with four or less looms. Throughout the post-Independence period the excise duty has been partly seen as a consumption tax, and has been "progressive" in the sense that a higher rate has been imposed on the finer varieties of mill cloth.

The effective rates of tax in the different sectors for different varieties of cloth cannot, however, be judged from the relative levels of tax on the final product alone. For one thing, the ratio of value added to gross value will be different for the different sectors and types. Secondly, taxes are levied on a variety of inputs -- raw cotton, cotton yarn, chemicals, fuel,

etc. -- used by all three sectors. Handlooms bear the burden of some of these taxes along with powerlooms and mills -- to varying degrees. Murty and Stern have produced estimates of the effective rates of tax (in 1973-74) through a detailed study of the input-output structure and the large number of taxes involved. According to their calculations in the fine and superfine varieties (using 34 and above counts of yarn), the effective rate of tax is in the expected direction. As a percentage of the rate on mills, it is around 70 for powerlooms and 45 for handlooms. But in coarser varieties (using 29 or less count-groups of yarn), the burden on handlooms is almost the same as for powerlooms (which still works out as 70 percent of the effective rate on mills). 1/

The relative effective rates of tax, then, do not fully explain the rough specialization by the three sectors in different grades of cloth. As we will see in detail in the next section, handlooms do specialize to some extent in fine varieties where the tax differential favors them most, but so do they in coarse cloth where the differential is least. At the same time, mills have found it easier for technical and marketing reasons to leave much of the production of coarse cloth to the decentralized sector (both powerlooms and handlooms). This important aspect of technological change in recent years in the textile industry is discussed more fully in Part III.

This effect on the production structure threatened to create shortage of coarse cloth at a price which poor consumers could afford at various periods of the post-war history. The government tried to counter this problem

1/ M.N. Murty and N.H. Stern, "Price and Tax Policies for Cotton Textiles in India", mimeo, Delhi, October 1982, Table 5.7, p. 89.

through another important instrument of textile policy - the direction to the mill sector that a certain proportion of the mill output should consist of coarse cloth which had to be sold at or below a controlled maximum price. This policy was pursued with varying intensity in the years between 1965 and 1978. One effect of this policy was to impose serious financial burden on the weaker mills and was clearly a factor in what became known as the "sick mill problem", with a large number of mills going bankrupt at regular intervals. The problem of sick mills has led to another facet of the textile policy -- the taking over of the bankrupt mills by the government which used them to produce the bulk of the cheap mill cloth for sale. The nationalized sector of the mill industry -- specializing in the production of coarse cloth -- has become quite large, accounting for perhaps a third of the total number of factories in the large scale cotton textile sector. It is clear that the policy of production of subsidized coarse cloth in the nationalized mills runs counter to some extent to the policy of protection of handlooms insofar as the latter supply a large share of the output of coarse cloth. The quantitative importance of this particular effect has not yet been analyzed.

The Question of the Powerloom Sector

It is now necessary to bring into the discussion the development of the powerloom sector which has played such an important role in the post-World War II development of the textile industry. The powerloom industry had established itself as an industry with a future even before and during the Second World War. Thus the high-level Fact-Finding Committee (Handloom and Mills) of 1942 put on record its view that the markets lost by the handlooms were annexed not by the organized sector but their new rivals, the powerlooms. At first the powerlooms were installed in the handloom sector by

the weavers themselves to improve their earnings, but later they grew with amazing rapidity under the ownership of outsiders. In the Bombay Province, for instance, there were barely 2,500 powerlooms in 1939, but in two years their number rose to 6,400. The Committee estimated that there were 15,000 powerlooms in the country and said that their number was growing daily. 1/

The post-war policy of protection of the handlooms at first had the effect of protecting the powerlooms as well. The quantitative restriction and excise duties were applied to the mill industry only. In fact, during the early years of the new policy of protection of the small-scale, an influential body of opinion was looking upon the powerlooms rather than the handlooms as the major feature of the decentralized sector of the textile industry in India in the medium-term future. The most important report on this question was that of the Kanungo Committee, submitted to the Government of India in 1954. The substance of the recommendation of the Kanungo Committee is best summarized in the following paragraph from the study of the industry by V.B. Kulkarni: 2/

The essence of the Kanungo Committee's proposals was its conversion scheme. It considered that for ordinary cloth "the prime and simple handloom is and must be a relatively inefficient tool of production." Except in the case of those piece goods which required an "intricate body pattern" there appeared "to be no variety of fabric which the handloom industry could produce in better quality or at a lower price (consistent with a reasonable wage being paid to the handloom weaver and his assistants) as compared to the mill industry." The Committee noticed that there were many powerloom centers such as Ichal Karanji, Malegaon,

1/ V.B. Kulkarni, op. cit., summarizing the findings on this point of the Report of the Fact-Finding Committee (Government of India, 1942).

2/ Ibid., pp. 181-82, citing Government of India: Report of the Textile Enquiry Committee, September 1954. The quotations within the passage cited refer to paragraphs 75 and 81 respectively in the above report.

Bhiwandi, Surat and Cambay which were at one time the strongholds of the handloom sector... Evidently the Committee wanted this process to be hastened through organized effort. It accordingly recommended that the handloom industry should be "technically more efficient by converting the handloom either into a semi-automatic loom and/or into a powerloom, as power becomes available more generally in areas where the handloom industry is widely prevalent."

This view of the role of powerlooms in the coming years was not shared by another body of opinion which was more devoted to the cause of handlooms. This point of view was forcefully put forward by another Committee under the chairmanship of Professor D.G. Karve which was appointed by the Planning Commission while the Kanungo Committee recommendations were still being considered by the government. This Committee suggested that the weaving capacities of both the mills and the powerloom sectors should be frozen at their existing levels. It went even further by recommending that efforts should be made to build up the production capacity of spinning as well in the non-mechanical sector. This was the basis for the government's brief honeymoon with the policy of promoting a new type of hand spinning machine -- the Ambar Charkha. As far as weaving was concerned, the final policy for the Second Five-Year Plan favored only a small role to powerlooms (an additional 35,000 looms producing only about 10 percent of the additional output was envisaged). Mills were to be allowed expansion only for the export sector with the help of newly installed automatic looms. The bulk of the new production of cloth was expected to come from handlooms.

The translation of the government's declared objective to actual policy has, however, been much less effective for powerlooms than for the mills.

First, the two instruments of control on mill-made cloth -- the excise duty, and the reservation of specified lines of production for the decentralized sector -- were not applied to powerloom units employing less than five looms until 1974.

Secondly, the lines of production prohibited have always been a much longer list for mills than for powerlooms. At the same time, as we have seen, the excise duty has been much heavier on mill cloth.

Thirdly, and probably most importantly, although powerlooms (like new loom capacity created in the mills) are supposed to be set up only after a license has been granted by the government, the government's ability to enforce this policy has been meagre. "Unauthorized" powerlooms have mushroomed all over the country. Sometimes they are nominally broken up into units of less than five workers to give some legal validity to their evading the heavier controls and duties on units of larger sizes.

SECTION 3

Production of Cloth in the Large and Small Sectors (1951-1979)

Total Production of Cloth

No definite estimate of production of cotton cloth is available for either the powerloom or the handloom sectors. The amount of yarn produced by the mills and sold for "civil consumption" is the only definite statistics. The Indian Textile Bulletin produces a series for the production of cotton cloth in the decentralized sector (i.e. outside the mills) on the assumption that (a) 90 percent of civil yarn deliveries are consumed by the two industries; and (b) an average one (1) kg. of yarn is used to produce 10 meters of cloth. The figures of cloth production estimated in this way for the decentralized sector as a whole and the known figures of production of cloth by mills are given in Table I.2. They show the extraordinarily high growth of production in handloom and powerloom (taken together) in the post-World War II period relative to the mill sector. In fact, the only sub-period in which the mills were able to increase their production was the First Plan period during which the decline of the level of production of cotton cloth during the war years was more than made up. In 1956 total cloth production in India was higher by about 20 percent compared to the level just before the war, and the mills reached their highest level of production, although the share of the decentralized sector in total production had already started to increase. Since 1956 there has been a continuous decline in the absolute quantity of cloth produced by mills, until at the end of the 'seventies mill production was only two-thirds of what it was in 1956. The total quantity of

cotton cloth produced has continued to increase in this period, as the decentralized sector has stepped in a big way to increase its share of total production from 25 to 57 per cent. But the rate of growth of the total quantity of cotton cloth produced has been much slower than in earlier periods. No direct or immediate link should, however, be established between the increasingly important role of the decentralized sector in meeting the demand for cotton cloth, and the slow growth of production. Many other factors are involved in the latter phenomenon, notably the growth of the man-made fiber industry. Some attempt to underline the more important of these factors is made in a later section.

The Relative Importance of Handlooms and Powerlooms

The task of estimating production separately in handlooms and powerlooms is even harder than that of arriving at a figure of total production in the decentralized sector. A first attempt at this estimate was made by M. Padmanabhan for the years between 1956 and 1963 "based on such factors as the increase in the number of powerlooms, pattern of cloth production in the two-industries, level of yarn consumption by them, etc.". ^{1/} More detailed data on yarn delivered for "civil consumption" has been published in the Indian Textile Bulletin since 1968. These statistics give details of yarn supply by "form" as well as by count-groups. It is generally believed that yarn which is supplied in the form of hanks is used by handlooms. This is the major information which provides a clue to the production of cloth by the handloom sector. However, it is known that

^{1/} M. Padmanabhan, "Estimates of Production by Handlooms and Powerlooms", Indian Textile Bulletin, August 1956.

powerlooms do use same yarn in hank form, particularly in the production of colored sarees. On the basis of a field study in Maharashtra, Padmanabhan found about 7 percent of yarn supplied in hank form was used by powerlooms. Padmanabhan was also able to provide a more refined estimate of production in the three sectors by allowing for the different yarn to cloth ratio in different count groups of yarn supplied to the decentralized sector. Based on past studies he assumed that 8, 10 and 15 meters of cloth are produced from one (1) kg, of yarn in the 1-20, 21-40 and 40 and above count-groups of yarn. Padmanabhan's estimate of cloth production in the three sectors was made on the basis of the above principles for the period up to 1971. We have extended the estimate to 1981 on the basis of the same methodology, and the information published by the Indian Cotton Mills Federation. The data for the entire post-World War II period are presented in Table I.3. The table shows the growing influence of powerlooms in the production of cotton cloth in the Indian economy in the last two decades. In fact, throughout the 'sixties and 'seventies, most of the additional production in the decentralized sector has been due to powerlooms. Taken in conjunction with the data given in Table I.2, it would seem that at the beginning of the 'eighties handlooms, powerlooms, and the mill sector accounted for 29, 32 and 39 percent, respectively, of the total quantity of cotton cloth produced.

The estimate is, of course, as described above based on rough procedures. In particular, the assumption that most of the yarn supplied in hank form is used by handlooms would seem to be a fairly loose one.

Distribution of Cloth By Count-Groups in Three Sectors

A question of great importance is the share of coarse and fine cloth produced in the three sectors. The indication of the degree of coarseness is

Table I.3: ESTIMATES OF PRODUCTION IN HANDLOOMS AND POWERLOOMS,
1956-81 (Million Meters)

Year	Handlooms	Powerlooms	Total
1956	1,379 (84)	255 (16)	1,634
1960	1,527 (72)	606 (28)	2,133
1963	1,891 (66)	985 (34)	2,876
1968	2,050 (58)	1,480 (42)	3,530
1971	1,770 (52)	1,630 (48)	3,400
1979	2,063 (44)	2,270 (53)	4,334
1981	2,253 (45)	2,720 (55)	4,973

Source: For 1956-71, calculation made by M. Padmanabhan, "Estimates of Production by Handlooms and Powerlooms", Indian Textile Bulletin, August 1975; and "The Sick Mill Problem in the Indian Cotton Textile Industry", Ph.D., Bombay, 1974, pp. 360-63; for 1979, calculated from data given in the Handbook of Statistics (ICMF), 1980 and following the method of Padmanabhan.

provided by the counts of yarn used in the production of the particular type of cloth. As already mentioned since 1968 figures are being published showing (a) the total quantity of yarn available for civil consumption (i.e. in the decentralized sector, (b) the total quantity of yarn in hank form (consumed mostly by the handlooms), and (c) the total quantity of yarn consumed by mills -- all broken down by broad count-groups. It is, therefore, possible to construct for the 1970's percentage distribution of count-groups of yarn consumed by the three sectors. These data are given in Table I.4. The table includes another important set of figures for 1942 giving the distribution for mills and handlooms constructed specially for the Fact-Finding Commission. (Powerlooms were unimportant at this date).

Looking first at the picture for 1979, the following points stand out:

- a. Handlooms produce a considerable proportion of their total output in the very coarse variety (10s count and less), much more so than either mills or powerlooms.
- b. Both powerlooms and handlooms have a proportionately higher share of the output of very fine cloth (higher than 40s count) compared to the mills. Powerlooms also have a major share of their output in the "finer than medium" count group, 31s-40s.
- c. The major share of the mill output is in the medium (21s-30s) and the "coarser than medium" (11-20s) count groups.

Some rough specialiation by sector thus does seem to emerge with handlooms concentrating in the coarser types of cloth, mills in the medium and the powerloom in the finer types. A word of caution should, however, be entered here. The strength of the cloth produced depends not only on the

Table I.4: PERCENTAGE DISTRIBUTION OF THE TOTAL QUANTITY OF YARN CONSUMED
IN DIFFERENT SECTORS BY COUNT-GROUPS, 1942-1979

Count Groups	1942		1970			1975			1979		
	Mills	Hand- loom	Mills	Power- loom	Hand- loom	Mills	Power- loom	Hand- loom	Mills	Power- loom	Hand- loom
1s-10s	8.1	20.0	8.4	3.9	27.2	5.9	6.0	24.8	10.7	8.7	24.1
11s-20s	49.6	34.4	26.5	20.8	31.1	28.7	23.5	37.0	34.1	18.2	33.2
21s-30s	25.7	19.6	39.3	23.6	13.6	38.0	22.0	9.2	37.3	21.3	13.8
31s-40s	11.6	14.2	19.7	21.9	15.8	20.9	22.0	15.6	18.2	32.4	15.5
40s	<u>5.0</u>	<u>11.8</u>	<u>6.5</u>	<u>29.8</u>	<u>12.3</u>	<u>6.6</u>	<u>26.5</u>	<u>13.5</u>	<u>4.5</u>	<u>19.4</u>	<u>13.4</u>
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: Civil deliveries of yarn in hank form are considered to be consumed by the handloom sector; the rest by the powerloom.

Source: 1942, Report of the Fact-Finding Committee.
1970, 1975 Indian Textile Bulletin, Annual Number 1976.
1979, Handbook of Statistics, ICMF, 1980.

count of yarn used, but also on the closeness of the weave. Some reference to this point is made in Section 4 when we look specifically at the adjustments made in the mill sector in response to the post-World War II textile policy.

Let us now consider changes in the count-wise distribution over time. Little change seems to have taken place in the decade of the 'seventies. The only point which remotely strikes one as perhaps being indicative of a perceptible trend is the increase in the share of the "finer than medium" (31s-40s) count group within the powerloom sector at the expense of the "fine" group of above 40s count.

More interesting is the comparison of the distribution of 1942 with that of the 'seventies. The pattern of production in the handloom sector has not changed very much. But it is clear that mills have "gone finer". Between 1942 and 1979 there has been a reallocation of 15 percentage points from the 11-20s count-group to the 21s-30s and 31s-40s count-groups. As already mentioned earlier, a large proportion of the output of the increasingly important powerloom sector is in the finer count-groups. These trends therefore reflect a major change in the pattern of consumption of cloth in India. Much more finer cloth is being consumed now compared to the situation in the early 'forties -- and the more mechanized sector, including mills and powerlooms, has been in the vanguard of this change.

Man-Made Fibers Policy and Trends

It is now time to bring into the picture the other major development in the textile scene of the post-World War II period -- second only to the development of the powerloom sector. It is well known that in the world economy man-made fibers and blended fabrics have made great strides at the expense of pure cotton products. It is estimated that the share of man-made

fibers in total cloth production is probably as much as 50 percent in the world today. The synthetics and blended fabrics have been, comparatively speaking, new-comers to the Indian scene. The data on production of cotton and non-cotton fabrics are brought together in Table I.5. It shows the strong increase in non-cotton fabrics in the last decade -- increasing from about 10 percent in 1968 (in quantity) to around 30 percent in 1979.

The development of man-made fibers in India has been like the rest of the textile industry, severely affected by government policies. From the point of view of the present study of the large-small issue, two elements of the government policy are of particular significance: (a) the package of policies which sought to encourage the production of man-made fibers in the small scale sector as much as in the cotton industry; and (b) the system of taxes and physical controls which has tended to dampen down the growth of man-made fiber demand and has indirectly had an impact on the role of the small-scale sector in the textile industry as a whole.

Let us first deal with the rationale and instruments of government policy seeking to discourage the growth of the man-made fiber industry. The basic motivation for this bulk of policies has been the desire to protect the agricultural sector producing raw cotton. The underlying assumption has been that the alternative use of land developed to producing cotton has low productivity (cotton being grown on special types of land suitable for monoculture), and a significant reduction in the production of cotton cloth will have adverse effects on small farmers in the raw cotton sector.

This concern for preserving the agricultural base of the raw material for producing cloth carried over into the government policy with respect to the two major types of man-made fibres available for the manufacture of cloth

Table I.5: PRODUCTION OF MAN-MADE FIBERS/FILAMENT YARNS
(Million kg.)

Year	Staple Fiber				Filament Yarn				
	Viscose	Acetate	Polyester	Total	Viscose	Acetate	Nylon	Polyester	Total
1951	-	-	-	0	2.5	-	-	-	2.5
1956	7.9	-	-	7.9	7.6	1.4	-	-	9.0
1965	37.2	-	1.4	38.6	35.2	2.0	1.5	-	38.7
1975	66.8	0.3	14.3	81.4	33.1	1.9	13.4	2.5	50.9
1981	93.4	0.3	26.7	120.4	40.2	1.5	21.7	15.1	78.6

Note: Viscose (cellulosic) fiber is based on forest products; polyester, nylon and acetate are petroleum bond products. Filament is a continuous strand of yarn which can be used directly on the looms; while in the case of fiber, it has to be spun in the same manner as cotton fibers.

Source: Handbook of Statistics (ICMF, 1982, Table 35, p. 51).

-- viscose and polyester. Viscose yarn is based on forestry products. The implicit assumption of government policy has been that the opportunity cost of growing trees in the Indian economy is close to zero -- or at least much lower than that of producing petroleum which is the basic raw material needed to produce polyester yarn. Thus although there has always been fiscal disincentives to the production of viscose it has never been of the magnitude imposed on polyester.

Viscose was the first to arrive in the Indian textile scene, and continues to be more important today in spite of the relative growth of polyester and near-substitutes of polyester (see Table I.5). It has built up a political lobby -- in much the same way as there has always been a cotton lobby -- so that the burden of fiscal discrimination has fallen disproportionately on polyester. In the international market, there is not much difference in the price of polyester and viscose fibres, but when these fibers are imported into India, the differential becomes almost four times on account of the government policy and consequent duties as levied on these fibers. ^{1/}

The implication of the differential treatment of the two basic types of man-made fibers on the textile economy in India is profound. Polyester-based fabrics (usually blended with other fibers) have important crease-resistant and durability properties which are not nearly so important for

^{1/} There are four plants in India for the manufacture of polyester fiber and two for viscose. The excise duty, as revised in the 1982 finance bill, is Rs.4 per kg. for viscose, but as much as Rs.45 per kg. for polyester fiber. Imports of man-made fibers are permitted. The import duty on polyester fiber is 165 percent on the c.i.f. value, but only 10 percent in the case of viscose. In both cases the excise duty is added to the import cost.

viscose-based fabrics. Polyester-based fabrics have the potentiality of competing with cotton cloth for low income groups. Because of the fiscal costs imposed in India, however, they have become the rich man's cloth; 1/ while it is the viscose-based fabrics which cater to the tastes of low income groups as relatively cheap silk substitutes.

The relatively high price of the raw material, which the producer in India of man-made fabrics has to pay, suggests that these newer types of textiles are still available only to high income groups. Table I.6 reproduces some relevant data on consumption of different kinds of textiles in households of varying income levels. It shows, as is to be expected, (a) that non-cotton textiles are 4 or 5 times as expensive per meter as cotton textiles and (b) it is only at a level of household income of above Rs.3000 per annum that non-cotton textiles become a significant part of the household's textile budget. But it must be emphasized that the household income group of Rs.3,000-6,000 or even Rs.6,000-Rs.10,000 cannot by any means be called the high income households in the Indian context. Many blue collar workers will be in these groups, and it is significant that in the Rs.6-10,000 group, nearly half of total expenditure on cloth is spent on non-cotton textiles. The evidence for strong consumer preference for non-cotton textiles -- in spite of the relatively high price per meter -- is very clear.

1/ As an example, a representative of the industry stated in January 1981 that the international price of polyester fiber was Rs.12 per kg. The ex-factory price of fiber produced in India was Rs.34 per kg., the higher cost of production partly reflecting the small capacity of the plants. Adding the excise duty of Rs.45, the price of the fiber would be more than six times the international price.

Table I.6: ESTIMATED TEXTILE PURCHASES PER HOUSEHOLD AT DIFFERENT INCOME LEVELS, ALL-INDIA, 1978

Annual Household Income (Rs.)	Cotton Textiles		Pure Non-Cotton		Mixed		All Textiles	
	Quantity (meters)	Value Rs.						
Less than 1,500	38.02	189192	0.90	17.02	2.16	34.36	41.08	241.31
1,500- 2,999	52.20	277.20	1.58	25.09	2.63	52.77	56.41	355.06
3,000- 5,999	70.09	411.54	3.87	83.41	6.04	147.96	80.00	642.10
6,000- 9,999	91.26	598.35	7.26	172.46	10.97	286.48	109.49	1,056.29
10,000-19,999	114.16	806.27	16.52	436.27	17.42	508.21	148.10	1,750.75
20,000+	141.16	1,031.48	25.34	770.49	27.13	909.21	193.99	2,711.18
Average for All Income Groups	74.69	449.96	5.53	132.53	7.67	198.80	87.88	781.37

Source: Handbook of Statistics on Cotton Textile Industry (13th edition), ICMF, Bombay, September, 1980, Table 21, p. 36 (quoting data from the Market Research Textiles Committee).

We can now turn to assessment of the government policy on man-made fibers on the small-large issue in the Indian textile industry. It can be argued that the maintenance of the demand for cotton textiles at the expense of man-made and particularly polyester-based fibers together with the physical and fiscal controls on the cotton factory industry which has been discussed earlier, has had an effect of protecting the small-scale sector in the textile economy as a whole. This is indeed true. But there is another aspect of government policy within the man-made fiber sector of the industry which has to be brought into the picture now.

As in the cotton industry an attempt has been made to encourage small units within the man-made fiber sector.

The policy of protection of the small-scale units in the production of cloth using man-made fibers has been the simple one of "sectoral demarcation" in the supply of raw material, rather than reservation of lines of production as in the case of the cotton industry. Sectoral demarcation meant that 100 percent man-made fiber fabrics was left entirely to the decentralized sector, and was further enforced by loom permits allowing use of only one type of raw materials -- viz. cotton, art-silk, natural silk, jute or wool -- depending on the sectoral location of the loom. Naturally it is easier to enforce the loom permits in the organized sector, so that mills have been effectively excluded from 100 percent man-made fabric production. The government policy has, however, permitted cotton mills to use filament in weft, so that blended fabrics can be produced in both the organized and the decentralized sectors. As far as excise duties are concerned, the structure of duties were transferred from fabrics to yarn in 1974-75, so that both sectors are equally affected by it. (The representatives of the decentralized

sector seems to have been very much in favor of this change). 1/ At the fabric stage there are (smaller) additional duties to be paid, depending on the cloth produced, and also a handloom cess. These duties presumably affect the powerlooms producing grey man-made cloth less than the mill sector, and should affect the handlooms even less.

The net effect of the policies has been to encourage a very large increase of specialized powerlooms involved in the production of man-made fabrics. Handlooms have been involved in the development of this industry to only a small extent (producing only about 7 percent of the total quantity of cloth). The Federation of Indian Art Silk Weaving Industry estimates that there is a total of 200,000 powerlooms involved in the industry, of which 91 percent are in the decentralized sector. 2/ The average size of the powerloom units is about 8 powerlooms. Many of them are "unauthorized", which means that they are not licensed by the authorities, and can escape excise taxes on the fabric produced. 3/ The grey fabric produced by the small powerloom sheds are finished in larger units, normally in the same town. The relationship between the small powerloom units and the larger mills which are involved in the dyeing, printing, finishing and marketing of the fabrics is close. A large part of the powerloom industry can then be said to be in the nature of

1/ 41st Annual Report of Silk and Art Mills Association Ltd., Bombay, August 1980, pp. 19-21.

2/ Memorandum of the Federation, dated 9 January 1981.

3/ The situation seems to have been a fairly open (i.e. unforceable) one. The government recently tried a scheme for voluntary registration of the unauthorized looms on payment of a small fee.

ancilliary units, specializing in one important aspect of the processing of man-made fabrics.

While government policy has been instrumental in producing a very high cost raw material for man-made fabrics, and contributed to the high price-low quantity textile economy in India, it is not clear that a policy of making available cheaper raw materials would have made a big difference to the relative importance of small and large sectors in the textile industry. We have seen how the structure of the industry has been shaped with the small powerloom units playing a dominant role in the production process of man-made fabrics. The profitability of these units would, if anything, be increased by policies which tend to reduce the raw material costs. The Federation of India Art Silk Weaving Industry maintained that the raw material problem forces the powerloom units to work at 33 percent of installed capacity. 1/

The over-all picture of the production of cotton and non-cotton cloth, broken down by the small (decentralized) and large (mill) scale of production is presented in Table I.7. It will be seen that even in the blended-mixed fabrics, in which the large scale mills have some advantage (and in which restrictions on the use of the raw material in mills do not apply), the mills have not overtaken the small sector.

1/ Memorandum of the Federation, dated 9 January 1981.

Table I.7: PRODUCTION OF COTTON AND NON-COTTON CLOTHS BY SECTOR, 1951-81
(Million Meters)

Year	Cotton Cloth			100% Man-Made Cloth			Blended/Mixed Cloth			Total cloth production
	Mill	Decen- tralized	Total	Mill	Decen- tralized	Total	Mill	Decen- tralized	Total	
1951	3727	1013	4740	13	287	300	-	-	-	5,040
1956	4852	1663	6515	6	430	436	-	-	-	6,951
1968	4366	3530	7896	4	980	993	-	-	-	8,889
1973	4169	3602	7771	1	886	887	129	121	250	8,908
1978	3251	4074	7325	12	1,463	1,475	983	765	1,748	10,548
1979	3206	4334	7540	6	1,308	1,314	942	731	1,673	10,527
1981	3147	4913	8120	-	1,458	1,465	919	641	1,560	11,145

Source: Handbook of Statistics (ICMF), 1982, Table 12, p. 29; also various years.

CONCLUSIONS ON PART I

The following findings are worth stressing by way of concluding this Part.

1. Handloom weaving had held its own against both the indigenous mill sector and imported cotton cloth in periods before Independence when protection of this sector became a reality. Unlike Japan in the 'twenties, there was no period of absolute decline in handloom production.
2. The policy of protection of the decentralized sector introduced in 1950, and extended in severity subsequently, was meant to encourage primarily the handlooms. In effect it has created a new industrial sector -- operating with low grade non-automatic looms in small units, called powerlooms -- which has had a phenomenally high rate of growth. Its share of cotton cloth produced in the decentralized sector is estimated to have increased from 16 percent in 1956 to 55 percent in 1981. Our figures suggest that since about the mid-'sixties, almost all of the increase in production in this sector has been provided by powerlooms. Production of cotton cloth in mills has declined by one-third between 1956 and 1971.
3. There is a rough specialization by types of cloth produced, with the handlooms accounting for a considerable proportion of total output in the very coarse variety (using yarn of 10s count or less). Both powerlooms and handlooms have a disproportionate share of the output of fine cloth (40s count and over), and mills are important in the medium varieties. But there is a significant degree of overlap between the sectors.

4. Along with the policy of protection of the small-scale, a major aspect of textile policy in India is the protection accorded to cotton against man-made fibers. The latter policy -- while contributing to the creation of a high cost-low production textile economy -- has also had indirect effects on the relative growths of small and large sectors. It is likely that a more liberal policy towards man-made fibers would have led to a more dynamic development of large scale industry. This conclusion is not absolutely clear because, within the restrictive framework, powerlooms (but not handlooms) have done well in developing as ancilliary units weaving grey man-made cloth for future processing by larger factories.

PART II

A COST-BENEFIT ANALYSIS OF THE THREE SECTORS OF THE WEAVING INDUSTRY

In this part we attempt a cost-benefit analysis of weaving technology in the three sectors of the industry. As we saw in Part I, there is some specialization by the type of cloth produced in handlooms, powerlooms and mills, but all three sectors produce enough standard cloth of medium count to make a comparison of costs meaningful and worthwhile.. Our analysis refers to the cost of weaving yarn of 40s x 40s count. Both private and social profitability are considered.

The data for the handloom and powerloom sectors are derived from a World Bank survey in a textile town in Uttar Pradesh -- Mau. For the factory sector (mills), we depend on secondary sources. The sources of the data, the definition of concepts and the way individual figures are derived are fully explained in the Annex to this paper.

A. Relative Costs of Producing Rs. 10,000 of Value Added

Table II.1 brings together the labor input and capital cost required to produce Rs. 10,000 of value added in the three sectors. The cost ratios are crucially dependent on the following:

- (i) the machine productivity, i.e. the output per loom shift and the number of workers needed to look after one loom;
- (ii) the number of shifts worked in each sector; and
- (iii) the value added per meter of cloth produced in the three sectors.

While the details will be found in the Annex, a few words on each of these factors are useful for the benefit of the general reader.

(i) Machine Productivity

Handlooms are, of course, the cheapest type of looms, and their productivity per loom shift is correspondingly the lowest. A large proportion of the handlooms are worked in sheds within the worker's residence. The adult

Table II.1: INPUTS REQUIRED TO PRODUCE VALUE ADDED OF Rs. 10,000
PER ANNUM IN THE THREE SECTORS OF THE WEAVING INDUSTRY

	Handlooms	Powerlooms	Mills
Number of workers (adult male equivalents)	3.36	1.76	0.51
Fixed Capital Costs:			
(a) Machinery	534	3,426	
(b) Land and building	5,155	4,480	
TOTAL	<u>5,689</u>	<u>7,906</u>	
Working Capital	<u>3,024</u>	<u>2,600</u>	
Total Capital	<u>8,713</u>	<u>10,506</u>	<u>19,000</u>

male weaver is generally assisted by other members of the family. Our data showed that two adult male equivalents of labor worked one loom and produced about 11 meters of cloth per day. The length of the working day is typically variable, but was on average equivalent to one standard 8-hour shift.

Both the powerloom and the mill sectors use non-automatic looms, and the productivity per loom shift is three times that of the handlooms. However, the quality of the looms used in the two sectors (powerlooms and mills) is different. The powerlooms make use of second-hand looms requiring a fair amount of maintenance. Even new looms which are being increasingly produced for this sector in India have less automatic features than non-automatic looms found in the mill sector. Thus, labor required to look after a loom is more for the powerlooms than for the mills. Our estimates are that taking weavers and other workers together, 1.6 workers are required per loom in the powerloom sector, and 0.8 per loom in the mills (powerlooms and mills use largely adult male workers).

(ii) Number of Shifts Worked

The capital-output ratio is significantly affected by the number of shifts worked in the three sectors. Our research showed that while handlooms worked a standard 8-hour shift, powerlooms were used on the average for 1.5 shifts and mills worked 2.5 shifts. The differences in the number of shifts worked are due in large measure to the varying availability of electricity in the three sectors. Handlooms are worked in weavers' households in which there is no supply of electricity. They can only be used in daylight. Powerlooms do indeed need electricity to operate, but small decentralized units in this sector have to depend on public supply of electricity which, in India, is not in continuous supply especially in the small towns. Mills, by contrast, often

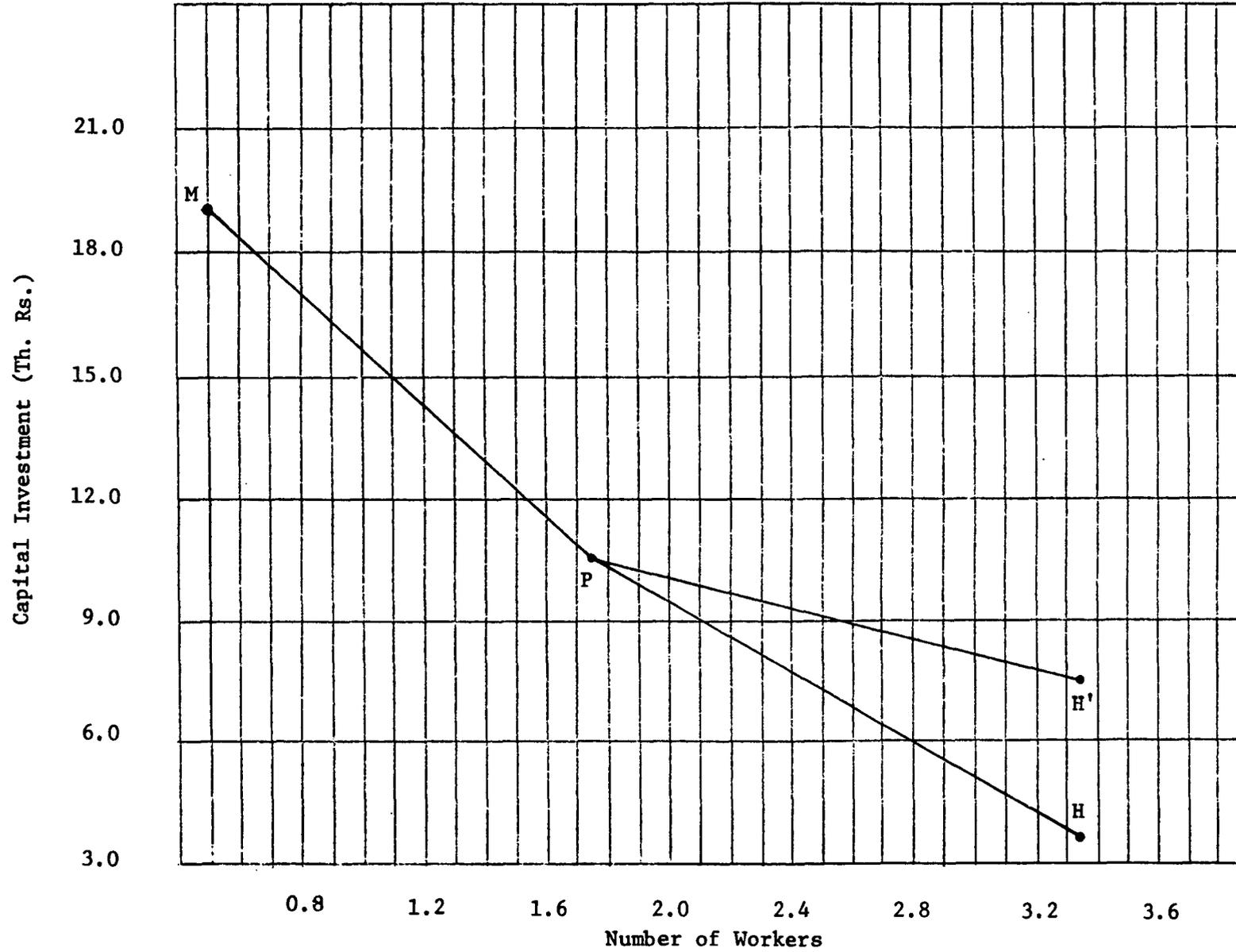
have their own generators. They are able to take advantage of the economies of scale in providing their own supply of electricity. The difference in the cost of machinery between powerlooms and mills given in Table II.1 partly reflects this fact (and partly the difference in the cost of the loom).

(iii) Value Added Per Meter of Cloth

The difference in the value added per meter of cloth between the sectors (even when we are comparing cloth produced from yarn of the same count) derives partly from the cost of power and maintenance, and more importantly, from the varying prices of the final product. Mills weave their cloth more closely than powerlooms; cloth produced by handlooms are also perceived to be more durable than powerloom cloth in the local markets. Powerloom cloth is consequently priced something like 20 percent lower than both handlooms and mill-made cloth. This difference is reflected in the cost figures of Table II.1.

The cost data are portrayed in Figure II.1. It shows a well-behaved isoquant with the variation in capital intensity being in the generally expected direction. Note that two alternative points are plotted for handlooms: point H represents only the cost of machinery plus working capital, while point H' adds 75 percent of the value of land and building to capital costs. As explained more fully in the Annex, the former is relevant for calculation of private profitability. The master-weaver in the handloom sector typically advances raw material and maintains the loom in the weaver worker's residence. He pays the weaver a piece-rated wage based on the amount of cloth produced. Thus for the master-weaver's calculation of private profits, the capital cost of the handloom and the working capital used are relevant -- not the value of land and building for which no rent is paid.

Figure 1: ISOQUANT FOR COTTON WEAVING



However, for social profitability calculations some of the latter have to be added to the cost of capital.

Given the isoquant, we need to know the wage cost per adult male worker in the three sectors in order to find the range of interest rates over which the different sectors are profitable from the point of view of a private entrepreneur.

B. Relative Wage Levels in the Three Sectors

In the town where the World Bank survey was undertaken, the wage earnings of an adult male worker were very similar in the powerloom and handloom sectors -- around Rs. 2,100 per annum. Hired male workers worked by themselves in powerlooms, while in handlooms adult males were assisted by members of their families in varying degrees. The participation of family members -- and how to value it -- is important for evaluation of "shadow wages" to be used in social profitability calculations. From the point of view of private profitability of an entrepreneur, however, the earnings per adult male worker are his labor cost. Wages in mills are considerably higher -- our best estimate is Rs. 4,900 (see Annex).

C. Private Profitability

The private profitability of powerloom weaving compared to handlooms might be assessed if we ask the question: does it pay the master-weaver who is employing handloom workers on a "putting out" system to switch to production on powerloom? Production in powerlooms require more capital per unit of value added, but less labor. Thus whether or not the switch to powerlooms will be profitable for the master-weaver depends on the rate of interest entering his calculation. The question can be posed in cost-benefit

terms: what is the internal rate of return which equates the increase in capital cost to the present value of the saving in wage bill?

The master-weaver, as discussed earlier, bears the cost of the machinery and of working capital amounting to Rs. 3,558 (per Rs. 10,000 of value added), but not of the land and buildings of the weaver's residence in which the looms are located. Thus for the same amount of value added, a switch to powerlooms would mean an additional capital cost of Rs. 6,948. The saving in wage bill could be 1.6 times Rs. 2,000 per annum. If we work with an expected life of the capital stock of 25 years, the internal rate of return which makes the master-weaver indifferent as between the two processes is 46.05 percent. An effective interest rate higher than this would mean the master-weaver has no incentive to shift to powerlooms. Since widespread co-existence of powerlooms and handlooms is observed in Mau, the interest rate implicitly accepted by entrepreneurs can be expected to hover round this figure.

Now consider an entrepreneur in the mill sector weighing the benefits of switching to powerloom production. The data given above gives the saving in capital cost of producing value added of Rs. 10,000 in powerlooms rather than mills as (19,000 - 10,506) or Rs. 8,494. But there is an increase in wage cost, because although wage rates are lower in powerlooms, the number of workers needed to produce the given value added of Rs. 10,000 is sufficiently larger to lead to a higher wage bill. The increase in labor cost has to be compared to the saving in capital cost to judge the net profitability of the two processes. As in the case of the comparison of handlooms and powerlooms we calculate the rate of interest which will make the present value of the

increase in wage cost equal to the saving in capital cost. (The assumption about the life of the machines is the same as before -- viz 25 years.)

$$\begin{aligned} & \text{The increase in wage bill} \\ & = \text{Rs. } (1.7 \times 2,100 - 0.5 \times 4,900) \\ & = \text{Rs. } 1,120 \end{aligned}$$

The rate of interest which equates this wage stream for 25 years to the saving in capital cost of Rs. 8,494 is 13.2 percent. At rates of interest above this level it will be more profitable to produce cloth of the type we have been discussing in the powerloom sector rather than in the mills.

It is thus seen that over a very wide range of interest rates -- between 13 and 46 percent -- powerlooms turn out to be the most profitable sector. The phenomenal growth of the powerloom sector documented in Part I is consistent with this finding. It is possible that even in the absence of physical restrictions on mills, given the cost structure and in particular, the wage differential between mills and powerlooms, the latter would have been the favored sector.

D. Social Profitability

The analysis has been carried out so far on the basis of the observed cost of employing an adult male worker in the three sectors. The shadow wage of a male worker appropriate to the evaluation of social costs would be different. The market male wage in powerlooms is most likely to be the nearest to the shadow wage in this sector, since the labor market is a highly competitive one. Institutional influences have clearly increased wages in the factory sector, and the shadow wage should be lower than the market wage in this sector. At the other end, the adult male worker in handlooms is always helped by family members (thus reducing his disutility of labor), and in

addition he enjoys the flexibility of working at home. Hence, the real cost of employing an adult male weaver in handlooms will most likely be less than the market cost. Finally, part of the value of land and buildings of the handloom weaver must be included in the costs of production in this sector when we are considering social profitability.

(1) The Powerloom-Mill Comparison

At one extreme, we can make the judgment that the lower wages in the powerloom sector really represent the appropriate social cost of using labor in either sector. The switchover value of the rate of interest is then drastically reduced.

At the powerloom wage the increase in wage cost involved in a switch from mills to powerloom = Rs. $(1.7 - 0.5) \times 2,100 =$ Rs. 2,520.

The rate of interest which equates this stream over a period of 25 years to the saving in capital cost (Rs. 8,494) is 30.1 percent.

Even if the shadow wage in the mill sector is not quite so low, the range of interest rates over which powerlooms are most profitable is reduced. The result might appear counter-intuitive because the effect of the use of a shadow wage lower than the market wage in the mill sector leads to the prediction that the more capital-intensive sector is more profitable. This is because we are considering movement between sectors with a large wage differential, and the use of the same shadow wage in both sectors is tantamount to removing the effective tax on labor in the mill sector. Of course, if the evaluation of the appropriate shadow wage was to be even lower than the powerloom wage -- if, for example, one feels that the alternative earnings for labor are even lower than this -- then the interest rate at which mill production becomes profitable relative to powerlooms will be lower. But

the shadow wage has to be very low indeed to make this "boundary" interest rate as low as 13.1 percent which was desired on the basis of private profitability accepting the very large market wage differential between the two sectors.

(ii) The Handloom-Powerloom Comparison

At the other end of the spectrum the market wage for adult male workers seems to be more or less the same in the powerloom as in the handloom sectors. But it is very likely that the shadow wage in the handloom sector should be lower than the observed market wage for the reasons already mentioned. The other point we must take into account for social profitability analysis is the addition of some of the land and building cost to the total cost of handlooms. (Not all such costs should be added because the buildings serve the dual purpose of residence and commercial venture.) As an example, if 50 percent of land and building cost is added to the capital cost of handlooms in this way, the switchover interest rates between the three techniques will be as shown in Table II.2 for three possible values of the shadow wage in handlooms.

The table brings out the point that the range of interest rates within which production in the powerloom sector is profitable is very much narrower when we are using social price of labor rather than market wages. The observed market profitability of powerlooms is due to the large market wage differential between powerlooms and mills on the one hand, and the absence of such a wage differential between powerlooms and handlooms on the other. In fact, the last column of Table II.2 shows that if the shadow wage for mills and powerlooms should be fixed at the observed level of the latter, and if the social price of labor in handlooms should be only about 50 percent

Table II.2: "SWITCHOVER" INTEREST RATES FOR VARIOUS VALUES OF SHADOW WAGE

	Handloom Shadow Wage As A Percentage of Market Handloom Wage		
	75%	66.6%	50%
Handlooms to Powerlooms	52.03	46.18	34.67
Powerlooms to mills (shadow wage equal to powerloom market wage)	31.13	31.13	31.13

N.B. In all cases 50 percent of the value of land and buildings has been added to the capital costs of handloom weaving.

E. Conclusions on Part II

The analysis of private profitability within the framework of a cost-benefit analysis clearly shows that given the wage differential between the powerlooms and the milllls, the former is the favored sector in the Indian weaving industry. Thus, the observed growth of this sector would probably have come about even in the absence of quantitative restriction on the millls. The range of interest rates over which powerlooms are profitable is so wide that this conclusion is likely to hold even if the values of the key parameters are somewhat diferent from what has been used in this study. ^{1/}

The use of shadow wages removes the effective tax on labor in the mill sector, and also reduces the cost of labor in the handlooms. From a social point of view, powerlooms thus turn out to be much less desirable.

^{1/} See the Annex for further details.

PART III

DYNAMIC EFFECTS OF POLICY ON THE TEXTILE ECONOMY SINCE INDEPENDENCE

SECTION 1

Adjustments in the Mill Sector to the Policy of Protection of the Small-Scale

The major developments in the decentralized sector, particularly in powerlooms under the policy of protection of the small-scale since the Second World War, left the mill industry with considerable pressures to change and adjust. This section describes some of the major features in this process of adjustment which has shaped the future of the textile industry in India for many years to come.

We have noted in the preceding pages that the policy of protection of the small-scale was directed at the weaving section of the industry. Nevertheless, insofar as the spinning mills in the large-scale sector were expected to supply the raw material (yarn) for the development of the small scale sector as well as its own requirements for weaving, the package of policies to help the small-scale units had inevitably some repercussions on the spinning factories. There has been a general presumption among Indian policy makers that the small-scale sector is in difficulty in getting an adequate supply of mill-spun yarn. It is felt that the mill industry first meets its own requirement of yarn for weaving in the integrated factories, and only the surplus which is left over is sold for the decentralized sector. Some observers who have studied the problem have expressed doubts about the small-scale sector being a "residual" market for yarn. Thus Ashok V. Desai writes: "According to our reading, given the differential excise duties, the wage differentials, and the restrictions on technological change in weaving by the mill, the small-scale powerloom sector has enjoyed a competitive edge over

the mills. Spinning yarn for sale is more profitable than weaving even for composite mills, and the small-scale sector's complaints of yarn shortage are only a reflection of powerlooms' profitability." 1/ Desai cites as evidence in support of this view that in years when total yarn output fell as in 1964-7 and 1974-7, the proportion of yarn sold to the decentralized sector rose sharply. Nevertheless, the climate of opinion in government circles, which feared a potential shortage of raw material to small units, has resulted in a policy of liberal licensing of capacity in the large-scale spinning industry which contrasts sharply with the freezing of capacity in the large-scale weaving sector. A large number of new spinning mills have come up -- increasing from 94 in 1950 to 370 in 1979. The government policy has, however, given preference to a policy of limiting the size of mills, so that much of the expansion of spindlage has come from an increase in the number of mills rather than the number of spindles per mill -- which has remained at around 20 thousand spindles per mill. There might have been some effect in this policy on failure to exploit economies of scale, though we have no evidence on this point at the moment. However, composite mills -- i.e. mills with both spinning and weaving capacities -- have been able to expand their spindlage from about 32 thousand per mill in 1950 to 43 thousand in 1979.

The creation of new capacity in the spinning sector has led to substantial technological change in this sector of the industry. The new spinning mills utilize ring spindles of post-war design which are

1/ Ashok V. Desai, "Technology and Market Structure under Government Regulation,: A Case Study of the Indian Textile Industry," National Council of Applied Economic Research, mimeo, Jan 81, p. 10. This section of the paper draws heavily on Desai's ideas.

significantly faster than in the other mills. The latter, and the composite mills, had to respond to their competition by (a) increase in the capacity utilization of their machinery and (b) significant new investment in cotton preparation. Second and third shift operation in spindles (for the industry as a whole) increased from 76 and 25 percent, respectively, in 1950 to 80 and 78 percent, respectively, in 1979. Old mills also made use of new engines to improve the quality of slivers, and of high draft conversion attachments which increased the capacity of draw frames and ring frames by a significant amount.

Technological progress in the spinning section of the organized textile industry -- induced by the competition of new licensed capacity -- has been paralleled in the weaving sector due to the competition of powerlooms. While many powerlooms in the decentralized sector have used second-hand machinery sold off by the larger mills, the phenomenal growth of the former have meant that a large proportion of the looms are, in fact, new and better maintained. The powerlooms had a great advantage in lower wages and lower (and more easily evadable) excise taxes and, because of the progressivity of the tax depending on the fineness of the cloth, the diversion of production to powerlooms was, as we have seen, particularly strong in the finer varieties.

Mills could and had to respond to the competition from the powerlooms in three principal ways.

First, some mills have installed automatic looms. In recent years, government policy, while freezing the number of looms in the mill sector, has permitted replacement of plain looms by automatic looms. But while automatic looms could be expected to produce superior and wide cloth suitable for the export market, it is not clear that at factor prices prevailing in India

automatic looms are profitable in either private or social sense. The proportion of automatic looms installed in Indian mills remains low.

Secondly, as in the spinning sector, the capacity utilization of looms increased throughout the period. Second shift operation increased from 73 percent of all looms in 1950 to 85 percent in 1979, and third shift operation from 10 percent to 66 percent. Further, the number of looms per worker continued to increase, and in the third shift operation in particular it was doubled from 0.82 in 1950 to 2.07 in 1979. ^{1/}

Thirdly, the mill sector started to specialize in more strongly woven and durable cloth by increasing the number of picks per meter. The length of cloth woven (in meters) per kilogram of cloth went down throughout the 'sixties. Equally important was the very substantial increase in pre-shrinking, dyeing and printing within the mill sector. A large diversion of mill output from grey to processed cloth took place. The organized sector thus tried to create for itself a niche of the textile market, differentiated from powerloom cloth not so much by the fineness of the yarn used, as by more durable and mechanically processed cloth produced.

A number of mills in the large-scale sector were unable to respond to the competition of the powerlooms -- aided and abetted by the discriminatory government policy. A total of 111 mills went bankrupt in the late 'sixties and 'seventies, constituting the notorious sick mill problem of the industry. These were mostly composite mills, a majority of them of smaller than average size and concentrating in the production of coarse and low-medium

^{1/} Ashok V. Desai, op. cit., Table 7, p. 23 quoting figures from the Textile Commissioners' Office and the Millowners Association.

cloth. 1/ These mills have been taken over by the government and put under the control of a public enterprise called the National Textile Corporation of India (NTC). The size of this sector is large. It employs 150 thousand workers. In terms of installed machines and employment its size is about 15-20 percent of the private large-scale mill sector. The NTC mills have incurred considerable losses since their date of nationalization. When they were first taken over they were looked upon as unemployment benefit schemes. But the growth of this sector has meant that policies have to be evolved to make them into profitable ventures, or at least reduce the flow of taxpayer's money going into the support of these units. Two different lines of policy are discernible in the still evolving strategy of the government with respect to the NTC mills. On the one hand, there is an attempt to "modernize" the mills (subject to the important constraint of limited ability to reduce the size of the labor force) and to diversify the production structure of the mills away from coarse and unprocessed cloth. On the other hand, the NTC mills are looked upon as partly a vehicle for producing "controlled cloth" -- i.e. cloth produced and distributed to the poorer sections of the society at subsidized prices. The difference between the costs of production and the sale price is being reimbursed to the NTC by the government. The NTC mills in 1980 were producing about 310 million meters of controlled cloth -- which accounted for 40 percent of such cloth produced by the mills. 2/

1/ M. Padmanabhan: The Sick Mill Problem, Bombay PH. D. Thesis 1974.

2/ Cf. Address by the Chairman of the NTC to the Textile Institute Annual Conference held at Asterville, North Carolina, 12-15, October, 1980, mimeo, p. 17.

SECTION 2

Consumption, Employment and Exports Since World War II

It is now time to attempt an evaluation of the performance of the textile industry in India with special references to the policy of protection of the small-scale. Three questions are singled out for consideration:

- (i) What has been the effect of the policy on the availability of textiles to ultimate consumers in the country?
- (ii) What is the assessment of the likely effect on the creation of employment?
- (iii) Is there any definite point which comes through on the impact of the policy on the performance of Indian textiles in international markets?

Consumption

Table III.1 gives the series on per capita availability of cloth (in meters), both cotton and non-cotton. It is clear that in terms of meters consumed, there was stagnation in the per capita consumption of cotton cloth from 1955 until 1965, and there has been a steady decline since then. Consumption of cotton cloth per capita in 1979 was a little below the level of 1951 -- about a third below the peak reached around 1965. Man-made and blended fabrics have filled the gap increasingly in the last decade, so that the per capita quantity of cloth consumed in meters, taking all types together, has not changed very much since 1964. It has been seen in Part I, Section 3 that non-cotton fabrics are much more expensive than cotton fabrics

Table III.1: PER CAPITA AVAILABILITY OF WOVEN CLOTH

Period	Per Capita Availability (meters)			Total
	Cotton cloth	Blended/ Mixed fabrics	Man-made fiber fabrics	
1951	10.99	-	-	10.99
1956	14.71	-	-	14.71
1957	14.50	-	-	14.50
1958	14.28	-	0.92	15.20
1959	13.72	-	1.15	14.87
1960	13.80	-	1.20	15.00
1961	14.76	-	1.15	15.91
1962	14.35	-	1.17	15.12
1963	14.69	-	1.24	15.93
1964	15.22	-	1.63	16.85
1965	14.72	n.a.	1.73	16.45
1966	13.95	n.a.	1.65	15.60
1967	13.57	n.a.	1.74	15.31
1968	14.37	n.a.	1.90	16.27
1969	13.61	0.20	1.79	15.60
1970	13.56	0.28	1.71	15.55
1971	12.40	0.45	1.72	14.57
1972	13.18	0.36	1.59	15.13
1973	12.04	0.44	1.46	13.94
1974	12.88	0.36	1.36	13.80
1975	12.58	0.61	1.37	14.56
1976	11.36	0.97	1.58	13.91
1977	9.57	2.32	1.86	13.75
1978 (P)	10.21	2.73	2.27	15.21
1979 (P)	10.19	2.54	1.98	14.71

per meter, and it has also been noticed in the last section that mill-made cotton cloth has been improving in quality in recent years as a direct result of the competition of the small-scale sector. The stagnation of per capita consumption of the quantity of cloth in the last decade and a half should then represent an increase in term of value. Surprisingly this is not what is revealed in Table III.2, which gives the growth of expenditure on clothing at constant prices. 1/ Per capita consumption of cloth seems also to have stagnated in terms of value since 1966. There might be an index number of problem here which should be investigated.

We have already noticed that the relative price of mill-made cotton fabrics, as well as of non-cotton fabrics produced by both sectors, has been increased by the government's excise and other policies. But it is precisely these areas in which consumer demand for cloth has been stronger over the years. It is clear that the relative stagnation per capita of the consumption of cloth in India is partly a result of the price policies which have discouraged consumption in these growing areas. But this particular effect cannot be traced to the policy of protection of the small-scale. We have argued that it is possible a reduction of the burden of duties (both excise and import) could have increased the supply of cloth using man-made fibers from the small-scale sector.

Employment

The employment of workers in the mill sector is given in Table III.3. It should be emphasized that the data refer to the spinning and the weaving sector together. We have seen in this paper that the spinning sector

1/Central Statistical Organization, National Accounts of India.

Table III.2: CONSUMPTION IN INDIA, 1960-1977
1970-71 prices

Year	Total in crores	Clothing in crores	Population (end year) in millions	Total (per capita) in rupees	Clothing (per capita) in rupees
1960-61	21978	1422	437.39	502.5	32.5
61-62	21969	1438	446.97	491.5	32.2
62-63	22223	1483	456.64	486.7	32.5
63-64	22981	1660	466.59	492.5	35.6
64-65	24417	1926	476.83	512.1	40.4
65-66	23551	1816	487.35	483.2	37.3
66-67	24532	2079	498.16	492.5	41.7
67-68	27763	2124	509.25	545.2	41.7
68-69	26869	2243	520.65	516.1	43.1
69-70	28136	2147	532.37	528.5	40.3
70-71	28870	2086	544.28	534.0	38.3
71-72	30579	2265	556.36	549.6	40.7
72-73	30157	2295	568.35	530.6	40.4
73-74	30978	2466	580.14	533.4	42.5
74-75	31162	2371	591.97	526.4	40.1
75-76	32502	2520	603.57	538.5	41.8
76-77	32455	2603	617.64	525.5	42.1

Table III.3: EMPLOYMENT OF WORKERS IN COTTON MILLS
(thousands)

Year	Average number of workers actually employed in			
	First shift 1	Second shift 2	Third shift 3	Total 4
1951	-	-	-	7,15
1956	-	-	-	8,07
1961	4,17	2,66	1,10	7,93
1962	4,17	2,65	1,16	7,98
1963	4,18	2,63	1,23	8,04
1964	4,22	2,71	1,38	8,31
1965	4,18	2,67	1,37	8,22
1966	4,04	2,54	1,30	7,88
1967	4,00	2,54	1,35	7,89
1968	3,83	2,43	1,34	7,60
1969	3,70	2,34	1,36	7,40
1970	3,73	2,35	1,41	7,49
1971	3,61	2,24	1,34	7,19
1972	3,78	2,35	1,49	7,62
1973	3,87	2,37	1,60	7,84
1974	3,85	2,36	1,66	7,87
1975	3,80	2,36	1,63	7,79
1976	3,70	2,30	1,60	7,60
1977	4,00	2,45	1,72	8,17
1978	4,10	2,51	1,81	8,42
1979	4,18	2,54	1,95	8,67
1980	4,21	2,58	1,97	8,76
1981	4,23	2,59	1,99	8,81

Source: Handbook of Statistics (ICMF), 1982, Table 51, p.77.

of the large-scale mills has expanded strongly, so that much of the increase in employment should be attributed to the expansion of yarn output. However, the increase in employment over the entire period has been modest -- surprisingly so in view of the increase in spinning capacity. Another striking feature is that whatever increase in employment has taken place over time has been due to the working of a third shift.

There are, of course, no data on the increase in employment in the small-scale sector of the textile industry. But considering the substantially more use of labor per unit of output (which is discussed in Part II), the employment effect of the protection of the small-scale must have been substantial. The following data suggest rough orders of magnitude involved. According to the Bank's Survey of Handloom and Powerlooms in a town in Northern India, 1.94 adult male workers worked per each handloom (on the average) producing 11 meters per day. Thus employment content in handlooms is 0.49 adult male workers per annual production of 1000 meters of cloth produced (excluding auxiliary workers like women and children of the household). In powerlooms 0.75 workers were employed on average per loom with an output of 27 meters per loom -- giving a figure of 0.09 workers per 1000 meters of such cloth per year. Thus referring to figures of cloth production given in Table 3, employment in handlooms would have increased between 1956 and 1981 by 335 thousands and employment in powerlooms by as much as 222 thousands. In addition, the powerloom sector in particular has contributed significantly to employment in the man-made fiber industry. On the assumption that all the man-made fabrics reported to be produced by the decentralized sector is, in fact, produced by powerlooms (an assumption which underestimates the total increase in employment because some man-made fabrics are in fact, produced by

the more labor intensive handlooms) and applying the same labor content of production to man-made fabrics in powerlooms as in cotton, this sector will account for another 200 thousand workers in 1979. Thus in the period 1956-79 the decentralized sector has probably provided new employment of about 750 thousand adult male workers. With all the doubts and difficulties about the statistics of production in the Indian textile industry, this figure contrasts markedly with the statistic of new employment in the mill sector of 50-60 thousand workers. Admittedly, cloth production in the mill sector has fallen, but the production of yarn has increased very strongly.

We conclude that there is prima facie evidence that the protection of the small-scale sector in the Indian textile industry has added significantly to new employment. As is reported in Part II, the wage level in the decentralized sector is at a considerably lower level than in the large-scale mills. The choice facing Indian authorities has been one of large increase in employment at a low wage as against a smaller addition to employment at a higher wage.

This conclusion, of course, immediately begs the hypothetical question: What would have been the increase in production, and the associated increase in employment in the mill sector in the absence of a policy of protection of the small-scale? This raises a whole series of subsidiary questions: What would have been the rate of increase of labor productivity in the mill sector? What would have been the increase in the export market? What would have been the relative price of cloth bought by the Indian consumers, and the price elasticity of demand? Speculations on most of these questions do not carry very far. Probably something can be said from comparative historical experience -- which might be attempted in another

paper. In any event, the answers to the sort of questions in this paragraph depend on whether or not restrictive policies other than that of small-scale protection are assumed to exist in this hypothetical world.

Exports

It has often been maintained that the policy of protection of the small-scale, by putting restrictions on the mill sector, has severely damaged India's prospects in international markets. This is again a hypothetical question on which some light might conceivably be thrown by looking at comparative historical experience. All we can do here is to set out the facts (i) if in fact, India's share in textile trade has been declining in the last two decades and (ii) what are the trends in India's exports of textiles from the different sectors.

Table III.4 brings together data on exports of cotton textile from India for the period 1961-79. It is seen that the quantity of cloth exported from the mill sector has declined substantially over the period (by about 25 percent), but that this decline has been partly made up by increased export from the decentralized sector. The buoyant sector of exports in cotton textiles has been cotton apparel -- and here India shared in a world-wide development of exports from third world countries.

Another significant aspect of the poor performance of Indian exports in cotton textiles proper is brought out in Table III.5. The share of India in the total quantity of exports of cotton yarn and cloth has been halved in the last two decades. Equally important to note is that India's traditional competitors -- Japan, U.K. and USA -- have also had a drastic decline in their shares of world exports. India, in other words, failed to take advantage of the relative decline in the competitiveness of the traditional rivals. New

Table III.4: EXPORTS OF COTTON TEXTILES FROM INDIA, 1961-79

Year	Cotton yarn		Handloom cloth		Millmade cloth		Powerloom		Cotton Apparel	Total
	Quantity (Mn Kg)	Value (Mn Rs)	Quantity (Mn meters)	Value (Mn Rs)	Quantity (Mn meters)	Value (Mn Rs)	Quantity (Mn meters)	Value (Mn Rs)	Value (Mn Rs)	Value (Mn Rs.)
1961	7.14	3.73	25.92	4.78	525.14*	46.15	n.a.	n.a.	0.14	60.10
1965	12.75	6.02	39.69	9.53	506.85	47.26	1.03	0.16	3.28	76.62
1970	30.45	26.88	27.50	7.42	413.42	65.66	4.56	0.61	7.74	130.18
1975	3.87	6.25	47.85	31.84	332.37	100.28	7.03	1.79	111.90	309.58
1979	5.90	14.65	65.85	61.38	395.00	185.92	49.00	17.99	343.09	719.05

* Linear meters.

** Includes other miscellaneous items.

Source: Handbook of Statistics on Cotton Textile Industry (ICMF)

Table III.5: EXPORTS OF COTTON TEXTILES (YARN & CLOTH) FROM THE MAIN EXPORTING COUNTRIES, RELATIVE SHARES (IN PERCENTAGES) OF TOTAL QUANTITY

	1960	1965	1970	1975	1979
India	8.8	8.5	8.2	4.1	4.1
<u>Traditional competitors:</u>					
Japan	19.0	14.4	6.1	4.3	2.0
U.S.A.	6.0	4.1	3.9	8.3	7.2
U.K.	5.0	3.3	2.4	2.4	2.4
Sub Total	30.0	21.8	12.4	15.0	11.6
<u>New competitors:</u>					
Hong Kong	5.0	6.6	7.1	5.0	3.8
Taiwan	1.0	2.1	5.2	6.8	5.1
Pakistan	4.9	4.7	12.3	13.8	9.4
South Korea	0.4	1.1	1.6	4.3	6.6
Sub Total	11.3	14.5	26.2	29.8	24.9
Totals including others	100.0	100.0	100.0	100.0	100.0

exporters of cotton textile like Hong Kong, Taiwan, Pakistan and South Korea emerged strongly in the world market. It is clear that many of these countries have consciously pursued a policy of cultivating the export market. The introduction of automatic looms in a number of mills have no doubt helped in the process. Automatic looms as a proportion of total loom capacity have been in 1967 as high as 70 percent for Pakistan and Taiwan and 100 percent for Hong Kong, as against only 13 percent for India. 1/ The adoptions of automatic looms, however, is dependent on many factors. The policy of small-scale protection cannot be considered to have been a crucial one. On the one hand, the restrictions on the mill sector might have reduced its financial capability of purchasing through large-scale modernization of equipment. On the other hand, we have seen in Section 1 of this part that faced with the intense competition from the profitable powerloom sector, mills have been encouraged to differentiate their products in the direction of better woven cloth. The adoption of automatic looms in a large number of cases can be seen as part of this process. It should be stressed that government policy allows for the replacement of looms in the mill sector with any type -- be it non-automatic or automatic.

1/ Deepak Nayyar, "An Analysis of the Stagnation in India's Cotton Textile Exports During the Sixties", Oxford Bulletin of Economics and Statistics, February 1973, p.9.

PART IV

SOME CONCLUDING REMARKS

We conclude by emphasizing a few points which seem to be the more noteworthy in the bird's eye survey of Indian textile history and policy given in this paper.

The three sectors of the textile industry -- handlooms, powerlooms and mills -- have come to stay ostensibly under the umbrella of the government's protective policy, but it is not clear that they would not have co-existed as important components of the industry even in the absence of such policies. In the survey of the development of the industry before the Second World War we found that handlooms expanded all the time in absolute terms, except during the years of the First World War, even though it was losing relatively to the factory industry. In the free trade period before the First World War, handlooms contributed as much as 16 percent of the increase in cloth consumption in India, in competition not only with Indian factory industry, but also with imports from Lancashire. After protection was introduced in the late 'twenties (triggered off by Japanese competition), handloom production along with factory production increased in the ratio of 3:7.

As far as the small-scale powerloom sector is concerned, we have seen that an important body of opinion in India after Independence was looking on the powerloom sector as the natural evolution of the handloom industry. (The powerlooms, indeed, were initially introduced by handloom weavers.) The government officially rejected this policy, but through its inability to enforce controls against powerlooms have in fact, allowed this sector to be the fastest growing sector of the industry. The restriction on the mills seems to have helped the powerlooms more than the handlooms.

It has been shown above that some rough specialization by count groups has existed in the three sectors of the cotton textile industry which partly explains the co-existence of the three technologies. Handlooms have traditionally specialized in very course cloth (using 10s count of yarn or less), although a sizeable proportion of very fine cloth is produced by them. Mills have contributed most of the output in the medium varieties of cloth (using 11-30s count yarn). Even the recent trends in the mill industry "going finer", partly in response to consumer preference moving in the direction of finer cloths, have not resulted by 1979 in mills overtaking the powerlooms in cotton fabrics using higher than 30s count of yarn. It was shown in Part III, Section 1, however, that mills have been producing more closely woven cloth to differentiate their products from the output of powerlooms.

Another factor which helps to explain the co-existence of the three sectors is segmentation in the factor markets. It was seen in Part II that the wage differential between the decentralized and the mill sectors is very large. Given relative factor productivities, this wage gap gave the powerloom sectors a strong advantage over the other two sectors. The cost-benefit analysis showed that powerlooms provided the most profitable technology over a wide range of interest rates. This conclusion is, of course, consistent with the observed growth rates of the three sectors -- the powerlooms taking the lead by a large margin. The co-existence of the three sectors may then partly be a cross-section picture of a dynamic process of change over time. But segmentation in capital markets could be expected to provide part of the explanation of the co-existence of the three sectors -- or at least slowing down the pace of change. The large-scale mill sector has probably better

access to the formal capital market in which interest rates are low, while both handlooms and powerlooms have to depend on localized capital markets with significantly higher interest rates. In some situations -- or areas -- interest rates available to mills might be low enough, and/or interest rates facing powerlooms might be high enough, for both mills and handlooms to be successful competitors.

The question must be asked: Has the policy of protection of the small-scale in the textile industry in India been responsible for substantial costs to the economy? The answer in the static cost-benefit sense as given in Part II seems to be pretty clear. Contrary to the intended policy of protecting the handloom sector, the bundle of policies has encouraged a spectacular growth rate of the powerloom industry. As shown in Part II, this has been largely due to the market wage in the powerloom sector being so far below that in the mill sector and not so different from that in handlooms. The shadow wage which should be used to assess social profitability would almost certainly be below the market wage in both the mills and the handlooms, and consequently from the social welfare point of view the range of interest rates within which powerlooms are profitable would be narrowed significantly. On this argument based on static efficiency alone, both mills and handlooms should have grown faster relative to powerlooms.

This conclusion does not take into account considerations related to (a) the distribution of income and (b) dynamic efficiency. Suppose that for institutional and other reasons the mill sector has developed a privileged and relatively small body of workers with a high wage -- and the wages of this labor aristocracy cannot be reduced. In this case, although social efficiency demands that the effective tax on labor in the mill sector be

removed by applying a lower shadow wage to this sector, there might be a case for encouraging the small-scale sector in order to change the pattern of distribution of earnings in favor of low wage workers. This argument would, of course, apply even strongly in favor of encouraging the handlooms, and has to be set against considerations of both static and dynamic efficiency..

Turning to the performance of the Indian textile industry in a time perspective, it is clear that the policy of protection of the small-scale has created more employment, given the levels of output attained. But the question remains: Has the policy reduced the efficiency of the large-scale sector by so much that even a larger volume of potential employment has been lost through lower output? We have noted in Part III the relative stagnation of per capita quantity of cloth consumed in India, although the value might have increased somewhat because of the diversion of consumption to finer cotton and man-made fabrics. It was also shown that India failed to take advantage of the decline of her traditional competitors -- Japan, the U.S. and the U.K. -- in the international market for textiles in the post-World War II period. It is easy to jump to the conclusion that the policy of protecting the small-scale had impeded technological progress in the mill sector, and also reduced its financial capacity to develop. There are, however, two points which need to be stressed as caution against quick conclusions.

First, it has been noted in Part III that faced with the intense competition from the powerlooms in particular, the mills have been developing in the direction of creating a market for better woven fabrics with modernized equipment. If the current policy continues, this type of specialization might be encouraged further. It has also been noted that the government policy which permits mills to replace existing looms with any type of looms -- and

not allow the factories to add to the number of mills --might have encouraged some to opt for automatic looms when the question of replacement came up. It is true that a large number of mills have become bankrupt and had to be taken over by the public sector. But for the healthier mills, technological progress might have been encouraged rather than discouraged by the policy of protection of the small-scale.

Secondly, an important point to note, which has been discussed in this paper, is that the policy of small-scale protection is only an element and probably a minor element in the development of the high price-low quantity textile economy in India in the last two decades. A major aspect of the package of policies which might have contributed to this outcome is the fiscal and import control measures which have discriminated against man-made fibers, and also against superior cloth -- areas in which consumer preference has been most strongly growing both nationally and internationally. These fiscal and import control policies are not inevitably associated with the policy of protection of the small-scale.

ANNEX

This annex presents details of the sources of the data used in the cost-benefit analysis presented in Part II of the paper, and also discusses some of the methods utilized in calculating key parameter values, e.g., working capital.

A special survey of powerlooms and handlooms was conducted by the World Bank 1/ in one provincial town -- Mau -- in Eastern Uttar Pradesh. Mau is essentially a center of production and trade in textiles. There are a large number of handloom and powerloom units, as well as a few large mills. In Sections 1 and 2 we analyze the cost of production data obtained from our survey of handlooms and powerlooms. No data were collected from the large mills. The comparison of costs in mills and powerlooms are made in Section 4 on the basis of studies conducted by other investigators.

1/ In association with the Giri Institute of Development Studies, Lucknow.

SECTION 1

The Sample

A. Handlooms

Our survey turned up two separate types of handloom establishments: (i) the small handloom unit which is essentially a family enterprise located in the house of the owner; and (ii) master-weavers' units which typically employ weavers as hired workers who, however, work in their own homes. The distribution of the two types of units in our sample is given in Table A.1.

Table A.1: DISTRIBUTION OF HANDLOOM UNITS IN THE SAMPLE SIZE

	No. of looms	Mean Employment	Mean Capacity (meters per day)	No. of units
(i) <u>Small</u>	1	3.4	8.2	14
	2	4.7	13.6	9
	3	5.7	21.1	7
	4	6.0	30.0	1
	5-6	6.0	20.0	1
(ii) <u>Large</u>	15-20	37.5	310	2
	30-35	62.5	363	4
	45	98.0	540	1
	70	140.0	770	1

The difference in organization between the two types of units needs to be explained a bit more. The weaver (producer) does not typically do his own marketing. He sells his output at a piece rate to the master weaver who

generally also advances the yarn needed for his product. This relationship between the producer and the master-weaver is as true for the small unit as for the master-weaver's establishment. Are we then merely looking at the same type of firm from two different ends? The answer is no, and the real difference turns on the ownership of looms. In the case of the small establishments, the weaver (producer) himself owns the loom, while in the larger enterprises covered in our survey the weavers are set up in their own residences with equipment paid for by the master-weaver. This is revealed by looking at the figures collected in the survey on initial capital required to start the business. They tend to be typically small for the independent units, and large for the master-weavers' establishments (varying with the number of looms owned). The difference between the two types of weaving units is critical to the evaluation of the cost of capital, both fixed and working capital, as well as for value added and earnings per worker.

B. Powerlooms

The powerloom units in Mau made use of second-hand as well as new looms located in small groups. Unlike handlooms, the sheds in which these powerlooms are located are not always part of residential premises of the owners. The raw material i.e. the cotton yarn and staple yarn are first sent to large-scale sizing plants existing in the town for preparing beams. These beams, when prepared, are rolled onto bobbins (with the help of winding machines) which in their turn are fixed onto the shuttles of the powerloom for weaving the cloth. At the end of the process the manufactured cloth is again sent for calendering to a larger unit to give a glaze to the product.

The size distribution of the powerloom units covered in our sample were as follows:

NUMBER OF LOOMS

	1-5	6-10	11-15	16-20	21-30	31 & above	Total
Average Number of Employed:							
Hired	8.50	14.75	21.70	27.88	43.00	34.00	19.9
Hired plus family	8.63	15.25	21.70	27.88	43.00	34.00	20.0
Number of Units	8	8	10	8	1	2	37

A peculiarity of the industry was that all the workers employed were male, and a very large proportion of those employed were hired operators on the looms (weavers).

Type of Products

The handlooms in our survey produced only sarees. Most of them produced just one quality of saree -- medium 40s x 40s count, although there were two or three units producing coarser sarees as well and two or three producing fine sarees as an additional line of business. The powerlooms produced dhoties and chaddar as well as sarees. It was not possible to get cost data separately for the three types of output. The comparison between handloom and powerlooms has, therefore, to be in terms of a rupee of value added of the cloth produced. The comparison makes sense because the powerlooms, like the handlooms, concentrated in the medium 40s x 40s count range in the cloth woven, even if they did not specialize in sarees.

SECTION 2

Economics of Handloom Weaving

A. The Earnings and Productivity of Weavers

The master-weaver's establishments make use of wage earners. The weavers working under them are paid by the pieces of sarees produced. The independent units use their family labor and sell the sarees produced mostly to the master-weavers, although in two of the thirty-two cases of such units we found that they sold their products directly to wholesalers as well. The basic data on labor and production for the two types are given in Table A.2.

The most important difference between the two types is (a) the type of labor involved in weaving and (b) the output loom ratio. In the small units most of the family is working at least part time. In the larger units only adult male workers are reported to be working as hired labor. It is conceivable that they are assisted by some family members who were not recorded in the master-weavers' statements to the interviewers. However, the difference between small and large units as far as adult male workers per establishment are concerned seems to be real. Looking at the figures on earnings accruing to the workers, the average monthly wage per adult male worker is roughly the same in the two types of units (around Rs. 160).

The number of looms per adult male worker is twice as much in the independent units as in the master-weaver's units (1 as against 0.5). But it is seen that productivity per loom in the small units is a little more than 50 percent of that in the master-weavers' establishments. Thus in fact, the larger number of looms per worker in the independent units merely means that

Table A.2: LABOR, LOOM AND PRODUCTION IN HANDLOOM

Type	No. of Looms per unit	Number of Workers Per Unit					Pieces produced per month	Average wage per price	Earnings per month per adult male worker (Rs.)	Pieces produced per loom per month	Pieces produced per adult male worker per month
		Hired	Family								
			M	WF	WP	C					
Large	34.9	70.4	-	-	-	-	2,304	-	161	66.0	32.7
Small	1.9	-	1.94	0.58	0.54	1.42	58.7	5.258	157.2	30.6	29.9

M = adult male

MF = full-time adult women

WP = part-time adult women

C = children

there is a great deal of underutilization of loom capacity in such units, leaving the productivity per worker more or less the same in the two types of units (considering, that is to say, adult male workers only). This could seem reasonable in terms of the organizational difference noted above between the two types of units. When the looms are owned by the master-weavers, they can be expected to maintain them in good working conditions, while many of the looms owned by the small-scale weavers will be old and of low efficiency.

For the purposes of this exercise, therefore, we take the number of weavers per loom, productivity per loom shift, and the earnings per worker as given in Table A.2 for the larger units.

B. The Cost of Capital

(1) Fixed Capital

The fact that a larger number of looms are available to small units (at a lower level of utilization) might suggest that the capital cost of such units will be higher. But, in fact, the low price of looms used in the handloom industry makes the cost of machines a minor part of total fixed capital. Much of the larger part of the value of fixed capital is accounted for by land and buildings used for the production process. The figures from our survey are given in Table A.3.

The low value of land and building for the larger master-weaver's firm is misleading. The master-weavers only gave the value of the premises used for their trading purposes -- the space needed for storing raw materials and cloths received from the handloom weavers in their employment. The value of the premises of the weavers actually devoted to production is not included in the questionnaires filled in by the master-weavers. From the point of view of the cost of production in the handloom industry, the figure of the value of

Table A.3: CURRENT VALUE OF FIXED CAPITAL PER ADULT MALE WORKER (Rs.)

	Machines	Land and Building	Total
Small	214	1138	1352
Large	159	396	555

land and building given for the small producer is more appropriate. Does one include the cost of land and value of the master-weavers' units on the ground as part of the chain of storing the cloth before it reaches the wholesaler? Probably it should be included, given the peculiar two-stage process of producing cloth in the handloom industry. Thus our figure of fixed capital cost per adult male worker is the value of machines in large firms (to get around the problem of under-utilization of looms in small firms) plus the value of land and building in small firms plus the value of land and building in large firms. This gives a total figure of Rs.1693 per adult male worker.

(ii) Working Capital

We now come to the question of working capital used in the production of handloom sarees. The organization of production in either type of unit discussed earlier is of relevance here. The master-weaver advances raw materials (and perhaps wages as well) to the producers who get paid at the stipulated rate per saree produced, as and when they deliver the finished saree to the master-weaver. The cost of the working capital involved is borne largely by the master-weaver. The amount of such capital required is a function of the period of production; that is, the time the goods are in the

pipeline. A.K. Sen, in his discussion of the problem included all recurring costs -- wage bill and material costs -- in the requirement of working capital. He commented: "If the average lag is one year, the whole of the year's recurring costs will be locked up as working capital. If the average lag is six months, with a working capital equal to half the years' recurring costs we can meet all the recurring cost requirements." ^{1/}

In the accounting data obtained from a typical industrial firm we do not have to consider the period of production, because the statistics on raw materials and semi-finished products in stock, as well as cash in hand together add up to the working capital required for the rate of production actually observed. For the handloom weavers' units surveyed by us, however, no such statistics for working capital can be clearly identified. The small independent units did not provide any data on stocks of raw material or products carried. They, however, did indicate the amount of yarn obtained from the master-weaver which was processed in their homes. The lag involved in producing the cloth was stated to be 1-2 months. The larger master-weavers' establishments did have stock data, but it is not clear if the stocks of materials advanced by them to their workers (and presumably retained in the latter's homes) were included in the figures given to the interviewers. We try to see how figures on working capital derived from the different approaches compare. Table A.4 gives three sets of estimates -- two for the large units, one based on reported stock data, and the other on the basis of recurring costs. A third estimate is for small firms based on materials and wage costs. The three estimates are not too widely apart and we have already

^{1/} A. K. Sen, The Choice Techniques, Oxford, 1968, p.101.

Table A.4: ALTERNATIVE MEASURES OF WORKING CAPITAL (IN RUPEES)

	Material cost (1)	Wage cost (2)	Total (3)	1/6 of total (4)	Working capital per adult male worker (5)	Current asset (6)	Current assets per adult male worker (7)
Large firms	306,000	135,000	441,000	73,500	1,044	53,250	756
Small firms	6,646	3,660	10,306	1,718	886	-	-

N.B. Column (5) gives an estimate of working capital on the assumption that the "period of production" is two months.

Column (7) is the figure of current assets directly reported by the large firms.

All figures are mean values of each group of firms.

mentioned that the stock data for larger firms probably underestimate working capital. An acceptable figure for working capital requirement in handloom weaving would probably be Rs. 900 per adult male worker.

C. Value Added per Worker

Having derived approximate value for wages and capital per worker in the handloom weaving industry, it remains to estimate value added per worker. The large units do provide data on value added in the statement of accounts given to the interviewers. From these data the value added per worker was found to be Rs. 251 as against average wage of Rs. 161 per worker. The difference between the two -- wages according to these data are 64 percent of value added -- account for payments to capital and land, and for profits of the master-weavers. Since we have seen earlier that the productivity per adult male worker (in quantity terms) is the same in the two types of units, and they produce the same type of fabric, we accept this figure as the value added per adult male worker for the handloom sector as a whole. We are thus able to get the labor and capital cost required to produce value added of Rs. 10,000 per annum given in Table II.1 in the text.

SECTION 3

Relative Costs in Handlooms and Powerlooms

The cost data available from our survey of powerlooms in Mau needed much less doctoring. The relevant statistics are available directly from the balance sheets of the firms collected during the survey. Table A.5 summarizes the data. (Because of the large inter-firm variability, geometric means are used.)

Table A.5: INPUTS REQUIRED TO PRODUCE VALUE ADDED
TO Rs.10,000 PER ANNUM (Rs.000)

Adult male workers	Fixed Capital			Working capital	Total capital	Wage per worker (Rs)
	Machinery	Land & Building	Total			
1.76	3,426	4,480	7,906	2,600	10,506	2,136

One point of adjustment about the number of workers required for production should be noted. Many of the powerlooms in the town of the survey suffered from power shortage. Thus although the number of shifts the plants were planning to work was generally 1.5 -- involving 12 hours of work -- the actual number of hours worked were smaller. The stock of labor employed reported by each firm gives the expected number of man-hours worked if each of

the workers were employed for an average of 1.5 shifts. The actual number of man-hours fell short of this amount. Since labor was paid on piece-rates based on the actual amount produced, the flow of labor time involved in the production of the actual output observed has to be adjusted downwards from the expected flow. Two sets of wage data available in our survey enable us to do this adjustment. We have, first, the average wage per worker actually paid based on the wage bill for the year given in the balance sheet of the establishment. Secondly, we have a figure of monthly wage for the workers employed in the establishment (appropriately weighted by major occupational categories) based on the expected level of output. The ratio of the former to the latter is 0.88 and would be used as an index of underemployment. The reported stock of labor per unit is multiplied by this factor to give the "effective" rate of man-years of labor used by the unit.

SECTION 4

Relative Costs in Mills and Powerlooms

Our field survey work did not attempt to collect cost data from mills. Any such attempt would be time consuming and difficult. It will have to face up to the basic problem of separating cost data from the composite (vertically integrated) mills which cover both spinning and weaving operations. It was decided to make broad comparisons from studies which have recently been undertaken. Three sets of data could be identified:

- (i) There is a study of relative costs by M. Padmanabhan for 1974 for weaving coarse medium grey cloth (34s x 34s counts). 1/ The cost data were derived from relevant published and unpublished sources available with organizations connected with the textile trade, rather than from a sample survey.
- (ii) The Planning Commission of the Government of India put together a study under the direction of Professor Raj Krishna in 1979. Again the basic data were in the nature of "most informed" estimates culled by the staff of the project from a variety of sources including interviews with selected establishments. 2/
- (iii) An attempt to quantify the relative costs of producing coarse cloth was made by a working group of the National Industrial Development

1/ M. Padmanabhan,

2/ Planning Commission, Government of India (1978).

Corporation Ltd. ^{1/} The data seemed to be mainly derived from the technical experience of textile engineers, particularly those working in the Ahmedabad Textile Industry's Research Association (ATIRA).

The attempt at quantification of costs of production which follows makes use of all the three sources cited above, and also refers to the statistics reported in the Annual Survey of Industry of the Indian Government (although these refer to registered spinning and weaving mills together). The estimate of relative costs of producing grey cloth of medium count (no finer than 40s x 40s count) will be built up step by step.

A. Capital Cost per unit of Value Added

(i) Cost of Machinery

We will first consider the non-automatic looms which are most usually used by Indian weaving mills. The looms are essentially the same as used by powerlooms, although there is a great deal of difference in the conditions of the looms used in the two sectors. The powerlooms used in the small-sector are older, often bought second-hand, and less well maintained. There is then a substantial difference in the price of a non-automatic loom used in the two sectors. Padmanabhan's study gives the ratio of the price of looms in mills to that in the decentralized units as 3:1. The Planning Commission study gives a higher ratio of 5:1. We will take the average of the two for our calculations -- 4:1.

^{1/} United Nations Industrial Development Organization (UNIDO), 1978.

(ii) Productivity Per Loom

Productivity in each sector depends on the number of shifts worked per day, and secondly, the output per loom shift of the type of cloth being woven. The relevant data from the two studies cited are as follows:

	<u>Powerlooms</u>	<u>Mills</u>
1. <u>Padmanabhan</u>		
Number of shifts	1.5	2.25
Output in meters per loom shift	27	34
Total output in meters per day	40.5	76.5
2. <u>Planning Commission</u>		
Production, Annual Output in meters	10,000	25,000

The two sets of data are fairly close together noting that the Planning Commission figures include difference in shifts per day. Taking into consideration the fact that shifts in the mill sector have been increasing continuously, we adopt the Planning Commission figures as representing overall differences in physical productivity per loom.

(iii) Value Added

Mill cloth is priced somewhat higher. The Planning Commission study gives the value added per meter as 36 percent higher for mills. Note that this price difference represents intrinsic difference in the quality (for example, durability) of the cloth produced, and not the effect of excise duties imposed on mill made cloth.

(iv) Non-Loom Capital Costs

So far we have concentrated on the costs of looms relative to value added. But there are other elements of fixed capital costs in both sectors consisting of the value of preparatory weaving machinery and of land and buildings. Secondly, there is working capital to be taken into account. In the World Bank survey of powerlooms, loom cost accounted for no more than 30 percent of fixed capital (i.e. including land and building) and 23 percent of total capital (i.e. including working capital). It is pertinent to assume that the proportion of fixed capital other than looms would be a larger proportion of the total in the mill sector than in powerlooms (nothing very much can be said about the relative importance of working capital without much more intensive enquiry). Thus capital-value added ratio would be higher in the mill sector by a factor significantly higher than what was derived in the last subsection (a). This is borne out by figures available from two other studies. In our own survey the capital-value added ratio in powerlooms in Mau was 1.05 -- taking geometric means. The Government of India Annual Survey of Industries for 1977-78 gives the capital-value added ratio in the factory sector at 1.91 (although admittedly it includes all cotton textile firms including spinning and weaving). In the study by the Working Group on Textile Technology, figures are given on capital costs -- including machines other than looms. The capital-output ratio for mills in this study comes to 2.05 times the ratio for powerlooms. 1/

1/ UNIDO, op. cit., Table 9, p.36.

In all probability, therefore, we shall not be far wrong if we take the ASI estimate that Rs.19,000 of the value of capital is required to produce Rs.10,000 value added in the mill sector.

(v) Employment-Value Added Ratio

We next need to calculate the employment per unit of value added in the two sectors. This is a function of two terms: value added per loom as has already been discussed; and the number of workers per loom shift. From Padmanabhan's data the value added per loom shift ratio between mills and powerlooms is equal to $(\frac{34}{27} \times 1.36)$ or 1.71. The number of looms looked after by a worker in a weaving mill varies between 2 and 4, so that we can take the average as 3. In powerloom units, according to the Bank survey, the number of looms is 1 - 2, with a mean value of around 1.5. We assume that the ratio of other workers to weavers are the same in the two industries. Thus the ratio of employment per unit of value added in mills to that in powerlooms is $0.5 \div 1.71 = 0.29$.

SECTION 5

Summary of Machine Productivity

Table II.1 in the text gives the summary of labor requirements and capital costs per Rs. 10,000 of value added produced in the three sectors. It might be worthwhile to have a summary of data in machine productivity (which lies behind Table II.1) and which have been discussed in this Annex. Table A.6 brings together our "best estimates" of these parameters. The differences between the three sectors are seen in some more detail from this table.

Table A.6: MACHINE PRODUCTIVITY IN THE THREE SECTORS

	Handloom	Powerloom	Machinery
Output per loom shift (m.)	11	27	34
Number of shifts	1	1.5	2.5
Number of workers per loom	2.02	1.60	0.8
Capital costs per loom			
Machinery	321	3,358	13,435
Land and building	3,100	4,392	-
Working capital	1,818	2,652	-
TOTAL	<u>5,239</u>	<u>10,402</u>	<u>57,000</u>

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