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Comparative Advantage of Textiles and Clothing: Evidence for Bangladesh, China, Germany and Turkey

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Abstract
In this study, the comparative advantage of four countries in the world: Bangladesh, China, Germany and Turkey is analysed with respect to the US and the EU-15 textiles and clothing markets by employing Balassa's revealed comparative advantage (RCA) index for the period 2000-2010. This country selection was made because all these countries rank in the top ten textile and clothing exporters in the world and they represent economies from four different income levels. The results have revealed that Bangladesh, China and Turkey have a strong comparative advantage in both the textile and clothing markets of the world, the US and the EU-15, while Germany has no significant comparative advantage in any of these markets. The findings show that the Bangladesh clothing industry has a substantially higher comparative advantage in all three markets compared to the other countries. It has also been found that Turkish textiles show the strongest comparative advantage in all three markets, whereas the comparative advantage of Chinese textiles indicates a slightly increasing trend in all aforementioned markets.

Key words: *revealed comparative advantage, textiles, clothing, Bangladesh, China, Germany, Turkey.*

Introduction

Textile and clothing industries play a key role in the economic prosperity of nations. During the industrialisation of 18th - 19th centuries, as well as nowadays, textile and clothing industries continue to contribute to the economic growth of countries with a lack of capital, but with an abundance of inexpensive labour [1].

This study aims to analyse the comparative advantage of Turkish textile and clothing industries in the world and major markets, such as the US and the EU-15 markets, and compare it to that of Bangladesh, China and Germany. In this context the revealed comparative advantage (RCA), an export performance based index, was used to observe the trade patterns and changes in the aforementioned countries over the period of 2000-2010. The RCA index identifies the success in exporting of a country compared to the world or a group of countries [2]. To that end, the RCA indices of the four countries were calculated based on textile and clothing export data according to the 2-digit Standard International Trade Classification (SITC) Revision 3.

The countries were selected from among the top 10 ranks of world textile and clothing exporters of 2010. Each of the four countries belongs to a different income level: Bangladesh, China, Turkey and Germany are considered as a low-income, lower-middle income, upper-middle income, and high income country for the year 2009, respectively [3]. According to the WTO data, Bangladesh was the 5th clothing exporting country in the world, while Turkey was 6th and 9th in the global textile and clothing market for the year 2010, respectively. Germany was the 4th greatest global exporter in terms of clothing and 2nd major exporting country in the world textile market for the same year, whereas China is the world-renowned clothing and textile leader of the globe [4].

General Economic Review of Textile and Clothing Industries in Countries Selected

Bangladesh is a low-income economy with a GDP per capita of $700 for the year 2010 [3]. Clothing exports, totaling $15.7 billion in 2010, accounted for more than 80% of total exports in that year. Textile and clothing related sectors in Bangladesh include cotton textiles, jute and garments [4, 5]. The greatest three commodity export groups of Bangladesh are clothing, textiles and fish, followed by textile fibres and leather goods for the year 2007 [6].

China's 2010 value of GDP per capita was $4,270 [3]. With the economic reforms of 1978, the Chinese economy has enjoyed rapid development, where the textile and clothing industries have been pioneers of the reform process. China's entry into the WTO in 2001 provided easier access to international markets [7]. Moreover 2005's phasing out of quotas led to the rapid strengthening of the market share of the Chinese textile and clothing industries in the global market [8]. For the year 2010, textile and clothing exports accounted for around 5% and 8% of Chinese total commodity exports. The major three commodity groups in China's export mix for the year 2010 were office machines, electrical machinery and telecommunications equipment, followed by clothing [6].

Turkey, which is an upper-middle–income country, had a GDP per capita of $9,890 in 2010 [3]. In the same year, textile and clothing products constituted around 8.5% and 11% of the total Turkish merchandise exports, respectively [6]. In the year 2010, Turkey ranked 9th in terms of textile exports and 5th in terms of clothing exports in the global market, with the EU being the greatest trading partner [4]. Road machines, clothing, and iron & steel constituted the greatest shares in Turkey's total exports, followed by textiles for the year 2010 [6].

Germany, whose textile and clothing industries together constitute the second largest consumer goods market, after the food and beverage industry [9], had a GDP per capita of $43,110 in 2010 [3]. Germany ranked 2nd and 4th among the greatest exporters in the global textile and clothing market, respectively [4]. The greatest segment of the sector is technical textiles with a 40% share. Moreover the

country is also among the greatest textile and clothing importers worldwide [9]. However, textile and clothing exports together accounted for only around 2% of German total commodity exports for the year 2010. The greatest three export product groups of Germany are road machines, electrical machinery and industrial machines [6]. Textile and clothing export figures of Germany, as well as the other three countries, to the world, the US and the EU-15 markets are given in ***Figure 1***.

When the textile and clothing exports of the selected countries are investigated in more detail, it will be seen that the main textile and clothing products exported from these countries to the world, the US and the EU-15 present similarities. The major textile aggregate group which is exported from Bangladesh, China and Turkey to the aforementioned markets consists of made-up articles, wholly or chiefly of textile materials. Only Germany exports special yarns, special textile fabrics and related products as the main aggregate group of textile exports to the three markets. The greatest share in clothing products that are exported from the countries studied to the markets mentioned includes articles of apparel and textile fabrics, either knitted or crocheted, except for Bangladesh's major clothing export to the US market, which is men's or boys' non-woven clothing and accessories [6].

Revealed comparative advantage

In order to study the trade pattern of nations in international markets, the 'comparative advantage' notion is adopted. Comparative advantage is defined as [10, p. 11]: "*the ability of a given economy to manufacture a product more efficiently than other countries do; it is reflected in the directions of export and import specialisations*" Accordingly the international trade data of a country in a selected industry is utilised to assess its comparative advantage in that particular industry [1].

Balassa [11, 12] developed the 'Revealed Comparative Advantage' (RCA) index concept in order to analyse international trade. This measure reflects success in the exporting of countries relative to a world-wide norm [2]. The RCA index is calculated as shown in ***Equation 1***:

$$RCA_{ij} = (X_{ij} / X_{it}) / (X_{nj} / X_{nt}) \qquad (1)$$

where X_{ij} denotes the export of commodity/industry j of country i, n stands for the world or a set of countries, and t for all product groups. The RCA index states whether the share of a selected product group in a country's total exports is greater than that of the whole world or group of countries. A country is considered to have a comparative advantage if RCA > 1, and a comparative disadvantage if RCA < 1 [11, 12].

Methodology

The analysis is based on the annual time series data of textile and clothing exports, obtained from United Nations (UN) trade statistics in the 2-digit Standard International Trade Classification (SITC) Revision 3 and World Trade Organization (WTO) Total Merchandise Trade over the period 2000 - 2010. From the 2-digit SITC Rev. 3 listing, textile and clothing products were identified according to SITC65 (*Textile Yarn, Fabrics, Made-Up Articles, and Related Products)* and SITC84 (*Articles of Apparel and Clothing Accessories)*, respectively.

Limitations of the Study

The limitations of the current study are based on the availability of export data. The latest export figures for the countries studied at the time of research belonged to the year 2010. Furthermore analysis of the comparative advantage of Bang-

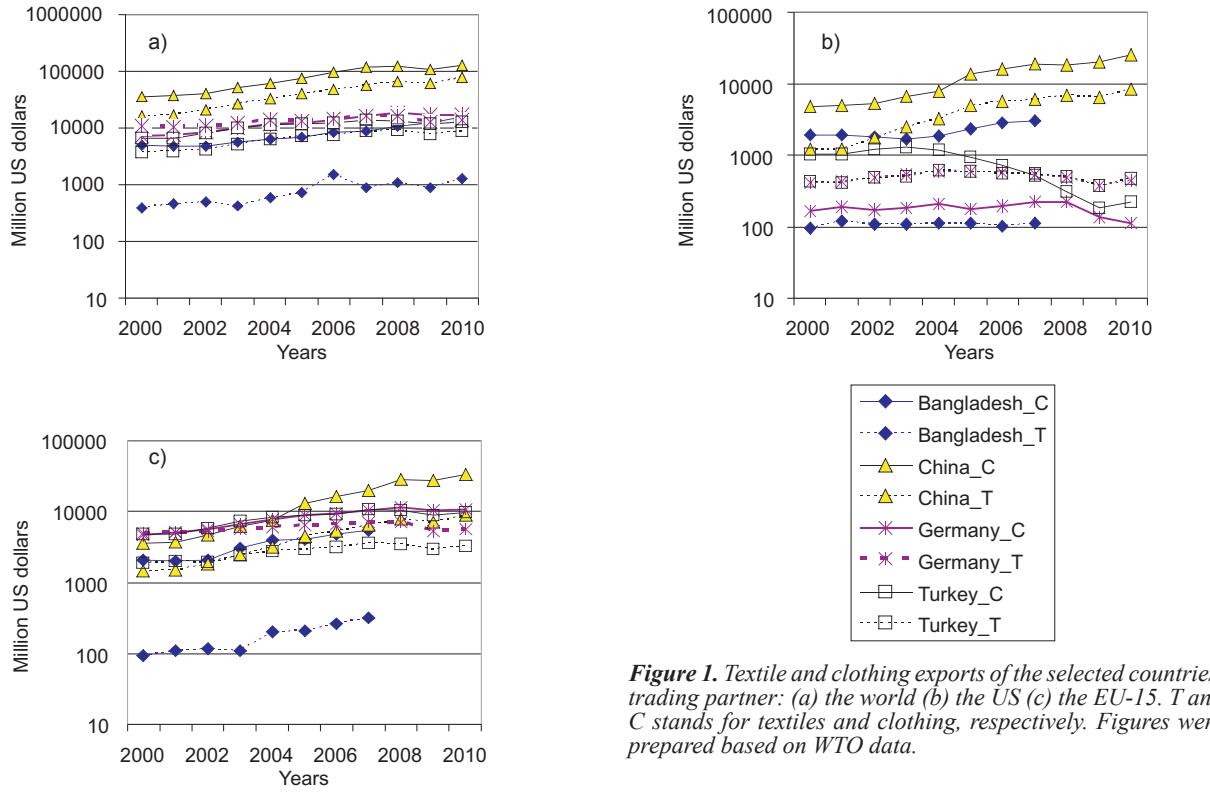

Figure 1. *Textile and clothing exports of the selected countries, trading partner: (a) the world (b) the US (c) the EU-15. T and C stands for textiles and clothing, respectively. Figures were prepared based on WTO data.*

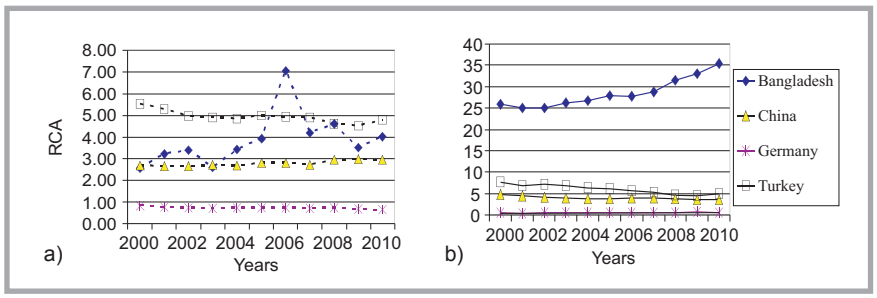

Figure 2. *RCA indices of the countries selected in the world market in terms of (a) textiles and (b) clothing (calculated based on UN Comtrade and WTO statistics).*

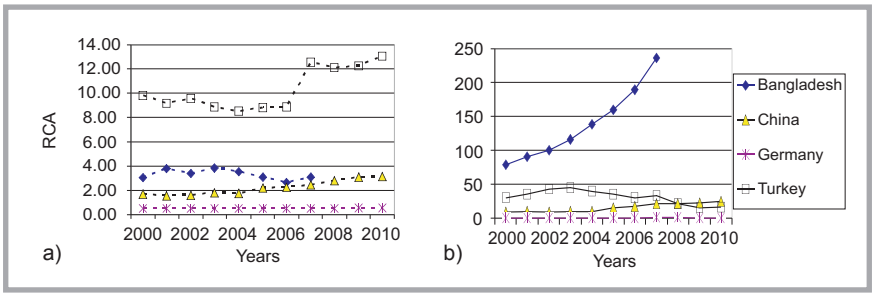

Figure 3. *RCA indices of the countries selected in the US market in terms of (a) textiles and (b) clothing (calculated based on UN comtrade and WTO statistics).*

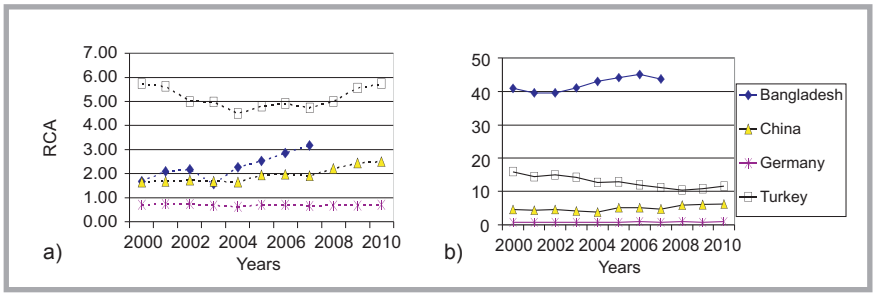

Figure 4. *RCA indices of the countries selected in the EU-15 market in terms of (a) textiles and (b) clothing (calculated based on UNcomtrade and WTO statistics).*

ladesh in the US and the EU-15 markets had to be concluded in 2007 due to incomplete data.

Revealed comparative advantage of countries selected

This section presents results of the RCA indices of the countries in question with respect to the world, the US and the EU-15 markets, respectively.

Revealed comparative advantage of countries selected with respect to the world market

The RCA indices of the countries selected in the world market in terms of textiles and clothing are given in ***Figure 2***. The countries selected have close comparative advantage values in terms of the textile industry in the world, except Germany, as seen from the figure. Although Bangladesh has an unsteady RCA index value in textiles, its general tendency has increased throughout the period. Similarly Bangladesh has a stronger comparative advantage in clothing, which is a more labour-intensive sector than textiles; this case is common for low-income countries [1]. It is found that China has a comparative advantage in both sectors, but lower than Turkey. Turkey's comparative advantage in textiles is the highest among the countries considered, despite the decreasing trend in recent years, which was also found by Karaalp [13]. The gap between the RCA index values of Chinese and Turkish textiles decreased throughout the period. A stronger convergence was observed in clothing. The RCA indices of both countries' clothing sectors decreased over the period, but the decrease of Turkey is more obvious. Although Germany is the 2nd and 4th greatest exporter in the global market in terms of textiles and clothing, respectively, it has a comparative disadvantage in both sectors. This result revealed the fact that although Germany is one of the greatest textile and clothing exporting countries in the world, the export shares of these sectors constitute a small share in Germany's overall export. This finding was also supported by Yılmaz *et al.* [14]. Both textile and clothing shares in Germany's total commodity export is lower than 2% [4]. The export shares of textile and clothing of high-income countries are generally low, as in the case of Germany, due to the labour-intensity characteristic of these sectors, with lower entry barriers compared to technology and capital-intensive higher value-added sectors with higher entry barriers.

Revealed comparative advantage of countries selected with respect to the US market

The RCA indices of the countries selected in the US market are shown in ***Figure 3***. The findings reveal that while Bangladesh has a significant and increasing comparative advantage in clothing, Turkey has the highest comparative advantage in textiles in the US market. After a steady trend between 2000 and 2006, the RCA index of Turkey in textiles experienced an increase in 2007 and maintained this value until the end of the whole period. Turkey continued to keep its RCA index advantage over its rivals throughout the period. China increased its comparative advantage both in terms of textiles and clothing in the US market after 2005, when textile and clothing quotas and restrictions were eliminated. The gap between China and Turkey in clothing has been closing since 2005. China, which has a cheaper labor force and lower energy costs, caught up with Turkey's comparative advantage in clothing in the US market in 2008 and passed Turkey in 2009. While Turkey's RCA index is 16.34, China's RCA index nearly doubles that of Turkey with a value of 24.26 in 2010 in terms of clothing. Whereas China has an increasing comparative advantage in clothing, it is found that Bangladesh had a spectacular increase throughout the period. The US is the major trading partner of Bangladesh for clothing products as well as for its total commodity products. Clothing constitutes the greatest share in Bangladesh's exports to the US. In some years Bangladesh's clothing share in its total export to the US market approached 90%. Bangladesh faced a slight decline in the RCA index of the textile industry between 2003 and 2006. This can be explained by the

increase in the share of clothing products in Bangladesh's exports to the US, which undermines the share of its textile exports. Contrary to the other three countries, Germany has a comparative disadvantage in textiles and clothing in the US market, as is the case in the world market. Germany's textiles and clothing share in its total exports to the US market is the lowest among the countries investigated, with values of 0.5% and 0.1%, respectively.

Revealed comparative advantage of ountries selected with respect to the UE-15 market

Figure 4 summarises the RCA indices for the countries selected in the EU-15 market. Among the countries, Bangladesh's and China's comparative advantage in textiles has been increasing since 2003. Bangladesh has the highest comparative advantage in the EU-15 clothing market, similar to the case in the US market. According to the RCA index values in the EU-15 clothing market, Turkey is far behind Bangladesh, with China coming after Turkey. However, the RCA index values of China and Turkey in the EU-15 clothing market converged throughout the period, especially after 2005. Turkey is losing its comparative advantage in the EU-15 clothing market. Precautions taken by the Turkish government have failed to maintain its comparative advantage in the EU-15 market in terms of clothing.

Contrary to clothing, Turkey has the highest comparative advantage in the EU-15 textile market. Turkey, which enjoys geographical proximity to the EU countries, exports the greatest share of its textile and clothing products to the EU-15 countries. Although Turkey's RCA index value declined from 2000 to 2004 in the EU-15 textile market, it has been increasing since 2005 due to the Turkish government's regulations and support to cope with the decline in Turkish textile exports. Therefore Turkey has managed to keep its RCA index over the other countries.

Germany, which is regarded as a capital abundant country, has a comparative disadvantage in textiles and clothing in the EU-15 market, as well as in the world and the US markets. However, its comparative disadvantage decreased throughout the period in clothing, but stayed constant in textiles.

Conclusion

The comparative advantage of the textile and clothing industries of Bangladesh, China, Germany and Turkey in the world, as well as the US and the EU-15 markets were analysed by employing Balassa's revealed comparative advantage (RCA) index for the period 2000-2010. Bangladesh, whose clothing share in its total exports is around 80%, had the highest comparative advantage in terms of clothing in all three markets. Turkey had the highest RCA index in all three markets in terms of textiles, with Bangladesh catching up in the world market. By maintaining the highest RCA index values in the EU-15 textile market, Turkey experienced a decrease between 2000 and 2004, followed by an increase. Although Germany is the 2nd textile and 4th greatest clothing exporting country in the world, textiles and clothing are the sectors where Germany is comparatively disadvantageous in all three markets. This is due to the fact that export shares of the textile and clothing sectors constitute a small amount in Germany's overall export, which is common for high-income countries. The overall findings agree with the general thesis that the shares of textile and clothing industries in the economies of lower-income countries are higher than those for higher-income countries. However, it should also be noted that while having small shares in their export mixes, high-income countries such as Germany maintain the highest ranks in the global textile and clothing markets.

Another interesting finding of the current study is that the RCA indices of China, the world's leading textile and clothing exporter, did not occupy the first place among the countries selected in any of the markets investigated. In this area China acted like a high-income country due to the moderate textile and clothing share in its total commodity exports, contrary to its low income per capita level compared to developed countries.

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