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4 The Multifiber Arrangement and Its Effect on the Profit Performance of the U.S. Textile Industry

Joseph Pelzman

4.1 Introduction

Over the past two-and-a-half decades trade in textile and apparel products has evolved from a trade environment, encumbered only by high tariffs, to a system of regulations that includes both high tariffs and ever more restrictive bilateral import quotas. This multifaceted trade management system regulating textile-apparel trade is of considerable interest because it has been credited with providing both a certain degree of market certainty and, consequently, an environment in which the U.S. textile industry has found it profitable to undertake major structural changes, which have transformed it from a small-scale, unintegrated, predominantly family-owned sector to a large-scale, more concentrated, capital-intensive, technologically advanced, and internationally competitive industry.¹ As such, the experience of the U.S. textile and apparel industries in repeatedly requesting and obtaining continued protection, as well as in implementing major structural adjustments, may be an important precedent for other so-called crisis industries who are now attempting to restructure U.S. trade policy in favor of greater protection.

A number of basic policy issues are raised by the Multifiber Arrangement (MFA) and its predecessor agreements. Primary among these issues is the degree to which the existence of the MFA has resulted in a misallocation of resources in both the developed and developing countries. For example, what portion of the average annual capital investment

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in the textile and apparel industries of \$1144.5 and \$425.7 million, respectively, during the 1970–80 period was attributable to the existence of the MFA? At a more general level, what impact has the MFA had on industry output, employment, prices, and profits? Another important issue concerns the magnitude of the economic cost of such an elaborate quota system. Clearly many significant issues are raised by the existence of this trade management system. A study of all of them would require resources far beyond those available for this project. Consequently, this paper focuses on just one important question raised by U.S. textile and apparel quotas, namely, whether these import quotas have served to improve the profit performance of the domestic industry.

Section 4.2 briefly outlines the history of textile trade regulation. The restructuring of the U.S. and West European textile industries is discussed in section 4.3. The methodology by which the marginal impact of the MFA on the profitability of domestic producers will be tested is explained in section 4.4. The empirical results are presented in section 4.5. Concluding remarks are given in section 4.6, and data sources are in the appendix.

4.2 International Regulation of Textile Trade

For the United States, trade in textile products has always been extremely important. In part this was and still is because of the size of the industry, its geographic concentration, its level of employment, and the political power it can wield.² The voluntary export controls agreed to by Japan in 1957 mark the beginning of a long list of international agreements (in the postwar period) designed to manage the trade of both textile and apparel products.³

4.2.1 Early Textile Trade Regulation

In the early 1950s the U.S. textile industry was faced with market adjustment problems precipitated by excess capacity in cotton textiles, a shift to synthetic fibers, technological changes, and increased imports of certain cotton textile products from Japan. As a partial solution to these problems the industry began to seek protection from import competition.⁴ The primary exporter targeted by the industry was Japan. In response to escape clause actions and fearing legislation authorizing import restrictions, Japan in 1957 agreed to a voluntary control of its exports of cotton textiles and apparel to the United States. While this agreement was successful in limiting Japanese exports of cotton products to the United States, it encouraged increased imports from new entrants, such as Hong Kong, Portugal, Egypt, and India. It soon became obvious to the U.S. administration that a more comprehensive solution was necessary to adequately control imports. In particular, the government

desired to avoid legislated import restrictions, preferring instead a legitimized system of trade restrictions whereby the world market would be divided so that both the developing countries and the industrialized countries would share the responsibility of an “orderly” market suitable for the expansion of developing countries and yet minimizing the damage to the U.S. market.⁵

Multilateral discussions, initiated by the United States and designed to reorder textile trade in accordance with these objectives, were held under the auspices of the GATT beginning on 16 June 1961. These discussions led in July 1961 to the first of a series of multilateral arrangements, known as the Short-Term Cotton Textile Arrangement (STA), which went into effect for one year beginning 1 October 1961. A more comprehensive agreement, known as the Long-Term Arrangement on Cotton Textiles (LTA), went into effect for five years on 1 October 1962 and was extended twice through 1973. Under the LTA cotton textile imports were controlled on an item-by-item basis.

The signing of the LTA initiated a departure from GATT rules for manufactured goods.⁶ Under this agreement importers could apply restraints selectively without compensation to exporters. Furthermore, under LTA provisions, unilateral action against an exporter could be implemented to cover all cotton exports regardless of whether there was any evidence of market disruption in the importing country.⁷ As an import restricting measure the LTA worked well initially. By 1967 the United States had restrained the supply of specific cotton textile and apparel products under article 3 of the LTA from seventeen of its major suppliers. Later that year these same countries accepted bilateral agreements with the United States under article 4 of the LTA. By 1972 the United States had concluded similar restraining agreements with thirteen other countries, bringing the total restraints to thirty suppliers.

Imports of man-made fiber textiles and apparel, unlike cotton textiles, increased more than ten-fold over the eleven-year life of the LTA. In response to the developing countries’ success in expanding exports of man-made apparel, the United States attempted to widen the scope of the LTA. In 1971 the United States reached bilateral agreements with its principal suppliers, Japan, Hong Kong, Taiwan, and Korea, designed to control the flow of wool and man-made textile and apparel products. However, these restrictions were not justified under the LTA framework, and subsequently the United States focused on amending the LTA so that it would cover textile and apparel products of all three fibers.⁸

4.2.2 The Multifiber Arrangement

Such an expanded agreement was reached on 20 December 1973 by some fifty governments. This multilateral agreement, known as the Arrangement Regarding International Trade in Textiles or more com-

monly the Multifiber Arrangement (MFA), became “the statement of principle and policy” regarding international textile trade.⁹ The MFA initially covered the period from 1 January 1974 to 31 December 1977 and was later extended, with some major modifications, first through 31 December 1981 and later through 31 July 1986. The primary goal of the MFA was the fulfillment of two conflicting objectives: to foster the expansion of world trade in textiles with particular emphasis on developing countries’ exports while, at the same time, preventing disruption of developed country markets.

These MFA objectives are clearly stated in its articles. Article 1 provides that the basic objective of the MFA be: “to achieve the expansion of trade, the reduction of barriers to such trade and the progressive liberalization of world trade in textile products while at the same time ensuring the orderly and equitable development of this trade and avoidance of disruptive effects . . .” Another principal aim of the MFA, also set forth in article 1, is “to further the economic and social development of developing countries and secure a substantial increase in their export earnings from textile products and to provide scope for a greater share for them in world trade in these products.”

Article 1 goes further to state that the safeguards provision of the MFA is to be applied in “exceptional circumstances” and is designed to “assist any process of adjustment which would be required by the changes in the pattern of world trade in textile products.”

The extent to which a particular country can impose unilateral control is limited to “market disruption,” which is defined in annex A of the agreement as serious damage to the producing industry. Along the general lines of the LTA, initial quotas were to be based on past import levels with the exception that these quotas were to grow at a minimum of 6 percent per annum (annex B of the agreement). Furthermore, provisions were made for a transfer of unused quotas among categories (the so-called swing provision) and between years (the so-called carry-over and carry-forward provisions).¹⁰

The MFA further provides in article 6 for special and more favorable treatment of new entrants and small suppliers. It also provides for surveillance procedures by the Textile Surveillance Body composed of both developed and developing country members. By 1 October 1977, the United States had negotiated bilateral agreements with eighteen countries limiting their principal textile exports. Furthermore, through its consultation mechanism, the United States had authority to unilaterally control imports of other textile categories considered disruptive.

While the MFA provides the framework for an “equitable”¹¹ regulation of trade in textile products, the specific implementation of this agreement is dependent on a set of bilateral agreements drawn according to article 4 of the MFA. The United States interpreted this article to

imply that bilateral agreements should provide a more liberal treatment of developing country suppliers "on overall terms." Consequently, under most of the bilaterals, within each aggregate limit specific quota levels for subgroups and specific quotas for items within subgroups were established. In the event that a particular item was perceived to be "very sensitive," specific levels were negotiated that held import growth to less than 6 percent for the duration of the agreement. For example, for the very sensitive wool industry U.S. bilaterals under the MFA have provided for growth of no more than 1 percent annually for both subgroup and specific item ceilings.

When the MFA came up for renewal at the end of 1977, the European Community (EC) pressed for greater control over developing country exports. Unlike the United States who had actively pursued bilateral agreements during the first MFA, the Europeans had no consistent textile trade policy.¹² Consequently, developing country suppliers increased their sales of textile and apparel products to the EC markets. In large part to satisfy EC concerns, the extension protocol renewing the MFA contained an amendment allowing "jointly agreed reasonable departures" from the 6 percent growth rate in quotas as well as from the agreement's "flexibility provisions," thus allowing not only growth at less than 6 percent but for zero or negative growth in those products considered sensitive by importing countries.¹³

While never formally invoking the "reasonable departures" clause, the U.S. government did respond to industry pressure threatening to hinder U.S. participation in the Multilateral Trade Negotiations (MTN) by reducing some of the flexibility in existing agreements. On 15 February 1979 the government issued its Administration Textile Program, referred to as the White Paper (U.S. Department of Commerce 1979).¹⁴ As part of this program, provision was made to limit the use of the carry-over provisions. Specifically, the program states that a "year to year increase . . . should not normally exceed the previous year's shipments plus one-half of the unfilled portion of the previous year's quota but in no event more than the current year's quota." Furthermore, the administration program promised closer monitoring of import quotas and a renegotiation of bilateral agreements to prevent "surges,"¹⁵ and provided a "snapback clause" so that tariff concessions negotiated in the MTN would revert to pre-MTN levels if the MFA was not renewed.

Under the provisions of the second MFA (MFA II), the United States concluded bilateral restraint agreements with twenty supplying countries and agreements with consultative mechanisms with eleven other countries. These bilateral agreements resulted in over 80 percent of total U.S. imports of textile and apparel products being subject to control by 1980.¹⁶

Under MFA II, the United States negotiated bilateral agreements whereby quotas were set at three levels: at the aggregate level covering all

textile and apparel products, in two to four broad groups of products, and at commodity specific levels. Within these commodity specific limits, the quota could be established as either a specific quantitative limit, a minimum consultation level, a consultation category, an agreed limit, or a designated consultation limit.¹⁷ These quantitative restraints for 1981 are listed in table 4.1 for all twenty countries with which the United States had such agreements during MFA II. As the data show, the three major suppliers (Hong Kong, South Korea, and Taiwan) had the largest share of the U.S. market.

The present Multifiber Arrangement (MFA III) is in its third life cycle. As such it represents a culmination of repeated increases in its restrictiveness. According to this latest agreement, future bilaterals will be allowed to limit the aggregate growth rate of textile imports to the growth rate of the domestic textile market, defined as the growth in the per capita consumption of textiles and apparel (estimated by the industry to be 1.5 percent). In addition, this MFA allows for the globalization of quotas¹⁸ and attempts to continue preferential treatment of smaller developing countries at the expense of the larger developing country exporters. The effects of these provisions will be felt most by Hong Kong, Taiwan, and South Korea, who combined accounted for 53 percent of total U.S. restricted textile and apparel imports in 1981. Under the recently completed bilateral agreements with one of these large exporters, sensitive items bound by specific limits have been limited to growth rates between 0.5 and 2.0 percent per annum. Smaller exporters, on the other hand, have been allowed growth rates exceeding 6 percent.¹⁹

Most industry specialists would agree that the protection provided under the MFA and its predecessor agreements has achieved its intended purpose, namely, a reduction in the growth of imports from restricted suppliers. The growth of textile and apparel imports in quantity is presented in table 4.2 for the United States and in table 4.3 for the European Community. The data in both tables demonstrate the relative success of the various trade restrictions, in that the rate of growth of textile and apparel imports has been remarkably small. In the post-MFA period, 1974–81, total textile imports grew at less than 2 percent per year. For the United States, textile imports measured in square-yard equivalents were actually lower in 1981 than in 1971. During the same period, the composition of U.S. imports changed radically from textiles toward apparel and from industrial countries toward imports from the developing countries.

In the European Community a concerted effort to control imports began only after 1976 and in particular during MFA II. Thereafter, both total imports and those from the developing countries grew at very modest rates. While total imports during 1976–80 grew at 4.9 percent per annum, imports from countries with bilateral agreements grew at only 2.2 percent per annum.

To dramatize the degree to which the commodity composition of textile imports have shifted in favor of apparel in the United States, the ratio of imports to domestic production for selected textile and apparel categories is presented in table 4.4. Comparing these ratios for various commodities representing yarn, fabrics, apparel, and made-up goods, the degree of import penetration in apparel is substantially higher. Among the apparel products, imports of sweaters, especially those made of wool, and shirts and blouses, predominantly for women and girls, rank among the highest. In contrast, imports of man-made yarn, broadwoven fabric, and knit fabric were quite modest. It would appear that this elaborate trade management system is quite successful in its ability to limit the market access of textile products where the industrialized countries possess comparative advantage, yet far less successful in the apparel area where the low-wage, developing countries have a stronger comparative advantage.

4.3 The Restructuring of the Textile Industry

Traditionally the apparel industry and (to a lesser degree) the textile industry have been dominated by a large number of small and medium sized, mostly privately held companies. The minimum scale for efficient operation was low. Consequently there were few significant barriers to entry, and concentration levels, while varying by subcategory, were far below the average for all manufacturing. In the postwar period, both the textile and apparel industries underwent a series of major, structural, demand-and-cost-related changes. The resulting characteristics of these industries are presented in table 4.5. Despite all the changes discussed below, both the textile and apparel industries have fairly low concentration rates (41 and 28 percent, respectively, in 1979). Furthermore, in both industries the import penetration ratio, measured in dollars, is less than 10 percent, in part because of the success of the quota system in restricting import growth.

Of the numerous factors having an impact on these industries in the postwar period, six factors seem most important. First, with the mass introduction and consumer acceptance of man-made fibers, firms using man-made fibers rapidly increased their share of textile output at the expense of those firms processing natural fibers. Second, changes in technology, especially in the conversion of fibers into yarn and yarn into fabrics, led to an increase in the minimum efficient size of textile plants. Similar advances in the apparel stage have been absent primarily because of technical constraints. Consequently, the apparel industry is still composed of many small and medium-sized plants with relatively low scales of operation. Third, international trade created new opportunities for expanding scale economies. In Europe, the formation of the European

Table 4.1 U.S. Bilateral Quotas and Fulfillment Levels under MFA II for 1981 (in thousand equivalent square yards)

Country	Aggre- gate Limit	Group 1 Limit	Group 2 Limit	Group 3 Limit	Group 4 Limit	Specific Limits	No. of Items on Spe- cific List	Total Imports Restricted by Specific Limits	Total Imports	Restricted Imports as a Percent of Total Specific Limits	Restricted Imports as a Percent of Total Imports	Country Share of Total Imports
Brazil	158990	56102	68725	35063	100854	100854	17	69084	75963	68.5	90.9	1.65
China	—	—	—	—	—	98920	8	111160	593564	112.4	18.7	12.94
Costa Rica	—	—	—	—	—	7892	1	7854	21769	99.5	36.1	.47
Egypt	—	—	—	—	—	—	—	—	56939	—	—	1.24
Haiti	—	—	—	—	—	26619	6	10685	44041	40.1	24.3	.96
Hong Kong	1140630	313719	712647	70839	43422	789572	33	622317	872064	78.8	71.4	19.01
India	228110	184740	—	43370	—	83242	7	33696	76911	40.8	44.2	1.68
Japan	—	—	—	—	—	—	3	—	469356	—	—	10.23
South Korea	703173	173978	547037	15860	—	470614	30	439513	706440	93.4	62.2	15.40

Macau	45570	44200	1516	—	—	29438	22	37499	43351	127.4	86.5	.95
Malaysia	—	—	—	—	—	24139	14	19896	38185	82.4	52.1	.83
Mexico	—	—	—	—	—	80803	14	33307	127488	41.2	26.1	2.78
Pakistan	188038	162966	27579	—	—	153573	3	127798	206687	83.2	61.8	4.51
Philippines	278772	24552	—	—	—	232841	104	133017	157617	57.1	84.4	3.44
Poland	53753	—	41685	2215	802	45594	22	14018	14018	30.7	100.0	2.46
Romania	—	—	32294	28000	—	16947	7	11332	28917	66.9	39.2	.63
Singapore	278251	62355	213351	3543	—	111203	18	77004	109857	69.2	70.1	2.39
Taiwan	903915	197728	701034	5713	—	561810	24	525008	834688	93.4	62.9	18.20
Thailand	—	—	64927	—	—	66367	20	42946	112267	64.7	38.3	2.44
Yugoslavia	—	—	—	—	—	816	1	4	4	0.5	100.0	—

SOURCE: U.S. Department of Commerce, Office of Textiles, Expired Restraints, 7 June 1982.

NOTES: A line (—) indicates no limit imposed.

Textile groups are normally defined as:

Group 1 — Yarns of cotton, wool, and man-made fibers.

Group 2 — Fabrics, made-up goods, and miscellaneous nonapparel products of cotton, wool, and man-made fibers.

Group 3 — Apparel of cotton, wool, and man-made fibers.

Group 4 — Special made-up goods and miscellaneous textile and apparel. For Hong Kong the categories are: 435, 436, 438, 443, 445/6, 447/8, 633/4, 635, 638/9, 641, 648.

Table 4.2 United States Imports of Textile and Apparel Products by Source, 1971–81 (in million equivalent square yards)

Year	Apparel	Textiles	Total	Hong Kong, Taiwan, South Korea	Latin America	Other Devel- oping Countries ^a	Japan	China	Europe and Others
1971	2,098	3,853	5,951	1,762	293	383	1,691	0.2	1,822
1972	2,226	4,010	6,236	1,810	369	559	1,249	11	2,238
1973	2,090	3,035	5,125	1,523	453	635	813	33	1,668
1974	1,937	2,473	4,410	1,475	422	571	861	84	998
1975	2,077	1,751	3,828	1,559	362	432	536	141	758
1976 ^b	2,578	2,560	5,138	2,134	463	708	832	153	848
1977 ^b	2,466	2,511	4,977	1,978	418	552	943	91	995
1978	2,905	2,835	5,740	2,247	605	776	853	201	1,058
1979	2,671	1,977	4,648	1,930	512	812	492	231	681
1980	2,884	3,000	4,884	2,210	461	820	461	325	608
1981	3,136	2,626	5,762	2,460	543	993	503	562	702
Average annual growth rates:									
1971–81	3.6	–3.4	–0.3	3.0	5.4	8.1	–9.8	18.2	–8.1
1971–73	–0.1	–7.9	–4.9	–4.8	14.3	16.5	–23.4	65.9	–2.9
1973–81	4.4	–1.6	1.3	5.2	2.0	4.9	–5.2	19.8	–9.1
Percentage share:									
1971	35.2	64.8	100.0	29.6	4.9	6.4	28.4	n.a.	30.6
1973	40.8	59.2	100.0	29.7	8.8	12.4	15.9	0.6	32.5
1981	54.4	45.6	100.0	42.7	9.4	17.2	8.7	9.8	12.2

SOURCES: International Trade Commission, *The History and Current Status of the Multifiber Arrangement, 1978*, Washington, D.C., 1978; International Trade Commission, *The Multifiber Arrangement, 1973 to 1980*, Washington, D.C., 1981; International Trade Commission, *U.S. Imports of Textile and Apparel Products under the Multifiber Arrangement, 1976 to 1981*, Washington, D.C., 1982.

^aDefined here as Asia and Africa (except Israel and South Africa).

^bMinor changes in conversion factors for converting garments, yarns, etc., into equivalent square yards took place between 1976 and 1977 when the system of product categories was changed.

Table 4.3 European Community Imports of Textile and Apparel Products, 1973–80 (thousand metric tons)

Year	Industrial Countries	Countries Covered by the MFA		Total	Total
		Countries with Agreements	Preferential Countries ^a		
1973	254	n.a.	n.a.	572	826
1974	334	n.a.	n.a.	752	1,086
1975	306	n.a.	n.a.	855	1,161
1976	356	651	n.a.	1,093	1,449
1977	332	598	301	1,001	1,333
1978	354	598	366	1,072	1,426
1979	472	697	421	1,225	1,697
1980	526	709	396	1,227	1,753
Annual growth rates:					
1973–76	11.9	n.a.	n.a.	24.1	20.6
1976–80	10.3	2.2	9.5 ^b	2.9	4.9

SOURCES: Commission of the European Community, *The European Community's Textile Trade*, Europe Information no. 44/81, Brussels, 1981, and unpublished data from the Commission of the European Community.

^aIncludes the products of the 46 countries of Africa, the Caribbean, and the Pacific (ACP) who receive duty free access to the European Economic Community.

^bFor 1977–80.

Table 4.4 Imports as a Percentage of Domestic Production for Selected Textile and Apparel Categories

Item	1972	1973	1974	1975	1976	1977	1978	1979	1980
Yarn:									
Cotton	4.1	2.9	1.8	1.8	3.6	1.9	4.1	1.7	2.6
Wool	3.1	2.8	5.5	3.6	5.0	7.2	6.8	4.4	4.9
Man-made, textured	11.8	7.3	3.2	2.3	2.2	3.1	1.4	0.8	0.6
Man-made, spun noncellulosic	1.5	1.6	0.8	0.6	0.9	2.1	3.4	2.2	2.8
Broadwoven fabric:									
Cotton	12.2	13.3	13.4	11.2	16.8	11.8	18.2	14.3	16.0
Wool	11.7	13.2	10.7	10.1	12.5	15.4	15.0	12.7	10.0
Man-made	3.5	2.7	2.8	3.0	3.3	3.3	3.9	3.4	2.8
Knit fabric:									
Cotton	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1
Wool	17.5	3.9	2.2	4.0	4.3	3.5	1.2	0.9	0.8
Man-made	3.4	1.8	0.7	0.7	0.6	0.6	0.5	0.3	0.2

Rugs, carpets:									
Cotton	28.3	31.3	58.7	40.1	58.9	26.8	26.5	20.2	49.3
Wool	10.3	19.8	34.6	43.7	63.4	61.5	64.0	58.9	102.9
Man-made	1.1	0.7	0.5	0.5	0.6	0.5	0.4	0.4	0.4
Sweaters, total:	77.3	74.8	79.0	89.0	115.2	106.8	119.4	122.1	162.6
Men's and boys'	35.8	42.1	37.0	43.3	61.5	60.6	86.8	75.8	68.9
Women's and girls'	101.1	95.1	107.4	111.0	141.2	129.1	136.7	148.3	219.3
Wool	110.5	156.7	139.7	187.5	390.2	426.5	201.0	214.6	436.7
Man-made	103.3	96.0	108.2	107.0	129.3	112.3	131.9	134.0	188.2
Shirts and blouses:									
Woven	33.8	29.4	31.4	35.3	48.1	49.3	67.5	70.1	70.1
Shirts and blouses, knit	41.3	40.6	41.1	47.3	46.9	39.5	46.7	42.9	40.8
Men's and boys'	23.9	24.7	15.8	19.0	18.1	17.3	24.8	23.0	23.2
Women's and girls'	62.5	60.1	74.4	79.1	82.8	65.4	72.5	66.2	65.6
Suits, total:	6.1	6.6	11.8	12.4	13.0	11.4	14.1	12.2	11.6
Trousers and slacks, total:	22.3	21.4	17.0	20.9	23.1	24.1	31.3	26.3	26.7
Men's and boys'	9.8	9.1	7.5	11.7	13.5	14.3	18.2	15.4	14.9
Women's and girls'	43.2	41.1	31.2	33.2	37.7	38.7	53.2	43.5	46.1

SOURCE: U.S. Department of Commerce, International Trade Administration, *Cotton, Wool and Man-Made Fiber Textiles and Apparel*, June 1982.

Table 4.5 Profile of the U.S. Textile and Apparel Industries, 1979 (in million of dollars except as noted)

	Textile Mill Products (SIC 22)	Apparel and Other Textile Products (SIC 23)
Number of establishments in 1977	7,100	26,000
Value of shipments	46,850	47,276
Total employment (000)	858.2	1,331.0
Production workers (000)	742.6	1,151.1
Average hourly earnings	4.87	4.38
Capital expenditure	1,423	524
Simple four-firm concentration ratio:		
1965	38%	21%
1979	41%	28%
Average 1965-79	39%	23%
Import penetration ratio: ^a		
1965	6.77%	3.23%
1979	8.16%	9.35%
Average annual growth in domestic demand: ^a		
1965-73	.031%	.039%
1974-79	.042%	.056%
Average annual growth in imports: ^a		
1965-73	.287%	.100%
1974-79	-.942%	-.989%

SOURCE: U.S. Department of Commerce.

^aValued in dollars.

Economic Community and the European Free Trade Association aided the industry by providing a larger market. The large internal U.S. market together with the Canadian market had already provided U.S. firms with the opportunities for exploiting scale economies. Fourth, many of the smaller, less capital-intensive textile enterprises, faced with this new internal competition, were absorbed by larger, more affluent conglomerates. Fifth, the introduction of cotton dust standards in 1974 led to intraindustry changes that forced marginal cotton textile firms to close down as a result of the proposed new regulations. Finally, the entire process of structural change was undertaken under the protective umbrella of the MFA and its predecessor agreements. These agreements were aimed at preserving the market share of domestic textile and apparel producers by limiting the growth of specific imports.

The resulting change in the composition of raw materials consumed by the textile and apparel industries is well known. Whereas in 1963 man-made fibers accounted for 36 percent of all fibers consumed by the U.S. textile industry, by 1980 man-made fibers rose to 75 percent of total fibers

consumed. A similar development occurred in the European Community and Japan where man-made fiber consumption rose from 26 and 43 percent to 60 and 67 percent, respectively. This interfiber competition had a very pronounced effect on the structure of the textile industry. It created a substantial barrier to entry by raising the cost of a minimum efficient plant, especially in the primary stages of production, namely weaving and knitting.²⁰

The shift toward man-made fibers can be attributed to both domestic and trade-related factors. First, the advances in polymer technology led to lower and more stable man-made fiber prices in contrast to higher natural fiber prices. Second, imports of man-made fiber products began to be restricted as early as 1971. Third, consumer tastes shifted in favor of easier care fabrics. This combined with technological changes in the use of man-made fibers contributed to the slow but steady collapse of the smaller textile firms primarily producing cotton textiles.

As mentioned above, the public introduction of proposed cotton dust standards in December 1974 also may have caused some intraindustry changes in the textile industry. While the actual rules did not take effect till the end of 1980, some analysts believe that the impending rules did encourage some textile firms to stop processing cotton. In a recent article, Maloney and McCormick (1982) point out that starting in 1974 a redistribution of wealth took place within the textile industry, where larger firms capable of adapting to the new cotton dust standards continued cotton production while smaller, more marginal firms were driven out of the cotton business.

For many years the textile sector was composed of three major activities: the treatment and transformation of raw fibers into yarn, the conversion of yarn into fabric, and the assembly of fabric into apparel. In large part as a result of the introduction of man-made fibers, technological changes introduced in the 1960s and 1970s have blurred the distinctions between this troika production process. In cases such as nonwoven fabrics, the processes of yarn and fabric production have merged. In cases such as seamless hosiery, certain sweaters, and sheets, yarn is transformed directly into the finished product. In addition to combining the production processes of certain products, technological changes have also altered the way each of these processes is carried out. In particular, the speed with which each operation is performed and the amount of automatic transfer between operations has increased. All this has led to a reduction in inventory requirements and in labor usage. It has, on the other hand, led to a substantial increase in capital requirements.²¹

In both the United States and Europe, increased investments in both textiles and apparel have been primarily influenced by steady increases in the capital intensity of the textile operation and by industry expectations of increased textile demand. From the data presented in table 4.6, the

Table 4.6 Volume of Gross Fixed Investment in the Textile and Clothing Industries, 1970-78 (annual averages, million \$)^a

Country	Textile Industry		Apparel Industry	
	1970-74	1975-78	1970-74	1975-78
Germany	615.7	428.0	155.7	130.0
Belgium	107.0	117.2	46.2	25.7
Denmark	37.9	21.4	8.8	7.6
France	545.1	318.6	96.1	92.3
Ireland	24.3	32.2	3.2	4.1
Italy	440.8	412.0	97.8	84.8
Netherlands	92.9	59.4	19.6	13.5
United Kingdom	437.4	311.1	79.0	71.1
Total EEC	2364.1	1699.9	506.4	429.1
Austria	79.6	59.7	22.9	18.5
Spain	149.5	119.6	44.6	24.9
Finland	45.4	27.7	21.3	17.9
Greece	122.9	172.7	8.3	16.4
Norway	22.1	18.8	4.6	5.3
Portugal	155.6	66.1	16.3	6.8
Sweden	50.2	46.9	13.0	12.2
Total Europe	2989.4	2211.4	637.3	531.1
Canada	147.4	107.4	21.9	18.6
United States	1278.9	1068.1	447.1	388.4
Total North America	1426.3	1175.5	469.0	407.0
Japan	1320.0	627.9	161.7	135.9
Australia	64.8	32.6	17.8	8.9
Total OECD	5800.5	4047.5	1285.8	1082.9

SOURCE: Organization for Economic Cooperation and Development (OECD), *Textile Industry in OECD Countries*.

^aAt 1975 prices and 1975 exchange rates.

investment boom in the industry appears to have started in the early 1970s and culminated in 1974. In the post-1975 recession, investment in the textile and apparel industries dropped off substantially from a pre-recession annual average of \$5.8 billion to a post-1975 level of \$4.0 billion for the entire Organization for Economic Cooperation and Development (OECD).

The pattern of OECD textile/apparel investment is generally assumed to be motivated by a number of factors.²² First, the anticipation of a boom in consumer demand combined with an anticipated reduction in the growth of imports led to the creation of highly capital-intensive excess capacities in the production and processing of man-made fibers. Second, advances in the quality of equipment combined with rising labor costs induced many enterprises to renew their capital stock more rapidly. Since 1975 the emphasis of investment activity has been concentrated on new

processes and on the elimination of bottlenecks. While gross fixed investment has declined in the post-1975 period, the capital stock of the industry does not appear to have declined. In fact, the textile industry in the OECD, and especially in the United States, has transformed itself over the past twenty to twenty-five years from a labor intensive, small-scale industry to one that is far more capital-intensive and above all more profitable. The same cannot be said, however, for most of the apparel industry, which is still predominantly labor and low-skill intensive.

Based on the above discussion, the restructuring of the textile (and to a lesser extent the apparel) industry apparently can be attributed to a variety of factors that are not all trade related. Yet the role of the MFA cannot be discounted. While it may not have played the major role, it did in fact preserve the market share for the domestic apparel industry, which is the largest (40 percent) customer of the U.S. textile industry.

4.4 Measuring the Impact of the MFA

A central proposition of economic theory is that, in long-run competitive equilibrium, resources will be allocated efficiently when prices equal marginal cost and producers earn only normal rates of return. Departures from this norm because of either imperfect competition or government intervention (e.g., trade restrictions) should result in an inefficient allocation of resources or rates of return above the competitive norm. A major area of industrial organization research has therefore focused on differences in market characteristics as determinants of above-competitive-equilibrium profits. The literature in this area has generally confirmed that the size distribution of sellers, the rate of growth of demand, and barriers to entry are important determinants of industry profitability.²³ More recently this literature has incorporated the impact of foreign trade on the performance of U.S. manufacturing industries.²⁴ The central proposition of this literature is quite simple. Actual and potential import competition increases the strength of the competitive process in the domestic market, in effect reducing seller concentration and resulting in competitively determined prices and normal profits. Conversely, one could argue that the existence of fewer foreign competitors or the expectation of fewer foreign competitors leads to higher domestic concentration and consequently to higher than competitive levels of profitability.

While existing studies have taken into account the role of import competition (Esposito and Esposito 1971), the role of exports (Caves, Khalizadeh-Shirazi, and Porter 1975), and the role of foreign direct investment (Pagoulatos and Sorensen 1976), an examination of the impact of Orderly Marketing Agreements, such as the MFA, on industry profit performance has not been carried out. By focusing on whether

U.S. textile and apparel quotas have served to improve the profit performance of the domestic industry, the following analysis attempts to fill this gap in the literature.

4.4.1 The Empirical Framework

The industrial organization literature uses multiple regression analysis to estimate the relationship between industry profitability, market structure, and foreign competition. These equations ordinarily include seller concentration, geographic dispersion, economies of scale, capital requirements, and market growth of demand as the major structural determinants of profitability and, at a minimum, the import penetration ratio as the foreign variable.²⁵ The theoretical justification for both the domestic structural variables and the international factors along with a thorough explanation of the model are more than adequately discussed in the substantial industrial organization literature cited earlier. Consequently, only a brief explanation of the theoretical rationale for each of the conventional variables is presented here.

Competitive Performance

The dependent variable used in the analysis to represent competitive performance is the price-cost margin (PCM) which has been successfully used in previous industrial organization studies (see, for example, Collins and Preston 1968, 1969, Kwoka 1977, Mann 1970, and Weiss 1974). This proxy of profitability equals profits plus capital costs (calculated as value added minus payroll) divided by value of shipments. Consequently, part of the cross-industry variability in profitability will reflect differences in capital intensity. To control for this variation in capital costs, the capital output ratio is used as an independent variable. The PCM can therefore be viewed as an approximation of a percentage margin of revenue over direct cost.²⁶

Economic theory would argue that in a competitive equilibrium, ceteris paribus, interindustry profit rates should equalize. That is, the PCM for a perfectly competitive industry in long-run equilibrium would be zero, regardless of the level of import competition. The state of competition in the textile and apparel industries represents a continuum from industries nearly perfectly competitive to industries where the joint-profit-maximization outcome is approached. Consequently, inequality of industry profit rates may indicate differences in the state of actual and expected competition. Lower actual or expected competition should, ceteris paribus, result in higher profits for that industry. In an open economy, Marvel (1980) has demonstrated that an expansion in preimport profitability induces imports to increase, while increases in imports tend to reduce ex post domestic profitability.

Capital Intensity

Because most of the subsectors of the textile and apparel industries differ in capital intensities and because the dependent variable (PCM) subtracts only direct factor costs, one must take account of implicit capital cost differences between subindustries. A capital output ratio (KO), calculated as the gross book value of fixed assets divided by value of shipments, is therefore included as an independent variable to control for the opportunity cost of capital. One would expect the KO ratio to be positively related to the price-cost margin.

A major weakness of the KO ratio is that in rapidly growing industries it may not reflect the steady-state equilibrium level of KO. To minimize this problem, value added per production worker (VAP) was added as a further independent variable. VAP will further distinguish the varying impact of changes in productivity occurring in both industries during the 1965–79 period.

Geographic Dispersion

To take into account differences in regional concentration of manufacturing activity within the United States, a particularly successful index used is one developed by Collins and Preston (CPIN; 1968). This index of regional concentration is calculated as the sum of the absolute differences between the percentage of a particular industry's domestic shipments and the population across census regions. Assuming that per capita demand for a given industry's product is distributed at a constant population share rate across regions, a high concentration of an industry in one region would imply that the industry product is tradeable. Consequently, increases in the CPIN index are associated with increased international trade and lower price-cost margins. The sign of CPIN is therefore expected to be positive for industries like textiles and apparel where manufacturing is not concentrated in one region of the United States.

Growth of Domestic Demand

Growth in industry demand (GROWD), calculated as the annual percentage change in industry shipments, should, *ceteris paribus*, exhibit an independent and positive relationship with industry profits. Theory and past empirical evidence support the proposition that when an industry experiences high growth in demand, firms may secure above-competitive profits. When growth is slow or declining, firms may be compelled to reduce profit margins to maintain adequate levels of sales.

Seller Concentration

The measure of seller concentration most often used is the four-firm concentration ratio (CR4). A generally accepted proposition is that the

greater the share of industry output controlled by a few firms, the greater the probability that these firms will tacitly collude to raise prices above long-run average costs. Thus, industry profit rates are likely to be positively related to seller concentration.²⁷

Economies of Scale

Oligopoly theory suggests that the greater the output of an entrant's minimum efficient plant relative to industry output, the higher the barrier to entry. Consequently, an economies of scale variable (ECSC) is calculated as the ratio of the average plant size among the largest plants producing 50 percent of the industry's value of shipments to total value of shipments of the industry. One would expect profits to be positively associated with the level of scale economies.

Foreign Competition

Empirical implementation of the structure-conduct-performance paradigm of industrial organization without foreign variables is straightforward. However, when foreign trade is introduced as a further constraint on above-competitive returns, one must take into account the simultaneity between industry profitability and international trade. As Marvel (1980) and White (1974) have pointed out, above-competitive profits by domestic manufacturers encourage imports, and a large import share, *ex post*, reduces profits.²⁸ To deal with this simultaneity problem, an expected import penetration ratio ($\widehat{\text{IMPR}}$) is added to the set of independent variables commonly used to explain variations in rates of return among industries.

Following the lead of Marvel (1980), the expected values for the import penetration ratios are estimated from the following equation:

$$(1) \quad \widehat{\text{IMPR}} = \beta_0 + \beta_1 \text{CR4} + \beta_2 \text{KO} + \beta_3 \text{AHE} \\ + \beta_4 \text{NPWP} + \beta_5 \text{CPIN},$$

where AHE is average hourly earnings of production workers, and NPWP is nonproduction workers payroll as a percent of total payroll. Because the import penetration ratio (IMPR) is bounded by zero, ordinary least squares is inappropriate. Consequently, the import penetration equation is estimated using a maximum likelihood Tobit procedure.²⁹

A second, equally important problem when introducing international trade is how to demonstrate that the restraining effect of imports depends on the domestic structure of the textile and apparel industry. That is, if one considers these industries to be imperfectly competitive, then increased imports should restrain above-competitive levels of profitability. On the other hand, if these industries are viewed as inherently competitive, then price will already equal marginal cost and, hence, there will be

no restraining effect from imports. To capture these differential effects of imports due to differences in industry concentration, we have followed the lead of Pugel (1980) in assuming that the impact of import competition varies interactively with the industry's concentration ratio. Consequently, the measure of import competition used is $\widehat{\text{IMPR}} \cdot \text{CR4}$. One would expect that in those cases where concentration ratios are high $\widehat{\text{IMPR}} \cdot \text{CR4}$ would be negatively related to the price-cost margin.³⁰

In addition to incorporating the expected import penetration measure, we have also added two variables to reflect barriers to foreign competition. The first measure is the ad valorem, trade-weighted, nominal tariff rate (AVE); the second is a proxy for the MFA. The measure for the quota system (MFASL) is calculated as the percent of an individual four-digit-SIC industry's imports subject to specific quantity limits at the textile category level. The higher (lower) the percentage of trade subject to a ceiling, the greater (lower) the barriers to foreign suppliers, and the higher (lower) the price-cost margin would be. That is, if a large portion of a four-digit industry's output is covered by specific import limits under the MFA, then it is assumed that the firms in the industry can be quite confident, based on the history of textile trade regulations, that imports will not be allowed to grow above the designated quota ceilings and therefore not grow as a percentage of the domestic market. Consequently, domestic textile and apparel firms may be more likely and willing to raise prices and increase profits above the competitive norm.

These arguments suggest an empirically useful estimating equation for the structure-conduct-performance paradigm in the following general form:

$$\begin{aligned}
 \text{PCM} = & \alpha_0 + \alpha_1 \text{KO} + \alpha_2 \text{CPIN} + \alpha_3 \text{ECSC} + \alpha_4 \text{GROWD} \\
 (2) \quad & + \alpha_5 \text{CR4} + \alpha_6 \text{VAP} + \alpha_7 \text{AVE} \\
 & + \alpha_8 (\widehat{\text{IMPR}} \cdot \text{CR4}) + \alpha_9 \text{MFASL}; \\
 & \alpha_1, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_9 > 0; \alpha_8 < 0; \alpha_2 \cong 0.
 \end{aligned}$$

4.5 Empirical Results

In the present study the textile and apparel industries are defined at their respective four-digit SIC levels. As such, our entire sample is composed of twenty-nine, four-digit textile SIC categories and thirty-three, four-digit apparel SIC categories over the fifteen-year period of 1965–79.³¹ The major drawback of such a limited sample, apart from the lack of universal applicability, is the high degree of homogeneity of the four-digit categories within each industry.³² Furthermore, given that our primary concern is the impact of the MFA on both the textile and the

apparel industries in the six-year period of 1974–79, a consistent set of observations over time series and cross sections is not sufficient for an efficient estimate of either a time-series or a cross-section equation. Therefore, the estimation of equation (2) can only be obtained by pooling cross-section and time-series observations for the pre-MFA period (1965–73) and the post-MFA period (1974–79) for each of the industries.³³ The pooling procedure used is commonly termed a cross-sectionally correlated and time-wise autoregressive model. The behavioral characteristics of this model are well known and need not be restated here.³⁴

Parameter estimates for both the textile and the apparel industries for the pre- and post-MFA periods are presented in table 4.7. In general, the results based on MFASL (the quota variable) suggest that the existence of the MFA did in fact improve the profit performance of the protected textile and apparel sectors.

4.5.1 Foreign Factors

The central concern of this paper is to determine whether the MFA had a positive impact on the profit performance of the domestic textile and apparel industries. The results as demonstrated by the coefficient of MFASL (α_9) presented in table 4.7 suggest that for both industries the MFA had a positive and significant impact on industry performance.³⁵ One can therefore argue that by providing market certainty for the domestic textile and apparel industries the MFA did improve their profit performance during 1974–79.

Two other foreign variables of some concern are the trade-weighted, ad valorem, nominal tariff rate (AVE) and the proxy for import competition ($\widehat{\text{IMPR}} \cdot \text{CR4}$). The empirical results of these two variables were far short of expectation. While the coefficient of AVE (α_7) was positive in three out of four cases, it was significantly different from zero only during the post-MFA period for the textile industry and only during the pre-MFA period for the apparel industry. The proxy for import competition was insignificant in all cases and of the wrong sign in three out of four cases. These results suggest that an increase in import penetration did not have a negative impact on the profit performance of either the textile or apparel industries. On the other hand, the positive and significant results of the tariff measure (in two cases) suggest that in addition to the positive influence of the MFA on the textile industry, high tariff rates also contributed positively to the profit performance of the industry. The most surprising aspect of these results was that while the MFA positively contributed to the profit performance of the apparel industry during 1974–79, high nominal tariffs significantly detracted from the industry's profit performance.

Table 4.7 Determinants of Textile and Apparel Industry Performance Using Pooled Cross-Section, Time-Series Data for the Pre- and Post-MFA Periods

Variables	Textiles		Apparel	
	Pre-MFA (1965-73)	Post-MFA (1974-79)	Pre-MFA (1965-73)	Post-MFA (1974-79)
Constant	0.063 (2.65)	0.220 (4.19)	-0.020 (1.07)	0.166 (3.88)
KO	0.010 (1.58)	-0.063 (4.75)	0.014 (0.76)	0.061 (2.20)
CPIN	0.024 (1.12)	0.014 (0.31)	0.016 (0.89)	0.081 (1.09)
ECSC	0.009 (0.86)	0.018 (0.67)	0.015 (2.47)	0.001 (0.11)
GROWD	0.007 (1.72)	0.051 (3.01)	-0.004 (0.87)	0.021 (1.39)
CR4	-0.001 (3.49)	-0.002 (1.78)	0.016 ^a (0.56)	0.001 (0.82)
VAP	0.011 (35.1)	0.001 (1.79)	0.015 (21.7)	0.001 (3.34)
AVE	0.003 (1.26)	0.001 (3.10)	0.003 (8.84)	-0.001 (3.47)
$\widehat{\text{IMPR}} \cdot \text{CR4}$	-0.002 ^a (1.20)	0.004 ^a (0.88)	0.003 ^a (1.48)	0.003 ^a (1.13)
MFA SL	— —	0.001 ^a (2.11)	— —	0.001 ^a (2.23)

NOTES: *t*-values are in parentheses. Summary of goodness-of-fit statistics, especially R^2 , are not reported because an interpretable R^2 when using generalized least-squares estimation does not exist.

^aThe estimated coefficient is multiplied by 100.

4.5.2 Domestic Factors

For the most part, the domestic market structure variables did not perform as expected. The coefficients of the capital output ratio (KO) for the textile and apparel industries in the pre-MFA period are not statistically significant, although positive as is generally predicted. In the post-MFA period for the textile industry the coefficient is negative and statistically significant. For the apparel industry it is positive and statistically insignificant. Part of the explanation for this result rests on the low variation in the KO variable.

A somewhat more interesting result can be seen in the geographic dispersion variable (CPIN). In general, past empirical evidence supports the proposition that the higher the geographic dispersion index, the more likely the given commodity will be traded internationally, and the lower the price-cost margin. However, for the textile and apparel industries where production in the United States has not been concentrated in a single region, the coefficient on CPIN is of the expected sign (positive) for both the pre- and post-MFA periods, although insignificant in all four cases. Therefore no inference can be drawn from this variable.

The results of the economies of scale (ECSC) and the value added per production worker (VAP) variables are mixed. It is generally accepted that in the 1970s the scale of operation in both the textile and the apparel industries was increasing with the significant improvements in labor productivity. This is reflected, in part, in the industry-specific results. For both industries the coefficient on VAP is positive and significant in both the pre- and post-MFA periods. The coefficient on ECSC is positive for both industries, although significant only in the pre-MFA period for the apparel industry.

A further mixed result is that the coefficient on the growth of domestic demand variable (GROWD) is positive, although statistically significant only for the textile industry in the post-MFA period. Finally, given the low level of concentration in the two industries, it is not surprising that the four-firm concentration ratio (CR4) is not significantly different from zero in three out of four cases. However, a negative sign was unexpected. The low variation in the data may be one explanation, but not the overriding one.

4.6 Conclusion

The MFA was only one factor among many others impacting the U.S. textile and apparel industries. Nevertheless, the MFA's role stands out because it is distinct from the other factors in its attempt to secure the market for the domestic textile and apparel industries. As such, one would expect that by limiting competition the MFA would positively affect the performance of the U.S. textile and apparel industries. The results suggest that in fact that was the case. This positive impact arises from the MFA's ability to control the growth in imports, as was its intention. Having determined that the MFA was indeed a successful protective instrument of the United States, the next important question to be answered is: What has this success cost?

Appendix

Annual observations for our domestic and foreign variables by four-digit, output-based Standard Industrial Classification (SIC) categories over the period 1965–79 were taken from generally available published sources. Data on the quota enforcement were obtained from the U.S. Department of Commerce, Office of Textiles. Our entire data base consisted of twenty-nine, four-digit textile categories (combining SIC 2257 and 2258 after 1972) and thirty-three, four-digit apparel categories over fifteen years, or a total of 930 observations. The variables are:

PCM = $(VA - PA)/VS$: Price-cost margin; where VA = value added, PA = payroll, and VS = value of shipments; obtained from *Census of Manufactures* (CM) and the *Annual Survey of Manufactures* (ASM), various years.

KO = $GBVFA/VS$: Capital output ratio; where GBVFA = gross book value of fixed assets; obtained from CM. The values for the intercensus period were derived by interpolation.

CPIN = $\sum_{i=1}^4 |(VS_i/VS) - (Pop_i/Pop)|$: Geographic dispersion; where i = the four census regions, and Pop = population; derived from CM. The values for the intercensus period were derived by interpolation.

GROWD = $\% \Delta VS$: Growth in domestic demand; derived from both ASM and CM.

VAP = $(VA/Prod)$: Value added per production worker; where Prod = the number of production workers; obtained from the Bureau of Labor Statistics (BLS).

AVE: Ad valorem, trade-weighted, nominal tariff rates; obtained from the U.S. Department of Labor.

CR4: The four-firm concentration ratio; obtained from both ASM and CM. The values for the intercensus period were derived by interpolation.

ECSC: Economies of scale derived as AVS/VS , where AVS = average plant size among the largest plants producing 50 percent of the industry's value of shipments; obtained from CM. The values for the intercensus period were derived by interpolation.

IMPR = $VM/VS + VM - VX$: Import penetration ratio; where VM = value of imports and VX = value of exports; obtained from BLS and the Office of Foreign Economic Research (OFER), computer tapes.

\widehat{IMPR} : The expected import penetration ratio estimated from equation (1).

GROWD = % Δ V/M: Growth in imports; derived from trade data provided by BLS and OFER.

MFASL: Share of an individual four-digit-SIC industry's imports subject to a specific quota. The quota levels by country and textile category were obtained from the U.S. Department of Commerce, Office of Textiles. These textile categories are defined by the United States for monitoring imports of textile and apparel products. They were converted to seven-digit TSUSA items using U.S. Department of Commerce, Industry and Trade Administration, Office of Textiles, *Correlation: Textile and Apparel Categories Tariff Schedules of the United States, Annotated*. Washington, D.C.: GPO, 1979. The individual TSUSA items were then converted to output-based SIC categories using a concordance provided by the U.S. Department of Labor, Office of Foreign Economic Research. While this concordance process is theoretically correct, the addition and deletion of both textile categories and SIC categories in the mid-1970s may have created some problems. Furthermore, for 1965–1973 no attempt is made to include the quota on cotton because there the concordance is far less reliable.

Notes

1. A recent survey of such changes is presented in Pelzman (1982). Note, however, that the degree of change varies considerably across the textile and apparel industries.

2. Despite the shrinking of the U.S. textile industry between 1910 and 1955, it still remained an important industrial sector. In the late 1950s and early 1960s it represented 6.0 percent of manufacturing employment and 4.0 percent of manufacturing output. Combined with the apparel industry, which accounted for an additional 7.0 percent of manufacturing employment and 3.6 percent of manufacturing output, the enlarged textile complex represented a substantial interest group. In 1980 the same complex represented 10.6 percent of manufacturing employment and 5.6 percent of manufacturing output. In addition to these economic facts, the enlarged complex when combined with fiber producers represented a well-organized political pressure group, with strong influences in the industrial Northeast in the 1960s and in the low-wage areas of the Southeast in the 1970s and 1980s.

3. For an in-depth discussion of the MFA and its development, see Keesing and Wolf (1980), Pelzman (1980), and U.S. ITC (1978). All of the agreements beginning with the Japanese voluntary export controls cover both textile and apparel products.

4. In 1957 Japanese cotton textile and apparel exports accounted for over 60 percent of total U.S. imports. These exports were concentrated in cotton gingham and velveteens. In response to these increased imports, the U.S. textile industry filed four escape clause petitions with the U.S. Tariff Commission between January and June 1956. For more details see U.S. ITC (1978, 1–5).

5. By "orderly" the administration meant a system whereby the developed country producers would not be subjected to competition from lower-cost producers.

6. The bilateral agreements negotiated under the LTA were contrary both to the principles of nondiscrimination of article I and to the safeguards provision of article XIX of the GATT.

7. Under the LTA, quotas could be either agreed on jointly or be imposed by the importing country. The usual course by which quotas were imposed by the United States was to first set specific limits on a limited set of items under article 3 (whether unilateral or negotiated) and then to follow up with a more comprehensive bilateral agreement under article 4. Quotas imposed under article 3 were initially set at the actual level of imports during the year ending three months prior to the consultation call. These quotas were generally increased by 5 percent a year. Under article 4 a much more comprehensive agreement was possible, thus limiting the imports of cotton from major developing country exporters even more.

8. Two major events occurred during 1961–72 which affected the operation of the LTA. First, there was a very rapid increase in the use and trade of man-made fibers which were not covered under the LTA. Second, new entrants into the market were heavily concentrated in apparel which also was not very well protected under the LTA.

9. The text of the MFA can be found in U.S. ITC (1978, appendix A).

10. The disposition of unused quotas is determined by the individual bilateral agreement. In general countries are allowed to borrow a total of 11 percent against a commodity-specific limit or aggregate limit. The distribution of that 11 percent between forward and backward borrowing is determined by the bilateral. In most cases it is 6 percent forward and 5 percent backward.

11. By “equitable” the authors of the MFA meant that it provided for a small but guaranteed 6 percent expansion in the exports of developing countries. By all accounts, this quota system was and remains highly inequitable because it denies market access to efficient producers.

12. The delay to negotiate bilateral agreements by the EC member states was in part due to their lack of agreement over the allocation of imports within the European Community. Furthermore, the EC debate over comprehensive or selective agreements delayed an EC trade position vis-à-vis textiles.

13. In the original MFA there was flexibility for switching quotas among years (carry-over and carry-forward) as well as among textile categories (swing). This flexibility provision was under attack both in the United States and the European Community for providing the potential for “surges” in developing country exports of so-called sensitive products. In MFA II the major suppliers were induced to give up these flexibility provisions in their most important categories. In addition, in those categories where the quotas were not filled, the new bilaterals eliminated specific quotas, substituting instead consultation provisions whereby the United States could impose quotas at levels below the original quotas but higher than existing trade.

14. The Administration Textile Program or the so-called White Paper was issued on 15 February 1979.

15. By limiting “surges” the administration intended to: (a) limit the carry-over provisions, (b) impose designated consultation levels, and (c) list categories considered to be sensitive and subject to a consultation or to an agreed limit.

16. It is difficult to determine what in fact the quota system has controlled. While it is true that over 80 percent of total U.S. textile and apparel imports in both 1980 and 1981 were controlled by the aggregate limit, imports in both years under specific limits represented slightly over 50 percent of total imports.

17. The difference between these limits is very subtle. Quotas set as either specific limits or agreed limits are for all practical purposes specific quotas. Items designated by minimum consultation levels are threshold markers which when crossed allow the United States to call a consultation for the purpose of setting a quota limit. Categories designated consultation categories do not have quotas set, but are considered sensitive items subject to a quota.

18. “Globalization of quotas” means a system where the importing country sets a maximum quantity for the level of imports based either on growth of imports vis-à-vis domestic demand or on some threshold import penetration rate. Given this maximum, in

the bilateral negotiations the importing country can allocate shares based on the premise, for instance, that new entrants (with no proven comparative advantage) be given greater access to the U.S. market. The above scenario was presented as a viable option by Shelley Appleton, secretary-treasurer, International Ladies' Garment Workers' Union, before the Trade Subcommittee, Committee on Ways and Means, U.S. House of Representatives, 21 July 1980. During MFA II the European Community did in fact impose such a global system for what they considered very sensitive items.

19. The recent bilateral agreement with Hong Kong imposed specific limits on twenty-seven categories, limiting growth rates between 0.5 percent to 2.0 percent per annum. Of these twenty-seven categories, nineteen will allow for only the minimum 0.5 percent growth. On the other hand, bilateral agreements with Pakistan, Mexico, and Singapore limit the growth of specific limits to 7 percent, 7 percent, and 5 percent per annum respectively.

20. These developments are discussed at some length in both Pelzman (1980) and OECD (1981).

21. For an excellent discussion of the adjustment process in the textile and apparel industries as it applies to trade and protection, see Glismann et al. (1983). The subject of technological change is presented in great detail in Boon (1981).

22. Some of these factors are noted in OECD (1981, 72-77). Note that without detailed data or an appropriate investment model, these factors are merely speculative.

23. See, for example, Collins and Preston (1968, 1969), Kwoka (1977), Mann (1970), Miller (1967), Rhoades and Cleaver (1973), and Stigler (1964). An extensive bibliography is included in Weiss (1974) and Scherer (1980).

24. See, for example, Esposito and Esposito (1971), Pagoulatos and Sorensen (1976), and more recently Pugel (1980) and Marvel (1980).

25. Other variables commonly used to explain interindustry differences in profitability include: consumer-producer distinctions, advertising/sales ratios, inventory/sales ratios, and buyer concentration. A full list of variables and the relevant literature is presented in Scherer (1980, chap. 9). These variables were excluded from this analysis primarily because they do not apply to our particular industry sample.

26. One can think of the PCM variable as a good proxy for the Lerner measure of monopoly power. That is, $PCM = (TR - TVC)/TR$, where payroll plus the cost of materials is a good proxy for variable cost (TVC). Value added is defined by census as the value of shipments plus services rendered minus cost of materials, supplies and containers, fuel, purchased electrical energy, and contract work. Therefore, $TR - TVC$ can be approximated by $VA - Payroll$. Accounting rates of return, such as rates of return on assets and equity, are frequently used as alternative indices of monopoly power and market performance. However, as Fisher and McGowan (1982) have shown, using accounting rates of return is valid only to the extent that profits are indeed monopoly profits or are economic profits. Given the fact that the actual state of competition in the textile and apparel industries is between these two polar cases, it was decided to use PCM as a proxy of domestic industry profitability.

27. Other measures of concentration including individual firm market shares, eight-firm concentration ratios, and the Herfindahl-Hirschman index have been used with some strikingly different results. Given our concern with the impact of the trade variables and in particular the impact of the MFA, it was decided to use the four-firm concentration ratio. This debate concerning different measures of concentration is presented in Scherer (1980, chap. 9).

28. Assuming that the domestic industry is not perfectly competitive and that foreign firms are not subject to entry limitations which result in domestic market power, White (1974) has shown that import shares are expected to be positively related to above-competitive profit rates earned by domestic firms. In a perfectly competitive environment

one would expect that above-normal profits would encourage entry from domestic sources as well, resulting in lower concentration and hence lower profits.

29. Related work by Marvel (1980) and DeRosa and Goldstein (1981) have successfully used a similar specification to predict import penetration. The results of this estimated equation are not reported here, but they are available from the author.

30. Some would argue that in the textile and apparel industries concentration rates are low, implying that domestic competition is high. In this case import competition may not affect profit rates but may rather drive marginal firms out of business.

31. Data sources for all the variables are presented in the appendix.

32. The impact of that homogeneity is that the variance in the PCM as well as in the independent variables is small.

33. One could argue that the MFA actually started in 1971 when the United States signed bilateral agreements with Japan, Hong Kong, Taiwan, and Korea designed to control not only the exports of cotton but also of wool and man-made textile and apparel products. However, given the lack of data on the level of constraints in these agreements during 1971–73, it was decided to date the MFA as of the 1974 agreements for which data were available.

34. One should not ignore the fact that pooling cross-section and time-series data has its own set of problems. In particular, difficulty arises because the disturbance term is likely to consist of time-series-related disturbances, cross-section disturbances, and a combination of both. The particular pooling procedure used here allows cross-section disturbances to be mutually correlated and heteroskedastic and allows time-series disturbances to be autoregressive. See Kmenta (1971, 512–14).

35. Throughout the paper statistical significance is taken to be at the 5 percent level.

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Comment David G. Tarr

The Pelzman paper is divided into descriptive and model sections. I found the descriptive section of the paper informative and useful. For example, his description of the industry noted that the minimum efficient size of textile firms has increased such that a restructuring of the industry has occurred. Textiles and apparel are now very different in that we now export textiles, and textiles are regarded as an internationally competitive industry. One question I have is, since much of U.S. exports are to Europe, would our net export position change significantly if Europe did not have restraints on imports from the developing countries?

The problems I have with the Pelzman paper are that the paper does not provide estimates of the variables its title leads one to expect and that

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The views expressed are those of the author and do not necessarily reflect those of the Federal Trade Commission or any individual commissioner.

no model of the industry is developed. In fact the paper is a test on the textile industry of the structure-conduct-performance paradigm of industrial organization. In this context the paper is a reasonable effort, but problems remain.

What estimates did I expect this paper to provide? I expected among other things to find estimates of the changes in output, employment, and profit in the textile industry induced by the MFA. I hoped that estimates of costs to consumers and deadweight losses to the economy would be provided. To my surprise, no such estimates were either provided or attempted. The reason no such estimates were provided or attempted is that no industry model is developed, in any real sense, from which these estimates may be derived.

Let me be more specific. If you were interested in determining the effects of the MFA on output, employment, profit, and price in the textile industry, how would you proceed? I would start with specification of a supply equation and a demand equation for the industry. One would hypothesize how the MFA affects the demand equation and enter it accordingly. (I call this an "industry" model.) Solving for the reduced form and estimating would yield estimates of the relevant parameters, including the coefficient for the effect of the quota. With the parameters estimated (and successfully tested), one could estimate (or simulate) the effects of the quota by recalculating the new equilibrium with different quota values plugged in. The changes in output, employment, profit, and prices attributable to the MFA could be calculated. Admittedly, this is not an easy process. It is also not the only way to proceed; but I had hoped to see something along these lines.

Pelzman states early on that resource constraints precluded the development of such a model in his paper. Instead he attempts to estimate the effect of a number of variables, including the MFA, on price-cost margins in the textile and apparel industries. In taking this approach, he precludes himself from answering what I believe to be the most important questions regarding the effects of the MFA.

Instead of a true industry model, Pelzman tests the structure-conduct-performance (SCP) paradigm of industrial organization on the textile industry. Price-cost margins are regressed on about ten variables traditionally employed in SCP tests. How the parameter estimates relate to any underlying structure is unknown, because no structural equations are specified. (That is, no SCP structural model, as opposed to an industry model as mentioned above, is developed.) Indeed why some variables enter the model at all or enter with the hypothesized sign is a point of confusion. This problem manifests itself very strongly when the parameters are estimated.

More fundamentally, there appears to be confusion regarding the purpose of the paper. If one is interested in testing the SCP paradigm of

industrial organization (with international variables), then why restrict oneself to the textile industry? Presumably the purpose of such an exercise is to make conclusions about whether concentration, or imports, or barriers to entry affect price-cost margins or profits. Restricting oneself to the textile industry severely limits the size of the sample and the range of the variables, such as the four-firm concentration ratio.

Before discussing the empirical results, I should add that Intrilligator and Weston (1975) have shown that it is possible to specify and estimate a simultaneous-equations model of the SCP paradigm of industrial organization. Without going into details, their results show that there are a number of important differences between single-equation and multiequation estimation techniques in this field, which suggest that the failure of single-equation methods to account for simultaneity bias casts serious doubt on single-equation studies of the SCP paradigm. Pugel (1978) has also done a simultaneous-equations model test of the SCP paradigm in which he explicitly incorporated international trade variables. Thus reasonable multiequation SCP models, starting with a structural specification and including most of the important variables modeled by Pelzman, exist in the literature, suggesting that a fuller model in this instance is not an impossible task.

Regarding the empirical results, I shall interpret them in the context of a test of the SCP paradigm on the textile industry rather than as evidence of resource allocation shifts due to the MFA. For the reasons I have mentioned, this is the only way the results can be meaningfully interpreted.

The capital output ratio was included as a measure of barriers to entry and was hypothesized to have a positive coefficient. The estimated coefficient was found to be insignificant. First, I note that Intrilligator and Weston (1975) have found that the capital intensity variable is especially susceptible to simultaneity bias.

But part of the problem is at the theoretical level. I believe that a high capital output ratio is not very reflective of barriers to entry. Following the recent work of Fisher (1979), a barrier to entry is said to exist if and only if entry would be socially beneficial but is somehow prevented. This is a definition of a barrier to entry in terms of the results one would like to see obtain. A high capital output ratio is reflective of the necessity of making a large investment to enter. Is that a barrier to entry? Assuming firms can borrow at rates that correctly reflect perceptions of risk, firms will enter depending on whether long-run anticipated profits will justify their initial large investments. This is the calculation one would make on behalf of society, so the capital output ratio is not a barrier to entry. Regarding the empirical results, if it is not a barrier to entry, it does not preserve abnormally high profits or prices, so we should not expect to find high price-cost margins dependent in a positive way on capital intensity.

Pelzman finds that the four-firm concentration ratio either had the wrong sign or was not statistically significant. He argues, with reason, that given the low levels of concentration among the industries sampled, this is an unsurprising result.

Regarding the foreign non-MFA variables, perverse results were obtained. An increase in imports was found to be either insignificant or to increase price-cost margins. Similarly the variable measuring, interactively, the influence of imports and concentration achieved mixed and nonsupporting results regarding its influence on price-cost margins. Although Pelzman follows Pugel (1978) by including an interactive relationship between import share and concentration (i.e., a competitive or unconcentrated industry would already have low price-cost margins that would not be significantly lowered by a higher share of imports), Pelzman uses the change in the share of imports rather than the import share directly. Since a country could have a large change in imports starting from a small base and have little effect on the price-cost margins, it is the latter measure which would seem to have the most relevance. Moreover, if one believes that imports must only enter interactively, then why include a separate variable for noninteractive imports? This is a manifestation of the more general problem mentioned above: One would like to know what structural model the author has in mind that leads to this form of the estimating equation. A properly specified model would almost certainly yield a different estimating equation and might find, as did Pugel (1978) and Marvel (1980), that imports restrain price-cost margins in concentrated industries.

Pelzman finds that the MFA restrictions result in higher price-cost margins. This is the most important result of the paper, but, lacking an industry model, we do not know the effect on output, employment, and profits.

In conclusion, I found the descriptive sections useful, but I believe it is necessary to specify and estimate a model of the *industry* if one wishes to obtain estimates of the effects of the MFA on resource allocation in the textile and apparel industries. As a test of the structure-conduct-performance paradigm of industrial organization, it is a useful addition to the literature; but the lack of a structural SCP model here as well leads to problems that cause the paper to fall short of being a very significant contribution in this limited area.

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Comment Martin Wolf

These remarks will cover three areas: first, the paper itself; second, issues that could have been discussed in the paper but were not; and, finally, the wider implications of the Multifiber Arrangement (MFA).

Analysis of the Paper

Professor Pelzman's paper is divided into three principal sections: a discussion of the MFA; a review of the evolution of the textile and clothing industries; and an econometric analysis of the impact of import restrictions and other factors on the profitability of the various branches of the textile and clothing industries. The paper hypothesizes that "by limiting competition the MFA would positively affect the performance of the U.S. textile and apparel industries." It concludes that "the results suggest that in fact that was the case." The discussion below concentrates on the econometric analysis, but begins with the historical sections.

History of the MFA

The paper provides a good account of the evolution of the MFA and brings out two important points: first, the primary role that the United States has played in its creation and development; second, the central place of bilaterally agreed export quotas. The latter feature ensures that exporters have some leverage in bargaining as well as the opportunity to extract the scarcity rent created by the quotas.

Only one point needs qualification. In general, as Professor Pelzman notes, imports of apparel from developing countries have grown much more rapidly than those of textiles. The main reason for this is the stronger comparative advantage of developing countries in the former than in the latter (Keesing and Wolf 1980, chap. 2). Thus, textile imports grew more slowly than those of apparel not so much because the trade management system is "quite successful" in this area, as the paper

suggests, but because of a lack of developing country competitiveness in most textile products. It would probably be more accurate to conclude that the system curbed but—at least until recently—did not prevent the consequences of developing countries' comparative advantage in clothing, while it was largely redundant in the case of textiles, at least after the mid-1960s.

Restructuring of the Textile Industry

Professor Pelzman's discussion brings out the rapid technical change in the textile industry but the much slower change in the clothing industry. This itself suggests that protection had a modest effect on technical change, since it was in the relatively less protected textile sectors rather than the generally more protected—because more vulnerable—clothing sectors that the increases in capital intensity were greatest.

Impact of the MFA

The empirical technique employed in an investigation of the effects of a number of independent variables, including import restraints, on the profitability of segments of the textile and apparel industries. A number of methodological issues arise, but the remarks made below are concerned almost exclusively with the specification of the model:

(a) The price-cost margin (PCM) is not a logical measure of profitability. It is rather the rate of return on capital across sectors that might be distorted from a hypothesized equality by the factors enumerated in the paper. The PCM variable should, therefore, have been divided by the capital output ratio (KO).

(b) Value added per worker (VAP) presumably captures comparative advantage. As such it is important, but in the present equation its high significance may be because profits are included in both the dependent and this independent variable. Furthermore, there is presumably colinearity between this variable and the capital output ratio. Wages per worker might have been a better variable to use as a proxy for human capital intensity when the physical capital output ratio is also included as an independent variable.

(c) Concentration may lead to higher wages rather than higher profits, which could be one reason why the concentration variable (CR4) performs poorly. More seriously, the relevant factor is, of course, potential competition. If barriers to entry are fairly low throughout the industries, measured concentration ratios may be of little economic significance.

(d) The import penetration ratios do not work well as explanatory variables. While the two-stage estimation technique used is a sensible way of dealing with the simultaneous relation between import penetration ratios and profitability, the equation for import penetration ratios in terms of the exogenous variables is puzzling. Particularly striking in the context of this paper is the fact that the MFA variable is used indepen-

dently of the import penetration variables in equation (1) and is not included in equation (2), although one would expect the effect of these restrictions to be via their impact on import penetration ratios. However, an additional simultaneity problem is involved in the use of the MFA variable, since low profits are likely to lead to the imposition of restrictions, which then raise profits *ceteris paribus*. A further equation explaining the imposition of MFA restraints in terms of the exogenous variables is needed.

(e) Finally, it is difficult to argue that the appropriate break between the two periods for the United States is after 1973. The United States had effective restraints on major suppliers in all three fibers by 1971.

In sum, while the analysis comes up with the desired result that MFA restraints raised profitability, there is sufficient doubt about the specification to throw similar doubt on the conclusion.

Issues That Need To Be Considered

Because of the limited focus of the paper, a number of important questions remain to be explored:

(a) According to the paper, average annual capital investment in textiles and clothing between 1970 and 1980 was \$1.5 billion in the United States. Is a large proportion of this explained by protection?

(b) What was the social rate of return on the resources invested?

(c) What effect did protection have on the factor intensity of the industry and especially on technical change?

(d) Finally, to what extent did technical change and capital-labor substitution nullify the purported employment benefits of the restraints?

These questions need further exploration by analysts interested in the impact of the MFA on the protected industries.

Implications of the MFA

The present MFA is the heir of export restraints on textiles imposed in the 1950s. This treatment of textiles used to be considered exceptional, but as similar devices have sprouted in other sectors—steel, automobiles, consumer electronics, and footwear, for example—the “exception” has become less exceptional. In fact, the MFA is beginning to look increasingly like a precedent rather than an exception. This raises two questions: First, why did the U.S. government get involved in constructing export cartels against its own citizens? Second, what general lessons can be learned from the evolution of the textile restraint arrangements toward their current convoluted state (Wolf 1982)?

Why Export Restraints?

In trying to understand how the system of export restraints grew up within textiles and then spilled over into other sectors, one learns a great

deal about the weak elements in the liberalization of commercial policy after World War II. Three points are relevant:

(a) The goal of successive administrations has been conservative, namely, to preserve the core of the agreements to liberalize trade from the infection of overly powerful lobbies. By creating such special arrangements, it has been hoped that domestic textile interests and subsequently those of other industries would be politically "sterilized."

(b) Another objective of successive administrations has been to preserve executive autonomy in trade policy matters by avoiding a request to Congress for authority to control imports directly, which is thought to have incalculable consequences.

(c) Finally, the device used buys off all existing significant producers in both importing and exporting countries. This, in turn, makes it politically the easiest form of protection to maintain.

In effect, the system is the consequence of taking the path of least political resistance over a long period.

What Are the Lessons?

There are two points, the first is relevant to the longstanding discussion of selectivity in safeguard protection, the second concerns the evolutionary tendencies of sectoral arrangements of this kind.

The MFA was intended to provide a balance of advantage between importers and exporters. It certainly embodied many explicit restraints on the actions of the former. Yet over time these restraints have been steadily whittled away, each derogation acting as a precedent for the next, with the result that the previously almost unthinkable notion of cutbacks in quotas is now completely acceptable. The experience suggests that restraints on the way that selective protection can be implemented decay over time, largely because of the imbalances of power between the importers and the particular exporter against whom action is taken. The crucial step then is the grant of international legitimacy to selective action. Once this had been given in the case of textiles, the proliferation of restraints and the erosion of safeguards against their abuse seem to have acquired an irresistible momentum.

This experience also says something about sectoral systems, especially those involving discrimination. Over time the exclusion of outsiders is increasingly successful, as a dense network of bureaucrats and industry lobbyists construct an independent and extremely complex structure of protection. Within the system there is something for almost everyone, at least when compared with other systems of protection. The exceptions are the governments of importing countries, who are happy to sacrifice the potential tariff revenue to obtain the acquiescence of exporters, and the governments of potentially successful, restricted exporters with small current quotas, who usually have little weight. In consequence, such

systems will not be liberalized from inside and are not allowed to be liberalized from outside. A recent paper which I coauthored asks whether the MFA will last indefinitely (Curzon et al. 1981). The only plausible answer is in the affirmative.

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