

EFFECTS OF CLUSTERS ON COMPETITIVENESS OF TEXTILE AND CLOTHING INDUSTRIES: ROLE OF TECHNOLOGY AND INNOVATION

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-Abstract-

Textile and clothing (T&C) industries are the important sectors that contribute to gross domestic product and provide high level employment opportunities especially for developing countries. However, these two sectors have been transforming over the last years due to technological changes, emergence of new important competitors and the abolition of import quotas. Contrary to these challenges, T&C industries have undertaken a process of restructuring, modernization and technological progress. In order to generate competitive T&C industries, clusters are playing the key role so as to enhance its efficiency and competitiveness in the T&C market. The aim of this paper is to investigate the effects of clusters on competitiveness level in these sectors.

Key Words: *Cluster, T&C industries, technical textile, innovation, networking*

JEL Classification: O13, O31, O32, O33.

1. INTRODUCTION

This paper is an attempt to examine the effects of clusters on competitiveness of T&C industries. To this end, definitions, main characteristics and advantages of clusters will be mentioned so as to comprehend the frame of cluster. After a brief account of cluster, international T&C trade will be demonstrated extending to years in order to observe the trend of these sectors. And main challenges of these industries that encountered will also be explained basically the effects of Agreement of Textile and Clothing. One reason is that this agreement conduces to transformation of these sectors expeditiously in terms of restructuring,

modernization and technological progress. In this regard, terms of technology and innovation are playing crucial role in order to retain and/or enhance competitiveness. On the other hand, because of the fact that T&C industries have strong relations with other industries, competitiveness of T&C industries depends on performance of other related sectors. In this frame, to conclude importance of clusters on T&C industries will be discussed and what ways of T&C clusters can contribute the competitiveness and performance of these sectors.

2. LITERATURE REVIEW

2.1. Definitions:

There are diverse definitions of clusters in conjunction with specific circumstances regarding economic activity and the institutional structure of the region or country. Yet, the most popular definition of cluster is based on Michael Porter's study named as "The Competitive Advantage of Nations". Porter describes cluster as "a geographically proximate group of companies and associated institutions in a particular field, linked by commonalities and complementarities." (Porter, M; 1990 p.78)

United Nations Industrial Development Organization (UNIDO) defines cluster as "a sectoral and geographical concentration of firms that produce and sell a range of related or complementary products and thus face common challenges and opportunities." (UNIDO, Vienna; 2001) On the other hand, European Commission identifies clusters as "institutional groups and related economic actors that are established near each other and have generated high level position to improve suppliers, skills, resources and specialized expertise." (Commission of the European Communities, Brussels; 2008)

Clusters have crucial roles from the point of enterprises since they are more creative and productive while located in a cluster instead of being individual firms. Also, clustering can enhance the performance of firms since clustering facilitates cooperation and networks based on joint work among local suppliers, customers, rivals, universities, research institutions, among others in specific geographic borders. These are the basic features and definitions of clusters. Yet, whether the national, regional or cross border clusters and no matter which business structures, all of cluster practices have to obtain the idea of shared proximity, networking and specialization. Cluster can approach these goals mentioned above thanks to these three significant features and advantages, as discussed below in detail.

2.2. Characteristics of Clusters:

Three main characteristics arise from literature (White Paper, 2009; Development of a Clustering Policy for Turkey) as the most significant for the success of clusters: proximity, networking and specialization.

- **Proximity:** Firms tend to locate each other closely due to the advantages of transferring of tangible and tacit knowledge, obtaining specialized workers. Proximity does not only comprise geographic proximity, but also social proximity, technical proximity, market proximity and economic proximity.
- **Networking:** Clusters differ from geographical agglomerations due to existing various networks in geographic boundaries. Networking provides an opportunity to linkage and collaborate working among customers, suppliers, universities and research institutions. In addition to this, when trust builds up within cluster, flow of information and knowledge increase between firms and institutions. And thus, the foundation of trustable environment is an essential for clusters in order to provide resource of growth.
- **Specialization:** A cluster and its members have to specialize so as to constitute substantial structure. Firms focus on their main activities and they leave other aims to other firms and cluster actors. Clusters may specialize in a specific sector but they tend to spread beyond other sectors and can comprise supporting and relating industries. Furthermore, specialization increases the demand of complementary and additional resources and makes a cluster more powerful thanks to raising reciprocal dependence among actors within cluster.

2.3. Advantages of Clusters:

It is widely accepted that being a member of a cluster offers advantages for each firm. Enterprises tend to enhance their knowledge level and skills by means of being more compatible and flexible in changing environments. In other words, firms can expect to reach high level effectiveness within a cluster. Within this framework, advantages of clusters (Akdeve, E. 2010; Class notes taken from presentation of Innovation and SMEs) are to be explained below:

- **Productivity and flexibility:** Clusters facilitate the increase of productivity through reducing transaction costs, enhancing flexibility and accessing to specialized workers. Firms within a cluster can reduce transaction costs

thanks to the proximity of related institutions and can shorten reaction times in order to respond demands. Clusters can benefit from efficient access to specialized labor, services, research institutions, information and some public goods like training and education. Also, contrary to production a model that is more strict and hierarchical, clusters can be platforms implemented models of flexible specialization based on small and specialized firms. In addition to this, clusters can lessen their failure and testing costs and thus, can contribute more to innovation capability.

- **Economies of Scale:** Clusters can facilitate firms to reach economies of scale by means of specialization. To give an example, the joint purchasing and marketing activities, the access of venture capital and the supporting specialized services are essential keys that make companies to be more focused on their main goals and to reach more level of output. Basically, small and medium enterprises gain more advantages within clusters than they are in isolation.
- **Commercialization:** Clusters can enable commercialization through facilitating to start up new firms and to create new products thanks to availability of suppliers, customers and other support mechanisms.
- **Innovation:** The most important thing that clusters present is to generate an environment where innovation is stimulated comprehensively. The multilateral interaction between firms and institutions is an essential process of creating technological and nontechnological innovativeness. Relations between social and unofficial linkages facilitate circulation of knowledge. And clusters thus can enhance flow and dissemination of information beside processes of intra firms and collective learning.

These can be called micro-institutional company specific advantages. On the other hand, there are also macro advantages on aggregate frame. For instance, clusters can also stimulate attraction of region where it is established by gaining positive reputation. Basically, they can be the key factors in order to encourage foreign investment within a cluster. Moreover, when firms in a cluster make interaction, relation and competition between each other, they create competitive advantages in the long term. So long as micro advantages that mentioned above are combined with such macro advantages, competitiveness of region is to increase and consequently national competitiveness may also improve due to the cluster activities.

3. TEXTILE AND CLOTHING INDUSTRIES

In general, T&C industries get involved with each other. Yet, contrary to common belief, textile sector is much more capital intensive than the clothing sector. And, textile industry is highly automated especially in developed countries. In this regard, when the most leading textile exporters are analyzed, three developed countries are observed in the first five countries, namely USA, Germany and Italy. On the other hand, in clothing industry just two developed countries rank among top five.

International textile trade has a market share, representing 295,5 billion US dollars in 2010. China is the first leading textile exporter in the world, and its share constitute more than quarter of total trade volume. Another important point that can be seen that developed countries have still important role and impact on this industry due to huge productivity gains through innovations. (OECD, 2004)

International clothing trade has increased by 11,5% to 353,8 billion US dollars in 2009. China is again the first leading clothing exporter, representing 34,2% of total world clothing export. On the other hand, contrary to textile trade, developing and less developed countries come to forefront as a result of structure of this sector which is characterized by mainly labor intensive processes.

To sum up, T&C industries have a crucial role in the international trade and employment. But, it is difficult to obtain the employment data due to high level of informality in these sectors. As a consequence of that, international trade data which is the most dependable source of these sectors has been displayed for this study, as well.

3.1 The Agreement of Textile and Clothing:

The Agreement of Textile and Clothing (ATC) was one of the significant issues for T&C industry. All restrictions terminated on 1 January 2005. The expiry of the ten-year transition period of ATC implementation means that trade in T&C products cannot be implemented under a special regime or any quotas. (http://www.wto.org/english/tratop_e/texti_e/texti_e.htm) Due to the abolition of the quota system, structures of these sectors began to change. Especially, export of countries such as China has increased by 21%, as the largest increase among the suppliers. Also T&C export from India, Indonesia, Turkey and Thailand increased by 19%, 12%, 7% and 5% respectively in 2005. In the following two years the first two countries that including Turkey the growth rate of exports slowed down, in the last two countries rate of exports reached 17% and 7% respectively in 2007. (WTO, OMC; 2010)

When the difference between the market share of these two sectors between 2004 (before ATC) and 2010 are analyzed, China is seen the most beneficiary country thanks to the elimination of quotas. T&C producers have move their companies and establishments to low cost countries in order to increase their profitability and enhance their competitiveness.

Less developed countries have an advantage as a result of low wages. Since labor cost can account for up to 60% of total production cost (International Journal of Business and Society, pp. 71-110), these countries can increase their production and export volume without research and development (R&D) or innovation. On the other hand, this is not advantage sustainable for developing and developed countries in order to maintain their trade performance of these sectors.

New competitors have emerged due to this agreement (ATC). And, enhancing competition has made other existing countries having difficulties in terms of trade performance and they had to found alternative ways in order to protect or increase their market share. Then, the importance of quality, R&D, technology, innovation as well as design and fashion is an unquestionable reality to enable finding new alternative ways which will be elaborated further.

4. ROLE OF TECHNOLOGY AND INNOVATION IN TEXTILE AND CLOTHING INDUSTRIES

Technological improvement has had different impacts on T&C industries. While enormous productivity gains have been accomplished in terms of technology and innovation in textile sector, clothing sector has acquired diversified improvements. The competitiveness of clothing industry is linked to mostly low labor costs which still enable countries a competitive edge in this industry. On the other hand, the situation is becoming more sophisticated; since time factors now play a far more significant role in determining competitiveness in these fashion oriented and time sensitive markets. (Hummels, D. 2000)

However, so as to enhance or remain competitiveness in textile industry, developing and developed countries have to invest in technology through either product and process innovations. In this regard, technical textile is playing a key role to satisfy this demand from the various perspectives.

It is widely accepted the definition of technical textile adopted from the following definition by The Textile Institute: “technical textiles are those textile materials and products manufactured primarily for their technical and performance properties rather than their aesthetic or decorative characteristics”.

Application areas of technical textile are definitely comprehensible and its content has been broadening constantly as a result of exploring new types of usages. Technical textiles have started to constitute great market share of T&C industries with high level of growth rate in the last years. It is seen that the technical textiles is the most dynamic and the most promising area of the textile industry. As the days go on, new products, new processes, new tools are presented to markets. And this sector has various application areas in terms of usage. Also, technical textiles have huge potential due to exploring of new products, meeting new demands and substituting conventional products. As a result of that, it is expected that this market will grow faster than ordinary textile products in point of both totally and sub groups.

On the other hand, technical textile is accordingly more known as an intermediate sector. Therefore, development of this sector depends on development and demands of construction, transportation, agriculture, medical, automobile industries, among others. In this respect, technical textile is expected to grow at approximately twice the rate of textiles for the clothing industry. (OECD, 2004)

When the countries that produce and consume technical textile are analyzed, North America and Western Europe come to the forefront. In these countries, share of the technical textile in T&C industry is very high and its share increases exponentially. Meanwhile, thanks to the low level of labor cost within the total expenditure, the necessity of high level research and development and the requirement of intensive capital less developed and developing countries receive fewer shares in technical textile market than in T&C industries. Due to investing in R&D, new products and new processes, developed countries are still leading exporters in T&C sectors. Furthermore, because of the fact that textile industry is related with other industries, it is not sufficient that textile industry remain competitive but also other related industries have to cooperate with T&C sectors.

5. IMPORTANCE OF CLUSTERS ON TECHNOLOGY INTENSIVE TEXTILE AND CLOTHING INDUSTRIES

It is emphasized that technology intensity is playing a key role in terms of competitiveness of T&C industries. However, competitiveness not only depends on investing in technology, R&D, but also performance of other industries, basically chemical and machinery industries. In fact, new materials are mainly developed in the chemical industry, and new processes are developed in the machinery industry. (OECD, 2004)

According to research done by OECD, Spain has increased R&D specialization and also enhanced its trade performance in T&C industries, measured by Revealed Comparative Advantage (RCA) model. However, despite of the fact that Sweden has increased its trade performance, the R&D intensity of T&C has lessened. While, Norway and France have improved their R&D specialization, their trade performance has declined. In this regard, there is no important correlation between the increase in R&D and trade performance for countries included in this research. In connection with that, the increase in R&D specialization does not always result in the improvement of competitiveness on T&C industry throughout the world.

The main reason of this weak relationship between R&D specialization and trade performance is the fact that most innovations in T&C are generated in other industries. As mentioned above, chemical and machinery industries are playing the key role in order to stimulate innovation in T&C industries. As a consequence of that, competitiveness of T&C sectors is subject to developing new products and process that created in elsewhere. Hence, technology transfer is the driving force of innovative activities within T&C industries.

In this regard, clusters should also be emphasized in terms of their contributions to the technology transferring. Networking plays a key role so as to establish an efficient cluster; in fact clusters differ from geographic agglomerations as a result of networking. Also, networking among cluster firms increases the dissemination and diffusion of knowledge that leads to innovation.

On the other hand, clusters have vast amount of participants that are engaged in T&C industries that are involved in other industries as well. Actually, T&C clusters are effective when their firms have strong interactions between both T&C industries and other related industries.

In fact, a cluster can be transformed in conjunction with backward and forward links of country or region with regards to T&C industry. Yet, networking is especially essential for these industries. Hence, in the past, T&C industries were continuing their lives without any relation between other sectors. But, today, the emergence of new types of tools, of new processing methods for new construction of T&C products and also of new technologies for complex textile and multi-material products enable these industries to generate textile consumer goods as well as textiles for industrial and technical uses for new markets. Innovation activities, typically cross other, non-textile sectors, or target previously non-textile

markets and increasingly lead to the establishment of cross-sectoral and cross-border networks and clusters. (Euratex. 2006, Strategic Research Agenda)

Another feature of T&C industry is that sector is dominated by Small and Medium Enterprises (SMEs). As a result of that, R&D and innovation activities do not have sufficient resources in terms of human and knowledge, continuity and strategic direction. In fact, most T&C firms do not employ R&D personnel or departments and do not allocate resources for R&D budgets. In this regard, the lack of financial resources is a barrier against textile innovation. Hence, SMEs basically access to finance for innovation should be essentially stimulated. In order to meet these demands, clusters are playing the key role in order to enable SMEs needed support and access, while they can focus on their core businesses. Otherwise these firms are not able accomplish their goals on their own.

Clusters also enhance networking among SMES in T&C industries at regional, national and international levels through strengthening the linkages and cooperation between firms and improving competitiveness level of SMEs. Thanks to strong networking, SMEs find collaborative solutions for common problems promptly. Hence, clusters enable SMEs to improve their productivity and flexibility through reducing transaction costs and accessing to specialized workers. In this regard, firms within a cluster can reduce transaction costs thanks to proximity of related institutions and can shorten reaction times in order to respond demands.

6. CONCLUSION

T&C industries are the important sectors thanks to its contribution to gross domestic product and employment especially for developing countries. On the other hand, it is widely accepted that the importance of these industries are known also by the developed countries. Yet, owing to the technological changes, emergence of new important competitors and the elimination of import quotas, to remain competitive in these industries is quite challenging. In order to cope with these challenges, structures and needs of this sector must be determined correctly and comprehensively.

Low cost competitive strategy is not sustainable through years within T&C industries due to the emergence of new low cost countries continually. In this regard, terms of technology and innovation are playing crucial role in order to retain and/or enhance competitiveness. Yet, it is not enough that only these industries do R&D or invest in innovation and technology. Because of the fact that T&C industries have strong relations with other industries, especially

chemical and machinery industries. Therefore, competitiveness not only depends on investing in technology, research and development, but also performance of other these industries. In this regard, clusters are playing significant role for T&C industries, due to the increasing productivity, efficiency and flexibility, facilitating commercialization, stimulating innovation, reaching economies of scale and strengthening the cooperation with other industries. In particular, because of the fact that these industries are dominated by SMEs and the necessity of collaboration and networking with other industries, the need of cluster is emerging more distinctly.

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