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TEXTILE AND CLOTHING INDUSTRY IN EUROPEAN CMEA COUNTRIES: FUTURE PLANS AND RESTRUCTURING TRENDS

ANALYSIS OF THE CURRENT STATE AND RESTRUCTURING TRENDS IN THE TEXTILE AND CLOTHING INDUSTRY OF THE USSR

by

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Introduction

Textile and clothing industry, just as many other consumer-oriented industries, is universally classified among "old", traditional sectors of manufacturing. The role of this industry and the trends that prevailed in it, however, broadly differed at different stages of economic history and in different countries.

Russia, beginning from the 19th century, had a traditionally strong textile industry essentially all of which was based on imported raw materials, with the only exceptions being flax, the "true" Russian fiber, and some wool yarn. The clothing industry was originated in the early 20th century when small dressmaking shops were gradually changing to minor-scale mass production. The textile industry in its modern form dates back from the early years of Soviet Government when the first large mills were built in accordance with Five-Year Plans.

The drastic change was that the Soviet textile and clothing industry began to be based on nearly 100% domestic raw materials. A raw cotton industry was established in Soviet Middle Asia and in the Caucasus, and wool was now produced throughout the nation. Subsequently production of chemical fiber was set up in the country.

The progress of the textile and clothing industry of the USSR can be broken down into several stages which were specified by industrial stategies of the Government at different periods.

During the early 1920s when the national economy began to be raised from the damage caused by the civil war and foreign inter-

vention, the growth of the USSR industry can be almost entirely identified with the development of light industries, primarily textile industry, since these industries were predominant in Russia before the October Revolution. This development was paralllelled by the construction of first large-scale clothing mills.

During the 1930s the national economy was industrialized, with the growth of heavy industries, primarily energy and machine-building industries, being especially rapid. As a result, the nation had a solid base for developing consumer-oriented industries.

In the 1950s the USSR regained the loss inflicted on it during World War II, established a strong textile industry and rapidly developed its clothing industry. By the mid-1960s ready--made clothes eventually prevailed in consumer's wardrobe and the fraction of tailor-made or self-made garments drastically declined.

The mid-1960s and early 1970s marked a new stage in the development of the textile and clothing industry. A special emphasis was placed with the production of knits and non-wovens and there was a definite upturn in the industrial consumption of chemical fibers. The fabrics used for producing apparel changed accordingly.

Thus, the process and raw material structure of the industries began to be changed. The rate of this restructuring, however, should be estimated as inadequate today. Obsolete factories and production departments existed in parallel with up-todate industries. For this reason a rather extensive reconstruction work was undertaken in the late 1970s and early

1980s in old clothing and especially textile mills. This was largely due to the fact that the Government formulated a long-term program of drastic improvements in the standard of living of the people which is primarily based on raising the output of consumer goods. During that period the capital outlays directed to light industry surpassed all previous records. The CMEA co-operation began to be felt as an important development factor. Mention ought to be made here of the huge modernization program that has been performed in the spinning mills with the cooperation of Czechoslovak partners.

Soviet economists maintain that the textile and clothing industry of the country entered a drastically new stage of development. As a result of earlier programs, people's demands for all textile and clothing products have been fully met. However, the consumer requirements to product quality significantly increased, and the possibility of boosting the production by adding new capacity was fully exhausted. All future development should be based on improvements in equipment and manufacturing processes, automation, use of chemical technologies, better efficiency of the industry organization structure. These problems are adressed by the present study.

1. Characterization and the Major Segments of the Textile and Clothing Industry of the USSR

The textile and clothing industry of the USSR belongs to a group of industries called light industry and dominates in the latter. The light industry is steadily the largest employer in the manufacturing sector of the country, with 3.4 million people

being on its payroll as of early 1985. The textile industry produces more than one half of the total light industry output and the clothing industry comes a close second in this category. Suffice it to say that in terms of employment the textile industry is outnumbered only by the machine-building complex*) in the manufacturing sector of the USSR economy.

In terms of the output of fabrics the USSR is second only to the US. However, the USSR is a bigger producer of cotton and wool fabrics than the US and substantially lags behind the latter in the output of silk fabrics (at about 1 : 4).

The textile industry has a rather intricate structure, whereas the clothing industry is adequately homogeneous, if the specialization of factories in men's and women's outerwear, men's suits, women's dresses, bed spreads, caps, etc. is to be ignorred.

Figure 1 shows the specialization of the clothing industry of the USSR.

The textile industry has several specialized segments:

- cotton;
- wool;
- linen;
- silk;
- hemp and jute;
- miscellaneous items.

It is quite evident that the segments have been classified by the raw material they use - cotton, flax, etc. The "subindust-

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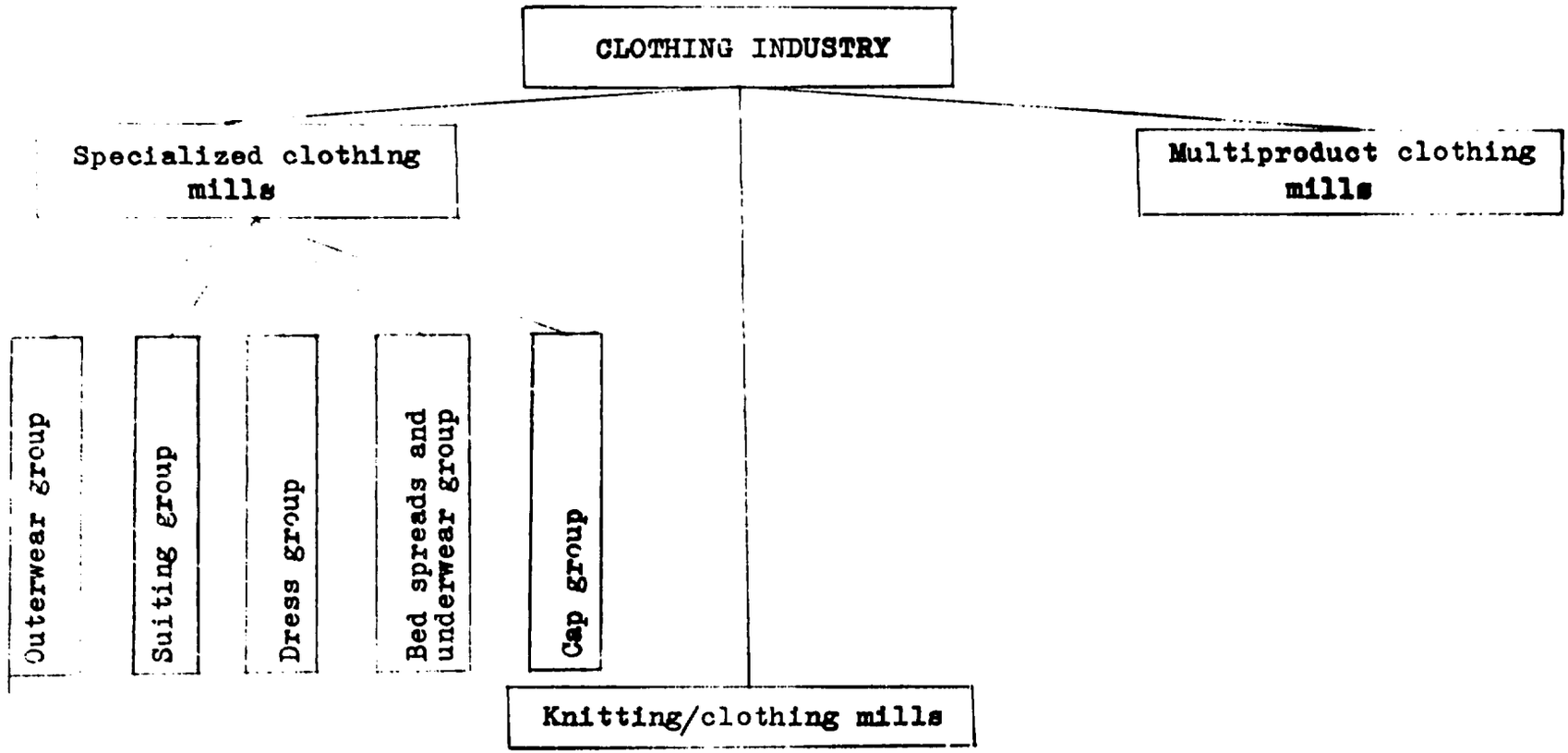
*) This covers the entire diversity of machine-building industries.

Fig. 1

Specialization of the Clothing Industry of the USSR*)



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*) The shear of specialized clothing factories was 61% in 1975 and 86% in 1980, of the total clothing segment.

ries", in turn, break down into groups of mills which do the primary processing of raw materials and groups of factories which produce finished textile fabrics. The production of finished fabrics includes spinning, weaving and finishing, and there are both factories which are specialized in these processes and integrated textile combines.

During the few past years there has been a steady need to add to the classification of industry segments characteristics such as the level of advancement of a particular textile process (weaving, knitting, non-woven technologies) and the final use of finished products.

With view to the foregoing four independent textile segments can be singled out:

- primary processing of agricultural products;
- traditional textile industries (weaving);
- advanced textile industries (knitting and production of non-woven fabrics);
- miscellaneous.

Figure 2 shows the improved structure of the textile industry of the USSR.

It is felt that the modification of industry classification will make it possible to boost the production efficiency of the entire industry, since the production of knitwear and non-wovens requires substantially less capital expenditure per square meter, as compared with the weaving process and raises productivity of labor*). Moreover, this reflects the actual restructuring pro-

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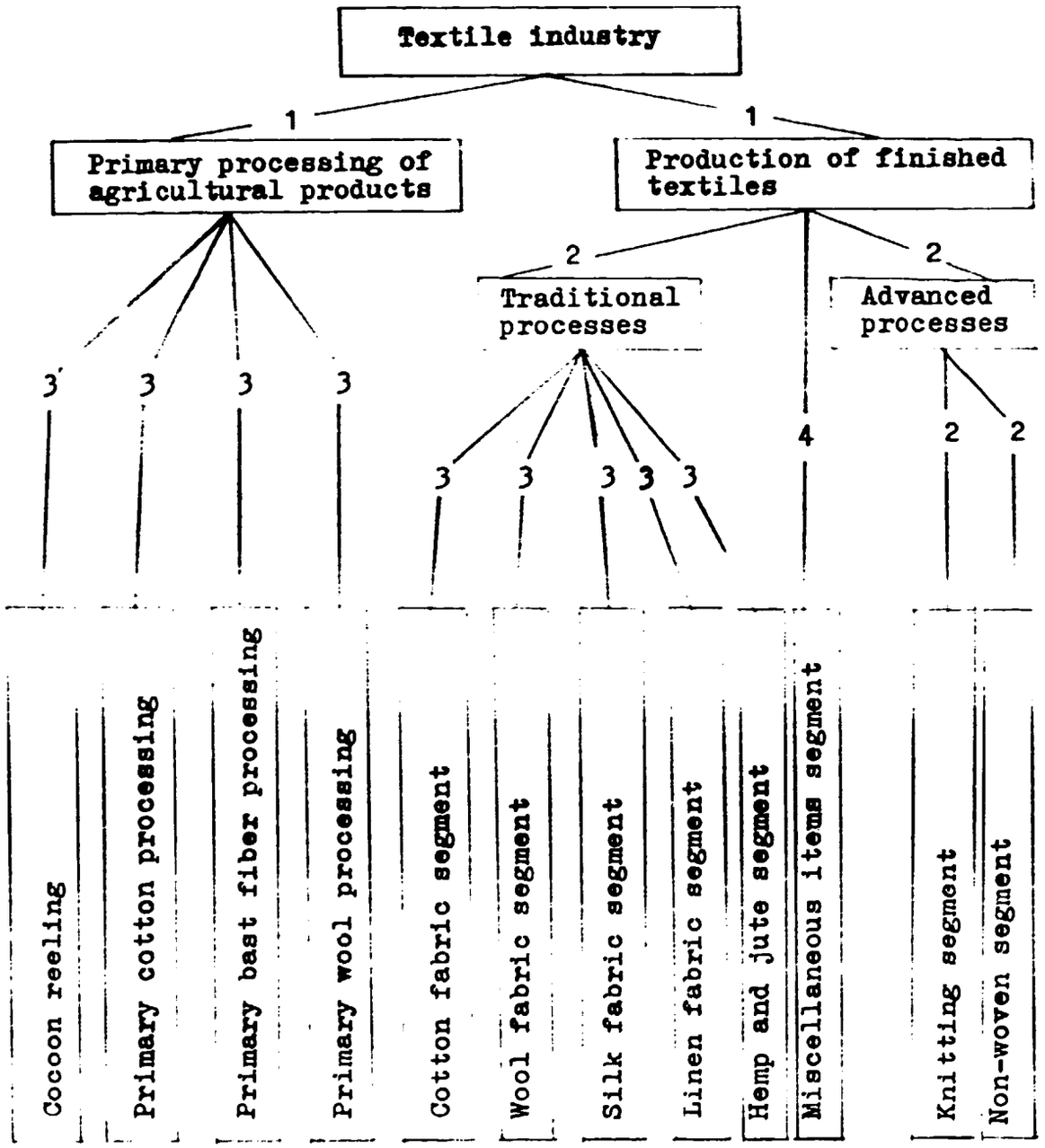
*)Some believe that use of the new generation of shuttleless looms will make the weaving industry again competitive in productivity of labor with other textile processes.

Fig. 2

Textile Industry Structure



Notations: 1 - differentiation by economic homogeneity of raw material and finished product; 2 - differentiation by textile process and its advancement; 3 - differentiation by the type of raw material; 4 - differentiation by process and end use of products

cess in the textile industry. In fact, during the 1970-1980 period the output of knitwear increased by nearly a quater and the output of non-woven fabrics was raised almost by 2.5 times, growing at a rate that was higher than for any other light industry product.

Generally the rate of productivity of labor increase in the textile and clothing industry is absolutely higher than the rate of workforce increase. Suffice it to say that during the 1970s this productivity of labor advantage was 34 points per year and beginning from the early 1980s all textile and clothing industry output increment has been due to growing productivity of labor.

The textile and clothing industry of the USSR is under centralized planned management, with all textile and clothing enterprises being ultimately subordinate to the Ministry of Light Industry of the USSR*). The Ministry uses a so called four-level management structure. With this structure, the actual responsibility for mill operation lies on Ministries of Light Industry of individual Republics, which operate through their Industry Groups conglomerated by production process and geography.

Thus, the Ministries of Light Industry of Union Republics bear double responsibility: they are subordinate both to the Ministry of Light Industry of the USSR and to the Councils of Ministers of Union Republics which coordinate all economic activities in their respective territories.

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*)Except for small mills which produce hadicrafts and simplest manufactured products, employ few people and operate under the Ministries of Handicraft Industries of individual republics of the Soviet Union.

Soviet managerial experts maintain that this system is in best harmony with highly diversified natural conditions and resources of the huge USSR territory and national traditions (the latter is an extremely important factor for a consumer goods industry).

In addition, there are also Ministry of Textile Industry of Russian Soviet Federal Socialist Republic which accounts for more than 50% of the entire textile output in the Soviet Union and several cotton processing ministries of Soviet Republics in Middle Asia and the Caucasus, the cotton suppliers.

The Ministry of Light Industry of the USSR is the top authority in both the technology and fashion policies for the textile and clothing industry and exercises them through its extensive network of research, technology-designing, and engineering institutions and fashion houses. The clothing industry has a big research institute in Moscow with branches in several capitals of Union Republics, an All-Union House of Fashion in Moscow, a fashion house in Leningrad, as well as fashion houses in the capitals of Union Republics and a range of larger regional centers. Each textile industry segment possesses its own good-size research institute and the bigger industries such as cotton have several. There are also technology-designing institutes. The Ministries of Light Industry of Union Republics have their own designing and engineering institutions.

In fashion policy, the All-Union Institute of Light Industry Product Range is the biggest authority. It studies the world-wide and home fashion trends and develops the future programs.

In addition, the Industry Groups and mills do their own fa-

shion designs. Practice shows that the shear of mill designs is at least 50% of the total output on the average.

Each year the textile and the clothing industry change up to 40 and 60%, respectively, of their product lines by modifying patterns and designs. These percentages have steadily been growing in recent period.

It is thus evident that both the desired level of economic performance and the high technology standard of the textile and clothing industry are achieved through a centralized management. The Government furnishes the industrial enterprises with capital, labor and operating resources and has the right to demand that they produce a certain quota of goods at a specified overall revenue, profit and efficiency*) and deliver a product range which is needed by the national economy and has a good sales potential.

The management system, however, leaves much room for mill independence in terms of tactical planning. This is especially important for consumer goods industries which are highly vulnerable to demand patterns and market trends.

Today clothing enterprises develop their own production programs on the basis of contracts with various wholesalers and retailers. The sales prices can in some cases be negotiated between the buyer and seller. The clothing industry, in turn, places orders with textile factories**). In this system provision

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*) Fixed profit percentage with respect to either product cost or fixed capital.

**) Exclusive of some industrial fabrics or fabrics sold through retail shops.

is made for tactical production changes in accordance with market shifts.

The output of the textile and clothing industry grows steadily in the USSR. Table 1 illustrates this trend for 1970-1973.

Table 1

	Value as percent of 1970					
	1970	1975	1980	1981	1982	1983
Value of textiles (millions of Roubles)	100	125	148	152	152	154
Value of clothing (millions of Roubles)	100	125	160	166	177	185

During the 1970-1980 decade the output of textiles increased by more than 50% and the production of garments tended to double. The enhanced rate of growth of the clothing industry stems from the fact that increasingly more mill fabrics are used for further industrial conversion and their proportion in consumer consumption declines accordingly.

Alongside the total outputs it is of interest to analyze the changes in individual textile and clothing products shown in Table 2. Over the period under scrutiny the production of non-woven fabrics, silk cloth, knitted underwear, carpets and rugs grew especially rapidly. This is due to the high consumer demand for these products and high efficiency of their production. Cotton fabrics remain to be a stable No. 1 in the textile

industry, however, their growth rate is not so high. The production of woollens stabilized and the demand for them somewhat dwindled in the USSR.

The clothing industry generally grew, during the same period, at substantially higher rates than the textile industry. However, 1982 and 1983 marked some slowdown in the production of garments. This owes to a sharp change in the market trends. Fashion began to be dominated by the so called "sporting" office style. There is an upturn in the demand for blended fabrics, varnished synthetic fabrics based on man-made light insulation, etc. The profile of stylish garments changed drastically. The clothing industry, however, failed to modify its production programs to suit the vogue and the consumer activity declined as a result.

The output data for the main groups of clothing shown in Table 3 clearly demonstrate that the downturn in the production of outerwear from heavy wool fabrics was initially developed in the 1970s. In addition to lighterweight overcoats, jackets from blended and synthetic fabrics, these products resisted strong competition from natural fur and leather clothes which were especially popular among consumers during that period. The growth rates were stable for other groups of garments and especially high for the dress group.

2. The Role of the Textile and Clothing Industry in the USSR Economy

The textile and clothing industry has an important part in the economic system of the country, generation of national income, and in domestic and international trade.

Table 2

Output	1970	1975	1980	1981	1982	1983
Cotton fabrics (million sq. m)	6095.5	6567.6	7000.3	7101.7	7074.1	7211.6
Wool fabrics (million sq. m)	635.7	728.6	745.1	750.1	728.0	693.4
Silk fabrics (million sq. m)	1135.8	1489.4	1743.9	1779.8	1793.4	1855.3
Non-wovens (million sq. m)	7[illegible].5	134.9	267.3	359.7	508.7	552.0
Knitwear (million pieces)	351.1	379.4	392.9	376.6	392.0	388.5
Knitted underwear (million pieces)	775.3	908.9	1098.4	1123.9	1107.2	1124.5
Carpets and rugs (million sq. m)	27927	35689	67775	73366	75783	77746
Clothing*) (million Roubles)	9801.2	12533.0	16398.6	16912.0	16458.8	16309.1

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*) Value as full production cost.

Table 3

Groups of products	Value (million Roubles)			Growth rate (%)	
	1970	1975	1980	1975/1970	1980/1975
Overcoats (standard and short), cloaks from cloth or man-made fur on woven or knitted base	80.0	68.2	65.97	85.2	96.7
Suits from woven or knitted durable-press fabrics	49.35	49.65	56.13	100.6	113.1
Dresses (including sun-frocks and dressing gowns) from woven or non-woven fabrics	120.35	160.68	190.09	133.5	118.7
Slacks	97.1	103.55	107.85	106.62	103.0
Shirts from natural (including wool) and synthetic fabrics and knits	142.5	170.2	202.74	119.4	119.1

Table 4 shows the variation of the shear of these industries in the total manufacturing output and national income of the USSR.

Table 4

	1970	1975	1980	1985
Shear of the textile and clothing industry of the USSR in:				
total manufacturing output	16.0	14.5	13.9	13.0[x)]
national income	13.4	11.9	11.7	11.7[x)]

Although it has a high rate of output growth, the textile and clothing industry's shear in the total manufacturing output and national income decreased somewhat in 1970-1980. Beginning from 1980 these figures tended to stabilize.

It is of interest to also compare the growth rates for selected industry segments. In fact, during 1975-1980 the output of total clothing, knitwear, and silk fabrics increased by 28, 25.5, and 34.8% in contrast to 24% for the intire manufacturing sector.

Comparable growth rates were achieved only in the machine-building sector (48%) and the chemical and petrochemical complex (32%).

The growth in the production of cotton and wool fabrics (11.6 and 16.6%, respectively) was less dynamic and stems from the rapid progress of these industries in preceding years.

x) Anticipiated.

Table 5

Products	Consumption				Average yearly growth rate (%)		
	1970	1975	1980	1983	1971/ 1975	1976/ 1980	1981/ 1983
Total woven fabrics (sq. m):	30.4	32.5	34.6	35.0	101.4	101.3	100.4
Including:							
cotton	21.2	22.0	23.8	24.7	100.7	101.6	101.2
wool	2.7	2.8	2.7	2.5	100.7	99.2	97.4
silk	4.7	5.9	6.6	6.4	104.7	102.3	94.0
linen	1.8	1.8	1.5	1.4	100.0	96.4	97.7
Knitwear (pieces)	1.8	2.0	2.1	2.1	102.1	101.0	100.0
Knitted underwear (pieces)	3.5	3.9	4.4	4.6	102.2	102.4	102.2

The yearly per capita consumption of textile and clothing products increased in parallel (see Table 5).

It may easily be observed that the growth of textile consumption lags behind the production (especially for wool fabrics). For this reason textile products may readily be targeted for exports.

Meanwhile there have been important changes in the population consumption structure, as indicated by data of Table 6.

Table 6

	1970	1975	1980
Total consumption of products for personal purposes:	100	100	100
Including:			
foods	56	54	52
non-foods:	44	46	48
including			
textile and clothing products	21	20	20

Generally the ratio of foods has been declining in the total personal consumption, being indicative of an increase in the standard of living of Soviet people. This, however, does not necessarily imply an increase in the shear of textile and clothing products in total consumption. Strong competion is being offered by durable goods and services, whose consumption grows at an increased rate.

Several evolutionary stages may be noticed in the production

and marketing of textile and clothing products. The vigorous upturn in demand during the postwar period was replaced by a decline in the mid-1960s (the growth rate was 1% in 1965).

The economic reform of 1965 and raised family incomes lead to a new consumer activity surge. The production of knitwear, ready-made clothes, and silk fabrics increased especially rapidly.

The output growth was greatest during 1966-1970 and amounted to 320% for knitwear, 180% for ready-made clothes, and 140% for wool and silk fabrics. Sales increased by 150%, with knitwear sales soaring to 230%.

The vigorous consumption, however, dwindled in the subsequent period and the personal wardrobes grew less rapidly and less variously.

The growth rate of total output stabilized or even dropped for some products. No rapid increases have been occuring in any of them (exclusive of non-woven fabrics), as was typical of the earlier period. The shear of textile and clothing products has been stabilized in the retail turnover.

Radically new trends were first initiated and then fully developed during the 1970s in demand for light industry products and, hence, in the industry operations. There developed masked unmet demand for textile products (i.e., the products did not fully satisfy consumer requirements). Imports became increasingly popular at the expense of similar domestic products.

The consumer activity not only grew at a reduced rate but sometimes even severely dropped in the textile and clothing markets.

This situation is two-sided, one side being positive and

the other negative. The positive is that the growth of the industry has met all essential consumer demands, while the negative is that much of the products do not sell, although people have money to buy them. This results in swelled personal savings, lowers the light industry performance and reduces the social and economic activity of people.

This market development was quite new for the Socialist economy and was studied in minute detail. The analysis indicated that the source of this trend was primarily social, rather than economic. Interviews with consumers revealed that more than 25% potential customers declined to buy. This is primarily due to unattrative design, pattern or color. Price, as a rule, is not a major consideration.

This trend is especially strong with younger people. More than 70% interviewed young buyers stated that they were ready to pay higher prices for products which would fully meet their requirements. Quality and especially style are now the chief concerns of younger people.

Soviet economists intend to adress the above problem by revising the planning concept for the textile and clothing industry. As the major discrepancy, the demand and supply have to be balanced in terms of both product diversity and product quality. The future industry policies will now be centered around improved product range programs which have to satisfy the increased consumer requirements to product quality.

There is a new approach to the very definition of quality of textile and clothing products - in contrast to the traditional "correlation between the actual 'physical and mechanical' proper-

ties and the standards". The quality level is now determined as user's appraisal and defined as absolute complience of craftsmanship, style, ease and cost of the product with consumer requirements.

These two trends now dominate the domestic market developments for the textile and clothing industry of the USSR.

It is also of interest to analyze the international market structure of these industries. Tables 7 and 8 show exports and imports of textile and clothing products in the USSR over the 1970-1984 period. The trends here are not as stable as for production, being influenced by world market patterns. However, here too the analyst will observe adequately stable tendencies.

3. The Current Level of the Textile and Clothing Industry as a Basis for Further Development

A typical feature of the organization structure of the textile industry of the USSR is its high concentration level which continues to grow. In fact, in 1975 14.8% of cotton spinning mills with a spindlage of 150,000 or greater had 40% of total spindles, whereas in 1980 these mills numbered 15.5% of the mills and had 41.3% of industry's spindles (see Tables 9 and 10). This trend also prevails in cotton weaving. The ratio of mills having more than 3000 looms was 13.0, 13.2, and 14.5% in 1971, 1975, and 1980, respectively. The percentage of looms installed at these factories grew from 43.7% in 1971 to 45.4% of the total loom pool of the industry in 1980 (see Tables 11-13). However, it should be noted that although they concentrated a large production potential, the big mills lag behind the smaller in terms of loom pool efficiency, but have greater than average producti-

Table 7

USSR Exports

Product	Unit	1970	1975	1980	1984
Cotton fiber	1000 t	516.5	800.2	843.2	
Flax fiber	"	9.3	8.3	7.2	12.6
Cotton yarn	"	5.3	2.1	1.4	2.3
Wool (washed weight)	"	17.1	6.7	1.6	6.1
Cotton and cotton--type fabrics	million m	307.1	247.8	123.8	93.2
Wool and wool-type fabrics	"	0.7	0.9	1.7	3.8
Silk and silk-type fabrics including synthetic silk fabrics	"	3.3	3.4	7.1	6.9
Linen and linen-type fabrics	"	3.9	4.0	2.3	1.9
Carpets and rugs	1000 sq. m	274.4	397.3	428.3	344.5
Staple fabrics	million m	3.9	4.0	2.3	1.9
Clothing and bedding	million Roubles	14.6	25.5	19.0	24.5
Overcoats and dresses (exclusive of leathers and furs), shirts, and underwear (exclusive of knitwear)	"	6.8	10.1	9.3	13.2
Knitwear (including underwear)	"	3.6	10.2	3.3	3.4
Hosiery	"	-	-	-	1.8

Table 8

USSR Imports

Product	Unit	1970	1975	1980	1984
Cotton fiber	1000 t	257.7	136.8	49.3	166.1
Flax fiber	"	-	-	-	-
Wool (washed weight)	"	82.7	110.0	124.2	89.6
Cotton yarn	"	56.3	67.8	111.5	18.7
Cotton and cotton-type fabrics	million m	154.6	181.1	226.8	358.9
Wool and wool-type fabrics	"	12.0	19.1	12.5	5.6
Silk and silk-type fabrics including synthetic silk fabrics	"	81.8	156.3	157.5	144.6
Linen and linen-type cloth	"	5.4	6.6	11.3	6.2
Carpets and rugs	1000 sq. m	5.2	11.8	27.5	28.6
Clothing and bedding	million Roubles	699.2	1135.5	1670.2	2291.9
Overcoats and dresses (exclusive of leathers and furs), shirts and underwear (exclusive of knitwear)	"	435.4	683.9	956.4	1271.9
Knitwear (including underwear)	"	202.7	327.5	454.1	682.4
Hosiery	"	17.0	27.3	67.3	74.6

vity of labor. This is due to the fact that some bigger enterprises face the problem of labor shortages. For this reason they encourage the operator to tend more machinery with corresponding reductions in equipment speeds and, hence, efficiency.

The wool fabrics segment has also been concentrating its production. In 1975 the spinning mills having more than 20,000 spindles amounted to 24.6% of the total industry, whereas in 1980 they grew to 29.7%. In 1975 and 1980 they concentrated 72.9 and 81.3% of the total spindlage of the industry. The biggest mills boast highest productivity of labor and equipment efficiency (see Tables 14 and 15). The concentration tendencies are still stronger in the wool weaving industry. Mills with 700 looms or greater are classified as large in this category. Big factories increased nearly two-fold during 1971-1980 (from 6.4 to 11% of the total mills). These factories concentrated 26.5, 33.8, and 34.4% of the total loom pool of the industry in 1971, 1975, and 1980, respectively (see Tables 16 - 18). The biggest mills have the highest level of productivity of labor and equipment efficiency.

In the linen fabrics segment the concentration trends are similar to those in the cotton fabrics industry. These are the highest productivity of labor in the biggest spinning mills, higher than average productivity of labor in weaving, and the lower than average equipment efficiency at largest enterprises (see Tables 19 - 23). This situation was somewhat remedied in recent years. The mills having been catching up with their design performance.

The silk fabrics industry has been concentrating its produc-

tion rather rapidly. The ratio of larger enterprises (having more than 1000 looms) grew from 25% in 1971 to 43.4% in 1980. These factories had 80.8% of industry's loom pool in 1980. The biggest enterprises offer the highest productivity of labor and equipment efficiency (see Tables 24 - 26).

As already noted, the textile and clothing industry is the biggest employer in the USSR. In spite of the fact that the light industry's payroll has been shrinking during the past 15 years in absolute figures (from 0.2 to 0.3% in five years), the workforce of the industry is now greater than 3.4 million. Table 27 shows the variation of employment patterns in the light industry during 1970-1980. From the Table it is evident that trainees experience the greatest reductions among all employee categories. This is due to the fact that the USSR has developed an extensive vocational system which trains skilled personnel for all sectors of e >-nomy. Thus, the trainee decreases in the industry are regarded by Soviet economists as a promising trend.

This author considers as positive the steady growth in technicians and engineers, since it reflects an important aspect of the technological progress in the textile and clothing industry, i.e., the increasing innovation which calls for additional expertise.

Table 28 presents the variation of workforce in the clothing segment and individual textile segments during 1970-1980. It may readily be noticed that the variation of workforce generally follows the trends in segment outputs. In contrast to the general workforce cuts throughout the light industry, the employment continues to grow in the knitwear and non-woven fabrics, i.e., in

Table 9

Classification of cotton mills by installed spindles in 1975 and comparison of productivity per operator and efficiency per 1000 spindles as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity / efficiency to industry averages	
			per operator	per 1000 spindles
Total factories:	100	100	100	100
including factories with the number of installed spindles:				
up to 10,000	9.2	0.3	33.2	98.4
from 10,001 to 30,000	9.5	1.6	68.8	104.5
from 30,001 to 50,000	14.8	6.5	84.3	102.2
from 50,001 to 80,000	19.4	13.4	99.7	111.3
from 80,001 to 100,000	14.8		101.4	106.0
from 100,001 to 150,000	17.5	23.4	103.4	95.6
from 150,001 or more	14.8	40.0	107.9	95.5

Table 10

Classification of cotton mills by installed spindles in 1980 and comparison of productivity per operator and efficiency per 1000 spindles as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per 1000 spindles
Total factories	100	100	100	100
Including factories with the number of installed spindles:				
up to 10,000	9.4	0.3	27.5	89.2
from 10,001 to 30,000	9.9	2.2	76.3	123.6
from 30,001 to 50,000	18.6	8.4	90.9	116.3
from 50,001 to 80,000	19.3	14.4	100.6	119.6
from 80,001 to 100,000	11.2	11.3	106.2	100.8
from 100,001 to 150,000	16.1	22.1	96.7	91.0
from 150,001 or more	15.5	41.3	107.3	92.0

Table 11

Classification of cotton mills by installed looms in 1971 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
including factories with the number of installed looms:				
up to 100	13.9	0.6	12.3	52.2
from 101 to 500	22.4	3.9	39.6	85.7
from 501 to 1000	17.4	9.2	84.9	104.0
from 1001 to 1500	13.9	12.8	103.2	104.5
from 1501 to 3000	19.4	29.8	115.0	104.2
from 3001 or more	13.0	43.7	110.0	96.2

Table 12

Classification of cotton mills by installed looms in 1975 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity / efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 100	12.2	0.6	13.2	53.7
from 101 to 500	24.3	4.0	40.2	84.8
from 501 to 1000	14.3	6.8	80.7	104.4
from 1001 to 1500	12.2	9.9	112.4	105.5
from 1501 to 3000	23.8	38.8	115.5	106.3
from 3001 or more	13.2	44.9	106.2	94.5

Table 13

Classification of cotton mills by installed looms in 1980 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend in per cent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 100	8.3	0.4	12.2	53.4
from 101 to 500	23.8	3.9	37.9	84.2
from 501 to 1000	12.8	5.6	77.1	106.8
from 1001 to 1500	16.9	13.4	107.2	106.3
from 1501 to 3000	23.2	31.2	117.6	104.7
from 3001 or more	14.5	45.4	104.9	94.9

Table 14

Classification of wool mills by installed spindles in 1975 and comparison of productivity per operator and efficiency per 1000 spindles as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per 1000 spindles
Total factories	100	100	100	100
Including factories with the number of installed spindles:				
up to 1,000	6.6	0.3	31.0	70.9
from 1,001 to 2000	9.8	0.8	34.6	78.2
from 2,001 to 3,000	10.7	1.5	45.2	89.2
from 3,001 to 4,000	8.2	1.6	52.6	91.9
from 4,001 to 5,000	9.8	2.6	54.5	89.9
from 5,001 to 10,000	20.5	7.7	60.4	95.3
from 10,001 to 20,000	9.8	8.1	73.7	96.1
from 20,001 to 60,000	16.4	38.0	117.6	104.6
from 60,001 or more	8.2	34.9	134.4	100.3

Table 15

Classification of wool mills by installed spindles in 1980 and comparison of productivity per operator and efficiency per 1000 spindles (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity / efficiency to industry averages	
			per operator	per 1000 spindles
Total factories	100	100	100	100
Including factories with the number of installed spindles:				
up to 1000	4.2	0.2	34.7	81.7
from 1,001 to 2,000	12.4	0.9	31.6	81.7
from 2,001 to 3,000	9.1	1.1	39.2	84.2
from 3,001 to 4,000	5.8	1.0	38.5	83.7
from 4,001 to 5,000	9.1	2.0	50.2	95.7
from 5,001 to 10,000	19.0	6.0	55.2	93.1
from 10,001 to 20,000	10.7	7.5	67.8	97.4
from 20,001 to 60,000	19.0	38.0	110.8	100.8
from 60,001 or more	10.7	43.3	138.7	102.3

Table 16

Classification of wool mills by installed looms in 1971 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 50	10.9	1.7	32.7	55.0
from 51 to 100	22.7	8.1	57.4	74.0
from 101 to 150	26.4	14.4	62.7	77.0
from 501 to 200	10.0	7.5	60.2	68.0
from 201 to 300	10.9	11.8	70.3	79.0
from 301 to 700	12.7	30.0	108.0	99.6
from 701 or more	6.4	26.5	182.0	153.8

Table 17

Classification of wool mills by installed looms in 1975 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 50	12.2	1.8	45.8	59.0
from 51 to 100	18.9	6.1	59.6	76.0
from 101 to 150	23.6	11.4	59.2	72.0
from 151 to 200	10.4	7.3	58.0	73.0
from 201 to 300	8.5	8.3	72.8	80.0
from 301 to 700	16.0	31.3	106.0	97.0
from 701 or more	10.4	33.8	161.0	135.0

Table 18

Classification of wool mills by installed looms in 1980 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 50	12	1.6	44.1	68.2
from 51 to 100	22	6.6	62.5	80.0
from 101 to 150	17	8.0	62.3	74.4
from 151 to 200	11	7.7	55.5	73.0
from 201 to 300	8	7.3	63.7	69.3
from 301 to 700	19	34.3	94.5	93.2
from 701 or more	11	34.4	170.1	133.6

Table 19

Classification of linen mills by installed spindles in 1975 and comparison of productivity per operator and efficiency per 1000 spindles as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per 1000 spindles
Total factories	100	100	100	100
Including factories with the number of installed spindles:				
up to 2000	18.8	2.2	79.9	134.1
from 2001 to 5000	22.9	7.3	82.9	132.3
from 5001 to 10000	20.8	13.7	89.8	118.5
from 10001 to 20000	16.7	21.5	88.3	94.2
from 20001 or more	20.8	55.2	119.0	90.6

Table 20

Classification of linen mills by installed spindles in 1980 and comparison of productivity per operator and efficiency per 1000 spindles as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed spindles at year-end, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per 1000 spindles
Total factories	100	100	100	100
Including factories with the number of installed spindles:				
up to 2,000	9.1	1.0	84.5	137.0
from 2,001 to 5,000	25.0	6.9	82.0	133.0
from 5,001 to 10,000	30.0	17.8	78.0	110.0
from 10,001 to 20,000	13.6	18.3	93.0	96.0
from 20,001 or more	22.3	55.9	122.0	92.0

Table 21

Classification of linen mills by installed looms in 1971 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 50	6.4	0.4	49.0	114.4
from 51 to 200	27.7	6.2	92.8	102.9
from 201 to 400	21.3	13.6	112.8	110.1
from 401 to 800	23.4	23.3	93.5	99.0
from 801 or more	21.9	51.5	102.0	97.4

Table 22

Classification of linen mills by installed looms in 1975 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 50	7.1	0.5	60.5	95.9
from 51 to 200	21.4	4.8	95.2	108.2
from 201 to 400	23.8	14.8	106.7	110.4
from 401 to 800	26.2	30.6	91.6	98.0
from 01 or more	21.5	49.3	104.9	97.4

Table 23

Classification of linen mills by installed looms in 1980 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 200	21.0	4.9	92.5	99.8
from 201 to 400	31.6	19.2	99.9	98.1
from 401 to 800	23.7	26.8	91.8	96.5
from 801 or more	23.7	49.1	109.5	102.3

Table 24

Classification of silk mills by installed looms in 1971 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend, in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 100	10.8	0.6	52.2	82.0
from 101 to 300	21.4	4.5	57.4	94.0
from 301 to 500	17.8	8.1	96.0	104.8
from 501 to 1000	25.0	22.9	95.0	103.0
from 1001 or more	25.0	63.9	107.0	99.0

Table 25

Classification of silk mills by installed looms in 1975 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at yearend in percent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 100	13.0	0.9	43.0	84.0
from 101 to 300	13.0	2.0	69.0	94.0
from 301 to 500	11.0	4.2	67.0	92.0
from 501 to 1000	22.0	15.5	76.0	94.0
from 1001 or more	41.0	77.4	114.5	107.0

Table 26

Classification of silk mills by installed looms in 1980 and comparison of productivity per operator and efficiency per loom as functions of factory size (in percent)

Factory size	Shear of factory size in the industry	Installed looms at year end, in per cent of the total	Ratio of productivity/efficiency to industry averages	
			per operator	per loom
Total factories	100	100	100	100
Including factories with the number of installed looms:				
up to 100	17.0	1.1	35.0	75.3
from 101 to 300	9.4	1.5	58.5	89.5
from 301 to 500	11.3	4.2	61.8	84.8
from 501 to 1000	18.9	12.4	62.6	85.6
from 1001 or more	43.4	80.8	114.0	103.3

Table 27

(millions of employed)

	1970	1975	1980	1975/1970	1980/1975
Light industry workforce, total	3.442	3.439	3.43	99.7	99.7
Including:					
Workers	2.934	2.917	2.895	98.7	99.2
Trainees	0.138	0.131	0.123	89.2	94.0
Technicians and engineers	0.209	0.229	0.258	123.6	112.6
Managerial and clerical	0.117	0.115	0.108	92.1	93.7
Auxiliary (janitors, etc.)	0.022	0.023	0.024	108.5	101.2
Miscellaneous	0.019	0.020	0.019	99.2	94.8

Table 28

(in percent)

	Workforce in 1975 as percent of 1970		Workforce in 1980 as percent of 1975	
	Total	Workers	Total	Workers
Cotton processing	108.7	108.4	103.8	103.7
Primary flax processing	99.8	92.3	99.7	98.5
Primary wool processing	101.4	101.3	121.3	124.4
Silk reeling	89.1	89.3	102.4	98.8
Cotton fabrics	96.0	95.0	97.1	96.8
Linen fabrics	89.1	88.7	87.3	86.7
Wool fabrics	105.1	105.0	104.4	104.8
Silk fabrics	109.8	108.9	106.1	106.4
Non-woven fabrics	-	-	136.5	133.9
Miscellaneous textile items	104.0	103.8	100.3	99.4
Knitwear	103.5	104.4	103.8	104.2
Clothing	98.1	98.0	98.9	97.9
Light industry, total	99.9	99.4	99.7	99.2

the advanced-level industries. The workforce also grows in primary cotton and wool processing and parallels the increases in the output of these fibers.

In the clothing industry the workforce slowly, albeit steadily declines, with the worker decrease being somewhat faster than the average for the entire light industry: 0.7 - 1.0 points versus 0.5. This is due to the fact that the clothing industry now has a strong competitor for hands, the service industry, which has been developing especially rapidly during the past 15 years in the USSR. If the workforce increment in the service industry is taken into account, the employment in garment production can be treated as generally stable.

Of great interest seems to be an analysis of female labor in the clothing and textile industry. It should first be stated that the prevailing trends are different for the clothing and for the textile segment. The clothing industry displays only minor variations of the ratio of women in the total workforce, from 1 to 4 points, the shifts being both ways, up and down. The proportion of women is currently estimated to be 75-80% on the average in the clothing industry and shows little promise of decline in near future. For the prospect 15-20 years industry fates can be identified with predominantly female workforce.

It would be a grieve error, however, to extend this forecast to the textile industry in the immediate future, although this traditional viewpoint has prevailed in the economic literature.

The textile industry shows a steady decline in female labor. For example, for USSR enterprises producing finished textile products the ratio of women dropped from 76% (in 1970) to 68% in 1980 and the

absolute female employment in these industries decreased by nearly 20%. The reason is quite simple: the productivity of labor grows at a higher rate for operating personnel (women) than for maintenance where male labor is predominantly employed. This tendency is parallelled by additional maintenance work to be done and creation of additional maintenance jobs. The interplay of these factors is expected to reduce the proportion of women in the textile industry to 50-55% within the future 15 years. As a result, the traditional approach to textile industry geography has to be revised. Previously textile factories were predominantly built as "satellites" of heavy industries for balancing the employment of men and women, while already today this approach leads to incomplete capacity utilization because of labor shortages.

Table 29 lists productivity of labor, output increments, and the growth rates of wages and salaries for the textile and clothing industry in 1970-1985. It is quite evident that the overwhelming portion of output increments is now achieved through better productivity of labor. Agricultural fiber processing is the only exception resulting from use of poorer land and higher labor intensity for raw materials processing.

The principle of faster growth rate for productivity of labor compared to earnings is used in Soviet economy. However, in order to stimulate light industry development for 1975-1980, the Government decided to make exorbitant wage and salary rises to the employees of the textile and clothing industry, all in full conformity with the economic strategy of the period. The implementation of this program began in 1975 with the cotton industry and was completed in the remaining segments over the period of 1975-1980, as may be as-

Table 29

(in percent)

	Output increments due to productivity of labor		1975/1970		1980/1975	
	1975	1980	productivity of labor	earnings	productivity of labor	earnings
Total light industry	94.5	100	125.2	121.7	117.8	122.7
Cotton processing	85.0	67.0	122.2	138.0	103.7	106.0
Cotton fabrics	100	100	118.5	119.3	115.8	126.7
Wool fabrics	81.0	100	124.0	121.2	112.4	124.3
Silk fabrics	100	100	145.5	119.5	129.0	120.2
Knitwear	100	100	123.1	119.6	121.6	123.7
Clothing	94.4	100	127.0	124.4	132.8	122.2

certained from the relevant characteristics of Table 29. The clothing and the silk industry, however, were able to maintain the traditional lead of productivity of labor. Henceforth this trend will be predominant in all the segments.

An analysis of the variation of labor productivity in the textile and clothing industry shows that the major growth factors are use of more technology-intensive processes (8.87%) and better management practices (6.47%), with the total productivity of labor increment being 18.34% over the five-year period.

Essentially all jobs in the textile and clothing industry are done by skilled personnel. The requirement for this category of labor is 420,000 - 440,000 per year and is met by training people in vocational schools and directly in the industry. The shear of skilled labor trained in non-factory vocational schools grows steadily (from 20% in 1970 to 30% in 1980).

Cotton fiber is still No. 1 in the raw materials picture of the textile industry (see Table 30). In 1984 the ratio of cotton fiber was 48.2% compared to 55.2% in 1970. The shear of natural fiber in the consumption structure of textile materials remains high. In 1970 the proportion of natural fiber was 83% and in 1984 it amounted to 68.5%. Because of the high natural fiber rate among textile materials, industry's fortunes are heavily depenDen on weather and climate, new land development, use of modern farming technologies, and crops. Year in, year out these factors have variable impact on the textile materials structure, sometimes leading to broad variations in the consumption of natural fiber. For example, in 1984 the utilization of cotton fiber increased only by 5.1% compared to 1970, whereas the 1980/1970 in-

Table 30

Structure of Textile Materials Consumption in 1970-1984

(in percent)

Material	1970	1975	1980	1984
Total textile materials	100	100	100	100
Including:				
Cotton fiber	55.2	53.8	52.1	48.2
Flax fiber	13.3	10.6	8.4	7.6
Hemp fiber	3.2	2.6	1.5	1.5
Kenaf and jute fiber	1.7	1.9	1.9	1.5
Natural wool	7.6	8.6	9.2	8.5
Regenerated wool	1.0	0.8	0.7	0.7
Factory wool	0.9	0.7	0.5	0.4
Raw silk threads	0.1	0.1	0.1	0.1
Total natural fiber	83.0	79.1	74.4	68.5
Man-made textile threads	3.4	3.8	4.1	3.8
Man-made industrial threads	0.2	0.2	0.5	0.5
Synthetic textile threads	1.3	1.9	2.1	3.0
Synthetic industrial threads	0.9	1.7	2.5	3.3
Man-made fiber	9.1	8.8	8.6	11.7
Synthetic fiber	2.2	4.5	7.5	9.2
Total chemical fiber	17.1	20.9	25.6	31.5

crement was 10.9%. The consumption of flax fiber has been dropping steadily during the past 14 years. In 1984 it was 68.6% of the 1970 level. The consumption of hemp fiber was 56.3% in 1984 compared to 1970. The animal wool requirement grew by 33.8 in 1984 versus 1970. Since the shear of wool amounts to about 13% of all natural fiber, the growth in this material did not have a crucial impact on the total natural fiber picture. In 1980 the consumption of natural fiber grew by 5.2% compared to 1970, whereas in 1984 it was 99.4% of the 1970 level. The downturn in the natural fiber requirement is also due to the fact that production of industrial crops by traditional methods is highly labor and capital-intensive. The need to raise the efficiency of farming, on the one hand, and to improve the quality of textile materials, on the other, lead to reductions in the use of natural textile materials and their substitution by chemical fibers.

The shear of chemical fiber in the textile materials structure increased nearly two-fold during 1970-1984, from 17.1 to 31.5%. The consumption of chemical fibers grew by 220% between 1970 and 1984. In chemical fiber category the largest growth was for synthetic textile threads (280% for 1984/1970) and synthetic fibers (490%). We estimate this tend as positive, since it ensures better stability of the raw materials base of the textile industry, raises the economic efficiency of textile complex, and improves the product line capability.

Modernization is a major factor behind the planned vigorous growth for the textile and clothing industry. A feature of the current economic period is that emphasis is placed with the qua-

litative factors of economic growth which do not involve additional jobs. This is achieved through the use of high-technology methods, all-round mechanization of main production processes, setting up of automated lines, mechanization of heavy and labor-intensive jobs, utilization of novel equipment in all the segments or, put another way, fixed capital renovation.

A large portion of new process equipment is imports. The geographic distribution of imported equipment for the textile industry is given in Table 32. In 1984 imports grew by 970% compared to 1970 and by 180% compared to 1980. Deliveries from socialist countries were the key factor in increased imports levels. In fact, during 14 years shipments from Bulgaria and Czechoslovakia grew by 16 and 15 times, respectively. Imports from the German Democratic Republic, Poland, and Hungary all rapidly increased - by 5.4, 9.3, and 13.6 times, respectively, for the 1984-1970 period.

Table 33 shows that the shear of Bulgaria, the German Democratic Republic, Poland, and Czechoslovakia in the structure of equipment imports has been stable during the past 14 years. The shear of these four nations alone in the USSR imports of textile equipment was 76.1% in 1970, 51.6% in 1975, 85.5% in 1980, and 88.9% in 1984.

The existing pricing practices for the products of the textile and clothing industry, on the one hand, lead to overrated production costs in primary fiber processing segments and delegation of part of this expenditure to the products of individual textile pro[illegible]% and, on the other, determined the present industry structure and the dynamics of profit generated inside

Table 32

Geography of Imported Equipment for the Textile Industry

(million Roubles)

	1970	1975	1980	1984
Total imported equipment for the textile industry	72.9	271.5	392.1	706.3
Bulgaria	2.5	11.0	16.9	40.3
The UK	1.9	9.1	2.1	7.3
Hungary	0	3.9	7.6	13.6
German Democratic Republic	17.6	28.5	57.9	95.6
Italy	3.6	47.3	3.8	6.9
The Netherlands	-	1.2	0.7	2.8
Poland	6.9	19.6	47.3	64.3
Rumania	-	-	-	8.9
The USA	0.1	3.5	0.2	-
The Federal Germany	2.5	14.2	14.9	10.3
France	6.2	7.0	2.2	6.5
Czechoslovakia	28.5	81.0	212.9	427.3
Switzerland	0.8	25.5	3.7	5.9
Japan	1.3	11.0	17.0	6.5

Table 33

Geography of Imported Equipment for the Textile Industry

(in percent)

	1970	1975	1980	1984
Total imported equipment for the textile industry	100	100	100	100
Bulgaria	3.4	4.1	4.3	5.7
The UK	2.6	3.4	0.5	1.0
Hungary	0	1.4	1.9	1.9
The German Democratic Republic	24.1	10.5	14.8	13.5
Italy	4.9	17.4	1.0	1.0
The Netherlands	-	0.4	0.2	0.4
Poland	9.5	7.2	12.1	9.1
Rumania	-	-	-	1.3
The USA	0.1	1.3	0.1	-
The Federal Germany	3.4	5.2	3.8	1.5
France	8.5	2.6	0.6	0.9
Czechoslovakia	39.1	29.8	54.3	60.6
Switzerland	1.1	9.4	0.9	0.8
Japan	1.8	4.1	4.3	0.9

the industry (see Table 34). Profit distribution was in proportion with the ratio of particular segment in the output. The drastic change in the industry profit picture in 1984 versus 1980 is a result of wholesale price revision carried out in 1981 and 1982. The wholesale price index was raised for cotton,linen, and knitwear to level out economic efficiency. In wool, silk, and clothing the wholesale price index was reduced to harmonize the unwarrantedly high economic efficiency of these industries. The modification of efficiency index and wholesale price index did not involve any changes in sales prices (wholesale industry prices or retail prices). The efficiency level that resulted from the wholesale price update provides necessary financial resources for the enterprises which have sound performance, to finance their operation, including allocations to the Government budget, mill bonus fund, and operating capital funds.

4. The Development Concept for the Textile and Clothing Industry of the USSR at the Present Stage

The current and the future stage of the textile and clothing industry of the USSR can be regarded as radically new. This stems from both the increased requirements of consumers to product quality and the shrinking base for increasing production.

During the 1960s and 1970s the industry used predominantly the labor-intensive development method. Production was increased primarily by bringing on stream new plants, whereas little attention was payed to modernization and reconstruction of the existing plants. This lead to a situation where much existing production capacity was idled, since the possibility of recruiting additional labor was almost fully exhausted. It is noteworthy that

Table 34

Industry Structure and Profit Dynamics for Industrial Operations of the Textile and Clothing Industry

(in percent)

	1975	1980	1984	Profit growth 1980/1975	1984/1975	1984/1980
Overall textile and clothing industry	100	100	100	109.1	145.5	133.4
Including:						
Total textiles	64.1	61.6	71.7	104.7	162.6	155.3
Cotton	14.7	14.2	26.4	105.6	261.4	247.5
Linen	3.8	2.4	3.4	68.3	129.9	190.2
Wool	16.6	15.8	15.4	104.0	134.7	129.5
Silk	6.8	8.6	7.0	138.8	151.4	108.8
Knitwear	7.4	10.9	12.0	161.8	236.1	146.0
Clothing	35.9	38.4	28.3	116.8	114.8	98.3

the poorest utilization rates were displayed by the newest plants having the best production equipment. Highly skilled labor continued to be employed by obsolete plants in traditional industry's centers.

Meanwhile, the capacity rate of fixed capital tended to decline. Novel technology raises the productivity of labor in textile industry by a substantial degree. For example, the productivity increments resulting from the use of new ring spinning machines amount to 30%, "air-jet" spinning machines and "air-jet rapier" / "microshuttle" looms to 100-150%. However, the capital intensity of the industry grows as fast. Already in the 1970s the cost of a single work place in the textile industry tended to rapidly go up (the data are listed in Table 35).

Table 35

	Cost of one work place ('000 Roubles)	
	existing plants	design
Cotton (spinning)	15	60
Wool	19	40
Silk	17	36

The combination of limited labor resources and soaring product capital intensity gave rise to a multitude of problems.

In spite of the radical renovation of equipment pools, the technological level of several textile segments is insufficiently high. This is especially true of industries such as wool, linen, miscellaneous textile items, and primary processing of wool and flax. The textile industry has a high proportion of

multipurpose, non-specialized equipment. This reduces product quality and lowers the rate of productivity of labor growth.

The problem of substantial reduction in heavy and unattractive labor has not been finally resolved.

When installed to replace obsolete or old machines, many types of currently manufactured equipment are incapable of increasing output in the same production area. This substantially reduces the reconstruction effect in the existing plants.

The raw materials base of the textile industry is insufficiently stable in both the amounts shipped and the quality and range of natural and chemical fibers. Special problems exist in production of modern synthetic fabrics, since the chemical industry has not so far met the textile requirements. This, in turn, hampers the diversification of clothing product lines. The clothing industry experiences shortages of modern facing and especially lining fabrics.

The existing production capacity is not fully used.

These are the major problems in the textile and clothing industry at the present stage and they govern the innovation programs being adopted for the future.

A "Multiprogram Plan of Increasing the Production of Consumer Goods and Services to People for 1986 - 2000" has recently been devised and approved in the USSR. This Plan is aimed at solving the abovementioned problems. There are two stages in it. Stage one (1986-1990) seeks to balance the manufacture of and demand for textile and clothing products in both quantity and range. Stage two (1990-2000) shall ensure a radically new level of meeting the consumer demand for industry's products in accordance

with optimal consumption rates and of meeting the industrial requirements in accordance with industrial plans.

Several problems have to be resolved for achieving these goals.

First, the shifting demographic patterns have to be taken into consideration. Their principal feature is that the rate of population growth slackens up. In 1986-1995 it is expected that potential work force will decrease in absolute figures. This reduction will be especially acute in traditional textile and clothing areas such as the Center, the Volga-Vyatka, and the Center-Black Earth Belt. The demographic situation thus dictates that the industries should raise their future output by boosting the production of labor and keeping a steady or even decreasing workforce.

The recruitment of labor for new plants should be achieved by workforce redistribution between different industry segments and production lines such that labor becomes available from existing plants as a result of their modernization and reconstruction. This involves careful investment planning in the clothing industry and some textile segments.

The development of "old", traditional textile segments such as cotton, wool, and linen should predominantly be achieved by reconstruction of existing plants in traditional textile areas. It is desirable that the projected clothing output increment be also produced through the use of updated technology , without increasing the existing production space. And vice versa, the advanced segments, i.e. knitwear, silk, non-woven fabrics, tend to have a lot of new construction which can take place in

regions which are newly developed by industries.

The high proportion of reconstruction in the total investment of the textile industry will tend to additionally raise the capital intensity of the industry in the future. Unfortunately, the viewpoint that reconstruction is more effective than new construction in terms of investment capital per unit product still persists in the economic literature. However, this concept does not seem to be true. Theoretical estimates based on industry practices enabled this author to reveal that costs declined as a function of output increment following reconstruction and that even if the output is increased two-fold (a quite unheard-of case) new construction will be more effective than reconstruction from the standpoint of saving the capital cost budgeted for increasing output. The reason for this is that there are no cost savings to be found in the reconstruction of textile plants when equipment cost grows at a higher rate than equipment efficiency. Meanwhile, the physical degradation of the active portion of capital equipment in the textile plants is generally low with the preventive overhaul system used in the USSR and the area holding the idled portion of capital equipment (because of its ancient build) is unsuitable for giving way to modern machinery. The result is that productivity of labor grows at a far higher rate than output per unit production area. This situation is typical of installation of new technology in the manufacturing sector in general and in textile industry in particular.

In summary, the future period can be defined for the traditional textile segments in the USSR as change to labor-efficient, capital-intensive policy. The capital intensity growth will, how-

ever, be somewhat hampered by the increased rate of progress in the advanced production processes - the non-woven and knitting technologies.

Of primary importance for labor resources policies in the future is formulation and implementation of a multiprogram plan of reduction of hand work in the clothing and textile industry on the basis of its mechanization and automation, especially in materials handling, transportation, warehousing, maintenance and other auxiliary jobs and processes. This is the area of greatest labor reduction potential which involves the lowest capital cost.

Faster technological progress is another key consideration. The textile industry needs further production automation, fewer process discontinuities and processing steps, use of new manufacturing techniques, all-round mechanization of major and auxiliary jobs, improvement of existing machinery, higher utilization of chemical materials. Use will be made of industrial robots.

In the spinning industry the principal areas of technological progress are use of automated in-line production, combination of adjacent process steps, use of shortened spinning routes, high-speed spindlefree spinning systems, further mechanization of hand jobs, better use of raw materials through reduction of their losses.

In the weaving industry this is automation of manufacturing processes in the preparatory departments on the basis of using high-capacity production units and in-line processes, use of a new generation of "microshuttle" looms and subsequently of "continuous multiframe fabric formation machines".

In the non-woven segment the physicochemical production me-

thods will further be improved, as offering better efficiency, readily lending themselves to automation and minimizing the capital investment. Strong impetus will be given to noval mechanical non-woven methods.

The technology level of knitting machines will be improved by increasing the range of knitting systems, installing electronic needle selection systems, and implementing automatic control and regulation of knitting process.

In the manufacture of knitted underwear fabrics it is desirable to use bigger raw materials and fabric bobbins, optimize system range and speed, automate cloth coil removal and develop in-line knitting-to finished fabric processes.

Use of high-speed equipment, specifically, automatic machines for manufacturing women's hose and stockings from synthetic threads with a knitting rate of up to 800-1000 pieces per minute will raise the productivity of labor in hosiery production by at least 200%.

In the clothing industry it is desirable to set up flexible integrated-mechanized lines and, based on them, factories for manufacturing mass-produced garments of high quality. Further it is intended to install second-generation integrated-mechanized lines which will increase the productivity of labor by 25-30% and ensure rapid product line modifications in accordance with fashion and consumer demand.

Substantial innovation reserves in the textile and clothing industry lie in the modification of their raw materials base. Highly important is the quality of agricultural materials such

as wool and cotton and shipment of these materials according to ordered grades. The quality of traditional Russian fiber - flax has to be radically improved. The ratio of long-fiber flax should be raised to 40% and the production of flax straw increased two or three-fold.

However, the key role in upgrading the raw materials base efficiency of the textile industry is accorded to increasing the use of chemical fibers. Special emphasis should be placed with the manufacture of low linear density threads, modified threads and fibers simulating natural materials and approaching the latter in their properties, heavier thread spools which make it possible to reduce labor in the subsequent manufacturing steps.

The shear of chemical fiber in the total raw materials for the textile industry should be raised to minimum 40% in the future, with the proportion of synthetic fiber in chemical materials 60-65% up. The output of polyester fibers and threads and synthetic industrial cloths has to be raised by 200 or 250%.

Radical optimization of the raw materials base of the textile industry can also be achieved by boosting the output of non-woven fabrics for industrial applications. Forecasts to the year 2000 predict that growth in this product can divert enough natural fiber to produce 2.5 million sq. m fabrics.

The raw materials base of a clothing industry is to a great degree a derivative of textile products, but special emphasis should be placed here with modern lining materials which impart elegance, light weight, and durable press in use.

Directly related to the technological progress and raw materials base development in the textile and clothing industry is

product line diversification and product quality improvement. Practice shows that in terms of quality and fashion the textile and clothing industry is still incapable of meeting the increased consumer requirements. This quality gap manifests itself in lack-luster "sheen" and low efficiency of final finishing jobs which ensure the consumer appeal of fabrics and hosiery, bad designs of many garments, inadequate press durability, poor fashion, etc.

In this context within the few future years it is necessary to implement a consumer-centered program of product quality improvement. This involves adding of new capacity in finishing jobs, elimination of bottleneckes in manufacturing processes, and setting up of a capacity reserve for better market-oriented manufacturing flexibility.

It is also necessary to devise and implement product line programs aimed at bridging the short supply gaps for several product categories such as denim fabrics, highquality worsted fabrics for suits, including cloth made from low linear density yarn, etc.

Estimates show that in three textile segments, cotton, wool, and silk, alone the yearly output increment can be as high as 1,000 or 1,500 million Roubles, if their product ranges are improved by reconstruction, modernization and adding of new finishing capacity.

The cotton industry has to radically improve its product lines in the two areas: increase its output of blended fabrics to 35 - 35% of the total production and reduce the manufacture of pure cotton cloth for industrial applications by minimum

200% on the average and by 600 or 800% for some product categories.

The wool industry must improve its product quality and diversify its product range through improvements in the fiber blends used and utilization of polyester fibers which impart durable press, elasticity, fluff, instead of polyacrylonitrile, greige or semigreige.

In production of apparel fabrics it is desirable to raise the shear of staple cloth having complex make-up through the use of modern spinning processes such as rope stapling.

In the knitting industry special emphasis is placed with increasing the rate of production of sports clothes, the availability of which is poorer than for any other category.

The clothing industry has to raise its production of modern fashions by reducing the manufacture of traditional products such as conventional dresses, suits, and overcoats.

Production must be hitched to the tastes of a specific consumer group (younger stylish people), with prices differentiated as a function of lot size. However, the existing rates of growth should be retained for inexpensive products intended for consumer categories such as children and sinior citizens.

For improving the industry organization structure it is desirable to further raise the level of product and process specialization, optimization and of cooperation and combination along the following lines:

- optimal product specialization in all textile segments and clothing;

- concentration of production of staple fabrics and indust-

rial cloth from chemical fibers in the silk industry;

- setting up of cotton and wool factories to produce yarn for the knitting industry, their optimal distribution with due regard to the contract relations with knitting factories;

- construction of spinning/knitting mills and knitwear factories;

- setting up of knitting/clothing factories to manufacture knitted underwear products; they are to be centered around consumer-oriented textile factories;

- establishment of long-term contract relations for deliveries of yarn, raw and finished fabrics.

Of paramount importance in the improvement of production efficiency is optimization of production capacities in the new and the recontructed plants through the minimizing of capital and operating costs. For clothing production lines the optimal capacity should also include the option of flexible process modifications.

The problem of improving the organization structure is especially acute for the clothing industry. It still has a low specialization level, with some factories manufacturing a complete product range - from bedding to winter coats. This leads to impossibility of using high-capacity specialized equipment and process tooling. As a result, the manufacturing process is cumbersome, the product quality is poor and productivity of labor grows at a slow rate. This author's estimates suggest that productivity of labor can be increased in the clothing industry without additional capital spending only by improvements in industry organization.

For improving management methods in the textile and clothing industry it is necessary to harmonize centralized planning and local manoeuvering and to raise the responsibility of production management. The major restructuring lines are as follows:

- improved planning to conform product output and diversity to consumer demand pattern, on the one hand, and the availability of materials and equipment, on the other;

- better efficiency of all economic levers for stimulating industry and trade, including evaluation criteria of economic activities, bonus tactics, crediting and pricing policies;

- setting up of a system of strict responsibility of industrial and trade enterprises for fulfiling their planned and contracted committments;

- use of sufficiently flexible and effective organization structures ensuring better distribution of industries over the territory of the country, improved coordination of the production of desired product quantities and ranges;

- greater degree of self-management for industry groups and individual enterprises in product line planning;

- formulation of production plans on the basis of contracts between industry and trade enterprises;

- greater importance of contracts; deliveries to contracted product ranges are to be used as the major criterion for evaluating the performance of enterprises taking part in production of consumer goods and those which supply raw materials and equipment to the former.

5. Guidelines for the Textile and Clothing Industry of the USSR to the Year of 2000

The rate of growth in the textile and clothing industry can be estimated from the growth concept. It has to be stated that, on the one hand, the present data are just a forecast, but on the other, they are based on projections of USSR Government planning institutions which specify the growth rate of economy. The very notion of planned economy presupposes the use of predictions which are the best possible fits of the expectations and by all means a balanced forecast for the entire national economy.

The guidelines for the textile and clothing industry of the USSR to the year 2000 are determined by two documents: the Multiprogram Plan of Increasing the Production of Consumer Goods and Services to the People for 1986-2000 and the Draft Guidelines of Economic and Social Development of the USSR for 1986-1990 and to the Year 2000. The forecast of the future development of the textile and clothing industry presented in Table 36 suggests that it is in full conformity with the scientific growth concept. The highest growth rates will be displayed by the more efficient production methods, primarily, the non-woven technologies. The promising trend of increased clothing pace compared to textiles will persist.

On the whole, the output growth predictions of the textile and clothing industry of the USSR to the year 2000 can be estimated as steady. The output of fabrics will be 14,000-15,000 million sq. m in 1990 and will grow to 18,000-19,000 million sq. m in 2000 This includes a two-fold increase in the production of new types

Table 36

Product	Unit	Growth rate (percent)				
		1985/ 1980	1990/ 1985	1995/ 1990	2000/ 1995	2000/ 1985
Total fabrics	m^2	111	107	111	111	132
including silk fabrics	"	112	107	123	127	166
Total non-woven materials	"	228	162	120	128	250
including non-woven fabrics	"	335	182	128	132	308
Knitted outerwear	pieces	114	113	114	115	150
Knitted underwear	"	126	117	107	127	160
Hosiery	pairs	107	116	109	108	137
Clothing products (in 1975 prices)	Roubles	118	112	112	110	138
Carpets and rugs	m^2	106	133	114	111	170

of silk cloth and a 230% increase in the output of apparel non-woven fabrics as soon as 1990.

The output of knitwear will be raised to 2,200-2,300 million pieces in 1990 and to 3,300-3,400 million pieces by the year 2000. The output (as retail price value) of clothing products will grow to 25,000-26,000 million Roubles in 1990 and to 34,000-35,000 million Roubles by the year 2000.

On the whole the output (as retail price value) of light industry products will be raised to 103,000 million Roubles in 1990 and to 142,000 million Roubles by the year 2000 versus 85,000 million Roubles in 1985.

The industry plan provides not only for the output increment, but also for improvement of industry product lines through manufacture of new products. A brief characteristic of new products planned for the textile and clothing industry of the USSR is presented in Table 37. The diversification of product lines is believed to not only improve textile industry's market potential and to raise the quality of ready-made garments (in consumer estimates), but to also produce a substantial economic benefit through production cost cuts.

The considerable output increment in the projected period should all be met by increased productivity of labor. The work force in the textile and clothing industry is predicted to change little if any to the year 2000.

The fixed capital of the textile and clothing industry has been planned to grow primarily during 1986-1990 and to largely stabilize in the following decade. The output shall be increased over the latter period through intensive utilization of

existing production capacity. The rate of productivity of labor growth over the entire 1986-2000 period will be 1-1.5 points ahead of fixed capital intensity growth and so conform to the investment efficiency requirement. This is especially important when all output increase is achieved due to the fixed capital factor.

The production cost in the textile and clothing industry shall be reduced by 3-4% on the average in the projected period.

Finally, it is of interest to analyze the future role of the textile and clothing industry in market development. Forecasts suggest that the shear of clothes in the total expendable goods consumption of USSR population will stabilize at about 20% in spite of the considerable absolute growth in 1985-2000. This stabilization will be achieved against a more rapid growth in the consumption of durable goods and services.

Table 37

New product	Economic effect and comparison with imports
Cotton/polyester blends with improved surface characteristics.	Quality raised to the standard of best imports, 10-15 % natural raw materials saved per unit product.
Cotton/high-strength viscose blends with improved surface density.	Quality raised to the standard of best imports, 5-10 % natural raw materials saved per unit product.
Wool fabrics for suits and overcoats, having improved surface density.	Quality raised to the standard of best imports, 15-20 % raw materials saved.
Silk fabrics with improved surface density.	Quality raised to the standard of best imports, 15-20 % natural raw materials saved.
New types of knitwear, less materials-intensitve, manufactured on single or twin-profiled circular knitting machines, base knitting machines, and automatic warp knitting machines.	Expansion to new product lines, savings of up to 10-25 % raw materials.
New types of silk fabrics based on the use of patterned, blended, and yarn-like threads.	Expansion to new product lines, supply of high-fashion improved-quality silk fabrics.
Knit-base man-made fur of improved structure and quality manufactured from modified	Diversification of the existing outerwear line, development of new high-fashion items from man-

Table 37 continued

New product	Economic effect and comparison with imports
polyamide fiber.	made fur in combination with other materials.
Inustrial non-woven fabrics as substitutes for natural fiber cloth	Alternative use of natural fiber cloth for consumer products, savings of natural raw materials.
Heavy industrial fabrics from chemical threads with a surface density of 250 gram/m^2 or higher.	Alternative use of cotton for apparel.

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