Estimating productivity and returns to scale in the US textile industry*

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Abstract. In light of the textile industry’s growing foreign competition, trade deficit and job loss, we estimate its productivity and efficiency for the period 1975–93 utilizing a variable elasticity of substitution production function. The results indicate that, despite job losses, the industry adjusted by increasing labor productivity and maintaining fairly stable profits. This performance does not warrant protectionist policies. However, with an elasticity of factor substitution less than one and decreasing, the impact of factor price increases could result in higher apparel prices and preference for cheaper imports. Furthermore, with an elasticity of capital output rapidly decreasing, significant technological improvements will be required to improve competitiveness since textile production is capital intensive. Recently revised rules on trade liberalization could increase competition in the industry.

Key words: textile, elasticity of factor substitution, protectionism

JEL classifications: D24, C22

1. Introduction

Over the last decade the performance of the US textile industry (SIC 22) was lackluster, primarily due to slow growth in sales and constantly decreasing employment. The rapid deterioration of the textile trade deficit and sector job losses are major concerns; specifically the deficit increased from $140 million in 1981 to $1,207 million in 1995, while employment decreased from 84,800 to 65,600 over the same period. These and other data on the industry are shown

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in Table 1A (Appendix). Several factors impact the performance of the textile industry. First, the indirect effect of rising apparel imports since the US apparel industry (SIC 23) is the largest consumer of American made textiles. The apparel trade deficit increased steadily from $4,923 million in 1980 to $32,875 million in 1995.\footnote{Computed from \textit{U.S. Foreign Trade Highlights} (U.S. Department of Commerce, 1995).} Second, intensive import competition from low wage developing countries including, for example, China, Taiwan and Hong Kong, that enjoy a significant labor cost advantage over US producers.\footnote{This is evidenced by the increasing textile production in China, Mexico, Indonesia, Taiwan, Hong Kong, Bangladesh, Pakistan and South Korea. Recent data from \textit{World Economic and Social Survey} 1996, (p. 250) reveal that the developed countries’ share of world trade (exports) in textile decreased from 61.3\% in 1980 to 37.3\% in 1994, while the Asian countries’ share increased from 27.9\% to 48.6\% over this period. Interestingly, China’s share increased from 4\% to 12\%. In terms of U.S.A. textile imports, the latest data from \textit{U.S. Industrial Outlook} (1994) indicate that in 1992 Mexico supplied 30.4\%, China 23.1\%, Taiwan 8.8\%, Pakistan 4.1\%, and Japan 4\%.} Third, the industry’s high level of automation that needs increasing expenditures on new plants and equipment. Fourth, the industry’s long history of import protection (Cline 1992). Xu (1997) shows that the trade restrictions on textile imports under the Multi-Fiber Agreements enable the industry to behave less competitively and raise profit margins.\footnote{Prior to the MFA the textile and apparel industry was protected by a multilateral trade-restricting arrangement in 1961, which took shape as the Short Term Arrangement Regarding International Trade in Textiles (STA). The STA was succeeded by the Long Term Arrangement (LTA) in 1962. Low (1993, Chapter 5) provides a detailed analysis of STA, LTA, and the different provisions of the MFA.} Finally, the increasing global competition because of recently revised rules to liberalize international trade.\footnote{The Multi-Fiber Agreements, which gave protection to the textile (and apparel) industry since 1974 expired in December 1994, and trade in apparel and textile will be fully governed by the World Trade Organization (WTO), an institution created during the Uruguay Round (1986–1993) of the General Agreement on Tariffs and Trade (GATT). The quotas allowed under the MFA will be phased out over a ten year period (January 1995 to January 2005) and tariffs will be significantly reduced, allowing more textile and apparel imports to enter the U.S. market. Even before the WTO, there were increasing imported textiles from Mexico under the North America Free Trade Agreement (NAFTA), and “sourced” apparel (assembled abroad from fabric made and cut in the U.S.A.) from Dominican Republic and El Salvador under the Caribbean Basin Initiative Agreement (CBI), which started in 1986. The rapid rise in imports during the 1980’s could be attributed to four factors: (i) the over valued dollar, (ii) rising U.S.A. income, (iii) fallen foreign prices, and (iv) the secular shift in textile production to foreign countries.}

The impact of trade on domestic employment and economic welfare is a topic of considerable research, including Frank (1977), Krueger (1980), Lawrence (1983), Pelzman and Martin (1981), Cline (1992) and Mittelhauser (1996). The results of some of these studies indicate that job loss in the industry is related to increased labor productivity and a decline in domestic demand rather than the trade deficit.\footnote{The results of studies by Krueger (1980), Frank (1977), and Lawrence (1983) indicate that job loss could also be attributed to an increase in labor productivity and/or a decline in domestic demand. Of the fifty-two manufacturing sectors studied, Lawrence (1983) finds twenty-five suffered employment decline over the period 1973–80. Importantly, the decline was primarily due to changes in domestic demand. In fact, the employment effect of international trade in thirty-eight of the fifty-two sectors was positive, one of these was the textile industry. The results further indicate that of the total decline in 15.7\% employment in the textile industry, there was an increase of 1.7\% due to foreign trade and a decline of 17.4\% due to changes in domestic demand. The results of an earlier study by Pelzman and Martin (1981) reveal that given the proposed tariff reduction during the Kennedy Round, the impact on employment and domestic output would be very small.} Cline (1990) articulates that, even with