

The Roles Technological Advancement and Knowledge Transfers in the Global Textiles and Clothing Sector



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Abstract

This article reviews the trends during the last two decades in textiles and clothing trade and provide insights for future strategies and policies. The post MFA period is characterized by the domination of China and shifts in major producers/suppliers. The history seemed coinciding with the traditional and modern economic theories revealing the labor cost and strategic government policies as major production/trade factors. The review, however, suggests that, in this highly competitive textiles and clothing sector in the digital age, effective use of the factors and transfer of the knowledge will set the path of sustainable development and competitive edge of the manufacturers in developing countries.

Keywords: Technology; Technical advancement; Global supply chain; Clothing export; Knowledge

Abbreviation: CAD: Computer-Aided Design; CAM: Computer-Aided Manufacturing; ERP: Enterprise Resource Planning

Introduction

For decades, the textiles and clothing industries have been the major contributor of economic growth for developing countries. Clothing manufacturing, in particular, is highly labor intensive and requires multiple procedures and materials that necessitate human handlings Varukolu V [1]. The phase out of the MFA (Multi-Fiber Arrangement) system in 2005 has pushed the sector to be truly global with worldwide access to the market, but facing the extreme competitiveness Alam MS [2] & Shahzad K [3]. The industry experts have called for efficiency and competitive edge as ways for the firms to remain or gain competitiveness in the globalized sector. In this paper, I reviewed the current factors, as well as the traditional factors, of textiles and apparel production and trade to provide the practitioners and policy-makers insights for their future policies and strategies. I gear this review towards the textiles and clothing industries' continuous and stable contribution to the global economy and worldwide consumers who desire quality and diversified products.

Discussion

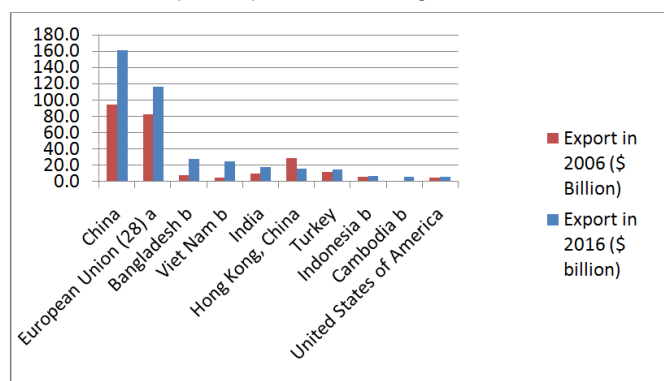
Although innovation and efficiency has been recommended for being 'winners' in such labor intensive production sector, the pattern of trade has been mostly driven by the labor cost and price. Drawn from the 1995 to 2004 data, Kapelko M [4] found that textile and clothing firms experienced minimal technical changes and even experienced a reduced level of technical

scale efficiency during the period. Similarly, [1] found that technological adoptions were negatively related to the export orientation among Indian clothing manufacturers, implying that price competition in the post MFA environment had pushed them away from capital investment. Many studies have also reported that the price was the primary factor of export advantage Hasan R [5] & Latif R [6]. Others found that government involvement in the competition was a significant contributor of export, which disproportionally decrease/increase the productivity of its manufacturers through tax rebates or similar forms of cost support Bao Q [7]. The size of the firm has been proven to be a direct predictor of competitiveness in the sector, because bigger firms are more equipped with capabilities and resources to respond to the market changes Atkin D [8] & Wignaraja G [9]. The size also determines the productivity/economies of scale.

Table 1 shows the world's top clothing exporters and their export volume in 2006 and 2016. The much anticipated domination of China in manufacturing sector has in fact happened in the clothing sector showing its nearly doubled export volume since the MFA phase-out preceded by its accession to the WTO. The reason I am pointing this out is that China should have lost its competitiveness in the global clothing export or at least stopped export growth given a lot more, low unskilled labor sources and capital investment in the world. Yet, this has not been the case. China's advantages in abundant labor sources were

coupled with the semi-controlled cost factors as well as currency manipulations were attributed for its take-off in global trade. Another significant factor is the rich experimental knowledge gained from their industrial development during the MFA period and know-hows transferred from the 'Big Three' in the past (Hong Kong, Taiwan, and South Korea). Hong Kong becoming a special administrative region of China and an established hub of world trade was an added bonus making knowledge transfers efficient.

Table 1: World Top 10 Exporters of Clothing in 2006 and 2016.



Note: Data source: World Bank. Mexico was one of the top 10s in 2006 with 2.6 billion export but did not make the list in 2016

While the endowed factors such as labor remain as the major factors of export growth in the sector, today's environment presents unique challenges to the developing countries and the exporters. Compared to the period of industrialization of the west and the initial stage of globalization, accumulated knowledge related to capitalism and the strategic roles of government had grown too much for them to repeat the same mistakes of, or to go through the same pace of development as the past. Such rich knowledge is readily available through information technologies that have been paralleling the course of globalization. More specifically, capital, resources including labor, and the knowledge can determine the entries to the industries and initiation of the development, yet the sustaining the development and remaining competitive in the global trade depends on how those factors are used. Knowledge transfers can accelerate the rate of technical advancement and sustain a long-term development.

The studies have found that the foreign investment, which is typically attracted by private profit potentials coupled with favorable international and national policies, has determined the success of underdeveloped countries' entries to the clothing export market Morris M [10] and their improvement in productivity over time. Foreign investment is directly related to the technological advancement in developing countries Myint MM [11]. Some of the big exporters of the previous decade have fallen behind, due to the ineffective use of foreign investment and some national policies that negatively influenced labor productivity and technological advancement Zeidan R [12].

In addition, through the decades of the industrialization and trade, we also learned that the simple rule of capitalism, specialization, was not a universal rule, at least in the textiles and clothing sector. Studies have found that specialization in a labor intensive area could result in 'growth without development'. There is historical and statistical evidence that labor cost or condition didn't improve while the export has grown in some countries Gimet C [13]. It has been recommended that the healthy growth should be facilitated by the strategic knowledge transfers for the firms to expand onto higher value added sectors Chowdhury MMR [14] and diversify product offerings to create competitive edges.

During the past two decades, the technology became a vital part of manufacturing and supply chain formations. The digital technologies, such as Computer-Aided Design (CAD), Computer-Aided Manufacturing (CAM) and Enterprise Resource Planning (ERP) have been adopted by major exporters of clothing worldwide Zhang M [15]. Such changes are gradual yet provide the manufacturers a competitive edge to offer sophisticated and speedy responses to the market demand along with quality, high value added products De Souza Libânio C [16] & Rasiah R [17]. While some may require significant investment, technology could be simply using internets and information systems to stay informed about new fabric trends and respond to buyers' order changes faster.

Chinese suppliers did not stay at low cost manufacturing. They have opened up a new era in the textiles and clothing sector. They are forerunners of continuous innovation and effectively integrate technologies into manufacturing and distribution channels. In a comprehensive quasi-experiment, [8] found that the export potentials or incentives provided initial interests by the textile product firms but did not result in technical improvement and quality advancement in their production. They even found that they caused productivity decrease. Note that both control and experimental groups of firms had the same input and cost structure in the experiment. However, the incentives, in the long term, created quality upgrades and technological advancements among the treated firms, compared to those controlled. Contrary to the concern that export opportunities and export orientation hinder the development by the increased level of price competition, the experiment has provided a clue how export can lead further technical improvement through effective use of resources and knowledge transfers in the long term.

Conclusion

The time or the struggle required in acquiring and transferring the knowledge and the technical advancement will be the determining factors of survival and beyond in the sector. Jin [18] has pointed out that technology investment does not result in the same level of increase in profit or efficiency among firms. How the resources are used to sustain a learning curve will differentiate the effectiveness of the investment. Government

and NGOs may lay grounds for capital investment through negotiating with and providing incentives to local and global private sectors. However, I emphasize that extended growth pattern will only be achieved through strategic applications of human capital and the learning curve.

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