TURKEY'S EXPORT COMPETITIVENESS IN THE EU-15 MARKET

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ABSTRACT

TURKEY'S EXPORT COMPETITIVENESS IN THE EU-15 MARKET

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The purpose of this thesis is to examine Turkey's export competitiveness in the first 15 members of the European Union (EU-15 market) against non-EU-15 competitors. The study covers the recent period since the Customs Union agreement signed between Turkey and the EU at the end of 1995. Turkey's position in the EU-15 market is analyzed in detail by focusing upon major dimensions of export competitiveness; such as 'export similarity', 'export diversification', 'intensive and extensive margins', 'revealed comparative advantages', 'dynamic market positioning' and 'competitive threat'. We use various indexes from the literature and develop some original indexes as our own contributions. In terms the subject-matter, time dimension and data-detail of our study, all indexes utilized in this thesis are applied to Turkey's case for the first time. Examining price and quantity differences across countries and within each industry, Turkey's competitive position in the EU-15 market is analyzed as compared to 30 countries for more than 3000 export-product groups classified according to their technological characteristics. Based on the results, suggestions at the levels of countries, products and technological categories are made for Turkey to improve its export strategy in terms of seizing the existing but unexploited opportunities in the EU-15 market against its competitors. Policy possibilities are also discussed for directing Turkey's competitiveness towards higher value-added products in a rational and strategic way.

Keywords: Turkey, European Union, export competitiveness, export diversification, revealed comparative advantages

ÖZ

TÜRKİYE İHRACATININ AB-15 PİYASASINDA REKABET GÜCÜ

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Bu tezin amacı, Türkiye'nin Avrupa Birliği-15 piyasasına (AB-15) yaptığı ihracatta rekabet gücünün AB-15 dışındaki rakip ülkelere karşı incelenmesidir. Çalışma, 1995 sonunda AB ile imzalanan Gümrük Birliği anlaşmasını izleyen yakın dönemi kapsamaktadır. Türkiye'nin AB-15 piyasasındaki durumu, 'ihracat benzerliği', 'ihracatta çeşitlenme', ihracatta 'yoğun-yaygın marjlar', 'açıklanmış karşılaştırmalı üstünlükler', 'dinamik piyasa konumlanması' ve 'rekabetçi tehdit' gibi ihracatta rekabet gücünün temel boyutlarına odaklanarak ayrıntılı olarak incelenmektedir. Bunun için bu tezde ilgili yazında yer alan çeşitli endeksler kullanılmaktadır ve kendi katkımız olarak bazı orijinal endeksler geliştirilmiştir. Tezde yer alan tüm endeksler, çalışmamızın konusu, zaman boyutu ve veri ayrıntısı bakımlarından Türkiye için ilk kez uygulanmıştır. Türkiye'nin AB-15 piyasındaki rekabetçi konumu, 30 ülke ile karşılaştırmalı olarak ve teknolojik özelliklerine göre sınıflandırılmış 3000'in üzerinde ihracat ürün-grubu için ülkeler arası ve endüstriler içi fiyat ve miktar farkları ele alınarak analiz edilmektedir. Analiz sonuçlarına dayanarak, Türkiye'nin AB-15 piyasasındaki rakipleri karşısında kullanamadığı fırsatları değerlendirebilmesi için ihracat stratejisini geliştirmesine ilişkin öneriler ülke, ürün ve teknolojik kategori düzeylerinde sunulmaktadır. Türkiye'nin rekabet gücünün daha yüksek katma değer yaratan ürünlere doğru akılcı ve stratejik biçimde yönlendirilmesine ilişkin politika olanakları da tartışılmaktadır.

Anahtar Kelimeler: Türkiye, Avrupa Birliği, ihracatta rekabet gücü, ihracatta çeşitlenme, açıklanmış karşılaştırmalı üstünlükler

To three angels in my life:

My mother, Müzeyyen; my sister, Özge and my daughter, Duru

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Even though he has been outside of Ankara most of the time due to his academic post in Northern Cyprus, my spouse Emre Özçelik constantly supported me and expanded my horizons in academic terms, especially when I was writing this thesis. Hence I would like to thank him a lot as well.

My father Ekrem Ekmen has also been abroad for occupational reasons. Even though he has been usually far away from me geographically, he always made me feel fine by supporting me without any reservations and expressing constantly his confidence in me. Thus, I also thank him very much.

My sister Özge Ekmen Maden has always been a very close source of support for me from the very beginning to the completion of this thesis. She never gave up encouraging my by repeating with patience that I can overcome all the difficulties in front of me. What incited me most to restart studying at seemingly desperate times was my sister's full-of-love attitude towards me and my little daughter. Thus, I would like to thank my sister very much, along with her spouse Alper Maden for his tolerance in sharing generously my sister's restricted time with me.

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CHAPTER 1

INTRODUCTION

Parallel to the reduction of trade barriers, which has been a practical result of the globalization process, countries have been striving to increase their competitiveness in the global markets, especially for about the last three decades. In this context, competitiveness has been used as a broad term to describe certain dimensions of overall economic performance of a country, including the ability to export, the level of productivity, the maintenance of high living standards, etc. Nowadays, some countries have specialized government agencies to deal with the issues of competitiveness, such as Ireland, Greece, Croatia, Bahrain, the Philippines, Guyana and the Dominican Republic. At the same time, the national competitiveness position of countries in the world markets has become closely related to their growth, development and trade policies.

Recently, measuring competitiveness at national and global levels has become very popular. *Global Competitiveness Report* of the World Economic Forum and *World Competitiveness Yearbook* of the International Institute for Management Development are two major periodical studies on international comparisons of national competitiveness. Measuring competitiveness at the industry and firm levels has also become very popular in the globalizing world. In this regard, in 1990, Michael Porter proposed a new approach, which is known as "the competitive advantage" to examine the competition policy of countries in the face of today's complicated world economy, characterized by segmented markets, heterogeneous products, economies of scale and different technologies.

It is generally known that the competitive position of a country can change depending on how competitiveness is defined and according to the indices used to measure competitiveness. In the literature, there is no unique and generally accepted definition and measurement of competitiveness. It can be measured at the national, industry, or firm levels. Moreover, competitiveness can be examined at different

levels of analysis, such as from a macro perspective, a micro perspective or a trade perspective.

At the theoretical level of analysis, competitiveness is a very broad and debatable issue due mainly to differences in definitions and conceptions. At the empirical level, researchers have generally focused upon trade-related variables to measure international performance within a comparative framework. Due to the relatively larger availability of data, assessments of the past performance in competitiveness based on trade indicators have become the most common way of research in the literature. In this regard, analyzing trade performance of a country requires an in-depth analysis of international trade flows and the construction of analytical tools for measuring trade activities.

Following the opening up of trade regimes, the importance of international trade has increased. The objective behind trade liberalization is the creation of a competitive environment in the world economy and the achievement of sustainable economic growth and development at country level, giving a high priority to increasing exports. Improving the trade performance relative to the main competitors is the most appropriate way to keep up in this fast-globalizing, new world-economic context. And, this is also the case for Turkey. Turkey, in accordance with the world trend, has been adopting trade liberalization policies since the 1980s.

In this process, the earlier 15 members of the EU have traditionally been the most important trading partners of Turkey. These earlier members are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Sweden, Spain, and the United Kingdom. These countries constitute what we call "the EU-15 market", which is a very important destination for Turkey's exports. Turkey's exports to the EU-15 market constitute nearly half of its total exports. Besides, the Customs Union between Turkey and the EU, which came into effect at the end of 1995, has been a turning point for Turkey in terms of a new regional-economic integration.

From Turkey's point of view; globalization, opening-up of trade regimes, customs unions, prospective membership in the EU, etc. have been discussed widely in the literature. Almost all such studies conclude that these processes have induced substantial changes in Turkey's trade structure. However, systematic studies that

analyze such changes *per se* are relatively rare. And the systematic studies on changes in Turkey's trade patterns usually evaluate the trade relations between Turkey and the EU, rather than focusing upon Turkey's competitors in the EU-15 market. In this respect, we believe that, from Turkey's perspective, it is more reasonable to analyze the competition between Turkey and the non-EU-15 countries in the EU-15 market. Previous studies show that there is a well-established, difficult-to-change trade structure among the EU-15 countries themselves. Against this rigorous trade structure, it seems very difficult for Turkey to compete dynamically with the EU-15 countries in the EU-15 market, as Turkey's traditional competitiveness areas with respect to these well-developed countries are mostly raw-material- and labor-intensive products. Nevertheless, when the trade patterns between EU-15 and non-EU-15 countries are examined, it is easier to observe dynamic and promising competition possibilities for Turkey against the non-EU-15 exporters in the EU-15 market. Non-EU-15 countries, which compete with Turkey in the EU-15 market, comprise Central and Eastern European Countries (CEECs), Middle Eastern and North African (MENA) countries, as well as certain countries from Asia, Africa, Latin America and also some from the developed world.

In other words, it is more realistic for a country like Turkey to focus upon improving its competitiveness against the non-EU-15 countries that export to the EU-15 market. This line of research (i.e., analyzing a country's competitiveness against non-EU-15 countries in the EU-15 market) has not been worked out sufficiently so far. Therefore, this insufficiency in the literature is one of our main motivations in writing this thesis.

Furthermore, competition among countries that export to the EU-15 market has intensified in the recent years. CEECs have generally been the most outstanding competitors in this market, especially after their accession to the EU in 2004 and 2007. MENA countries also have prominent export relations with the EU-15 countries. Certain Asian countries – led by China – have also considerably increased their exports to this market. On the other hand, the export shares of certain developed countries – such as the US, which is the most important trading partner of the EU – have decreased in recent years. In other words, the EU-15 market is obviously a very dynamic market, creating potential gains in competitiveness for those countries with

rational trade strategies. In this dynamic framework, as an important exporter to the EU-15 market, Turkey has a special interest in enhancing export competitiveness in the EU-15 market. Thus, we think that analyzing Turkey's competitiveness against the non-EU-15 countries (rather than against the EU-15 countries) will be more indicative for improving its dynamism in terms of exporting capability. Indeed, we believe that many sectors in Turkey have not exploited fully the potential opportunities and benefits to be reaped from this dynamic market. Therefore, there is a clear need for analyzing Turkey's competitiveness in the EU-15 market against the non-EU-15 competitors. For this purpose, we focus upon three major dimensions of competitiveness within the context of this thesis.

First, we analyze competitiveness in terms of 'export similarity' in Chapter 2. 'Export similarity' is an important starting point, because evaluating the relative competitiveness levels of two countries with very different trade patterns (and especially with very different export structures) would not make much sense. In order to be meaningful and indicative for shaping future trade policies, a country's competitiveness analysis should start with the determination of the degree of similarity with respect to the exports of the main competitors. Therefore our first step is to determine Turkey's main competitors in the EU-15 market, along with the degree of competition facing Turkey in its different export sectors. To do this, we examine the export similarity between Turkey and its 26 competitors for more than 3000 products and prices of these products which are grouped into technological categories. In this context, inspired by Antimiani and Henke (2007), we create a price similarity index for analyzing 'export similarity' in terms of not only export products but also export prices. In this sense, this is the first study to compare Turkey's export prices to those of other countries. Therefore, we improve the existing literature by focusing upon export price as well as product differences.

Secondly, we further analyze competitiveness in terms of 'export diversification' in Chapter 3. Improving competitiveness in the world markets requires export diversification, which can be attained by either changing the share of existing commodities ("intensive margin") or including new commodities in the export portfolio ("extensive margin"). Thus, we determine the role of new products in Turkey's competitive position against its non-EU-15 competitors. More

specifically, we determine the extent to which the changes in Turkey's exports in the EU-15 market result from existing exports and from new product varieties. This study is the first attempt to utilize these methodologies in the case of Turkey, along with a much broader set of sectors and a much more disaggregate data-set, and thus covering an unprecedentedly large variety of products.

Thirdly, we analyze competitiveness in terms of static and dynamic comparative advantages in Chapter 4. Improving comparative advantages against main competitors is the key to acquiring higher levels of competitiveness in the fast-globalizing world. Therefore, we analyze in detail Turkey's static and dynamic comparative advantages against the non-EU-15 countries in the EU-15 market. This is the first study examining Turkey's competitiveness in such a dynamic framework of analysis. We also carry out a detailed analysis of 'competitive threat'. Calculation and utilization of 'threat indexes' are also our contribution to the existing literature.

The rest of this Introduction is organized as follows: In Part 1.1, we examine and discuss the concept of competitiveness in detail in terms of its definitions and measurement. In Part 1.2, we present some general and preliminary descriptive statistics, concerning mainly the export performances of Turkey and its non-EU-15 competitors. In Part 1.3, we provide introductory outlines and summaries of our main chapters on 'export similarity and competitiveness' (Chapter 2), 'export diversification and competitiveness: intensive and extensive margins' (Chapter 4), 'comparative advantages and dynamic market positioning' (Chapter 4), and concluding remarks (Chapter 5).

1.1 The Concept of Competitiveness

In the literature, there are various definitions and measures of competitiveness, which are incompatible with each other in some of the cases. One of the main debates on competitiveness is whether it is a national-level or firm-level issue. Krugman (1994) claims that competitiveness is a firm-level issue and firms rather than nations compete for exports. On the other hand, Lall (2001) views competitiveness as a national matter. Similarly, Garelli (2002) claims that competition takes place between nations rather than firms, and he further argues that not only goods and services exported by firms but also the abilities of nations to

develop a well-functioning education system and to improve technological capabilities are vital for competitiveness.

Competitiveness of a country can also be evaluated in terms of its macroeconomic performance, microeconomic performance and trade performance. In terms of macroeconomic performance, by using some relevant indicators such as openness, institutional framework, macroeconomic conditions etc., competitiveness of a nation is evaluated as a whole and/or compared to the performance of other countries in a global context. In terms of microeconomic performance, competitiveness is evaluated in terms of sectors, sub-sectors and firms, and the most widely-used indicators of competitiveness at this level of analysis are relative prices, productivity, price-cost margins, relative market sizes, structure of the firms, etc. In terms of trade performance, as the name suggests, trade performance (generally, export performance) is the main indicator of competitiveness. In other words, at the trade-level of analysis, examining export performance is more-or-less synonymous with competitiveness. In this regard, changes in the export share and export structure of a country in the world markets can be considered as relevant and important indicators of changes in export competitiveness.

In this thesis, we examine and evaluate Turkey's competitiveness in detail in terms of its trade performance within the contexts of our Chapters 2, 3 and 4. Therefore, our thesis is mainly about trade-related dimensions of competitiveness. However, we think that it is also a good idea to summarize concisely the measurement of competitiveness in terms of macroeconomic and microeconomic performances in the context of this Introduction. Thus, in what follows, we first review the most popular definitions and measures of competitiveness, and then discuss the macroeconomic, microeconomic, and trade-oriented approaches to competitiveness.

Definitions and Measurement of Competitiveness

One of the most popular definitions used by the World Economic Forum (WEF, 2005-2006, p. 3) is that competitiveness of a nation is "a collection of factors, policies and institutions which determine the level of productivity of a country and that therefore determine the level of prosperity that can be attained by an economy".

Competitiveness at national level is also defined as "the degree to which a country can, under free and fair market conditions, produce goods and services that meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its citizens" (President's Commission on Competitiveness, 1984). According to the definition by the National Competitiveness Council (NCC) in Ireland, "competitiveness is the ability to achieve success in markets leading to better standards of living for all" (NCC, 2001: 80) Needless to say, these are mainly developmental and relatively general definitions.

It is also possible to see more trade-oriented and specific definitions of competitiveness. For instance, in its "Glossary of Statistical Terms", OECD defines "competitiveness in international trade" as "a measure of a country's advantage or disadvantage in selling its products in international markets".[1] Competitiveness is "the advantage a country has in exporting a certain product over other countries", according to the International Trade Center (ITC, 2007). Keyder et al. (2004) define competitiveness as an increase in a country's standard of living, induced by increases in the country's share in total world exports. Competitiveness has also been defined for firm or industry levels, and "[m]ost authors use the term to refer to an advantage of firms or industries vis-à-vis their competitors in domestic or international markets" (Cockburn et al., 1998: 1). Similarly, Hill and Jones (1995) conceptualize competitiveness at the level of firms or industries as the best profit performance with respect to competitors.

As it can be seen from these various definitions, competitiveness has various aspects and dimensions; and hence, there are many different indicators for measuring competitiveness. In this thesis, we analyze competitiveness mainly as a trade-related concept and phenomenon, and our examination of competitiveness fits best to the definition by ITC (2007), which we cited in the paragraph above. Consequently, we mainly utilize trade-related indicators to measure competitiveness in this thesis.

Given the fact that competitiveness is a multi-dimensional concept, and that there is a vast literature in its definition, indicators and measurement, Frohberg and

[1] OECD, Glossary of Statistical Terms, accessed online at: http://stats.oecd.org/glossary/detail.asp?ID=399 (21 August 2012).

Hartman (1997) separate the indicators of competitive advantage into two: indicators measuring ex-post performance of competitiveness (e.g., trade and market share indicators, real exchange rate and foreign direct investment), and methods measuring potential competitiveness (accounting methods, domestic resource costs, mathematical models). Also, some studies construct a single index consisting of quantitative/qualitative indicators, and some others utilize Porter's (1990) "diamond model". Finally, some of them use various indexes and econometric methods to assess competitiveness and its determinants at country, industry or firm level. In the face of this vast literature on competitiveness, we think that it is a good idea to summarize the measurement of competitiveness in the literature by categorizing three main levels of analysis; i.e., competitiveness defined and measured in terms of (i) macroeconomic, (ii) microeconomic, and (iii) trade-related performances. As mentioned above, we further examine competitiveness in terms of trade performance in detail in each of our main chapters (i.e., Chapters 2, 3 and 4) as well as in Part 1.3 of this Introduction.

Competitiveness in terms of macroeconomic performance

In terms of macroeconomic performance, competitiveness of a nation is assessed as a whole and compared to the others in a global context by using some relevant indicators, such as degree of openness, quality of institutional framework, favorability of macroeconomic conditions, etc. In recent years, measuring competitiveness at national and global level has become very popular. World Economic Forum (WEF) and International Institute for Management Development (IMD) are two major international organizations that publish annual competitiveness reports, in which countries are ranked according to their competitiveness. WEF and IMD generally use broad quantitative and qualitative variables to measure competitiveness in a single index.

WEF's *Global Competitiveness Report* (GCR) includes 139 countries, which have huge differences in terms of their per-capita-GDPs and development levels. In the GCR, overall competitiveness of countries is associated with a single index, which is called the "Global Competitiveness Index" (GCI). The GCI is made up of nearly 90 variables. The survey data used in the GCI come from WEF's *Executive*

Opinion Survey, and "hard data" are also obtained from publicly available sources. In the computation of the GCI, many important factors, which influence productivity and competitiveness, are taken into account (i.e., institutions, infrastructure, macro-economy, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation). The GCI is constructed under the assumption that the factors influencing competitiveness vary across countries and, hence, the weight of each factor changes from one country to another, depending especially on the stage of development. In this sense, the GCI first divides the countries into three groups (i.e., factor-driven stage, efficiency-driven stage, and innovation-driven stage); then organizes the factors into three sub-indexes (i.e., basic requirement sub-index, efficiency enhancers sub-index, and innovation and sophistication sub-index); and then weights these sub-indexes differently, depending on the development stage of the country under consideration.

Table 1.1 Global Competitiveness Index (GCI) for Turkey

	Rank (out of 139)	**Score (1-7)**
GCI 2010–2011	61	4.2
GCI 2009–2010 (out of 133)	61	4.2
GCI 2008–2009 (out of 134)	63	4.1
Basic requirements	68	4.5
1st pillar: Institutions	88	3.6
2nd pillar: Infrastructure	56	4.2
3rd pillar: Macroeconomic environment	83	4.5
4th pillar: Health and primary education	72	5.6
Efficiency enhancers	55	4.2
5th pillar: Higher education and training	71	4.0
6th pillar: Goods market efficiency	59	4.2
7th pillar: Labor market efficiency	127	3.6
8th pillar: Financial market development	61	4.2
9th pillar: Technological readiness	56	3.9
10th pillar: Market size	16	5.2
Innovation and sophistication factors	57	3.6
11th pillar: Business sophistication	52	4.2
12th pillar: Innovation	67	3.1

Source: World Economic Forum, Global Competitiveness Report, 2010-2011.

In the 2010-issue of the GCR, Turkey is classified as "efficiency driven" and ranked 61st in competitiveness among 139 countries (See Table 1.1 above). Turkey's ranking stayed constant with respect to the previous year, and its competitive position is below the positions of earlier EU members, the new entrants and the candidate countries. According to the Report, Turkey benefits from the relative dynamism of its large market size, which is characterized by intense local competition (16th). Moreover, Turkey's position is not bad in terms of reasonable sophisticated business practice (52nd) and reasonable developed infrastructure (56th). However, as compared to the EU, Turkey seems to be performing rather poorly in certain important areas; such as the deficiencies in the level of primary education and healthcare (72nd), the inefficiencies in the labor market (127th), and the shortcomings in the reinforcement of the efficiency and transparency of public institutions (90th) (WEF, 2010-2011, p.27).

Similar to the GCI, the *World Competitiveness Yearbook* of IMD ranks countries in terms of competitiveness and analyzes their ability to compete by using 286 statistics for 49 industrialized and emerging economies. IMD groups the data into four major factors that influence competitiveness (i.e., economic performance, government efficiency, business efficiency, and infrastructure). Hard data are collected from international, regional and national organizations and survey data are obtained from Annual Executive Opinions.

Competitiveness in terms of microeconomic performance

In terms of microeconomic performance, competitiveness is generally evaluated at the levels of sectors, sub-sectors and firms. In this approach, competitiveness is considered as the capability of exhibiting the best profit performance against the competitors (Hill and Jones, 1995). The most widely-used indicators of competitiveness are relative prices, productivity, price-cost margins, relative market sizes, structure of the firms, etc.

In the fast-globalizing and increasingly complex world economy, technological capability and availability of capital are the most important factors behind the success of firms in international markets; and hence, behind the economic development of countries via productivity growth. As segmented markets,

heterogeneous products, economies of scale and different technologies have started to put a new face on the concept of comparative advantage, Michael Porter (1990:73) proposed a new approach, which is called “the competitive advantage”. Comparative advantage of nations is based on foreign trade, while competitive advantage represents the entire supply side of the economy. Porter’s model is known as the “diamond of national competitiveness”, where he defines the competitive advantage of a nation in a given industry as “its capacity to entice firms to use the country as a platform from which to conduct business” (Porter, 1990). He also draws attention to four conditions that constitute the four sides of ‘the diamond’. These are; factor conditions (i.e., resources, natural resources, capital and infrastructure), demand conditions (i.e., the nature of home demand for the industry’s product), related and supporting industries (i.e., the presence or absence of supplier industries and related industries that are internationally competitive), and firm strategy, structure, and rivalry (i.e., the conditions governing how companies are created, organized and managed, and the nature of domestic rivalry). In addition to these conditions, government attitude and policy and the role of chance are also emphasized as the determinants of competitiveness by Porter (1990). Porter’s argument is that government can influence each of the above determinants, either positively or negatively, through its policies and operational capacities. This is the reason why government as a determinant of competitiveness must be viewed separately from the other four determinants. Also, events such as wars, political decisions by foreign governments, large increases in demand, shifts in the world financial markets and exchange rates, discontinuity of technology and input demand can influence competitiveness. All in all, countries are considered to have competitive advantage in the industries where ‘the diamond’ is found to be strong (Porter, 1990).

Another example for the evaluation of competitiveness in terms of microeconomic performance is the Business Competitiveness Index (BCI), which was developed also by Michael Porter. The BCI is based mainly on survey data, and it aims to identify microeconomic factors that are vital to enhancing competitiveness. The BCI ranks countries in terms of their microeconomic competitiveness. The main idea behind the construction of the BCI is that prosperity at national level is created by productive firms. The microeconomic foundations of productivity are reflected in

two sub-indexes (i.e., 'company operations and strategy' and 'quality of national business environment'). The weighted average of the two sub-indexes is defined as the BCI. The weights are determined by relevant regressions, where the dependent variable is the level of per-capita-GDP. Using many explanatory variables, the regressions are run on per-capita-GDP, and then the variables with statistically significant coefficients are accepted as the main factors that improve productivity.

In the studies that employ Porter's (1990) 'diamond model' (for revealing the factors that contribute to the competitiveness of the firms/industries), competitiveness is mostly associated with productivity, and especially with total factor productivity. Generally, such studies develop a relevant questionnaire for firm-level analysis, based on Porter's four conditions mentioned above. And then they usually evaluate competitiveness of the firms by means of Porter's methodology. For example, Vega-Rosado (2006) determines the competitive industries in Puerto Rico by carrying out a cluster analysis, as proposed by Porter (1990), for the years 1987, 1992, 1997, 2001 and 2002. Then he analyzes the four determinants of competitiveness. He concludes that ten industries are competitive in Puerto Rico, and that there is a need for strengthening the elements of the Porter's 'diamond' in all the exporter industries in order to increase their competitiveness. Similarly, Esterhuizen and Rooyen (2007) use Porter's (1990, 1998) model to assess the competitiveness of selected South African agricultural exporting firms, and then they investigate the factors influencing the competitiveness of those firms. They find that sugar, groundnuts, oranges are the "winner" industries at primary level, while maize meal and apple juice sectors are the "winners" at the value-added level. They also find that strong competition in the domestic market, devaluation of South Africa's domestic currency, and a strict regulatory framework are the factors that affect competitiveness positively, while crime and the cost and availability of capital are the factors influencing it negatively.

Microeconomic analyses of competitiveness have also been carried out for the case of Turkey. For example, Öz (2002) also uses Porter's 'diamond model' in order to determine the sources of Turkey's international competitive advantage for the years 1971, 1978, 1985 and 1992. She first determines the competitive industries, and then clusters them by using Porter's model. She finds that the factors in Porter's

model are useful in explaining the competitive advantage of Turkey's industries, except 'domestic rivalry' and 'the role of government'. She also concludes that, after the trade liberalization in the 1980s and the resulting increase in overall exports, Turkey managed to achieve a 'deepening' in the existing clusters. Another example concerning the microeconomic dimensions of competitiveness is the study by Özçelik and Taymaz (2004), who investigate the role of innovations and R&D activities on the export competitiveness of firms operating in the Turkish manufacturing industry. To do so, they estimate export intensity equations where the dependent variable is the share of exports in total sales, and the set of explanatory variables comprises technology-related variables, firm size, real wage rate, advertisement intensities, ownership structures, composition of employees, etc. They find that the effects of technology-related variables are significantly positive. In addition, they emphasize the varying effects of the firm size, advertisement intensities, ownership structures and real wages on export competitiveness of innovator and non-innovator firms.

Erdil and Pamukçu (2007) analyze the effects of trade liberalization of the 1980s on R&D expenditures in Turkey by using econometric methods. Their study shows that R&D expenditures, as a percentage of GDP in Turkey in 2005, is lower than that of such CEECs as the Czech Republic, Hungary and Poland. They explain this situation with reference to the high share of medium and low technology manufacturing industries as well as the inadequacy of financial incentive schemes for R&D activities and the imperfectness of capital markets that make the funding of innovation activity difficult. Their main conclusion is that export incentives, liberalization of imports and FDI-friendly policies have failed to contribute positively to the R&D expenditures. Based on these results, they draw attention to a major problem in the structure of the Turkish economy; that is to say, the ongoing deficiency in shifting towards a higher-tech path of development.

Competitiveness in terms of trade performance

Countries' export performances are usually considered as indicators of their competitive positions in the international markets. In the literature, among the tools for measuring the export performance of a country are 'export similarity', 'export

diversification', and 'revealed comparative advantages'. Indeed, these three major tools constitute the essence of our thesis in the context of our Chapters 2, 3 and 4. We provide detailed information about these tools in Part 1.3 of this Introduction as well as in each related chapter. For the time being, we present a brief review of other trade-oriented tools for analyzing competitiveness; i.e. the trade performance index (TPI), intra-industry trade (IIT) analysis, real exchange rate (RER) analysis, and unit labor cost (ULC) analysis.

Trade Performance Index (TPI)

International Trade Center (ITC) defines competitiveness in terms of trade performance. Thus, ITC developed a so-called 'Trade Performance Index' (TPI), which incorporates some quantitative indicators to assess competitiveness at the levels of countries and sectors. The TPI covers 184 countries and 14 different export sectors (such as fresh food, processed food, wood products, textiles, chemicals, leather products, basic manufactures, non-electric machinery, information technology and consumer electronics, and transport equipment). In particular, this index demonstrates the changes in market shares and reveals the factors that cause these changes. By means of the TPI, it is possible to evaluate export diversification for products and markets. The TPI also provides a systematic overview of export performance and comparative and competitive advantages at the level of sectors.

Table 1.2 Groups of indicators used in the calculation of the TPI by ITC

Current Performance	**General Profile**	**Decomposition of changes in world market share (last 5 years)**
P1. Value of net exports	G1. Value of exports	C1. Relative change of world
P2. Per capita exports	G2. Trend growth of exports	market share
P3. Product diversification and	(last 5 years)	Decomposed into:
concentration	G3. Share in national exports	(C1a) Competitiveness effect
P4. Market diversification and	G4. Share in national imports	(C1b) Initial geographic
concentration	G5. Growth in per capita exports	(C1c) Initial product
	(last 5 years)	(C1d) Adaptation
	G6. Level in relative unit values	

Source: International Trade Center (ITC).

Table 1.2 above summarizes the indicators used in the calculation of the TPI under three categories: “general profile”, “current performance”, and “decomposition of changes in trade performance”.

For each country and each sector, the TPI consists of 22 indicators. These indicators provide information about (i) the general profile of the country or the sector, (ii) the current competitiveness position, and (iii) the changes in the recent export performance. A weighted average of these indicators gives the final competitiveness ranking.

Intra-Industry Trade (IIT) Analysis

Increasing intra-industry trade (IIT) for a country is generally accepted as an indicator of competitiveness. Moreover, especially for the transition economies, higher IIT may imply lower costs of adjustment to the changed trade structure, because the highness of IIT reflects almost the same production and consumption basis, thus reducing accession costs and improving competitiveness without important fluctuations in the economy.

Following the seminal study by Grubel and Lloyd (1971), the conventional measure of IIT for a given ‘product *i*’ can be formulated as follows:

$$IIT_i = \frac{(X_i + M_i) - |X_i - M_i|}{X_i + M_i} \qquad (1)$$

where X_i is the exports of product i and M_i is its imports. This index will be zero, if there is no intra-industry trade; and it will be one, if all trade is intra-industry. [See Erlat and Erlat, 2003 and 2006 for applications to Turkish foreign trade.]

In the literature, total IIT is usually divided into two types; i.e., vertical-IIT (VIIT) and horizontal-IIT (HIIT). While the VIIT refers to trade in similar products with different quality, HIIT refers to trade in similar products differentiated with properties other than quality. Al-Mawali (2005) argues that if there are large differences between the factor endowments of two trading partners, total IIT flows will be mostly in vertical form, whereas if there is little or no difference between the

factor endowments of the trading partners, horizontal IIT will be relatively more dominant. Hence, as opposed to HIIT, the vertical component of total IIT is related to inter-industry and it is positively related with differences in factor endowments. [Erlat and Erlat, 2010, 2011 and 2012 have measured HIIT and VIIT for Turkish foreign trade.]

In the literature, there is also a debate on disentangling of total IIT into its components. Some studies use unit values of exports and imports, others use trade specialization index (i.e., trade overlapping). In this regard, Kandogan (2003) develops a new method to disentangle total IIT into its components. His method is simple to carry out and is practical in using total IIT and its components as dependent variables in analyzing the determinants of intra-industry trade as well as that of inter-industry and total trade.

Real Exchange Rate (RER) Analysis

The Real Exchange Rate (RER) is one of the most widely-used measures of competitiveness. Conventionally, the RER is calculated as: $RER = ep / p^*$, where e is the nominal exchange rate (defined as foreign currency per unit of domestic currency), and p/p^* is the ratio of the domestic price level (p) to the foreign price level (p^*). For example, given e, if domestic prices rise more than foreign prices, then the RER will increase and thus the domestic currency will appreciate in real terms, indicating a decline in the competitiveness of domestic products. RER-measurement becomes useless if there are many trading partners to be compared in terms of competitiveness. In this case, the so-called 'Reel Effective Exchange Rate' (REER) can be used. The REER is a trade-weighted composite index of all bilateral real exchange rates. Interpretation of changes in the RER or REER as a direct measure of changes in competitiveness can be problematic under certain circumstances, because there may be some other and more fundamental reasons behind competitiveness changes such as favorable conditions in the world economy, abundance of capital movements, effective R&D policies, etc.

Unit Labor Cost (ULC) Analysis

Calculating the 'unit labor cost' (ULC) is a conventional way of measuring the cost-competitiveness of a country. ULC can be defined in different ways. For example, the ratio of wages to labor productivity is one of the widely-used definitions of ULC. With this definition, Turkey's ULC can be calculated as 'the wage per employed person (measured in TLs) divided by the output per the total number of employees'. Therefore, the ULC of a country takes into account the changes in both wages and labor productivity. In this respect, any increase in the ULC can be considered as a signal for decreasing competitiveness. Just to give an example from a study examining Turkey's competitiveness in terms of ULCs; Keyder et al. (2004) estimate a competitiveness index based on ULCs (ULCBCI; i.e., Unit Labor Cost-Based Competitiveness Index) for the period 1999-2003. In their model, they use such variables as the nominal wage, nominal exchange rate, output in private manufacturing, labor productivity, unit labor cost measured in TLs, unit labor cost measured in $US and the weighted average of foreign unit labor costs of Turkey's 15 major trading partners. As a result of this ULC analysis, they conclude that Turkey's ULCs are much lower than that of its trading partners, and hence Turkey is a cost-competitive country with respect to its trading partners.

1.2 General Descriptive Statistics

In this part of the Introduction, we provide some general and preliminary descriptive statistics for Turkey and its main competitors in the EU-15 market. Table-1.3 below provides information for the developmental levels and total export performances of Turkey and its selected major competitors in the EU-15 market, for the years 1996 and 2010. In 1996, Turkey's GDP per capita was 3034 $USs, while that of its competitors ranged from a minimum of 407 $USs (India) to a maximum of 43094 $USs (Switzerland). In 2010, Turkey's GDP per capita rose to 10050 US$s, while that of its competitors ranged from a minimum of 1375 $USs (again, India) to a maximum of 85443 $USs (Norway).

Table 1.3 Overview of Turkey's main competitors in the EU-15 market

	GDP per capita (current US$)		GDP (current billion US$)		Exports of goods and services (% of GDP)	
Country	**1996**	**2010**	**1996**	**2010**	**1996**	**2010**
Hungary	4454	12863	45.9	128.6	48.97	86.55
Thailand	3019	4614	181.9	318.9	39.25	71.25
Singapore	25796	41987	94.7	213.2	178.49	207.17
Slovakia	5078	16036	27.3	87.1	53.32	81.25
Korea	12249	20540	557.6	1014.9	27.86	52.37
Czech Republic	6291	18789	64.9	197.7	46.51	67.86
Poland	4057	12303	156.7	469.8	22.31	42.25
Lithuania	2340	11046	8.4	36.3	49.97	68.58
Switzerland	43094	67644	304.8	529.4	36.53	53.55
Slovenia	10635	22898	21.1	46.9	49.91	65.42
India	407	1375	399.8	1684.3	10.21	22.77
Malta	9852	19625	3.7	8.2	77.42	88.18
China	703	4433	856.1	5930.5	20.05	29.55
Israel	18465	28522	105.1	217.4	28.18	36.87
Latvia	2273	10723	5.6	24.0	46.82	53.81
Morocco	1328	2795	36.6	90.8	26.28	33.00
Tunisia	2155	4194	19.6	44.2	42.11	48.76
Malaysia	4747	8373	100.9	237.8	91.58	97.30
Japan	37422	43063	4706.2	5488.4	9.70	15.19
Ukraine	873	2974	44.6	136.4	45.65	50.75
Brazil	5109	10993	839.7	2143.0	6.57	10.87
Russia	2651	10481	391.7	1487.5	26.07	29.89
South Africa	3593	7272	143.7	363.5	24.73	27.34
Croatia	5194	13774	23.3	60.9	35.89	38.32
United States	28772	46702	7751.1	14447.1	11.19	12.73
Egypt	1071	2698	67.6	218.9	20.75	21.35
Norway	36555	85443	160.2	417.8	40.78	41.14
Turkey	3034	10050	181.5	731.1	21.54	21.21
Indonesia	1124	2952	227.4	708.0	25.82	24.56
Bulgaria	1063	6335	8.9	47.7	59.39	57.77
Mexico	3547	9133	332.9	1035.9	32.08	30.29
Romania	1562	7539	35.3	161.6	28.14	23.49
Canada	20685	46212	613.8	1577.0	38.39	29.43

Source: World Bank, World Development Indicators

It is obvious from Table 1.3 that Turkey has been competing in the EU-15 market with a wide variety of countries in terms of their developmental levels. Among Turkey's competitors, there have been quite poor countries (such as Egypt,

India, Indonesia, etc.), moderate-income countries (such as Brazil, Latvia, Lithuania, Russia, etc.), high-income countries (such as Israel, Korea, Slovenia, etc.), and very-high-income countries (such as Canada, Japan, Norway, US, etc.). In a sense, this diversity in per-capita-incomes of Turkey's competitors demonstrates that the EU-15 market is a good economic destination for the exports of a great variety of products. That is to say, many countries at very different stages of economic development can sell their domestically produced goods and services in this dynamic market. Therefore, our choice of 'EU-15' as the main market of analysis for Turkey's export competitiveness is also somewhat justified in the sense that Turkey can potentially reap benefits from the multi-layered demand structure in this market

In Table 1.3 above, the percentage share of total exports (to all world markets; i.e., not only to the EU-15 market) in the GDPs of the countries is given in the last two columns for 1996 and 2010. It is generally agreed that 'exports as percentage of GDP' provide useful information about the general level of competitiveness. In this regard, Turkey's performance was almost unchanged from 1996 to 2010, as indicated by the ratio of exports-to-GDP being slightly higher than 21 percent in both years. In this period, Turkey's GDP quadrupled from 181.5 to 731.1 billion $USs; and the almost constant exports-to-GDP ratio implies that the level of Turkey's exports also quadrupled. This four-fold increase in GDP (and also the associated four-fold increase in exports) in about 15 years is obviously a good performance on the part of Turkey.

However, there are some countries, whose economies were able to grow more than four-fold in the same period (i.e., China 6.9-fold, Bulgaria 5.4-fold, Romania 4.6-fold, Latvia and Lithuania both 4.3-fold, and India 4.2-fold). Moreover, as far as export competitiveness (as indicated by the exports-to-GDP ratio) is concerned, Turkey performed quite poorly with respect to its competitors. While this ratio remained almost constant for Turkey from 1996 to 2010 (implying a zero percentage-point change), many countries achieved quite impressive increases in this indicator; such as, 37.58%-point increase by Hungary, 32%-point by Thailand, 28.68%-point by Singapore, 27.93%-point by Slovakia, 24.51%-point by Korea, 21.35%-point by the Czech Republic, 19.94%-point by Poland, 18.61%-point by Lithuania, 17.03%-point by Switzerland, 15.52%-point by Slovenia, 12.57%-point

by India, 10.76%-point by Malta, 9.49%-point by China, 8.69%-point by Israel, 7%-point by Latvia, 6.72%-point by Morocco, 6.65%-point by Tunisia, 5.73%-point by Malaysia, 5.49%-point by Japan, 5.09%-point by Ukraine, and so on. At this point, Turkey's relatively lagging position in terms of its exports-to-GDP ratio (with respect to its major competitors in the EU-15 market) can be considered as a first signal for Turkey's policy-makers and trade strategists, who should work harder to promote Turkey's exports.

In the rest of this section of the Introduction, following Erlat (2012), we present seven figures, which show the export shares of certain country groups in total EU-15 imports in graphical form for the period 1996-2010.

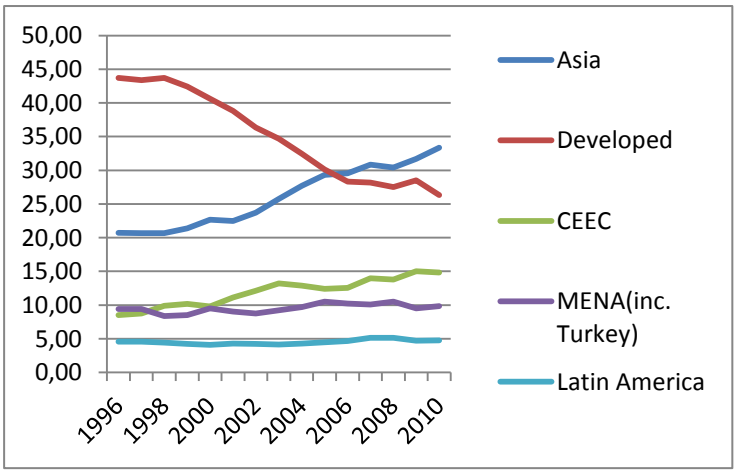

Figure 1.1 Export Shares of Country Groups in Total EU-15 Imports, 1996-2010

Figure 1.1 above indicates clearly that the export shares of Asian countries increased impressively (from about 15% to 30%) at the expense of the developed countries (whose share fell drastically from about 43-44% to 26-27%). Indeed, the relative performances of the Asian and the developed countries are like mirror images of each other. That is to say, in the EU-15 market from 1996 to 2010, the developed countries have clearly lost their competitive edge to the Asian countries. Though relatively more modest, the CEECs have also exhibited a prominent increasing trend in the same period. As such, these preliminary graphical analyses may signify that Turkey's strongest competitors in the EU-15 market are likely to be

the Asian countries along with the CEECs. The performances of other country groups (i.e., MENA and Latin American countries) have been apparently steady.

When we further examine the sharp decrease in the export shares of the developed countries in total EU-15 imports, it is easily observed that this decrease has originated mainly from the US and Japan, as demonstrated in Figure 1.2, below. These two countries have lost about half of their export shares in the EU-15 market from 1996 to 2010. While Switzerland's share has also decreased relatively more slightly, the shares of Canada and Norway have remained relatively unchanged.

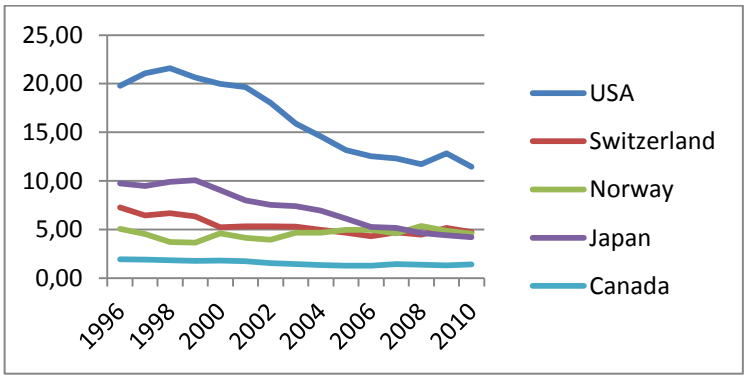

Figure 1.2 Export Shares of Developed Countries in Total EU-15 Imports, 1996-2010

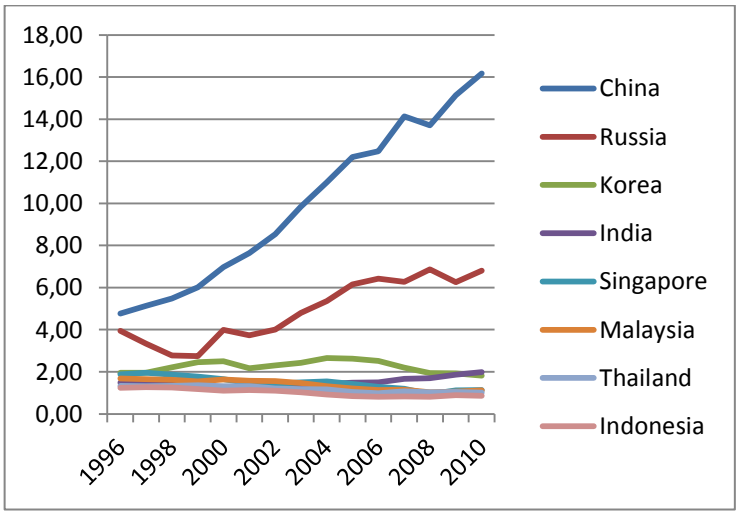

Figure 1.3 Export Shares of Asian Countries in Total EU-15 Imports, 1996-2010

Interestingly enough, the impressive export performance of the Asian countries is attributable to only two countries; namely, China and Russia, as shown in Figure

1.3 above. As a matter of fact, most of the Asian countries (Korea, India, Singapore, Malaysia, Thailand, and Indonesia) performed at quite steady rates in terms of their export shares in the EU-15 market. As a major exporter of energy, Russia's share has increased from about 4% to 7%, which is most likely to have resulted from the increases in energy prices in the period under consideration. On the other hand, China's share has exhibited a very steep upward trend, recording an increase from about 5% to 16%. Therefore, even though we have mentioned above that the Asian countries are likely to be among Turkey's strongest competitors in the EU-15 market, this statement now needs a modification in the light of Figure 1.3. As Turkey is not an exporter of energy, leaving Russia aside, and thus we can argue that, among Asian countries, China seems to be Turkey's strongest competitor in the EU-15 market, according to our preliminary descriptive analysis.

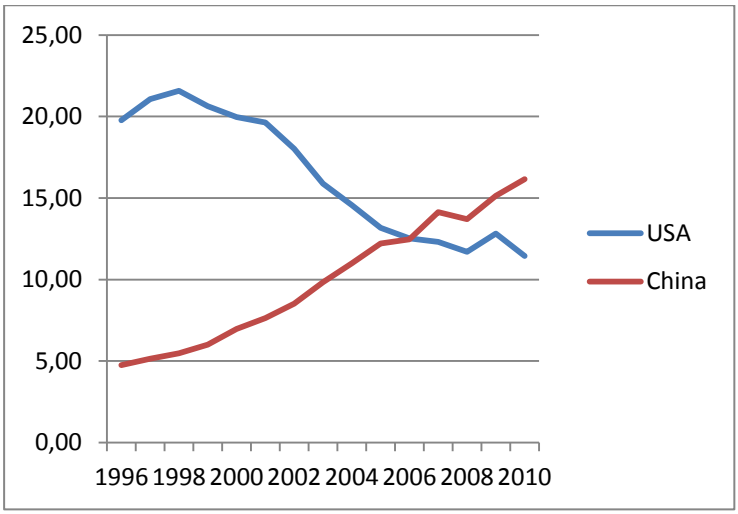

Figure 1.4 Export Shares of the Two Leaders in the EU-15 Market: USA vs. China

In recent times, there have been many hot debates about the world-economic leadership position of the US. Many economists have a tendency to think that the US is losing its competitive edge, especially against China. Figure 1.4 above provides some evidence in this regard within the context of the competition between the US and China in the EU-15 market from 1996 to 2010. Here, again, we observe a mirror-image figure, reflecting the regular rise of China associated with the regular decline of the US. The export share of the US has fallen from about 20 % to 12 %, whereas

that of China rose from about 5% to 16%. In the EU-15 market, in terms of export shares, China caught up with the US as of 2006, and performed better than the US in the recent years. In other words, the US seems to be actually and regularly lagging behind China, as far as the EU-15 market is concerned.

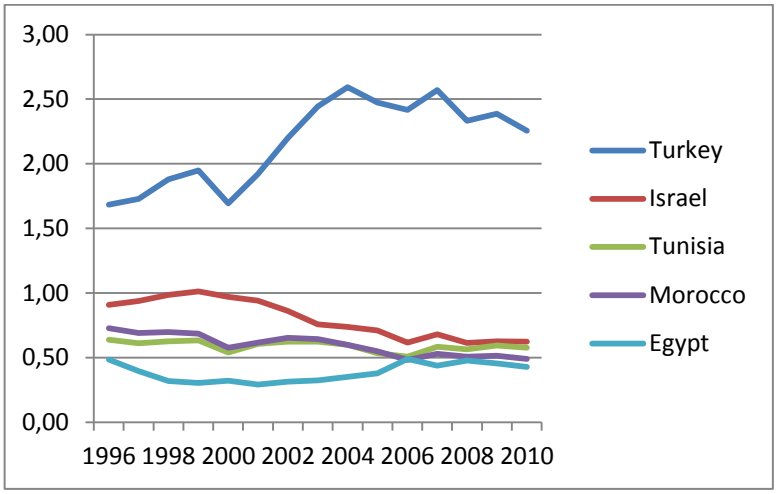

Figure 1.5 Export Shares of MENA Countries in Total EU-15 Imports, 1996-2010

When we include Turkey in the MENA countries, it is clear from Figure 1.5 that Turkey is the leader in this group. The export shares of other MENA countries (i.e., Israel, Tunisia, Morocco, and Egypt) have remained consistently below 1%, whereas that of Turkey has fluctuated roughly between 1.5% and 2.5%. There is no sign of potential competition to be posed by the MENA countries to Turkey, as far as Figure 1.5 depicts. For Turkey, there seems to be two main periods during which its export share increased quite sharply: First, between 1996 and 1999 and secondly, between 2000 and 2004. The first rise is easy to account for, because it took place just after the initiation of Customs Union between Turkey and EU at the end of 1995. That is to say, the immediate effect of the Customs Union on Turkey's export share in the EU-15 market seems to have been quite positive. The second period (2000-2004), during which Turkey's export share increased further, might be just a continuation of the first one, after a short-term decrease in 1999. In 1999, the adverse effects of the Asian financial crisis of 1997 might have been fully felt in Europe and Turkey. In recent years, Turkey's share has fluctuated around 2.5%. It should also be

noted that Turkey's export share in the EU-15 market is still much lower than that of the developed countries, China and Russia.

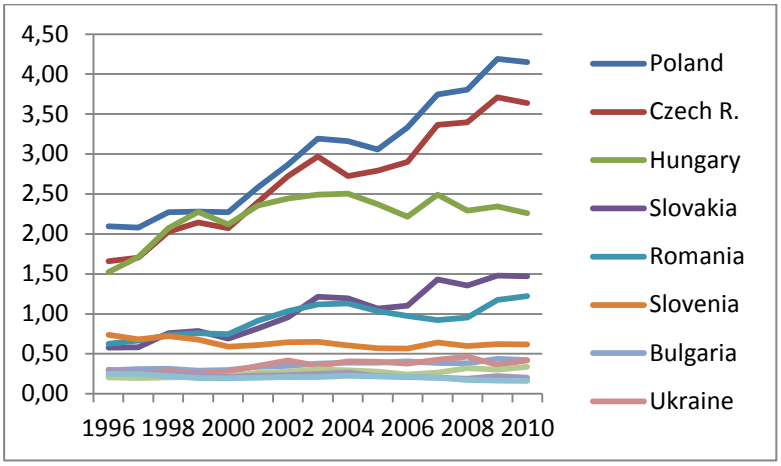

Figure 1.6 Export Shares of CEECs in Total EU-15 Imports, 1996-2010

Twelve new members were admitted to the EU in the 2004 and 2007 expansions. These new members are mostly the CEECs. As shown in Figure 1.6 above, the positive effects of these expansions on the export shares in the EU-15 market can be observed most easily for Poland and the Czech Republic and, to some extent, for Slovakia and Romania. In terms of their export shares in the EU-15 market in the recent years, Poland, the Czech Republic and Hungary stand out among the CEECs. Especially after their EU-membership, Poland and the Czech Republic have had a prominent upward trend, while Hungary's performance is relatively steady. In this regard, for Turkey, Poland and the Czech Republic seem to be the two strongest competitors from the CEECs. In addition to their upward trend in recent years, the export shares of these two countries are also higher than that of Turkey.

Finally, in Figure 1.7 below, two Latin American countries in the EU-15 market are shown. Both countries' export shares are lower than that of Turkey. However, Brazil's share is closer to Turkey's. Both Brazil and Mexico seem to have performed quite steadily in the EU-15 market, even though Mexico exhibits a very slight upward trend from 0.5% towards 1.0% but her performance is lower than that of Brazil.

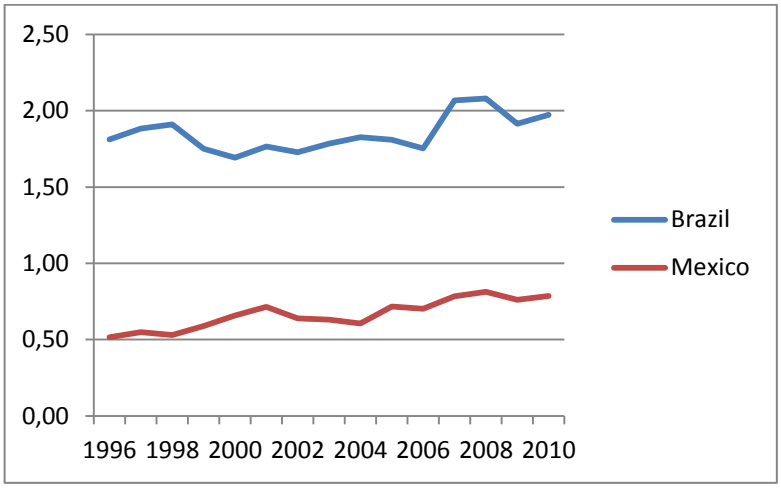

Figure 1.7. Export Shares of Latin American Countries in Total EU-15 Imports, 1996-2010

1.3 Outline and overview of Chapters 2, 3 and 4

It is now time to provide an introductory outline of our thesis, which is made up of three major chapters. Chapter 2 focuses on 'export similarity and competitiveness', Chapter 3 on 'export diversification and competitiveness', and Chapter 4 on 'comparative advantages and dynamic market positioning'. Chapter 5 contains the 'Conclusions', where we compile our results and discuss some policy implications. In the rest of this introductory chapter, we provide an overview of our major Chapters 2, 3 and 4.

1.3.1 Export Similarity and Competitiveness

As explained above, in this study, our main and general purpose is to carry out a detailed and extensive analysis of Turkey's export competitiveness in the EU-15 market. For this purpose, our first step is to determine Turkey's main competitors in this market, along with the degree of competition facing Turkey in its different export sectors. We do this type of preliminary analysis in Chapter 2, where we focus upon the concept of 'export similarity'.

In the literature, computation of a variety of indexes concerning 'export similarity' has long been one of the most common methodologies to determine (i) the main competitors of a country in a given market and (ii) the degree of competition facing this country in its export products. The utilization of export similarity

indicators in the literature can be traced back to Finger and Kreinin (1979), which is the seminal and one of the most influential studies on this subject. These authors were among the first international economists to develop an 'export similarity' indicator and incorporate it into the analysis of 'export competitiveness'. [2] The essential idea in this methodology is that 'export similarity' is implicitly related to 'export competitiveness' thanks to the following reasoning: Given two countries exporting to the same market; the more similar the 'export structures' of the two countries, the higher the degree of competition between these two countries in that market. Of course, conversely, dissimilarity of export structures suggests a lower degree or absence of competition.

In other words, a sensible analysis of the export competitiveness of a country in a given market should start with the identification of (i) its export similarity/dissimilarity with respect to the competing countries in that market and (ii) the degree of competition in each of its export products. Without such identification, it would be much more difficult and much less significant to try to carve out a rational trade strategy aimed at improving exporting capability. It is obvious that the construction of a rational trade strategy should rely on a methodological and empirical framework that distinguishes between relatively stronger and weaker competitors as well as between export products facing relatively higher and lower competitive pressure. It is in this light that Chapter 2 is the first step in our analysis of Turkey's export competitiveness in the EU-15 market, focusing upon the concept of 'export similarity'.

In Chapter 2, our data source is United Nations Commodity Trade Statistics ("UN-comtrade"), which is known as the world's widest data-set on trade-related variables. The Customs Union between Turkey and the EU began at the end of 1995,

[2] It should be noted that the academic interest in 'export similarity' has accelerated in recent years, especially in line with China's outstanding performance in exerting increasingly higher competitive pressure on export markets world-wide. Some relatively recent examples that utilize the concept of 'export similarity' in analyzing export competitiveness for different countries and regions are: Xu and Song (2000), Zhiyu (2003), Schott (2006, 2008), Peters (2008, pp. 25-28), Loke (2009), Yunxia (2009), IMF (2011, pp. 27-31). Further examples, together with the studies in the specific contexts of Turkey and the EU, are cited in Chapter 2.

marking an important structural change in Turkey's trade relations with the EU. On the other hand, the latest data were available for 2007 at the time of writing Chapter 2. Hence, our 'export similarity' analysis in Chapter 2 covers the period from 1996 to 2007, based on 5-digit data (SITC Rev. 3). We present our results for total exports (SITC 0-9), as well as for the category of 'manufacturing industries' (SITC 5-8). The results have also been calculated for the full period (1996-2007) and for the last five years (2004-2007). We have considered our 26 major competitors in the EU-15 market while conducting this analysis. Chapter 2 provides further details in these respects.

As we further emphasize in Chapter 2, in the literature there are not many studies that focus upon Turkey's export similarity with and competitiveness against its non-EU-15 rivals in the EU-15 market. However, EU-15 is a very large, geographically and potentially promising export market for Turkey. Therefore, Chapter 2 in general can be considered as a response to this deficiency in the related literature. Besides, the relatively few existing studies on this important subject-matter usually deal with particular export sectors, utilizing data generally at a quite aggregate level. In this regard, one of our data-related contributions is to examine in detail Turkey's all export products from SITC-0 to SITC-9 at a highly disaggregate level (i.e., at the 5-digit sector level). It is known that aggregation bias is a potential problem in calculating and using the "export similarity index" (ESI). Aggregate-level data may yield overestimated degrees of similarity, and hence deceptive information about the competitive pressures facing the country-under-consideration. We believe that our effort in using data at the disaggregate level along with a wider set of export sectors will enrich this literature significantly, thereby leading to the formation of a much broader framework for trade strategy analyses.

Moreover, the studies in the literature have generally used only the conventional "export similarity index" (ESI). In Chapter 2, we compute not only the conventional ESI, but also two other related similarity indexes, namely, the "product similarity index" (PSI) and the "price similarity index" (PRSI). Even though the conventional ESI is good at giving an idea about the similarity in 'export structures' between two competing countries, it also has a limitation: It doesn't take into account the 'level of exports'. Hence, it may not provide sufficiently reliable information in

the case of two competing countries that are very different in terms of the volumes of their exports and sizes of their economies. Our further calculations of the PSI and the PRSI, which involve absolute export values, can be considered as a response to this potential limitation of the ESI.

At this point, we should point out that we extended the "quality similarity index" (QSI) developed by Antimiani and Henke (2007), to cover all price comparisons and called it PRSI. Considering the importance of 'product heterogeneity' in this type of competitiveness analysis, we decomposed the export products with respect to their prices and created a separate similarity index for each price-category. Our decomposition comprises rival products with (i) prices higher than Turkey's price, (ii) prices similar to Turkey's price, and (iii) prices lower than Turkey's price. To our knowledge, there is no such decomposition analysis in the related literature. The main advantage of this new index can be summarized as follows: Thanks to our PRSI, not only can we determine Turkey's strongest competitors in the EU-15 market, but also we are able to see whether or not the competition arises from price differentials. Moreover, with this new index, we can determine the direction of price differences as well. In this way, it becomes possible to have a reliable opinion about how to obtain an advantageous competitive position in the future in terms of price and quality. The application of this new index is provided in Chapter 2 and the concluding Chapter 5.

Of course, export competitiveness has also important technological dimensions. In today's very dynamic and fast-globalizing world, it becomes increasingly more and more important to be able to produce and export relatively higher-tech products, as they provide the exporting country with more value-added as compared to relatively lower-tech products. Indeed, competitiveness in higher-tech products is nowadays considered to be an important sign of development. With these stylized facts in mind, we also classify the export sectors in terms of their technological characteristics, in order to be able to see the technological aspects of the competition facing Turkey in the EU-15 market. Following Erlat and Erlat (2003) we obtain five technology-related product categories: (i) Raw-material-intensive goods (RMIG), (ii) Labor-intensive goods (LIG), (iii) Capital-intensive goods (CIG),

(iv) Easy-to-imitate research-intensive goods (EIRG) and (v) difficult-to-imitate research-intensive goods (DIRG).

In general, our results in Chapter 2 indicate that Turkey confronts a quite strong export competition in the EU-15 market. A concise summary, for the time being, would go as follows: Over time, and especially in recent years, Turkey's export similarity has decreased with the Middle Eastern and North African (MENA) countries, whereas it has increased with the Central and Eastern European Countries (CEECs), the Latin American countries and the developed countries. However, Turkey's export similarity with the developed countries (such as Canada, Norway, Switzerland, and the US) is relatively lower. This result presumably implies that Turkey has not yet reached a sufficient level of technological development so as to effectively compete with the products from the developed countries. Competition for Turkey seems to have concentrated mainly in the LIG and CIG categories. In the research-intensive categories (EIRG and DIRG), Turkey's exports are usually similar with those of developing countries (such as, the Czech Republic, Poland, Slovakia, Slovenia and Brazil) even though in some cases developed countries like Canada and Norway can also be included in the list.

1.3.2 Export Diversification and Competitiveness: Intensive and Extensive Margins

'Export similarity' is an important first step towards understanding the general features of a country's competitiveness in a given export market, as argued above. Within an analogous framework of examination, 'export growth' of a country over time is also a straightforward indicator of competitiveness. In simple terms, in a given period of time, if a country's volume of exports in a given market has grown with respect to its competitors, one can argue that there has been an improvement in the export competitiveness of that country in that period. However, such simplicity in evaluating export competitiveness will usually not provide sufficiently useful information about the main source of improved competitiveness. Indeed, the economies of the countries in the world have generally a long-term tendency to grow positively, implying a steadily growing demand for imports at the world-economy level of analysis, and hence positively growing exports over the long-term for most

countries. Therefore, merely looking at growing export volumes in a steadily growing world economy will be insufficient to have a reliable opinion on the export competitiveness of a country. Therefore, one should examine carefully the main sources of export growth in order to have a better understanding of the significant details of a country's export competitiveness. In this regard, the concept of 'export diversification' shows up as a further important step in analyzing export competitiveness. Thus, we carry out a detailed analysis of Turkey's 'export diversification' in the EU-15 market in our Chapter 3.

Export diversification is an important concept, because there is a well-known line of thought, according to which export competitiveness has to do with successful diversification of the export products over time. The general idea here can be summarized as follows: A country is more likely to improve its export competitiveness against its competitors if that country is capable of producing and exporting 'new varieties of products' in a dynamic manner, rather than merely relying on producing and exporting 'traditional products' in a relatively static manner. In other words, new export products can be considered to be more conducive to competitiveness, as compared to the already-existing, traditional export products. However, recent studies have investigated whether this way of reasoning is actually valid. In this framework, the following question has become important: In a given market in a certain period of time, what has been the main source of export growth of a country; new products or old products? That is to say, identifying the main source of export growth over time is now a necessary step in the construction of a workable framework for developing practical export strategies.

One common methodology to analyze the degree of export diversification[3] has been the calculation of 'extensive and intensive margins' of exports.[4] Even though

[3] For earlier studies involving alternative measures of export diversification and its evalution over time, with applications to Turkish foreign trade, see Erlat and Şahin (1998) and Erlat (1999).

[4] The general name to denote this methodology is: 'Extensive and intensive margins of trade'. That is to say, such margins are calculated and used not only for exports but also for imports. However, as our main purpose in this study is to shed light on Turkey's export competitiveness in the EU-15 market, we will be basically dealing with the 'export margins' of Turkey and its competitors in this market.

the review of the related literature shows that the extensive and intensive margins have been defined in different ways by different studies, the main and general idea here is to determine the degree of the contribution of the new and old products to the export growth of a country in a given market in a given period of time. In our framework of analysis in Chapter 3, we consider the 'extensive margin' as a measure of the 'extension' of the set of exported products through the addition of new export products over time. On the other side, the 'intensive margin' is a measure of the 'intensity' of the set of existing products that have been already exported in the previous time periods. Therefore, in general and simple terms, a larger extensive margin is an indicator of a higher degree of export diversification; whereas a larger intensive margin suggests a lower degree of export diversification.[5]

Our data source in Chapter 3 is "Eurostat" – the major statistical office of the European Union. Eurostat provides us with the necessary import figures of the EU-15 countries. In Chapter 3, we use import data of the EU-15 market, because it provides 'homogeneous' customs values of imports coming from non-EU-15 countries. If we had used and compiled the separate export data-set of each non-EU-15 exporter in this market, misleading results and evaluation errors could have arisen due to the country-specific measurement and reporting procedures. The Eurostat data-set was in accordance with SITC Rev. 3 between 1996 and 2006; however, they revised it to Rev. 4 in 2007. As extensive-intensive margin computations would be severely affected from such reclassification, we were not able to use data after 2006. Therefore, we had to confine our analysis to the period 1996-2006, thus, using SITC-Rev.3 data consistently throughout the entirety of our calculations. Like in Chapter 2,

[5] Concerning the relative importance of the roles of the extensive and intensive margins in export growth, the results in the literature are quite mixed, in fact. On this subject-matter, one can find a considerable number of studies, which were carried out for different countries and regions, using data at the levels of countries, industries or firms. In this Introduction, we can cite a few examples to draw attention to the lack of a general harmony in the literature: Hummels and Klenow (2005) find that the extensive margin contributes to export growth more significantly than the intensive margin, while Besedes and Prusa (2007) and Helpman et al. (2007) come up with the primacy of the intensive margin. Lucio et al. (2010) conclude that the role of the intensive margin is more dominant in the short run, while both the intensive and extensive margins become equally effective in the long run. With these mixed results in mind, our main objective in Chapter 3 is to distinguish between Turkey's export-product categories, in which the export growth can be explained more dominantly by the extensive as well as the intensive margins. A more directly related literature review is provided in our Chapter 3.

our data in Chapter 3 is also at a quite disaggregate level, i.e. at 5-digit, so as to take into account the potentially important effects of product heterogeneity in these types of analysis.

In Chapter 3, our main focuses of attention are the factors that influence the growth of Turkey's exports and the growth of Turkey's market share in the EU-15 market against its main competitors. What has been the degree of effectiveness of extensive and intensive margins on the changes in Turkey's exports and market share? Against which competitors and in which product categories does Turkey compete more dominantly in the new products and in the existing products? With these questions in mind, we calculate first the extensive margins, and then intensive margins for Turkey and its competitors in the EU-15 market for the period 1996-2006, in order to constitute a broad framework for comparative analysis. Like in Chapter 2, we also classify the export products into five groups according to their technological characteristics (i.e. the RMIG, LIG, CIG, EIRG, and DIRG categories), and report our results also with respect to this technology-related classification. Following our detailed analysis of the extensive-intensive margins in this way, we also compute the "export price index" for the intensive margin of Turkey and its competitors for further comparison purposes.

All in all, our main contribution in Chapter 3 can be summarized concisely as follows at this stage of the Introduction: Turkey's export competitiveness from different viewpoints has been analyzed for particular product categories by certain methodologies. However, to our knowledge, in the literature, there is no study that has dealt with Turkey's competitiveness by using the important methodology of extensive-intensive margins and by incorporating the export price index for the intensive margin. In this regard, our Chapter 3 is the first attempt to utilize these methodologies in the case of Turkey, along with a much broader set of sectors and a much more disaggregate data-set, and thus covering an unprecedentedly large variety of products. We hope that these new features of our analyses will not only enrich the existing empirical literature, but also provide an expanded choice set for export strategy possibilities.

One important conclusion that we derive from our analysis in Chapter 3 is that, in general for all competitors in the EU-15 market, the growth of exports has arisen

primarily from the intensive margin, rather than the extensive one. This result is in line with the previous findings of such studies as Besedes and Prusa (2007) and Helpman et al. (2007). But our results also suggest that the extensive margin (i.e., export diversification) has been relatively more contributive in the case of developing countries, as compared to the developed ones. In all sectors, Turkey's extensive margin is the highest among its competitors, which is, of course, good news for Turkey. However, our results also suggest that Turkey's export growth is due to the intensive margin more than due to the extensive one. With respect to the comparisons of export price indexes, we find that Turkey's prices have generally risen more than those of its competitors, especially in the RMIG, LIG, CIG, and EIRG categories. It seems that, except in the DRIG-category, Turkey's export products are of higher quality than the products of its competitors. More detailed results and discussions are provided in Chapter 3 and the concluding Chapter 5.

1.3.3 Comparative Advantages and Dynamic Market Positioning

After our detailed examination of the similarity and diversification of exports, we turn to the corner-stone of competitiveness analysis; i.e. 'comparative advantage', in Chapter 4. 'Comparative advantage' has long been the main concept around which patterns of international trade have been theoretically examined since the early 19th century. It is known well that David Ricardo's 'classical' development of this concept formed the basis of later major theories of international trade. Most notably, the neoclassical trade theory, based on the famous Heckscher-Ohlin model, relies also on 'comparative advantage' as an explanatory key concept. While Ricardo's classical theory explains the basis for trade in terms of varying production conditions between trading partners, the neoclassical Heckscher-Ohlin model relies on the differences in factor endowments to account for the existence of trade. Despite this main difference between the classical and neoclassical theories of trade, the two approaches have a common conclusion based on the concept of comparative advantage: A country will specialize in and export the goods in which it has a comparative advantage, and import the goods in which it has a comparative disadvantage. In other words, although comparative advantage is attributed to different sources in the classical and neoclassical approaches (i.e., to labor

productivity differences in the classical theory, and to the relative abundance/scarcity of resources in the neoclassical theory), it is the 'comparative advantage' that determines the patterns of exports and imports in the final analysis. This being the case, 'comparative advantage' has always been the generally-agreed concept to explain the essential reason behind competitiveness in international trade.

However, it is practically very difficult – if not impossible – to determine accurately the actual comparative advantages of a country. For example, in the case of the simplest version of the neoclassical trade theory, based on the traditional Heckscher-Ohlin model, the researcher needs to know accurately about the relative amounts of labor and capital of the trading partners in order to be able to determine which country has a comparative advantage in the labor-intensive goods and which country in the capital-intensive goods. While it may be possible to measure the labor force somewhat accurately, it is usually a formidable task and a debatable issue to measure the capital stock especially at country-level of analysis. Therefore, practical applications of the theoretical concept of 'comparative advantage' have usually been potentially problematic.

Nevertheless, a practical concept was also developed in relation to 'comparative advantage'. This useful concept is known as 'Revealed Comparative Advantage' (RCA), which was developed for the first time by Liesner (1958). However, it was after Balassa's (1965) seminal and influential study that the RCA started to become a widely-used indicator of competiveness in the literature. While 'comparative advantage' is a generally-accepted 'theoretical' explanation for competitiveness, the concept of RCA can be regarded as its 'practical' counterpart. The idea behind the concept of RCA can be summarized as follows: According to the 'theoretical' concept of 'comparative advantage', a country is postulated *a priori* (i.e., before observation) to possess export competitiveness in the goods in which it has a comparative advantage; whereas, according to the 'practical' concept of RCA, if a country has actually exported certain goods, these exported goods 'reveal' *a posteriori* (i.e., after observation) that this country has comparative advantage in those goods. Since the introduction of the idea of RCA, various RCA indexes have been further utilized for analyzing the competitiveness of countries. In other words, RCA has proven to be one of the most standard indicators of competitiveness for

about the last 50 years. Therefore, in a study like ours, it is necessary to utilize this indicator to increase our understanding of Turkey's export competitiveness in the EU-15 market. Feeling this need in the face of the main purposes of our study, we analyze Turkey's competitiveness in further detail by computing RCA indexes in Chapter 4.

However, like most indicators, the conventional RCA index also has its limitations. While the conventional RCA index is capable of providing useful information within a 'static' context of analysis, it is not so serviceable in examining the temporal changes in the comparative advantages. Hence, the chief constraining feature of the conventional RCA index is its mainly 'static' treatment of the comparative advantages that are revealed. That is to say, it is troublesome to try to identify the dynamic changes in comparative advantages by using merely the conventional RCA index. Therefore, we also utilize an additional methodology in order to complement our results obtained from the conventional RCA index. This relatively newer methodology was developed by Edwards and Schoer (2002), by way of which one can analyze the 'dynamic market positioning' of competitors in a given market over time.

In 'dynamic market positioning', by means of a so-called 'dynamic RCA index', export goods are categorized into six groups as (i) rising stars, (ii) falling stars, (iii) lagging retreat, (iv) lost opportunity, (v) leading retreat, and (vi) lagging opportunity. The category of 'rising stars' is the most desirable case as it refers to those export goods for which the worldwide demand and the exporter's market share are rising simultaneously. In contrast, 'lost opportunity' can be considered the worst case as it refers to those export goods for which worldwide demand is rising while the exporter's share is falling. Detailed explanations for the 'dynamic RCA index' and for these six categories are provided in Chapter 4. At this point, we should also note that Edwards and Schoer (2002) capture the dynamic element in the changing RCAs by comparing the values in an initial and a final year. In our own analysis in Chapter 4, we develop an improved procedure for capturing dynamism as much as possible. That is to say, rather than restricting ourselves with merely an initial and a final year, we analyze changes in the RCAs on a yearly basis by computing average annual changes for the whole period under consideration. In this way, we are able to

see what has happened to the comparative advantages not only between the initial and final years, but also on an annual basis throughout the whole period.

Like in Chapter 2, our main data-source is United Nations Commodity Trade Statistics ("UN-comtrade") in Chapter 4. Our computations involve data at 3-digit level, according to SITC Rev. 3. We cover the whole period 1996-2010 in our analysis in Chapter 4, while we also submit results for two sub-periods; i.e., 1996-2003 and 2004-2010. The purpose of this sub-periodization is to see the possible effects of EU-expansions in 2004 and 2007. Also, like in the previous chapters, we carry out our analysis in Chapter 4 with respect to the five technological classifications (RMIG, LIG, CIG, EIRG, and DIRG), which we have already explained above.

Concerning our contributions in Chapter 4, the first noteworthy novelty in our study can be summarized as follows: In the previous literature, Turkey's dynamic market positioning has not been analyzed at all; and hence, our utilization of 'dynamic RCA index' is the first attempt to examine Turkey's competitiveness in such a dynamic framework of analysis. Secondly, after our 'static' and 'dynamic' examinations of Turkey's competitiveness in the EU-15 market by means of RCA indexes, we also carry out a detailed analysis of 'competitive threat'. We do this type of analysis in order to see the 'competitive threats' facing Turkey's exports in the EU-15 market, as well as the 'threats' that Turkey pose to the exports of its competitors in the same market. That is to say, another contribution by us in Chapter 4 is our calculation and utilization of 'threat indexes'. For analyzing Turkey's competitiveness, such indexes have not been computed and utilized in the literature so far.

Turkey's concern about the 'competitive threats' in the EU-15 market has increased especially after the admission of the CEECs to the EU in 2004 and 2007, along with the rise of China's exports in world markets in the last decade. Therefore, it is obviously important for Turkey's policy-makers and trade strategists to have detailed information about the degree and source of competitive threats facing Turkey's exports in the EU-15 market. In this regard, the Export Similarity Index (ESI), which we have already calculated, examined and explained in the context of Chapter 2, can also be interpreted as a measure of competitive threat. However,

Jenkins (2008) criticized such interpretation of the ESI, arguing that a single value of ESI cannot indicate accurately the reciprocal threat between two competing countries. Considering Jenkins's critique, we interpreted the ESI merely as the degree of similarity in export compositions in Chapter 2, where our main purpose is to determine *not* the reciprocal threats, but Turkey's major competitors in the EU-15 market. Thus, we utilize a more specific and reliable 'threat index' separately in Chapter 4 for figuring out the reciprocity in threats in a more accurate way. The calculation of the 'threat index' is based on Spearman's Rank Correlation (SRC) coefficients between the RCA indexes of the two competing countries in a given market (Shafaeddin, 2004; Lederman et al., 2006). We compute this index between Turkey and its competitors in the EU-15 market for each year in the period 1996-2010 so that we can see the changes in reciprocal threats on an annual basis. Detailed explanation for the interpretation of this index is provided in Chapter 4. In addition to the conventional usage of this index in the literature, we also construct a practical matrix of four possibilities to categorize the 'threats-and-opportunities' in a more useful way. In the context of our matrix, depending on the relative values of the correlation coefficients between the RCAs of Turkey and its competitors, it is possible to observe one of the following four outcomes: (i) Turkey and its competitor pose threat to each other. (ii) There is opportunity for the competitor. (iii) There is opportunity for Turkey. (iv) Neither Turkey nor its competitor poses a threat or an opportunity to each other.

Some noteworthy introductory results from our Chapter 4 are as follows: In terms of our conventional RCA analysis, the bulk of Turkey's comparative advantages (64.2% of its total exports) are concentrated in the LIG (44.8% of its total exports) and CIG (19.4% of its total exports) categories, on the average, for the full period (1996-2010). In contrast, the degree of Turkey's comparative advantages in 'high-tech' products is quite low (5.3% of its total exports for EIRG, and 6.2% of its total exports for DIRG). Turkey's extensive dependence on LIG, which can only create rather low amounts of 'value added', along with its relatively poor performance in 'high-tech' goods should be taken as a serious warning by Turkish policy-makers and trade strategists, who should develop a workable long-term perspective to re-structure Turkey's exports from low- to high-value-added products.

Fortunately, in terms of our dynamic RCA analysis, 37.3% of Turkey's export goods belong to the 'rising stars' category in the full-period (1996-2010). As we briefly explained above, the 'rising stars' category is the best market position and this 37.3% is the highest among the shares of other categories for Turkey (i.e., 31.9% for 'lagging retreat', 11.2% for 'leading retreat', 6.9% for 'falling stars', 6.6% for 'lagging opportunity', 6.0% for 'lost opportunity'). However, this high share of the 'rising stars' category can situate Turkey only at the rank of 12th among 33 main competitors, meaning that 11 exporters in the EU-15 market have higher shares for the 'rising stars' category. Last but not the least, in terms of our 'competitive threat' analysis, our results show that the threats posed to Turkey's exports especially by some CEECs (i.e., Romania, Bulgaria, Slovakia, Croatia, Poland, and Hungary), a few MENA countries (Tunisia and Morocco), and also by India and China should be considered seriously. Of course, much more detailed results and interpretations are provided in Chapter 4.

After our detailed analysis of export similarity (Chapter 2), export diversification (Chapter 3), comparative advantages and dynamic market positioning (Chapter 4), Chapter 5 concludes by providing a combined summary of our results along with some policy implications. All in all, we have carried out an in-depth analysis of Turkey's export competitiveness in the EU-15 market, incorporating different but related dimensions of Turkey's exporting capability. In this way, we have constructed a broad and useful framework of analysis, by way of which one can figure out Turkey's export patterns in detail. We hope that the results from this study can be utilized to improve Turkey's export competitiveness in the EU-15 market in particular, and in the world markets in general.

CHAPTER 2

EXPORT SIMILARITY AND COMPETITIVENESS: THE CASE OF TURKEY IN THE EU-15 MARKET

2.1 Introduction

In this chapter, we analyze the similarity of Turkey's export patterns with those of the major exporters to the EU-15 market from 1996 to 2007 at a highly disaggregated level of product data. Our comparisons are based on the products exported to the EU-15 market as well as the prices of these products.

In the literature, the similarity of export structures between two countries is considered to be an appropriate measure of the degree of competition. The main point is that the more similar the export compositions, the stronger the competition between the competitors (Calderon, 2006; Schott, 2006; Antimiani and Henke, 2007; Wu and Chen, 2004; IDB, 2004). Export similarity has also been used in explaining the effects of economic integration on the countries outside the integration, especially on developing countries. The idea here is that the more dissimilar the export structures between developed and developing countries, the less the developing countries benefit from tariff reductions, which mainly cover the products exported by the developed countries (Finger and Kreinin, 1979; Kreinin and Plummer, 2007; Derado, 2008; Benedictis and Tajoli, 2007; Crespo et al., 2004, Caetano et al., 2002, Langhammer and Schweickert, 2006). Lastly, the similarity of a developing country's export products with those of the developed countries (such as with the export products of OECD countries) can be considered as an indicator of the relative sophistication of the country's exports. (Schott, 2008).

In the light of these usages of export similarity in the literature, the first purpose of this chapter is to determine Turkey's strongest competitors in the EU-15 market. More specifically, we aim to determine the extent to which the patterns of specialization observed in Turkey and other countries are competitive with each other in the EU-15 market. Our second objective is to obtain an idea about the effects of the EU enlargements on Turkey's exports to the EU-15 market by analyzing

especially the similarity of Turkish exports to those of the new members from the Central and Eastern European Countries (CEECs). Thirdly, we also aim at understanding the relative sophistication of Turkey's exports by comparing its composition to that of the developed countries, such as Canada, Japan, Norway, Switzerland and the US.

For our purposes in this chapter, we utilize three export similarity indexes. The first one is the well-known 'Export Similarity Index' (ESI), which was developed by Finger and Kreinin (1979). The second one is the 'Product Similarity Index' (PSI) and the third one is the 'Price Similarity Index' (PRSI). In this regard, as we have already emphasized in the Introduction, the PRSI is an original contribution by us. Inspired by Antimiani and Henke (2007) and the conventional intra-industry trade indexes, we developed this index for analyzing 'export similarity' in terms of not only export products but also export prices. In this sense, this is the first study to compare Turkey's export prices to those of other countries by using the PRSI. This index involves a decomposition of the rival products into three groups; i.e., the rival products with (i) prices higher than Turkey's price, (ii) prices similar to Turkey's price and (iii) prices lower than Turkey's price. With this new index, it is possible to determine (i) whether or not the competition arises from price differentials and (ii) the direction of price differences.

In the literature, there are few studies that analyze Turkey's export performance in the EU-15 market *vis-à-vis* other non-EU-15 countries. Moreover, the existing studies usually focus upon differences across particular industries, and they utilize data mostly at aggregate levels. In this regard, this is also the first study to examine the export similarity and export composition of Turkey and its competitors at a highly disaggregate level of data, focusing upon a wide variety of products, which are grouped into technological categories. The existing literature needs to be improved by encompassing the heterogeneity of export products within industries and focusing upon price and quantity differences. Comparing Turkey with its competitors at a high level of detail and also incorporating technological categories, this chapter extends the literature by examining the export products and prices across countries within each industry.

2.2 Literature Review

The index to measure export similarity was developed originally by Finger and Kreinin (1979). This index is known as the 'Export Similarity Index' (ESI). Finger and Kreinin mainly analyzed the effects of reducing trade barriers on the exports from developing countries to developed countries. Their seminal study has led to many recent studies that deal further with the important concept of export similarity (such as, Calderon, 2006; Schott, 2006; Antimiani and Henke 2007; Wu and Chen, 2004; IDB, 2004; Kreinin and Plummer, 2007; Derado, 2008; Benedictis and Tajoli, 2007; Crespo et al., 2004; Caetano et al. (2002); Langhammer and Schweickert, 2006; Schott, 2008).

In the context of the export similarity between Turkey and European countries, one of the early studies is Akder (1985), who analyzes Turkey's export similarity with that of Portugal, Spain and Greece in the European Community market. More recently, Akgüngör et al. (2002) use the ESI to determine the degree of Turkey's similarity to EU countries in terms of the export shares of the tomato, grape and citrus-fruit industries in the context of overall fruit and vegetable processing industry. Another recent study is Yılmaz (2003), who calculates the similarity among the exports of Turkey, a group of CEECs and EU-15 countries, based on two-digit SITC Rev.3 data. Another recent application of the ESI can be found in Antimiani and Henke (2007), who measure the similarity of agri-food exports of the EU-15 countries with those of Poland, Hungary, Czech Republic, China and Turkey. They use the ESI as well as product- and quality-similarity indexes, covering the period 1996-2000.

2.3 Data and Methodology

Our analysis is based on product-level export data from the third countries (i.e., from the non-EU-15 countries) to the EU-15 market, classified according to the SITC Rev.3 at the 5-digit level. The EU-15 market consists of the EU's 15 earlier members (i.e., Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Sweden, Spain, and the United Kingdom). Non-EU-15 countries are the main exporters to the EU-15 market; i.e., Central and

Eastern European Countries (CEECs), Middle Eastern and North African (MENA) countries, developed countries, and countries from Asia and Latin America.

The Customs Union between Turkey and the EU started at the end of 1995; hence, our initial year is 1996. The latest data were available for the year 2007 at the time of writing this chapter, and this is the reason why our analysis ends at 2007. We analyze 1996-2007 as the full period (F-P) and 2004-2007 as the last period (L-P), separately. By evaluating the last period separately, we are able to focus upon the recent developments in Turkey's exports, and also we can analyze the similarity between Turkey and the CEECs, before and after their accession to the EU. We carry out calculations for overall products (SITC 0-9) and manufacturing products (SITC 5-8), separately.

Based on Hufbauer and Chilas (1974) and Yılmaz (2002), we also classify the export sectors according to their technological characteristics. This classification has also been used extensively by Erlat and Erlat (2003, 2005 and 2008). In this classification, the export products are categorized into five technological groups: Raw-material-intensive goods (RMIG), labor-intensive goods (LIG), capital-intensive goods (CIG), easy-to-imitate research-intensive goods (EIRG), and difficult-to-imitate research-intensive goods (DIRG). More specifically, this classification can be summarized as follows:

RMIG: SITC 0, 2 (excl. 26), 3 (excl. 35), 4, 56.
LIG: SITC 26, 6 (excl. 62, 67, 68), 8 (excl. 87, 88).
CIG: SITC 1, 35, 53, 55, 62, 67, 67, 78.
EIRG: SITC 51, 52, 54, 58, 59, 75, 76.
DIRG: SITC 57, 7 (excl. 75, 76, 78), 87, 88.

The data used in this chapter comprise mainly the exports of non-EU-15 countries to the EU-15 market. Our data source is the largest trade data-base in the world; namely, United Nations Commodity Trade Statistics ("UN-comtrade"), which compiles data from exporting countries separately.

Using export data has a certain advantage. These data are expressed in terms of 'free-on-board (f.o.b) prices', and hence they do not include transportation costs, etc.

On the other hand, import data usually include transportation costs, etc. Therefore, unit-values obtained by dividing export values by export quantities can serve as a better proxy for quality, as compared to unit-vales obtained by dividing import values by import quantities.

However, export data obtained from UN-comtrade have also some problems. First of all, the countries included in our study are quite heterogeneous. We deal with both developed and developing countries, which have quite different statistical data-bases and their own methods of collecting data. Although UN-comtrade standardizes the data collected from individual countries, some problems may still arise due to such differences and specificities. For example, some classification problems concerning export quantities may occur. More specifically, some countries report their exports of certain goods in terms of weight (e.g., in kilograms), whereas some others report their exports of the same goods in terms of numbers. Therefore, uniform calculations are not always possible for certain export goods for some countries. Another problem in UN-comtrade data is that there are some cases where SITC-subcategories do not add up to the next higher category level. UN-comtrade explains this problem as follows: The data are collected and reported by some countries according to the Harmonized System (HS) Commodity Classification, and for some codes there is not a perfect match between SITC and HS-classification. For example, such a problem exists for SITC-673 and SITC-676, where there are huge differences between the sums of 5-digit and 3-digit products. This problem is peculiar only to 4-digit and 5-digit levels of data, and not to 3-digit and more aggregated levels. Therefore, we take SITC-673 and SITC-676 products at 3-digit level rather than the 5-digit level. Also, Turkey's export data were not fully published at the 5-digit level in 2006 and 2007 due to a so-called "pro-secrecy law" (*Gizlilik Esası Kanunu*). However, this law was repealed as of January 2009, thanks to pressures from the EU. As such, Turkey has only recently started to publish its correct export data at disaggregate level for the years 2006 and 2007. Therefore, we take Turkey's export data for the years 2006 and 2007 from the Turkish Statistical Institute (TUIK). All in all, we utilize the export data obtained from UN-comtrade by overcoming the above-mentioned problems as much as possible.

Our analysis of Turkey's exports with respect to its competitors over time, across countries and across sectors involves certain methodologies for computing three similarity indexes. These methodologies and indexes are explained below.

2.3.1 Export Similarity Index (ESI)

The ESI, developed by Finger and Kreinin (1979), is intended to measure the similarity between the exports of any two countries competing in a given market. This index is based on the share of each product in each country's total exports, and it is calculated as the sum of the minimums of the two shares for each product. Formally:

$$ESI(ab,c) = \sum_j \min\left[\frac{X_{j(a,c)}}{\sum X_{j(a,c)}}, \frac{X_{j(b,c)}}{\sum X_{j(b,c)}}\right] \qquad (1)$$

where $ESI(ab,c)$ refers to the export similarity index of countries *a* and *b* in the common market (*c*); $X_{j(a,c)}$ refers to the exports of product j from country a to market c, and similarly $X_{j(b,c)}$ refers to the exports of product *j* from country *b* to market *c*; $\sum X_{j(a,c)}$ and $\sum X_{j(b,c)}$ are total exports of country *a* and *b* to market *c*, respectively. Therefore, the first term in brackets is the share of product *j* in country *a*'s exports to market *c*, while the second term is the share of product *j* in country *b*'s exports to market *c*.

An index value very close to unity can be interpreted to suggest that the two countries (*a* and *b*) are perfect competitors in the common market (*c*). An index value very close to zero can be interpreted to suggest that there is no competition at all between the two countries.

The ESI is sensitive to the choice of data-level such that its value tends to increase with higher levels of aggregation, and vice versa. Keeping this in mind, we carry out our calculations at a highly disaggregated level. Disaggregated data also enable us to see the heterogeneities across/within industries.

Finally, it is clear that the ESI is not affected by the relative sizes of the exports of the countries.[6] Therefore, we need further indexes that involve the effects of the differences in export sizes. Thus, we also calculate the following two indexes, which are based on absolute export values.

2.3.2 Product Similarity Index (PSI)

Inspired by the G-L index (Grubel and Lloyd, 1971), Antimiani and Henke (2007) developed the PSI index. The PSI between country a and country b is calculated as follows:

$$PSI_i = 1 - \frac{\sum_j | X^i_{j(a,c)} - X^i_{j(b,c)} |}{\sum_j (X^i_{j(a,c)} + X^i_{j(b,c)})} \qquad (2)$$

where *i* may stand for a 3-digit sector obtained from 5-digit products *j* or it may represent any categorization we choose in presenting the results, or it may refer to the country as a whole. The PSI index at the country level can also be calculated as a weighted average of the values of PSI_i, where weights are given by the shares of sum of two countries' exports of industry i in their total exports. The value of the index changes between 0 and 1. If the PSI is zero, there is perfect dissimilarity and if it is one, there is perfect similarity between the exports of the two countries.

The PSI is a version of the G-L index, which measures the level of intra-industry trade (simultaneous exports and imports in the same industry) of a country at different levels of aggregation. In the G-L index, similarity of a country's exports with its own imports is measured. In the PSI, similarity of a country's exports with another country's exports in a common market is measured.[7]

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[6] Finger and Kreinin (1979: 906) stress this aspect of the ESI in their original article as follows: "Since the index is intended to compare only patterns of exports across product categories, it should not be influenced by the relative sizes or scales of total exports. To remove the scale effect, the exports of, say *a* must be rescaled so that they are equal in total to those of *b*".

[7] For a detailed account of the G-L index, see Erlat and Erlat (2003).

2.3.3 Price Similarity Index (PRSI)

Antimiani and Henke (2007) developed a so-called "quality similarity index" (QSI), which was inspired by the measurement of vertical and horizontal inter-industry trade. Horizontal intra-industry trade refers to measuring the similarity of a country's exports and imports for sectors exhibiting similar qualities. Antimiani and Henke carry this idea over to measuring the similarity of exports with similar qualities. In doing so they implement a procedure developed by Greenaway et al (1995) for IIT and this methodology was applied to the Turkish case by Erlat and Erlat (2012).

This involves measuring quality by price and price by the unit values (UV) of exports. Thus letting *j* indicate 5-digit sectors in the i^{th} 3-digit sector, the UV for $X_{j(a,c)}$ by $UV^{j}_{X_j,(a,c)}$ and the UV for $X_{j(b,c)}$ by $UV^{j}_{X_j,(b,c)}$. Their ratio, $UV^{j}_{X_j,(a,c)}/UV^{j}_{X_j,(b,c)}$, is then used to categorize ex[ports as to whether they satisfy one of the following inequalities:

$$1-\alpha \le \frac{UV^{j}_{X_j,(a,c)}}{UV^{j}_{X_j,(b,c)}} \le 1+\alpha \qquad (3.a)$$

$$\frac{UV^{j}_{X_j,(a,c)}}{UV^{j}_{X_j,(b,c)}} > 1+\alpha \qquad (3.b)$$

$$\frac{UV^{j}_{X_j,(a,c)}}{UV^{j}_{X_j,(b,c)}} < 1-\alpha \qquad (3.c)$$

The coefficient α is normally positioned between 0.15 and 0.25. In our case, we selected a relatively higher coefficient that is equal to 0.25, due to the high degree of heterogeneity of the economies under consideration.

Antimiani and Henke consider only the category given by (3.a), arguing that products with similar prices also have similar qualities. We extend their approach by considering *all* the categories given in (3). That is, the index we use measures the degree of similarity between the export products of Turkey and its competitors in terms of a price decomposition that involves competing products with (i) prices

lower than Turkey's price, (ii) prices similar to Turkey's price and (iii) prices higher than Turkey's price.

Although the two are formally the same, we shall call our index PRSI to distinguish it from the QSI and express it as

$$PRSI_{iq} = \left(\frac{\sum_{j=1}^{n_{iq}} (X_{j(a,c)} + X_{j(b,c)}) - \sum_{j=1}^{n_{iq}} | X_{j(a,c)} - X_{j(b,c)} |}{\sum_{j=1}^{n_i} (X_{j(a,c)} + X_{j(b,c)})} \right) \quad (3)$$

where *i* indicates a 3-digit sector, n_i all 5-digit sectors in a 3-digit sector "j" indicates 5-digit sectors and and n_{iq} the 5-digit sectors in a 3-digit sector that fall into a price category indicated by *q* as given by the three expressions given in (3). We call the conditions that yield these categories "medium price-similarity (PRSI-M)" (3.a), "higher-price-similarity (PRSI-H)" (3.b) and "lower-price similarity (PRSI-L)" (3.c), respectively.

Using values as indicators of quality is a quite common practice in the literature (e.g., Stiglitz, 1987; Abd-el-Rahman, 1991; Aiginger, 1997; Bojnec and Ferto, 2007; Caetano and Galego, 2007).[8] Thus, higher prices are taken as indicators of higher qualities of the product varieties and vice versa. We rely on this idea in interpreting the results that we obtain from the PRSI. Nevertheless, we are aware that price differences can also arise from non-quality factors, such as higher cost-efficiency (due to, for example, very low wages), as stated by Schott (2006). Therefore, in interpreting the PRSI in terms of quality, we also keep such non-quality factors in mind.

[8] Kandogan (2006: 225), with reference to Aiginger (1998), explains the rationale behind using unit-prices as an indicator of quality as follows: "First, if the products are similar, the prices that consumers are willing to pay must reflect differences in the consumers' perception of the quality of the products. Second, higher quality products embody a greater proportion of factors that do not make a corresponding contribution to the weight of the product, such as human capital and better technology".

2.4 Empirical Results

2.4.1 Results from the ESI

We utilize the ESI for overall products, for manufacturing products and for each technological category, separately. Our calculations are based on Equation (1) above.

There is no clear-cut criterion as to whether the computed ESI is high or low. Hence, in order to interpret the index more accurately, we first examine the similarity of each country's exports with one another in the EU-15 market. That is to say, we first analyze the bilateral similarities in exports in the EU-15 market. Table 2.1 presents the results for overall industries for the full-period. Highlighted numbers in the table indicate the highest 10 values for the ESI.

Table 2.1 ESI for overall products, 1996-2007

	TR	BG	HR	CZ	HU	PL	RO	SK	SI	IL	MA	TN	CN	IN	ID	JP	CH	NO	CA	US	KR	RU	BR	MX
TURKEY	-																							
BULGARIA	0.31	-																						
CROATIA	0.24	0.30	-																					
CZECHR	0.29	0.22	0.24	-																				
HUNGARY	0.26	0.22	0.24	0.44	-																			
POLAND	0.35	0.28	0.29	0.50	0.42	-																		
ROMANIA	0.32	0.42	0.37	0.30	0.29	0.37	-																	
SLOVAKIA	0.27	0.25	0.25	0.43	0.36	0.41	0.34	-																
SLOVENIA	0.27	0.22	0.27	0.45	0.36	0.41	0.28	0.42	-															
ISRAEL	0.10	0.10	0.11	0.14	0.15	0.12	0.10	0.10	0.12	-														
MOROCCO	0.28	0.29	0.22	0.10	0.13	0.14	0.32	0.12	0.10	0.09	-													
TUNISIA	0.27	0.27	0.24	0.15	0.17	0.17	0.34	0.15	0.14	0.09	0.42	-												
CHINA	0.21	0.21	0.20	0.28	0.31	0.26	0.25	0.22	0.20	0.15	0.13	0.15	-											
INDIA	0.29	0.25	0.20	0.19	0.18	0.21	0.27	0.18	0.18	0.20	0.23	0.23	0.24	-										
INDONESIA	0.19	0.20	0.17	0.15	0.16	0.18	0.25	0.16	0.13	0.07	0.18	0.17	0.23	0.21	-									
JAPAN	0.17	0.09	0.11	0.33	0.32	0.25	0.13	0.33	0.31	0.14	0.04	0.07	0.28	0.14	0.12	-								
SWITZERLAND	0.15	0.16	0.18	0.30	0.22	0.22	0.17	0.18	0.26	0.21	0.07	0.09	0.22	0.19	0.09	0.25	-							
NORWAY	0.08	0.07	0.05	0.11	0.10	0.12	0.09	0.10	0.12	0.06	0.05	0.15	0.09	0.07	0.05	0.08	0.12	-						
CANADA	0.10	0.11	0.11	0.19	0.17	0.17	0.13	0.15	0.14	0.15	0.07	0.07	0.15	0.12	0.10	0.19	0.20	0.13	-					
USA	0.15	0.12	0.13	0.28	0.26	0.23	0.14	0.19	0.21	0.22	0.06	0.08	0.23	0.19	0.10	0.39	0.37	0.12	0.36	-				
KOREA	0.21	0.10	0.16	0.27	0.31	0.23	0.14	0.30	0.28	0.09	0.06	0.07	0.31	0.13	0.14	0.47	0.14	0.1	0.13	0.24	-			
RUSSIA	0.06	0.09	0.10	0.10	0.06	0.11	0.09	0.09	0.08	0.05	0.03	0.13	0.06	0.06	0.05	0.04	0.07	0.22	0.14	0.07	0.04	-		
BRAZIL	0.12	0.12	0.11	0.15	0.15	0.17	0.14	0.15	0.14	0.06	0.07	0.08	0.10	0.15	0.13	0.12	0.10	0.10	0.20	0.15	0.09	0.11	-	
MEXICO	0.15	0.10	0.10	0.25	0.25	0.20	0.12	0.23	0.22	0.10	0.07	0.18	0.16	0.13	0.08	0.29	0.14	0.31	0.15	0.24	0.24	0.10	0.15	-

Countries that are most similar to each other are the Czech Republic and Poland (0.50), Korea and Japan (0.47), Slovenia and the Czech Republic (0.45), Hungary and Czech Republic (0.44), Slovakia and Czech Republic (0.43), Hungary and Poland (0.42), Slovakia and Slovenia (0.42), Morocco and Tunisia (0.42), Slovakia and Poland (0.41), Slovenia and Poland (0.41). It is clear that the similarities among CEECs themselves are quite high. This is also valid for MENA countries as well as the developed countries.

As can be seen in the matrix above, the highest similarity coefficient is 0.50 across countries. Hence, in interpreting the highness/lowness of Turkey's similarity to its competitors, it should be kept in mind that any coefficient between 0.40 and 0.50 represents quite a high degree of similarity.

Table 2.2 ESI between Turkey and its competitors

	Overall		Manufacturing	
	F-P	L-P	F-P	L-P
POLAND	0.34	0.37	0.37	0.41
ROMANIA	0.32	0.34	0.35	0.36
BULGARIA	0.31	0.32	0.32	0.34
MOROCCO	0.29	0.27	0.33	0.30
INDIA	0.29	0.29	0.31	0.31
CZECHR	0.28	0.33	0.30	0.35
TUNISIA	0.27	0.26	0.31	0.30
SLOVENIA	0.27	0.30	0.29	0.32
SLOVAKIA	0.26	0.32	0.28	0.34
LITHUANIA	0.26	0.24	0.31	0.29
HUNGARY	0.26	0.27	0.27	0.28
CROATIA	0.24	0.23	0.27	0.26
KOREA	0.21	0.24	0.22	0.26
CHINA	0.20	0.22	0.21	0.23
INDONESIA	0.19	0.18	0.24	0.25
LATVIA	0.18	0.18	0.26	0.25
ESTONIA	0.17	0.16	0.20	0.17
JAPAN	0.17	0.22	0.17	0.23
MEXICO	0.15	0.19	0.18	0.22
USA	0.15	0.17	0.15	0.17
SWITZERLAND	0.14	0.16	0.15	0.16
BRAZIL	0.12	0.14	0.19	0.23
ISRAEL	0.10	0.09	0.09	0.08
CANADA	0.10	0.11	0.11	0.11
NORWAY	0.08	0.07	0.14	0.16
RUSSIA	0.06	0.05	0.11	0.10

We evaluate Turkey's export similarity with its competitors in detail in Table 2.2 above. This table presents the results for the ESI for Turkey for overall industries and for the manufacturing industry in the full period (F-P: 1996-2007) and the last period (L-P: 2004-2007). The ranking in the table is according to the ESI for overall industries in the full period.

Table 2.2 shows that, in overall, countries that are most similar to Turkey are such CEECs as Poland, Romania, Bulgaria, the Czech Republic, Slovenia and Slovakia, such MENA countries as Tunisia and Morocco, as well as India. Export similarity between Turkey and most of the CEECs has increased in the last period. Also, ESI for the manufacturing industry is higher than the ESI for overall products for all competitors of Turkey, except Israel. On the other hand, although it has increased in the last period, export similarity is relatively lower between Turkey and the developed countries, such as Canada, Norway, Switzerland, and the US, as compared to other competitors of Turkey. The increase in the ESI in the last period (as compared to the full period) is highest for Slovakia, the Czech Republic and Japan in overall products; and for Slovakia, the Czech Republic and Poland in the manufacturing industry.

Table 2.3 below presents the ESI results according to technological categories. The ordering of countries is alphabetical. Highlighted numbers show the highest three values of ESI for each category.

The table indicates that Turkey's highest export similarities with its competitors are concentrated in the CIG and LIG categories. In general, the most similar countries to Turkey are from the CEEC and MENA.

The table also demonstrates that the countries that are most similar to Turkey are: China, Morocco and Hungary in RMIG; Morocco, Bulgaria and Romania in LIG; the Czech Republic, Poland and Hungary in CIG; Poland, Lithuania and Slovakia in EIRG; and Slovenia, Poland and the Czech Republic in DIRG.

When the full period and the last period are compared, we don't observe any significant change in the RMIG category. For the LIG category, in the last period, there is a decrease in the degree of similarity with respect to some CEECs, such as Hungary, Lithuania, Poland, Slovakia and Slovenia. On the other hand, an increase is observed for the similarity with respect to Bulgaria and Romania. For the CIG

category, in the last period, there is a general increase in the degree of similarity with respect to most countries, except India and Indonesia. In contrast to the LIG category, we observe an increase in the CIG category in the last period for most of the CEECs, such as Poland, Hungary, the Czech Republic, Latvia, Lithuania, Slovakia, Slovenia and Romania. In the CIG category, the highest increase in the degree of similarity is with the developed countries like the US and Japan, as well as with Poland and Slovenia from CEE. For the EIRG and DIRG categories, in the last period, there is a slight increase in similarity with respect to most countries.

Table 2.3 ESI for Turkey in terms of technological categories

	RMIG		LIG		CIG		EIRG		DIRG	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
BRAZIL	0.04	0.05	0.12	0.14	0.27	0.33	0.09	0.10	0.30	0.33
BULGARIA	0.14	0.15	0.47	0.49	0.17	0.16	0.11	0.15	0.25	0.32
CANADA	0.07	0.09	0.10	0.11	0.25	0.27	0.09	0.09	0.18	0.20
CHINA	0.18	0.16	0.28	0.32	0.23	0.25	0.09	0.09	0.27	0.32
CROATIA	0.10	0.09	0.37	0.36	0.20	0.19	0.08	0.10	0.24	0.30
CZECHR	0.09	0.10	0.24	0.25	0.54	0.58	0.20	0.23	0.30	0.32
ESTONIA	0.05	0.05	0.26	0.22	0.30	0.27	0.05	0.07	0.23	0.21
HUNGARY	0.15	0.12	0.31	0.27	0.49	0.52	0.17	0.24	0.27	0.26
INDIA	0.10	0.11	0.35	0.37	0.39	0.34	0.12	0.14	0.28	0.31
INDONESIA	0.04	0.04	0.30	0.32	0.23	0.16	0.09	0.10	0.16	0.20
ISRAEL	0.12	0.12	0.12	0.10	0.10	0.09	0.10	0.13	0.12	0.13
JAPAN	0.07	0.08	0.09	0.11	0.38	0.46	0.13	0.13	0.21	0.22
KOREA	0.06	0.07	0.26	0.22	0.40	0.46	0.12	0.10	0.21	0.28
LATVIA	0.02	0.03	0.30	0.29	0.20	0.26	0.08	0.13	0.13	0.18
LITHUANIA	0.05	0.05	0.39	0.35	0.26	0.29	0.39	0.49	0.20	0.20
MEXICO	0.06	0.06	0.18	0.20	0.34	0.41	0.08	0.08	0.20	0.22
MOROCCO	0.17	0.17	0.48	0.48	0.21	0.21	0.04	0.06	0.15	0.13
NORWAY	0.03	0.02	0.12	0.13	0.16	0.14	0.12	0.12	0.27	0.30
POLAND	0.14	0.14	0.29	0.26	0.55	0.62	0.51	0.56	0.34	0.39
ROMANIA	0.11	0.11	0.40	0.42	0.31	0.34	0.19	0.28	0.27	0.30
RUSSIA	0.02	0.01	0.13	0.09	0.15	0.13	0.06	0.04	0.20	0.24
SLOVAKIA	0.09	0.10	0.27	0.25	0.43	0.47	0.29	0.34	0.27	0.30
SLOVENIA	0.07	0.08	0.23	0.20	0.48	0.55	0.21	0.14	0.35	0.34
SWITZERLAND	0.09	0.11	0.18	0.20	0.26	0.24	0.10	0.10	0.21	0.22
TUNISIA	0.08	0.07	0.39	0.41	0.21	0.22	0.05	0.07	0.22	0.17
USA	0.13	0.14	0.14	0.14	0.41	0.49	0.12	0.11	0.23	0.23

2.4.2 Results from the PSI

In the previous part, we computed the ESI and reported the results at country level and for each technological category. As mentioned earlier, the ESI is not affected by the relative sizes of the exports. In this part, we employ another similarity index, which is based on absolute export values. First, we compute PSI_i for 3-digit sectors from the 5-digit data. Then, we calculate the PSI for the country as a whole. Finally, we also compute the PSI for each technological category. Our calculations are based on Equation (2) above.

Table 2.4 below presents the values of the PSI for overall products and for the manufacturing industry, separately. The ranking is according to the PSI-values for overall products in the full period (1996-2007)

Table 2.4 PSI for Turkey with Individual Countries

	Overall		Manufacturing	
	F-P	L-P	F-P	L-P
POLAND	0.33	0.35	0.37	0.39
ROMANIA	0.29	0.30	0.32	0.33
INDIA	0.27	0.27	0.30	0.29
CZECHR	0.27	0.31	0.29	0.33
SLOVAKIA	0.26	0.33	0.28	0.36
HUNGARY	0.26	0.27	0.27	0.29
SLOVENIA	0.23	0.24	0.26	0.26
MOROCCO	0.22	0.18	0.23	0.18
KOREA	0.21	0.24	0.22	0.25
TUNISIA	0.20	0.16	0.22	0.17
CHINA	0.19	0.19	0.19	0.19
BULGARIA	0.16	0.17	0.16	0.18
INDONESIA	0.14	0.12	0.17	0.13
SWITZERLAND	0.12	0.14	0.13	0.15
CROATIA	0.12	0.11	0.13	0.12
MEXICO	0.12	0.13	0.13	0.14
JAPAN	0.12	0.17	0.12	0.18
BRAZIL	0.11	0.13	0.15	0.17
CANADA	0.10	0.10	0.10	0.11
LITHUANIA	0.09	0.09	0.10	0.10
ISRAEL	0.09	0.08	0.09	0.07
USA	0.08	0.11	0.08	0.12
ESTONIA	0.08	0.08	0.08	0.08
NORWAY	0.07	0.07	0.14	0.15
RUSSIA	0.06	0.05	0.11	0.10
LATVIA	0.05	0.05	0.05	0.05

According to Table 2.4, countries that are most similar to Turkey are Poland, Romania, India, the Czech Republic, Slovakia, Hungary and Morocco. The table also shows that Turkey's export similarity with most of the countries is higher for the manufacturing industry than for overall products. Moreover, Turkey's export similarity with most of the CEECs has increased in the last period, while it has decreased with Morocco, Tunisia and Israel in overall products and in the manufacturing industry. These changes are more prominent for the manufacturing industry. On the other hand, although Turkey's export similarity with developed countries, such as Switzerland, Japan, Norway and the US, is relatively lower during the full period; it has increased in the last period for both the overall products and the manufacturing industry. The increase in the PSI in the last period (as compared to the full period) is highest for Slovakia, Japan and the Czech Republic in both overall products and the manufacturing industry. On the other hand, the decrease in the PSI in the last period is highest for India, Morocco and Tunisia. Although the magnitudes of values and ranking of the countries are sometimes different from those of ESI, countries that are most similar to Turkey are more or less same according to both PSI and ESI. The highest differences between the magnitudes of ESI and PSI are for Latvia (0.13 for total and 0.21 for manufacturing), Lithuania (0.17 for total and 0.21 for manufacturing), Bulgaria (0.15 for total and 0.16 for manufacturing) and Croatia (0.12 for total and 0.14 for manufacturing). For those countries which PSI values are smaller than the ESI values, we can say that the magnitudes of the flows matter.

Table 2.5 below presents the PSI-results according to the technological classification. The ordering of countries is alphabetical. Highlighted numbers show the highest three values of the PSI for each category.

According to Table 2.5, in RMIG, China has the highest export similarity with Turkey. Morocco and Hungary follows China in this category. In LIG, Romania, India and Morocco; and in CIG, Poland, Hungary and the Czech Republic are the countries that have the highest export similarity with Turkey. Poland's PSI-value is much higher than that of other countries. In EIRG, Poland, Slovakia and the Czech Republic; and in DIRG, Slovenia, Brazil and Poland have the highest export similarity with Turkey.

Table 2.5 PSI for Turkey in terms of technological categories

	RMIG		LIG		CIG		EIRG		DIRG	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
BRAZIL	0.03	0.04	0.07	0.08	0.23	0.23	0.09	0.09	0.29	0.32
BULGARIA	0.09	0.10	0.19	0.24	0.14	0.10	0.06	0.06	0.17	0.21
CANADA	0.06	0.09	0.06	0.07	0.15	0.10	0.08	0.09	0.17	0.20
CHINA	0.18	0.16	0.26	0.28	0.22	0.25	0.05	0.06	0.18	0.21
CROATIA	0.06	0.06	0.14	0.13	0.07	0.05	0.05	0.04	0.21	0.27
CZECHR	0.09	0.10	0.23	0.24	0.46	0.52	0.23	0.28	0.21	0.22
ESTONIA	0.04	0.03	0.09	0.09	0.05	0.05	0.04	0.05	0.14	0.15
HUNGARY	0.14	0.12	0.24	0.22	0.47	0.49	0.20	0.29	0.20	0.19
INDIA	0.09	0.10	0.35	0.36	0.24	0.20	0.12	0.15	0.24	0.28
INDONESIA	0.04	0.04	0.21	0.19	0.12	0.07	0.08	0.08	0.10	0.10
ISRAEL	0.12	0.13	0.09	0.07	0.05	0.03	0.09	0.13	0.12	0.13
JAPAN	0.05	0.05	0.09	0.10	0.21	0.33	0.09	0.11	0.08	0.12
KOREA	0.04	0.03	0.19	0.14	0.37	0.46	0.13	0.11	0.18	0.25
LATVIA	0.02	0.02	0.06	0.06	0.04	0.05	0.01	0.02	0.03	0.04
LITHUANIA	0.04	0.04	0.13	0.13	0.03	0.03	0.08	0.11	0.10	0.11
MEXICO	0.06	0.06	0.05	0.04	0.28	0.26	0.08	0.08	0.19	0.18
MOROCCO	0.17	0.18	0.34	0.32	0.05	0.03	0.02	0.03	0.15	0.11
NORWAY	0.02	0.01	0.10	0.10	0.16	0.13	0.11	0.13	0.25	0.30
POLAND	0.12	0.12	0.29	0.26	0.51	0.57	0.53	0.52	0.29	0.31
ROMANIA	0.07	0.08	0.37	0.39	0.26	0.27	0.12	0.15	0.26	0.30
RUSSIA	0.01	0.01	0.07	0.05	0.14	0.13	0.06	0.04	0.17	0.16
SLOVAKIA	0.06	0.07	0.19	0.21	0.43	0.50	0.25	0.46	0.27	0.30
SLOVENIA	0.04	0.04	0.16	0.14	0.42	0.40	0.13	0.11	0.35	0.34
SWITZERLAN	0.09	0.11	0.18	0.20	0.24	0.24	0.03	0.03	0.10	0.13
TUNISIA	0.08	0.06	0.30	0.27	0.06	0.06	0.03	0.03	0.21	0.15
USA	0.11	0.12	0.13	0.13	0.24	0.37	0.02	0.03	0.05	0.07

Like in the case of ESI, PSI-results do not exhibit a considerable difference between the full period and the last period in the RMIG category (Table 2.5 above). In LIG; there is an increase in the PSI in the last period, mainly, for Bulgaria, Romania and Slovakia, while there is a decrease for Hungary, Poland and Slovenia. On the other hand, the changes in the CIG category seem to be quite interesting. In this category, in the last period, the highest increases in similarity belong to such developed countries as the US, Korea, and Japan; as well as to such CEECs as Poland and the Czech Republic that have had a high export performance in the EU-15 market in recent years. In contrast, India, Bulgaria and Indonesia are the countries

with the highest decrease in the PSI in the last period in the CIG category. In EIRG, there is not a remarkable change in the last-period, except for Slovakia and Hungary for which the PSI has increased considerably in the last-period.

Finally, it is a good idea to check the degree of consistency between the results from the ESI and the PSI. In this respect, computing correlations between these two indexes can be useful and informative. Thus, we also present Spearman's rank correlations between the ESI and the PSI in Table 2.6 below. The reported correlation coefficients are all statistically significant at the 5 % level and they range from a minimum of 0.76 (for EIRG) to a maximum of 0.94 (for RMIG), as can be seen in Table-6 below. For overall products, the correlation coefficient is 0.83. These correlation coefficients are generally high enough to safely argue that our results from the ESI and the PSI are consistent with each other to a large extent.

Table 2.6 Spearman's rank correlation between ESI and PSI

	Spearman rank correlation between ESI and PSI
Overall	**0.8336**
RMIG	**0.9482**
LIG	**0.7815**
CIG	**0.8045**
EIRG	**0.7605**
DIRG	**0.7876**

2.4.3 Results from the PRSI

Now, we calculate the Price Similarity Index (PRSI) for three possible cases indicated in conditions (3.a), (3.b) and (3.c) above. In fact, these cases for the PRSI are decompositions of the PSI according to the prices measured via unit-values (UVs) of the products. The first one, which we call the Medium-Price Similarity Index (PRSI-M), covers Turkey's and its competitors' export products within the same range of prices. In other words, it considers the products for which the UV of Turkish products relative to that of other countries lie between 0.75 and 1.25, as given in condition (3.a). The second one, which we call the Higher-Price Similarity

Index (PRSI-H), covers the products for which the price of Turkish exports is higher than that of its competitors. In other words, it considers the products for which the UV of Turkish exports relative to that of other countries is higher than 1.25, as given in condition (3.b). The last one, which we call the Lower-Price Similarity Index (PRSI-L), covers the products for which condition (3.c) holds. In other words, it considers the products for which the relative UV of Turkish exports is lower than 0.75.

To obtain the PRSI, we first calculate the UVs. UN-comtrade database provides quantity information in terms of "kg", "number", "liters", etc. For example, Turkey reports its exports in terms of weight (e.g., in kilograms) for certain products, while some other countries report their exports of the same products in terms of number of units. Therefore, uniform calculations of relative UVs are not always possible for certain export goods. Hence, we had to exclude such goods. However, this exclusion doesn't create an important problem since those certain export goods have actually a very small weight in total products.

We calculate the UV of a product exported from a country by dividing the 'value of exports' by the 'quantity of exports'. We repeat this procedure for each product exported from each country. Then, we obtain a UV-ratio between 'country a' (say, Turkey) and 'country b' (say, any competitor of Turkey in the EU-15 market) for each 5-digit product, as given in conditions (3.a), (3.b) and (3. c), and, we select the products for which these three conditions hold for $\alpha = 0.25$. Finally, we calculate the PRSI for each condition and analyze the 'price-similarity' of Turkish exports with respect to the exports of its competitors in the EU-15 market, based on these unit-value differentials.

Table 2.7 below summarizes the results of the decomposition of PSI into its PRSI-components for overall products and the manufacturing industry, separately. Ranking is according to the PSI for the full period (1996-2007). Highlighted numbers show the maximum values among PRSI-medium, PRSI-high and PRSI-low in the full period.

Table 2.7 Decomposition of PSI into its PRSI-components

	Overall								Manufacturing							
	PSI		PRSI-Medium		PRSI-High		PRSI-Low		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
POLAND	0.33	0.35	0.20	0.20	0.05	0.03	0.08	0.12	0.37	0.39	0.22	0.23	0.05	0.03	0.09	0.13
ROMANIA	0.29	0.30	0.15	0.17	0.08	0.05	0.06	0.08	0.32	0.33	0.16	0.18	0.09	0.06	0.07	0.09
INDIA	0.27	0.27	0.07	0.09	0.14	0.12	0.07	0.05	0.30	0.29	0.07	0.10	0.15	0.10	0.08	0.08
CZECHR	0.27	0.31	0.13	0.13	0.04	0.03	0.09	0.15	0.29	0.33	0.15	0.14	0.04	0.03	0.10	0.16
SLOVAKIA	0.26	0.33	0.13	0.17	0.03	0.03	0.09	0.13	0.28	0.36	0.15	0.19	0.04	0.03	0.10	0.14
HUNGARY	0.26	0.27	0.10	0.11	0.03	0.02	0.13	0.14	0.27	0.29	0.10	0.11	0.02	0.02	0.14	0.16
SLOVENIA	0.23	0.24	0.11	0.13	0.02	0.02	0.09	0.08	0.26	0.26	0.13	0.14	0.03	0.02	0.10	0.09
MOROCCO	0.22	0.18	0.13	0.10	0.04	0.04	0.05	0.04	0.23	0.18	0.14	0.10	0.04	0.04	0.05	0.04
KOREA	0.21	0.24	0.08	0.09	0.05	0.07	0.08	0.08	0.22	0.25	0.09	0.10	0.05	0.07	0.08	0.08
TUNISIA	0.20	0.16	0.12	0.07	0.02	0.01	0.06	0.08	0.23	0.17	0.14	0.11	0.02	0.01	0.07	0.09
CHINA	0.19	0.19	0.04	0.06	0.10	0.08	0.05	0.05	0.19	0.19	0.05	0.09	0.10	0.06	0.04	0.05
BULGARIA	0.16	0.17	0.06	0.08	0.07	0.06	0.02	0.03	0.16	0.18	0.06	0.09	0.08	0.06	0.02	0.03
INDONESIA	0.14	0.12	0.05	0.03	0.08	0.07	0.02	0.02	0.17	0.13	0.06	0.03	0.09	0.09	0.02	0.01
SWITZERLAND	0.12	0.14	0.01	0.01	0.01	0.01	0.10	0.12	0.13	0.15	0.01	0.01	0.01	0.01	0.11	0.12
CROATIA	0.12	0.11	0.03	0.04	0.03	0.03	0.06	0.05	0.13	0.12	0.04	0.04	0.03	0.03	0.07	0.05
MEXICO	0.12	0.13	0.05	0.08	0.03	0.01	0.05	0.03	0.13	0.14	0.05	0.09	0.03	0.01	0.05	0.04
JAPAN	0.12	0.17	0.02	0.04	0.01	0.03	0.09	0.10	0.12	0.18	0.02	0.04	0.01	0.03	0.09	0.11
BRAZIL	0.11	0.13	0.05	0.05	0.03	0.04	0.03	0.04	0.15	0.17	0.07	0.07	0.04	0.06	0.05	0.05
CANADA	0.10	0.10	0.02	0.03	0.01	0.01	0.07	0.06	0.10	0.11	0.02	0.03	0.01	0.01	0.08	0.06
LITHUANIA	0.09	0.09	0.05	0.05	0.03	0.02	0.02	0.02	0.10	0.10	0.05	0.05	0.03	0.02	0.02	0.02
ISRAEL	0.09	0.08	0.01	0.02	0.00	0.01	0.08	0.05	0.09	0.07	0.01	0.02	0.00	0.01	0.07	0.04
USA	0.08	0.11	0.02	0.04	0.01	0.01	0.06	0.06	0.08	0.12	0.02	0.04	0.01	0.01	0.06	0.07
ESTONIA	0.08	0.08	0.04	0.03	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.03	0.01	0.01	0.03	0.04
NORWAY	0.07	0.07	0.02	0.02	0.01	0.01	0.04	0.04	0.14	0.15	0.04	0.04	0.02	0.02	0.09	0.09
RUSSIA	0.06	0.05	0.03	0.02	0.02	0.02	0.01	0.02	0.11	0.10	0.04	0.03	0.04	0.03	0.02	0.04
LATVIA	0.05	0.05	0.02	0.02	0.01	0.01	0.01	0.02	0.05	0.05	0.02	0.02	0.02	0.01	0.01	0.02

According to the table, in overall products, PRSI-Medium is the highest among the three ranges (i.e., among PRSI-Medium, PRSI-High and PRSI-Low) for most of the countries from CEE such as Poland, Romania, the Czech Republic, Slovakia and Slovenia as well as for countries like Morocco, Tunisia and Korea. That is to say, competition between Turkish exports and the exports of these countries are concentrated on goods whose prices lie within the same range. The results for the manufacturing industry indicate a similar picture, although the values for manufacturing are higher than the values for overall products. Based on the assumption that price is an indicator of quality, we can conclude that export similarity between Turkey and these countries are mainly due to products that have similar qualities.

On the other hand, PRSI-High is the highest for China, India, Indonesia and Bulgaria. In other words, Turkey is similar to those countries in the products for which Turkish exports have higher prices. With this result, we can conclude that, among all countries that have similar export patterns with Turkey, Turkish exports are of higher quality than only the exports of China, India and Indonesia and Bulgaria.

In contrast, PRSI-Low is the highest for Switzerland, US, Japan, Canada and Norway, implying that Turkey's similarity with developed countries is concentrated on the products for which Turkish exports have lower prices. Obviously, the higher quality of the exports of developed countries is one of the main explanations for this result.

Table 2.7 shows that, in the last period (2004-2007) for both the overall products and the manufacturing industry, there is a significant increase in the value of PRSI-Low between Turkey and such CEECs as the Czech Republic, Slovakia and Poland. That is to say, the similarity of goods, for which Turkey's prices are lower than the prices of these countries, has increased in the post-2004 period; i.e., after the first expansion in the EU. In this connection, we can conclude that there may be some factors other than price, which have started to determine the degree of competition between Turkey and these CEECs after 2004. An increase in the quality of their goods associated with their joining the EU in 2004 is a possible explanation for the result that their export similarity with respect to Turkey has increased in spite of their rising export prices. Another explanation, which is complementary to the first one, can also go as follows: Turkish exporters might have found no alternative but to decrease their prices relatively in order to be able to maintain their competition with these countries after 2004. As such, Turkish exporters might have responded more dominantly by price cuts (rather than quality improvements) to the increasing quality of the products of its competitors. In other words, Turkey might have inevitably preferred price competition to quality competition. Another reasonable explanation can be related to the rise of demand by the EU-15 countries for the products of these countries following their entrance in the EU. Again in this case, Turkish exporters might have inevitably reduced their prices for sustaining their

competitiveness, once the EU-15 countries switched their expenditures towards the products of these newly-admitted countries.

Tables 2.8.a-e below present the PRSI results according to the technological classification. Ranking is according to the PSI in the full period (1996-2010). Highlighted numbers in the table show the maximum values among PRSI-medium, PRSI-high and PRSI-low for the countries with the highest PSI in each category for the full period.

Table 2.8.a-e Decomposition of PSI into its PRSI components for each category

Table 2.8.a RMIG

RMIG	PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
CHINA	0.18	0.16	0.04	0.05	0.11	0.10	0.03	0.01
MOROCCO	0.17	0.18	0.08	0.09	0.04	0.06	0.04	0.03
HUNGARY	0.14	0.12	0.06	0.05	0.05	0.03	0.03	0.04
ISRAEL	0.12	0.13	0.01	0.03	0.01	0.03	0.10	0.07
POLAND	0.12	0.12	0.05	0.05	0.04	0.05	0.03	0.03
USA	0.11	0.12	0.03	0.03	0.03	0.04	0.05	0.04
INDIA	0.09	0.10	0.03	0.03	0.05	0.06	0.02	0.02
BULGARIA	0.09	0.10	0.03	0.04	0.04	0.03	0.02	0.04
SWITZERLAND	0.09	0.11	0.02	0.02	0.02	0.04	0.04	0.05
CZECHR	0.09	0.10	0.02	0.03	0.04	0.04	0.03	0.03
TUNISIA	0.08	0.06	0.05	0.03	0.01	0.01	0.03	0.03
ROMANIA	0.07	0.08	0.03	0.04	0.03	0.02	0.02	0.02
CANADA	0.06	0.09	0.02	0.03	0.01	0.02	0.03	0.05
MEXICO	0.06	0.06	0.03	0.03	0.01	0.01	0.02	0.02
SLOVAKIA	0.06	0.07	0.02	0.02	0.02	0.01	0.02	0.03
CROATIA	0.06	0.06	0.02	0.01	0.03	0.04	0.01	0.01
JAPAN	0.05	0.05	0.00	0.00	0.01	0.01	0.04	0.03
INDONESIA	0.04	0.04	0.01	0.01	0.01	0.01	0.02	0.02
LITHUANIA	0.04	0.04	0.02	0.02	0.02	0.01	0.01	0.01
KOREA	0.04	0.03	0.02	0.00	0.01	0.02	0.01	0.01
ESTONIA	0.04	0.03	0.01	0.01	0.02	0.01	0.01	0.01
SLOVENIA	0.04	0.04	0.02	0.02	0.01	0.01	0.01	0.01
BRAZIL	0.03	0.04	0.01	0.01	0.01	0.01	0.01	0.01
LATVIA	0.02	0.02	0.01	0.01	0.01	0.00	0.00	0.00
NORWAY	0.02	0.01	0.01	0.00	0.00	0.00	0.01	0.00
RUSSIA	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00

Table 2.8.b LIG

LIG	PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
ROMANIA	0.37	0.39	0.21	0.26	0.10	0.06	0.06	0.07
INDIA	0.35	0.36	0.10	0.12	0.14	0.19	0.11	0.05
MOROCCO	0.34	0.32	0.23	0.20	0.06	0.06	0.05	0.05
TUNISIA	0.30	0.27	0.20	0.14	0.03	0.01	0.07	0.11
POLAND	0.29	0.26	0.18	0.14	0.03	0.03	0.08	0.10
CHINA	0.26	0.28	0.07	0.07	0.14	0.14	0.05	0.07
HUNGARY	0.24	0.22	0.08	0.06	0.02	0.02	0.14	0.14
CZECHR	0.23	0.24	0.10	0.09	0.04	0.03	0.09	0.12
INDONESIA	0.21	0.19	0.07	0.03	0.14	0.15	0.01	0.01
BULGARIA	0.19	0.24	0.07	0.11	0.11	0.11	0.02	0.03
KOREA	0.19	0.14	0.08	0.06	0.04	0.04	0.07	0.05
SLOVAKIA	0.19	0.21	0.09	0.08	0.03	0.03	0.06	0.10
SWITZERLAND	0.18	0.20	0.01	0.01	0.00	0.00	0.17	0.18
SLOVENIA	0.16	0.14	0.04	0.04	0.02	0.02	0.10	0.08
CROATIA	0.14	0.13	0.04	0.04	0.02	0.02	0.09	0.07
LITHUANIA	0.13	0.13	0.08	0.08	0.03	0.03	0.02	0.02
USA	0.13	0.13	0.02	0.03	0.01	0.01	0.09	0.09
NORWAY	0.10	0.10	0.02	0.03	0.01	0.01	0.07	0.07
ISRAEL	0.09	0.07	0.01	0.02	0.00	0.01	0.08	0.04
ESTONIA	0.09	0.09	0.04	0.04	0.01	0.02	0.04	0.04
JAPAN	0.09	0.10	0.01	0.01	0.00	0.00	0.08	0.09
BRAZIL	0.07	0.08	0.03	0.03	0.02	0.03	0.02	0.02
RUSSIA	0.07	0.05	0.02	0.01	0.03	0.03	0.02	0.02
CANADA	0.06	0.07	0.01	0.02	0.00	0.00	0.05	0.04
LATVIA	0.06	0.06	0.02	0.02	0.02	0.02	0.02	0.02
MEXICO	0.05	0.04	0.01	0.01	0.01	0.01	0.02	0.02

According to Table 2.8.a, in the RMIG category, among the countries with the highest PSI, PRSI-Medium is the highest for Morocco, Hungary and Poland (among PRSI-medium, PRSI-high and PRSI-low) in the full-period. For Asian countries such as China and India, PRSI-High is the highest; while for Israel and USA, PRSI-Low is

the highest in the full-period. There is no remarkable change in the value of the indexes between the full period and the last period.

Table 2.8.b shows the results for the LIG category in the same way. In this category, for Romania, Morocco, Tunisia, Poland, and the Czech Republic, PRSI-Medium is the highest in the full period. Moreover, for Romania, there is a remarkable increase in the value of the index in the last period. However, there is a decrease for the others. For China, India and Indonesia, PRSI-High is the highest. And for India, there is a considerable increase in the last period. For Hungary, PRSI-Low is the highest among others.

Table 2.8.c CIG

CIG	PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
POLAND	0.51	0.57	0.35	0.44	0.06	0.02	0.10	0.11
HUNGARY	0.47	0.49	0.21	0.28	0.01	0.01	0.25	0.20
CZECHR	0.46	0.52	0.32	0.29	0.04	0.03	0.11	0.20
SLOVAKIA	0.43	0.50	0.30	0.41	0.01	0.00	0.12	0.08
SLOVENIA	0.42	0.40	0.31	0.32	0.02	0.01	0.08	0.07
KOREA	0.37	0.46	0.17	0.23	0.11	0.16	0.08	0.07
MEXICO	0.28	0.26	0.13	0.23	0.05	0.00	0.11	0.03
ROMANIA	0.26	0.27	0.13	0.11	0.05	0.04	0.08	0.12
SWITZERLAND	0.24	0.24	0.01	0.02	0.02	0.03	0.21	0.20
USA	0.24	0.37	0.06	0.19	0.00	0.01	0.18	0.18
INDIA	0.24	0.20	0.09	0.07	0.06	0.05	0.08	0.08
BRAZIL	0.23	0.23	0.14	0.14	0.03	0.06	0.06	0.03
CHINA	0.22	0.25	0.11	0.17	0.06	0.06	0.05	0.01
JAPAN	0.21	0.33	0.04	0.12	0.02	0.05	0.14	0.16
NORWAY	0.16	0.13	0.06	0.07	0.01	0.01	0.09	0.05
CANADA	0.15	0.10	0.03	0.05	0.00	0.00	0.11	0.05
RUSSIA	0.14	0.13	0.06	0.05	0.06	0.03	0.02	0.04
BULGARIA	0.14	0.10	0.08	0.07	0.06	0.02	0.01	0.00
INDONESIA	0.12	0.07	0.06	0.05	0.04	0.02	0.02	0.00
CROATIA	0.07	0.05	0.04	0.03	0.01	0.01	0.02	0.01
TUNISIA	0.06	0.06	0.01	0.01	0.01	0.00	0.04	0.05
ESTONIA	0.05	0.05	0.02	0.02	0.01	0.01	0.02	0.02
ISRAEL	0.05	0.03	0.01	0.01	0.00	0.00	0.04	0.01
MOROCCO	0.05	0.03	0.02	0.02	0.01	0.00	0.02	0.01
LATVIA	0.04	0.05	0.03	0.04	0.01	0.00	0.01	0.01
LITHUANIA	0.03	0.03	0.02	0.02	0.00	0.00	0.01	0.01

Table 2.8.d EIRG

EIRG	PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
POLAND	0.53	0.52	0.39	0.23	0.04	0.04	0.10	0.26
SLOVAKIA	0.25	0.46	0.05	0.02	0.03	0.03	0.17	0.42
CZECHR	0.23	0.28	0.06	0.03	0.03	0.02	0.13	0.23
HUNGARY	0.20	0.29	0.08	0.05	0.01	0.01	0.11	0.22
SLOVENIA	0.13	0.11	0.07	0.06	0.03	0.02	0.03	0.03
KOREA	0.13	0.11	0.03	0.01	0.01	0.01	0.09	0.09
INDIA	0.12	0.15	0.02	0.04	0.06	0.07	0.04	0.03
ROMANIA	0.12	0.15	0.03	0.03	0.02	0.02	0.07	0.09
NORWAY	0.11	0.13	0.02	0.03	0.04	0.05	0.05	0.05
JAPAN	0.09	0.11	0.00	0.00	0.00	0.00	0.09	0.11
ISRAEL	0.09	0.13	0.02	0.05	0.01	0.03	0.06	0.05
BRAZIL	0.09	0.09	0.03	0.02	0.03	0.03	0.03	0.03
CANADA	0.08	0.09	0.01	0.01	0.02	0.03	0.06	0.04
MEXICO	0.08	0.08	0.02	0.02	0.03	0.02	0.04	0.04
INDONESIA	0.08	0.08	0.03	0.01	0.02	0.03	0.03	0.04
LITHUANIA	0.08	0.11	0.03	0.02	0.03	0.07	0.02	0.02
BULGARIA	0.06	0.06	0.03	0.03	0.01	0.01	0.02	0.02
RUSSIA	0.06	0.04	0.02	0.01	0.02	0.01	0.02	0.01
CHINA	0.05	0.06	0.00	0.00	0.01	0.01	0.04	0.05
CROATIA	0.05	0.04	0.01	0.01	0.02	0.01	0.02	0.02
ESTONIA	0.04	0.05	0.00	0.00	0.01	0.01	0.03	0.03
TUNISIA	0.03	0.03	0.00	0.00	0.01	0.01	0.01	0.02
SWITZERLAND	0.03	0.03	0.00	0.01	0.00	0.00	0.02	0.02
MOROCCO	0.02	0.03	0.00	0.01	0.01	0.02	0.01	0.01
USA	0.02	0.03	0.00	0.00	0.00	0.00	0.02	0.02
LATVIA	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.01

In the CIG category (Table 2.8.c), PRSI-Medium is the highest for most of the countries with the highest PSI, such as Poland, the Czech Republic, Slovakia, Slovenia, Korea, Mexico and Romania. Moreover, for Poland, Slovakia, Korea and Mexico, there is a significant increase in the value of the index in the last period. On the other hand, for Czech Republic, there is a decrease in the value of PRSI-Medium, and a remarkable increase in the value of PRSI-Low in the last period. For Hungary, Switzerland and USA, PRSI-Low is the highest among others in the full period. For

Hungary, while PRSI-Low decreased, PRSI-Medium increased in the last period. All in all, we can conclude that, in the CIG category, Turkey's competition with most of the countries has increased in the last period.

According to Table 2.8.c, the developments in the export similarities for the CIG category deserve further attention. When we look at the situation in terms of prices, we do observe that, for most countries, there is an increase in the similarity of products whose prices are in the same range. Indeed, the only exception to this observation is the considerable increase in the value of PRSI-low for the Czech Republic in the last period. In other words, in the last period, there is an increase in the similarity of products for which Turkey's price (and hence quality) is lower *only* in the case of its competition with the Czech Republic. Besides, in the case of Turkey's competition with Hungary; in the last period, similarity has concentrated on the goods for which prices of the two countries are in the same range; whereas in the full period, similarity has concentrated on the goods for which Turkey's price is lower. In other words, it is possible to say that Turkey has achieved quality-upgrade in its competition with Hungary. The same result is also valid for Turkey's competition with the US and Japan. For example, there is a prominent increase in Turkey's export similarity with Japan in the last period, and this similarity increase has resulted mainly from the increase in PRSI-Medium (rather than in PRSI-Low). At this point, two interpretations are possible: Either Turkey has achieved quality-upgrade in its competition with Japan in the recent years, or it has increased the relative sizes of its exports that are of similar quality with Japan's products. All in all, we can conclude that, in the CIG category, in the last period, Turkey has engaged in quality competition (rather than price competition) with most of its competitors in the EU-15 market.

In the EIRG category (Table 2.8.d), the value of PSI is much higher for Poland than for other countries, and this high PSI with Poland is mostly due to PRSI-Medium. However, in contrast to the CIG category, in the last period, there is a considerable decrease in PRSI-Medium in favor of PRSI-Low. For other CEECs with the highest PSIs, such as Slovakia, the Czech Republic, Hungary and Romania, PRSI-Low is the highest for the full-period, and there are prominent increases in this index in the last period. Although there is not any change in the last period; for

Korea, Norway and Japan, PRSI-Low is also the highest for the full-period. In other words, unlike in the CIG category, Turkey has engaged in price competition rather than quality competition in the EIRG category with most of the countries from CEE and the developed countries.

Table 2.8.e reports the results for the DIRG category. Somewhat similar to the EIRG category, PRSI-Low is the highest for Slovenia, Poland, Slovakia, Norway, the Czech Republic, Tunisia and Hungary in the DIRG category. Also, there is an increase in the value of this index for all of these countries, except Tunisia. Therefore, Turkey has relied on price competition (rather than quality competition) with these countries in the DIRG category. On the other hand, for India, PRSI-Medium is the highest; while for Brazil, Romania and Croatia, PRSI-High is the highest.

Table-2.8.e DIRG

DIRG	PSI		PRSI-Medium		PRSI-High		PRSI-Low	
	F-P	L-P	F-P	L-P	F-P	L-P	F-P	L-P
SLOVENIA	0.35	0.34	0.13	0.10	0.05	0.04	0.18	0.19
BRAZIL	0.29	0.32	0.08	0.09	0.11	0.12	0.10	0.11
POLAND	0.29	0.31	0.09	0.10	0.10	0.06	0.10	0.15
SLOVAKIA	0.27	0.30	0.09	0.10	0.08	0.06	0.10	0.14
ROMANIA	0.26	0.30	0.08	0.12	0.10	0.08	0.08	0.10
NORWAY	0.25	0.30	0.03	0.02	0.05	0.06	0.18	0.22
INDIA	0.24	0.28	0.13	0.12	0.07	0.10	0.05	0.07
CROATIA	0.21	0.27	0.04	0.06	0.09	0.10	0.08	0.11
CZECHR	0.21	0.22	0.07	0.08	0.06	0.05	0.08	0.10
TUNISIA	0.21	0.15	0.04	0.02	0.01	0.01	0.15	0.12
HUNGARY	0.20	0.19	0.06	0.06	0.04	0.03	0.10	0.10
MEXICO	0.19	0.18	0.04	0.04	0.06	0.04	0.08	0.10
KOREA	0.18	0.25	0.05	0.06	0.04	0.07	0.09	0.13
CHINA	0.18	0.21	0.03	0.06	0.09	0.08	0.05	0.07
RUSSIA	0.17	0.16	0.03	0.04	0.06	0.05	0.08	0.08
BULGARIA	0.17	0.21	0.05	0.09	0.06	0.04	0.06	0.07
CANADA	0.17	0.20	0.01	0.03	0.02	0.04	0.13	0.14
MOROCCO	0.15	0.11	0.01	0.01	0.01	0.02	0.12	0.09
ESTONIA	0.14	0.15	0.02	0.04	0.02	0.02	0.10	0.09
ISRAEL	0.12	0.13	0.01	0.02	0.01	0.02	0.10	0.09
INDONESIA	0.10	0.10	0.03	0.02	0.03	0.03	0.04	0.04
LITHUANIA	0.10	0.11	0.03	0.04	0.02	0.03	0.04	0.04
SWITZERLAND	0.10	0.13	0.01	0.02	0.01	0.01	0.07	0.10
JAPAN	0.08	0.12	0.01	0.01	0.02	0.04	0.06	0.08
USA	0.05	0.07	0.00	0.01	0.01	0.01	0.03	0.05
LATVIA	0.03	0.04	0.01	0.01	0.01	0.01	0.02	0.03

Finally, we calculate PSI and PRSIs at the 3-digit sector level, classified according to the technology levels. Tables 2.9.a-e show 3-digit sectors for countries with full-period PSI-averages that are greater than 0.50, according to technological categories. Other columns show the average of Medium-Price Similarity Index (PRSI-M), Higher-Price Similarity Index (PRSI-H) and Lower-Price Similarity Index (PRSI-L), respectively. Bold numbers show the highest value among PRSI-M, PRSI-H and PRSI-L in the full period, and italic numbers indicate the highest value in the last period.

Table 2.9.a RMIG, 3-digit sectors – Countries with average-PSIs exceeding 0.50

		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
Sectors	**Countries**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**
S3-017	**Morocco**	0.53	0.85	0.00	0.00	0.00	0.00	**0.53**	*0.85*
S3-024	**Slovenia**	0.57	0.20	0.18	0.00	**0.35**	*0.20*	0.03	0.00
S3-035	**Switzerland**	0.66	0.35	0.00	0.00	0.00	0.00	**0.66**	*0.35*
S3-059	**Hungary**	0.76	0.70	**0.46**	0.20	0.13	0.18	0.17	*0.32*
	China	0.52	0.50	0.20	0.09	**0.30**	*0.41*	0.02	0.01
S3-062	**Poland**	0.58	0.66	**0.47**	*0.33*	0.01	0.02	0.11	0.32
	China	0.60	0.73	**0.50**	*0.67*	0.05	0.05	0.05	0.00
S3-098	**Czech R**	0.54	0.49	0.16	*0.30*	**0.32**	0.16	0.05	0.03
S3-223	**Czech R**	0.59	0.66	**0.42**	*0.49*	0.17	0.17	0.00	0.00
	Hungary	0.77	0.74	0.23	0.24	0.11	*0.34*	**0.43**	0.16
	China	0.74	0.79	0.00	0.00	**0.74**	*0.79*	0.00	0.00

According to Table 2.9.a, in the RMIG category, Turkey has the highest export similarities with the Czech Republic, Hungary, Slovenia, China, Morocco and Switzerland in the sectors 017 (Meat And Edible Meat Offal, Prepared or Preserved N.E.S.), 024 (Cheese and Curd), 035 (Fish, dried, salted or in brine; smoked fish; flours, meals and pellets of fish, fit for human consumption), 059 (Fruit Juices and Vegetable Juices), 062 (Sugar Confectionery), 098 (Edible Products and Preparations, N.E.S), 223 (Oil-seeds and oleaginous fruits, whole or broken, of a kind used for the extraction of other fixed vegetable oils).

Table 2.9.b LIG, 3-digit sectors – Countries with average-PSIs exceeding 0.50

		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
Sectors	**Countries**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**
263	USA	0.52	0.53	**0.29**	*0.46*	0.03	0.01	0.20	0.06
265	Czech R	0.60	0.71	**0.54**	*0.71*	0.02	0.00	0.04	0.00
	Poland	0.57	0.64	**0.55**	*0.64*	0.00	0.00	0.02	0.00
267	Slovakia	0.56	0.57	**0.37**	*0.40*	0.09	0.17	0.10	0.00
	Slovenia	0.54	0.46	**0.28**	*0.38*	0.07	0.01	0.18	0.07
269	Poland	0.62	0.80	**0.29**	*0.61*	0.05	0.00	0.27	0.20
	USA	0.55	0.41	**0.26**	*0.21*	0.04	0.00	0.24	0.19
612	Czech R	0.52	0.74	0.14	0.00	**0.30**	*0.68*	0.08	0.06
	Tunisia	0.54	0.70	0.04	0.04	**0.32**	*0.45*	0.18	0.21
	Brazil	0.69	0.85	0.11	0.01	**0.50**	*0.84*	0.09	0.00
666	Hungary	0.65	0.60	0.05	0.00	0.01	0.00	**0.59**	*0.59*
	Romania	0.60	0.56	0.23	*0.35*	**0.36**	0.21	0.00	0.01
	Tunisia	0.56	0.34	0.01	0.02	0.19	0.02	**0.37**	*0.31*
	Japan	0.54	0.40	0.00	0.00	0.00	0.00	**0.54**	*0.40*
694	USA	0.52	0.34	0.02	0.05	0.00	0.00	**0.50**	*0.28*
	Hungary	0.62	0.50	0.02	0.01	0.01	0.01	**0.59**	*0.48*
	Poland	0.50	0.51	**0.24**	*0.33*	0.20	0.04	0.06	0.14
	Romania	0.67	0.57	0.22	*0.33*	**0.45**	0.24	0.00	0.00
	Slovakia	0.74	0.86	**0.54**	*0.80*	0.16	0.00	0.04	0.06
	Slovenia	0.80	0.77	0.05	0.01	0.16	0.23	0.59	0.53
	India	0.76	0.78	0.13	0.15	**0.62**	*0.62*	0.01	0.01
	Norway	0.75	0.67	0.15	*0.42*	0.02	0.04	**0.59**	0.20
	Korea	0.60	0.45	**0.47**	*0.30*	0.02	0.06	0.11	0.09
699	Romania	0.60	0.63	0.18	0.19	**0.28**	0.05	0.15	*0.39*
	Norway	0.52	0.50	0.11	0.13	0.02	0.01	**0.40**	*0.37*
811	Bulgaria	0.74	0.83	0.00	0.00	0.74	0.83	0.00	0.00
	Croatia	0.77	0.71	**0.61**	*0.71*	0.16	0.00	0.00	0.00
	Latvia	0.59	0.75	0.00	0.00	**0.59**	0.75	0.00	0.00
	Switzerland	0.52	0.79	**0.23**	0.21	0.19	0.57	0.10	0.00
	Russia	0.68	0.71	0.00	0.00	**0.68**	0.71	0.00	0.00
	Brazil	0.58	0.78	0.00	0.00	**0.58**	0.78	0.00	0.00
	Czech R	0.54	0.62	**0.19**	0.15	0.17	0.15	0.17	*0.32*
	Romania	0.50	0.63	0.06	0.11	**0.42**	*0.48*	0.02	0.04
	Slovakia	0.53	0.64	0.14	*0.27*	**0.27**	0.17	0.12	0.20
	Slovenia	0.58	0.60	0.16	0.19	**0.36**	*0.27*	0.07	0.14
841	Poland	0.66	0.53	**0.52**	*0.36*	0.00	0.00	0.14	0.17
	Romania	0.79	0.80	**0.64**	*0.75*	0.07	0.00	0.08	0.05
	Morocco	0.75	0.73	**0.58**	*0.66*	0.09	0.00	0.08	0.07
	Tunisia	0.69	0.76	**0.58**	*0.55*	0.01	0.00	0.10	0.21
	China	0.51	0.49	0.19	0.00	**0.32**	*0.46*	0.00	0.03
	India	0.55	0.63	0.14	0.22	**0.31**	*0.39*	0.10	0.02
842	Poland	0.63	0.48	**0.47**	*0.39*	0.00	0.00	0.15	0.09
	Romania	0.70	0.69	**0.46**	*0.50*	0.23	0.17	0.02	0.02
	Morocco	0.65	0.69	**0.60**	*0.64*	0.02	0.00	0.04	0.05
	Tunisia	0.60	0.43	**0.44**	*0.23*	0.04	0.02	0.11	0.18
	China	0.53	0.58	0.14	0.15	**0.39**	*0.42*	0.00	0.00
897	Israel	0.67	0.43	0.03	0.10	0.06	0.14	**0.57**	*0.19*
	China	0.63	0.58	0.00	0.00	**0.41**	*0.58*	0.22	0.00
	India	0.64	0.77	0.25	0.19	**0.33**	*0.57*	0.06	0.01

According to Table 2.9.b, the degree of competition between Turkey and the other countries is quite high in the LIG category. In the sectors 263 (Cotton Textile Fibers), 265 (Vegetable Textile Fibers, Raw or Processed but not Spun; Waste of These Fibers), 267 (Manmade Fibers, Suitable for Spinning and Waste of Manmade Fibers), 269 (Worn Clothing and Other Worn Textile Articles; Rags), 841 (Men's or Boys' Coats, Jackets, Suits, Trousers, Shirts, Underwear etc. of Woven Textile Fabrics) and 842 (Women's or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Skirts, Underwear, etc. of Woven Textiles), PRSI-Medium is highest among the three price similarity indexes for Poland, the Czech Republic, Slovenia and Slovakia from CEE, and Tunisia and Morocco from MENA. However, for example, in sector 612 (Manufactures of Leather or Composition Leather, N.E.S.; Saddlery and Harness), similarity concentrates in the goods for which Turkey's prices are higher than those of its competitors, such as the Czech Republic, Tunisia and Brazil.

Table 2-9.b shows that in the sectors 666 (Pottery), 694 (Nails, Screws, Nuts, Bolts, Rivets and Similar Articles, of Iron, Steel, Copper or Aluminum), 699 (Manufactures of Base Metal, N.E.S.), PRSI-Low is the highest for developed countries, such as USA and Norway. In these sectors, where export patterns between Turkey and these developed countries are highly similar, Turkish exports can be said to be of lower quality than the exports of its developed competitors. Finally, in sectors 694 (Nails, Screws, Nuts, Bolts, Rivets and Similar Articles, of Iron, Steel, Copper or Aluminum), 841 (Men's or Boys' Coats, Jackets, Suits, Trousers, Shirts, Underwear etc. of Woven Textile Fabrics), 842 (Women's or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Skirts, Underwear, etc. of Woven Textiles) and 897 (Jewelry, Goldsmiths' and Silversmiths' Wares, and Other Articles of Precious or Semiprecious Materials, N.E.S.), for Asian countries such as China and India, PRSI-High is the highest. In other words, Turkish exports are of higher quality than the exports of China and India in the LIG category, in which exports patterns between Turkey and its competitors are highly similar.

Table 2.9.c CIG, 3-digit sectors – Countries with average-PSIs exceeding 0.50

		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
Sectors	Countries	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**
111	Slovenia	0.72	0.53	0.13	0.07	**0.52**	*0.35*	0.07	0.11
112	Norway	0.67	0.76	0.06	0.06	0.01	0.00	**0.61**	*0.70*
122	Czech R	0.52	0.67	0.29	0.23	0.09	0.00	0.15	0.44
551	Bulgaria	0.74	0.77	0.07	0.01	**0.34**	*0.74*	0.32	0.03
	Morocco	0.71	0.68	0.06	0.01	**0.49**	*0.62*	0.16	0.06
	Indonesia	0.65	0.70	0.06	0.00	**0.51**	*0.65*	0.09	0.05
553	Brazil	0.54	0.53	0.07	0.10	0.04	0.05	**0.43**	*0.39*
625	Czech R	0.74	0.70	**0.56**	*0.30*	0.01	0.00	0.17	*0.41*
	Poland	0.78	0.73	**0.77**	*0.73*	0.01	0.00	0.00	0.00
	Slovakia	0.51	0.54	**0.47**	*0.41*	0.00	0.00	0.04	0.13
	Slovenia	0.62	0.63	**0.62**	*0.63*	0.00	0.00	0.00	0.00
	Korea	0.62	0.71	**0.62**	*0.70*	0.00	0.00	0.00	0.00
	USA	0.71	0.73	0.18	0.18	0.00	0.00	**0.52**	*0.54*
629	Czech R	0.58	0.65	**0.30**	*0.50*	0.27	0.15	0.01	0.01
	Hungary	0.73	0.69	**0.66**	0.51	0.01	0.01	0.06	0.17
	Poland	0.61	0.44	**0.33**	0.33	0.06	0.00	0.05	0.11
	Slovakia	0.77	0.91	**0.55**	0.90	0.22	0.01	0.00	0.00
	Switzerland	0.64	0.64	0.11	0.16	0.00	0.00	**0.53**	0.48
672	Poland	0.54	0.50	**0.45**	*0.44*	0.04	0.05	0.04	0.01
673	Bulgaria	0.76	0.75	**0.52**	*0.58*	0.24	0.17	0.00	0.00
	Czech Repu	0.82	0.72	**0.82**	*0.72*	0.00	0.00	0.00	0.00
	Hungary	0.84	0.88	**0.84**	*0.88*	0.00	0.00	0.00	0.00
	Poland	0.85	0.90	**0.78**	*0.69*	0.00	0.00	0.07	0.21
	Romania	0.78	0.77	**0.71**	*0.77*	0.07	0.00	0.00	0.00
	Slovakia	0.61	0.58	**0.61**	*0.58*	0.00	0.00	0.00	0.00
	China	0.58	0.42	**0.51**	*0.42*	0.07	0.00	0.00	0.00
	India	0.54	0.71	**0.50**	*0.71*	0.04	0.00	0.00	0.00
	Indonesia	0.52	0.77	**0.42**	*0.77*	0.10	0.00	0.00	0.00
	Switzerland	0.73	0.72	0.18	*0.38*	0.00	0.00	**0.56**	0.34
	Russia	0.59	0.33	0.18	0.26	0.42	0.07	0.00	0.00
	Brazil	0.65	0.73	**0.65**	*0.73*	0.00	0.00	0.00	0.00
676	Czech R	0.85	0.92	**0.53**	0.20	0.00	0.00	0.31	*0.72*
	Poland	0.75	0.82	**0.60**	*0.57*	0.00	0.00	0.15	0.25
	Switzerland	0.81	0.87	0.00	0.00	0.00	0.00	**0.81**	*0.87*
	Norway	0.58	0.47	**0.37**	*0.34*	0.00	0.00	0.21	0.13
	Russia	0.75	0.81	**0.48**	0.13	0.00	0.00	0.28	*0.68*
684	Croatia	0.55	0.55	**0.41**	*0.39*	0.03	0.03	0.12	0.13
	Czech R	0.54	0.54	**0.52**	*0.49*	0.02	0.05	0.00	0.00
	Poland	0.61	0.62	**0.50**	*0.61*	0.10	0.01	0.01	0.00
	Slovenia	0.56	0.60	**0.56**	*0.60*	0.00	0.01	0.00	0.00
	USA	0.52	0.67	0.03	0.07	0.00	0.00	**0.50**	*0.60*
781	Czech R	0.54	0.80	**0.42**	*0.57*	0.04	0.00	0.08	0.23
	Hungary	0.57	0.74	0.20	*0.57*	0.00	0.00	**0.37**	0.17
	Poland	0.63	0.83	**0.53**	*0.83*	0.10	0.00	0.00	0.00
	Slovakia	0.65	0.90	**0.55**	*0.90*	0.00	0.00	0.10	0.00
	Slovenia	0.61	0.65	**0.58**	*0.65*	0.00	0.00	0.04	0.00
	Mexico	0.63	0.60	**0.26**	*0.60*	0.11	0.00	0.26	0.00
783	Czech R	0.66	0.62	0.14	*0.41*	**0.51**	0.22	0.01	0.00
	Poland	0.66	0.78	0.27	0.19	0.08	0.25	**0.31**	*0.34*
784	Hungary	0.69	0.69	0.11	0.02	0.00	0.00	**0.58**	*0.67*
	Poland	0.55	0.46	0.18	0.04	0.02	0.00	**0.35**	*0.41*
	Romania	0.54	0.72	0.04	0.01	0.00	0.00	**0.50**	*0.71*
	Slovakia	0.54	0.41	0.04	0.00	0.01	0.00	**0.48**	*0.41*
	Slovenia	0.69	0.57	0.25	0.17	0.11	0.07	**0.33**	*0.33*
	China	0.58	0.76	**0.33**	*0.61*	0.19	0.13	0.07	0.02
	Switzerland	0.73	0.76	0.00	0.00	0.00	0.00	**0.72**	*0.75*
	Norway	0.53	0.40	0.02	0.01	0.00	0.00	**0.51**	*0.38*
	Korea	0.74	0.69	0.03	0.06	0.00	0.00	**0.72**	*0.62*
	Brazil	0.55	0.41	0.23	*0.34*	0.00	0.01	**0.32**	0.07
785	Hungary	0.62	0.67	0.14	0.03	0.14	0.02	**0.34**	*0.63*
	Lithuania	0.56	0.62	**0.46**	*0.58*	0.05	0.03	0.06	0.00
	Tunisia	0.61	0.65	0.11	0.13	**0.35**	*0.29*	0.15	0.23

Table 2.9.c above reports the results for the CIG category, in which PRSI-Medium is generally the highest for the countries other than the developed ones. For the developed countries, PRSI-Low is the highest. In other words, for example, in sectors 625 (Rubber Tires, Interchangeable Tire Treads, Tire Flaps and Inner Tubes For Wheels of All Kinds), 629 (Articles of Rubber), N.E.S.), 672 (Iron or Steel Ingots and Other Primary Forms, and Semi-finished Products of Iron or Steel), 673 (Iron or Non-alloy Steel Flat-Rolled Products, not Clad, Plated or Coated) , 676 (Iron and Steel Bars, Rods, Angles, Shapes and Sections, Including Sheet Piling), 684 (Aluminum) and 781 (Motor Cars and Other Motor Vehicles Principally Designed for The Transport of Persons, Including Station Wagons), the similarity of Turkey's exports with all countries, except the developed ones, has concentrated on the products with similar prices (and hence with similar qualities). However, the similarity of Turkey's export patterns with those of the developed countries, such as Norway, Switzerland and the US, has concentrated on goods for which Turkish exports are relatively cheaper. Hence, Turkish exports are of lower quality as compared to the exports of its developed competitors in the CIG category. In contrast to the general picture, in sector 673 (Iron or Non-alloy Steel Flat-Rolled Products, not Clad, Plated or Coated), the similarity between Turkey and Asian countries, such as China, India and Indonesia, have concentrated on the goods for which prices lie within the same range (rather than in the goods for which Turkish exports are relatively more expensive). When we take into account the fact that Turkey's similarity with the CEECs in the CIG category is *as usual* the highest in PRSI-Medium; the unusual result with respect to China, India and Indonesia can be said to be arising from the peculiarities of these Asian countries themselves, rather from Turkey. At this point, it is arguable that the export products of these Asian countries in this sector are of relatively higher quality than their products in other sectors.

Sector 784 (Parts and Accessories for Tractors, Motor Cars and Other Motor Vehicles, Trucks, Public-Transport Vehicles) represents also a different case with respect to the general picture in the CIG category. In general, for the CEECs, PRSI-Medium is the highest. However, in sector 784, PRSI-Low is the highest for these countries. Similarly, for China, in almost all sectors, PRSI-High is the highest, except sector 784. In this sector, prices of Turkish and Chinese exports lie within the same

range. In the light of these observations, we can conclude that Turkey's prices in sector 784 are relatively lower, as compared to the other sectors. Hence, price competition (rather than quality competition) characterizes the case of Turkey in this sector.

Table 2.9.d EIRG, 3-digit sectors – Countries with average-PSIs exceeding 0.50

		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
Sectors	**Countries**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**
581	Korea	0.54	0.65	0.04	0.03	0.04	0.04	**0.46**	0.58
582	Slovakia	0.51	0.53	0.14	0.14	0.11	0.13	**0.26**	0.26
583	Lithuania	0.59	0.67	**0.36**	*0.65*	0.21	0.02	0.02	0.00
	Slovakia	0.51	0.40	**0.31**	*0.21*	0.11	0.00	0.10	0.19
	Slovenia	0.66	0.76	**0.49**	*0.62*	0.09	0.03	0.08	0.11
	Norway	0.51	0.60	0.05	0.00	0.01	0.00	**0.46**	*0.60*
	Canada	0.52	0.44	0.18	0.17	0.05	0.00	**0.29**	*0.27*
759	Slovenia	0.62	0.57	0.00	0.01	**0.57**	*0.47*	0.04	0.10
	Indonesia	0.59	0.53	0.00	0.00	**0.51**	*0.46*	0.08	0.06
	Russia	0.54	0.46	0.15	0.12	**0.21**	*0.25*	0.17	0.10
761	Hungary	0.69	0.81	0.30	0.15	0.00	0.00	**0.39**	*0.65*
	Poland	0.81	0.74	**0.68**	0.35	0.00	0.00	0.13	*0.39*
	Japan	0.74	0.50	0.00	0.00	0.00	0.00	**0.74**	*0.50*
	Korea	0.58	0.35	0.18	0.00	0.00	0.00	**0.40**	*0.35*

According to Table 2.9.d, where the results for the EIRG category are presented, in sectors 581 (Tubes, Pipes and Hoses of Plastics) and 582 (Plates, Sheets, Film, Foil and Strip of Plastics) , PRSI-Low is the highest for Korea and Slovakia, respectively. In sector 583 (Monofilament with a Cross-Sectional Dimension Exceeding 1 mm, Rods, Sticks And Profile Shapes of Plastics) , PRSI-Medium is the highest for Lithuania, Slovakia and Slovenia. In sector 759 (Parts, for Office Machines), PRSI-Low is the highest for Norway and Canada, while PRSI-High is the highest for Slovenia, Indonesia and Russia. That is to say, in sector 759, the similarity of Turkish exports with Slovenia, Indonesia and Russia is characterized by the higher quality of Turkish products. In sector 761 (TV Receivers whether or not incorporating Radio-broadcast Receivers or Sound or Video Recording or Reproducing Apparatus), the similarity of Turkish exports with respect to Japan and Hungary is concentrated on goods for which the price of Turkish exports are lower;

while with respect to Poland, it is concentrated on goods for which the prices of Turkish and Polish exports lie within the same range.

Table 2.9.e DIRG, 3-digit sectors – Countries with average-PSIs exceeding 0.50

		PSI		PRSI-Medium		PRSI-High		PRSI-Low	
Sectors	**Countries**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**	**F-P**	**L-P**
574	India	0.55	0.63	**0.46**	*0.61*	0.05	0.02	0.03	0.00
	Indonesia	0.54	0.42	**0.50**	*0.40*	0.04	0.01	0.00	0.00
711	Croatia	0.54	0.61	0.22	0.18	0.04	0.00	**0.28**	*0.43*
	Romania	0.52	0.62	**0.27**	*0.31*	0.15	0.13	0.10	0.17
713	Brazil	0.53	0.58	0.06	0.01	**0.43**	*0.50*	0.04	0.06
716	Bulgaria	0.54	0.51	**0.33**	0.31	0.13	0.04	0.09	0.17
	Estonia	0.55	0.75	0.18	0.47	0.01	0.00	**0.37**	0.28
	Poland	0.53	0.54	0.25	0.19	0.03	0.06	**0.25**	0.30
	Brazil	0.63	0.52	**0.33**	0.24	0.02	0.05	0.28	0.24
718	Korea	0.59	0.76	**0.30**	0.65	0.04	0.07	0.25	0.03
723	Czech R	0.58	0.50	**0.31**	0.02	0.08	0.04	0.19	*0.45*
	Hungary	0.70	0.72	0.11	0.02	0.03	0.02	**0.56**	0.69
	Poland	0.67	0.56	0.08	0.02	0.03	0.02	**0.57**	0.52
	Romania	0.50	0.61	0.10	0.00	0.04	0.06	**0.36**	0.54
	Slovakia	0.74	0.86	0.10	0.01	0.04	0.06	**0.60**	0.79
	Slovenia	0.81	0.79	0.01	0.01	0.02	0.03	**0.78**	0.76
742	Poland	0.57	0.52	0.12	0.10	**0.28**	0.00	0.17	*0.42*
	Slovenia	0.63	0.54	0.02	0.01	**0.55**	*0.45*	0.07	0.09
	India	0.54	0.54	0.17	0.20	0.12	0.08	**0.26**	0.26
	Slovakia	0.59	0.57	0.00	0.00	0.00	0.00	**0.58**	0.57
	Korea	0.55	0.45	0.16	0.20	0.15	0.00	**0.24**	0.25
746	Czech R	0.53	0.58	0.05	0.10	0.05	0.01	**0.43**	0.47
747	Bulgaria	0.69	0.84	0.19	*0.52*	0.02	0.01	**0.48**	0.32
	Romania	0.67	0.53	0.12	*0.25*	**0.53**	0.22	0.03	0.06
	Slovenia	0.65	0.77	0.03	0.01	0.02	0.00	**0.60**	*0.75*
	Israel	0.72	0.68	0.00	0.00	0.00	0.00	**0.72**	*0.68*
	India	0.80	0.85	**0.45**	*0.56*	0.23	0.19	0.11	0.10
	Canada	0.69	0.83	0.00	0.01	0.00	0.00	**0.69**	*0.83*
	Korea	0.74	0.81	**0.46**	*0.47*	0.09	0.02	0.19	0.33
	Brazil	0.53	0.80	0.02	0.00	0.06	0.14	**0.45**	*0.67*
748	Hungary	0.50	0.53	0.11	0.05	0.06	0.00	**0.33**	*0.48*
	Poland	0.51	0.51	0.09	0.11	0.21	0.08	**0.21**	*0.33*
	India	0.54	0.66	0.09	0.13	0.03	0.01	**0.42**	*0.53*
	Norway	0.52	0.47	0.03	0.00	0.00	0.00	**0.49**	*0.47*
	Korea	0.56	0.60	0.12	0.09	0.11	0.11	**0.33**	*0.40*
	Brazil	0.53	0.64	0.14	*0.22*	0.15	0.24	**0.25**	0.19
775	Poland	0.51	0.59	0.24	0.20	0.00	0.00	**0.27**	*0.40*
	Slovenia	0.53	0.41	**0.34**	*0.25*	0.01	0.00	0.19	0.16
	Korea	0.63	0.64	0.29	0.19	0.00	0.00	**0.33**	*0.44*
873	Romania	0.52	0.35	0.08	*0.17*	**0.39**	0.07	0.05	0.11

In the DIRG category (Table 2.9.e), in general, the export similarity between Turkey and its competitors are concentrated on products for which Turkish exports are of lower quality. In sector 574 (Polyacetals, Other Polyethers and Epoxide Resins, Polycarbonates, Alkyd Resins and Other Polyesters), PRSI-Medium is the highest for India and Indonesia, unlike in the other categories in which PRSI-High is the highest for these countries. It is possible to say that the exports of Turkey and those of India and Indonesia have similar qualities in sector 574. This result is also valid for India in sector 747 (Taps, Cocks, Valves and Similar Appliances for Pipes, Boiler Shells, Tanks, etc.). For other sectors, in general, the similarity between the exports of Turkey and those of its competitors are concentrated on products for which Turkish exports have lower quality.

2.5 Concluding Remarks

In this chapter, we analyzed Turkey's export similarity with the major exporters in the EU-15 market for the period 1996-2007 at a highly disaggregated level of data. We examined the countries and sectors according to technological categories by means of three export similarity indexes. The main conclusion to be emphasized is that Turkey faces strong competition in the EU-15 market. The degree of competition changes with respect to countries and sectors over the years.

Considering the idea that greater similarity implies higher competition, our results from the export similarity indexes indicate that Turkey's main competitors in the EU-15 market are such CEECs as Poland, Bulgaria, the Czech Republic, Slovakia and Slovenia, and two MENA countries, i.e., Tunisia and Morocco. Moreover, competition between Turkey and these CEECs has increased in the last years, especially after they joined the EU. On the other hand, competition between Turkey and the MENA countries, especially Tunisia and Morocco, has decreased in the last years. Turkey's export similarity with the developed countries, such as Canada, Norway, Switzerland, and the US, has increased in the last period; but this similarity is still relatively lower than that with other countries.

In terms of the technological categories, we find that competition between Turkey and other countries concentrate generally in LIG and CIG. In the RMIG category, China, Morocco and Bulgaria; in LIG, Morocco, Bulgaria and Romania; in

CIG, the Czech Republic, Poland and Hungary; in EIRG, Poland and Slovakia; and in DIRG, Slovenia, Poland and the Czech Republic are the countries that are most similar to Turkey. In other words, these are the countries that pose the strongest competition to Turkey in the EU-15 market in each technological category. In LIG, Turkey's similarity with Bulgaria and Romania has increased in the last period, while it has decreased with other CEECs. In CIG, Turkey's export similarity with most countries has increased in the last period.

We also analyzed Turkey's export similarity with the other countries by focusing upon the price differences at both the country and sector levels. At the country level, Turkey's similarity with the CEECs, Tunisia, Morocco, Korea, Brazil and Mexico are concentrated on the products whose prices lie within the same range. Based on the assumption that price, measured via unit-value, is an indicator of quality, we can conclude that, in the EU-15 market, Turkey is subject to the strongest competition from these countries since they have similar export patterns in the products with similar qualities.

We also found that, after 2004, the export similarity between Turkey and CEECs (especially Poland, the Czech Republic and Slovakia) is generally the highest for products in which Turkish exports are relatively cheaper such as sectors 122 (Tobacco, Manufactured), 625 (Rubber Tires, Interchangeable Tire Treads, Tire Flaps and Inner Tubes for Wheels of All Kinds), 676 (Iron and Steel Bars, Rods, Angles, Shapes and Sections, Including Sheet Piling) and 723 (Civil Engineering and Contractors' Plant and Equipment). Hence, after 2004, the nature of Turkey's competition with these countries could have shifted from quality competition to price competition. In other words, Turkish exporters might have reduced their prices in such products in order to cope with the increasing forces of competition coming from these CEECs. Increases in the quality of the products of these countries and/or the initiation of their membership in the EU in 2004 are possible explanations for the observation that their export similarity with Turkey has increased at a time when their export prices rose. This observation is more remarkable in the EIRG and DIRG categories. On the contrary, in the CIG category, Turkish products seem to have passed through a certain degree of quality-upgrading in the last period. And thus,

Turkey has engaged in quality competition (rather than price competition) for most of the sectors in the CIG category.

On the other hand, we found that Turkey is similar to China, India, Indonesia and Bulgaria in the products for which Turkish exports have higher prices. Therefore, we can conclude that, among all countries that have similar export patterns to Turkey, Turkish exports have higher quality than only the exports of China, India, Indonesia and Bulgaria.

Turkey's similarity with developed countries, such as Switzerland, the US and Norway, is concentrated in the products for which Turkey has lower prices. The higher quality of the exports of the developed countries explains the observation that, although their exports are more expensive than Turkish exports, they have similar export patterns with Turkey.

Finally, we examined Turkey's similarity with its competitors that have PSI-values higher than 0.50, at the 3-digit sector level, according to the technological categories. In the LIG category, the PSI is greater than 0.50 for Romania in 6 sectors; for Poland and Korea in 5 sectors; for China, India, Tunisia, the Czech Republic, Slovakia, Slovenia and the US in 3 sectors; for Morocco, Norway, Brazil and Hungary in 2 sectors. Our decomposition results further show that, in most of these sectors, PRSI-M is the highest for the CEECs, PRSI-L is the highest for the developed countries, and PRSI-H is the highest for Asian countries. In the EIRG category, the PSI is greater than 0.50 for Slovakia, Slovenia and Korea in 2 sectors, for Poland, Lithuania, Russia, Korea, Norway, Canada and Japan in 1 sector. According to the decomposition results, in this category for all sectors with PSI exceeding 0.50, PRSI-L is the highest for Japan, Korea, Hungary, Norway and Canada, PRSI-H is the highest for Russia and Indonesia, and PRSI-M is the highest for Poland and Lithuania. The results are mixed for Slovakia and Slovenia. In the DIRG category, the PSI is greater than 0.50 for Korea in 5 sectors, for Brazil and Slovenia in 4 sectors, for Romania and India in 3 sectors, for the Czech Republic and Slovakia in 2 sectors. The decomposition results indicate that PRSI-L is the highest for most of these sectors and countries.

CHAPTER 3

EXPORT DIVERSIFICATION, INTENSIVE AND EXTENSIVE MARGINS, AND COMPETITIVENESS: THE CASE OF TURKEY IN THE EU-15 MARKET

3.1 Introduction

One of the most challenging issues for developing countries is the need to reduce their dependence on traditional export products. Not only increasing export earnings but also exporting new product varieties is required in order to establish a more reliable basis for foreign exchange earnings and compete more successfully in international markets. Therefore, export diversification, which can be attained by either changing the share of existing commodities ("intensive margin") or including new commodities in the export portfolio ("extensive margin") is needed to raise competitiveness in the world markets.

In this chapter, we evaluate the degree of Turkey's export diversification in terms of the so-called 'extensive and intensive margins'. In this context, intensive margin refers to the share of products that are already being exported, while extensive margin refers to the share of new products in the export portfolio. We measure the relative significance of these margins in the context of the changes in Turkey's exports and market shares in the EU-15 market. More specifically, using 5-digit SITC Rev.3 data and covering the period from 1996 to 2006, we determine the extent to which the rise in Turkey's exports in the EU-15 market is attributable to increases in existing exports and to increases in new product varieties. Relying on our calculations, we compare Turkey to its main competitors in this market. To do so, we first count the number of export products along the period under consideration. This number provides us with a rough idea about Turkey's export-product variety. As such, the changes in this number over the years give us a preliminary idea about the development in Turkey's extensive margin.

Even though counting 'number of products' is a practical and useful first step towards understanding the degree of export diversification, it alone is insufficient to see important details that cannot be overlooked in a study such as this one.

Therefore, we also analyze and evaluate the degree of export diversification in terms of shares, using some more technical methodologies. That is to say, secondly, we measure the intensive and extensive margins of Turkey and its competitors in the EU-15 market by means of the relatively new methodologies developed by Hummels and Klenow (2005), Feenstra and Kee (2007), and Amiti and Freund (2008).

In this way, we first reveal the relative shares of countries' existing and new export products in the EU-15 market by determining the number of products. And secondly, we reveal each country's share of existing and new products in its own exports thanks to our analysis of the intensive and extensive margins. As such, we end up constructing a broad framework of analysis, by way of which the relative importance of extensive and intensive margins in Turkey's export growth in the EU-15 market can be examined in detail and in comparison with Turkey's main competitors in this market. Last but not the least, we also calculate the conventional 'Export Price Index' for Turkey's intensive margin and compare it to the Export Price Index for the same products from the rest of the world to the EU-15.

To our knowledge, this is the first study to emphasize, analyze and evaluate the importance of intensive and extensive margins in terms of Turkey's competitiveness and capability of export diversification. Furthermore, our computation and interpretation of the Export Price Index for Turkey's intensive margin is also unprecedented. More generally, we contribute to the empirical investigation of export diversification by providing new evidence based on intensive and extensive margins, insofar as the main exporters to the EU-15 market are concerned.

3.2 Literature Review

It is generally agreed that export diversification is a desirable practice, especially for developing countries, because it enhances export competitiveness by widening the set of variety of export products, thereby reducing dependence on traditional exports that have a long-term tendency of declining terms of trade. By means of regular and successful export diversification, countries can improve the overall terms of trade for their exports, minimize the conjectural fluctuations in export revenues, and establish a more dynamic and reliable export sector. In this

sense, export diversification and export competitiveness can be considered as two sides of the same coin.

In the literature, export diversification has been measured in several ways. To give an example for Turkey, Erlat and Sahin (1998) and Erlat (1999) examine export diversification in terms of changes in Turkey's traditional and non-traditional sectors over time. Another way to analyze export diversification in relation with competitiveness involves the use of the concept of 'concentration ratio', which is a well-known and key measure of domestic competition. In other words, 'concentration ratios' can also be utilized as indicators of international competitiveness. Indeed, Sakakibara and Porter (2001) find that rivalry at domestic level is the main determinant of Japan's export competitiveness in world markets, and Uriu (1996) argues that concentrated industries are more conducive to enhancing the international competitiveness of a country.

In this respect, Erlat and Akyüz (2003) analyze competitiveness in terms of changes in various indicators of industrial concentration in Turkey. An earlier application of this idea can also be found in Erlat (1993), who examines the relationship between industrial concentration and exports in selected sectors of the Turkish manufacturing industry for the period 1986-1989. Employing such measures of industrial concentration as the Concentration Ratio (CR), Hirschman-Herfindahl (the H-) index, Rosenbluth or Hall & Tideman (the RHT) index, Comprehensive Measure of Concentration (the CCI) index, and the Entropy (the E-) index; Erlat (1993) provides support for the hypothesis that there exists a positive relationship between industrial concentration and exports in the case of Turkey. In a similar vein, Cortes (2006) undertakes an econometric investigation to reveal the relationship between domestic competition and trade performance, and finds that the concentration ratio, as a key measure of domestic competition, is also significantly and positively related to export competitiveness. As such, Erlat (1993) and Cortes (2006) are supportive of each other in terms of revealing that domestic competition is a significant factor that contributes to international competitiveness.

Since the concentration-ratio approach to international competitiveness has already been studied for the case of Turkey, we chose to analyze Turkey's competitiveness in the EU-15 market by means of a different and more relevant

approach for the purposes of our thesis. In this chapter, we evaluate Turkey's export diversification in conjunction with export competitiveness in terms of 'intensive and extensive margins'. In the literature, the studies that involve intensive-margin analysis originate from Armington's (1969) 'model of national differentiation'. Such studies focus mainly upon the growth in the set of products that have been already exported previously. On the other hand, the studies that involve extensive-margin analysis originate from Krugman's (1980) 'monopolistic competitive model'. Such studies consider only the growth in the set of new export-products. Recently, however, Hummels and Klenow (2005) argued that neither the Armington- nor the Krugman-model alone is successful enough in explaining the sources of export growth in a comprehensive way.

In the literature, the 'extensive margin' is generally used to refer to the extent of 'new varieties of export products'. Feenstra (1994) is one of the earlier and major studies that measure the growth in product variety over time. Incorporating 'product variety' with the US import price index, he finds a strong evidence for the role of product variety growth in affecting this index. In this connection, some later studies that deal with product variety have utilized the Feenstra-index developed in Feenstra (1994). For example, Feenstra et al. (1999) analyze the effect of export variety on productivity in the case of South Korea's and Taiwan's exports to the US at the sector level between 1975 and 1991. They conclude that, in 9 of 16 export sectors, product variety has a significantly positive effect on productivity. Also, Feenstra and Kee (2007) compare the export variety of China and Mexico in the US market over the period 1989-2001 by using HS-10 digit US import data. They find a significant increase in Mexico's export variety in all industries, especially after Mexico's admittance to the NAFTA. They find a significant increase in China's export variety as well. They conclude that China's export variety has recently exceeded that of Mexico in certain industries. Analogously, Feenstra and Kee (2006) relate export variety with productivity, and they find that among the countries exporting to the US, the ones with higher export variety also have higher productivity. Funke and Ruhwedel (2001) find a positive correlation between the product variety of exports of 19 OECD countries to the US and their per-capita-income over the period 1989-

1996. All these studies show that there is an important connection between the ability to export new products and productivity, and hence competitiveness.

On the other hand, the intensive/extensive-margin analysis by Hummels and Klenow (2005), as an extended and cross-country version of Feenstra (1994), is especially important for our purposes in this thesis. Hummels and Klenow (2005) examine both the extensive and intensive margins in a cross-country context for a given year. They develop extensive and intensive margins in order to see the cross-country differences between the exports of smaller and larger economies in terms of quantity, quality and product variety. Using trade data for 110 exporter and 59 importer countries for the year 1995, Hummels and Klenow (2005) find that the extensive margin constitutes the bulk of the exports of larger economies. They also find that the intensive margin is affected more by higher quantities than higher prices. In the literature, many studies have followed and further developed Hummels and Klenow's (2005) framework of analysis. For example, Alvarez and Claro (2007) analyze the sources of China's export growth in Chilean markets. Their study is based on Hummels and Klenow's (2005) methodology of decomposing export growth into extensive and intensive margins, and then decomposing further the intensive margin into price and quantity margins. They find that China's export growth is mainly due to the increase in the intensive margin. Yoshida (2008) also relies on the extensive and intensive margins, as developed by Hummels and Klenow (2005), as a determinant of intra-industry trade between Japan and Korea. He finds that the level of intra-industry trade is positively influenced by the introduction of new products, and negatively affected by the increases in the trade of old products. Iranzo and Ma (2006) assess the extents to which China's influence on Mexico-US trade are due to extensive and intensive margins. Employing econometric estimation techniques, they find that China's exports to the US have adversely affected the volume of Mexico's existing products, while it has positively affected Mexico's new exports. Kandogan (2006) compares the transition economies, i.e., formerly socialist countries from Central and Eastern Europe and Commonwealth of Independent States (CEECs and CIS) in terms of the extensive and intensive margins of their exports to the market economies over the years 1992-1999. Using a modified version of Hummels and Klenow's (2005) methodology, he finds that the increase in the

intensive margin is much more important for CIS-exports, while the increase in the extensive margin is more significant for the exports of CEECs.

In this literature, one of the most important studies has been carried out by Besedes and Prusa (2007), who interpret the extensive margin as the ability of a country to obtain new export partners and markets, and the intensive margin as the ability to maintain the existing export relations. They decompose the intensive margin into 'surviving' and 'deepening' existing relations. Based on detailed export data for 46 developed and developing countries between 1975 and 2003, they conclude that developing countries have higher growth rates in the extensive margin as compared to the developed ones, while the opposite is valid in the case of the intensive margin. They also find that the developing countries lag behind the developed ones in terms of the 'survival' and 'deepening' components. Finally, they conclude that differences across countries in terms of the extensive margin have a negligible impact on long-run export growth, while survival and deepening components have a considerable effect. Their results confirm the Helpman, Melitz and Rubinstein (2007) and Felbermayr and Kohler (2006), who find that much of the growth of trade is due to the intensive margin rather than the extensive margin.

Amurgo-Pacheco and Pierola (2007) add a geographical dimension to the classical product-definitions of the margins. They define the intensive margin in terms of "Old products being exported to Old Destinations", and the extensive margin in terms of three possibilities: "Old Products being exported to New Destinations", "New Products to New Destinations" and "New Products to Old Destinations". They find that the intensive margin is much more important than the extensive margin in the growth of trade for all countries in their sample. However, they also find that the relative importance of the extensive margin is higher for poorer regions relative to richer ones. Finally, they conclude that, at the extensive margin, geographical diversification is more important than product diversification.

Amiti and Freund (2008) decompose China's export growth into its extensive and intensive margins for the period 1992-2006. Using HS-6-digit data, they reach an interesting result: Almost the entire growth of China's exports to the world is due to the intensive margin. At HS-10-digit level, they find that the extensive margin is responsible from about 5-15% of this growth. They also construct an average export

price index for China between 1997 and 2005, and find that the ratio of the price of China's exports to that of the US declined by 12 % over this period. They explain China's falling prices as a result of the huge increases in the volume of Chinese exports.

3.3 Data, Methodology and Empirical Results

Our analysis in this chapter is based on product-level data for EU-15's imports from the non-EU-15 countries for the period 1996-2006. The reason for using import data is that we need total non-EU-15 exports to the EU-15 market in terms of both value and weight. Summing up export weights of the non-EU-15 countries at this detailed product-level might have generated misleading results, and hence incomplete and incorrect assessments. Data used in this chapter come from Eurostat (Statistical Office of the European Communities), which compiles customs-value of all EU-15 imports by exporting country using the SITC classification for the years after 1995. We preferred Eurostat, because, in dealing with import data, it is more reasonable to use countries' own data sources than secondary sources. Our period of analysis ends in 2006, because the SITC system was revised in 2006, and Eurostat started to report data in 2007 in SITC Rev.4 rather than Rev.3. As extensive and intensive margins are very sensitive to such revisions, the least risky choice in front of us was to end the period in 2006. As such, this chapter uses SITC-Rev. 3, five-digit data from 1996 to 2006.

In this chapter, we present the results for overall (SITC 0-9), manufacturing (SITC 5-8) and primary (SITC 0-4) sectors, separately. As we had done in the previous chapter, we also classify the sectors as raw-material-intensive goods (RMIG), labor-intensive goods (LIG), capital-intensive goods (CIG), easy-to-imitate research-intensive goods (EIRG), and difficult-to-imitate research-intensive goods (DIRG).

As we have already mentioned in the literature survey, most of the studies on extensive and intensive margins are based on Hummels and Klenow (2005). Hummels and Klenow (2005) decompose the market share of a country into its extensive and intensive margins at a point in time. In their methodology, extensive margin of a country measures the ratio of 'the value of world exports of the products

produced by this country' to 'the value of world exports of all products produced by all countries'. However, there are some problems with this methodology. First, the value of the index depends on the set of products exported by the country-in-question, but not on its own value of exports. Hummels and Klenow (2005: 710) summarize the disadvantage concerning this problem as follows: "a country may appear to have a large extensive margin because it exports a small amount in categories in which the world exports a lot". Secondly, as mentioned by Feenstra and Kee (2007), the application of this extensive-margin index in its original form leads to inconsistencies in cross-year comparisons. Feenstra and Kee (2007) overcome this problem by averaging the worldwide exports over the years. In this way, they obtain a consistent set of countries suitable for comparison. However, even after this qualification, another problem remains. That is, measuring the importance of intensive margin in the market share may be still misleading, even after this modification. For this reason, we measure only the extensive margin by the methodology of Feenstra and Kee (2007); and we utilize another index for the measurement of the intensive margin.

As we mentioned at the beginning of this chapter, the most practical way of measuring the export-product variety of a country is to count the number of product categories that the country exports over time. Therefore, we first present the number of exported products for overall products along with the manufacturing and primary industries, according to technological categories in the initial and final years of analysis (i.e., 1996 and 2006). Then, we present our more sophisticated indexes and results, which we obtain by employing the methodologies developed by Feenstra and Kee (2007) and Amiti and Freund (2008).

3.3.1 The Number of the Types of Export-Products in the EU-15 market

Table 3.1 below shows the number of the types of export-products in 1996 and 2006, in terms of (i) total number of products that each country exported to the EU-15 market and (ii) the percentage-ratio of these numbers in the total number of products exported to the EU-15 market by all the 30 countries considered. The ranking is according to the number of product-types for the overall industries in 2006.

According to Table 3.1, for overall industries, Turkey was able to export 2215 and 2569 different products (at 5-digit level of analysis) to the EU-15 market in 1996 and 2006, respectively. As of 2006, in terms of export diversification, Turkey's performance puts her at the i 9th position (together with Canada) among the 30 exporters in the EU-15 market. In general, this can be considered a good performance.

Table 3.1 Number of product types and percentage-share of each number in the total number of product types exported to the EU-15 market

	OVERALL (SITC 0-9)				Manufacturing (SITC 5-8)				Primary (SITC 0-4)			
	1996		2006		1996		2006		1996		2006	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
U S	3082	97.6	3071	95.3	2380	98.8	2398	97.2	688	93.6	659	89.2
CHINA	2491	78.9	2925	90.8	2037	84.6	2349	95.2	444	60.4	563	76.2
SWITZERLAND	2957	93.6	2890	89.7	2360	98.0	2350	95.2	585	79.6	527	71.3
POLAND	2586	81.9	2790	86.6	2109	87.6	2179	88.3	467	63.5	601	81.3
CZECH R	2606	82.5	2727	84.6	2170	90.1	2205	89.3	426	58.0	512	69.3
NORWAY	2679	84.8	2721	84.5	2193	91.1	2185	88.5	475	64.6	524	70.9
JAPAN	2661	84.3	2666	82.7	2240	93.0	2250	91.2	409	55.6	403	54.5
INDIA	2237	70.8	2604	80.8	1854	77.0	2134	86.5	373	50.7	461	62.4
CANADA	2546	80.6	2569	79.7	2053	85.3	2078	84.2	483	65.7	478	64.7
TURKEY	**2205**	**70.1**	**2557**	**79.7**	**1783**	**74.0**	**2097**	**85.0**	**422**	**57.4**	**460**	**62.2**
HUNGARY	2456	77.8	2513	78.0	2014	83.6	2010	81.4	431	58.6	492	66.6
BRAZIL	2085	66.0	2403	74.6	1691	70.2	1928	78.1	384	52.2	468	63.3
KOREA	2076	65.7	2320	72.0	1814	75.3	2014	81.6	255	34.7	295	39.9
SLOVENIA	2122	67.2	2320	72.0	1805	75.0	1897	76.9	308	41.9	414	56.0
ROMANIA	1766	55.9	2226	69.1	1520	63.1	1877	76.1	237	32.2	339	45.9
SLOVAKIA	1971	62.4	2220	68.9	1688	70.1	1840	74.6	274	37.3	373	50.5
RUSSIA	2155	68.2	2207	68.5	1789	74.3	1823	73.9	356	48.4	376	50.9
THAILAND	1797	56.9	2171	67.4	1457	60.5	1760	71.3	329	44.8	401	54.3
ISRAEL	2107	66.7	2151	66.8	1780	73.9	1808	73.3	316	43.0	331	44.8
BULGARIA	1696	53.7	2030	63.0	1422	59.1	1693	68.6	266	36.2	330	44.7
ESTONIA	1681	53.2	1989	61.7	1444	60.0	1624	65.8	230	31.3	359	48.6
MEXICO	1707	54.1	1911	59.3	1443	59.9	1621	65.7	255	34.7	280	37.9
MALAYSIA	1619	51.3	1891	58.7	1386	57.6	1607	65.1	224	30.5	276	37.3
CROATIA	1564	49.5	1856	57.6	1322	54.9	1549	62.8	234	31.8	299	40.5
INDONESIA	1607	50.9	1809	56.1	1322	54.9	1493	60.5	276	37.6	308	41.7
LITHUANIA	1182	37.4	1762	54.7	1007	41.8	1393	56.4	167	22.7	361	48.8
UKRAINE	1228	38.9	1649	51.2	1019	42.3	1399	56.7	201	27.3	241	32.6
MOROCCO	1406	44.5	1586	49.2	1130	46.9	1295	52.5	268	36.5	286	38.7
TUNISIA	1333	42.2	1561	48.4	1141	47.4	1322	53.6	186	25.3	234	31.7
LATVIA	1028	32.6	1518	47.1	882	36.6	1271	51.5	138	18.8	240	32.5

Moreover, Table 3.1 also demonstrates that, for overall industries, in 1996 and 2006, respectively, Turkey was able to export 70.1 % and 79.7 % of all types of products exported to the EU-15 market from the rest of the world. For the manufacturing industry, Turkey's performance in product variety is given by 74 % in 1996 and 85 % in 2006; while, for the primary industry, it is 57.4 % and 62.2 % in 1996 and 2006, respectively. That is to say, in terms of diversifying its exports, Turkey is structurally more successful in the manufacturing industry than in the primary products. This can also be regarded as a promising result to some extent, because diversification in manufacturing can be considered a better sign of development, as compared to diversification in primary products. However, we should also note that product variety in manufacturing is higher than that in the overall and primary sectors for most of the countries in Table 3.1.

The number of the types of export-products is the highest for the US in both 1996 and 2006. China's prominent success in increasing the types of its export-products from 1996 to 2006 is also noteworthy. Switzerland, Norway, Japan, Poland, the Czech Republic and Canada had higher numbers of product types than China in 1996; however, China's number of product varieties is higher than all of these countries in 2006.

In Tables 3.2.a-e, we present the number of product types and percentage-share of each number in the total number of product types exported to the EU-15 market according to technological categories. The rankings are according to the number of exports of products in 2006 for each technological category.

According to this set of tables, Turkey's performance in export diversification is best in the LIG category in both 1996 and 2006, as compared to the other four technological categories. More specifically, in the LIG category, Turkey exported 86 % of all types of products exported to the EU by the world in 1996, and 91.7 % in 2006. Turkey's lowest product variety is in the EIRG category in both 1996 and 2006, putting it in the 14^{th} rank among the 30 countries considered. Apparently, these results are not so hope-generating for Turkey, because they indicate that Turkey's patterns of export diversification tend to concentrate more in LIG, which can create quite small amounts of 'value added' on the path of economic development, than in EIRG, which yield much higher amounts of 'value added'. Fortunately, however, at

this stage of our analysis, there is a reason to be optimistic about Turkey's performance in export diversification. That is to say, Turkey's position in DIRG, which can be considered the best type of export products in terms of creating the highest 'value added', is relatively better and more promising, as Turkey is placed in the 9th rank among the 30 exporters in 2006.

Tables 3.2.a-e Number of products and shares, technological categories

Table 3.2.a RMIG

	RMIG			
	1996		2006	
	Number	%	Number	%
U S	630	93.5	602	89.6
NORWAY	444	64.5	489	84.1
CHINA	392	58.2	508	75.6
MOROCCO	254	65.9	273	72.8
CZECH R	393	58.3	479	71.3
SWITZERLAND	534	79.2	476	70.8
HUNGARY	394	58.5	452	67.3
CANADA	450	66.8	449	66.8
BRAZIL	336	49.9	422	62.8
TURKEY	**375**	**55.6**	**411**	**61.2**
INDIA	327	48.5	404	60.1
SLOVENIA	277	41.1	385	57.3
JAPAN	362	53.7	363	54.0
THAILAND	295	43.8	361	53.7
SLOVAKIA	259	38.4	356	53.0
ROMANIA	217	48.7	300	52.8
LATVIA	126	23.7	222	50.7
ESTONIA	209	31.0	334	49.7
ISRAEL	301	44.7	309	46.0
POLAND	435	32.2	565	44.6
BULGARIA	234	34.7	294	43.8
INDONESIA	243	36.1	280	41.7
MEXICO	224	37.7	247	40.6
CROATIA	210	31.2	271	40.3
RUSSIA	328	33.2	355	38.5
LITHUANIA	160	30.3	341	37.5
MALAYSIA	204	33.2	252	36.8
UKRAINE	182	27.0	225	33.5
KOREA	224	18.7	259	33.0
TUNISIA	176	26.1	215	32.0

Table 3.2.b LIG

	LIG			
	1996		2006	
	Number	%	Number	%
CHINA	852	90.5	942	97.4
U S	933	99.1	934	96.6
SWITZERLAND	921	97.9	915	94.6
INDIA	819	87.0	901	93.2
TURKEY	**809**	**86.0**	**887**	**91.7**
CZECH R	870	92.5	876	90.6
JAPAN	870	92.5	865	89.5
POLAND	853	90.6	862	89.1
NORWAY	854	90.8	849	87.8
KOREA	761	80.9	818	84.6
ROMANIA	661	70.2	813	84.1
THAILAND	702	74.6	813	84.1
CANADA	820	87.1	812	84.0
HUNGARY	827	87.9	807	83.5
BRAZIL	676	71.8	798	82.5
SLOVENIA	754	80.1	789	81.6
BULGARIA	596	63.3	777	80.4
SLOVAKIA	696	74.0	742	76.7
INDONESIA	667	70.9	726	75.1
ESTONIA	686	72.9	717	74.1
ISRAEL	719	76.4	709	73.3
MALAYSIA	592	62.9	689	71.3
RUSSIA	670	71.2	689	71.3
MEXICO	616	65.5	660	68.3
CROATIA	577	61.3	649	67.1
MOROCCO	576	61.2	641	66.3
LITHUANIA	502	53.3	637	65.9
TUNISIA	566	60.1	626	64.7
LATVIA	428	45.5	577	59.7
UKRAINE	429	45.6	572	59.2

Table 3.2.c CIG

	CIG			
	1996		2006	
	Number	%	Number	%
U S	370	97.1	373	96.1
CHINA	264	69.3	360	92.8
SWITZERLAND	363	95.3	358	92.3
NORWAY	344	90.3	345	88.9
POLAND	310	81.4	340	87.6
CZECH R	331	86.9	337	86.9
JAPAN	333	87.4	337	86.9
HUNGARY	292	76.6	315	81.2
INDIA	241	63.3	311	80.2
TURKEY	**240**	**63.0**	**310**	**79.9**
BRAZIL	254	66.7	305	78.6
CANADA	281	73.8	305	78.6
SLOVENIA	273	71.7	303	78.1
RUSSIA	270	70.9	297	76.5
KOREA	231	60.6	288	74.2
SLOVAKIA	239	62.7	287	74.0
ROMANIA	192	50.4	267	68.8
ESTONIA	179	47.0	245	63.1
MEXICO	184	48.3	225	58.0
BULGARIA	207	54.3	222	57.2
THAILAND	159	41.7	222	57.2
ISRAEL	195	51.2	220	56.7
CROATIA	166	43.6	206	53.1
UKRAINE	152	39.9	199	51.3
MALAYSIA	149	39.1	198	51.0
LATVIA	98	25.7	196	50.5
LITHUANIA	100	26.2	181	46.6
INDONESIA	130	34.1	170	43.8
TUNISIA	107	28.1	167	43.0
MOROCCO	102	26.8	139	35.8

Table 3.2.d EIRG

	EIRG			
	1996		2006	
	Number	%	Number	%
U S	413	99.0	414	98.3
SWITZERLAND	408	97.8	397	94.3
CHINA	338	81.1	389	92.4
JAPAN	385	92.3	377	89.5
CZECH R	317	76.0	342	81.2
INDIA	292	70.0	340	80.8
POLAND	309	74.1	336	79.8
NORWAY	329	78.9	330	78.4
CANADA	315	75.5	308	73.2
HUNGARY	292	70.0	304	72.2
ISRAEL	286	68.6	302	71.7
RUSSIA	290	69.5	282	67.0
KOREA	251	60.2	279	66.3
TURKEY	**201**	**48.2**	**273**	**64.8**
BRAZIL	251	60.2	264	62.7
SLOVAKIA	220	52.8	264	62.7
SLOVENIA	204	48.9	243	57.7
MEXICO	207	49.6	221	52.5
ROMANIA	174	41.7	214	50.8
THAILAND	137	32.9	191	45.4
ESTONIA	129	30.9	188	44.7
UKRAINE	117	28.1	188	44.7
MALAYSIA	152	36.5	177	42.0
INDONESIA	165	39.6	176	41.8
BULGARIA	170	40.8	172	40.9
CROATIA	124	29.7	163	38.7
LATVIA	88	21.1	150	35.6
LITHUANIA	93	22.3	149	35.4
MOROCCO	90	21.6	113	26.8
TUNISIA	86	20.6	96	22.8

Table 3.2.e DIRG

	DIRG			
	1996		2006	
	Number	%	Number	%
U S	722	98.9	734	96.7
SWITZERLAND	719	98.5	731	96.3
CHINA	635	87.0	713	93.9
JAPAN	699	95.8	711	93.7
NORWAY	697	95.5	696	91.7
CZECH R	685	93.8	683	90.0
CANADA	670	91.8	682	89.9
POLAND	669	91.6	677	89.2
TURKEY	**580**	**79.5**	**676**	**89.1**
KOREA	602	82.5	665	87.6
INDIA	548	75.1	639	84.2
HUNGARY	640	87.7	624	82.2
ROMANIA	513	70.3	622	81.9
BRAZIL	558	76.4	607	80.0
ISRAEL	595	81.5	599	78.9
SLOVENIA	605	82.9	591	77.9
RUSSIA	587	80.4	576	75.9
THAILAND	493	67.5	574	75.6
MALAYSIA	513	70.3	567	74.7
SLOVAKIA	548	75.1	564	74.3
CROATIA	479	65.6	559	73.6
BULGARIA	481	65.9	558	73.5
MEXICO	467	64.0	548	72.2
ESTONIA	471	64.5	499	65.7
UKRAINE	340	46.6	456	60.1
TUNISIA	392	53.7	452	59.6
INDONESIA	393	53.8	449	59.2
LITHUANIA	319	43.7	446	58.8
MOROCCO	376	51.5	415	54.7
LATVIA	280	38.4	366	48.2

Based on the tables above, we also determine countries' gains and losses (i.e., increases and decreases) in their number of exported products from 1996 to 2006 for each technological category. This set of computations provides us with a preliminary idea about the extensive margins of the countries. Tables 3.3.a-e present our results in this regard.

Tables 3.3.a-e Gain and Losses in the Number of Exported Products

Table 3.3.a RMIG **Table 3.3.b LIG** **Table 3.3.c CIG**

	Gain in RMIG		Gain in LIG		Gain in CIG
LITHUANIA	181	BULGARIA	181	LATVIA	98
POLAND	130	ROMANIA	152	CHINA	96
ESTONIA	125	LATVIA	149	LITHUANIA	81
CHINA	116	UKRAINE	143	ROMANIA	75
SLOVENIA	108	LITHUANIA	135	INDIA	70
SLOVAKIA	97	BRAZIL	122	**TURKEY**	**70**
LATVIA	96	THAILAND	111	ESTONIA	66
BRAZIL	86	MALAYSIA	97	THAILAND	63
CZECH R	86	CHINA	90	TUNISIA	60
ROMANIA	83	INDIA	82	KOREA	57
INDIA	77	**TURKEY**	**78**	BRAZIL	51
THAILAND	66	CROATIA	72	MALAYSIA	49
CROATIA	61	MOROCCO	65	SLOVAKIA	48
BULGARIA	60	TUNISIA	60	UKRAINE	47
HUNGARY	58	INDONESIA	59	MEXICO	41
MALAYSIA	48	KOREA	57	CROATIA	40
NORWAY	45	SLOVAKIA	46	INDONESIA	40
UKRAINE	43	MEXICO	44	MOROCCO	37
TUNISIA	39	SLOVENIA	35	POLAND	30
INDONESIA	37	ESTONIA	31	SLOVENIA	30
TURKEY	**36**	RUSSIA	19	RUSSIA	27
KOREA	35	POLAND	9	ISRAEL	25
RUSSIA	27	CZECH R	6	CANADA	24
MEXICO	23	U S	1	HUNGARY	23
MOROCCO	19	JAPAN	-5	BULGARIA	15
ISRAEL	8	NORWAY	-5	CZECH R	6
JAPAN	1	SWITZERLAND	-6	JAPAN	4
CANADA	-1	CANADA	-8	U S	3
U S	-28	ISRAEL	-10	NORWAY	1
SWITZERLAND	-58	HUNGARY	-20	SWITZERLAND	-5

Table 3.3.d EIRG **Table 3.3.e DIRG**

	Gain in EIRG
TURKEY	**72**
UKRAINE	71
LATVIA	62
ESTONIA	59
LITHUANIA	56
THAILAND	54
CHINA	51
INDIA	48
SLOVAKIA	44
ROMANIA	40
CROATIA	39
SLOVENIA	39
KOREA	28
POLAND	27
CZECH R	25
MALAYSIA	25
MOROCCO	23
ISRAEL	16
MEXICO	14
BRAZIL	13
HUNGARY	12
INDONESIA	11
TUNISIA	10
BULGARIA	2
NORWAY	1
U S	1
CANADA	-7
JAPAN	-8
RUSSIA	-8
SWITZERLAND	-11

	Gain in DRIG
LITHUANIA	127
UKRAINE	116
ROMANIA	109
TURKEY	**96**
INDIA	91
LATVIA	86
MEXICO	81
THAILAND	81
CROATIA	80
CHINA	78
BULGARIA	77
KOREA	63
TUNISIA	60
INDONESIA	56
MALAYSIA	54
BRAZIL	49
MOROCCO	39
ESTONIA	28
SLOVAKIA	16
CANADA	12
JAPAN	12
SWITZERLAND	12
U S	12
POLAND	8
ISRAEL	4
NORWAY	-1
CZECH R	-2
RUSSIA	-11
SLOVENIA	-14
HUNGARY	-16

According to Tables 3.3.a-e, for Turkey, the increase in the number of types of export-products is 36 in RMIG, 78 in LIG, 70 in CIG, 72 in EIRG and 96 in DIRG. Interestingly enough, Turkey has the highest gain in the DIRG category, where it is ranked the 4th among its 30 competitors, thanks to its inclusion of 96 types of new products between 1996 and 2006. Reasonably, if the DIRG category is considered to

be the most important sector in terms of expanding development possibilities and improving export competitiveness in the long term, this result should be interpreted as a very positive outcome for Turkey's experience of export diversification in this period. That is to say, Turkey performed much better than the overwhelming majority of its competitors in the EU-15 market in the 1996-2006 period, in terms of diversifying its exports of DIRG, which usually tend to create the highest value-added from exporting activity and the largest improvements in the terms-of-trade for the exporting country. What is more, Turkey is the top-country in the EIRG category in terms of the increases in the number of exported products, with 72 new products being exported in 2006 as compared to 1996. That is to say, among the 30 exporters, Turkey is the most successful one in diversifying its exports of EIRG, which are presumably the second-best types of export-products for enhancing the level of development and degree of international competitiveness. However, as discussed in the context of the previous set of tables, Turkey's 2006-ranks for the EIRG and DIRG categories are still quite low (i.e., 14th and 9th, respectively), despite its prominently fine performance of export diversification in these categories from 1996 to 2006. Therefore, we can conclude that Turkey has still a long road to go to catch up with such developed countries as the US, Switzerland, Japan, Norway and Canada in terms of exporting as many research-intensive products as these countries actually sell in the EU-15 market. In this respect, a relatively more encouraging conclusion is also possible: In the post-2006 period, important opportunities seem to exist for Turkey, especially in the EIRG category and, to a slighter extents, in the DIRG category as well as in the CIG category, where Turkey ranks the 6th in terms of the increase in the number of new export-products. That is to say, the improvement opportunities are relatively more limited in the CIG and DIRG categories as Turkey already exports about 80 % and 90 % of all types of products in these categories, respectively; whereas the same percentage-ratio for the EIRG category is a much lower 65 %, as of 2006 (Tables 3.2.c-d-e). Finally, Turkey's similarity with India in both the number of product types and the increase in these numbers in LIG, CIG and DIRG is also noteworthy (Tables 3.2.b-c-e and Tables 3.3.b-c-e)

Moreover, it is observed in Tables 3.3.a-e that developing countries – especially Lithuania, Latvia, China, Romania, Ukraine and Turkey – are the

countries with the highest increases in the number of exported products from 1996 to 2006. In contrast, developed countries such as Switzerland, US, Japan, Canada and Norway are the ones with the lowest increases, and in some cases with decreases in the number of the type of products exported to the EU-15 market. However, the magnitude of the losses for the developed countries is much lower than the magnitude of the gains for the developing countries, implying that the developing counties did *not* necessarily improve their product varieties at the expense of the developed countries. EU-15's overall demand for imports should have sufficiently and effectively increased so as to create extra opportunities for the developing countries from 1996 to 2006.

3.3.2 Product Varieties and Extensive Margins (based on Feenstra and Kee, 2007)

In this methodology, the extensive margin of a country is defined as the growth rate of export-product variety from time t_0 to time t_1.

First, we measure product variety by the ratio of 'the value of worldwide exports in products that any country exports to the EU-15 market' to 'the value of worldwide exports from all non-EU-15 countries to the EU-15 market'. Formally:

$$PV_t^a = \frac{\sum_{j \in I_t^a} X_j^w}{\sum_{j \in I^w} X_j^w} \qquad (1)$$

where PV_t^a refers to the product variety of "country *a*" in year *t*; *j* refers to the product; *a* refers to the country-in-question (e.g. Turkey); *w* refers to the world (i.e., all non-EU-15 countries exporting to the EU-15 market in our case); I_t^a refers to the set of products exported to the EU-15 market by "country *a*" at time *t*; I^w refers to the total set of worldwide products exported to the EU-15 market in the overall period; and X_j^w is the *average value* of worldwide exports for product j, summed over all non-EU-15 countries and averaged across years. By summing across countries and

averaging across years, we obtain a consistent comparison set of products exported by the world that does not itself vary over time.

The numerator in this expression is the value of worldwide exports in products that "country *a*" exports to the EU-15 market, averaged over the years. The denominator is the worldwide exports from all non-EU-15 countries to the EU-15 market, which are also averaged over the years. Therefore, PV_t^a can be understood as world exports to the EU-15 market in I^a in year *t relative to* world exports to the EU-15 market in all I^w.

Then, the extensive margin of "country *a*" (EM^a) is defined as the growth rate of product variety from the year t_0 to the year t_1, and computed by the following formula:

$$EM^a = [\ln(PV_{t1}^a) - \ln(PV_{t0}^a) * 100 \qquad (2)$$

Table-3.4 below presents the product varieties and extensive margins of the countries from 1996 to 2006 for overall, manufacturing and primary sectors. The ranking is based on the extensive margins. Blue numbers indicate the countries, compared to which Turkey is definitely more successful in the related sectors. Green numbers show the countries with negative extensive margins.

Table-3.4 should be carefully interpreted. That is to say, product varieties and extensive margins should be considered together in making cross-country comparisons; because, considering only the extensive margin and taking it alone as a success indicator of exporting new products can be misleading. For example, in 1996, one country can have a very high product variety close to 100 percent, and another country can have a very low product variety. In 2006, the first country can still have a very high product variety close to 100 percent, and the second country might have increased its product variety remarkably. Given this pattern, let us suppose that the extensive margin for the first country turns out to be lower than that of the second country. In such a case, it can be misleading to conclude that the first country is definitely unsuccessful in exporting new products, as compared to the second country. More accurately, it could be safely concluded that a country is

definitely more successful than one of its competitors in exporting new products if that country's product variety in 1996 and its extensive margin are both higher.

Table 3.4 Product varieties and extensive margins, 1996 & 2006

	Overall				Manufacturing				Primary		
	PV-1996	PV-2006	EM		PV-1996	PV-2006	EM		PV-1996	PV-2006	EM
TURKEY	74.8	89.0	17.3	LATVIA	66.2	80.6	19.6	SLOVAKIA	29.7	71.6	87.9
LATVIA	64.4	76.1	16.7	UKRAINE	77.0	85.8	10.8	TURKEY	31.7	75.8	87.3
SLOVAKIA	70.7	83.4	16.5	LITHUANIA	73.5	79.2	7.5	POLAND	40.0	85.6	76.2
POLAND	78.7	91.8	15.5	ROMANIA	84.2	89.9	6.6	SWITZERLAND	51.1	87.1	53.3
SWITZERLAND	85.7	95.2	10.5	THAILAND	84.1	89.0	5.6	SLOVENIA	25.2	37.1	38.6
ROMANIA	69.0	76.1	9.8	MALAYSIA	83.5	87.7	4.9	ROMANIA	27.0	38.5	35.7
LITHUANIA	69.0	75.9	9.5	S KOREA	88.2	92.4	4.7	S KOREA	25.0	31.8	23.9
UKRAINE	72.0	79.1	9.3	CROATIA	80.0	83.7	4.6	MALAYSIA	25.5	31.5	21.1
S KOREA	71.2	76.3	6.8	CHINA	94.1	98.3	4.4	LITHUANIA	58.6	70.7	18.8
SLOVENIA	70.7	75.5	6.5	MOROCCO	76.2	79.5	4.2	HUNGARY	37.1	44.6	18.5
MALAYSIA	68.1	72.3	6.0	INDIA	90.4	93.8	3.7	INDIA	67.3	76.9	13.3
INDIA	84.0	88.9	5.7	ESTONIA	81.3	84.4	3.7	CZECH R	73.2	81.5	10.8
TUNISIA	70.8	74.7	5.3	INDONESIA	82.1	85.2	3.7	LATVIA	59.7	65.4	9.0
CZECH R	87.7	91.8	4.5	TURKEY	90.7	94.0	3.5	TUNISIA	58.1	62.8	7.7
MEXICO	78.3	81.3	3.7	TUNISIA	77.0	79.7	3.5	BRAZIL	77.0	83.1	7.6
BRAZIL	88.2	91.5	3.6	BULGARIA	82.4	85.3	3.4	MEXICO	60.7	64.2	5.7
BULGARIA	67.3	69.5	3.2	SLOVAKIA	85.6	88.5	3.3	UKRAINE	60.5	63.7	5.2
NORWAY	92.3	94.8	2.7	MEXICO	84.9	87.6	3.2	NORWAY	87.9	92.2	4.8
CROATIA	65.7	67.1	2.1	SLOVENIA	87.3	90.1	3.2	BULGARIA	28.2	28.9	2.4
HUNGARY	76.9	78.3	1.8	CZECH R	93.4	95.8	2.6	RUSSIA	81.0	82.6	2.0
MOROCCO	62.8	63.9	1.7	BRAZIL	92.7	95.1	2.5	ISRAEL	30.2	30.5	1.1
U.S.A	96.2	96.5	0.3	NORWAY	94.4	96.3	2.0	MOROCCO	25.3	25.6	1.1
JAPAN	80.4	80.0	-0.5	CANADA	95.1	96.6	1.6	U.S.A	90.5	89.8	-0.8
ISRAEL	75.8	75.3	-0.7	POLAND	93.0	94.4	1.5	JAPAN	40.6	36.5	-10.5
RUSSIA	90.4	89.1	-1.5	U.S.A	98.5	99.4	0.9	CROATIA	26.1	23.2	-12.0
CHINA	87.9	84.1	-4.4	JAPAN	95.3	96.0	0.7	CHINA	72.0	46.0	-44.9
THAILAND	79.5	74.8	-6.0	SWITZERLAND	98.7	98.5	-0.2	CANADA	82.1	46.2	-57.4
INDONESIA	78.0	71.2	-9.1	HUNGARY	91.1	90.6	-0.6	ESTONIA	68.0	38.0	-58.3
ESTONIA	77.7	70.8	-9.3	ISRAEL	92.6	91.6	-1.1	THAILAND	66.8	36.4	-60.8
CANADA	91.2	83.0	-9.5	RUSSIA	94.4	91.9	-2.7	INDONESIA	66.6	35.6	-62.7

According to Table 3.4, Turkey's extensive margin is the highest among other countries when we consider overall sectors. In 1996, Turkey exported 74.8 percent of all types of products that the EU-15 countries imported. That percentage-ratio increased to 88.96 in 2006, indicating a growth rate of 17.33 percent (using the logarithmic growth formula given above). Latvia, Slovakia, and Poland are the countries that follow Turkey. On the other hand, Japan, Israel, Russia, China, Thailand, Indonesia, Estonia and Canada are the countries that have negative extensive margins in the overall sectors. Extensive margin of the US has remained almost unchanged from 1996 to 2006, and it is also lower than that of the majority of

the countries. However, US is different from other countries, because its product variety was already very high in 1996 (96.24 per cent), which, of course, limited its possibilities of growth in product variety, and hence its extensive margin. Finally, Turkey's product variety in 1996 and also its extensive margin are both higher with respect to Tunisia, Slovenia, Slovakia, Lithuania, Romania, Malaysia, Bulgaria, Croatia, Latvia, Ukraine, Korea and Morocco. That is to say, in the case of overall sectors, Turkey is definitely more successful than these countries in exporting new products to the EU-15 market.

In the case of the manufacturing industry, Table 3.4 shows that all countries have increased their product variety from 1996 to 2006, except Switzerland, Hungary, Israel, and Russia. Also, in 2006, product varieties are higher for China and developed countries like the U.S, Switzerland, Japan and Canada; while extensive margins are higher for developing countries, especially for the small ones, such as Latvia, Ukraine, Lithuania and Romania. In manufacturing, Turkey's extensive margin is 3.52 percent, which is higher than that of Slovenia, Slovakia, Mexico, and Bulgaria. As compared to these countries, Turkey's product variety in 1996 is also higher. Therefore, we can conclude for the manufacturing industry that Turkey is definitely more successful than these countries in terms of the ability to export new products to the EU-15 market. It should also be noted that Turkey is very similar to India in terms of product variety and extensive margin in the manufacturing industry. Moreover, China is one of the most successful countries in manufacturing in terms of exporting new products. China's product variety in 1996 is higher (94.06 per cent) than that of the most countries, and its extensive margin is also higher than that of the countries such as the Czech Republic, Poland, Brazil, Israel, Hungary, Turkey, India, etc.

Table 3.4 shows that, for most of the countries, extensive margins in the primary sector are higher than those in the overall and manufacturing sectors. Most probably, this pattern is due to the fact that product varieties in the primary sector in 1996 were quite low for all countries, relative to those in overall and manufacturing sectors. This initial structural difference must have paved the way for higher growth in product variety in the primary sector from 1996 to 2006. In the primary sector, Slovakia has the highest extensive margin (87.9 percent). Turkey, Poland and

Switzerland have also relatively higher extensive margins as compared to their competitors. On the other hand, Indonesia, Thailand, Estonia, Canada and China are the countries that have the lowest extensive margins in the primary sector.

Next, we calculate and interpret the product varieties and extensive margins of the countries from 1996 to 2006 according to the technological characteristics of the exported products. Tables 3.5.a-e below present the results. The ranking is based on the extensive margins in each category.

Tables 3.5.a-e Product varieties and extensive margins, technological categories

Table 3.5.a RMIG

	RMIG		
	PV-1996	PV-2006	EM
SLOVAKIA	28.6	73.1	94.0
TURKEY	30.4	77.4	93.6
POLAND	39.5	87.6	79.7
SWITZERLAND	50.7	88.8	56.0
SLOVENIA	24.7	36.8	39.7
ROMANIA	27.3	35.1	25.1
HUNGARY	35.7	43.7	20.2
KOREA	23.8	28.8	18.8
LITHUANIA	60.9	71.2	15.5
MALAYSIA	24.7	28.4	13.9
INDIA	68.4	78.5	13.8
CZECH R	75.0	83.9	11.1
BRAZIL	78.0	85.2	8.8
LATVIA	62.0	67.7	8.7
TUNISIA	60.5	65.3	7.7
MEXICO	61.6	65.5	6.2
UKRAINE	62.3	65.5	5.1
NORWAY	90.4	94.7	4.7
ISRAEL	29.7	30.7	3.4
BULGARIA	26.4	26.9	1.8
RUSSIA	83.3	84.5	1.5
MOROCCO	25.2	25.4	0.8
U S	93.1	92.3	-0.9
JAPAN	40.1	36.4	-9.5
CROATIA	25.2	22.2	-13.0
CHINA	73.3	45.9	-46.8
CANADA	84.5	46.6	-59.4
ESTONIA	70.0	37.7	-61.9
THAILAND	67.8	35.5	-64.8
INDONESIA	68.6	35.1	-67.1

Table 3.5.b LIG

	LIG		
	PV-1996	PV-2006	EM
LATVIA	72.7	86.6	17.4
INDONESIA	86.6	95.4	9.6
UKRAINE	83.1	90.8	8.9
ROMANIA	84.9	92.8	8.8
LITHUANIA	77.6	84.1	8.0
BULGARIA	83.4	89.8	7.4
CROATIA	82.0	86.5	5.4
CANADA	93.7	98.1	4.6
BRAZIL	93.2	97.4	4.4
THAILAND	94.7	97.5	2.9
POLAND	91.7	94.2	2.7
TUNISIA	82.7	85.0	2.7
MOROCCO	80.6	82.5	2.4
SLOVENIA	89.0	91.0	2.3
SLOVAKIA	87.9	89.7	2.0
INDIA	96.6	98.5	2.0
TURKEY	92.7	94.5	1.9
ESTONIA	86.9	88.4	1.7
CHINA	98.4	99.8	1.4
RUSSIA	94.4	95.6	1.3
MEXICO	86.6	87.4	0.9
CZECH R	91.6	92.4	0.8
KOREA	91.5	91.8	0.4
SWITZERLAND	99.8	99.8	-0.1
U S	99.9	99.8	-0.1
JAPAN	98.5	98.4	-0.1
ISRAEL	95.5	95.3	-0.2
MALAYSIA	90.8	90.3	-0.5
NORWAY	94.6	93.5	-1.1
HUNGARY	93.8	91.5	-2.4

In the RMIG category (Table 3.5.a), Turkey's extensive margin is the second-highest just after Slovakia. This result is mainly due to Turkey's low product variety in 1996. Indeed, in 1996, Turkey exported 70% of the total number of exported products (Table-3.2.a), but the share of world exports of these Turkish products in total world exports was only 30.4 per cent (see Table 3.5.a). However, from 1996 to 2006, although Turkey's share of 70% increased to 80%, the share of world exports increased much faster from 30.4% to 77%. In this connection, we can argue that Turkish exporters seem to have made a correct choice by diversifying their exports in the RMIG category, for which the EU-15-demand for imports from the rest of the world increased remarkably. In this category, product varieties of the countries in 1996 were generally lower, as compared to other categories; and hence we observe relatively higher extensive margins in these RMIG.

In the LIG category (Table 3.5.b), product variety is the lowest for Latvia (72.7 %) in 1996 and for Lithuania (84.1 %) in 2006. Not surprisingly, Latvia has the highest extensive margin in LIG (17.4%). Indonesia (9.6%) and Ukraine (8.9%) follow Latvia. Especially Indonesia seems to be a very successful country in exporting new products in this category, because its product variety in 1996 was higher than that of many countries, and its extensive margin is the second-highest.

Turkey's extensive margin is 1.94% in this category. Among the countries with lower product variety than Turkey in 1996, Turkey's extensive margin is higher than Estonia, Mexico, the Czech Republic, South Korea and Malaysia. Therefore, in this category, Turkey is clearly more successful than these countries. However, its performance in exporting new products lags behind the countries such as India, Poland, Thailand, Brazil and Canada.

In the CIG category (Table 3.5.c), product variety is the lowest for Morocco both in 1996 and 2006. In this category, Korea has the highest extensive margin (21.7%), followed by Malaysia (21.7%) and Thailand (17.3%). Bulgaria (-6.4%) and Israel (-5.5%) has the lowest extensive margins. Turkey's extensive margin is 3.7% in this category. Among the countries having lower product varieties than Turkey in 1996, Turkey's extensive margin is higher than Croatia, Bulgaria and Israel. Therefore, Turkey's performance in exporting new products is definitely better than that of these countries. As we mentioned before, Turkey and India are very similar in

terms of the number of exported products. However, for the CIG category, in 1996, share of world exports of India's exported products in total world exports was much lower than that of Turkey. But, in 2006, these shares are close to each other. In a sense, this shows that India has been rather successful in choosing new products in this category. Turkey's performance in the CIG category is also quite similar to that of Slovakia and Slovenia. On the other hand, while Turkey and China were performing similarly in 1996, China seems to have surpassed Turkey considerably as of 2006.

In the EIRG category (Table 3.5.d), both in 1996 and 2006, product variety is the lowest for Tunisia (74.5%). The extensive margin is the highest for Ukraine (13.9%), followed by Latvia (13.2%) and Lithuania (9.9%). Not surprisingly, these are the countries with the lowest product variety in 1996. On the other hand, Indonesia (-1.4%), Japan (-0.9%), Switzerland (-0.4%) and Mexico (-0.2%) have the lowest extensive margins in this category. The case of Switzerland and Japan is obviously due to the fact that their product varieties in 1996 were already close to 100 %.

Turkey is very similar to Slovakia in terms of product variety and extensive margin in EIRG. Turkey's extensive margin is 5.2 %, and it is one of the highest values, putting Turkey in the 7th place out of 30. Moreover, Turkey's extensive margin is higher than Romania, Malaysia, Tunisia, Bulgaria, Croatia, Morocco, Indonesia, and Thailand. Turkey's product variety in 1996 was also higher than that of these countries. It is also noteworthy that Turkey's extensive margin in the EIRG category is the highest among all categories. Indeed, Turkey is even more successful in the EIRG than in the CIG category, since its product variety in EIRG in 1996 was higher than that in CIG, and also its extensive margin is higher in EIRG than in CIG. This relative success in EIRG on the part of Turkey can be considered an encouraging result, as it is usually desirable for any developing country to diversify successfully its exports of research-intensive goods on the way to improving international competitiveness and expanding development possibilities.

Finally, in the DIRG category (Table 3.5.e), product variety is the lowest in both 1996 and 2006, and the extensive margin (37.2%) is the highest for Latvia. Ukraine (11.0%), Lithuania (10.0%) and Romania (9.0%) follow Latvia in terms of

the extensive margin. On the other hand, Russia (-10.8%), Hungary (-2.4%), and Israel (-2.3%) have the lowest extensive margins in this category, even though their product varieties in 1996 were not significantly higher than those of the other countries. In other words, these three countries seem to be unsuccessful in diversifying their exports of DIRG. Turkey's extensive margin in DIRG is 3.1%, while its product variety was already high (91.3%) in 1996. Turkey's ability to export new products has been definitely higher than that of Poland, Japan, India, Hungary, Slovenia, Slovakia, Bulgaria and Estonia.

Table 3.5.c CIG

	CIG		
	PV-1996	PV-2006	EM
KOREA	69.8	86.7	**21.7**
MALAYSIA	62.5	77.7	**21.7**
THAILAND	67.3	80.0	**17.3**
ROMANIA	77.3	88.6	**13.6**
INDIA	77.2	88.2	**13.4**
MEXICO	71.8	80.5	**11.4**
MOROCCO	60.6	67.9	**11.4**
INDONESIA	62.6	69.6	**10.7**
CHINA	83.8	91.9	**9.2**
ESTONIA	76.0	83.3	**9.2**
TUNISIA	63.9	70.1	**9.1**
UKRAINE	73.2	80.0	**8.9**
LITHUANIA	68.6	72.0	**4.9**
LATVIA	68.6	71.6	**4.4**
HUNGARY	87.1	90.9	**4.3**
SLOVAKIA	84.0	87.6	**4.3**
TURKEY	84.5	87.7	**3.7**
CROATIA	71.5	74.0	**3.4**
RUSSIA	89.1	91.7	**2.8**
SLOVENIA	85.2	87.3	**2.5**
BRAZIL	86.3	88.4	**2.4**
NORWAY	90.7	92.6	**2.1**
POLAND	91.0	92.0	**1.2**
CANADA	87.3	88.3	**1.1**
CZECH R	89.7	90.4	**0.8**
U S	91.7	92.3	**0.6**
SWITZERLAND	93.3	92.9	**-0.4**
JAPAN	89.5	88.8	**-0.8**
ISRAEL	77.0	72.8	**-5.5**
BULGARIA	83.9	78.6	**-6.4**

Table 3.5.d EIRG

	EIRG		
	PV-1996	PV-2006	EM
UKRAINE	76.5	87.9	**13.9**
LATVIA	74.5	85.0	**13.2**
LITHUANIA	77.0	85.1	**9.9**
ESTONIA	81.1	86.2	**6.1**
SLOVENIA	86.5	91.9	**6.1**
SLOVAKIA	88.0	93.1	**5.6**
TURKEY	89.1	93.8	**5.2**
MALAYSIA	83.7	87.6	**4.5**
BULGARIA	82.2	85.8	**4.3**
THAILAND	85.1	88.3	**3.6**
ROMANIA	86.5	89.5	**3.5**
INDIA	93.7	96.9	**3.3**
CROATIA	81.9	84.6	**3.2**
TUNISIA	74.8	76.7	**2.5**
CHINA	96.0	98.2	**2.3**
CZECH R	96.3	98.1	**1.8**
MOROCCO	78.1	79.3	**1.6**
NORWAY	95.7	97.2	**1.6**
POLAND	94.9	96.4	**1.5**
KOREA	93.6	94.7	**1.1**
ISRAEL	95.8	96.4	**0.6**
HUNGARY	96.1	96.6	**0.4**
CANADA	97.0	97.2	**0.2**
RUSSIA	95.3	95.4	**0.2**
BRAZIL	94.3	94.3	**0.0**
U S	99.9	99.8	**-0.1**
MEXICO	91.9	91.8	**-0.2**
SWITZERLAND	99.8	99.4	**-0.4**
JAPAN	99.3	98.4	**-0.9**
INDONESIA	88.1	86.9	**-1.4**

Table 3.5.e DIRG

	DIRG		
	PV-1996	PV-2006	EM
LATVIA	50.5	73.2	**37.2**
UKRAINE	71.2	79.5	**11.0**
LITHUANIA	66.4	73.3	**10.0**
ROMANIA	81.3	89.0	**9.0**
MALAYSIA	85.0	90.6	**6.3**
KOREA	88.0	93.7	**6.3**
CHINA	91.2	96.8	**5.9**
CZECH R	91.3	96.3	**5.4**
CROATIA	78.7	82.9	**5.2**
NORWAY	92.0	96.8	**5.1**
MOROCCO	75.9	79.6	**4.8**
THAILAND	80.7	84.4	**4.5**
BULGARIA	79.5	83.0	**4.3**
MEXICO	82.3	85.5	**3.9**
TURKEY	91.1	94.0	**3.1**
SLOVENIA	84.1	86.5	**2.9**
JAPAN	89.6	92.1	**2.7**
U S	96.4	99.0	**2.7**
TUNISIA	76.5	78.5	**2.6**
BRAZIL	92.2	94.0	**1.9**
SLOVAKIA	80.3	81.8	**1.8**
ESTONIA	76.5	77.6	**1.4**
INDIA	86.6	87.4	**0.9**
POLAND	91.0	91.7	**0.8**
CANADA	95.4	95.4	**0.0**
SWITZERLAND	97.1	97.1	**0.0**
INDONESIA	80.7	80.4	**-0.3**
ISRAEL	92.2	90.1	**-2.3**
HUNGARY	85.2	83.2	**-2.4**
RUSSIA	93.0	83.5	**-10.8**

All in all, a general assessment of our results for Turkey's extensive margins in terms of the technological categories would go as follows: Due to a very low product variety in 1996, Turkey's extensive margin in RMIG has turned out to be the highest among 30 major exporters in the EU-15 market. In terms of Turkey's performance in the extensive margin, EIRG, CIG and DIRG follow RMIG, respectively. However, as a matter of fact, there are not considerably large differences in Turkey's extensive margins in the EIRG, CIG and DIRG categories. On the other hand, Turkey's extensive margin is the lowest in LIG, and this result occurred mainly due to the fact that Turkey's product variety in LIG in 1996 was already quite high (92.7 %); indeed, it was the highest product variety for Turkey among the five technological categories. Even so, Turkey's relative success in

especially the relatively high-tech products (i.e., EIRG and DIRG) should not be underestimated, because Turkey's product variety in these two categories was also rather high in 1996 (89.1% and 91.1%, respectively, for EIRG and DIRG). In other words, Turkey has exhibited a good performance in export diversification, as it seems to have been breaking its dependence on the traditional labor-intensive products and channeling its exporting capability increasingly more towards relatively high-tech products, as well as capital-intensive ones. Of course, these are desirable results for a developing country striving for enhancements in its international competitiveness.

More specifically, if we return to Tables 3.2.a-e and take a look at the final year (i.e. 2006), we observe that, in EIRG, Turkey exports 65 % of total number of products, and the share of world exports of these Turkish products in total world exports is 94%. In CIG, Turkey exports 80%, while the share of world exports is 88%. In DIRG, Turkey exports 80%, while the share of world exports is 94%. That is to say, Turkey is especially successful in diversifying its export-products in those technological categories for which the EU-15-demand for imports from the rest of the world has been in ascendancy. Therefore, focusing upon its exporting capability in the context of the EU-15 market, Turkey can be said to be successful in exporting new products. And, for the future, there seem be further opportunities to enhance its ability to diversify its exports, and hence its competitiveness.

3.3.3 Extensive and Intensive Margins of Export Growth (based on Amiti and Freund, 2008)

Unlike in the previous index, in Amiti and Freund (2008), who construct extensive and intensive margins of a country's export growth, both the extensive and intensive margins of a country depend only on the value of its own exports. In other words, it does not take into account the shares in the import market. So, the decomposition by Amiti and Freund (2008) is useful in terms of export growth of a country over time, rather than cross-country comparisons. Hence, the methodology developed by Amiti and Freund (2008) should not be confused with the methodology developed by Feenstra and Kee (2007).

Amiti and Freund (2008) decompose export growth of a country from one year to another into three parts: i) the increase in the export growth due to the growth in products that were exported in both years ("intensive margin"), ii) the contraction in export growth due to products exported in the base year but no longer exported in the final year ("disappearing goods"), and iii) the increase in export growth due to the export of new products ("new goods"). They define the extensive margin as 'the new-goods component' *minus* 'the disappearing-goods component'. At this point, we should note that Amiti and Freund (2008) is the first study to introduce "disappearing goods" into the definition of the extensive margin.

Formally, Amiti and Freund (2008) decompose export growth of a country from one year to the next into its extensive and intensive margins as flows:

$$\underbrace{\frac{\sum_j X_{t,j} - \sum_j X_{t-1,j}}{\sum_j X_{t-1,j}}}_{\text{Export Growth}} = \underbrace{\frac{\sum_{j \in I} X_{t,j} - \sum_{j \in I} X_{t-1,j}}{\sum_j X_{t-1,j}}}_{\text{(i) Intensive Margin}} + \underbrace{\frac{\sum_{j \in I_t^N} X_{t,j}}{\sum_j X_{t-1,j}} - \frac{\sum_{j \in I_t^D} X_{t-1,j}}{\sum_j X_{t-1,j}}}_{\text{(ii) (iii) Extensive Margin}} \quad (3)$$

where I_t^N is the set of products exported by the country in the year *t* but not exported in the year *t-1* (new products); I_{t-1}^D is the set of products exported in the year *t-1* but not exported in the year *t* (disappearing products); *I* is the set of products exported in both the year *t* and the year *t-1*; $X_{t,j}$ and $X_{t-1,j}$ are values of the exports of "product *j*" in the year *t* and the year *t-1*, respectively.

Therefore, as in Amiti and Freund (2008), we decompose export growth of a country from 1996 to 2006 into three parts:

(i) the growth in products that were exported in both periods, which they call "the intensive margin";

(ii) the increase in export growth due to the new products

(iii) the decrease in export growth due to the disappearing goods. Extensive margin is defined as the component (ii) *minus* component (iii).

Tables 3.6.a-c below present the export growth of the countries from 1996 to 2006 and the share of export growth attributed to the intensive and extensive margins for the overall, manufacturing and primary sectors, respectively. The ranking is according to the export growth for the overall sectors.

Tables 3.6.a-c Intensive and Extensive Margins, based on Amiti and Freund (2008)

Table 3.6.a Overall Industries

		Overall			
		Share of export growth from			
	ΔX (%	**Int.**	**Ext.**	*New*	*Disap.*
CHINA	499	0.98	0.02	0.02	0.00
SLOVAKIA	368	0.94	0.06	0.07	0.01
CZECH R.	343	0.99	0.01	0.01	0.01
ROMANIA	314	0.96	0.04	0.05	0.01
POLAND	312	0.97	0.03	0.04	0.00
UKRAINE	294	0.94	0.06	0.10	0.04
RUSSIA	294	1.03	-0.03	0.01	0.04
ESTONIA	292	0.93	0.07	0.09	0.01
HUNGARY	278	0.99	0.01	0.02	0.01
TURKEY	254	0.96	0.04	0.04	0.01
BULGARIA	251	0.93	0.07	0.09	0.02
MEXICO	227	0.99	0.01	0.03	0.02
KOREA	222	0.99	0.01	0.02	0.01
LITHUANIA	212	0.77	0.23	0.24	0.01
INDIA	152	0.87	0.13	0.14	0.01
BRAZIL	145	0.94	0.06	0.06	0.01
NORWAY	139	1.04	-0.04	0.00	0.05
TUNISIA	108	0.97	0.03	0.05	0.02
SLOVENIA	104	0.90	0.10	0.11	0.01
THAILAND	86	0.97	0.03	0.04	0.00
CROTIA	83	0.89	0.11	0.16	0.05
MALAYSIA	82	0.96	0.04	0.06	0.01
ISRAEL	72	0.99	0.01	0.04	0.03
MOROCCO	65	0.88	0.12	0.13	0.01
CANADA	64	0.67	0.33	0.39	0.06
INDONESIA	64	0.97	0.03	0.07	0.04
SWITZERLAND	60	1.01	-0.01	0.02	0.04
US	51	1.07	-0.07	0.00	0.07
JAPAN	37	1.01	-0.01	0.01	0.02

Table 3.6.b Manufacturing Industry

		Manufacturing			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
CHINA	524	0.98	0.02	0.02	0.00
CZECH R.	379	1.00	0.00	0.00	0.00
SLOVAKIA	376	0.95	0.05	0.05	0.00
UKRAINE	353	0.92	0.08	0.12	0.04
POLAND	327	0.99	0.01	0.01	0.00
HUNGARY	317	1.00	0.00	0.00	0.00
ROMANIA	310	0.97	0.03	0.04	0.00
ESTONIA	300	0.93	0.07	0.08	0.01
TURKEY	290	0.98	0.02	0.02	0.00
BULGARIA	259	0.99	0.01	0.03	0.02
MEXICO	234	0.99	0.01	0.02	0.01
KOREA	224	0.99	0.01	0.01	0.00
LITHUANIA	216	0.85	0.15	0.16	0.01
BRAZIL	180	0.96	0.04	0.05	0.00
RUSSIA	162	1.00	0.00	0.02	0.02
INDIA	160	0.94	0.06	0.06	0.00
THAILAND	101	0.97	0.03	0.03	0.00
TUNISIA	100	0.96	0.04	0.05	0.01
SLOVENIA	96	0.93	0.07	0.08	0.01
MALAYSIA	83	0.96	0.04	0.04	0.01
CROTIA	79	0.97	0.03	0.06	0.03
CANADA	76	0.76	0.24	0.25	0.01
ISRAEL	74	0.98	0.02	0.03	0.01
NORWAY	71	0.99	0.01	0.01	0.01
MOROCCO	59	0.90	0.10	0.11	0.01
US	56	1.00	0.00	0.00	0.00
SWITZERLAND	56	1.00	0.00	0.00	0.00
INDONESIA	51	0.93	0.07	0.10	0.03
JAPAN	36	1.00	0.00	0.00	0.01

Table 3.6.c Primary Industry

		Primary			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
RUSSIA	444	1.00	0.00	0.01	0.00
KOREA	386	0.99	0.01	0.01	0.00
ROMANIA	369	0.84	0.16	0.18	0.02
SLOVAKIA	327	0.85	0.15	0.16	0.01
SLOVENIA	300	0.63	0.37	0.38	0.01
ESTONIA	281	0.92	0.08	0.09	0.01
POLAND	257	0.90	0.10	0.11	0.00
BULGARIA	225	0.67	0.33	0.36	0.02
MEXICO	216	0.98	0.02	0.03	0.01
LITHUANIA	215	0.64	0.36	0.38	0.02
UKRAINE	211	0.97	0.03	0.05	0.02
NORWAY	203	1.00	0.00	0.00	0.00
CHINA	172	1.00	0.00	0.03	0.02
SWITZERLAND	168	0.98	0.02	0.02	0.00
TUNISIA	146	1.00	0.00	0.02	0.02
CZECH R.	139	0.88	0.12	0.12	0.00
BRAZIL	132	0.95	0.05	0.05	0.00
INDIA	118	0.38	0.62	0.62	0.00
TURKEY	114	0.77	0.23	0.23	0.00
CROTIA	108	0.53	0.47	0.50	0.03
HUNGARY	106	0.88	0.12	0.12	0.00
INDONESIA	89	1.01	-0.01	0.02	0.03
MOROCCO	79	0.85	0.15	0.16	0.01
MALAYSIA	75	0.95	0.05	0.07	0.01
ISRAEL	66	1.00	0.00	0.04	0.03
JAPAN	36	0.99	0.01	0.01	0.01
THAILAND	35	0.92	0.08	0.08	0.00
CANADA	30	0.88	0.12	0.22	0.10
US	15	0.98	0.02	0.08	0.06

According to the tables, China has the highest rate of export growth in both the overall and manufacturing sectors from 1996 to 2006. China is followed by Slovakia and the Czech Republic in those sectors. In the primary sector, Russia, Korea and Romania have the highest rate of export growth among others. On the other hand, developed countries such as Japan, the US and Switzerland have the lowest export growth in overall sectors.

Turkey's export growth rate is 254% in the overall sectors and 290% in manufacturing. In all categories, such MENA countries as Morocco and Tunisia, and such Asian countries as India and Indonesia have lower rates of export growth than Turkey. In general, China and the CEECs have higher rates of export growth than Turkey in overall and manufacturing sectors. Considering the extensive and intensive

margins of export growth, the tables show that a large proportion of the export growth of all countries arises from their intensive margins.

Interestingly, in overall sectors, Canada's extensive margin is the highest (33%), whereas the previous index showed that Canada is the least successful country in exporting new products. The reason why Canada has the highest extensive margin according to Amiti and Freund (2008) index can be explained as follows: In overall sectors, there is a product with code 99908, which was exported by Canada for the first time in 2006. However, product-99908 is registered as "confidential trade" in Eurostat. Even though this product constitutes a high proportion of Canada's total exports (12%), there is no corresponding data in EU-15. In other words, the share of this product in total imports of EU-15 is zero percent. Therefore, in the Amiti and Freund index, -which is based only on the own exports of the country, Canada's extensive margin turns out to be the highest, while it is the smallest in Feenstra and Kee (2007). Following Canada; Lithuania (23%), India (13%) and Morocco (12%) are the other countries with the highest extensive margins in overall sectors. The U.S (-7%), Russia (-3%), Norway (-4%) and Switzerland (-1%) have negative extensive margins due to disappearing goods from 1996 to 2006.

Rather similar to the cases of Romania and Taiwan, Turkey's extensive margin is 4% in overall sectors, and it results from the exports of new products. According to the Feenstra and Kee (2007) index, Turkey's extensive margin was the highest in overall sectors; however, according to the Amiti and Freund (2008) index, Turkey is ranked the 16^{th}. The reason for this big difference is that, in 2006, Turkey exported a relatively small amount in categories in which the world exported a lot to the EU-15 market.

In the manufacturing sector (Table 3.6.b), the effect of disappearing products on the extensive margin is generally much lower, as compared to the overall sectors. In manufacturing, only 2% of Turkey's export growth is due to the extensive margin, which results completely from new products. Canada (24%), Lithuania (15%) and Ukraine (8%) have the top-three extensive margins in manufacturing.

Relative to the overall and manufacturing sectors, the extensive margin in the primary sector is the highest for most of the countries (Table 3.6.c). 23% of Turkey's export growth in the primary sector is due to the extensive margin, which is

completely due to new products. India (62%), Croatia (47%) and Slovenia (37%) are the leading countries in the primary-sector exports in terms of their extensive margins.

Next, we calculate the extensive and intensive margins according to technological categories. Tables 3.7.a-e present the results, where the ranking is based on the export growth for overall sectors.

According to Tables 3.7.a-e, among other categories, Turkey's rate of export growth is the highest in the CIG category (940%) and 99 % of this growth comes from the intensive margin, hence only 1% from the extensive margin. This 1% arises completely from new products. The EIRG category (702%) follows CIG; and again only 1% of this growth comes from the extensive margin. New products lead to a 2% contribution to this growth, whereas disappearing goods cause a 1% decrease. In the DIRG category, Turkey's rate of export growth is 253% and 7% of this growth comes from the extensive margin. New products lead to a 10% increase, while disappearing goods cause a 3% decrease. In the LIG category, Turkey's rate of export growth is 154%. All of this growth comes from the intensive margin. Finally, in the RMIG category, Turkey's export growth is the lowest (123%), while its extensive margin is the highest (25%). All in all, we can conclude that a far greater portion of Turkey's export growth is due to the intensive margin, rather than the extensive margin. As we mentioned in the previous case, a relatively higher extensive margin in the RMIG category is a natural result since Turkey's product variety was very low in 1996. On the other hand, in DRIG, Turkey is quite successful in exporting new products, as compared to other categories. In CIG, while the export growth is very high, we observe that this growth has not been supported by new product varieties. For other countries, the extensive margins are relatively higher, such as China with 19%. In this regard, Turkey seems to have fallen behind its competitors in terms of producing and exporting new products.

As far as the other countries are concerned, in RMIG, Russia has the highest rate of export growth (439 %), and is due completely to the intensive margin. In this category, India has the highest extensive margin, which constitutes 63 percent of its export growth. Indeed, India is the only country whose extensive margin is higher than its intensive margin in this category. Moreover, Tunisia, Israel and Indonesia

have negative extensive margins. In other words, for these three countries, the decrease in export growth due to disappearing goods dominates the increase in export growth resulting from new products.

In LIG, a larger portion of the exports of most countries takes place along the intensive margin. In this category, China has the highest rate of export growth (325%) and 99% of this growth comes from the intensive margin. The highest extensive margin belongs to Slovenia (28%). Mexico is the only country with a negative extensive margin (–9%). For Mexico, new products lead to a 7-percent increase in export growth, while disappearing goods cause a 16-percent decrease.

Tables 3.7.a-e Extensive and Intensive Margins of the Export Growth, technological categories

Table 3.7.a RMIG

		RMIG			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
RUSSIA	439	1.00	0.00	0.00	0.00
KOREA	409	0.99	0.01	0.01	0.00
ROMANIA	302	0.89	0.11	0.13	0.03
ESTONIA	266	0.92	0.08	0.09	0.01
SLOVAKIA	264	0.85	0.15	0.16	0.01
SLOVENIA	243	0.82	0.18	0.19	0.01
POLAND	235	0.90	0.10	0.10	0.00
MEXICO	220	0.98	0.02	0.03	0.01
JAPAN	208	0.99	0.01	0.02	0.00
NORWAY	198	1.00	0.00	0.00	0.00
UKRAINE	197	1.00	0.00	0.06	0.05
CHINA	195	1.00	0.00	0.02	0.02
LITHUANIA	179	0.63	0.37	0.39	0.01
BULGARIA	170	0.62	0.38	0.47	0.09
BRAZIL	141	0.95	0.05	0.05	0.00
CZECH R.	123	0.86	0.14	0.14	0.00
TURKEY	123	0.75	0.25	0.25	0.00
INDIA	122	0.37	0.63	0.63	0.00
HUNGARY	118	0.89	0.11	0.11	0.00
TUNISIA	115	1.01	-0.01	0.02	0.03
CROTIA	100	0.54	0.46	0.48	0.02
INDONESIA	91	1.01	-0.01	0.02	0.03
SWITZERLAND	89	0.96	0.04	0.04	0.00
MALAYSIA	73	0.94	0.06	0.07	0.01
MOROCCO	66	0.85	0.15	0.16	0.01
ISRAEL	54	1.02	-0.02	0.02	0.04
THAILAND	37	0.92	0.08	0.08	0.00
CANADA	31	0.88	0.12	0.21	0.10
US	18	0.98	0.02	0.07	0.04

Table 3.7.b LIG

		LIG			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
CHINA	325	0.99	0.01	0.01	0.00
BULGARIA	273	0.97	0.03	0.03	0.00
ROMANIA	237	0.98	0.02	0.02	0.00
LITHUANIA	228	0.94	0.06	0.06	0.00
UKRAINE	208	0.97	0.03	0.05	0.01
SLOVAKIA	184	0.97	0.03	0.03	0.00
ESTONIA	175	0.96	0.04	0.05	0.00
CZECH R.	159	1.00	0.00	0.00	0.00
TURKEY	154	1.00	0.00	0.00	0.00
POLAND	149	1.00	0.00	0.00	0.00
RUSSIA	121	1.00	0.00	0.01	0.01
INDIA	111	1.00	0.00	0.00	0.00
HUNGARY	80	0.99	0.01	0.02	0.00
BRAZIL	79	0.96	0.04	0.04	0.00
TUNISIA	53	0.97	0.03	0.03	0.01
CANADA	52	-0.32	1.32	1.32	0.00
THAILAND	50	0.99	0.01	0.02	0.00
MALAYSIA	48	0.99	0.01	0.02	0.01
MOROCCO	47	0.98	0.02	0.03	0.01
ISRAEL	44	0.98	0.02	0.03	0.01
MEXICO	39	1.09	-0.09	0.07	0.16
US	32	1.00	0.00	0.01	0.01
KOREA	29	0.98	0.02	0.03	0.01
SLOVENIA	25	0.72	0.28	0.30	0.01
CROTIA	22	0.98	0.02	0.06	0.04
INDONESIA	19	0.98	0.02	0.03	0.01
JAPAN	16	0.99	0.01	0.02	0.01
NORWAY	15	0.99	0.01	0.02	0.01
SWITZERLAND	13	1.00	0.00	0.01	0.01

In CIG, China has the highest rate of export growth (1072%) and 81 percent of this growth comes from the intensive margin, hence 19% from the extensive margin. In this category, 71% of Malaysia's export growth comes from the extensive margin, putting Malaysia in the leader position in terms of the extensive margin. In CIG, it is interesting to note that the share of disappearing goods is nearly zero percent for most of the countries, presumably implying that demand for CIG is relatively stronger.

In EIRG, Slovakia has the highest rate of export growth (1578%) and 98% of this growth comes from the intensive margin. The highest extensive margin belongs to Ukraine (34%). Croatia and Japan have negative extensive margins due to disappearing goods.

Table 3.7.c CIG

		CIG			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
CHINA	1072	0.81	0.19	0.19	0.00
TURKEY	940	0.99	0.01	0.01	0.00
UKRAINE	811	0.91	0.09	0.10	0.01
LITHUANIA	657	0.74	0.26	0.29	0.03
TUNISIA	613	0.83	0.17	0.17	0.01
CZECH R.	572	1.00	0.00	0.00	0.00
THAILAND	513	0.97	0.03	0.03	0.00
ESTONIA	500	0.96	0.04	0.08	0.04
INDIA	466	0.78	0.22	0.22	0.00
POLAND	441	0.99	0.01	0.01	0.00
SLOVAKIA	407	0.96	0.04	0.04	0.00
KOREA	345	0.96	0.04	0.04	0.00
HUNGARY	315	0.99	0.01	0.01	0.00
BULGARIA	294	0.99	0.01	0.01	0.01
MEXICO	285	0.98	0.02	0.03	0.01
ROMANIA	236	0.94	0.06	0.07	0.01
INDONESIA	198	0.63	0.37	0.37	0.00
RUSSIA	196	0.98	0.02	0.02	0.00
SLOVENIA	192	0.94	0.06	0.07	0.00
BRAZIL	186	0.96	0.04	0.04	0.00
CROTIA	182	0.98	0.02	0.05	0.03
MOROCCO	157	0.67	0.33	0.34	0.01
ISRAEL	133	0.77	0.23	0.25	0.01
NORWAY	127	1.00	0.00	0.00	0.00
SWITZERLAND	99	1.00	0.00	0.00	0.00
US	85	1.00	0.00	0.00	0.00
MALAYSIA	83	0.29	0.71	0.72	0.00
JAPAN	51	1.00	0.00	0.00	0.00
CANADA	26	0.97	0.03	0.07	0.03

Table 3.7.d EIRG

		EIRG			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
SLOVAKIA	1578	0.98	0.02	0.02	0.00
CZECH R.	1081	1.00	0.00	0.00	0.00
CHINA	1009	1.00	0.00	0.00	0.00
POLAND	765	1.00	0.00	0.00	0.00
HUNGARY	757	1.00	0.00	0.00	0.00
TURKEY	702	0.99	0.01	0.02	0.01
ESTONIA	520	0.92	0.08	0.10	0.02
ROMANIA	507	0.87	0.13	0.14	0.01
LITHUANIA	288	0.78	0.22	0.22	0.01
BRAZIL	281	0.86	0.14	0.16	0.02
KOREA	260	1.00	0.00	0.01	0.00
MEXICO	246	1.00	0.00	0.01	0.01
INDIA	241	0.92	0.08	0.08	0.00
TUNISIA	213	0.92	0.08	0.09	0.01
RUSSIA	178	0.95	0.05	0.06	0.01
CANADA	177	0.99	0.01	0.02	0.01
UKRAINE	157	0.66	0.34	0.35	0.01
INDONESIA	155	0.97	0.03	0.03	0.00
SWITZERLAND	134	1.00	0.00	0.00	0.00
MALAYSIA	130	0.99	0.01	0.01	0.00
SLOVENIA	97	0.85	0.15	0.19	0.03
ISRAEL	95	0.99	0.01	0.01	0.00
THAILAND	92	0.98	0.02	0.02	0.00
NORWAY	92	0.96	0.04	0.04	0.00
US	68	1.00	0.00	0.00	0.00
BULGARIA	65	0.86	0.14	0.37	0.23
JAPAN	26	1.01	-0.01	0.00	0.01
CROTIA	17	2.34	-1.34	0.23	1.58
MOROCCO	2	3.62	-2.62	0.59	3.21

In DIRG category, Romania has the highest rate of export growth (819%) and 4% of this growth comes from the extensive margin. Lithuania has the highest extensive margin (28%); while Ukraine, Russia, Indonesia, Switzerland, Japan and Norway have negative extensive margins due to disappearing goods.

Table 3.7.e. DIRG

		DIRG			
		Share of export growth from			
	ΔX (%)	**Int.**	**Ext.**	*New*	*Disap.*
ROMANIA	819	0.96	0.04	0.04	0.00
POLAND	598	0.96	0.04	0.04	0.00
CHINA	567	0.95	0.05	0.05	0.00
ESTONIA	561	0.88	0.12	0.12	0.01
SLOVAKIA	442	0.87	0.13	0.13	0.00
CZECH R.	396	1.00	0.00	0.00	0.00
TUNISIA	356	0.99	0.01	0.02	0.01
BULGARIA	352	0.98	0.02	0.02	0.00
HUNGARY	334	1.00	0.00	0.00	0.00
MEXICO	279	0.98	0.02	0.02	0.00
INDIA	275	0.98	0.02	0.04	0.02
CROTIA	263	0.94	0.06	0.06	0.00
TURKEY	253	0.93	0.07	0.10	0.02
LITHUANIA	236	0.72	0.28	0.30	0.01
KOREA	235	1.00	0.00	0.00	0.00
UKRAINE	224	1.06	-0.06	0.15	0.21
BRAZIL	223	0.99	0.01	0.01	0.01
MOROCCO	146	0.94	0.06	0.07	0.01
SLOVENIA	131	0.92	0.08	0.09	0.01
THAILAND	126	0.94	0.06	0.06	0.00
ISRAEL	119	1.00	0.00	0.01	0.01
INDONESIA	114	1.15	-0.15	0.02	0.17
NORWAY	62	1.01	-0.01	0.01	0.02
CANADA	60	0.95	0.05	0.05	0.01
US	49	1.00	0.00	0.00	0.00
MALAYSIA	49	0.99	0.01	0.03	0.02
SWITZERLAND	40	1.01	-0.01	0.00	0.01
RUSSIA	40	1.80	-0.80	0.04	0.84
JAPAN	38	1.01	-0.01	0.00	0.01

Finally, we also calculate the 'Export Price Index' (EPI) for Turkey's intensive margin, and compare it to the EPI for the same export-products from the rest of the world (i.e., the world exports excluding intra-EU-15 exports) to the EU-15 market. Our analysis covers the period 1996-2006. Our index is based on Feenstra (1994), who derives a conventional price index as follows:

$$P = \prod_{j \in I} \left(\frac{p_{jt}}{p_{jt-1}} \right)^{w_{jt}(I)} \qquad (4)$$

where

$$w_{jt}(I) = \frac{\left(\frac{s_{jt}(I) - s_{jt-1}(I)}{\ln s_{jt}(I) - \ln s_{jt-1}(I)} \right)}{\sum_{j \in I} \left(\frac{s_{jt}(I) - s_{jt-1}(I)}{\ln s_{jt}(I) - \ln s_{jt-1}(I)} \right)} \qquad s_{jt} = \frac{p_{jt} X_{jt}}{\sum_{j \in I} p_{jt} X_{jt}}$$

In this set of formula, P is the export price index (EPI); p_{jt} is the unit value of product j in year t, defined as the ratio of the export value to quantity (X_{jt}); I is the set of products exported by Turkey in both periods; w_{jt} is the logarithmic mean of s_{jt} ; s_{jt} is the share of product j in Turkey's exports to the EU-15 market.

The EPI involves the products that Turkey exports in both 1996 and 2006 and Table 3.8 below shows the values of EPI for Turkey and the rest of the world (ROW) in the overall and manufacturing sectors, along with technological categories

Table 3.8. Export Price Index (EPI) for Intensive Margin, Turkey and the Rest of the World (ROW)

	TURKEY	ROW
Overall	**1.20**	**1.02**
Manufacturing	**1.12**	**0.96**
RMIG	**1.49**	**1.38**
LIG	**1.12**	**0.93**
CIG	**1.35**	**1.36**
EIRG	**1.09**	**0.84**
DIRG	**0.83**	**0.92**

In Table 3.8, for overall sectors, Turkey's EPI between 1996 and 2006 is 1.20, indicating a 20% increase in export prices over the period. On the other hand, the EPI for the same products from the rest of the world (ROW) is 1.02, indicating merely a 2% increase in export prices.

In the manufacturing sector, for the same products exported to the EU-15 market, the EPIs for Turkey and the ROW are, respectively, 1.12 and 0.96. In other words, in manufacturing, Turkey's export prices rose by 12 %, while the ROW's prices fell by 4 %. In RMIG, the EPI for Turkey (1.49) is higher than that for the ROW (1.38). In LIG, export prices rose by 12 % for Turkey, fell by 7 % for the ROW. In CIG, the values of the index for Turkey and the ROW are very close to each other (1.35 and 1.36, respectively).In EIRG, there is a 9-% increase for Turkey, and a 16-% decrease for the ROW. Finally, in DIRG, the index is 0.83 for Turkey and 0.92 for the ROW.

It is important to note that the EPI we calculated above assumes that the same products are available in the two years. In other words, it ignores new and disappearing products. In this regard, Kang (2009) theoretically and empirically shows that the fall in export prices is offset by increasing export-variety, suggesting that countries have to export more on the extensive margin to offset a fall in export prices. In the light of Kang's contribution, Turkey's high extensive margin in the DIRG category (see Table 3.7.e) can be said to have offset the fall in its export prices in this category over the period; moreover, exporting new products in the DIRG category becomes increasingly vital for Turkey to compete successfully in the EU-15 market. The same conclusion is also valid for the CIG category since the EPIs for Turkey and the ROW are almost the same.

As a final concluding remark, we can remind the following: Amiti and Freund (2008) interpret the price trends as an indicator of terms-of-trade effects. They argue that the decline in prices reflect a negative terms-of-trade effect since increased exports along the intensive margin push down the prices. Also, there may be further reasons behind the change in prices, such as changes in productivity and real exchange rates, which are, of course, beyond the scope of our study.

3.4 Concluding Remarks

In this chapter, we evaluated Turkey's export diversification in terms of extensive and intensive margins, and constructed a framework of analysis for comparing Turkey with its main competitors in the EU-15 market. We first calculated and assessed the number of products exported to this market by each

country in 1996 and 2006, since changes in the number of exported products give a preliminary idea on the extensive margins of the countries. Then, we analyzed the extensive and intensive margins in terms of export shares by using more sophisticated methodologies. First, we examined the extensive margins of all countries over time, based on the methodologies developed by Hummels and Klenow (2005) and Feenstra and Kee (2007). In this regard, we evaluated the importance of new products in terms of their shares in the EU-15 market. Secondly, based on Amiti and Freund (2008), we measured the relative importance of extensive and intensive margins on Turkey's export growth in the EU-15 market from 1996 to 2006, and compared it with Turkey's main competitors in this market. In this way, we assessed the importance of new products in terms of their shares in countries' own exports. Last but not least, we also computed the Export Price Index for Turkey's intensive margin, and compared it with that of the rest of world in the context of the EU-15 market.

One of our major results is that the much larger portions of export growth are generally due to the intensive margin (rather than to the extensive margin) for all countries.

In our cross-country comparisons, in terms of the number of newly exported products, we observed that Lithuania, Poland, Estonia, China and Slovenia in RMIG; Bulgaria, Romania, Latvia, Ukraine and Lithuania in LIG; Latvia, China, Lithuania, Romania, India and Turkey in CIG; Turkey, Ukraine, Latvia, Estonia and Lithuania in EIRG; and Lithuania, Ukraine, Romania, Turkey and India in DIRG are the most successful countries.

Based on Feenstra and Kee (2007), our computations demonstrated that, in 2006, product varieties are especially higher for China and such developed countries as the U.S, Switzerland, Japan and Canada, while the extensive margins are generally higher for the developing countries, especially for the small ones like Latvia, Ukraine, Lithuania and Romania.

We detected that Turkey's extensive margin is the highest among other countries in overall sectors, and that Turkey has a higher ability to export new products as compared to Slovenia, Slovakia, Bulgaria and Taiwan in both the overall

and manufacturing sectors. Also, Turkey is very similar to India in terms of product variety and the extensive margin in the manufacturing industry.

In the case of the manufacturing industry, all countries have increased their product variety from 1996 to 2006, except Switzerland, Hungary, Israel, and Russia. Not surprisingly, China is one of the most successful countries in this industry in terms exporting new products.

For most of the countries, extensive margins in the primary sector are higher than those in the overall and manufacturing sectors. This pattern is most probably due to the fact that product varieties in the primary sector in 1996 were quite low for all countries, relative to those in the overall and manufacturing sectors.

Based on the extensive-intensive margin methodology developed by Amiti and Freund (2008), which is especially useful in terms of analyzing the export growth of a country over time; our results indicated that Turkey's rate of export growth is the highest in the CIG category (940% from 1996 to 2006). However, 99% of this growth comes from the intensive margin, implying that the remaining 1% comes from the extensive margin. This 1% contribution by the extensive margin arises completely from new products. In RMIG, Turkey's export growth is the lowest (123%), while its extensive margin is the highest (25%). The share of disappearing products is zero percent in RMIG, LIG and CIG, 1% in EIRG, and 3% in DIRG. Therefore, we can conclude that disappearing products do not lead to a remarkable decrease in the export growth of Turkey. We also conclude that the intensive margin, as compared to the extensive margin, is far more effective in Turkey's export growth.

From Turkey's point of view, rather than in the context of cross-country comparisons, according to the three types of extensive-intensive margins measurement (i.e., the number of exported products; Feenstra and Kee; and Amiti and Freund), in the RMIG category, Turkey's ability to export new products seems quite successful. In 1996, although the number of products exported by Turkey is not very low, the share of world exports of these products in the total world exports is very small. However, Turkey has overcome this drawback to a large extent as of 2006, presumably due to Turkish exporters' correct choices of new products and the high share of these products both in the EU-15 market and in Turkey's own exports. In LIG, the number of products that are already being exported by Turkey as well as

the world export share of these products in total world exports to the EU-15 are higher, as compared to other categories in 1996. This structural aspect of the LIG category has limited the increase in Turkey's extensive margin. In both EIRG and CIG, Turkey exhibited a successful performance in terms of exporting new products from 1996 to 2006, as based on our results obtained through the methodology developed by Feenstra and Kee (2007). It should also be noted that Turkey performed better in EIRG than in CIG. However, our results based on the methodology of Amiti and Freund (2008) show that these new products lead to an infinitesimal increase in Turkey's own export growth. In DIRG, Turkey is also quite successful in terms of its ability to export new products, based on all the three criteria.

Utilizing the Feenstra and Kee (2007) index, we detected that Turkey's product varieties in EIRG and CIG increased considerably from 1996 to 2006. However, Amiti and Freund (2008) index shows that the extensive margin is very small in these categories. In other words, there are new products exported by Turkey to the EU-15 market, and the share of world's exports of these products in EU-15's total imports increased remarkably. However, Turkey's value of exports of these products increased only slightly.

Consequently, the new products produced and exported by Turkey from 1996 to 2006 seem to be correct choices for improving its competitiveness. Turkey has opportunities to raise its export growth as well as its competitiveness in the EU-15 market by increasing the production and exports of these new products. However, it should also be noted that if Turkey continues to export these new products at the existing relatively low levels, its competitiveness will not improve at all. If Turkey has unsurpassable difficulties to achieve an increase in the exports of these new products, a 'second-best' choice can be re-allocating resources to the production of the 'old' products that have already been exported previously.

CHAPTER 4

COMPARATIVE ADVANTAGES AND DYNAMIC MARKET POSITIONING: THE CASE OF TURKEY IN THE EU-15 MARKET

4.1 Introduction

In this chapter, we analyze Turkey's comparative advantages vis-à-vis the non-EU-15 countries in the EU-15 market. Since such static treatment may be insufficient in figuring out the changes in comparative advantages over time, we also analyze Turkey's dynamic market positioning in the EU-15 market vis-à-vis its competitors. Finally, based on the comparative advantages, we examine the extent to which the exports of Turkey and its competitors pose 'threats' to each other by means of two useful indexes for measuring competitive threat.

More specifically, evaluating the comparative-advantage patterns of Turkey and its competitors, we aim at determining Turkey's competitiveness position in the EU-15 market. We also monitor the dynamic positioning of Turkish exports by identifying the products that shift dynamically and by examining whether these shifts have arisen from the supply-side fluctuations in Turkey or from the demand-side fluctuations in the EU-15 market. Based on these static and dynamic approaches, we select the relatively more promising sectors for Turkey's exports. Last but not the least; we also analyze the threatening effects on Turkish exports from especially the new EU members and the rise of China in order to decide whether Turkey's existing concerns about these countries are reasonable.

Technically, we use the 'Revealed Comparative Advantage' (RCA) index due to Bela Balassa (1965). However, this RCA index treats the concept of comparative advantage from a static point of view and such static treatment is usually insufficient in explaining the changing comparative advantages over time. Dynamically changing nature of comparative advantages is self-evident in, for example, China's surpassing of Japan or developing countries' surpassing of the developed ones in terms of competitiveness. Therefore, we also classify exports by their dynamic market positions, following Edwards and Schoer (2002). Finally, based on the RCAs, we

utilize two competitive threat indexes to analyze the threat on Turkey's exports from other countries, and vice versa. The first competitive threat index is based on Spearman's rank correlation coefficients between the RCAs, and the second one is a kind of 'threat/opportunity index' that we develop.

Differently from the previous literature, which has generally focused on Turkey's comparative advantages vis-à-vis EU-15 countries in the EU-15 market (Erlat and Erlat, 2005) or Turkey's comparative advantages vis-à-vis other countries in the world market; we analyze Turkey's comparative advantages vis-à-vis the non-EU-15 countries in the EU-15 market. Moreover, this paper is the first attempt to evaluate Turkey's dynamic market positioning vis-à-vis its competitors in the EU context.

Whether there have been significant changes in Turkey's comparative advantages in the EU market and the sectors in which these changes can be further utilized as potential advantages, there are two important issues facing the prospects of trade policy in Turkey, which has been a candidate for EU membership for a long period of time. Hence, analyzing Turkey's comparative advantages at this level of detail can provide useful information for decision-making processes, by way of which Turkey's growth and development possibilities can be raised via efficient allocation of resources. Also, analyzing the magnitude of competitive threat on Turkey by other countries helps to understand whether there are significant reasons for Turkey to carry serious concerns about such threats.

4.2 Literature Review

In this section, we review some prominent empirical applications of the Revealed Comparative Advantage (RCA) approach. In the literature, many different RCA indexes have been suggested and used, such as those by Bowen (1983), Yeats (1985), Vollrath (1991), Lafay (1992), etc. However, the most commonly used RCA index in empirical studies remains Balassa's 'classical' RCA index (Balassa, 1965).

Amador et al. (2009) compare export and import patterns of Portugal with Spain, Greece and Ireland between 1967 and 2004, using ISIC 4-digit data. Based on the Balassa index, they find that Portugal becomes more open and less specialized in exports over time, like Spain and Greece. However, the degree of specialization is

higher in exports than in imports. They also find that the degree of persistence of export patterns is higher than that of import patterns. Arghyrou and Bazina (2002) examine the competitiveness and the trade performance of Greece at the sectoral level, based on the RCA index. Their analysis shows that, in the 1990s, Greece lost its competitiveness in the sectors in which it had comparative advantage previously. Ferto and Hubbart (2002) investigate the competitiveness of Hungarian agri-food sector vis-à-vis the EU for the period 1992-1998 by employing the RCA index, the Relative Trade Advantage (RTA) index, the Relative Export Advantage (RXA) index and the Relative Import Advantage (RIA) index. Haddad (2000) uses the RCA index to assess the competitiveness of the Middle Eastern and North African (MENA) countries in the world market.

In the literature, the studies on Turkey's competitiveness mostly use the RCA index; and also, most of them evaluate Turkey's competitiveness in the EU market. Akgüngör et al. (2002) examine the competitiveness of the Turkish 'fruit and vegetable processing industry' in the EU market. By using the RCA index and export performance index (EPI), they find that Turkish exports are competitive relative to Spanish and Portuguese exports in the grape processing sector, while they are competitive relative to Greek and Portuguese exports in the processed citrus products sector. However, Turkey does not have a competitive advantage for processed tomato exports over the rival countries.

Vergil and Yıldırım (2006) evaluate the effects of the Customs Union (CU) on the competitiveness of Turkey in the period 1993-2002. This one is the first studies using panel data econometric methods, based on the RCAs for 215 exporting industries, which are categorized according to their technology levels (using the classification developed by Foders, 1996), as well as according to the intensities of factors of production (using the method developed by Hufbauer and Chilas, 1974). The dependent variable in the model is the RCA index, while the explanatory variables are the exchange rate, GDP of EU, and a dummy variable for capturing the effects of the CU. They find that the CU has a positive effect on the competitiveness of advanced-technology and difficultly-imitable research-oriented products, while it has adverse effects on the competitiveness of capital-intensive and intermediate-technology products of Turkey in the EU market.

Yılmaz (2003) examines the international competitiveness of Turkey vis-à-vis Bulgaria, Romania, the Czech Republic, Hungary, Poland and the EU-15 in the world market between 1996 and 1999, based on the following four indexes: RCA, Comparative Export Performance (CEP), Trade Overlap (TO), Export Similarity (ES). In this study, the sector-level classification is also based on Hufbaer and Chilas (1974). In terms of the RCA index, empirical results suggest that Turkey is in a strong competitive position in the labor-intensive sector, while it has comparative disadvantages in the easily-imitable research-oriented sector and the difficultly-imitable research-oriented sector.

Similarly, Utkulu and Seymen (2004) analyze Turkey's competitiveness and trade structure vis-à-vis the EU at the sector-level, based on various RCA measures. They use annual 2-digit SITC-Rev.3 data, covering 63 products for the period 1990-2002. Seymen and Şimşek (2006) investigate and compare the competitiveness of Turkish and Chinese exports in the OECD market, based on several RCA indexes.

Erlat and Erlat (2005) examine the comparative advantage of Turkish exports relative to the EU exports. They use annual 3-digit SITC-Rev.3 data, covering 256 products for the period 1990-2000. They employ the RCA index, using two different classifications of the sectors. The first classification is based on their 'traditionality index', while the second one is based on Hufbauer and Chilas's (1974) technological classification which is used throughout this thesis. They find that Turkey has comparative advantage in 82 sectors out of 256. In addition, Belgium, Denmark, Finland, Greece and Spain show a similar pattern with Turkey. They also show that the shares of the traditional sectors, in which Turkey has comparative advantage, are decreasing. The reason for this decrease can be explained as follows: The traditional exporters tend to take their competitiveness for granted, and they do not significantly try to improve their products and exporting abilities. Of course, such deficiencies on the part of traditional exporters should be dealt within the context of a careful export policy. Those sectors with relatively higher comparative advantages should be evaluated in accordance with their export shares.

İnce and Demir (2007) analyze Turkey's competitiveness vis-à-vis Germany, investigating RCA patterns and sector-level shares of export and import items. They

find that Turkey has a comparative advantage in textile and apparel products, while it has a comparative disadvantage in high-tech products with respect to Germany.

4.3 Data and Methodology

In this chapter, we use the 'UN-comtrade' database, which reports trade flows for goods in terms of value and weight at the 3-digit level of SITC-Rev.3 classification, which includes 256 products. Since EU-15 is not available as a single market, we compile the EU-15 data by bringing together the separate data provided by each individual member country. Our calculations are also based on SITC-Rev.3 at 3-digit level. The data cover the 1996-2010 period.

In this respect, there is a potential limitation such that the RCA may actually result from policy-related or other distortions, rather than the true comparative advantage. To mitigate such a potential limitation, we examine export patterns in time series rather than at a point in time. We make our calculations for each year, but we present the results as the averages for the whole period and for two sub-periods. That is to say, we divide the whole period into a 'first period' (1996-2003) and a 'second period' (2004-2010). By doing this, we are able to see whether there is a significant difference between the RCA patterns of the sectors before and after the EU-expansion in 2004.

All data are measured in US Dollars ($US). Since we were not able to find 'world export data', we obtained it by adding up the exports of all countries to the EU-15 market. In this way, we also minimize some potential 'distortion problems', since it is known that imports may be distorted by transportation costs, insurance expenses, etc. Such distortions are less likely in the case of export data.

We also classify the products in accordance with their technological characteristics, exactly like in the previous chapters. Just to recall this classification at the expense of repetition, this method categorizes the products as 'raw-material-intensive goods' (RMIG), 'labor-intensive goods' (LIG), 'capital-intensive goods' (CIG), 'easy-to-imitate research-intensive goods' (EIRG), and 'difficult-to-imitate research-intensive goods' (DIRG).

In this chapter, our analysis of Turkey's competitiveness performance involves the computation of static and dynamic RCA indexes as well as competitive threat indexes. The methodologies to obtain these indexes are summarized below.

4.3.1 The RCA index by Balassa (1965)

Traditional trade theory provides us with a useful framework to understand how countries compete in the international markets. In this framework, competitiveness is generally linked to relative price (cost) differences. A country has a comparative advantage in the production of a good if it can produce that good at a lower opportunity cost than its trading partner and, therefore, every country should specialize in those goods in which it has a comparative (cost) advantage.

It is well-known that David Ricardo (1772-1823) developed the 'classical' trade theory that explains the basis and patterns for trade in terms of the differences in comparative advantages, based on comparative labor costs. It can be seen in any standard textbook on international economics that there are two countries producing two goods using labor as the only factor of production in the simplest version of the Ricardian model of trade. Goods are assumed to be identical across countries, while labor productivities (or inversely, labor requirements per unit of output) can vary across countries. It is this technological difference (that is to say, the difference in labor productivities) what makes trade possible and mutually beneficial between the two countries. The technological differences are reflected by the differences in unit labor costs. In addition, goods are assumed to be transported between countries at zero cost; that is to say there are no transportation costs. By assumption, labor cannot move between countries, although it can be re-allocated between industries within a country. Generally, full employment of labor is assumed. Another underlying assumption of the model is the existence of perfect competition. This assumption makes the price of each good equal to its marginal cost of production, while producers are price-takers because they are too small to affect the market price. The later 'neoclassical' Heckscher-Ohlin (HO) model of international trade theory is a modified version of the Ricardian theory of comparative advantage. In this model, the main source of comparative advantage is not technological difference per se. The HO model assumes that technology is the same everywhere, and that comparative

advantage arises from differences in relative factor endowments, which lead to differences in relative factor prices and differences in relative prices of the goods. Thus, in a two-country, two-good and two-factor (labor and capital) framework, relative abundance (or scarcity) of the two factors gives rise to varying relative goods-prices in the two countries, eventually yielding reciprocal comparative advantages.

However, measuring comparative advantage is problematic due to the unobservable relative autarkic prices; that is to say, they are simply unobservable at the post-trade equilibrium. Therefore, some 'revealed' indexes have been developed to analyze comparative advantages. Actually, it was Liesner (1958) who first attempted to 'reveal' comparative advantages. However, the most common measures of comparative advantage are generally based on the 'Revealed Comparative Advantage' (RCA) index developed by Bela Balassa (1965). Balassa (1965) assumes that trade patterns reflect both relative costs and differences in non-price factors. Then, he suggests that comparative advantage can be 'revealed' by observing trade patterns. He formulated the RCA index as follows:

$$RCA_{ij} = \frac{X_{ij} / X_i}{X_{wj} / X_w} \qquad (1)$$

where RCA_{ij} is the revealed comparative advantage index for commodity *j* of country *i*; X_{ij} is the exports of commodity *j* of country *i*; X_i is the total exports of country *i*; X_{wj} is the world exports of commodity *j*; and X_w is total world exports. Rearranging the terms on the right-hand side, it can be shown that the RCA_{ij} index compares "country *i*'s share in the world market for commodity *j*" to "its share in the world market for all commodities".

At this point, the scope of the countries and products can change depending on the main purposes of each study. The term 'world' may cover all countries, a group of countries, or a single country. For example, Erlat and Erlat (2005) use the term 'world' to cover the EU-15 countries. In this chapter, we consider EU-15 as a single

country and analyze the RCA of Turkish exports in this 'single' market vis-à-vis world exports (excluding intra-EU trade) to this market. Therefore, 'world' covers non-EU-15 countries exporting to the EU-15 market.

The value of the RCA index varies between zero and infinity at product level. When RCA is higher (lower) than 1, "the share of country *i*'s exports of commodity *j* in its total exports" is higher (lower) than "the share of world's exports of commodity *j* in world's total exports"; and hence, country *i* has a revealed comparative advantage (disadvantage) in commodity *j*.

This RCA index is a very popular measure of a country's trade specialization and competitiveness. It is useful in determining whether a country has a comparative advantage in a certain product or not. However, it is not clear whether the magnitude of the RCA index actually reflects the magnitude of comparative advantages. For this reason, Hillman (1980) developed a necessary and sufficient condition for the correspondence between RCA index and pre-trade relative prices. Under this condition the RCA index can be more appropriate for cross-country comparisons. Then, Marchese and Simone (1989) rewrote Hillman's (1980) condition in the following form:

$$HI = \frac{1-(X_{ij} / X_{wj})}{(X_{ij} / X_i)(1-(X_i / X_w))} \qquad (2)$$

If HI is larger than unity, then the RCA index will be a good indicator of cross-country comparisons of comparative advantage. In our study, we find that HI is greater than unity for all the sectors and countries, and therefore we conclude that RCA is a good indicator for cross-country comparisons.

4.3.2 Dynamic RCA Index by Edwards and Schoer (2002)

The RCA index by Balassa (1965) treats the concept of comparative advantage from a static point of view and such static treatment is usually insufficient in explaining the changing comparative advantages over time. Therefore, Edwards and Schoer (2002) developed an index to analyze the changing comparative advantages

over time. They called it the "Dynamic RCA index". They built the index by decomposing the growth in RCA into its components. Formally, by taking the logs of the conventional RCA index and then by total differentiation, they decomposed the growth in the RCA index as follows:

$$\frac{\Delta RCA_{ij}}{RCA_{ij}} = \frac{\Delta(X_{ij}/X_i)}{X_{ij}/X_i} - \frac{\Delta(X_{wj}/X_w)}{X_{wj}/X_w} \qquad (3)$$

In this formula, the first term on the right-hand side reflects the growth in the share of commodity *j* in total trade of country *i*, and the second term reflects the growth in the share of commodity *j* in world trade.

Observing the relative trends in the share of commodity *j* in country *i* and world exports, Edwards and Schoer (2002) analyze the 'dynamics of market position' as summarized in Table 4.1 below.

Table 4.1 Dynamic Market Positioning of Exports (by Edwards&Schoer, 2002)

Share of commodity j in country i's exports		**Share of commodity j in world exports**	**Rising Stars**
↑	>	↑	
↑		↓	**Falling Stars**
↓	>	↓	**Lagging Retreat**
↓	<	↓	**Leading Retreat**
↑	<	↑	**Lagging Opportunity**
↓		↑	**Lost Opportunity**

Source: Edwards and Schoer (2002)

Following Edwards and Schoer (2002), we classify Turkish exports according to their dynamic market positions, such as "rising stars", "falling stars", "lagging retreat", "leading retreat" and "lost opportunity". We also apply this classification to

all other countries under consideration. However, we should note that Edwards and Schoer (2002) evaluate the changes in RCA by comparing the values between an initial and a final year. In this study, our evaluation is somewhat different. We evaluate the changes in RCA on a year-by-year basis. In this way, we calculate average annual changes in RCA. Hence, our evaluation does not depend merely on a comparison of the initial and final years in the period under consideration. That is to say, we are able to include all the years into our evaluation process.

In our approach, thus, we compare "the increase or decrease in the share of a product in Turkey's total exports" and "the increase or decrease in the share of that product in world's total exports to EU-15". If Turkey's share is rising in the EU-15 market more than the rise in the share of this product in world exports, then we classify this as a "rising star". This is the most preferred location for a country since the market share of the country is increasing in products for which demand is growing worldwide. If Turkey's share is rising but less than the rise in the share of this product in world exports, then we classify this as a "lagging opportunity". If Turkey's share is falling less than the fall in the share of this product in the world market, it is called a "leading retreat". If Turkey's share is falling more than the fall in the share of this product in the world market, it is called a "lagging retreat". If Turkey's share is rising while the share in worldwide exports is falling, it is called a "falling star". Conversely, if Turkey's share is falling while the share in worldwide exports is rising, it is called a "lost opportunity". This is the least favorable position for a country. The cases of "rising stars" and "leading retreat" are evaluated as "successful restructuring of exports", while the cases of "falling stars" and "lost opportunity" are evaluated as "poor restructuring of exports". Leading retreat is referred to as "successful restructuring" since "retreat" may be seen as a rational way of restructuring away from the products with declining demand in the EU-15 market. Also, "falling stars" are not evaluated as undesirable as lost opportunity, since a country is gaining market share in this case, although it is not as desirable as the rising star category. Moreover, Tsikata (1999) also carries out a four-fold classification of dynamic market positions, which is slightly different from that of Edwards and Schoer (2002) and he puts the "falling star" category in the "competitive but vulnerable" quadrant.

4.3.3 Competitive threat indexes based on RCAs

The purpose of the methodologies described in the previous section is to examine the competitive performance of the countries based on static and dynamic RCA indexes. In addition to such analysis, we also examine the extent of 'competitive threat' that Turkey and the other countries pose to each other. Actually, analyzing the threat from China to the exports of other developing countries has been very popular in recent years. From Turkey's perspective, admission of the CEECs to the EU has also increased its concerns about the 'threatening/opportunity effects' in relation to these countries, especially in recent years.

In the literature, the studies on 'competitive threat' generally use the 'Export Similarity Index' (ESI) developed by Finger and Kreinin (1979). However, Jenkins (2008) criticizes the interpretation of the ESI as an indicator of competitive threat from one country to another. He argues that a single value of ESI for a pair of countries implies that competitive threat between two countries is the same for both. However, he claims that, since the scale of total exports and degree of export diversification may be different for these countries, a single ESI value cannot represent the reciprocal threat between the countries. At this point, we should recall that we also computed and utilized the ESI in the context of our Chapter 2. However, considering Jenkins' critique, we interpreted this index merely as an indicator of the degree of similarity between the export compositions of Turkey and its competitors. That is to say, in our Chapter 2, we used the ESI for the purpose of determining Turkey's major competitors in the EU-15 market, rather than analyzing reciprocal threats. Therefore, in this Chapter 4, we employ two other methodologies to deal with competitive threats. In this regard, a popular measure of the degree and nature of competition between two countries in a common export market is the Spearman's Rank Correlation (SRC) coefficient between the RCA indexes of the countries (Shafaeddin, 2004; Lederman et al., 2006). SRC coefficient is a nonparametric test, which is often used to measure the correlation between two random variables. The possible values for the SRC coefficient range from –1 to +1. A value close to +1 (–1) is interpreted to mean strong positive (negative) correlation, while a value of zero indicates a complete lack of correlation. More specifically, a positive coefficient implies that the two countries are competing in the destination market. The higher

the coefficient is, the stronger the competitive threat between the two countries. We use the SRC coefficient to analyze the correlation between the RCAs of Turkey and its competitors. A positive and high coefficient is interpreted to mean a highly similar RCA performance, and hence a high competitive threat between Turkey and its competitor under consideration. We calculate SRC coefficients between Turkey and other exporters in the EU-15 market for each year from 1996 to 2010. In this way, we are able to see the changes in competitive threat on a year-by-year basis.

Secondly, based on the critiques by Jenkins (2008), we utilize the index of competitive threat to measure the threat which the other non-EU-15 countries pose to the Turkish exports in the EU market and the threat which Turkey poses to the other non-EU-15 exports. In this methodology, we first identity the products in which each non-EU-15 country has over-unity RCA in the EU-15 market. All those products were considered to be a competitive threat on Turkey. Then we calculate the share of those products in total exports of Turkey. The results give the extent to which Turkey's exports are likely to be threatened from the other non-EU-15 countries, which we call as "threat on Turkey". Then we measure "threat by Turkey" by calculating the share of exports of each non-EU-15 country accounted by products in which Turkey has over-unity RCA.

Thirdly, we also compute and utilize a 'threat/opportunity index' based on the RCA indexes of the countries. In this methodology, we distinguish between four possible outcomes by comparing the RCA values of Turkey and others. Then, we calculate and interpret the export-shares of Turkey and its competitors in their total exports that fall under each outcome. The methodology we develop is summarized in Table 4.2, which shows the four possibilities concerning the RCAs of Turkey and other exporters in the EU-15 market.

Table 4.2 Threat/opportunity matrix, Turkey and its competitors

		Turkey's RCA >1	Turkey's RCA <1
Other country's RCA >1		Threat between Turkey and other	Opportunity for other country created by Turkey
Other country's RCA <1		Opportunity for Turkey created by other cou	No threat /No opportunity

4.4. Empirical Results

4.4.1 Results from the RCA index

Comparisons among countries

As a first step, we calculate the RCA index for each 3-digit sector of all countries in our sample for each year. After this, we determine the actual number of over-unity RCA sectors (i.e., the sectors for which the RCA index is higher than 1) and their percentages in the total number of exporting sectors. Then we distribute them among the technological categories.

However, looking only at the number of the sectors may be misleading since our sample is very heterogeneous in terms of country sizes. Therefore, we also calculate the shares of exports of over-unity RCA sectors in the total exports of the country in question.

We present the results as averages of the periods; i.e., the full period (FP) for 1996-2010, the first period (P1) for 1996-2003, and the second period (P2) for 2004-2010. By doing this, we can see the changes in the RCA positions of the countries before and after the enlargements in the EU, as well as the changes in recent years. We consider the case of 33 countries in this context.

Tables 4.3.a-b present the results for overall sectors. Part 'a' of the table shows the actual number of sectors and their percentages in the total number of sectors with the rankings. Part 'b' shows the shares of exports of these sectors in the total exports of the country in question with the rankings.

According to Table 4.3.a, Turkey has 68 over-unity RCA sectors and is ranked 13th. These 68 RCA sectors constitute 28% of Turkey's total number of sectors and the exports of these 68 sectors constitute 85 per cent of Turkey's total exports. In terms of the share of RCA exports, Turkey is ranked 15th, with 85.2 per cent. This share stays constant from the first to the second period.

Poland, the Czech Republic, Switzerland and the US are the countries with the highest numbers of over-unity RCA sectors. Although Turkey has recorded an increase from the first to the second period, some CEECs such as Romania, Latvia, Lithuania and Croatia have had the highest increases from the first to the second period in terms of the actual numbers of over-unity RCA sectors.

The percentage of over-unity RCA sectors in total number of sectors does not exceed 50 % in any of the countries considered. The ranking of the countries is more-or-less similar to the previous case. Turkey has exhibited an increase from 26.6% in the first period to 29.4% in the second period. As in the previous case, Romania, Latvia, Lithuania and Croatia have had the highest increase from the first to the second period.

Table 4.3.b shows the shares of the exports of over-unity RCA sectors in the total exports of the country in question. Differently from the previous case, the export shares of over-unity RCA sectors in total exports are above 50 % for all countries. This share is the highest for Russia (93 %), which is followed by Morocco and Egypt, while it is the lowest for Canada (76.7%). Interestingly, Russia is one of the countries with the lowest percentage of over-unity RCA sectors in total number of sectors (ranked 31st), while it has the highest share of over-unity RCA exports in total exports. Therefore, we can conclude that Russia has a very concentrated export structure.

It should also be noted that 'the values for the share of RCA exports in total exports' (in Table 4.3.b) are closer to each other among countries, as compared to 'the values for average number and percentage of RCA sectors' (in Table 4.3.a). This observation may indicate that the countries are quite heterogeneous in terms of the variety of products in which they have comparative advantages, whereas they are relatively more homogeneous in terms of the contribution of the RCA exports to their total export earnings. In other words, different countries may have many or few RCA sectors; however, the major source of export revenue remains to be the RCA sectors, irrespectively of the degree of diversity or uniformity of comparative advantages.

According to Table 4.3.b, like in the case of Turkey, the shares stay constant from the first to the second period for Switzerland, Indonesia and Poland. The Czech Republic, Russia, Israel, Malaysia and Hungary are the countries with the highest increases from the first to the second period, while Latvia, Thailand, Tunisia and the US have the highest decreases from the first to the second period. At this point, Latvia is quite an interesting case. In the case of actual number of RCA sectors and the share of RCA sectors in total number of sectors, Latvia is one of the countries with the highest increase from the first to the second period. However, in the case of

the share of RCA exports in total exports, it has the highest decrease from the first to the second period. This result may be giving a clue about Latvia's 'incorrect' choice concerning competitiveness. In other words, despite an apparent diversification of RCA sectors, share of Latvia's RCA sectors in total exports has not increased.

Tables 4.3.a-b Export Performance of the overall over-unity RCA sectors

Table 4.3.a Numbers & Percentages

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
POLAND	110	(1)	106	115	45.0	(1)	44.5	45.7
CZECH R	109	(2)	109	108	43.0	(2)	43.3	42.6
SWITZERLAND	100	(3)	102	99	39.5	(3)	40.2	38.6
USA	98	(4)	96	99	38.5	(4)	37.8	39.3
SLOVENIA	89	(5)	89	89	37.2	(5)	37.5	36.8
BULGARIA	86	(6)	81	92	36.7	(6)	35.1	38.5
CHINA	81	(7)	81	82	33.6	(10)	33.7	33.5
SLOVAKIA	80	(8)	80	80	33.9	(7)	33.9	33.9
HUNGARY	79	(9)	78	80	33.7	(8)	33.4	34.2
CROTIA	79	(10)	72	86	33.6	(9)	31.1	36.5
INDIA	77	(11)	71	84	31.7	(11)	29.9	33.7
ROMANIA	69	(12)	61	78	29.7	(13)	27.1	32.7
TURKEY	**68**	**(13)**	**65**	**72**	**27.9**	**(16)**	**26.6**	**29.4**
JAPAN	67	(14)	65	69	28.5	(14)	27.8	29.4
CANADA	66	(15)	63	69	26.6	(18)	25.8	27.5
ISRAEL	66	(16)	66	65	29.9	(12)	30.6	29.2
THAILAND	64	(17)	62	67	27.4	(17)	27.1	27.8
LITHUANIA	64	(18)	57	72	28.1	(15)	25.5	31.0
BRAZIL	60	(19)	56	66	25.2	(22)	23.5	27.1
UKRAINE	60	(20)	59	61	26.4	(19)	26.9	25.8
INDONESIA	58	(21)	55	62	25.2	(21)	24.2	26.4
S AFRICA	57	(22)	60	54	23.2	(23)	24.7	21.5
LATVIA	56	(23)	49	64	26.0	(20)	23.8	28.5
MEXICO	50	(24)	53	47	21.8	(26)	23.5	19.9
MOROCCO	49	(25)	46	52	22.9	(25)	22.6	23.1
MALAYSIA	44	(26)	39	50	19.9	(27)	17.7	22.4
KOREA	43	(27)	44	42	19.3	(28)	20.1	18.5
EGYPT	43	(28)	42	44	22.9	(24)	23.8	21.8
TUNISIA	39	(29)	34	46	18.6	(29)	16.5	21.1
RUSSIA	37	(30)	42	30	15.1	(31)	17.5	12.5
MALTA	32	(31)	32	33	17.2	(30)	16.3	18.3
NORWAY	26	(32)	33	19	10.5	(33)	13.1	7.5
SINGAPORE	26	(33)	24	28	11.4	(32)	10.6	12.2

Table 4.3.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
RUSSIA	93.0	(1)	91.5	94.8
MOROCCO	91.4	(2)	92.1	90.7
EGYPT	90.3	(3)	92.2	88.2
LATVIA	88.8	(4)	91.4	85.8
JAPAN	88.5	(5)	90.2	86.6
LITHUANIA	87.5	(6)	88.4	86.4
MALAYSIA	87.1	(7)	85.5	88.8
MALTA	86.5	(8)	85.2	88.0
UKRAINE	86.5	(9)	87.2	85.6
TUNISIA	86.1	(10)	88.3	83.6
CROTIA	86.0	(11)	86.1	85.9
INDONESIA	85.5	(12)	85.6	85.5
SLOVENIA	85.5	(13)	86.6	84.3
S AFRICA	85.3	(14)	84.2	86.6
TURKEY	**85.2**	**(15)**	**85.2**	**85.2**
ISRAEL	85.2	(16)	83.7	87.0
BULGARIA	85.2	(17)	85.9	84.3
SWITZERLAND	85.0	(18)	85.0	85.0
THAILAND	84.8	(19)	87.2	82.1
ROMANIA	84.7	(20)	85.6	83.6
NORWAY	84.5	(21)	83.8	85.3
SINGAPORE	84.5	(22)	84.0	85.0
CHINA	83.9	(23)	83.6	84.3
KOREA	83.4	(24)	83.3	83.5
BRAZIL	82.9	(25)	84.3	81.2
SLOVAKIA	82.8	(26)	83.5	82.1
INDIA	82.7	(27)	83.9	81.2
POLAND	82.1	(28)	82.1	82.0
HUNGARY	81.2	(29)	79.8	82.7
CZECH R	81.0	(30)	79.1	83.1
MEXICO	80.7	(31)	80.5	80.8
USA	76.7	(32)	78.9	74.2
CANADA	76.7	(33)	76.8	76.5

Next, we determine the number of over-unity RCA sectors, their percentages in the total number of sectors, and shares of these exports in the total exports for each technological category. Table 4.4 presents the results for the RMIG category.

Tables 4.4.a-b Export Performance of RCA sectors, RMIG

Table 4.4.a Numbers

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
POLAND	33	(1)	29	38	13.6	(1)	12.2	15.1
CANADA	30	(2)	28	32	12.0	(2)	11.4	12.7
BULGARIA	27	(3)	24	30	11.5	(4)	10.5	12.5
LITHUANIA	27	(4)	22	32	11.7	(3)	9.9	13.7
UKRAINE	24	(5)	24	24	10.7	(5)	11.1	10.2
BRAZIL	23	(6)	22	25	9.6	(8)	9.2	10.1
CROTIA	22	(7)	20	24	9.5	(9)	8.8	10.3
S AFRICA	22	(8)	23	21	8.9	(11)	9.3	8.4
HUNGARY	22	(9)	21	23	9.2	(10)	8.8	9.7
MOROCCO	21	(10)	21	22	10.0	(6)	10.3	9.8
LATVIA	21	(11)	19	24	9.8	(7)	9.0	10.8
CZECH R	20	(12)	20	21	8.0	(14)	7.9	8.1
INDONESIA	20	(13)	19	21	8.5	(13)	8.2	8.8
USA	19	(14)	19	19	7.6	(16)	7.6	7.6
INDIA	18	(15)	18	19	7.6	(15)	7.5	7.7
EGYPT	16	(16)	15	18	8.6	(12)	8.2	9.1
RUSSIA	15	(17)	16	14	6.3	(19)	6.7	5.9
ISRAEL	15	(18)	17	14	7.0	(17)	7.7	6.1
THAILAND	15	(19)	15	15	6.5	(18)	6.6	6.4
TURKEY	15	(20)	16	14	6.1	(21)	6.5	5.6
MEXICO	14	(21)	14	14	6.1	(20)	6.2	6.0
SLOVAKIA	14	(22)	13	15	5.9	(22)	5.6	6.3
SWITZERLAND	13	(23)	12	14	5.2	(24)	4.9	5.6
SLOVENIA	13	(24)	10	16	5.3	(23)	4.0	6.7
NORWAY	12	(25)	14	10	4.9	(27)	5.6	4.1
ROMANIA	12	(26)	10	15	5.2	(25)	4.4	6.1
TUNISIA	11	(27)	10	12	5.1	(26)	4.7	5.5
MALAYSIA	9	(28)	9	9	4.1	(28)	4.1	4.2
CHINA	7	(29)	10	4	3.1	(29)	4.2	1.8
MALTA	4	(30)	4	5	2.3	(30)	2.0	2.7
SINGAPORE	4	(31)	3	4	1.7	(31)	1.5	1.9
KOREA	2	(32)	3	2	1.1	(32)	1.2	0.9
JAPAN	1	(33)	1	1	0.5	(33)	0.4	0.5

Table 4.4.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
NORWAY	72.9	(1)	69.4	77.0
RUSSIA	72.3	(2)	65.7	79.8
BRAZIL	51.5	(3)	55.5	46.9
EGYPT	50.6	(4)	42.5	59.9
LATVIA	44.1	(5)	46.4	41.5
LITHUANIA	37.4	(6)	33.4	41.9
UKRAINE	35.1	(7)	37.9	31.8
CANADA	33.5	(8)	37.4	29.1
INDONESIA	33.4	(9)	28.2	39.3
MEXICO	31.2	(10)	29.5	33.1
S AFRICA	31.1	(11)	32.3	29.7
MOROCCO	30.7	(12)	33.0	28.1
TUNISIA	19.6	(13)	18.1	21.2
CROTIA	16.3	(14)	14.8	18.1
THAILAND	15.3	(15)	15.1	15.4
INDIA	14.4	(16)	11.5	17.8
BULGARIA	13.7	(17)	14.8	12.4
MALAYSIA	13.1	(18)	11.4	15.1
POLAND	12.0	(19)	12.1	11.9
ISRAEL	11.5	(20)	13.0	9.8
TURKEY	9.5	(21)	11.2	7.6
HUNGARY	6.2	(22)	6.7	5.7
USA	5.6	(23)	4.8	6.5
ROMANIA	5.6	(24)	5.8	5.5
SLOVAKIA	4.7	(25)	5.8	3.5
CZECH R	4.5	(26)	5.2	3.7
SWITZERLAND	3.0	(27)	2.7	3.4
SLOVENIA	2.9	(28)	1.8	4.2
CHINA	2.6	(29)	3.9	1.2
SINGAPORE	2.5	(30)	1.5	3.6
KOREA	1.8	(31)	0.5	3.2
MALTA	1.5	(32)	0.9	2.1
JAPAN	0.3	(33)	0.3	0.3

According to Tables 4.4.a-b, Turkey has 15 over-unity RCA sectors in the RMIG category, with the rank of 20. And, these 15 sectors constitute 9.5% of

Turkey's total exports, with the rank of 21. The number of over-unity RCA sectors decreased from 16 to 14 from first to second period, while the export share of these products decreased from 11.2% to 7.6%.

Table 4.4.a shows that, in the RMIG category, Poland, Canada, Bulgaria, and Lithuania are the countries with the highest number of over-unity RCA sectors in the full-period. The same ranking is valid for the percentage of over-unity RCA sectors in the total number of sectors.

Table 4.4.b shows that Norway has the highest share of exports of over-unity RCA sectors in total exports. Although the number of over-unity RCA sectors constitutes 4.9% of the total number of exporting sectors, these sectors constitute 72.9% of Norway's total exports. This result shows that Norway's RCA sectors have concentrated in the RMIG category. A similar result can be obtained for Russia as well. Indeed, Russia, Brazil and Egypt follow Norway, and the export shares of these countries are all above 50%. Japan, Malta, Korea and Singapore are the countries with the lowest share in this category. When we compare the first period and second period, we see that Egypt, Russia and Indonesia have the highest increases in the share of exports of over-unity RCA sectors in total exports. The highest decrease in this share from the first to the second period is observed for Brazil, even though the numbers of RCA sectors and its percentage in total number of sectors increased from the first to the second period. Israel has the highest similarity with Turkey in terms of both average numbers and shares.

Next, we analyze the export performance of the countries in LIG. Tables 4.5.a-b present the results. Turkey has 30 over-unity RCA sectors in the LIG category, with the rank of 4 and exports of these 30 sectors constitute 44.8% of Turkey's total exports, with the rank of 4 again. So, we can conclude that LIG are quite dominant in Turkish exports among other categories. The number of over-unity RCA sectors increased from 29 to 33 from the first to the second period. However, the share of these sectors in Turkey's total exports has decreased considerably from 51.6% to 37%. That is to say, for Turkey in the LIG category, while the number of products increased, the export-share of over-unity RCA sectors decreased, implying that Turkey's RCA performance in the LIG category has been lower than its RCA performance in total exports.

Tables 4.5.a-b Export Performance of RCA sectors, LIG

Table 4.5.a Numbers

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
CHINA	40	(1)	38	43	16.5	(1)	15.6	17.5
CZECH R	34	(2)	36	32	13.4	(2)	14.1	12.5
INDIA	32	(3)	32	32	13.3	(3)	13.5	13.0
TURKEY	30	(4)	29	33	12.5	(5)	11.8	13.3
POLAND	30	(5)	32	28	12.3	(6)	13.6	10.9
CROTIA	29	(6)	30	29	12.6	(4)	12.9	12.2
SLOVENIA	29	(7)	32	26	12.3	(7)	13.6	10.7
SWITZERLAND	27	(8)	29	25	10.6	(11)	11.3	9.7
BULGARIA	26	(9)	26	27	11.2	(8)	11.3	11.2
ROMANIA	26	(10)	24	28	11.1	(9)	10.5	11.7
SLOVAKIA	26	(11)	27	25	10.9	(10)	11.2	10.5
INDONESIA	24	(12)	25	24	10.6	(12)	10.7	10.4
THAILAND	24	(13)	25	23	10.3	(14)	10.7	9.8
LITHUANIA	24	(14)	23	24	10.4	(13)	10.3	10.5
LATVIA	20	(15)	20	21	9.5	(15)	9.6	9.5
TUNISIA	19	(16)	17	21	9.0	(16)	8.2	9.8
HUNGARY	18	(17)	21	15	7.8	(19)	9.0	6.4
MOROCCO	17	(18)	16	19	8.1	(18)	7.8	8.3
ISRAEL	16	(19)	17	15	7.2	(20)	7.6	6.8
EGYPT	15	(20)	16	14	8.1	(17)	9.3	6.7
BRAZIL	12	(21)	11	14	5.2	(23)	4.6	5.8
USA	12	(22)	11	14	4.8	(26)	4.2	5.5
KOREA	12	(23)	13	11	5.5	(22)	5.9	5.0
MALTA	11	(24)	13	10	6.1	(21)	6.4	5.7
UKRAINE	11	(25)	11	12	5.0	(24)	5.1	4.9
MALAYSIA	11	(26)	10	12	5.0	(25)	4.6	5.5
CANADA	10	(27)	10	11	4.2	(27)	4.2	4.2
S AFRICA	10	(28)	11	8	4.0	(28)	4.5	3.4
JAPAN	8	(29)	8	8	3.4	(29)	3.3	3.5
MEXICO	6	(30)	9	4	2.8	(30)	3.8	1.6
SINGAPORE	3	(31)	3	3	1.4	(31)	1.4	1.3
NORWAY	3	(32)	4	2	1.2	(32)	1.6	0.7
RUSSIA	3	(33)	4	1	1.2	(33)	1.8	0.5

Table 4.5.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
INDIA	53.5	(1)	62.1	43.6
TUNISIA	50.1	(2)	57.6	41.6
ROMANIA	49.0	(3)	57.5	39.2
TURKEY	44.8	(4)	51.6	37.0
MOROCCO	41.7	(5)	43.7	39.3
INDONESIA	40.7	(6)	46.3	34.2
CHINA	37.5	(7)	40.9	33.7
CROTIA	37.0	(8)	43.5	29.6
BULGARIA	36.4	(9)	38.4	34.3
LITHUANIA	36.3	(10)	42.6	29.1
ISRAEL	34.6	(11)	32.6	36.9
LATVIA	33.0	(12)	37.1	28.4
MALTA	28.5	(13)	32.9	23.6
POLAND	28.2	(14)	33.9	21.6
SLOVENIA	27.9	(15)	33.2	21.9
EGYPT	24.0	(16)	33.4	13.2
THAILAND	23.9	(17)	26.3	21.3
CZECH R	23.2	(18)	25.0	19.1
SLOVAKIA	21.1	(19)	24.6	17.0
SWITZERLAND	16.6	(20)	18.1	14.9
S AFRICA	16.5	(21)	20.3	12.2
UKRAINE	15.3	(22)	18.3	11.9
HUNGARY	11.1	(23)	14.2	7.6
CANADA	10.8	(24)	9.4	12.4
BRAZIL	10.1	(25)	9.4	10.9
MALAYSIA	9.0	(26)	7.9	10.2
USA	6.8	(27)	5.6	8.2
KOREA	6.0	(28)	7.5	4.3
JAPAN	4.0	(29)	4.1	3.9
RUSSIA	2.5	(30)	3.7	1.1
MEXICO	2.3	(31)	3.4	1.2
SINGAPORE	1.7	(32)	1.6	1.9
NORWAY	1.5	(33)	2.0	0.8

Table 4.5.a shows that China, the Czech Republic, India, Turkey and Poland have the highest number of over-unity RCA sectors in the LIG category; while Table 4.5.b shows that India, Tunisia, Romania, Turkey and Morocco have the highest shares in this category. Similar to Turkey, the share of over-unity RCA sectors in total exports has decreased considerably in the second period for India, Tunisia and Romania. Although these countries still have the highest shares in the second period,

following Egypt, they have the highest decrease in shares from the first to the second period.

Tables 4.6.a-b Export Performance of RCA sectors, CIG

Table 4.6.a Numbers

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
POLAND	20	(1)	21	20	8.3	(1)	8.6	8.0
SLOVENIA	18	(2)	19	17	7.5	(2)	7.9	7.1
CZECH R	17	(3)	18	17	6.8	(3)	7.0	6.5
S AFRICA	15	(4)	16	14	6.1	(5)	6.6	5.4
BULGARIA	15	(5)	15	15	6.4	(4)	6.4	6.4
TURKEY	15	(6)	14	16	6.0	(6)	5.6	6.4
SWITZERLAND	14	(7)	14	14	5.5	(8)	5.5	5.5
SLOVAKIA	13	(8)	14	12	5.5	(7)	5.8	5.2
ROMANIA	12	(9)	11	13	5.2	(9)	5.0	5.3
BRAZIL	12	(10)	12	12	5.0	(11)	5.0	4.9
RUSSIA	12	(11)	13	10	4.8	(12)	5.3	4.2
INDIA	12	(12)	11	13	4.8	(13)	4.4	5.1
UKRAINE	11	(13)	12	11	5.1	(10)	5.3	4.8
MEXICO	11	(14)	12	10	4.7	(14)	5.1	4.3
USA	11	(15)	11	11	4.3	(16)	4.1	4.5
JAPAN	10	(16)	10	10	4.3	(15)	4.2	4.4
HUNGARY	9	(17)	10	9	3.9	(17)	4.1	3.8
KOREA	7	(18)	8	7	3.3	(20)	3.6	3.0
EGYPT	7	(19)	7	7	3.9	(18)	4.1	3.7
LATVIA	7	(20)	5	9	3.3	(19)	2.6	4.1
THAILAND	7	(21)	6	9	3.1	(22)	2.6	3.6
CHINA	7	(22)	7	8	2.9	(24)	2.8	3.2
NORWAY	7	(23)	9	5	2.9	(25)	3.6	2.0
INDONESIA	7	(24)	6	8	3.0	(23)	2.7	3.4
ISRAEL	7	(25)	6	7	3.1	(21)	2.9	3.3
CANADA	5	(26)	6	5	2.2	(27)	2.2	2.2
MOROCCO	5	(27)	6	5	2.4	(26)	2.7	2.1
MALAYSIA	5	(29)	3	6	2.1	(28)	1.5	2.7
CROTIA	5	(28)	4	5	2.0	(29)	1.8	2.2
LITHUANIA	4	(30)	4	5	1.9	(30)	1.6	2.3
MALTA	3	(31)	3	4	1.8	(31)	1.3	2.4
SINGAPORE	3	(32)	3	3	1.2	(32)	1.2	1.2
TUNISIA	2	(33)	1	3	0.8	(33)	0.2	1.4

Table 4.6.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
SLOVAKIA	33.4	(1)	34.9	31.6
SLOVENIA	30.5	(2)	28.1	33.2
JAPAN	26.3	(3)	24.7	28.1
S AFRICA	25.8	(4)	21.6	30.5
UKRAINE	25.3	(5)	19.6	31.9
BULGARIA	23.7	(6)	23.7	23.7
CZECH R	22.2	(7)	21.7	25.0
MEXICO	22.1	(8)	21.1	23.2
POLAND	20.9	(9)	17.8	24.5
TURKEY	19.4	(10)	12.8	27.0
KOREA	19.0	(11)	18.8	19.2
RUSSIA	15.7	(12)	18.6	12.3
ROMANIA	13.2	(13)	10.6	16.1
HUNGARY	12.1	(14)	10.8	13.6
BRAZIL	12.0	(15)	12.2	11.8
EGYPT	9.9	(16)	11.6	8.0
SWITZERLAND	9.6	(17)	8.7	10.5
LATVIA	8.2	(18)	5.4	11.5
THAILAND	8.1	(19)	6.8	9.6
NORWAY	8.0	(20)	8.9	6.8
INDIA	6.6	(21)	4.3	9.2
CANADA	5.5	(22)	5.6	5.2
USA	5.3	(23)	5.1	5.4
MALTA	5.0	(24)	3.8	6.3
CROTIA	4.0	(25)	3.5	4.4
INDONESIA	3.6	(26)	3.4	3.9
CHINA	3.5	(27)	3.1	3.8
ISRAEL	2.7	(28)	2.5	3.0
LITHUANIA	2.3	(29)	1.8	2.8
MOROCCO	1.8	(30)	1.8	1.8
MALAYSIA	1.5	(31)	1.2	1.9
TUNISIA	1.2	(32)	0.3	2.2
SINGAPORE	1.1	(33)	0.9	1.2

Analysis of the export performance of the countries in the CIG category is given in Tables 4.6.a-b.

According to Table 4.6-a-b, Turkey has 15 over-unity RCA sectors, and 6% of its total number of sectors has over-unity RCA's in the CIG category. Exports of these over-unity sectors constitute 19.4% of its total exports, with the rank of 10. Interestingly, Turkey has the highest increase from the first to the second period in terms of share, which corresponds to a 14.2% increase. We should note that, from the first to the second period, two more CIG's (sector 678-Iron and Steel and sector 684-Aluminum) have gained RCA status, and that the share of these two goods in Turkey's total exports is quite high, implying that Turkey has specialized in two 'correct' capital-intensive goods from the first to the second period.

Table 4.6.a shows that Poland, Slovenia and the Czech Republic are the countries with the highest number of over-unity RCA sectors in the CIG category. The same ranking is valid for the percentage of over-unity RCA numbers in total number of sectors. Table 4.6.b shows that Slovakia, Slovenia and Japan have the highest shares of over-unity RCA sectors in total exports.

Next, we analyze the export performance of the countries in the EIRG category. Tables 4.7.a-b present the results.

Turkey has 2 RCA sectors (sector 761-TV Receivers whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus and sector 511-Hydrocarbons and their halogenated, sulfonated, nitrated or nitrosated derivatives) in the EIRG category, with the rank of 28 and exports of these 2 sectors constitute 5.3% of its total exports. The number of over-unity RCA sectors increased from 2 to 3 from first to second period and the share of these sectors in Turkey's total exports also increased from 4.8% to 5.9%. We should note that, in terms of both numbers and shares, Turkey's position is the worst in the EIRG category, as compared to other categories.

The US, Switzerland, China, Israel and Japan have the highest number of over-unity RCA sectors in the EIRG category. In terms of the shares in total exports, Singapore, Malaysia, Switzerland and China are the top countries. CEEC countries, except Hungary, are at lower ranks relative to other categories. However, Slovakia and the Czech Republic have the highest increase from the first to the second period in terms of share (12.6% and 8.3%, respectively). In other words, Slovakia and the Czech Republic have exhibited a remarkable increase in share, even though they are

still relatively backward in this category. In terms of the increase in share, China and Switzerland follow Slovakia and the Czech Republic. Japan, Singapore, Malaysia and Thailand have the highest decrease in terms of export shares.

Tables 4.7.a-b Export Performance of RCA sectors, EIRG

Table 4.7.a Numbers

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
USA	20	(1)	21	20	8.0	(1)	8.1	7.9
SWITZERLAND	15	(2)	15	14	5.7	(3)	5.9	5.5
CHINA	13	(3)	15	12	5.5	(4)	6.0	4.8
ISRAEL	13	(4)	13	13	6.0	(2)	6.0	6.0
JAPAN	12	(5)	13	10	5.0	(5)	5.5	4.4
MALAYSIA	9	(6)	9	10	4.1	(6)	3.8	4.3
INDIA	8	(7)	7	9	3.3	(8)	3.1	3.5
SINGAPORE	8	(8)	8	7	3.4	(7)	3.6	3.1
THAILAND	7	(9)	8	7	3.0	(11)	3.3	2.7
KOREA	7	(11)	8	6	3.1	(9)	3.7	2.5
MEXICO	7	(10)	7	7	3.0	(10)	3.3	2.8
CZECH R	7	(12)	6	8	2.7	(13)	2.4	3.0
HUNGARY	7	(13)	6	7	2.9	(12)	2.7	3.1
S AFRICA	7	(14)	6	7	2.6	(14)	2.6	2.7
BRAZIL	6	(15)	5	7	2.5	(15)	2.3	2.8
UKRAINE	6	(16)	5	7	2.5	(16)	2.1	3.0
RUSSIA	5	(17)	7	4	2.2	(17)	2.8	1.6
INDONESIA	5	(18)	4	6	2.1	(18)	1.9	2.4
SLOVAKIA	5	(19)	5	5	2.1	(19)	2.1	2.1
POLAND	5	(20)	5	5	1.9	(20)	2.0	1.8
CANADA	5	(21)	4	5	1.8	(21)	1.8	1.9
SLOVENIA	4	(22)	5	4	1.7	(22)	1.9	1.5
LITHUANIA	4	(23)	4	4	1.7	(23)	1.7	1.8
BULGARIA	3	(24)	3	4	1.4	(25)	1.3	1.6
TUNISIA	3	(25)	3	4	1.5	(24)	1.3	1.7
CROTIA	3	(26)	3	2	1.2	(27)	1.3	1.0
EGYPT	2	(27)	3	2	1.3	(26)	1.5	1.1
TURKEY	2	(28)	2	3	1.0	(28)	0.8	1.2
ROMANIA	2	(29)	3	2	1.0	(29)	1.1	0.8
MOROCCO	2	(30)	1	2	0.9	(31)	0.7	1.1
MALTA	2	(31)	1	2	1.0	(30)	0.6	1.4
LATVIA	2	(32)	1	2	0.7	(32)	0.5	1.0
NORWAY	2	(33)	2	1	0.6	(33)	0.7	0.5

Table 4.7.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
SINGAPORE	50.8	(1)	54.8	46.1
MALAYSIA	34.5	(2)	37.5	31.1
SWITZERLAND	27.1	(3)	23.7	30.9
CHINA	26.7	(4)	23.1	30.8
KOREA	24.7	(5)	25.9	23.3
USA	24.0	(6)	25.0	22.8
ISRAEL	22.7	(7)	22.3	23.2
JAPAN	22.4	(8)	26.7	17.6
HUNGARY	21.2	(9)	20.0	22.5
THAILAND	19.9	(10)	22.2	17.3
MEXICO	12.9	(11)	14.0	11.6
CANADA	8.0	(12)	6.3	10.0
CZECH R	7.9	(13)	4.0	12.3
SLOVAKIA	7.5	(14)	1.7	14.2
INDONESIA	6.8	(15)	7.0	6.5
MALTA	6.3	(16)	3.0	10.1
INDIA	6.1	(17)	5.7	6.5
UKRAINE	5.5	(18)	6.6	4.3
TURKEY	5.3	(19)	4.8	5.9
POLAND	4.1	(20)	3.2	5.2
EGYPT	3.6	(21)	3.7	3.4
MOROCCO	3.5	(22)	3.3	3.8
S AFRICA	3.0	(23)	2.9	3.0
LITHUANIA	2.5	(24)	2.0	3.0
BRAZIL	2.5	(25)	1.7	3.3
RUSSIA	2.3	(26)	3.0	1.5
CROTIA	2.2	(27)	3.4	0.8
BULGARIA	2.0	(28)	2.3	1.6
ROMANIA	1.8	(29)	1.7	2.0
TUNISIA	1.8	(30)	1.2	2.5
SLOVENIA	1.1	(31)	1.1	1.2
LATVIA	1.1	(32)	0.8	1.4
NORWAY	0.8	(33)	1.0	0.6

At this point, we have already determined, in the context of our Chapter 2, that Turkey and CEECs are quite similar in terms of their export compositions in the

EIRG category. Here, in this chapter, we also observe that CEECs, like Turkey, are not so successful in this category. Even though the performance of some CEECs has increased in recent years, they are still in a backward position in this category, except Hungary. Indeed, Hungary is in an outstanding position in not only the EIRG category but also the DIRG category, whereas Turkey's competition with other CEECs concentrates mainly in other categories. In this regard, our RCA analysis in this chapter and our similarity analysis in Chapter 2 are in line with each other, concerning the competition between Turkey and CEECs, in research-intensive products.

Finally, we analyze the export performance of the countries in the DIRG category. Tables 4.8.a-b present the results.

According to the table, Turkey has 6 over-unity RCA sectors, with the rank of 24. And, exports of these over-unity sectors constitute 6.2% of its total exports, with the rank of 26. The number of over-unity RCA sectors increased from 5% to 7%, and export shares of these sectors increased from 4.8% to 7.8% from the first to the second period.

Table 4.8.a also shows that Japan, the US, Switzerland and the Czech Republic are the countries with the highest number of over-unity RCA sectors, while Russia, Egypt, Norway, Indonesia and Morocco are the countries with the lowest number of over-unity RCA sectors in the DIRG category. According to Table 4.8.b, Malta, Japan, the US, Korea and Hungary have the highest shares of exports of over-unity RCA sectors in this category in total exports, while Russia, Indonesia, Norway and India are the ones with the lowest shares.

Unlike in the other categories (and especially in contrast with the LIG category), we observe that, in the DRIG category, generally, the developed countries occupy the higher ranks, while the developing countries such as India and Indonesia, as well as Turkey, remain at the lowest ranks. When we look at the changes from the first to the second period, we see that Croatia, Romania and Morocco have the highest increases in terms of the shares, while the US and Switzerland have the highest decreases

Tables 4.8.a-b Export Performance of RCA sectors, DIRG

Table 4.8.a Numbers

	Average Number of RCA Sectors				Average % of RCA Sectors in Total Number of Exporting Sectors			
	FP	Rank	P1	P2	FP	Rank	P1	P2
JAPAN	36	(1)	34	39	15.4	(1)	14.4	16.5
USA	35	(2)	35	35	13.8	(2)	13.8	13.8
SWITZERLAND	32	(3)	32	31	12.4	(3)	12.6	12.3
CZECH R	31	(4)	30	31	12.1	(4)	11.9	12.4
SLOVENIA	25	(5)	24	26	10.4	(5)	10.0	10.9
HUNGARY	23	(6)	21	26	9.9	(6)	8.8	11.2
SLOVAKIA	22	(7)	22	23	9.4	(7)	9.2	9.7
POLAND	22	(8)	19	25	8.9	(8)	8.1	9.8
CROTIA	20	(9)	15	26	8.4	(9)	6.2	10.9
ROMANIA	17	(10)	14	21	7.3	(10)	6.0	8.7
CANADA	16	(11)	15	16	6.3	(13)	6.2	6.5
ISRAEL	15	(12)	14	16	6.7	(11)	6.4	7.1
BULGARIA	14	(13)	13	16	6.1	(14)	5.5	6.8
KOREA	14	(14)	13	16	6.4	(12)	5.8	7.1
CHINA	14	(15)	12	15	5.6	(16)	5.0	6.2
MEXICO	12	(16)	11	12	5.1	(17)	5.0	5.2
MALTA	11	(17)	12	11	6.0	(15)	6.0	6.1
THAILAND	11	(18)	9	13	4.6	(19)	3.9	5.3
MALAYSIA	10	(19)	8	13	4.6	(18)	3.7	5.7
SINGAPORE	9	(20)	7	11	3.7	(20)	2.9	4.7
UKRAINE	7	(21)	7	7	3.1	(21)	3.3	2.9
BRAZIL	7	(22)	6	8	2.9	(22)	2.4	3.4
INDIA	7	(23)	3	11	2.8	(23)	1.3	4.5
TURKEY	**6**	**(24)**	**5**	**7**	**2.3**	**(26)**	**1.9**	**2.9**
LATVIA	6	(25)	4	7	2.6	(24)	2.1	3.1
LITHUANIA	5	(26)	5	6	2.3	(27)	2.0	2.7
TUNISIA	5	(27)	4	6	2.3	(25)	2.1	2.6
S AFRICA	4	(28)	4	4	1.6	(28)	1.6	1.5
MOROCCO	3	(29)	2	4	1.5	(29)	1.2	1.9
INDONESIA	2	(30)	2	3	1.0	(30)	0.7	1.3
NORWAY	2	(31)	4	1	0.9	(32)	1.4	0.3
EGYPT	2	(32)	1	3	1.0	(31)	0.7	1.3
RUSSIA	2	(33)	2	1	0.6	(33)	0.9	0.3

Table 4.8.b Export Shares

	Share of RCA Exports in Total Exports			
	FP	Rank	P1	P2
MALTA	45.2	(1)	44.6	45.9
JAPAN	35.5	(2)	34.4	36.7
USA	35.0	(3)	38.4	31.2
KOREA	32.0	(4)	30.6	33.5
HUNGARY	30.6	(5)	28.0	33.4
SWITZERLAND	28.6	(7)	31.7	25.2
SINGAPORE	28.4	(8)	25.2	32.1
MALAYSIA	28.1	(6)	27.6	30.5
CROTIA	26.5	(9)	20.9	32.9
CZECH R	23.1	(10)	23.2	22.9
SLOVENIA	23.1	(11)	22.5	23.8
CANADA	18.9	(12)	18.1	19.8
THAILAND	17.6	(13)	16.7	18.5
POLAND	16.8	(14)	15.0	18.9
SLOVAKIA	16.1	(15)	16.5	15.8
ROMANIA	15.1	(16)	10.1	20.9
MOROCCO	13.7	(17)	10.2	17.7
ISRAEL	13.7	(18)	13.3	14.0
CHINA	13.6	(19)	12.5	14.8
TUNISIA	13.4	(20)	11.1	16.0
MEXICO	12.2	(21)	12.4	11.8
BULGARIA	9.3	(22)	6.6	12.4
LITHUANIA	9.1	(23)	8.7	9.6
S AFRICA	9.0	(24)	7.0	11.2
BRAZIL	6.9	(25)	5.5	8.4
TURKEY	**6.2**	**(26)**	**4.8**	**7.8**
UKRAINE	5.2	(27)	4.8	5.6
LATVIA	2.3	(28)	1.7	3.0
EGYPT	2.3	(29)	1.0	3.7
INDIA	2.1	(30)	0.4	4.0
NORWAY	1.4	(31)	2.5	0.1
INDONESIA	1.1	(32)	0.7	1.6
RUSSIA	0.3	(33)	0.5	0.1

Up to now, we made cross-country comparisons. The number of products in the technology-related categories is quite different for countries. Moreover, the distribution of the over-unity RCA sectors exhibits considerable differences across countries. For a more concise presentation of the results that we discussed so far, we now present a summary-table, i.e. Table 4.9 below, which we compiled from our preceding tables. We constructed Table 4.9 in such a way that technological

categories can be compared within each country (instead of 'between countries') for the full period (1996-2010). The bold numbers indicate the category with the highest share of over-unity RCA sectors in total exports. The countries are listed in alphabetical order.

Table 4.9. Summary of the share of exports of over-unity RCA sectors in total exports

	RMIG	LIG	CIG	EIRG	DIRG
BRAZIL	**51.5**	10.1	12.0	2.5	6.9
BULGARIA	13.7	**36.4**	23.7	2.0	9.3
CANADA	**33.5**	10.8	5.5	8.0	18.9
CHINA	2.6	**37.5**	3.5	26.7	13.6
CROTIA	16.3	**37.0**	4.0	2.2	26.5
CZECH R	4.5	**23.2**	22.2	7.9	23.1
EGYPT	**50.6**	24.0	9.9	3.6	2.3
HUNGARY	6.2	11.1	12.1	21.2	**30.6**
INDIA	14.4	**53.5**	6.6	6.1	2.1
INDONESIA	33.4	**40.7**	3.6	6.8	1.1
ISRAEL	11.5	**34.6**	2.7	22.7	13.7
JAPAN	0.3	4.0	26.3	22.4	**35.5**
KOREA	1.8	6.0	19.0	**24.7**	32.0
LATVIA	**44.1**	33.0	8.2	1.1	2.3
LITHUANIA	**37.4**	36.3	2.3	2.5	9.1
MALAYSIA	13.1	9.0	1.5	**34.5**	28.1
MALTA	1.5	28.5	5.0	6.3	**45.2**
MEXICO	**31.2**	2.3	22.1	12.9	12.2
MOROCCO	30.7	**41.7**	1.8	3.5	13.7
NORWAY	**72.9**	1.5	8.0	0.8	1.4
POLAND	12.0	**28.2**	20.9	4.1	16.8
ROMANIA	5.6	**49.0**	13.2	1.8	15.1
RUSSIA	**72.3**	2.5	15.7	2.3	0.3
S AFRICA	**31.1**	16.5	25.8	3.0	9.0
SINGAPORE	2.5	1.7	1.1	**50.8**	28.4
SLOVAKIA	4.7	21.1	**33.4**	7.5	16.1
SLOVENIA	2.9	27.9	**30.5**	1.1	23.1
SWITZERLAN	3.0	16.6	9.6	27.1	**28.6**
THAILAND	15.3	**23.9**	8.1	19.9	17.6
TUNISIA	19.6	**50.1**	1.2	1.8	13.4
TURKEY	9.5	**44.8**	19.4	5.3	6.2
UKRAINE	**35.1**	15.3	25.3	5.5	5.2
USA	5.6	6.8	5.3	24.0	**35.0**

Table 4.9 should be evaluated for each country separately. It is observed that Brazil, Egypt, Latvia, Lithuania, Mexico, Norway, Russia, S. Africa and Ukraine have their highest share in the RMIG category among the other categories. The LIG category is dominant for Bulgaria, Croatia, the Czech Republic, India, Indonesia, Israel, Poland, Romania, Thailand, Tunisia, and Turkey. The CIG category is dominant only for Slovakia and Slovenia, while the EIRG category is dominant for Korea, Malaysia and Singapore. Lastly, the DIRG category is dominant for Hungary, Japan, Malta, Switzerland and the US.

The RCA Performance of Turkey's Individual Export Sectors

In the previous section, we compared the RCA performance of the countries based on the technological categories of their exports for the full period (1996-2010) and the two sub-periods (1996-2003 and 2004-2010). We now focus upon Turkey separately and evaluate the RCA performance of its individual exporting sectors. First, we review the share of over-unity RCA sectors in Turkey's total exports, based on technological categories for each year from 1996 to 2010. By doing this, we will be able to see the details at temporal and sector-level dimensions, separately.

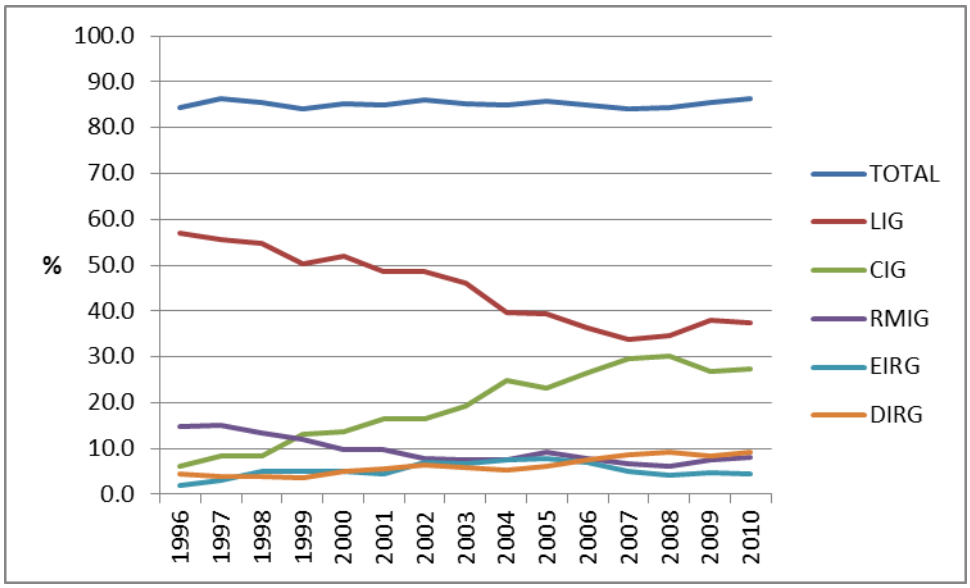

Figure 4.1 Share of Turkey's RCA sectors in total exports, 1996-2010

Based on Figure 4.1, we observe that the share of Turkey's over-unity RCA exports in total exports has changed between a minimum of 84.1% (in 2007) and a maximum of 86.4% (in 2010). Although LIG constitute the highest share from 1996 to 2010, it has been decreasing over time. The LIG category has the highest share in 1996 (57.0%) and it has been decreasing steadily until 2007 (33.7%). Although it has increased to 37.5% in 2010, it is still far lower than its 1996-value. This decrease in the share of LIG seems to be offset by the corresponding increase in the share of the CIG category. Indeed, the decrease in the LIG category and the increase in the CIG category are like mirror images of each other. The share of over-unity RCA exports in total exports of Turkey in the CIG category is the lowest in 1996 (6.2%) and it has been increasing until 2008 (30.2 %). The share of RMIG is the highest in 1997 (15.0%) and it has been decreasing until 2008 (6.2%); however, there is a slight increase in the share of RMIG since 2008 and it is 8.0% in 2010. The share of EIRG is the lowest in 1996 (1.9%), relative to the other years as well as relative to the other categories. It is the highest in 2005 (7.8%), but it has decreased until 2010 (4.4%). The share of DIRG has been increasing in recent years. It was 4.5 % in 1996, while it has increased to 9.2% in 2010.

Now, we evaluate Turkey's 3-digit sectors with the highest RCA coefficients in each technological category for the full period (1996-2010) and the two sub-periods (1996-2003 and 2004-2010). We also present the three countries with the highest RCA coefficients in these 3-digit sectors. We chose the sectors with the highest RCAs as the ones that have RCA in the full period or in one of the two sub-periods. Tables-4.10.a-e present the results. Bold numbers indicate the over-unity RCA coefficients together with the sectors.

In the RMIG category (Table 4.10.a), Turkey's highest RCA sectors are 058, 056, 046, 057 and 278. Thailand, Morocco, Tunisia, Egypt, India, S. Africa, Ukraine, Czech Republic and Brazil are the countries with the highest RCAs in the sectors in which Turkey has the highest RCAs. On the other hand, Turkey has over-unity RCA in the sectors 041, 091, and 043 in the first sub-period, while it doesn't have over-unity RCA in these sectors in the second sub-period. In other words, Turkey lost its comparative advantage in these sectors in the second sub-period. Even though Turkey had over-unity RCA's in these sectors in the first sub-period, its RCA

coefficient was still much lower than that of the top-three countries. On the other hand, Turkey didn't have a RCA in sector 282 in the first period, while it gained a RCA in this sector in the second period. However, Turkey is not ranked among the top-three countries in this sector.

Table 4.10.a Turkey's highest-RCA sectors, 3-digit, RMIG

RMIG	**1996-2010**	**1996-2003**			**2004-2010**		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-058	**7.82**	**8.14**	1-Turkey	8.14	**7.45**	1-Turkey	7.45
Fruit Preserved, and Fruit Preparations			2-Thailand	6.59		2-Thailand	5.74
(Excluding Fruit Juices)			3-S.Africa	4.94		3-Morocco	3.90
S3-056	**6.91**	**7.83**	1-Morocco	11.78	**5.87**	1-Morocco	9.70
Vegetables, Roots and Tubers, Prepared			2-Turkey	7.83		2-Turkey	5.87
or Preserved, N.E.S.			3-Egypt	7.06		3-Egypt	5.45
S3-046	**6.47**	**10.54**	1-Turkey	10.54	**1.82**	1-Bulgaria	12.19
Meal and Flour of Wheat and Flour of			2-Egypt	8.36		2-Ukraine	6.25
Meslin			3-India	4.86		3-Lithuania	4.76
S3-057	**5.91**	**6.65**	1-Turkey	6.65	**5.06**	S. Africa	7.48
Fruit And Nuts (Not Including Oil Nuts),			2-S.Africa	6.64		2-Turkey	5.06
Fresh or Dried			3-Morocco	4.95		3-Morocco	3.88
S3-278	**3.61**	**3.53**	1-Ukraine	8.56	**3.70**	1-Ukraine	10.14
Crude Minerals, N.E.S.			2-S.Africa	4.68		2-S.Africa	6.26
			3-Turkey	3.53		3-Brazil	4.80
S3-062	**3.44**	**3.61**	1-Thailand	4.68	**3.25**	1-Thailand	5.85
Sugar Confectionery			2-Mexico	4.28		2-Czech	3.87
			3-Turkey	3.61		3-Turkey	3.25
S3-421	**3.00**	**4.61**	1-Tunisia	37.14	**1.16**	1-Ukraine	39.63
Fixed Vegetable Fatsand Oils, Soft, Crude,			2-Ukraine	16.77		2-Tunisia	27.21
Refined or Fractionated			3-Turkey	4.61		3-Brazil	3.78
S3-054	**2.48**	**2.83**	1-Morocco	13.02	**2.09**	1-Morocco	18.12
Vegetables, Fresh, Chilled, Frozen or			2-Egypt	11.50		2-Egypt	12.22
Simply Preserved; Roots, Tubers N.E.S.			3-Israel	6.16		3-Israel	9.51
S3-273	**2.02**	**1.77**	1-India	13.57	**2.32**	1-India	12.58
Stone, Sand And Gravel			2-Egypt	9.42		2-Croatia	12.34
			3-Croatia	6.49		3-Egypt	9.15

Table 4.10.a (continued)

RMIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-291	**1.88**	**2.48**	1-China	6.70	**1.19**	1-Morocco	6.97
Crude Animal Materials, N.E.S.			2-Croatia	3.30		2-Tunisia	3.29
			3-Brazil	3.21		3-China	2.85
S3-075	**1.85**	**2.23**	1-Indonesia	8.70	**1.41**	1-Indonesia	10.42
Spices			2-India	7.91		2-India	7.18
			3-Singapore	6.44		3-Tunisia	2.41
S3-048	**1.83**	**1.82**	1-Switzerlan	5.79	**1.85**	1-Poland	5.58
Cereal Preparations And Preparations of			2-Thailand	2.67		2-Bulgaria	5.15
Flour or Starch of Fruits or Vegetables			3-Israel	2.27		3-Switzerlar	3.80
S3-223	**1.60**	**2.12**	1-Canada	37.12	**1.02**	1-Canada	36.62
Oil Seeds and Oleaginous Fruits of a Kind			2-Ukraine	6.48		2-Ukraine	4.21
Used For Extracting Other Vegetable Oils			3-Hungary	2.62		3-Czech R.	1.72
S3-091	**1.01**	**1.32**	1-India	8.81	0.65	1-Indonesia	6.91
Margarine and Shortening			2-Indonesia	6.92		2-Poland	4.71
			3-Malaysia	4.62		3-Malaysia	4.00
S3-282	**1.00**	0.83	1-Ukraine	18.26	**1.19**	1-Latvia	8.61
Ferrous Waste And Scrap; Remelting			2-Lithuania	11.20		2-Bulgaria	4.38
Ingots of Iron or Steel			3-Russia	7.14		3-Croatia	3.62
S3-041	0.90	**1.36**	1-Canada	21.34	0.38	1-Ukraine	22.43
Wheat (Including Spelt) and Meslin,			2-Ukraine	18.25		2-Canada	19.13
Unmilled			3-Bulgaria	3.20		3-Bulgaria	10.46
S3-043	0.61	**1.15**	1-Ukraine	59.48	0.01	1-Latvia	27.12
Barley, Unmilled			2-Bulgaria	9.27		2-Lithuania	22.37
			3-Russia	6.52		3-Bulgaria	22.32

In the LIG category (Table 4.10.b below), Turkey has the highest RCAs in the sectors 662, 844, 655, 812 and 846. In these five products, Turkey's competitors are more-or-less the same: Bulgaria, Morocco, India, Malta, Korea, Slovakia, and Egypt. Turkey has always ranked among the top-three countries in all its highest-RCA sectors in the LIG category in those five sectors. On the other hand, although Turkey didn't have comparative advantage in the sectors 613, 692, 699 and 642 in the first sub-period, it gained comparative advantage in these sectors in the second sub-period. However, it has not ranked among the top-three countries in these sectors.

Turkey's competitors in these sectors are mainly CEECs, such as Lithuania, Ukraine, Poland, Slovakia, Slovenia, and the Czech Republic. That is to say, even though Turkey could not rank among the top-three countries in the second sub-period, it gained comparative advantage against these CEECs, which are the strongest countries in these sectors.

Table 4.10.b Turkey's highest-RCA sectors, 3-digit, LIG

LIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-662	**10.34**	**12.10**	1-Turkey	12.10	**8.32**	1-Turkey	8.32
Clay Construction Materials and			2-Bulgaria	8.06		2-Bulgaria	2.92
Refractory Construction Materials			3-Czech R.	5.58		3-Czech R.	2.46
S3-844	**9.07**	**10.83**	1-Turkey	10.83	**7.06**	1-Bulgaria	7.61
Women's Coats, Capes, Jackets, Suits,			2-Bulgaria	7.20		2-Turkey	7.06
Trousers, Dresses, Underwear, Etc.			3-Morocco	5.35		3-Morocco	5.85
S3-655	**8.50**	**7.70**	1-Malta	15.22	**9.41**	1-Malta	34.00
Knitted Or Crocheted Fabrics (Including			2-Korea	12.89		2-Turkey	9.41
Tubular Knit Fabrics, N.E.S., Pile Fabrics			3-Turkey	7.70		3-Korea	7.51
S3-812	**7.91**	**7.58**	1-Egypt	34.24	**8.30**	1-Slovakia	8.73
Sanitary, Plumbing and Heating Fixtures			2-Bulgaria	8.13		2-Turkey	8.30
And Fittings, N.E.S.			3-Turkey	7.58		3-Egypt	5.89
S3-846	**7.16**	**7.40**	1-Turkey	7.40	**6.88**	1-Turkey	6.88
Clothing Accessories, of Textile			2-India	4.30		2-Croatia	5.69
Fabrics,(other than those for babies)			3-Romania	4.05		3-India	3.34
S3-658	**7.14**	**8.48**	1-Egypt	9.78	**5.60**	1-India	5.70
Made-Up Articles, Wholly or Chiefly of			2-Turkey	8.48		2-Turkey	5.60
Textile Materials, N.E.S.			3-India	7.84		3-Egypt	4.46
S3-845	**6.45**	**7.45**	1-Tunisia	9.65	**5.31**	1-Tunisia	9.33
Articles of Apparel,of Textile Fabrics,			2-Turkey	7.45		2-Morocco	5.66
Whether or Not Knitted or Crocheted,			3-Morocco	6.74		3-Turkey	5.31
S3-661	**6.41**	**6.90**	1-Croatia	7.48	**5.84**	1-Croatia	7.96
Lime, Cement, and Fabricated			2-Turkey	6.90		2-Turkey	5.84
Construction Materials, except Glass and			3-India	6.59		3-India	5.60
S3-656	**6.10**	**6.87**	1-Turkey	6.87	**5.22**	1-Turkey	5.22
Tulles, Lace, Embroidery, Ribbons,			2-Switzerland	4.34		2-Romania	4.23
Trimmings And Other Small Wares			3-India	3.97		3-India	3.62

Table 4.10.b (continued)

LIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-263	**5.50**	**4.44**	1-Egypt	46.91	**6.71**	1-Egypt	17.35
Cotton Textile Fibers			2-Turkey	4.44		2-Turkey	6.71
			3-Israel	3.72		3-Israel	3.85
S3-653	**5.07**	**5.14**	1-Indonesia	8.01	**4.99**	1-Turkey	4.99
Woven Fabrics of Manmade Textile			2-Turkey	5.14		2-Indonesia	4.38
Materials (Not Including Special Fabrics)			4-Korea	4.67		3-China	3.22
S3-652	**4.84**	**4.69**	1-India	9.11	**5.01**	1-Turkey	5.01
Cotton Fabrics, Woven (Not Including			2-Turkey	4.69		2-India	3.94
Special Fabrics)			3-Indonesia	4.46		3-Indonesia	3.49
S3-842	**4.84**	**5.28**	1-Romania	9.24	**4.33**	1-Morocco	11.18
Women's Coats, Capes, Jackets, Suits,			2-Morocco	8.34		2-Romania	6.18
Trousers, Dresses, Skirts, Underwear			3-Tunisia	8.30		3-Bulgaria	5.26
S3-651	**4.79**	**5.27**	1-Egypt	13.81	**4.25**	1-Indonesia	5.74
Textile Yarn			2-India	7.83		2-India	5.44
			3-Turkey	5.27		3-Egypt	4.63
S3-693	**4.68**	**4.97**	1-Turkey	4.97	**4.35**	1-Turkey	4.35
Wire Products (Excluding Insulated			2-Czech R.	3.77		2-Korea	3.52
Electrical Wiring) And Fencing Grills			3-Korea	3.38		3-Romania	3.27
S3-843	**4.33**	**4.91**	1-India	6.89	**3.66**	1-India	5.48
Men's Coats, Capes, Jackets, Suits,			2-Morocco	5.43		2-Turkey	3.66
Blazers, Trousers, Shirts, Etc. , Knitted Or			3-Turkey	4.91		3-Indonesia	3.21
S3-665	**3.74**	**4.31**	1-Czech R.	5.05	**3.08**	1-Turkey	3.08
Glassware			2-Turkey	4.31		2-Slovenia	3.03
			3-Romania	3.77		3-Malta	2.96
S3-269	**3.68**	**4.89**	1-Tunisia	10.27	**2.30**	1-Tunisia	10.19
Worn Clothing and other Worn Textile			2-Lithuania	6.62		2-Slovakia	4.39
Articles; Rags			3-Slovakia	5.08		3-Lithuania	3.75
S3-659	**3.47**	**3.42**	1-India	16.86	**3.53**	1-India	16.73
Floor Coverings, Etc.			2-Turkey	3.42		2-Egypt	6.21
			3-Egypt	2.89		3-Turkey	3.53
S3-841	**3.11**	**3.11**	1-Tunisia	12.93	**3.12**	1-Tunisia	9.43
Men's Coats, Jackets, Suits, Trousers,			3-Romania	8.73		2-Morocco	7.63
Shirts, Underwear Etc. of Woven Textile			3-Morocco	7.79		3-Romania	6.08

Table 4.10.b (continued)

LIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-848	**2.95**	**3.88**	1-India	7.48	**1.88**	1-Malaysia	10.37
Articles of Apparel and Clothing Accessories of			2-China	5.85		2-India	5.38
Other Than Textile Fabrics			3-Malaysia	5.61		3-China	3.01
S3-266	**2.87**	**2.99**	1-Korea	7.44	**2.73**	1-Korea	8.69
Synthetic Fibers Suitable for Spinning			2-Mexico	3.32		2-Japan	3.17
			3-Turkey	2.99		3-Turkey	2.73
S3-654	**2.24**	**2.76**	1-Lithuania	13.23	**1.64**	1-Latvia	9.51
Woven Fabrics of Textile Materials, Other than			2-India	11.41		2-Lithuania	9.38
Cotton or Manmade Fibers			3-Latvia	9.74		3-India	8.26
S3-657	**2.14**	**2.04**	1-Israel	2.24	**2.25**	1-Morocco	3.87
Special Yarns, Special Textile Fabrics And Related			4-Croatia	2.08		2-Israel	3.04
Products			5-Turkey	2.04		3-Turkey	2.25
S3-697	**2.08**	**2.28**	1-China	6.41	**1.85**	1-Malta	5.51
Household Equipment of Base Metal, N.E.S.			2-Malta	3.64		2-China	4.12
			3-Turkey	2.28		3-Croatia	2.32
S3-664	**1.79**	**2.13**	1-Czech R	5.16	**1.40**	1-Czech R.	3.19
Glass			2-Israel	2.36		2-Poland	2.72
			3-Turkey	2.13		3-Hungary	2.04
S3-897	**1.34**	**1.36**	1-Thailand	8.71	**1.31**	1-Thailand	10.52
Jewelry, Goldsmiths' And Silversmiths' Wares, and			2-India	4.97		2-Switzerland	3.98
Other Articles of Precious Materials, N.E.S.			3-Switzerland	3.81		3-India	3.85
S3-613	**1.23**	0.70	1-Lithuania	6.58	**1.84**	1-Lithuania	7.68
Furskins, Tanned Or Dressed, Assembled or			2-Poland	6.54		2-Ukraine	5.16
Unassembled without the addition of other materials,			3-Ukraine	4.67		3-Poland	4.24
S3-666	**1.22**	**1.01**	1-China	7.41	**1.46**	1-Thailand	7.11
Pottery			2-Thailand	6.00		2-China	4.60
			3-Romania	4.90		3-Indonesia	3.01
S3-692	**1.13**	0.94	1-Czech R.	5.40	**1.36**	1-Czech R.	4.42
Metal Containers for Storage or Transport			2-Poland	4.93		2-Poland	3.98
			3-Slovakia	3.20		3-Latvia	2.80
S3-699	0.96	0.79	1-Czech R.	5.30	**1.15**	1-Czech R.	3.74
Manufactures of Base Metal, N.E.S.			2-Poland	3.79		2-Slovenia	2.46
			3-Slovenia	2.98		3-Poland	2.45
S3-642	0.96	0.47	1-Slovakia	4.88	**1.19**	1-Poland	3.59
Paper And Paperboard, Cut to Size or Shape, and			2-Slovenia	3.72		2-Slovenia	3.03
Articles of Paper or Paperboard			3-Poland	2.94		3-Slovakia	2.95

Table 4.10.c Turkey's highest-RCA sectors, 3-digit, CIG

CIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-783	**10.71**	**9.94**	1-Turkey	9.94	**11.60**	1-Turkey	11.60
Road Motor Vehicles, N.E.S.			2-Poland	5.56		2-Poland	6.63
			3-Czech R.	4.65		3-Czech R.	3.37
S3-782	**8.76**	**3.32**	1-Thailand	11.45	**14.99**	1-Turkey	14.99
Motor Vehicles for the Transport of Goods			2-Turkey	3.32		2-Thailand	11.38
and Special Purpose Motor Vehicles			3-Poland	3.31		3-Brazil	3.97
S3-676	**5.59**	**5.99**	1-Latvia	7.22	**5.14**	1-Latvia	15.80
Iron and Steel Bars, Rods, Angles, Shapes			2-Ukraine	6.15		2-Ukraine	7.68
and Sections, Including Sheet Piling			3-Turkey	5.99		3-Turkey	5.14
S3-679	**3.51**	**3.57**	1-Ukraine	6.02	**3.45**	1-Ukraine	6.70
Ironand Steel Tubes, Pipes and Hollow			2-Romania	3.98		2-Romania	3.58
Profiles, Fittings For Tubes and Pipes			3-Croatia	3.70		3-Turkey	3.45
S3-121	**3.07**	**3.53**	1-Brazil	10.31	**2.53**	1-Brazil	12.61
Tobacco, Unmanufactured; Tobacco			2-Turkey	3.53		2-Bulgaria	5.94
Refuse			3-India	2.76		3-India	3.25
S3-625	**2.69**	**3.10**	1-Korea	5.05	**2.22**	1-Slovenia	3.51
Rubber Tires, Interchangeable Tire			2-Slovenia	4.13		2-Slovakia	3.43
Treads, Tire Flaps and Inner Tubes for			3-Turkey	3.10		3-Korea	3.37
S3-621	**2.48**	**2.22**	1-Czech R	5.29	**2.78**	1-Czech R	4.68
Materials of Rubber, Including Pastes,			2-Slovenia	4.09		2-Romania	3.64
Plates, Sheets, Rods, Thread, Tubes, Etc.			3-Slovakia	3.74		3-Slovenia	3.45
S3-673	**2.33**	**3.06**	1-Bulgaria	29.48	**1.49**	1-Bulgaria	7.74
Iron or Nonalloy Steel Flat-Rolled			2-Slovakia	11.19		2-Ukraine	5.14
Products, Not Clad, Plated or Coated			3-Romania	8.89		3-Slovakia	4.06
S3-629	**1.97**	**1.57**	1-Malta	20.09	**2.44**	1-Malta	17.31
Articles of Rubber, N.E.S.			2-Czech R.	3.04		2-Poland	4.01
			4-Slovakia	2.26		3-Slovenia	3.10
S3-672	**1.79**	**2.13**	1-Ukraine	36.91	**1.40**	1-Ukraine	53.64
Iron or Steel Ingots and Other Primary			2-Russia	8.61		2-Russia	5.84
Forms, And Semifinished Products of Iron			3-Brazil	8.35		3-Brazil	2.18

Table 4.10.c (continued)

CIG	1996-2010	1996-2003			2004-2010		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-781	**1.61**	0.94	1-Slovakia	5.41	**2.38**	1-Mexico	4.60
Motor Cars and Other Motor Vehicles			2-Korea	4.42		2-Japan	4.54
Designed for The Transport of Persons			3-Japan	4.39		3-Slovakia	4.40
S3-111	**1.60**	**1.80**	1-Czech R	4.18	**1.38**	1-Switzerlar	8.93
Nonalcoholic Beverages, N.E.S.			2-Slovakia	3.83		2-Latvia	3.96
			3-Slovenia	3.57		3-Poland	2.25
S3-784	**1.37**	**1.15**	1-Slovakia	3.90	**1.63**	1-Czech R	4.29
Parts and Accessoriesfor Tractors, Motor			2-Czech R	3.72		2-Slovakia	4.07
Cars and Other Motor Vehicles, N.E.S.			3-Japan	2.24		3-Poland	3.09
S3-532	**1.22**	**1.11**	1-Mexico	16.36	**1.34**	1-Slovenia	7.02
Dyeing And Tanning Extracts, And			2-S Africa	8.65		2-S Africa	6.98
Synthetic Tanning Materials			3-Slovenia	5.81		3-Mexico	2.49
S3-786	**1.00**	**1.38**	1-China	5.74	0.56	1-China	4.29
Trailers And Semi-Trailers; Other			2-Slonenia	5.29		2-Slovenia	4.06
Vehicles, Not Mechanically Propelled			3-Hungary	4.66		3-Hungary	3.00
S3-678	0.98	0.81	1-Ukraine	12.12	**1.18**	1-Ukraine	6.30
Iron And Steel Wire			2-Czech R	8.13		2-Czech R	4.86
			3-Lithuania	4.48		3-Lithuania	4.53
S3-684	0.96	0.73	1-Egypt	6.54	**1.22**	1-Norway	4.57
Aluminum			2-Norway	5.57		2-Slovenia	4.23
			3-Russia	3.52		3-Egypt	3.44

In the CIG category (Table 4.10.c above), the sectors 783, 782, 676, 679, and 121 are Turkey's highest-RCA sectors. Turkey is generally ranked among the top-three in these sectors. However, Turkey fell behind Bulgaria in the sector 121 due to the decrease in its RCA coefficient in the second sub-period. In the sector 782, there is a remarkable increase in Turkey's RCA coefficient and Turkey rose from the second to the first rank in this sector, creating a big difference with respect to its competitors.

In the previous part, we have already drawn attention to the increase in Turkey's over-unity RCA exports in the CIG category. At this point, we should also emphasize the large contribution of the sector 782 to that increase. In this sector, Thailand and Brazil are Turkey's main competitors in the second period. On the other hand, Turkey gained comparative advantage in sectors 684 and 678 in the

second sub-period, with no over-unity RCA in these sectors in the first sub-period. In this regard, it is observed that the RCAs of Turkey's competitors in sector 678 has decreased considerably, implying that Turkey can further enhance its competitiveness in this product. Besides, when we consider the highness of the export value of sector 684, the role of this sector in the increasing share of the CIG category is especially remarkable. In this important sector (684), Norway, Slovenia and Egypt are the highest-RCA countries, and hence they are the most important competitors of Turkey.

In the EIRG category (Table 4.10.d), only two sectors, 761 and 511, have over-unity RCA in both periods. However, there is a high decrease in the RCA coefficient of sector 761. In sector 582, Turkey gained comparative advantage in the second sub-period. Turkey has failed to rank among the top-three countries in sectors 511, 761 and 582 in the second sub-period. Moreover, while Turkey was the leader in sector 761 in the first sub-period, it handed over the leadership to Slovakia in the second sub-period.

Table-4.10.d. Turkey's highest-RCA sectors, 3-digit, EIRG

EIRG	**1996-2010**	**1996-2003**			**2004-2010**		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-761	**6.68**	**8.20**	1-Turkey	8.20	**4.94**	1-Slovakia	10.48
Tv Receivers (Including Video Monitors &			2-Poland	4.41		2-Turkey	4.94
Projectors)			3-Korea	3.48		3-Hungary	4.45
S3-511	**1.17**	**1.33**	1-Israel	6.43	**1.34**	1-Israel	8.73
Hydrocarbons, N.E.S. and Their			2-Russia	3.47		2-USA	2.60
Derivatives			3-Croatia	2.60		3-Russia	2.56
S3-582	**1.08**	0.58	1-Israel	4.01	**1.64**	1-Israel	5.19
Plates, Sheets, Film, Foil And Strip Of			2-Switzerland	2.89		2-Switzerlar	3.06
Plastics			3-USA	1.89		3-USA	2.07

In the DIRG category (Table 4.10.e), Turkey's highest-RCA sectors are 775, 773, 733, and 713. Turkey's RCA coefficients increased from the first to the second sub-period, except for sector 773. In the first sub-period, Turkey could not rank

among the top-three countries in any of these sectors. In the second sub-period, Turkey was able to become the second in the sectors 733 and 775. Therefore, 733 and 775 are especially prominent sectors for Turkey in the DIRG category; and Slovenia, China, Switzerland and Slovakia are Turkey's main competitors in these sectors. In the sectors 793 and 749, Turkey did not have over-unity RCA in the first sub-period, whereas it succeeded to have over-unity RCA in these sectors in the second sub-period; even though the magnitude of the coefficients are much smaller than that of the leader countries, such as Korea and Croatia.

Table-4.10.e. Turkey's highest-RCA sectors, 3-digit, DIRG

DIRG	**1996-2010**	**1996-2003**			**2004-2010**		
Sector	Turkey's RCA	Turkey's RCA	First 3 Countries's RCA		Turkey's RCA	First 3 Countries's RCA	
S3-775	**3.31**	**2.85**	1-Slovenia	9.53	**3.84**	1-Slovenia	5.70
Household Type Electrical and			2-China	4.31		2-Turkey	3.84
Nonelectrical Equipment, N.E.S.			3-Korea	3.36		3-China	3.08
S3-733	**3.06**	**2.10**	1-Switzerland	4.46	**4.16**	1-Switzerlar	4.68
Machine Tools for Working Metal,			2-Slovakia	2.93		2-Turkey	4.16
Sintered Metal Carbides or Cermets			3-Bulgaria	2.50		3-Slovakia	2.35
S3-773	**2.01**	**2.48**	1-Tunisia	7.45	**1.48**	1-Morocco	11.48
Equipment For Distributing Electricity,			2-Slovakia	6.00		2-Romania	8.37
N.E.S.			3-Hungary	5.39		3-Tunisia	7.33
S3-713	**1.36**	**1.14**	1-Hungary	9.15	**1.61**	1-Hungary	9.12
Internal Combustion Piston Engines and			2-Mexico	5.88		2-Poland	3.72
Parts Thereof, N.E.S.			3-Poland	2.73		3-Japan	3.00
S3-793	0.89	0.54	1-Korea	12.10	**1.31**	1-Korea	16.17
Ships, Boats (Including Hovercraft) and			2-Croatia	9.37		2-Croatia	12.42
Floating Structures			3-Poland	3.53		3-China	1.79
S3-749	0.68	0.38	1-Israel	4.28	**1.02**	1-Croatia	3.37
Nonelectric Parts And Accessories of			2-Malta	3.75		2-Switzerlar	2.69
Machinery, N.E.S.			3-Czech R	2.94		3-Czech R.	2.13

4.4.2 Dynamic Market Positioning

Comparisons among Countries

Evaluating dynamic market positions is a useful way to see and understand the changes in countries' competitiveness in the international markets. Therefore, in this

part, we analyze the dynamic market positions of Turkey and its competitors in the EU-15 market over the whole period.

Table 4.11 below shows the shares of “rising stars”, “falling stars”, “leading retreat”, “lagging retreat”, “lagging opportunity” and “lost opportunity” in the total exports of the countries in the period 1996-2010 for overall sectors. These 6 categories have already been explained and discussed in Part 4.3 (“Data and Methodology”, see Table 4.1). The ranking in Table 4.11 is based on the “rising stars”. Bold numbers show the highest category among others for each country.

Table 4.11 indicates that 37.3% of Turkey’s total exports fall in the category of “rising stars”, 6.9% in “falling stars”, 11.2% in “leading retreat”, 31.9% in “lagging retreat”, 6.6% in “lagging opportunity” and 6% in “lost opportunity”. While the highest share of “rising stars” is good news for Turkey, “lagging retreat” has the second-highest share, implying that a considerable portion of Turkish exports belongs to sectors which are declining in terms of their share in the EU-15 market. In fact, “retreat” can be seen as a rational way of restructuring away from the products with declining demand by EU-15, and hence the year-by-year decrease in the exports of these products can be a good development for Turkey, provided that the rate of this decrease slows down so that Turkey can restructure its exports from ‘lagging retreat’ to ‘leading retreat’.

When we compare the categories within each country, we see that most of the countries, including Turkey, have the highest share in the “rising stars”. Therefore, most countries are in the optimal position since the share of these countries in the EU-15 market is rising in products for which EU-15-demand is growing. On the other hand, Malaysia, Brazil, Morocco, Singapore and China have the highest shares in “falling stars”; Malta and Latvia in “leading retreat”; Romania and India in “lagging retreat”; and Russia, Norway and Slovenia in “lagging opportunity”. None of the countries has the highest share in “lost opportunity”. However, for Egypt, the share of this category is very high compared to other countries. In other words, Egypt is losing market share in most of the sectors for which EU-15 demand is growing.

Table 4.11 Dynamic market positioning, overall sectors, 1996-2010

	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
CANADA	**57.0**	(1)	13.6	(24)	1.9	(25)	16.4	(14)	1.9	(25)	9.4	(17)
UKRAINE	**55.1**	(2)	21.3	(14)	2.7	(23)	7.5	(26)	9.6	(10)	3.8	(30)
ISRAEL	**54.6**	(3)	25.0	(10)	1.7	(26)	10.4	(24)	3.8	(20)	4.4	(28)
S AFRICA	**53.5**	(4)	16.2	(22)	4.0	(19)	2.4	(32)	16.0	(6)	7.9	(23)
SLOVAKIA	**47.6**	(5)	11.3	(27)	0.6	(32)	15.2	(16)	7.8	(11)	17.7	(9)
INDONESIA	**44.6**	(6)	21.8	(11)	16.1	(3)	14.6	(17)	0.1	(32)	3.0	(32)
HUNGARY	**43.5**	(7)	18.3	(18)	1.6	(27)	15.4	(15)	2.5	(23)	18.8	(8)
KOREA	**42.8**	(8)	10.2	(29)	9.4	(8)	14.4	(18)	2.4	(24)	21.0	(5)
CROTIA	**41.3**	(9)	20.4	(16)	6.1	(16)	22.8	(7)	5.9	(16)	3.4	(31)
BULGARIA	**40.6**	(10)	29.6	(7)	6.3	(14)	11.7	(23)	1.6	(26)	10.3	(14)
POLAND	**39.8**	(11)	12.3	(26)	2.7	(24)	16.7	(13)	6.4	(14)	22.1	(2)
TURKEY	**37.3**	**(12)**	**6.9**	**(31)**	**11.2**	**(6)**	**31.9**	**(3)**	**6.6**	**(13)**	**6.0**	**(25)**
MEXICO	**36.9**	(13)	21.8	(12)	1.1	(30)	6.1	(27)	25.3	(3)	8.8	(19)
LITHUANIA	**36.6**	(14)	18.2	(19)	1.4	(29)	27.4	(4)	0.1	(31)	16.5	(10)
BRAZIL	35.2	(15)	**54.5**	**(2)**	0.4	(33)	1.2	(33)	0.5	(28)	8.2	(21)
USA	**34.5**	(16)	10.9	(28)	9.2	(10)	19.7	(11)	4.6	(18)	21.3	(4)
EGYPT	**34.5**	(17)	20.6	(15)	5.7	(17)	5.7	(28)	0.0	(33)	33.7	(1)
CZECH R	**31.1**	(18)	20.0	(17)	3.5	(22)	14.1	(19)	9.9	(9)	21.5	(3)
THAILAND	**30.6**	(19)	30.3	(6)	7.6	(12)	18.6	(12)	2.9	(21)	10.0	(15)
LATVIA	29.0	(20)	21.5	(13)	**29.8**	(2)	12.8	(21)	0.1	(29)	6.8	(24)
ROMANIA	28.6	(21)	12.8	(25)	3.5	(21)	**36.1**	**(1)**	4.0	(19)	15.5	(11)
NORWAY	28.1	(22)	5.2	(32)	0.9	(31)	5.2	(30)	**46.1**	**(2)**	14.4	(12)
JAPAN	**27.3**	**(23)**	17.5	(20)	12.8	(5)	13.3	(20)	21.2	(5)	8.0	(22)
INDIA	27.2	(24)	17.1	(21)	7.5	(13)	**34.2**	**(2)**	2.9	(22)	11.2	(13)
CHINA	26.8	(25)	**31.5**	**(5)**	4.7	(18)	23.1	(6)	5.5	(17)	8.8	(18)
MALTA	25.2	(26)	26.2	(9)	**30.9**	**(1)**	12.3	(22)	0.6	(27)	4.7	(27)
SINGAPORE	23.2	(27)	**35.6**	**(4)**	10.9	(7)	21.8	(9)	0.1	(30)	8.3	(20)
SLOVENIA	22.8	(28)	15.7	(23)	6.2	(15)	9.8	(25)	**24.8**	**(4)**	20.6	(6)
TUNISIA	22.6	(29)	**29.5**	(8)	8.1	(11)	23.7	(5)	11.5	(8)	4.4	(29)
MALAYSIA	21.9	(30)	**57.8**	**(1)**	3.9	(20)	5.3	(29)	6.3	(15)	4.8	(26)
MOROCCO	21.5	(31)	**40.1**	**(3)**	9.3	(9)	21.0	(10)	6.6	(12)	1.4	(33)
SWITZERLAN	21.3	(32)	7.0	(30)	14.8	(4)	**21.8**	(8)	15.7	(7)	19.3	(7)
RUSSIA	13.1	(33)	2.8	(33)	1.5	(28)	4.3	(31)	**68.6**	**(1)**	9.7	(16)

Next, we examine the dynamic market positions for each technological category in the context of Tables-4.12.a-e., covering the full period. The ranking is based on the share of each category in total exports. Bold numbers indicate the highest share of each category within each country.

Table 4.12.a Dynamic market positioning, RMIG, 1996-2010

	TOTAL	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
NORWAY	75.2	19.6	(2)	3.7	(14)	0.6	(18)	1.8	(11)	**45.8**	(2)	3.8	(3)
RUSSIA	73.6	8.2	(10)	0.8	(28)	1.0	(13)	1.8	(13)	**60.2**	(1)	1.7	(9)
EGYPT	55.6	14.6	(6)	7.2	(8)	0.8	(15)	0.1	(29)	0.0	(28)	**32.9**	(1)
BRAZIL	55.5	14.0	(7)	**39.2**	(1)	0.0	(30)	0.2	(27)	0.3	(16)	1.8	(8)
LATVIA	45.4	9.5	(8)	12.5	(4)	**23.3**	(1)	0.0	(33)	0.1	(25)	0.1	(23)
LITHUANIA	39.3	**15.7**	(5)	9.0	(7)	0.1	(26)	4.4	(5)	0.0	(32)	10.1	(2)
UKRAINE	37.1	**15.8**	(4)	10.4	(5)	0.2	(21)	0.1	(28)	9.9	(5)	0.6	(14)
CANADA	36.1	**18.1**	(3)	4.9	(11)	1.2	(11)	10.0	(1)	1.8	(9)	0.2	(18)
INDONESIA	35.6	**26.1**	(1)	9.1	(6)	0.0	(31)	0.4	(22)	0.0	(33)	0.0	(30)
MEXICO	33.2	2.5	(21)	4.3	(12)	0.7	(16)	1.3	(17)	**24.3**	(3)	0.1	(24)
S AFRICA	32.6	3.3	(19)	**27.4**	(2)	1.1	(12)	0.8	(19)	0.0	(29)	0.1	(22)
MOROCCO	32.4	3.8	(17)	**14.0**	(3)	0.2	(22)	7.7	(2)	5.6	(6)	1.2	(10)
TUNISIA	23.1	5.7	(14)	1.9	(18)	0.1	(25)	1.5	(15)	**11.3**	(4)	2.7	(6)
CROTIA	19.1	9.2	(9)	3.1	(16)	**5.7**	(2)	0.2	(26)	1.0	(13)	0.0	(32)
THAILAND	16.9	4.7	(15)	**6.4**	(9)	1.8	(6)	3.7	(7)	0.0	(26)	0.2	(17)
BULGARIA	16.6	**7.7**	(12)	5.7	(10)	0.9	(14)	1.6	(14)	0.5	(15)	0.2	(19)
INDIA	16.2	**6.5**	(13)	1.6	(20)	2.8	(3)	4.6	(4)	0.0	(31)	0.7	(13)
POLAND	14.8	**3.8**	(18)	2.7	(17)	1.7	(9)	2.4	(9)	1.1	(12)	3.0	(5)
MALAYSIA	14.8	**8.2**	(11)	3.5	(15)	2.7	(5)	0.2	(25)	0.1	(22)	0.1	(26)
ISRAEL	12.7	0.5	(33)	**3.7**	(13)	2.8	(4)	2.5	(8)	2.9	(7)	0.2	(16)
TURKEY	12.6	1.5	(28)	1.1	(27)	1.8	(8)	**6.6**	(3)	1.5	(11)	0.0	(28)
USA	9.6	**4.1**	(16)	1.9	(19)	1.6	(10)	1.8	(12)	0.1	(24)	0.2	(21)
HUNGARY	9.3	1.6	(27)	1.2	(24)	0.0	(32)	**4.1**	(6)	0.2	(20)	2.2	(7)
ROMANIA	7.8	**2.3**	(22)	1.5	(21)	1.8	(7)	0.3	(24)	1.8	(8)	0.1	(27)
CZECH R	7.3	**2.1**	(24)	1.3	(23)	0.6	(17)	1.4	(16)	1.0	(14)	0.9	(12)
SLOVAKIA	7.3	2.1	(23)	1.2	(26)	0.0	(28)	0.6	(20)	0.1	(23)	**3.3**	(4)
CHINA	5.0	0.9	(29)	1.4	(22)	0.1	(24)	**2.1**	(10)	0.2	(18)	0.2	(20)
SLOVENIA	4.6	**1.8**	(26)	1.2	(25)	0.1	(23)	0.0	(30)	0.3	(17)	1.1	(11)
SWITZERLAND	4.5	0.9	(30)	0.6	(31)	0.2	(20)	1.0	(18)	**1.7**	(10)	0.1	(25)
SINGAPORE	4.1	2.6	(20)	0.7	(29)	0.0	(33)	0.6	(21)	0.2	(21)	0.0	(29)
KOREA	2.7	**2.0**	(25)	0.4	(33)	0.0	(27)	0.3	(23)	0.0	(30)	0.0	(31)
MALTA	2.3	**0.8**	(31)	0.7	(30)	0.3	(19)	0.0	(31)	0.2	(19)	0.3	(15)
JAPAN	1.0	**0.6**	(32)	0.4	(32)	0.0	(29)	0.0	(32)	0.0	(27)	0.0	(33)

According to Table 4.12.a, RMIG-exports constitute 12.6 % of Turkey's total exports. 1.5 percentage-point of this share belongs to "rising stars", 1.1 percentage-point to "falling stars", 1.8 percentage-point to "leading retreat", 6.6 percentage-point to "lagging retreat" (i.e., nearly half of total exports); and 1.5 percentage-point to "lagging opportunity". That is to say, a very large portion (almost half) of Turkey's exports fall into the category of "lagging retreat", and this is not a desirable

market position. Actually, a decrease in the exports of these products is a good development for Turkey since these products are declining in terms of their share in the EU-15 market. But the rate of this decrease should slow down so that Turkey can restructure its exports from 'lagging retreat' to 'leading retreat' category.

Table 4.12.a also shows that Norway, Russia, Egypt and Brazil are the countries for which RMIG-exports constitute the highest component of their total exports. However, for Russia and Norway, the largest part of RMIG-exports falls in the category of "lagging opportunity", for Egypt in "lost opportunity" and for Brazil in "falling stars". In other words, the countries for which RMIG-exports constitute the highest component of their total exports are in an undesirable market position. For example, Norway's RMIG-exports constitute 75.2% of its total exports and of this 75.2%, 45.8 percentage-points belong to the "lagging opportunity" category.

Indonesia is in the most optimal dynamic position in the RMIG category among other countries, as the highest share of its exports is in the "rising stars" category. More specifically, Indonesia's RMIG-exports constitute 35.6 % of its total exports and of this 35.6%, 26.1 percentage-points belong to the category of "rising stars". On the other hand, Egypt is in the most undesirable position, as its RMIG-exports constitute 55.6 % of its total exports and of this share, 32.9 percentage-points belong to the category of "lost opportunity". That is to say, Egypt is losing market share in the EU-15 market in most of the RMIG-sectors, for which EU-15-demand is growing.

Table 4.12.b below presents the dynamic market positioning of the countries in the LIG category, which constitutes 48.2 % of Turkey's total exports. 5.5 percentage-points of this share belong to "rising stars", 2.8 to "falling stars", 9.4 to "leading retreat", 24.8 (i.e., nearly half) to "lagging retreat", 1.4 to "lagging opportunity" and 4.2 to "lost opportunity". Thus, the highest portion of Turkey's LIG-exports is in the "retreat" categories. In other words, the bulk of Turkish exports in the LIG category fall in sectors that are declining in terms of their shares in the EU-15 market. Of course, this is not a desirable case in dynamic market positioning.

The largest component of LIG-exports are in "rising stars" for Lithuania, Israel, S. Africa, Canada and the US, in "falling stars" for Tunisia, Morocco, Bulgaria, Slovenia, Thailand, Egypt, Slovakia, Malaysia, Brazil, Japan and Mexico,

in “lagging retreat” for India, Romania, Turkey, Indonesia, China, Croatia, Latvia, Malta, Switzerland, Ukraine, Hungary, Korea, and Norway and in “lost opportunity” for Poland, the Czech Republic and Russia.

In LIG, Israel is in the best dynamic position, as 38.4% of its total exports are in the LIG category and of this 38.4%, 28.0 percentage-points belong to “rising stars”. On the other hand, Poland, the Czech Republic and Russia are in the most undesirable market positions in the LIG category.

Table 4.12.b Dynamic market positioning, LIG, 1996-2010

	TOTAL	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
INDIA	56.4	8.1	(7)	7.0	(12)	3.3	(11)	**29.2**	(2)	0.0	(24)	8.7	(3)
TUNISIA	53.8	2.4	(22)	**19.5**	(1)	8.0	(5)	22.3	(4)	0.0	(25)	1.7	(13)
ROMANIA	52.5	2.2	(23)	5.5	(16)	1.2	(18)	**34.8**	(1)	0.4	(12)	8.4	(4)
TURKEY	48.2	5.5	(11)	2.8	(25)	9.4	(1)	**24.8**	(3)	1.4	(4)	4.2	(9)
MOROCCO	44.8	4.0	(17)	**17.7**	(3)	9.2	(2)	13.3	(9)	0.4	(11)	0.1	(28)
INDONESIA	44.0	8.9	(6)	4.2	(20)	8.9	(4)	**22.0**	(5)	0.0	(26)	0.0	(33)
BULGARIA	40.2	9.0	(5)	**17.4**	(4)	5.4	(7)	8.0	(15)	0.0	(28)	0.3	(23)
CHINA	39.7	5.3	(12)	8.1	(9)	3.5	(10)	**16.3**	(8)	1.5	(3)	5.0	(7)
CROTIA	39.5	6.5	(9)	6.8	(13)	0.4	(26)	**21.3**	(6)	4.0	(1)	0.5	(22)
LITHUANIA	39.3	**11.0**	(3)	4.5	(19)	2.4	(13)	19.2	(7)	0.0	(27)	2.2	(11)
ISRAEL	38.4	**28.0**	(1)	5.0	(18)	0.3	(29)	2.6	(25)	0.9	(5)	1.7	(14)
LATVIA	36.4	4.1	(16)	6.3	(14)	6.9	(6)	**12.5**	(10)	0.0	(23)	6.5	(5)
POLAND	32.8	3.0	(20)	3.8	(22)	0.4	(25)	11.9	(11)	0.2	(17)	**13.5**	(1)
MALTA	31.8	0.8	(30)	7.3	(11)	9.1	(3)	**9.7**	(13)	0.1	(20)	4.8	(8)
SLOVENIA	31.7	3.8	(18)	**19.1**	(2)	2.1	(15)	3.3	(23)	3.4	(2)	0.0	(30)
THAILAND	28.5	9.2	(4)	**9.9**	(6)	1.4	(17)	7.0	(17)	0.2	(16)	0.7	(19)
EGYPT	26.9	4.8	(14)	**11.8**	(5)	4.9	(8)	5.3	(20)	0.0	(29)	0.0	(32)
CZECH R	26.8	0.1	(33)	3.9	(21)	1.1	(19)	8.1	(14)	0.3	(13)	**13.2**	(2)
SLOVAKIA	25.2	5.2	(13)	**9.4**	(7)	2.1	(14)	6.9	(18)	0.7	(7)	1.0	(18)
SWITZERLAND	20.8	2.0	(26)	2.1	(28)	2.9	(12)	**10.3**	(12)	0.3	(15)	3.4	(10)
UKRAINE	20.4	3.1	(19)	5.9	(15)	4.3	(9)	**6.8**	(19)	0.1	(21)	0.2	(27)
S AFRICA	20.0	**11.4**	(2)	7.7	(10)	0.3	(27)	0.3	(32)	0.1	(19)	0.1	(29)
HUNGARY	16.9	1.3	(29)	1.6	(31)	0.9	(21)	**7.0**	(16)	0.7	(6)	5.4	(6)
CANADA	15.3	**7.0**	(8)	3.0	(23)	0.2	(31)	4.1	(22)	0.6	(9)	0.5	(21)
MALAYSIA	13.8	4.8	(15)	**5.2**	(17)	0.6	(23)	2.5	(26)	0.0	(31)	0.7	(20)
BRAZIL	13.0	2.0	(25)	**9.2**	(8)	0.1	(32)	0.5	(30)	0.0	(33)	1.2	(17)
USA	12.3	**6.2**	(10)	1.7	(30)	1.1	(20)	2.8	(24)	0.3	(14)	0.3	(24)
KOREA	10.5	2.1	(24)	1.8	(29)	0.7	(22)	**4.8**	(21)	0.0	(30)	1.2	(16)
JAPAN	7.0	1.4	(28)	**2.4**	(27)	2.0	(16)	0.5	(31)	0.4	(10)	0.2	(26)
MEXICO	6.7	1.6	(27)	**2.6**	(26)	0.3	(28)	1.3	(28)	0.6	(8)	0.2	(25)
SINGAPORE	6.0	2.7	(21)	2.9	(24)	0.2	(30)	0.2	(33)	0.0	(22)	0.0	(31)
NORWAY	4.6	0.2	(32)	0.4	(33)	0.0	(33)	**2.2**	(27)	0.2	(18)	1.6	(15)
RUSSIA	4.6	0.2	(31)	0.8	(32)	0.6	(24)	1.0	(29)	0.0	(32)	**2.0**	(12)

Table 4.12.c Dynamic market positioning, CIG, 1996-2010

	TOTAL	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
SLOVAKIA	34.5	8.7	(13)	**17.4**	(1)	0.0	(19)	0.1	(13)	7.3	(3)	1.0	(18)
SLOVENIA	32.1	8.9	(12)	**14.6**	(2)	1.1	(3)	0.9	(3)	4.2	(4)	2.5	(13)
S AFRICA	28.4	**14.7**	(7)	7.6	(3)	0.0	(20)	0.3	(8)	3.4	(5)	2.5	(12)
JAPAN	27.4	6.2	(17)	0.3	(20)	3.6	(1)	0.0	(22)	**16.4**	(1)	1.0	(19)
UKRAINE	26.5	**25.0**	(1)	0.6	(14)	0.0	(25)	0.0	(29)	0.2	(19)	0.7	(22)
CZECH R	25.2	**18.5**	(3)	0.2	(27)	0.0	(32)	0.5	(6)	1.7	(8)	4.2	(7)
BULGARIA	25.0	**14.7**	(6)	1.2	(7)	0.2	(9)	0.0	(23)	1.1	(11)	7.8	(2)
MEXICO	24.0	**20.6**	(2)	1.3	(6)	0.0	(22)	0.1	(14)	0.4	(17)	1.7	(16)
POLAND	22.6	**15.5**	(5)	0.4	(18)	0.3	(7)	0.0	(18)	1.6	(9)	4.7	(5)
KOREA	21.5	4.4	(21)	0.1	(29)	0.2	(8)	0.2	(10)	0.1	(23)	**16.5**	(1)
TURKEY	21.3	**17.9**	(4)	0.2	(26)	0.0	(13)	0.7	(4)	2.3	(6)	0.1	(28)
RUSSIA	16.5	3.6	(23)	0.1	(30)	0.0	(33)	0.0	(33)	**9.1**	(2)	3.7	(9)
BRAZIL	15.5	**9.7**	(10)	3.2	(4)	0.1	(12)	0.0	(24)	0.0	(32)	2.6	(11)
ROMANIA	15.2	**6.9**	(15)	0.6	(12)	0.0	(24)	0.0	(28)	1.8	(7)	5.9	(4)
HUNGARY	14.1	**9.8**	(9)	0.2	(28)	0.0	(16)	0.1	(16)	0.5	(15)	3.6	(10)
SWITZERLAND	12.0	2.0	(30)	0.0	(32)	1.0	(5)	3.9	(2)	0.4	(16)	**4.6**	(6)
EGYPT	10.5	**9.4**	(11)	0.3	(21)	0.0	(28)	0.0	(19)	0.0	(27)	0.7	(21)
INDIA	10.5	**7.9**	(14)	1.0	(8)	1.3	(2)	0.3	(9)	0.0	(30)	0.0	(33)
THAILAND	10.4	4.4	(19)	1.0	(9)	0.0	(15)	**4.7**	(1)	0.0	(28)	0.2	(25)
NORWAY	10.3	1.3	(33)	0.0	(33)	0.0	(17)	0.2	(11)	1.4	(10)	**7.4**	(3)
LATVIA	10.2	**9.8**	(8)	0.3	(23)	0.0	(30)	0.0	(17)	0.0	(25)	0.0	(30)
USA	10.1	**5.8**	(18)	0.9	(10)	0.1	(10)	0.6	(5)	0.5	(14)	2.1	(15)
CANADA	9.1	**6.4**	(16)	0.2	(25)	0.0	(31)	0.2	(12)	0.2	(18)	2.1	(14)
MALTA	6.9	2.6	(26)	0.0	(31)	0.1	(11)	0.1	(15)	0.1	(22)	**3.9**	(8)
CHINA	5.9	**3.7**	(22)	0.6	(15)	0.4	(6)	0.3	(7)	0.0	(29)	1.0	(17)
CROTIA	5.9	**4.4**	(20)	0.3	(22)	0.0	(29)	0.0	(32)	0.8	(12)	0.3	(24)
INDONESIA	4.8	**3.0**	(24)	1.9	(5)	0.0	(21)	0.0	(26)	0.0	(26)	0.0	(32)
ISRAEL	4.1	**2.8**	(25)	0.6	(13)	0.0	(14)	0.0	(21)	0.0	(31)	0.6	(23)
LITHUANIA	4.1	**2.3**	(28)	0.6	(16)	1.1	(4)	0.0	(20)	0.1	(21)	0.0	(31)
TUNISIA	3.1	**2.6**	(27)	0.4	(17)	0.0	(26)	0.0	(30)	0.1	(20)	0.0	(29)
MOROCCO	3.1	**2.2**	(29)	0.2	(24)	0.0	(18)	0.0	(25)	0.6	(13)	0.1	(26)
MALAYSIA	3.1	**1.4**	(32)	0.9	(11)	0.0	(23)	0.0	(27)	0.1	(24)	0.7	(20)
SINGAPORE	2.3	**1.8**	(31)	0.4	(19)	0.0	(27)	0.0	(31)	0.0	(33)	0.1	(27)

Table 4.12.c above presents the dynamic market positioning of the countries in the CIG category. According to the table, 21.3% of Turkey's total exports are in the CIG category and 17.9 percentage-points of this share belong to "rising stars", 0.2 to "falling stars", 0.7 to "lagging retreat", 2.3 to "lagging opportunity" and 0.1 to "lost opportunity". So, Turkey is in an optimal market position, because almost all of Turkey's CIG-exports belong to the "rising stars" category. Furthermore, Slovakia, Slovenia, S. Africa, Japan, Ukraine, the Czech Republic, Bulgaria, Mexico, Poland, Korea and Turkey are the countries with the highest share of CIG-exports in their

total exports. Most of CIG-exports fall in "rising stars" for Ukraine, Mexico, the Czech Republic, Turkey, Poland and South Africa, in "falling stars" for Slovakia and Slovenia, in "lagging opportunity" for Japan and in "lost opportunity" for Korea. Ukraine is in the best dynamic position in this category such that 26.5 % of its total exports are in the CIG category and of this share, 25.0 percentage-points belong to "rising stars".

Table 4.12.d Dynamic market positioning, EIRG, 1996-2010

	TOTAL	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
SINGAPORE	48.5	**28.2**	(1)	7.0	(5)	0.0	(20)	5.1	(2)	0.0	(17)	8.2	(2)
CHINA	34.0	11.1	(9)	**18.3**	(2)	0.3	(6)	1.6	(6)	1.1	(6)	1.6	(6)
SWITZERLAND	33.1	0.1	(33)	0.2	(33)	10.2	(1)	**14.1**	(1)	0.2	(11)	8.2	(1)
MALAYSIA	31.9	2.1	(25)	**20.2**	(1)	1.9	(3)	0.0	(27)	5.8	(1)	1.8	(5)
USA	28.0	**14.8**	(6)	5.3	(8)	0.0	(22)	4.6	(3)	3.2	(3)	0.0	(30)
KOREA	27.8	**18.1**	(3)	3.8	(12)	0.6	(5)	3.3	(4)	0.0	(18)	2.0	(4)
HUNGARY	26.7	**19.6**	(2)	6.1	(7)	0.1	(11)	0.5	(17)	0.0	(25)	0.3	(17)
ISRAEL	26.0	**12.4**	(8)	8.8	(4)	1.4	(4)	1.0	(10)	1.5	(5)	0.9	(9)
JAPAN	23.6	**7.4**	(12)	2.8	(13)	5.9	(2)	2.4	(5)	0.6	(7)	4.4	(3)
THAILAND	21.0	15.4	(5)	5.2	(9)	0.0	(23)	0.0	(31)	0.0	(33)	0.4	(14)
SLOVAKIA	18.4	**16.4**	(4)	1.0	(25)	0.0	(30)	0.6	(14)	0.0	(15)	0.4	(15)
MEXICO	17.3	**8.5**	(11)	7.0	(6)	0.0	(21)	1.1	(8)	0.0	(20)	0.7	(12)
CZECH R	16.9	6.2	(15)	**9.6**	(3)	0.0	(15)	0.5	(18)	0.3	(10)	0.3	(20)
CANADA	16.6	**13.0**	(7)	2.4	(16)	0.0	(25)	0.8	(11)	0.4	(9)	0.0	(24)
MALTA	13.0	**10.3**	(10)	0.3	(31)	0.0	(17)	1.5	(7)	0.0	(19)	0.9	(10)
INDONESIA	10.8	**6.4**	(14)	4.3	(11)	0.0	(24)	0.0	(32)	0.1	(13)	0.0	(32)
POLAND	10.0	**6.9**	(13)	2.0	(17)	0.2	(9)	0.6	(15)	0.0	(23)	0.4	(16)
INDIA	9.3	0.8	(31)	**4.6**	(10)	0.1	(10)	0.6	(13)	2.2	(4)	0.9	(11)
TURKEY	7.1	0.9	(30)	1.1	(23)	0.0	(28)	0.0	(33)	**5.1**	(2)	0.0	(29)
UKRAINE	5.8	**2.2**	(24)	1.6	(18)	0.0	(26)	0.7	(12)	0.0	(22)	1.3	(7)
ROMANIA	5.6	**4.2**	(17)	1.2	(22)	0.0	(14)	0.1	(22)	0.0	(28)	0.0	(23)
BRAZIL	5.2	**2.5**	(22)	2.5	(14)	0.1	(13)	0.0	(30)	0.1	(12)	0.0	(31)
LITHUANIA	4.7	**3.3**	(20)	1.4	(20)	0.1	(12)	0.0	(29)	0.0	(32)	0.0	(28)
MOROCCO	4.7	**4.4**	(16)	0.3	(30)	0.0	(33)	0.0	(25)	0.0	(30)	0.0	(27)
TUNISIA	4.7	**3.7**	(18)	0.8	(27)	0.0	(32)	0.2	(20)	0.0	(16)	0.0	(33)
SLOVENIA	4.6	1.2	(29)	**2.4**	(15)	0.2	(8)	0.0	(23)	0.5	(8)	0.3	(18)
S AFRICA	4.5	**2.5**	(23)	1.5	(19)	0.2	(7)	0.0	(28)	0.1	(14)	0.3	(19)
BULGARIA	4.1	**2.0**	(26)	1.3	(21)	0.0	(27)	0.6	(16)	0.0	(24)	0.2	(21)
EGYPT	4.1	**3.3**	(19)	0.8	(28)	0.0	(19)	0.0	(24)	0.0	(29)	0.0	(26)
LATVIA	3.7	**2.6**	(21)	1.1	(24)	0.0	(29)	0.0	(26)	0.0	(31)	0.0	(25)
NORWAY	3.0	**1.4**	(28)	0.3	(32)	0.0	(16)	0.4	(19)	0.0	(26)	0.9	(8)
CROTIA	2.9	**1.9**	(27)	0.8	(26)	0.0	(31)	0.1	(21)	0.0	(27)	0.1	(22)
RUSSIA	2.2	0.4	(32)	0.4	(29)	0.0	(18)	**1.0**	(9)	0.0	(21)	0.5	(13)

Table 4.12.e Dynamic market positioning, DIRG, 1996-2010

	TOTAL	Rising Stars	Rank	Falling Stars	Rank	Leading Retreat	Rank	Lagging Retreat	Rank	Lagging Opp.	Rank	Lost Opp.	Rank
MALTA	49.4	2.8	(28)	**33.5**	(1)	0.7	(9)	5.5	(4)	4.5	(3)	2.4	(9)
USA	41.1	6.0	(17)	8.4	(7)	3.0	(7)	5.5	(3)	1.9	(10)	**16.2**	(1)
JAPAN	38.0	10.3	(7)	**12.6**	(3)	6.9	(4)	2.9	(7)	4.6	(2)	0.6	(21)
KOREA	37.3	**20.9**	(1)	3.9	(21)	7.9	(2)	1.8	(13)	2.3	(8)	0.4	(23)
HUNGARY	34.6	**14.9**	(4)	7.1	(12)	0.5	(10)	3.7	(6)	1.4	(11)	6.9	(2)
SINGAPORE	34.5	3.0	(27)	4.7	(16)	**23.0**	(1)	2.3	(11)	0.0	(23)	1.5	(14)
MALAYSIA	33.2	4.4	(24)	**27.7**	(2)	0.1	(21)	0.1	(27)	0.0	(31)	0.9	(19)
SWITZERLAND	33.1	9.6	(8)	3.7	(22)	3.7	(6)	**12.4**	(1)	3.4	(6)	5.4	(3)
CROTIA	31.6	**18.7**	(2)	9.1	(5)	0.0	(26)	1.3	(16)	0.0	(25)	2.4	(8)
CZECH R	28.0	5.9	(18)	**8.0**	(8)	2.4	(8)	2.6	(9)	6.5	(1)	2.8	(6)
SLOVENIA	27.8	4.9	(22)	**8.7**	(6)	5.6	(5)	4.8	(5)	2.0	(9)	1.8	(12)
CANADA	25.5	**17.0**	(3)	6.9	(13)	0.0	(28)	0.2	(25)	0.6	(14)	0.7	(20)
THAILAND	22.0	4.3	(25)	3.6	(23)	**7.4**	(3)	2.4	(10)	3.9	(4)	0.5	(22)
POLAND	21.8	**12.1**	(6)	4.2	(18)	0.0	(23)	1.7	(14)	3.4	(5)	0.4	(24)
SLOVAKIA	21.2	**8.8**	(10)	7.2	(11)	0.2	(16)	2.7	(8)	0.1	(20)	2.3	(10)
ROMANIA	19.7	**13.3**	(5)	4.2	(19)	0.4	(11)	0.6	(21)	0.2	(16)	0.9	(17)
CHINA	19.1	**7.6**	(11)	6.8	(14)	0.3	(12)	1.1	(17)	3.0	(7)	0.3	(26)
ISRAEL	18.6	5.5	(20)	**9.4**	(4)	0.0	(22)	2.1	(12)	0.4	(15)	1.1	(15)
MEXICO	17.9	5.7	(19)	**6.4**	(15)	0.0	(29)	0.8	(18)	0.0	(26)	5.0	(4)
TUNISIA	16.6	**8.8**	(9)	7.4	(10)	0.1	(17)	0.0	(30)	0.2	(17)	0.0	(30)
MOROCCO	15.5	7.5	(12)	**7.9**	(9)	0.0	(27)	0.1	(28)	0.0	(21)	0.0	(31)
BULGARIA	14.0	**6.5**	(15)	4.6	(17)	0.3	(14)	0.8	(19)	0.0	(27)	1.8	(11)
S AFRICA	13.9	1.0	(32)	4.1	(20)	0.1	(18)	**7.6**	(2)	0.1	(18)	1.0	(16)
LITHUANIA	13.4	**5.0**	(21)	2.7	(25)	0.0	(24)	1.4	(15)	0.0	(24)	4.2	(5)
BRAZIL	11.6	**6.8**	(14)	1.4	(30)	0.2	(15)	0.5	(22)	0.0	(28)	2.7	(7)
TURKEY	11.4	**7.1**	(13)	1.9	(28)	0.0	(31)	0.0	(33)	0.7	(13)	1.7	(13)
UKRAINE	8.7	**6.1**	(16)	2.4	(27)	0.0	(30)	0.0	(32)	0.1	(19)	0.1	(28)
INDIA	8.1	**4.4**	(23)	3.6	(24)	0.1	(20)	0.0	(31)	0.0	(33)	0.0	(33)
NORWAY	6.3	**2.6**	(29)	1.0	(31)	0.3	(13)	0.7	(20)	0.7	(12)	0.9	(18)
LATVIA	5.5	**3.0**	(26)	1.8	(29)	0.0	(32)	0.5	(23)	0.0	(29)	0.3	(27)
INDONESIA	4.7	1.6	(31)	**2.7**	(26)	0.1	(19)	0.3	(24)	0.0	(30)	0.0	(32)
EGYPT	2.8	**2.2**	(30)	0.6	(33)	0.0	(33)	0.0	(29)	0.0	(32)	0.0	(29)
RUSSIA	2.2	**0.9**	(33)	0.7	(32)	0.0	(25)	0.2	(26)	0.0	(22)	0.4	(25)

The dynamic market positioning of the countries in the EIRG category is presented in Table 4.12.d above. 7.1% of Turkey's exports belong to the EIRG category. Of this 7.1%, 5.1 percentage-points belong to "lagging opportunity". Turkey is ranked the second in the "lagging opportunity" category among other countries. This rank means that Turkey is gaining share in the EU-15 market for the products for which EU-15 demand is growing, however this gain is not sufficient to move Turkey to an optimal dynamic position.

The table also shows that Singapore, China, Switzerland and Malaysia are the countries with the highest share of EIRG-exports in total exports. For Singapore the largest part of these exports belongs to "rising stars", for China and Malaysia to "falling stars" and for Switzerland to "lagging retreat". Singapore is in the best market position such that 48.5 % of its total exports are in the EIRG category and of this share, 28.2 percentage-points (more than half) belong to "rising stars".

Table 4.12.e above presents the dynamic market positioning of the countries in the DIRG category, which constitutes 11.4 % of Turkey's total exports. 7.1 percentage-points of this share belong to "rising stars", implying that Turkey is in a promisingly competitive position despite the relatively low share of DIRG-exports in its total exports.

Table 4.12.e also shows that Malta, the US, Japan and Korea are the countries with the highest share of DIRG exports in total exports. For Korea, the largest part of DIRG-exports is in "rising stars", for Malta and Japan in "falling stars" and for the US in "lost opportunity". Korea is in the best dynamic position, as 37.3% of its total exports are in the DIRG category and 20.9 percentage-points of this share belong to "rising stars". On the other hand, the US is in an undesirable market position, because 41.1% its total exports are in the DIRG category, whereas 16.2 percentage-points of this share belong to "lost opportunity".

All in all, Turkey is in undesirable positions in RMIG and LIG, as its exports are mostly in "retreat" in these categories. However, "retreat" can also be interpreted somewhat in a positive way, as well-designed industrial and trade policies can lead Turkey to carry out a successful restructuring away from these low-value-added products towards products that generate higher value added. On the other hand, in the EIRG category, Turkey is ranked as the top-second country in terms of "lagging opportunity". Although Turkey is not in an optimal position in this category, it has an improving trend in terms of its share for the products for which EU-15 demand is growing. For the time being, however, this improving trend seems to be quite weak to shift Turkey to an optimal position, as Turkey is "lagging" prominently in materializing the "opportunities". In DIRG, Turkey is in a promising and hope-generating market position, despite the relatively low share of DIRG-exports in total exports. Given these improvement tendencies in the 'high-tech' products (i.e., in

EIRG and DIRG), Turkey seems to have a potential to raise its international competitiveness in the medium-to-long run, provided that rational science and technology policies are incorporated effectively with well-designed trade policies. Finally, Turkey is clearly in the best market position in the CIG category, as indicated by the fact that Turkey's CIG-exports are almost completely in the "rising stars" category. Considering the relatively higher share of CIG-exports in total exports, as compared to that of EIRG- and DIRG-exports, Turkey's long-term priority in improving its competitiveness in the EU-15 market can be summarized as follows: Turkey should channel its industrial and technological energies into a national effort of transforming its productive infrastructure away from such low-value-added products as RMIG and LIG towards mainly CIG, supporting this transformation simultaneously by also encouraging the production and exports of EIRG and DIRG.

Next, we develop further our major conclusions in the previous paragraph in more detail. To do so, we focus upon Turkey separately and evaluate its dynamic market positioning for overall sectors and technological categories in the two sub-periods (1996-2003 and 2004-2010).

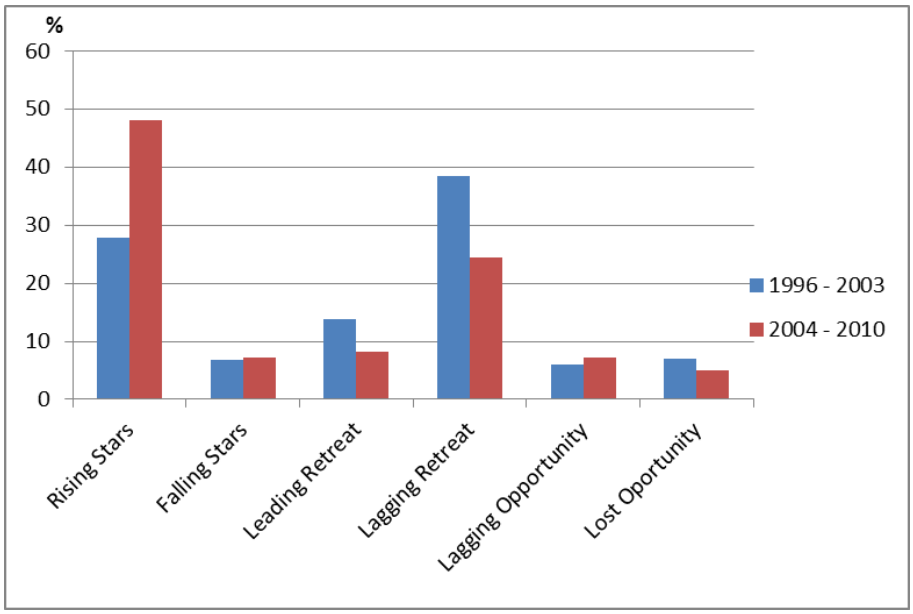

Figure 4.2 Turkey's dynamic market positioning, overall sectors

Figure 4.2 above shows the share of each market position in Turkey's total exports for overall sectors. We find that the share of "rising stars" in Turkey's total exports increased remarkably from 28% to 48% from the first to the second sub-period, while the shares of "leading retreat" and "lagging retreat" decreased prominently. The changes in the other three market positions are relatively much smaller.

This depiction of the changes in the shares of Turkey's market positions demonstrates that, from the first to the second sub-period, Turkey has been successful in restructuring away from the declining segments of the EU-15 market, as indicated by Turkey's decreasing shares in the "retreat" categories. What is more, this positive development has also been supported by a successful restructuring towards "rising stars".

Turkey's dynamic market positioning for each technological category in the two sub-periods (1996-2003 and 2004-2010) is presented in Figures 4.3.a-e below.

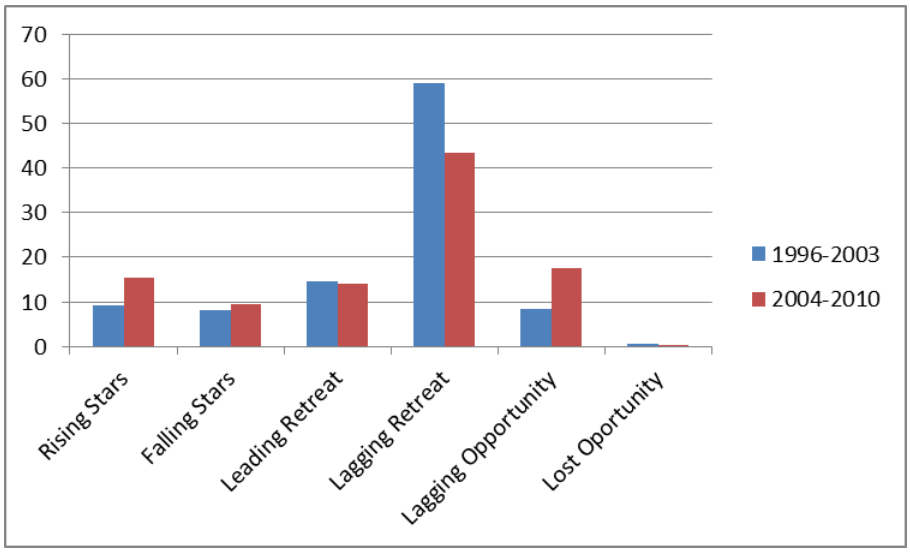

Figure 4.3.a Turkey's dynamic market positioning, RMIG

In the RMIG category (Figure 4.3.a), although the share of "lagging retreat" decreased slightly from the first to the second period, it still constitutes the highest share in both periods. In this category, we should consider the rise of the "rising stars" as a desirable development, but it should also be noted that the simultaneous rise of the "lagging opportunity" overshadows this development.

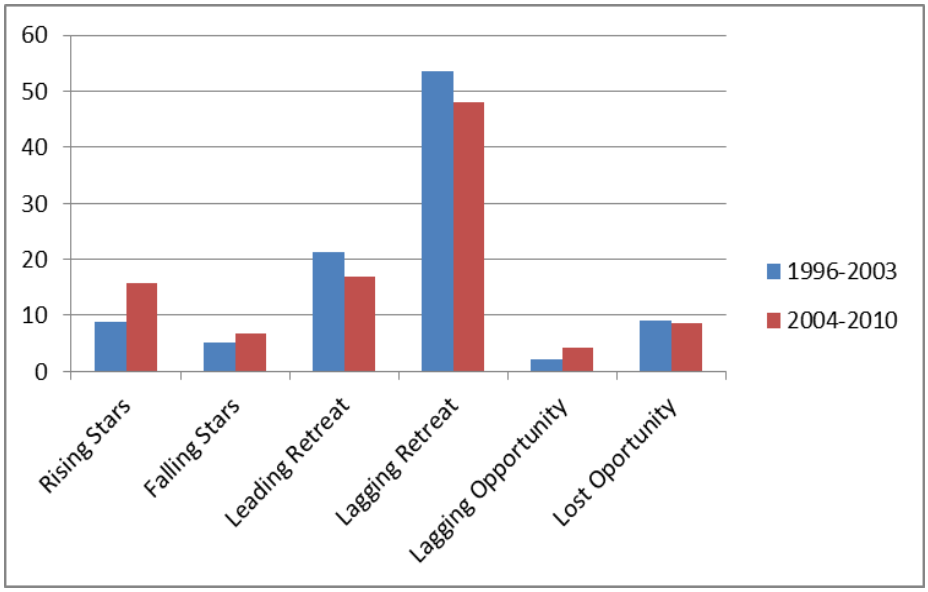

Figure 4.3.b Turkey's dynamic market positioning, LIG

Although Turkey has restructured its LIG-exports out of the declining markets (see the declining shares of "retreat" categories in Figure 4.3.b) into growing markets (see the increasing share of the "rising star" category) from the first to the second period, "lagging retreat" still constitutes the largest part of LIG-exports in both periods.

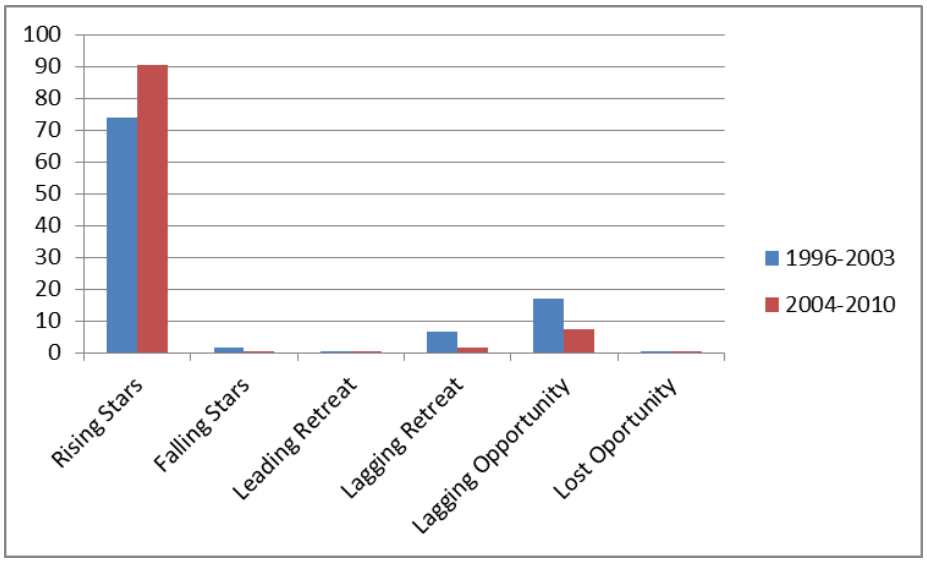

Figure 4.3.c Turkey's dynamic market positioning, CIG

In CIG (Figure 4.3.c), "rising stars" constitute the highest component of exports in both periods. There is a decline in the shares of "lagging retreat" and "lagging opportunity" categories. Indeed, this decline seems to be offset by the corresponding increase in the share of "rising stars". Therefore, there is a successful restructuring of Turkish exports in CIG in terms of dynamic market positioning.

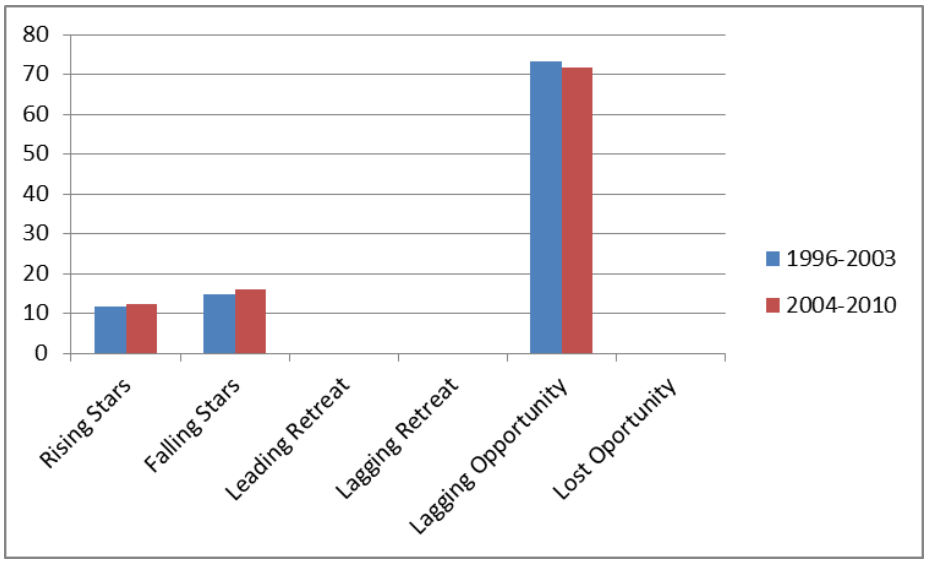

Figure 4.3.d Turkey's dynamic market positioning, EIRG

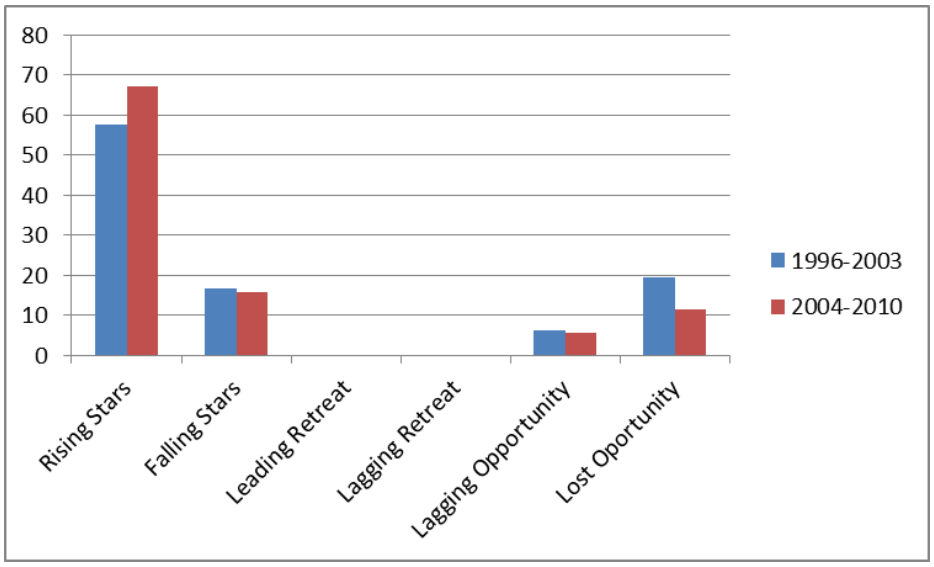

Figure 4.3.e Turkey's dynamic market positioning, DIRG

In EIRG (Figure 4.3.d), the largest part of Turkey's exports belongs to "lagging opportunity" in both periods. No significant changes occurred in the dynamic market positions in this category.

In DIRG (Figure 4.3.e), "rising stars" constitute the highest component of Turkey's exports in both periods. There is a decline in the shares of "lost opportunity", and this decline is offset by the corresponding increase in the share of "rising stars". This also suggests a successful restructuring in DIRG from first period to the second period.

Now, we evaluate Turkey's 3-digit sectors with their dynamic market positions in the full period and the two sub-periods (1996-2003 and 2004-2010). The sectors examined here are the same sectors in our RCA analysis in section 4.4.1, where we chose the sectors with the highest RCAs; i.e., the sectors that have RCA in the full period or in one of the two sub-periods). Thus, Tables 4.13.a-e below present the results for the dynamic market positions of Turkey's over-unity RCA sectors at 3-digit level.

Table 4.13.a Dynamic Market Positions of Turkey's over-unity RCA sectors, 3-digit, RMIG

RMIG	Dynamic Market Positioning		
Sector	1996-2010	1996-2003	2004-2010
S3-058 Fruit Preserved, and Fruit Preparations (Excluding Fruit Juices)	Leading Retreat	Leading Retreat	**Rising Stars**
S3-056 Vegetables, Roots and Tubers, Prepared or Preserved, N.E.S.	Lagging Retreat	Lagging Retreat	**Rising Stars**
S3-046 Meal and Flour of Wheat and Flour of Meslin	Lost Opportunity	Lost Opportunity	Lost Opportunity
S3-057 Fruit And Nuts (Not Including Oil Nuts), Fresh or Dried	Lagging Retreat	Lagging Retreat	Falling Stars
S3-278 Crude Minerals, N.E.S.	Falling Stars	Falling Stars	Leading Retreat
S3-421 Fixed Vegetable Fatsand Oils, Soft, Crude, Refined or Fractionated	**Rising Stars**	**Rising Stars**	Lagging Opportunity
S3-291 Crude Animal Materials, N.E.S.	Lagging Retreat	Lagging Retreat	Lagging Retreat
S3-075 Spices	Lagging Retreat	Lagging Retreat	Lagging Retreat
S3-048 Cereal Preparations And Preparations of Flour or Starch of Fruits or	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-223 Oil Seeds and Oleaginous Fruits of a Kind Used For Extracting Other	Lost Opportunity	Lagging Retreat	Lost Opportunity
S3-091 Margarine and Shortening	**Rising Stars**	**Rising Stars**	Lagging Opportunity
S3-282 Ferrous Waste And Scrap; Remelting Ingots of Iron or Steel	**Rising Stars**	Lagging Opportunity	**Rising Stars**
S3-041 Wheat (Including Spelt) and Meslin, Unmilled	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-043 Barley, Unmilled	**Rising Stars**	**Rising Stars**	Lost Opportunity

According to Table 4.13.a above, sectors 048 and 041 are Turkey's "rising stars" in the RMIG category in both sub-periods. In sectors 421, 091 and 043, there are "lagging" or "lost opportunities" in the second sub-period, although these sectors were "rising stars" in the first sub-period. It seems that Turkey experienced an incorrect supply-side restructuring in these sectors from the first to the second sub-period, as Turkey failed to materialize the existing opportunities in the second sub-period due to the decline in its export performance in these sectors. In other words, Turkey should have increased its exports in these sectors for materializing these opportunities. On the other hand, in sectors 062 and 282, Turkey realized a successful supply-side restructuring by increasing exports of these sectors, thereby transforming the opportunities into "rising stars". Also, sectors 058 and 056 became "rising stars" in the second sub-period. However, this positive restructuring is due to not only Turkey's supply-side success in improving its export performance in these sectors, but also the demand-side developments in the EU-15 market, where the general conjuncture has been in favor of a higher demand for the products of these sectors. Finally, sectors 054, 291 and 075 are in the position of "lagging retreat", implying that the fall in the share of these sectors in Turkey's total exports has been higher than the fall in the share of world exports of these sectors in the EU-15 market. The rate of this fall should slow down so that Turkey can restructure its exports from 'lagging retreat' to 'leading retreat'.

Table 4.13.b below shows the dynamic market positions of Turkey's over-unity RCA sectors in the LIG category. Similar to the results in our cross-country analysis, most of the over-unity RCA sectors in LIG are in the position of "retreat" categories for Turkey. Only sectors 655, 846, 692 and 699 are in the "rising stars" position in both the full period and the two-sub-periods. In sectors 844 and 693, we observe a successful restructuring from "lost and lagging opportunities" to "rising stars". This success is mainly due to Turkey's export performance in these sectors. In sector 642, we also see a successful restructuring from "falling stars" to "rising stars", and this success is mainly due to demand-side developments in the EU-15 market, rather than Turkey's export performance. On the contrary, sector 897 has moved from "rising star" in the first sub-period to "lost opportunity" in the second sub-period. The decrease in the share of this sector in Turkey's total exports, despite the increase in

its share in total world exports, has led to such an unsuccessful restructuring of this sector in Turkey's market position.

Table 4.13.b Dynamic Market Positions of Turkey's over-unity RCA sectors, 3-digit, LIG

LIG	Dynamic Market Positioning		
Sector	1996-2010	1996-2003	2004-2010
S3-662 Clay Construction Materials and Refractory Construction Materials	Lagging Retreat	Lost Opportunity	Lagging Retreat
S3-844 Women's Coats, Capes, Jackets, Suits, Trousers, Dresses, Underwear,	Lost Opportunity	Lost Opportunity	**Rising Stars**
S3-655 Knitted Or Crocheted Fabrics (Including Tubular Knit Fabrics,	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-812 Sanitary, Plumbing and Heating Fixtures And Fittings, N.E.S.	Lagging Opportunity	Lagging Opportunity	Lost Opportunity
S3-846 Clothing Accessories, of Textile Fabrics,(other than those for babies)	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-845 Articles of Apparel,of Textile Fabrics, Whether or Not Knitted or Crocheted,	Lagging Retreat	Lost Opportunity	Leading Retreat
S3-263 Cotton Textile Fibers	Leading Retreat	Lagging Retreat	Leading Retreat
S3-653 Woven Fabrics of Manmade Textile Materials (Not Including Special	Leading Retreat	Lagging Retreat	Leading Retreat
S3-652 Cotton Fabrics, Woven (Not Including Special Fabrics)	Leading Retreat	Lagging Retreat	Leading Retreat
S3-842 Women's Coats, Capes, Jackets, Suits, Trousers, Dresses, Skirts, Underwear	Lagging Retreat	Lagging Retreat	Lagging Retreat
S3-651 Textile Yarn	Leading Retreat	Leading Retreat	Leading Retreat
S3-693 Wire Products (Excluding Insulated Electrical Wiring) and Fencing Grills	**Rising Stars**	Lagging Opportunity	**Rising Stars**

Table 4.13.b (continued)

LIG	Dynamic Market Positioning		
Sector	1996-2010	1996-2003	2004-2010
S3-843 Men's Coats, Capes, Jackets, Suits, Blazers, Trousers, Shirts, Etc. , Knitted	Lagging Retreat	Lagging Retreat	Falling Stars
S3-665 Glassware	Lagging Retreat	Lagging Retreat	Falling Stars
S3-269 Worn Clothing and other Worn Textile Articles; Rags	Lagging Retreat	Lagging Retreat	Lagging Retreat
S3-659 Floor Coverings, Etc.	Leading Retreat	Lagging Retreat	Falling Stars
S3-841 Men's Coats, Jackets, Suits, Trousers, Shirts, Underwear Etc. of Woven	Leading Retreat	Lagging Retreat	Leading Retreat
S3-848 Articles of Apparel and Clothing Accessories of Other Than Textile	Lagging Retreat	Lagging Retreat	Lagging Retreat
S3-266 Synthetic Fibers Suitable for Spinning	Leading Retreat	Falling Stars	Lagging Retreat
S3-654 Woven Fabrics of Textile Materials, Other than Cotton or Manmade Fibers	Lagging Retreat	Lagging Retreat	Leading Retreat
S3-657 Special Yarns, Special Textile Fabrics And Related Products	Falling Stars	Falling Stars	Leading Retreat
S3-697 Household Equipment of Base Metal, N.E.S.	Falling Stars	Falling Stars	Lagging Retreat
S3-664 Glass	Lost Opportunity	Lost Opportunity	Lagging Retreat
S3-897 Jewelry, Goldsmiths' And Silversmiths' Wares, and Other Articles of Precious	Lagging Opportunity	**Rising Stars**	Lost Opportunity
S3-613 Furskins, Tanned Or Dressed, Assembled or Unassembled without	Falling Stars	Falling Stars	Falling Stars
S3-666 Pottery	Falling Stars	Falling Stars	Falling Stars
S3-692 Metal Containers for Storage or Transport	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-699 Manufactures of Base Metal, N.E.S.	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-642 Paper And Paperboard, Cut to Size or Shape, and Articles of Paper or	Falling Stars	Falling Stars	**Rising Stars**

Table 4.13.c Dynamic Market Positions of Turkey's over-unity RCA sectors, 3-digit, CIG

CIG	Dynamic Market Positioning		
Sector	1996-2010	1996-2003	2004-2010
S3-783 Road Motor Vehicles, N.E.S.	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-782 Motor Vehicles for the Transport of Goods and Special Purpose Motor	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-676 Iron and Steel Bars, Rods, Angles, Shapes and Sections, Including Sheet	**Rising Stars**	**Rising Stars**	Lost Opportunity
S3-679 Ironand Steel Tubes, Pipes and Hollow Profiles, Fittings For Tubes and Pipes	**Rising Stars**	**Rising Stars**	Lost Opportunity
S3-121 Tobacco, Unmanufactured; Tobacco Refuse	Lagging Retreat	Lagging Retreat	**Rising Stars**
S3-621 Materials of Rubber, Including Pastes, Plates, Sheets, Rods, Thread, Tubes,	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-672 Iron or Steel Ingots and Other Primary Forms, And Semifinished Products of	**Rising Stars**	**Rising Stars**	Lost Opportunity
S3-781 Motor Cars and Other Motor Vehicles Designed for The Transport of Persons	**Rising Stars**	**Rising Stars**	Falling Stars
S3-111 Nonalcoholic Beverages, N.E.S.	Lagging Opportunity	Lagging Opportunity	Lagging Opportunity
S3-784 Parts and Accessoriesfor Tractors, Motor Cars and Other Motor Vehicles,	**Rising Stars**	**Rising Stars**	Falling Stars
S3-532 Dyeing And Tanning Extracts, And Synthetic Tanning Materials	Falling Stars	Leading Retreat	Falling Stars
S3-786 Trailers And Semi-Trailers; Other Vehicles, Not Mechanically Propelled	Lagging Opportunity	Lost Opportunity	**Rising Stars**
S3-678 Iron And Steel Wire	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-684 Aluminum	**Rising Stars**	**Rising Stars**	**Rising Stars**

According to Table 4.13.c above, most of Turkey's over-unity RCA sectors in the CIG category are in the positions of "rising star", "lagging" or "lost opportunity". Sectors 738, 782, 621, 678 and 684 are in the "rising stars" position in the full period as well as in the two sub-periods. In sectors 625 and 786, there has been a successful restructuring of exports from the first to the second sub-period such that the exports of these sectors have increased along with the materialization of the "lagging" and "lost" opportunities. As such, these sectors have become "rising stars" in the second sub-period. On the contrary, sectors 676, 679 and 672 were "rising stars" in the first sub-period but, due to decreases in the exports of these sectors, they have become "lost opportunities" in the second sub-period. In sector 111, there are "lagging opportunities" in both sub-periods.

Table 4.13.d Dynamic Market Positions of Turkey's over-unity RCA sectors, 3-digit, EIRG

EIRG	**Dynamic Market Positioning**		
Sector	1996-2010	1996-2003	2004-2010
S3-761	Lagging Opportunity	**Rising Stars**	Lost Opportunity
Tv Receivers (Including Video Monitors & Projectors)			
S3-511	Falling Stars	**Rising Stars**	Falling Stars
Hydrocarbons, N.E.S. and Their Derivatives			
S3-582	Falling Stars	Falling Stars	Falling Stars
Plates, Sheets, Film, Foil And Strip Of Plastics			

In the EIRG category (Table 4.13.d above), none of the three sectors (761, 511 and 582), which gained comparative advantage in the second sub-period, is in the "rising stars" position in the second sub-period. In sector 761, Turkey lost its optimal position (i.e., "rising star" position) and moved to the worst position (i.e., "lost opportunity" position). It seems that such an undesirable shift in this sector is the result of an unfavorable change in Turkey's export patterns. In sector 511, Turkey also lost its optimal position and moved to the "falling star" position. This shift, on the other hand, seems to be the result of the changes in the patterns of world exports to the EU-15 market. The scope of our analysis cannot let us know the exact cause

behind this shift, but demand-side changes on the part of the EU-15 market seem to be a reasonable explanation.

The third over-unity RCA sector that gained its comparative advantage in the second sub-period (i.e., sector 582) is in the "falling star" position in both sub-periods. For Turkey, the case of sector 582 is worth elaborating, especially in comparison with Israel[9]. Turkey is observed to have gained comparative advantage in this sector in the second-sub period by increasing its RCA coefficient. On the other hand, Israel has slightly increased its RCA coefficient, and continued to be the RCA-leader in this sector in both sub-periods. However, simply looking at these results, it would *not* be correct to make the following policy conclusions: "Turkey can improve its competitiveness against Israel by concentrating on and raising its exports in this sector", or "Israel should maintain its leadership by increasing its exports in this sector". In this regard, correct interpretation requires a dynamic viewpoint, rather than a static one. When we examine the changes in this sector in a dynamic framework analysis, we observe that the share of this sector in the EU-15 market has decreased on a year-by-year basis. In accordance with this decreasing trend, Israel has *correctly* reduced its exports in this sector year by year in the second sub-period (By the way, Israel also correctly adjusted the rate of reducing its exports in this sector; i.e., the reduction in Israel's share has been slower than the decrease of the share of this sector in the EU-15 market). In this way, Israel has brought its position to "leading retreat". Thus, Israel channeled its resources successfully to other sectors that have been rising. In this respect, the case of Turkey is contrary to that of Israel. In other words, Turkey has continued to increase its exports in this sector, without considering the fall of this sector in the EU-15 market. From a short-term viewpoint, Turkey might have benefitted from this situation because it increased its export revenue. However, this situation is not sustainable in the medium-to-long run. For Turkey, a rational trade policy should aim at decreasing the exports of this sector on a gradual basis, thereby channeling resources into rising sectors. In sum, static RCAs in sector 582 have increased for both Israel and Turkey;

[9] For earlier evidence on the similarity of Turkey and Israel with regard to comparative advantage in research-intensive goods, see Erlat and Erlat (2004).

however, in terms of desirability and rationality, Israel's case is a positive example, while Turkey's case is a negative one.

Table 4.13.e below shows the dynamic market positions of the over-unity RCA sectors in the DIRG category. Sectors 775, 773 and 793 lost their optimal position of "rising stars", moving to the positions "falling stars" and "lost opportunities" in the second sub-period. On the other hand, Turkey achieved a successful restructuring in sector 733 from the first to the second sub-period, and moved its position from "lost opportunity" to "rising star" by materializing the opportunities. Sector 713 is also a "rising star" for Turkey in both sub-periods.

Table-4.13.e Dynamic Market Positions of Turkey's over-unity RCA sectors, 3-digit, DIRG

DIRG	**Dynamic Market Positioning**		
Sector	1996-2010	1996-2003	2004-2010
S3-775 Household Type Electrical and Nonelectrical Equipment, N.E.S.	**Rising Stars**	**Rising Stars**	Falling Stars
S3-733 Machine Tools for Working Metal, Sintered Metal Carbides or Cermets	Lost Opportunity	Lost Opportunity	**Rising Stars**
S3-773 Equipment For Distributing Electricity, N.E.S.	**Rising Stars**	**Rising Stars**	Lost Opportunity
S3-713 Internal Combustion Piston Engines And Parts Thereof, N.E.S.	**Rising Stars**	**Rising Stars**	**Rising Stars**
S3-793 Ships, Boats (Including Hovercraft) and Floating Structures	**Rising Stars**	**Rising Stars**	Lost Opportunity
S3-749 Nonelectric Parts And Accessories of Machinery, N.E.S.	Falling Stars	Falling Stars	Falling Stars

Finally, in the EIRG and DIRG categories, we also see that some sectors are "rising stars" for Turkey, although Turkey doesn't have RCA in these sectors in the EU-market. For EIRG, these sectors are 583 (Monofilament with a Cross-Sectional Dimension Exceeding 1 Mm, Rods, Sticks and Profile Shapes of Plastics), 581 (Tubes, Pipes and Hoses of Plastics) and 524 (Inorganic Chemicals, N.E.S.; Organic

and Inorganic Compounds of Precious Metals). The RCA-coefficients of sectors 583 and 581 have increased in the second sub-period, becoming very close to 1. Turkey can rationally and realistically aim at concentrating on and increasing its exports in these sectors so as to gain comparative advantage relatively more easily. Even though the RCA-coefficient of sector 524 is much smaller than 1, this sector can also be considered as a promising one in terms of its potential contribution to Turkey's international competitiveness over the long run. In DIRG, sectors 723 (Civil Engineering and Contractors' Plant and Equipment), 711 (Steam or Other Vapor Generating Boilers, Super-Heated Water Boilers and Auxiliary Plant For Use Therewith; and Parts Thereof), 748 (Transmission Shafts and Cranks), 718 (Power Generating Machinery and Parts Thereof, N.E.S), 872 (Instruments and Appliances, N.E.S., For Medical, Surgical, Dental or Veterinary Purposes) and 871 (Optical Instruments and Apparatus, N.E.S.) are the "rising stars" for Turkey, even though Turkey doesn't have RCA in these sectors. Especially sectors 711 and 748 have RCA coefficients that are very close to 1 and, hence, Turkey should put priority on these sectors in the DIRG category.

4.4.3 Competitive Threat to Turkey

In this section, we analyze the competitive threat to Turkey's exports by (i) Spearman's rank correlation (SRC) coefficients, (ii) competitive threat index (based on Jenkins, 2008), and (iii) our own "threat/opportunity" index (inspired by Jenkins, 2008). We have already explained and discussed these 'threat' indicators in section 4.3 of this chapter.

Spearman's rank correlation (SRC) coefficients

In Table-4.14 below, we present SRC coefficients between the RCA-indexes of Turkey and its competitors in the full period as well as in the first and second sub-periods for overall industries. The ranking is based on the values for the full period. An asterisk (*) indicates that the coefficient is statistically significant at 5% level.

Table 4.14 Spearman rank correlation (SRC) coefficients between the RCA-indexes of Turkey and its competitors, overall industries

	1996-2010	1996-2003	2004-2010
TUNISIA	0.5121*	0.5200*	0.4692*
ROMANIA	0.4771*	0.4497*	0.4595*
MOROCCO	0.4676*	0.5039*	0.4270*
EGYPT	0.4405*	0.4184*	0.4474*
INDIA	0.4340*	0.4583*	0.3985*
BULGARIA	0.4202*	0.3963*	0.4208*
SLOVAKIA	0.3743*	0.3354*	0.3661*
POLAND	0.3454*	0.2953*	0.3546*
THAILAND	0.3401*	0.3811*	0.3427*
LATVIA	0.3295*	0.2748*	0.3007*
KOREA	0.3252*	0.3094*	0.3263*
LITHUANIA	0.3215*	0.2645*	0.3315*
BRAZIL	0.3135*	0.1529*	0.4133*
HUNGARY	0.3078*	0.2776*	0.3273*
CZECH R	0.2969*	0.2609*	0.3118*
CROTIA	0.2945*	0.3158*	0.2937*
MEXICO	0.2816*	0.2727*	0.3148*
SLOVENIA	0.2801*	0.2312*	0.3222*
MALTA	0.2772*	0.3067*	0.2498*
CHINA	0.2727*	0.2437*	0.3548*
INDONESIA	0.2519*	0.2470*	0.2931*
UKRAINE	0.2305*	0.2498*	0.2557*
S AFRICA	0.2029*	0.1914*	0.2400*
MALAYSIA	0.1834*	0.2017*	0.2017*
ISRAEL	0.1788*	0.2000*	0.2132*
JAPAN	0.1241*	0.0959	0.1767*
NORWAY	0.1089	0.0968	0.1048
SWITZERLAN	0.1064	0.1050	0.1276*
SINGAPORE	0.0191	0.0201	0.0756
CANADA	-0.0363	-0.0615	-0.0260
RUSSIA	-0.0765	-0.0557	-0.0475
USA	-0.0768	-0.0796	-0.0498

In Table 4.14, the higher the coefficients are, the more similar are Turkey and its competitors in terms of their RCA-patterns and, hence the stronger the competitive threat between them. Therefore, we conclude that reciprocal competitive threat is the highest between Turkey and its following competitors: Tunisia, Romania, Morocco, Egypt, India and Bulgaria. From the second to the first sub-period, the competitive threat has decreased between Turkey and such MENA

countries as Tunisia and Morocco, while it has increased between Turkey and such CEECs as Bulgaria, Poland, Hungary, and the Czech Republic. The competitive threat between Turkey and China has also increased remarkably in the second sub-period.

Competitive Threat Index (based on Jenkins, 2008)

Table 4.15 below presents the results for the "competitive threat index" for overall sectors in the full-period (FP) and for the first and second sub-periods (P1 and P2). Part-a of the table presents the share of Turkey's exports that are under threat from its competitors, while part-b shows the share of its competitors' exports that are under threat from Turkey.

According to Table 4.15, for example, Poland has over-unity RCA in 66 % of Turkey's exports. Reading the table in this way, we can conclude that the severest threat to Turkey's exports originate from such CEECs as Poland, Bulgaria, Romania, and Lithuania, as well as from Asian countries like India and China. Over 50% of Turkey's exports are composed of products in which these countries have comparative advantage. However, the severity of threat from these countries has decreased from the first to the second period, except for Poland. More specifically, the threat on Turkey's exports from Poland, the Czech Republic, Slovakia, Slovenia, Hungary as well as from Japan and Brazil, has increased.

Table 4.15 also shows the competitive threats posed by Turkey to the exports of its competitors. For example, 59% of Morocco's exports are products in which Turkey has over-unity RCA. Morocco, Tunisia, Slovakia and Romania are the countries facing the most severe threat from Turkey. Comparing "the threats posed by Turkey to its competitors" and "the threats posed to Turkey by its competitors", we observe that the former is higher than the latter for only 7 countries; i.e., for Slovakia, Morocco, Tunisia, Ukraine, Brazil, Mexico and Malta. In other words, the degree of threat posed by Turkey to these 7 countries is higher than the degree of threat posed by these countries to Turkey.

Table 4.15 Competitive threat index, overall sectors

Share of Turkey's exports under threat from its competitors, overall sectors

	FP	Rank	P1	P2
POLAND	66.3	(1)	60.5	68.7
BULGARIA	58.3	(2)	65.6	55.2
ROMANIA	53.9	(3)	58.9	51.8
LITHUANIA	53.3	(4)	59.5	50.6
INDIA	52.8	(5)	63.2	48.3
CHINA	48.7	(6)	57.0	45.1
CZECH R	45.8	(7)	42.1	47.4
SLOVAKIA	44.3	(8)	38.4	46.8
CROTIA	43.9	(9)	50.2	41.2
SLOVENIA	41.7	(10)	36.2	44.1
MOROCCO	41.5	(11)	51.8	37.1
LATVIA	40.9	(12)	47.9	37.9
THAILAND	40.4	(13)	43.6	39.0
TUNISIA	39.6	(14)	50.4	35.0
HUNGARY	38.1	(15)	30.4	41.4
INDONESIA	37.6	(16)	47.6	33.4
EGYPT	36.5	(17)	44.0	33.3
S AFRICA	32.8	(18)	25.6	35.8
JAPAN	30.8	(19)	21.5	34.8
UKRAINE	28.6	(20)	30.6	27.8
KOREA	28.3	(21)	24.2	30.0
ISRAEL	24.9	(22)	28.0	23.5
BRAZIL	21.5	(23)	19.3	22.5
MEXICO	20.4	(24)	16.5	22.1
SWITZERLAND	18.4	(25)	16.1	19.3
USA	15.9	(26)	16.0	15.8
MALAYSIA	13.6	(27)	14.5	13.2
MALTA	10.3	(28)	10.5	10.2
CANADA	9.6	(29)	8.9	9.9
RUSSIA	7.2	(30)	5.9	7.7
NORWAY	6.9	(31)	5.3	7.6
SINGAPORE	6.9	(32)	6.9	6.9

Share of Turkey's competitors' exports under threat from Turkey, overall sectors

	FP	Rank	P1	P2
POLAND	43.6	(5)	41.6	44.2
BULGARIA	42.8	(6)	46.3	41.4
ROMANIA	49.1	(4)	50.8	48.4
LITHUANIA	27.7	(17)	41.5	23.0
INDIA	30.9	(11)	23.6	33.8
CHINA	25.4	(20)	25.0	25.5
CZECH R	37.6	(9)	37.7	37.5
SLOVAKIA	54.2	(3)	51.9	54.9
CROTIA	26.6	(18)	33.6	22.6
SLOVENIA	38.3	(8)	41.0	36.9
MOROCCO	58.7	(1)	58.6	58.8
LATVIA	26.0	(19)	23.7	27.1
THAILAND	31.5	(10)	32.6	30.7
TUNISIA	55.9	(2)	64.1	51.5
HUNGARY	24.3	(21)	23.5	24.7
INDONESIA	18.3	(24)	15.4	20.2
EGYPT	29.4	(14)	39.8	25.0
S AFRICA	21.0	(23)	22.9	20.0
JAPAN	29.3	(15)	27.5	31.0
UKRAINE	39.9	(7)	33.0	42.9
KOREA	29.6	(13)	33.2	27.4
ISRAEL	16.7	(25)	18.7	15.2
BRAZIL	28.2	(16)	22.6	30.8
MEXICO	30.3	(12)	30.8	30.0
SWITZERLAND	12.6	(27)	13.0	12.3
USA	13.1	(26)	12.6	13.5
MALAYSIA	10.1	(28)	10.4	9.9
MALTA	22.3	(22)	26.0	18.9
CANADA	8.4	(29)	9.1	8.0
RUSSIA	5.5	(30)	6.4	5.2
NORWAY	3.5	(32)	4.6	3.0
SINGAPORE	5.4	(31)	6.3	4.7

Threat/Opportunity Index

Inspired by Jenkins (2008), we constructed a "threat/opportunity index" of our own for each of the countries listed as Turkey's major competitors in the EU-15 market, as explained in section 4.3 of this chapter. This index is based on the average values in the full period (1996-2010) for overall industries. The results are presented in Table 4.16 below.

Table 4.16 Threat/opportunity index, overall industries, 1996-2010

	SHARE OF TURKEY'S EXPORTS								SHARE OF LISTED COUNTRY'S EXPORTS							
	Threat by listed country on Turkey	(rank)	Opp. of Turkey created by listed country	(rank)	Opp. of listed country created by Turkey	(rank)	No threat / No opp.	(rank)	Threat by Turkey on listed country	(rank)	Opp. of listed country created by Turkey	(rank)	Opp. of Turkey created by listed country	(rank)	No threat / No opp.	(rank)
POLAND	58.3	(1)	24.2	(32)	8.0	(8)	9.5	(25)	41.1	(5)	41.0	(26)	2.4	(30)	15.4	(9)
BULGARIA	51.1	(2)	31.4	(31)	7.2	(11)	10.4	(22)	40.3	(6)	42.6	(25)	2.5	(29)	14.7	(11)
INDIA	48.2	(3)	34.3	(30)	4.6	(20)	12.9	(13)	21.4	(17)	13.5	(32)	9.5	(4)	55.5	(2)
ROMANIA	46.6	(4)	35.9	(29)	7.3	(9)	10.3	(24)	42.5	(4)	35.5	(27)	6.6	(7)	15.5	(8)
LITHUANIA	46.5	(5)	35.9	(28)	6.8	(12)	10.8	(21)	24.8	(13)	61.2	(13)	3.0	(26)	11.1	(21)
CHINA	40.7	(6)	41.8	(27)	8.0	(7)	9.5	(26)	19.4	(19)	60.7	(15)	6.0	(10)	13.9	(12)
MOROCCO	39.3	(7)	43.2	(26)	2.2	(29)	15.4	(4)	55.9	(1)	34.2	(28)	2.8	(27)	7.1	(31)
TUNISIA	37.8	(8)	44.7	(25)	1.8	(32)	15.7	(1)	50.8	(2)	32.0	(30)	5.1	(16)	12.1	(16)
CZECH R.	37.2	(9)	45.2	(24)	8.6	(5)	8.9	(28)	33.4	(8)	47.4	(24)	4.2	(19)	15.0	(10)
LATVIA	36.3	(10)	46.2	(23)	4.6	(19)	12.9	(14)	19.5	(18)	63.6	(11)	6.5	(9)	10.4	(24)
THAILAND	35.7	(11)	46.8	(22)	4.7	(18)	12.9	(15)	24.3	(14)	57.5	(18)	7.2	(6)	11.0	(22)
CROTIA	35.0	(12)	47.5	(21)	8.9	(2)	8.6	(31)	23.0	(16)	60.7	(14)	3.6	(21)	12.7	(14)
INDONESIA	34.9	(13)	47.6	(20)	2.7	(28)	14.8	(5)	3.3	(29)	20.2	(31)	14.9	(2)	61.5	(1)
SLOVAKIA	34.8	(14)	47.6	(19)	9.5	(1)	8.0	(32)	50.7	(3)	33.7	(29)	3.5	(22)	12.0	(17)
SLOVENIA	33.1	(15)	49.4	(18)	8.6	(6)	8.9	(27)	32.9	(9)	50.2	(21)	5.4	(12)	11.4	(20)
EGYPT	32.0	(16)	50.5	(17)	4.5	(22)	13.0	(11)	26.1	(12)	59.9	(16)	3.3	(23)	10.7	(23)
HUNGARY	29.5	(17)	53.0	(16)	8.6	(4)	8.9	(29)	7.1	(25)	47.8	(23)	17.2	(1)	27.9	(3)
S. AFRICA	28.3	(18)	54.2	(15)	4.5	(21)	13.0	(12)	18.2	(20)	68.7	(9)	2.8	(28)	10.3	(26)
JAPAN	25.8	(19)	56.6	(14)	5.0	(16)	12.5	(17)	27.6	(10)	61.8	(12)	1.7	(31)	8.9	(29)
KOREA	24.8	(20)	57.7	(13)	3.4	(26)	14.1	(7)	24.3	(15)	58.1	(17)	5.3	(14)	12.4	(15)
UKRAINE	21.4	(21)	61.1	(12)	7.2	(10)	10.3	(23)	35.7	(7)	48.5	(22)	4.3	(18)	11.6	(18)
ISRAEL	19.2	(22)	63.3	(11)	5.6	(15)	11.9	(18)	13.6	(23)	73.0	(8)	3.1	(24)	10.3	(27)
MEXICO	18.4	(23)	64.0	(10)	2.0	(30)	15.5	(3)	26.3	(11)	53.2	(20)	3.9	(20)	16.6	(5)
BRAZIL	18.3	(24)	64.2	(9)	3.2	(27)	14.3	(6)	15.9	(21)	55.3	(19)	12.3	(3)	16.4	(7)
USA	9.7	(25)	72.8	(8)	6.2	(13)	11.3	(20)	5.0	(26)	74.2	(6)	8.1	(5)	12.7	(13)
SWITZERLAND	9.5	(26)	73.0	(7)	8.9	(3)	8.6	(30)	7.3	(24)	77.5	(5)	5.3	(15)	10.0	(28)
MALAYSIA	9.1	(27)	73.4	(6)	4.5	(23)	13.1	(10)	4.5	(27)	82.1	(3)	5.6	(11)	7.8	(30)
MALTA	6.6	(28)	75.9	(5)	3.7	(25)	13.8	(8)	15.8	(22)	66.3	(10)	6.5	(8)	11.5	(19)
SINGAPORE	5.0	(29)	77.4	(4)	1.8	(31)	15.7	(2)	0.7	(31)	78.2	(4)	4.6	(17)	16.4	(6)
CANADA	3.5	(30)	79.0	(3)	6.1	(14)	11.4	(19)	3.1	(30)	73.7	(7)	5.3	(13)	17.9	(4)
RUSSIA	3.3	(31)	79.2	(2)	3.9	(24)	13.6	(9)	4.3	(28)	89.9	(1)	1.2	(32)	4.6	(32)
NORWAY	2.0	(32)	80.5	(1)	4.9	(17)	12.6	(16)	0.6	(32)	86.0	(2)	3.0	(25)	10.4	(25)

Using the example of Poland, Table 4.16 can be read as follows: (i) 58.3% of Turkey's exports are under threat from Poland, (ii) Turkey has an opportunity to gain comparative advantage in 24.2% of its exports, in terms of its competition with Poland, (iii) 8% of Turkey's exports create an opportunity for Poland to gain comparative advantage, in terms of its competition with Turkey and (iv) 9.5 % of Turkey's exports have no threat/opportunity relationship with Poland.

Similarly, (i) 41.1% of Poland's exports are threatened by Turkey, (ii) 41% of Poland's exports have an opportunity to gain comparative advantage, in terms of its competition with Turkey, (iii) 2.4% of Poland's exports create an opportunity for Turkey to gain comparative advantage, in terms its competition with Poland and (iv) 15.4% of Poland's exports have no threat/opportunity relationship with Turkey.

Table 4.16 indicates that the severest threat on Turkey comes from Poland, Bulgaria, India, Romania, Lithuania, China, Morocco, Tunisia and the Czech Republic. On the other hand, Morocco, Tunisia, Slovakia, Romania and Bulgaria are the countries facing the highest threat from Turkey.

The share of opportunities for Turkey created by other countries is generally higher than the share of opportunities for other countries created by Turkey. Norway, Russia, Canada and Singapore are the countries that especially create opportunities (rather than threat) for Turkey, because the share of threat posed by them on Turkey is much smaller than the share of opportunity they create for Turkey.

4.5 Concluding Remarks

In this chapter, we evaluated Turkey's competitiveness position vis-à-vis its non-EU-15 competitors in the EU-15 market form both static and dynamic points of view. We based our evaluation on the RCA index (due to Bela Balassa, 1965) and on the analysis of dynamic market positioning (due to Edwards and Schoer, 2002). We also examined the extent of competitive threat between Turkey and its competitors.

Our results show that the countries are quite heterogeneous in terms of the variety of products in which they have comparative advantages, whereas they are relatively more homogeneous in terms of the contribution of the RCA-exports to their total export earnings. In other words, different countries may have many or few RCA sectors; however, the major source of export revenue remains to be the RCA

sectors, quite irrespectively of the degree of diversity or uniformity of comparative advantages.

Our RCA-analysis shows that the composition of the over-unity RCA sectors exhibits a great deal of diversity among countries. The share of over-unity RCA exports in total exports concentrates on the RMIG category for Brazil, Egypt, Latvia, Lithuania, Mexico, Norway, Russia, S. Africa and Ukraine, on the LIG category for Bulgaria, Croatia, Czech Republic, India, Indonesia, Israel, Poland, Romania, Thailand, Tunisia, and Turkey, on the CIG category for Slovakia and Slovenia, on the EIRG category for Korea, Malaysia and Singapore and on the DIRG category for Hungary, Japan, Malta, Switzerland and the US.

A year-by-year analysis of Turkey's over-unity RCA sectors show that the LIG category possesses the highest share in the full period, but the share of this category has been decreasing over time. This decrease in the share of LIG seems to be offset by the corresponding increase in the share of the CIG category. On the other hand, the share of EIRG has been increasing until 2006, but it has been decreasing since then. In the final year of analysis (2010), the share of over-unity RCA exports in total exports is the lowest for the EIRG category, among other categories. On the contrary, the share of the DIRG category has been increasing after 2004. However, the shares and dynamics of these two high-tech categories are not very promising in terms of Turkey's RCA-patterns.

In the RMIG category, in terms of the full-period averages of the 3-digit sectors, Turkey's highest RCA-sectors are "Crude Animal Materials", "Spices", "Cereal Preparations and Preparations of Flour Or Starch of Fruits or Vegetables", "Oil Seeds and Oleaginous Fruits of A Kind Used For Extracting Other Fixed Vegetable Oils" and "Margarine and Shortening". The countries with the highest RCAs in these sectors are India, Indonesia, China, Bulgaria, Russia, Tunisia, Ukraine, and Canada. Thus, these countries are the strongest competitors of Turkey in these sectors.

In the LIG category, "Clay Construction Materials and Refractory Construction Materials", "Women's or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Underwear, Etc.", "Knitted or Crocheted Fabrics, N.E.S", "Sanitary, Plumbing And Heating Fixtures And Fittings, N.E.S" and "Clothing Accessories, of Textile Fabrics,

Whether or Not Knitted or Crocheted (Other Than Those For Babies)" are Turkey's highest RCA sectors. Bulgaria, India, and Egypt are the countries with the highest RCAs in these sectors, and therefore the strongest competitors in these sectors.

In the CIG category, "Road Motor Vehicles", "Motor Vehicles for the Transport of Goods and Special Purpose Motor Vehicles", "Iron and Steel Bars, Rods, Angles, Shapes and Sections, Including Sheet Piling", "Tobacco, Unmanufactured; Tobacco Refuse" are Turkey's highest RCA sectors. Poland, Czech Republic, Ukraine and Brazil are the countries with the highest RCAs in these sectors.

For EIRG, Turkey's over-unity RCA sectors are "TV Receivers", "Hydrocarbons, N.E.S. and Their Halogenated, Sulfonated, Nitrated or Nitrosated Derivatives", "Plates, Sheets, Film, Foil And Strip of Plastics" and its strongest competitors are Israel, Switzerland, the US and Hungary.

For DIRG, "Household Type Electrical And Nonelectrical Equipment, N.E.S", "Machine Tools for Working Metal, Sintered Metal Carbides or Cermets, Without Removing Material", "Equipment For Distributing Electricity, N.E.S", "Internal Combustion Piston Engines and Parts Thereof, N.E.S" and "Nonelectric Parts and Accessories of Machinery, N.E.S" are Turkey's over-unity RCA sectors. Slovakia, China, Hungary, and Korea are the countries with the highest RCAs in these sectors.

After our 'static' analysis, we also examined the comparative advantages of Turkey and its competitors from a 'dynamic' perspective. In this framework, one important observation is that most of the countries, including Turkey, have the highest share in "rising stars". In this regard, the exceptions can be listed as follows: Malaysia, Brazil, Morocco, Singapore and China have the highest share in "falling stars", Malta and Latvia in "leading retreat", Romania and India in "lagging retreat" and Russia, Norway and Slovenia in "lagging opportunity".

For Turkey, "lagging retreat" is the second-highest market position. That is to say, a considerable amount of Turkey's exports include products with decreasing export-shares in the EU-15 market. The immediate policy implication is that Turkey should gradually reduce its exports of such products in order to shift from the position of "lagging retreat" to the position of "leading retreat", thereby restructuring its export composition successfully away from the products for which EU-15-

demand is declining. Indeed, evaluating Turkey's dynamic market positioning for the first and the second sub-periods separately, we observe that Turkey has been generally successful in restructuring out of the declining segments of the EU-15 market. Moreover, restructuring into "rising stars" has supported this positive development. To be sure, Turkey will enhance its international competitiveness further, if it keeps on achieving such successful restructurings in the future.

Turkey has realized the best restructuring of exports in sector 844 ("Women's or girls' coats"), moving its position from "lost opportunity" to "rising stars". Also, in sectors 058 ("fruit") and 056 ("vegetables"), Turkey has been remarkably successful in restructuring its exports from the first to the second sub-period. On the other hand, Turkey's restructuring has been unsuccessful in sector 812 ("Sanitary, plumbing and heating fixtures and fittings"), in which its market position shifted from "lagging opportunity" to "lost opportunity".

The sectors 783 ("Road motor vehicles"), 782 ("Special-purpose motor vehicles"), 655 ("Knitted or crocheted fabrics"), 846 ("Clothing accessories"), 684 ("Aluminum") and 678 ("wire of iron or steel") are the promising sectors, as they are among the prominent "rising stars" of Turkey.

Our analysis also shows that, in most of the 3-digit sectors, Turkey's restructuring of exports has arisen from supply-side developments in Turkey, rather than from demand-side shifts in the EU-15 market.

CHAPTER 5

CONCLUSIONS

This thesis has concentrated on the evaluation of Turkey's export performance and competitiveness in the EU-15 market. Three main objectives have been kept in mind in writing this thesis; (i) to analyze Turkey's competitive position in the EU-15 market with respect to its non-EU-15 competitors (based on price competition and, hence, implicitly on quality competition), (ii) to examine whether there have been significant changes in Turkey's competitive position over the years since the initiation of the Customs Union at the end of 1995 and (iii) to determine the relatively more promising export-sectors that should be promoted with priority in order Turkey to improve and expand its possibilities of export-led growth and development. Our framework of analysis has also enabled us to observe the extent of the 'catch-up' that Turkey experienced with respect to its developed competitors, especially in terms of certain high-tech export sectors, at a time when Turkey has been striving to adjust its economic and socio-political structures for its prospective EU-membership.

In accordance with our purposes summarized above, this thesis has been constructed in such a way to involve the most relevant methodologies in the literature. Country-level analyses of export competitiveness have been generally carried out for one or two of the research areas such as 'export similarity', 'export diversification', 'intensive and extensive margins' of exports, 'revealed comparative advantages' (RCAs), 'dynamic market positioning', and 'competitive threat'. We have focused upon *all* of these areas in our effort to analyze Turkey's competitiveness in the EU-15 market in detail. These areas of research are generally based on the computation and interpretation of various export-related indexes. In this regard, we have not only utilized such existing indexes in the literature, but also developed some indexes of our own in order to assess the case of Turkey in a more appropriate and detailed way. As such, we ended up writing three detailed chapters, within which the major dimensions of Turkey's export competitiveness in the EU-15 market have been examined: Export similarity in Chapter 2, export diversification in

Chapter 3, and RCAs along with dynamic market positioning and competitive threat in Chapter 4. In this concluding chapter, we compile the most noteworthy results from the previous chapters, and discuss particular policy implications derived from such compilation.

Concluding remarks in terms of countries

The most general result is that Turkey faces strong competition in the EU-15 market. The degree of competition changes with respect to the competitors, sectors and technological categories over the years. Since the start of the Customs Union between Turkey and the EU, Turkey has generally improved its competitiveness in the EU-15 market; however, in some cases, Turkey lags behind the performance of its competitors as well as its own export potential. During the period under consideration, Turkey has made some progress to cope with the significant challenges that originate from various dynamics in the EU-15-demand, in the relative strength of its competitors and in Turkey's own exporting capabilities.

Based on our analysis of 'export similarity', Turkey's main competitors in the EU-15 market are such CEECs as Poland, Romania, Bulgaria, the Czech Republic, Slovenia and Slovakia; such MENA countries as Tunisia and Morocco; as well as India. Turkey's competition with the CEECs has increased in recent years, especially after their membership in the EU in 2004. Conversely, Turkey's competition with the MENA countries has decreased. On the other hand, the degree of competition with the developed countries, such as Canada, Norway, Switzerland, and the US has generally remained at relatively lower levels throughout the whole period. In recent years, however, an increasing tendency, to some extent, is also observed in Turkey's competition with the developed countries.

Considering the whole period since the Customs Union, for Turkey's main competitors, such as the CEECs (i.e., Poland, the Czech Republic, Romania, Slovakia, Slovenia), MENA countries (i.e., Tunisia and Morocco), and also for Korea, the competition concentrates in products whose prices lie within the same range (hence, implicitly, in products with similar qualities). That is to say, Turkey's product quality has been more-or-less the same with that of its main competitors, when we take the whole period into account. However, Turkey's competition with

developed countries, such as Switzerland, the US, Japan, Canada and Norway, has concentrated on the products for which Turkey's exports have lower prices. This result indicates, expectedly, that the exports of the developed countries are of higher quality as compared to Turkey's exports. On the other hand, for Bulgaria, India, China and Indonesia, the competition concentrates in the products for which Turkey's exports have higher prices. Therefore, we can conclude that Turkey's exports are of higher quality merely with respect to the exports of China, India, Indonesia and Bulgaria. This general picture, which covers the whole period, suggests that Turkey has a long road to go for carrying its export competitiveness to the level of developed-country products, even if its performance seems good enough with respect to its major competitors in the EU-15 market.

When we focus upon the more recent years, instead of the whole period, the picture becomes somewhat less optimistic for Turkey. As emphasized above, Turkey's competition with the CEECs has increased especially in the post-2004 period; i.e., after the first expansion in the EU. Unfortunately, the increasing competition with CEECs in recent years has started to concentrate on goods for which Turkey's prices are relatively lower. That is to say, Turkey has started to lag behind some of its main competitors in recent years in terms of product quality. In this regard, some reasonable arguments can be put forward to explain such recent dynamics concerning the case of Turkey vis-à-vis the CEECs in the EU-15 market. First of all, their joining the EU might have forced/encouraged the exporters of the CEECs to increase the quality of their products. Indeed, their access to EU-funds might have contributed significantly to their export promotion policies. Hence, the CEECs might be reaping the benefits from their new advantageous position associated with their full membership in the EU, as compared to Turkey's relatively more limited Customs Union with the EU. Under these circumstances, the only choice for Turkish exporters might have been decreasing their prices so as to keep on competing with the CEECs after 2004. As such, Turkish exporters might have responded more dominantly by price cuts (rather than quality improvements) to the increasing quality of the products of its competitors. In other words, Turkey might have found itself inevitably in a competitive environment in which it had to engage more in price competition than quality competition. Such competitive pressures on

Turkey might have been intensified even further, supposing that the EU-15 countries have tended to switch their expenditures in favor of the products of these newly-admitted countries.

Although there is a strong and increasing competition between Turkey and the CEECs according to the similarity of their export structures, our analysis in terms of export diversification yields a somewhat different outlook. Turkey lags behind Poland and Czech Republic as far as product varieties are concerned (in terms of both the number of exported types and the share of world exports of these products in the EU-15 market) in both 1996 and 2006. However, Turkey has a much better performance in terms of the extensive margins, surpassing all the CEECs**.** That is to say, Turkey surpasses the CEECs in terms of its performance in adding new product varieties into its export portfolio. Export diversification is known to expand countries' possibilities of competitiveness and development by reducing their dependence on the exports of traditional and lower-value-added products. Therefore, Turkey's leading position vis-à-vis the CEECs in the EU-15 market in terms of its capability of export diversification is hope-generating.

From the RCA-point of view, the average number of over-unity RCA-sectors in both periods, as well as average percentage of these sectors in the total number of sectors, is lower for Turkey than for Poland, the Czech Republic, Slovakia, Slovenia and Bulgaria. Moreover, the difference with Turkey is very high for the cases of Poland and the Czech Republic. Commenting on export diversification, we have mentioned above that Turkey lags behind Poland and the Czech Republic as far as product varieties are concerned (in terms of both the number and share of products in both 1996 and 2006). These two countries seem to have made good use of their diversification advantage in obtaining very high numbers of over-unity RCA sectors. In general, the variety of the products in which CEECs have comparative advantage is higher than the variety of the products in which Turkey has comparative advantage.

When we analyze the export shares of these sectors in total exports of the countries, it is observed that Turkey's shares are higher than the shares of the CEECs but, the difference is not as big as in the case of numbers. That is to say, although CEECs have a higher variety of products in which they have comparative advantage,

the contribution of these RCA-exports to total export earnings is higher for Turkey. This result can be seen as an advantageous situation for Turkey for the time being, as Turkey seems to be specializing in relatively fewer products that contribute to export earning a lot. However, in the future, CEECs can increase their export earnings more easily, because each RCA-sector is a potentially promising export-earner. That is to say, CEECs can improve their competitiveness by specializing more in the products in which they already have RCA. However, Turkey will have to increase the exports of its new products much more in order to gain RCA in those new products in the first place. This interpretation implies a long-term disadvantage for Turkey, as compared to CEECs.

Although Turkey has a better position in terms of the shares of over-unity RCA exports in total exports, when we look at the changes from the first to the second period, we see that some CEECs, as in other cases, have advanced quite remarkably. Indeed, Turkey's share has remained relatively constant from the first to the second period, like Poland. However, the shares of the Czech Republic and Hungary have increased considerably, even though their shares are still lower than that of Turkey.

All in all, one general policy implication for Turkey can be set forth as follows at this stage of our conclusion: Against the strong and increasing competition from the CEECs, Turkish exporters should be supported especially for (i) improving the quality of their existing products and (ii) sustaining their dynamism in exporting new products. In this way, not only a potential and serious loss of ground in the EU-15 market can be avoided effectively, but also Turkey's competitiveness can be duly improved in line with the recent dynamics in this market.

While such optimism is reasonable concerning Turkey's competitiveness against its main competitors (i.e., the CEECs) in the EU-15 market, we need to be much more realistic in terms of Turkey's prospects with respect to the developed countries, such as Canada, Norway, Switzerland, and the US. Even though competition with these developed countries has tended to increase in recent years; generally, they are not Turkey's main competitors in the EU-15 market, especially in terms of export similarity. Moreover, Turkey's export products are of lower quality, as compared to the products of these developed countries. Therefore, as Schott (2008) also points out, the relative sophistication of Turkish exports is unsatisfactory

in terms of both quantity and quality to be able to compete with the products of the developed countries. In terms of export diversification, Turkey also lags behind these countries in both 1996 and 2006. Although the increase in the number of exported products between 1996 and 2006 is higher for Turkey than for the developed countries, this result, in fact, originates from the fact that they had already very high numbers of exported products in 1996.

On the other hand, Turkey's average number of over-unity RCA sectors, as well as the average share of these sectors in the total number of sectors in both periods, is lower than that of Switzerland and the US, very close to that of Japan and Canada and much higher than that of Norway. In terms of export shares of these sectors in total exports, Turkey's position is behind Japan, the same as Switzerland, and better than the US, Canada and Norway. Therefore, Japan is more successful than Turkey in obtaining earnings from its over-unity RCA sectors (especially in the first period), while the US, Canada and Switzerland are not as successful as Turkey. Hence, the US, Canada and Switzerland could not make use of the advantage of having high numbers of over-unity RCA sectors. As such, the export share of their over-unity RCA sectors has lagged behind that of all countries, including Turkey. On the other hand, Japan was in a more advantageous situation than Turkey in the first period; however, Japan's performance has declined in the second period so that Turkey converged successfully towards Japan. Therefore, the developed countries do not have a remarkable advantage vis-à-vis Turkey in terms of export earnings from the RCA sectors. However, their superiority is very clear in terms of quality competition and export diversification.

All in all, given Turkey's relative backwardness in quality competition and export diversification vis-à-vis the developed countries, trade policies in Turkey should be designed so as to involve a sequence of priorities. In other words, Turkey's top-priority seems to be the promotion of export sectors that are directly and relatively more successfully competing with the CEECs. It seems that Turkey should not be in a hurry for channeling its limited resources and policy-making energies into the promotion of export sectors that may have a potential to compete with the developed countries.

When we analyze the dynamics in the EU-15 market from a broader perspective that involves a comparison of developed countries vis-à-vis the developing countries, our results indicate that the latter's position has generally improved better than that of the former. That is to say, the relative importance of the exports of the developing countries has been increasing regularly in the EU-15 market in our period of analysis. Indeed, this relative rise of the developing countries against the developed ones has been a general trend at the global level, and the reflections of this trend in the EU-15 market are quite prominent. For example, there are decreases in the number of the product types exported from the developed countries to the EU-15 market, while the developing countries exhibited increases in this respect. However, the gains of the developing countries are much higher than the losses of the developed countries. That is to say, the improvement on the part of the developing countries has not been necessarily at the expense of the developed countries. The upshot is that demand for imports by the EU-15 countries has increased in a dynamic pace, generating further export possibilities for the developing countries, including Turkey, from 1996 to 2006.

The competitive pressures exerted on Turkey by the Asian countries are also worth discussing. For example, at the level of overall industries analyzed, India is one of the prominent countries with which Turkey's degree of competition is very high in the EU-15 market. However, India has certain disadvantages in competing with Turkey in terms of the quality of its products. It seems that Turkey is able to cope with Indian competition relatively easily. Such other Asian countries as China and Indonesia are also in a similar disadvantageous position with respect to Turkey. That is to say, quality of Turkish exports is also higher than that of the exports from these Asian countries. However, when we further delve into the details of competitiveness by considering its export-diversification dimension, China shows up as a much more serious competitor, which has a very strong advantage in terms of its ability to export new products. Clearly, export products of China are more diverse than that of Turkey in both 1996 and 2006, and its extensive margin is also higher in terms of both the numbers of new products and world's export shares of these products in the EU-15 market. Indeed, in terms of export diversification, China is one of the most successful countries in this market. If China maintains its success in

exporting new products in the future, it is likely that its disadvantages in quality competition will be gradually replaced by the dominance of its advantages in price competition. On the other hand, India is very similar to Turkey in terms of product variety and the extensive margin, whereas Indonesia lags behind Turkey in terms of both quality competition and export diversification. Therefore, the only serious competitive challenge from Asia to Turkey comes from China. However, the Chinese challenge alone is so strong that Turkish policy-makers should respond promptly by supporting the diversification of Turkish exports effectively.

In terms of RCAs, China and India have higher numbers of over-unity RCA sectors and higher shares of over-unity RCA sectors in total number of sectors with respect to Turkey. On the other hand, Indonesia is behind Turkey in these respects. In terms of export shares, Turkey is better than China and India, and the same as Indonesia. However, we should note that the differences in shares between Turkey and these countries are very small. Therefore, we cannot conclude that Turkey is definitely more successful than India and China in terms of earning export revenues from the over-unity RCA sectors. But we can safely argue that Indonesia is more successful than Turkey, China and India because, even though Indonesia has a lower number of RCA sectors, the shares of these sectors in its total exports are higher than those of Turkey, China and India. This result can imply a short-term advantage on the part of Indonesia but, in the long run, Indonesia's limited number of over-unity RCA sectors is likely to put this country in a more disadvantageous position against Turkey, China and India. The case of Indonesia in this respect is reminiscent of Turkey's case against the CEECs, which we discussed above.

Although it has decreased slightly in recent years, Turkey's competition with the MENA countries, especially with Tunisia and Morocco, is still higher than with most of its other competitors in the EU-15 market. Turkey's competition with these countries concentrates on the products that are of similar quality. However, in export diversification (in terms of both the numbers of new products and world's export shares of these products in the EU-15 market), Turkey is in a far better position as compared to these countries. Even though the MENA countries are better than most of the countries, including Turkey, in terms of the shares of the exports of over-unity RCA sectors in total exports, Turkey has a higher number of RCA sectors. It seems

that, especially due to this point, the MENA countries are not a serious source of concern for Turkey in the EU-15 market.

Concluding remarks in terms of technological categories

We have also obtained some important results from our analysis of the technological categories of the products exported to the EU-15 market. One obvious general result is that competition facing Turkey concentrates mainly in the LIG and CIG categories, while Turkey has quite modest shares of high-tech products in its total exports. In such research-intensive products (EIRG and DIRG), Turkey's exports are usually similar with those of the developing countries, especially with the relatively richer ones such as the Czech Republic, Poland, Slovakia, Slovenia and Brazil. In some cases, some developed countries, like Canada and Norway, also exhibit a considerable similarity with Turkey's exports of EIRG and DIRG. In addition to these general remarks, we provide more specific conclusions for each technological category separately in the following part.

In the RMIG category, Turkey's export patterns are most similar with China, Morocco and Hungary and, hence, the highest competition for Turkey originates from these countries in this category. Turkey engages in quality competition with China in RMIG-exports. The competition between the exports of Turkey and that of Morocco and Hungary is concentrated in products whose prices and qualities lie within the same range.

In terms of export diversification in the RMIG category, Turkey is more successful than these countries in exporting new products. In this regard, the case of China deserves further attention. China is better than Turkey in terms of the number of RMIG-products exported in 1996 and 2006. The increase in the number of products exported from 1996 to 2006 is also higher for China than for Turkey. However, the results from the Feenstra and Kee index suggest that the newly exported RMIG-products of China have very low shares in total world exports, implying that China's new RMIG-exports do not have a dynamic demand at the global level. Indeed, China's extensive margin in RMIG is negative. Therefore, as far as the RMIG-category is concerned, China seems to have made some incorrect choices of new products. In fact, as also emphasized above, considering *overall*

industries, China's performance in export diversification in terms of adding new products to its export portfolio is very impressive. However, there seems to be some problems in its diversification of RMIG-exports. Therefore, while it is very formidable to compete effectively with China in most industries, China's relatively weaker position in RMIG can provide much easier opportunities to capture for its competitors, including Turkey. Hence, Turkey can and should make good use of this apparent drawback in China's RMIG-exports.

Actually, Turkey is also in a better position than Morocco and Hungary in the RMIG category. In 1996, Hungary's product variety was only slightly higher than that of Turkey, which in turn was much higher than that of Morocco. In 2006, Turkey is superior to both of these countries in terms of product variety as well as the extensive margin.

Therefore, in RMIG, Turkey's ability to export new products is quite successful, as compared to its main competitors in this category. As a matter of fact, in 1996, although the number of products exported by Turkey was not so low, the share of world exports of these products in total world exports was very small. However, Turkey has overcome this drawback as of 2006. Turkish exporters' correct choices of new products along with the high share of these products both in the EU-15 market and in Turkey's own exports might have contributed positively to this successful performance. The contrasting cases of China and Turkey in the RMIG category reveal that correct choices of new products are very important for visible improvements in competitiveness. The lesson here is that detailed projections aimed at predicting the future demand for new products can serve as good guidelines in making correct choices about export-oriented product innovations.

In terms of the RCAs in RMIG, Turkey's number of over-unity RCA sectors is lower than those of Morocco and Hungary, while it is quite higher than that of China. The same result is also valid for the export shares of these sectors in the total exports of the countries. In dynamic terms, the largest part of RMIG exports belongs to the 'lagging retreat' position for Turkey, Hungary and China, whereas it belongs to 'falling stars' for Morocco. In other words, Turkey, Hungary and China have been decreasing their shares of RMIG-exports in accordance with the declining EU-15-

demand for these products, whereas Morocco has been increasing its shares of RMIG-exports for which EU-15 demand has been falling.

In the LIG category, Turkey's most obvious competitors are Morocco, Bulgaria, Romania and India in terms of export similarity. In recent years, the similarity of exports has increased with Bulgaria and Romania, while it has decreased with Morocco. Competition with these countries concentrates on LIG for which Turkey's and their prices lie in the same range. Especially with Romania, there is a remarkable increase in this similar-price segment of competition.

Turkey's ability to export new products in the LIG category lags behind these countries. However, Turkey's capability to export new products was constrained by its already high (92.7%) product variety in 1996. The case of India as a main competitor of Turkey in LIG is especially outstanding. Not only India's extensive margin, but also its product variety (96.6%) is higher, as compared to Turkey. Therefore, India is definitely more successful than Turkey in diversifying exports and exporting new products. Nonetheless, competition possibilities between India and Turkey in terms of exporting new products are very limited, because both countries have already very high product varieties, as of 2006. Under these circumstances, in LIG, the other three main competitors (i.e., Romania, Bulgaria, and Morocco) are more likely to improve their competitiveness in the EU-15 market vis-à-vis Turkey in the future by exerting higher competitive pressure through further export diversification.

On the other hand, Turkey's product varieties in terms of both numbers and shares are the highest for the LIG category, as compared to the other technological categories. This result shows that Turkey's export diversification tends to concentrate relatively more in LIG. However, Turkey's extensive margin is the lowest in LIG, and this result is mainly due to the fact that Turkey's product variety in LIG was already quite high (927 %) in 1996. With this limited capability of exporting new products, Turkey's product variety reached 94.5% in 2006, which is also very high. Therefore, Turkey's ability to export new LIG-products is further constrained for the post-2006 period.

In terms of RCAs in the LIG category, Turkey's number of over-unity RCA sectors is almost the same as India's; while it is higher than those of Morocco,

Bulgaria and Romania (even though it is very slightly higher with respect to Bulgaria and Romania). In terms of the export shares of these sectors, India is in a better position than Turkey; indeed, India is the country with the highest share in this respect. What is more, India, Bulgaria, Romania and Turkey are actually the top-four countries in terms of their shares of over-unity RCA exports of LIG in total exports. And, despite the fact that these shares have fallen remarkably from the first to the second period, they still keep their top positions.

Obviously, India, Morocco, Bulgaria and Romania are the most prominent competitors of Turkey in the LIG category in the EU-15 market; and this competition concentrates mainly in products for which the prices of Turkey and its competitors are similar. Moreover, Turkey is actually producing and exporting most of the LIG varieties as of 2006. Under these circumstances, producing new products cannot lead Turkey to improve its competitiveness significantly against these countries. Turkey and its competitors are also quite similar in terms of their RCAs in the LIG category, where all of them have decreased the share of over-unity RCA sectors in total exports. In other words, all of them seem to be in the process of reducing the dominance of LIG in their exports.

Considering that the 'lagging retreat' position has the highest share in LIG (as well as in RMIG), it can be argued that Turkey has been shifting away from these categories towards more 'correct' sectors, which have a higher potential to contribute to development and competitiveness. Actually, in the RMIG and LIG categories, the decline in the shares of over-unity RCA sectors in total exports shows that Turkey has been restructuring its exports towards more capital-intensive and higher-tech products. However, the 'retreat' from the RMIG and LIG categories should continue gradually (rather than rapidly) for this restructuring to yield much more successful and permanent results in terms of development and competitiveness. For example, Turkey should continue to export LIG in the 'traditional' sectors that are positioned as 'rising stars', since there seems to be no new opportunities in this category.

All in all, Turkish policy-makers should consider these results as a warning. The LIG category generally involves traditional and low-value-added products; and specialization in such products at earlier stages of development can be inevitable. However, long-term dependence on the exports of such products starts to restrict the

possibilities of development and competitiveness at a certain point in time. Therefore, developing countries should reduce the weights of such products in their total exports over time, in favor of higher-value-added products. Given Turkey's well-known and long-term experience with LIG and in the light of the more recent details summarized above, it is obviously time for Turkey to design a broad reallocation of its export-oriented productive resources towards sectors that can produce and export higher-tech and higher-value-added goods.

In the CIG category, for Turkey, the degree of competition is the highest with Poland, the Czech Republic and Hungary in terms of export similarity. Turkey's competition with these countries has increased in recent years. Actually, Turkey's export similarity with not only these countries but also with most of the countries has increased recently, as mentioned above. In CIG, however, the highest increases in similarity are observed with developed countries like the US and Japan, as well as with such CEECs as Poland and the Czech Republic that have had a high export performance in the EU-15 market in recent years. Therefore, the increases in export similarity in CIG can be especially considered as important and positive developments on the part of Turkey. Furthermore, Turkey's competition with these countries concentrates on products whose prices and qualities are in the same range, and this type of competition has also increased in recent years. In this regard, the only exception is Turkey's competition with the Czech Republic since there is an increase in the similarity of products for which Turkey's price (and hence quality) is lower than that of the Czech Republic.

At this point, Turkey's competition in CIG with such developed countries as Japan and the US is especially interesting. For example, the prominent increase in the export similarity between Turkey and Japan in recent years has resulted mainly from products with similar prices (and hence, similar qualities). Therefore, Turkey might have achieved quality-upgrade in its competition with Japan in the recent years or it might have increased the relative size of its exports that are of similar quality with Japan's products. The same result is also valid for Turkey's competition with Hungary, which is one of the most similar competitors of Turkey. Apparently, in the CIG category in recent years, Turkey has engaged in quality competition (rather than price competition) with most of its competitors in the EU-15 market. Supposing that

quality competition is a more reliable way of improving competitiveness in the long run, Turkey's performance in the CIG category is quite promising.

However, in CIG, Turkey could not replicate its success in quality-upgrade in the area of export diversification. For example, unlike in the case of upgrading quality, Turkey has failed to improve its position against Hungary in diversifying exports, because Hungary has higher product varieties both in 1996 and 2006 as well as a higher extensive margin, compared to Turkey. In fact, Turkey has performed better than Hungary in terms of increasing the number of exported products (i.e., 70 new products for Turkey, and 23 for Hungary). However, world's export shares of these products increased more for Hungary than for Turkey. In other words, Hungarian exporters seem to have made more correct choices concerning new export products. Once again, we witness the importance of the correct choices of new products, for which demand has been higher.

On the other hand, Turkey's other two main competitors in CIG (i.e., the Czech Republic and Poland) have lower extensive margins compared to Turkey. However, we cannot definitely say that their lower extensive margins imply higher success for Turkey in exporting new products, since their product varieties in 1996 were already higher than that of Turkey.

Amiti and Freund (2008) index suggests that Turkey's extensive margin in the CIG category is quite small. In other words, there are new products exported by Turkey to the EU-15 market, but Turkey's value of exports in these products has increased only slightly. Therefore, although Turkey still has a potential to export new products in the CIG category, it should make better choices of these new products that will create gains for Turkey both in the EU market and in its own exports.

Considering the RCAs in the CIG category, Turkey is almost in the same position as Poland and Czech Republic in terms of both the number of over-unity RCA sectors and the export shares of these CIG-sectors in total exports. Hungary lags behind Turkey in both the numbers and shares. An interesting point to emphasize is that Turkey's share of over-unity RCA sectors in its total exports have increased remarkably after 2004 (from 12.8 % to 27 %) in the CIG category. This share has also increased for Poland, Czech Republic and Hungary after 2004; however the increase in Turkey's share is the highest, as compared to these three

important competitors in the EU-15 market. Moreover, the 'falling stars' position has the largest share in the CIG category for Turkey as well as for these three competitor. At this point, we can recall that the export similarity between Turkey and these countries has increased after 2004. This increase in similarity concentrates in products, which have over-unity RCA and which are 'rising stars'. In the light of these results, it is reasonable to conclude that the degree of competition between Turkey and these three countries is at a very high level, implying that these countries pose a very serious challenge to Turkey in the CIG category.

In the EIRG category, Turkey's export patterns are most similar with Poland, the Czech Republic and Slovakia. It should be emphasized that the degree of similarity with Poland is much higher than with the other countries. Therefore, Turkey's most obvious competitor in EIRG is Poland, followed by the Czech Republic and Slovakia. In this category, there is not a remarkable change in recent years in terms of export similarity with Poland and the Czech Republic, like with most of the other countries. However, Turkey's export similarity (and hence, degree of competition) with Slovakia has increased considerably in the last years.

In the whole period, Turkey's competition with Poland has concentrated in EIRG for which the prices are in same range. However, differently from the CIG category, in recent years, there is a large decrease in the competition between products with similar prices in favor of an increase in the competition between products for which Turkish prices are relatively lower. Indeed, Turkey's competition with the Czech Republic and Slovakia as well as with Hungary and Romania has concentrated in products for which Turkish exports have lower prices in the whole period and, there are prominent increases in this type of competition in the last years. So, unlike in the CIG category, Turkey has engaged mainly in price competition (rather than quality competition) in the EIRG category, especially with the CEECs. The same result applies also to Turkey's competition with the developed countries. That is to say, in such an important category as EIRG, which can create much higher values-added than the RMIG, LIG and CIG, Turkey has failed to achieve quality improvements that are especially important for strengthening its competitiveness position against its competitors in the long term. In this regard, a reasonable option

for Turkey can be to increase R&D supports along with the intensification of science and technology policies.

Interestingly enough, our analysis of Turkey's performance in export diversification in the EIRG category demonstrates that Turkey is the top-country in terms of the increases in the number of exported products, with 72 new products being exported in 2006 as compared to 1996. However, despite this remarkable increase, Turkey still exports a modest percentage (i.e., 65%) of the total number of products exported to the EU-15 in the EIRG category in 2006. According to the Feenstra and Kee (2007) index, Turkey's extensive margin (in terms of the shares in the EU-15 market) is ranked the 7th among 30 competitors. This result can be evaluated as a successful performance but, according to the Amiti and Freund (2008) index, Turkey's extensive margin (in terms of the shares in each country's own export growth) is very small in the EIRG category. In other words, there are new products exported by Turkey to the EU-15 market and the share of world's exports of these products in EU-15's total imports has increased remarkably. However, the problem is that Turkey's value of exports of these products has increased only slightly.

When we compare Turkey's export diversification to that of its three main competitors (i.e., Poland, the Czech Republic and Slovakia) in the EIRG category, we see that Turkey's product varieties (in terms of both the number of exported products and the world's export shares of these products in total world exports) are lower than that of Poland and the Czech Republic, and very close to that of Slovakia in both 1996 and 2006. On the other hand, Turkey's share of the number of exported products in the total number of products exported to the EU-15 market in 2006 (65%) is slightly higher than that of Slovakia, and lower than that of the Czech Republic and Poland. Also, although the extensive margin is higher for Turkey than for Poland and the Czech Republic in the EIRG category, we cannot definitely conclude that Turkey is more successful than these countries in exporting new products, as their product varieties in 1996 was already higher than that of Turkey, limiting the growth of their extensive margins. All in all, we can conclude that, despite particular improvements in the EIRG category from 1996 to 2006, Turkey's

product varieties in 2006 are still behind that of its main competitors (i.e., Poland, the Czech Republic and Slovakia).

Despite Turkey's good performance in increasing product varieties from 1996 to 2006, Turkey's 2006-ranks for the EIRG are still quite low, especially as compared to such developed countries as the US, Switzerland, Japan, Norway and Canada in terms of export diversification. That is to say, Turkey has still a long road to go to catch up with the developed countries in terms of exporting as many EIRG as these countries actually sell in the EU-15 market.

If we evaluate Turkey's performance in EIRG in comparison to its performance in the other technological categories, it is noteworthy that Turkey's extensive margin in the EIRG category is the highest among all categories. Indeed, Turkey is even more successful in EIRG than in CIG, since its product variety in EIRG in 1996 was higher than that in CIG. Its extensive margin is also higher in EIRG than in CIG. This success in EIRG relative to other technological categories can be considered as an encouraging result, as it is usually desirable for any developing country to diversify successfully its exports of research-intensive goods on the way to improving international competitiveness and expanding development possibilities. Therefore, Turkey's backwardness in EIRG relative to its main competitors and the developed countries should not lead pessimism.

Actually, in EIRG, Turkey can have a significant potential to increase its now-low levels of product variety vis-à-vis other countries, especially if we consider its success in increasing its product variety in this category between 1996 and 2006. Indeed, Turkey has not yet engaged in quality-upgrade against its competitors in the EIRG category. Once Turkey achieves such upgrades in quality, very important opportunities can arise for Turkey to improve its competitiveness by exporting more and more new products in this category.

From the RCA point of view, Turkey has only two over-unity RCA sectors, which situates Turkey in the 28th rank in the EIRG category. Poland, Slovakia and Czech Republic are not much better than Turkey, as they also have quite few over-unity RCA sectors in EIRG (i.e., five, five, and seven, respectively). Like in the case of product variety, developed countries and China are in leading positions in the EIRG category. As Turkey's main competitors, Poland, Slovakia and Czech

Republic are also situated at the lower of rankings. In terms of export shares of over-unity RCA sectors in total exports, Czech Republic and Slovakia are slightly better than Turkey, which in turn is just one rank higher than Poland. That is to say, there are not significant differences between Turkey and these three competitors in terms of shares in the EIRG category. In this respect, what distinguishes Turkey from its competitors is mainly about how these shares have changed from the first to the second period. While Turkey's share has remained almost unchanged, Czech Republic and Slovakia have increased their shares remarkably, the former from 4 % to 12 % and the latter from 1.7 % to 14.2 %. In other words, Turkey has lagged prominently behind these two competitors after 2004 in terms of RCA-competition in EIRG. In this regard, there is not a significant difference between Turkey and its closest competitor, Poland, from the first to the second period; and both countries are almost the same in terms of their RCAs in the EIRG category.

From the dynamic point of view, in EIRG, the highest share belongs to 'rising stars' for Slovakia and Poland, to 'falling stars' for Czech Republic, and to 'lagging retreat' for Turkey. Therefore, among its competitors, Turkey is in the worst position in also dynamic terms. In this regard, the case of Slovakia is the most noteworthy one, because this country has prominently surpassed Turkey especially in the second period by means of higher quality competition, higher shares of over-unity RCA exports and better dynamic market positions.

Like in the case of export similarity and export diversification, Turkey's competitive capability in EIRG is very weak with respect to developed countries. Unsurprisingly, the developed countries are the most competent ones in this category, whereas Turkey is situated in the lowest ranks. Therefore, it is not possible to argue that Turkey has been converging towards the level of developed countries in this category. For the time being, the most realistic option for Turkey in EIRG is to concentrate upon improving its competitiveness against the export products of CEECs. On the other hand, it is also obvious that Turkey tends to fail in gaining advantages against the CEECs in terms of price competition. Therefore, Turkey should try to improve its competitiveness against the CEECs in the EIRG category by engaging in quality competition and expanding its portfolio of export products.

Finally, in DIRG-exports, Turkey is most similar to Czech Republic, Poland, Slovenia and Brazil. Turkey's competition with the Czech Republic, Poland and Slovenia concentrates on the products for which Turkish prices are lower. Therefore, Turkey has mainly relied on price competition (rather than quality competition) with these countries in the DIRG category. With Brazil, the competition concentrates on the products for which Turkish exports have higher prices. So, Turkey engages in quality competition with Brazil in this category. Also, there is an increase in the competition between Turkey and these countries in recent years.

In terms of its performance in export diversification in the DIRG category, Turkey is ranked the 4th among its 30 competitors, thanks to its inclusion of 96 types of new products between 1996 and 2006. In 2006, Turkey exported 89% of the total number of products exported to the EU-15 in the DIRG category. In terms of shares in the EU-15 market, in 2006, the share of world exports of these products in total world exports to the EU-15 market is 94%. Hence, Turkey has the potential to capture important opportunities in this category as well.

Therefore, in terms of the number and share of exported products in the EU-15 market in the DIRG category, there are also good reasons to be optimistic about Turkey's performance. That is to say, Turkey's position in DIRG, which can be considered the best type of export products in terms of creating the highest 'value added', is relatively better and more promising, as compared to the EIRG category. It is, of course, the responsibility of Turkish policy-makers to support these two very important 'high-tech' categories by creating effective incentives and improving the institutional framework for university-industry cooperation.

The analysis of RCAs indicates that, in DIRG, certain CEECs like Poland, Czech Republic and Slovenia are placed at the top ranks, following the developed countries. In this regard, Turkey is situated at quite low ranks in terms of both the number of over-unity RCA sectors and the share of these sectors in total exports. Brazil is very similar to Turkey in this category. In terms of dynamic market positioning, the highest shares belong to 'rising stars' for Turkey, Brazil and Poland; and to 'falling stars' for Slovenia and Czech Republic. Therefore, it seems that, in DIRG, Slovenia and Czech Republic can experience declines in their competitive performance in the medium-to-long term, unless some favorable changes occur in the

EU-15 market. However, Czech Republic's prospects can be better than those of Slovenia, as Czech Republic's share in 'lagging opportunity' is quite close to its share in 'falling stars'. If Czech Republic can successfully reallocate its resources in the 'falling-star' sectors to its 'lagging-opportunity' sectors, and then increase its exports in the 'lagging-opportunity' sectors; it can reach a very competitive position in DIRG as well.

Concluding remarks in terms of 3-digit sectors

Finally, we present our concluding remarks for Turkey's highest 3-digit RCA sectors in the full period (1996-2010) in each technological category. The following sectors are ordered in terms of RCA coefficients.

(CIG) SITC-783 Road Motor Vehicles, N.E.S.: Poland, the Czech Republic and Japan are Turkey's most obvious competitors in this sector. Turkey's competition with Poland and the Czech Republic concentrates on the products with similar prices; and with Japan in the products in which Turkish exports have lower prices. Dynamically, this sector is a 'rising star' for Turkey in both periods.

(LIG) SITC-662 Clay Construction Materials and Refractory Construction Materials: Turkey's most visible competitors in this sector are the Czech Republic, Brazil and Bulgaria. Turkey's competition with these countries concentrates on the products with similar prices. At the same time, Turkey, Bulgaria and the Czech Republic are the countries with the highest RCAs in this sector. Dynamically, Turkey is in the 'lost opportunity' position in both periods. This result suggests that this sector's share in Turkey's total exports has been decreasing since 1996, while its share in total world exports to the EU-15 market has been increasing. In other words, Turkey's share has been declining despite the fact that the EU-15-demand for the products of this sector has been rising. Of course, this is an undesirable situation for Turkey. Indeed, it seems that some elements of 'irrationality' exist in this sector from Turkey's viewpoint, because Turkey has still the highest RCA in this sector (despite the decrease in the second period), it has been competing at similar level of prices with its competitors and also, the EU-15-demand has been ascending. Under these

favorable circumstances, Turkey should have increased the share of this sector in its total exports, rather than exhibiting the 'lost opportunity' position. Therefore, this sector seems to require special attention by Turkish policy-makers for the effective removal of the possible sources of 'irrationality'.

(LIG) SITC-844 Women's or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Underwear: Turkey's main competitors in this sector are China, India and Morocco and competition with China has increased remarkably in the second period. With China and India, Turkey's competition concentrates on the products in which Turkish prices are higher. In other words, Turkey engages in quality competition with China and India. On the other hand, with Morocco, prices (and hence qualities) lie in the similar range. Turkey, Bulgaria and Morocco are the countries with the highest RCAs in both periods. Although China and India are not among the top-three countries, they have also RCA in this sector. In dynamic terms, Turkey is in the 'lost opportunity' position in the first period, and in the 'rising stars' position in the second period. In other words, Turkey has realized the most successful restructuring of its exports in this sector.

(CIG) SITC-782 Motor Vehicles for the Transport of Goods and Special Purpose Motor Vehicles: Turkey's main competitors in this sector are Poland, Japan and Canada. Turkey's competition with Poland concentrates on the products with similar prices and, with Japan and Canada on the products in which Turkish prices are lower. Thailand, Turkey, Poland in the first period; and Turkey, Thailand and Brazil in the second period have the highest RCAs. Dynamically, this sector is a 'rising star' for Turkey in both periods.

(LIG) SITC-655 Knitted Or Crocheted Fabrics (Including Tubular Knit Fabrics, N.E.S., Pile Fabrics And Open-Work Fabrics), N.E.S.: Turkey's most obvious competitors in this sector are Korea, Switzerland and China. In the second period, competition with China has increased, while competition with Switzerland has decreased. Turkey's competition with Korea is concentrated on the products with similar prices with Switzerland on the products in which Turkish prices are lower;

and with China on the products in which Turkish prices are higher. Malta, Korea and Turkey are the countries with the highest RCAs in this sector. Switzerland and China also have RCAs in this sector. Dynamically, this sector is a 'rising star' for Turkey in both periods.

(LIG) SITC-812 Sanitary, Plumbing and Heating Fixtures and Fittings, N.E.S.: the Czech Republic, Poland and Switzerland are the most important competitors of Turkey in this sector. Turkey engages in quality rather than price competition with these countries in both periods. Egypt, Bulgaria and Turkey in the first period and Egypt, Slovakia and Turkey in the second period are the countries with the highest RCA coefficients. Switzerland, Poland and the Czech Republic also have RCA in this sector. Dynamically, Turkey is in the 'lagging opportunity' position in the first period and in the 'lost opportunity' position in the second period. Therefore, Turkey has experienced an undesirable change in its dynamic market positions in this sector.

(RMIG) SITC - 056: Vegetables, Roots and Tubers, Prepared or Preserved, N.E.S.: Turkey's prominent competitors in this sector are Morocco, China and Hungary. Turkey's competition with Morocco and Hungary concentrates on the products for which prices are in the same range, while with China it concentrates on the products in which Turkish exports have higher prices. However, in the second sub-period, Turkey's competition with Hungary shifted to the products in which Turkish exports have lower prices. One possible reason for this is that Turkish exporters must have cut their prices to compete with Hungarian exports in the EU-15 market, following Hungary's membership in the EU. In terms of the magnitude of the RCAs, Morocco can be considered as the most important competitor of Turkey and China and Hungary follow Morocco. Egypt has also comparative advantage in this sector. In terms of dynamic positions, Turkey moved from 'lagging retreat' to 'rising stars' from the first period to the second period. Therefore, this sector is also very important for Turkey's competitiveness and thus should be supported as one of the rising stars of Turkey.

(CIG) SITC-761 TV Receivers (Including Video Monitors & Projectors): Turkey's most obvious competitors in this sector are Poland, Japan and Hungary. Turkey engages in price competition with these countries (rather than quality competition). Turkey, Poland, Korea in the first period and Slovakia, Turkey and Hungary in the second period are the countries with the highest RCAs. Dynamically, similar to sectors 676 and 679, this sector was a 'rising star' for Turkey in the first period, whereas it has fallen into the position of 'lost opportunity' in the second period. Therefore, Turkey has experienced an obviously unsuccessful restructuring of its exports in this sector from the first to the second period.

(RMIG) SITC - 046 Meal and Flour of Wheat and Flour of Meslin: Turkey's most visible competitors in this sector are the US, Mexico and Canada. In addition, Turkey's competition with Lithunaia has increased remarkably in the second period, making this country the fourth important competitor of Turkey. Turkey's competition with the US and Canada is concentrated in goods with similar prices, while with Mexico and Lithuania it concentrates on goods in which Turkish prices are higher. Turkey, Egypt, and India in the first period, Bulgaria, Ukraine and Lithuania in the second period have the highest RCAs in this sector. In other words, like those of Egypt and India, Turkey's RCA has decreased dramatically so that the CEECs seized the leadership in this sector. Although the US, Mexico and Canada are not among the top-three countries with the highest RCAs, they maintained over-unity RCAs in both periods. Therefore, the US, Mexico and Canada remain the most important competitors of Turkey, in addition to the more recently emerging positions of the CEECs. In terms of dynamic market positioning, Turkey is in the worst position with 'lost opportunities' in both the first and second periods. So, considering its high RCA, Turkey has a certain potential in this sector. This potential can be materialized by re-capturing the 'lost opportunities' and increasing the level of exports.

(RMIG) SITC-057 Fruit and Nuts (Not Including Oil Nuts), Fresh or Dried: Turkey's most obvious competitors in this sector are the US, Israel and Morocco. However, export similarities and, hence, degrees of competition are very low in this sector, as compared to other sectors. Turkey, South Africa and Morocco

are the countries with the highest RCAs in both periods. Morocco is the strongest competitor of Turkey in terms of both RCAs and export similarities. However, when we analyze the sector dynamically, we see that Turkey is in the 'lagging retreat' position in the first period and in 'falling stars' in the second period. It is likely that EU-15's demand for the products of this sector has been declining over time. It should also be noted that the CEECs do not have any over-unity RCAs in this sector in either of the periods. Presumably, intra-EU-15 trade has become more dominant in this sector over time due to EU's own agricultural policies. If EU policies remain unchanged, there seems to be no promising future for Turkey in this sector in the EU-15 market. The other reason for this decline might be that Turkish exports could not pass the EU standards as it happened with grapes recently.

(CIG) SITC-676 Iron and Steel Bars, Rods, Angles, Shapes and Sections, Including Sheet Piling: The Czech Republic, Switzerland and Poland are Turkey's most prominent competitors in this sector. Competition with these countries is so strong that Turkey's export similarity with them is above 0.80. Turkey's competition with Poland and the Czech Republic has concentrated on the products with similar prices in the first period. However, in the second period, with the Czech Republic it has concentrated on the products in which Turkish exports have lower prices. With Switzerland, it has also concentrated on the products in which Turkish exports have lower prices. Latvia, Ukraine and Turkey have the highest RCAs in this sector in both periods. Turkey's three main competitors (i.e., the Czech Republic, Switzerland and Poland) also have RCAs in this sector. Dynamically, this sector was one of the 'rising stars' of Turkey in the first period; however, it has turned out to be in the 'lost opportunity' position in the second period. Therefore, Turkey has experienced an unsuccessful and undesirable restructuring of its exports in this sector by starting to decrease the share of this sector in its total exports in the post-2004 period. It seems that, despite the price cuts in the second period, Turkey has failed to compete effectively with these countries in the post-2004 period.

(RMIG) SITC-278 Crude Minerals, N.E.S.: Turkey's main competitors in this sector are Norway, Slovakia and China. Turkey engages in quality competition

with Slovakia and China and in price competition with Norway. Ukraine, South Africa and Turkey in the first period and Ukraine, South Africa and Brazil in the second period have the highest RCAs in this sector. In terms of dynamic market positions, this sector is a 'falling star' for Turkey in the first period, while it is in the 'lagging retreat' category in the second period. Therefore, we can say that the share of world's exports of this sector in total world exports has been decreasing since 1996. Turkey's exports in this sector increased year by year during the first sub-period, contrary to the declining trend in the EU-15 market. However, in the second sub-period, Turkish exports have responded to this declining trend in the same direction and the share of this sector in Turkey's total exports has also been decreasing since 2003.

(CIG) SITC-679 Iron and Steel Tubes, Pipes and Hollow Profiles, Fittings For Tubes and Pipes: Turkey's main competitors in this sector are Switzerland, Hungary and the Czech Republic. As in the case of SITC-676, Turkey's competition with Poland and the Czech Republic has concentrated on the products with similar prices in the first period. However, in the second period, it has concentrated on the products in which Turkish exports have lower prices. With Switzerland, Turkey's competition has concentrated on the products in which Turkish prices are lower in both periods. Ukraine, Romania, Croatia and Turkey are the countries with the highest RCAs. Dynamically, similar to SITC-676, this sector was a 'rising star' of Turkey in the first period; however, it has moved to the 'lost opportunity' position in the second period. Therefore, it also seems that, for this sector, Turkey could not compete with its competitors in the second period, despite its price cuts and thus, the share of this sector in Turkey's total exports has decreased in the post-2004 period.

(DIRG) SITC-775 Household Type Electrical and Nonelectrical Equipment, N.E.S.: Turkey's most obvious competitors in this sector are Korea, Slovenia and Poland. Turkey's competition with Slovenia concentrates on the products with similar prices. On the other hand, Turkey's competition with Korea and Poland concentrates on the products in which Turkish exports have lower prices. Turkey's competition with Poland in this price range has increased remarkably in the

second period. Slovenia, China, and Korea in the first period and Slovenia, Turkey and China in the second period are the countries with the highest RCAs. Dynamically, this sector has moved from the position of 'rising star' to 'falling star' from the first to the second period. It seems that such restructuring is related mainly to the developments in the EU-15 market. EU-15-demand for the products of this sector might have decreased or shifted away from non-EU-15 countries towards intra-EU-15 trade. This trend in the EU-15 market may be temporary and Turkey can continue to increase its exports in this sector for some time more.

(DIRG) SITC-733 Machine Tools for Working Metal, Sintered Metal Carbides or Cermets, Without Removing Material: Turkey's main competitors in this sector are Slovakia, the US and Switzerland. Turkey's competition with these countries has increased in the second period. Turkey's competition with Slovakia concentrates on the products with similar prices. On the other hand, its competition with the US and Switzerland concentrates in the products in which Turkish exports have lower prices. Switzerland, Slovakia and Bulgaria in the first period and Switzerland, Turkey and Slovakia in the second period are the countries with the highest RCAs. Dynamically, Turkey has realized a very successful restructuring in this sector from the first to the second period by transforming its position of 'lost opportunity' to a 'rising star'.

(DIRG) SITC – 773 Equipment for Distributing Electricity, N.E.S.: Turkey's most obvious competitors in this sector are Morocco, Tunisia and China. Turkey's competition with Morocco and Tunisia concentrates on the products in which Turkish exports have lower prices and with China on the products in which Turkish exports have higher prices. In other words, Turkey engages in price competition with Morocco and Tunisia, and in quality competition with China. Tunisia, Slovakia and Lithuania in the first period and Morocco, Romania and Tunisia in the second period are the countries with the highest RCAs. Dynamically, this sector has shifted from the 'rising star' position to the 'lost opportunity' position for Turkey. In other words, Turkey could not compete successfully with its main competitors, especially with Tunisia and Morocco, in the second period.

(DIRG) SITC-713 Internal Combustion Piston Engines and Parts Thereof, N.E.S.: Turkey's main competitors in this sector are Brazil, Switzerland and the Czech Republic. Turkey's competition with Switzerland concentrates on the products with similar prices and with Czech Republic and Brazil on the products in which Turkish prices are higher. That is to say, Turkish exports in this sector are of high-quality, as differently from other sectors in the DIRG category. Hungary, Mexico, Poland and Japan are the countries with the highest RCAs. Turkey's main competitors (Brazil, Switzerland and the Czech Republic) also have RCAs in this sector. Dynamically, this sector has been a 'rising star' for Turkey in both periods, thanks mainly to the high quality of its products.

(EIRG) SITC-511 Hydrocarbons, N.E.S. and Their Derivatives: Turkey's main competitors in this sector are Israel, Brazil and the Czech Republic. Turkey's competition with these countries has concentrated on the products with similar prices. Israel, Russia and Croatia in the first period and Israel, the US and Russia in the second period are the countries with the highest RCAs. Dynamically, this sector was a 'rising star' for Turkey in the first period, while it has turned out to be a 'falling star' in the second period. However, this shift has resulted mainly from demand-related fluctuations in the EU-15 market, rather than from supply-side problems in Turkey.

(EIRG) SITC 582 Plates, Sheets, Film, Foil and Strip of Plastics: Turkey's most prominent competitors in this sector are Slovakia, the Czech Republic and Poland. Turkey's competition with these countries concentrates on the products with similar prices. Israel, Switzerland and the US are the countries with the highest RCAs. Those three prominent competitors have also RCAs in this sector. Dynamically, this sector has been a 'falling star' for Turkey in both periods. In other words, demand for EU-15 in this sector has been decreasing over time even tough Turkey has been increasing its exports.

Consequently, this thesis aimed to shed new light upon Turkey's export competitiveness with respect to other exporters in the EU-15 market. Our findings verified the hypothesis that there exist significant opportunities that have been

insufficiently exploited by Turkey in the context of its competition with these non-EU-15 exporters. The degree and characteristics of this competition vary with respect to competitors, sectors, and prices of export-goods. Therefore, Turkey should be cautious enough to take into account each of these factors in designing its competition policy in the EU-15 market. Our results also demonstrated that Turkey has already embarked upon a restructuring trend from low value-added sectors towards relatively more capital-intensive and high value-added research-intensive sectors, even though it retains specialization in some sub-optimal sectors. All in all, our analyses revealed Turkey's prominent and hope-generating export sectors as well as unpromising ones in comparison to its competitors in the EU-15 market in terms of the price and quality of exported goods, the capability of exporting new products and dynamic market positions. As such, the findings, results and analyses in this thesis constitute a detailed guideline for carving out Turkey's trade policy in a rational way. We hope that this thesis can be utilized to improve Turkey's export competitiveness in the EU-15 market in particular, and in the world markets in general.

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APPENDICES

APPENDIX A

CLASSIFICATION OF SITC REV.3 3-DIGIT PRODUCTS ACCORDING TO THEIR TECHNOLOGICAL CHARACTERISTICS

Code	Product Description
RMIG	
001	Live Animals Other Than Animals Of Division 03
011	Meat Of Bovine Animals, Fresh, Chilled Or Frozen
012	Meat, Other Than Of Bovine Animals, And Edible Offal, Fresh, Chilled Or Frozen
016	Meat And Edible Meat Offal, Salted, In Brine, Dried Or Smoked; Edible Flours And Meals Of Meat Or Meat Offal
017	Meat And Edible Meat Offal, Prepared Or Preserved N.E.S.
022	Milk And Cream And Milk Products Other Than Butter Or Cheese
023	Butter And Other Fats And Oils Derived From Milk
024	Cheese and Curd
025	Birds' Eggs And Egg Yolks, Fresh, Dried Or Otherwise Preserved, Sweetened Or Not; Egg Albumin
034	Fish, Fresh (Live Or Dead), Chilled Or Frozen
035	Fish, Dried, Sltd R In Brine; Smkd Fish; Flours, Meals N Pellets R Fish, Fit F Human Consumptn
036	Crustaceans Molluscs,
037	Fish, Crustaceans, Molluscs And Other Aquatic Invertebrates, Prepared Or Preserved, N.E.S.
041	Wheat (Including Spelt) And Meslin, Unmilled
042	Rice
043	Barley, Unmilled
044	Maize (Not Including Sweet Corn) Unmilled
045	Cereals, Unmilled (Other Than Wheat, Rice, Barley And Maize)
046	Meal And Flour Of Wheat And Flour Of Meslin
047	Cereal Meals And Flours, N.E.S.
048	Cereal Preparations And Preparations Of Flour Or Starch Of Fruits Or Vegetables
054	Vegetables, Fresh, Chilled, Frozen Or Simply Preserved; Roots, Tubers And Other Edible Vegetable Products
056	Vegetables, Roots And Tubers, Prepared Or Preserved, N.E.S.
057	Fruit And Nuts (Not Including Oil Nuts), Fresh Or Dried
058	Fruit Preserved, And Fruit Preparations (Excluding Fruit Juices)
059	Fruit Juices (Incl. Grape Must) and Vegetable Juices, Unfermented And Not Containing Added Spirit
061	Sugars, Molasses, And Honey
062	Sugar Confectionery
071	Coffee And Coffee Substitutes
072	Cocoa
073	Chocolate And Other Food Preparations Containing Cocoa, N.E.S.
074	Tea And Mate
075	Spices
081	Feeding Stuff For Animals (Not Including Unmilled Cereals)
091	Margarine And Shortening
098	Edible Products and Preparations, N.E.S.
211	Hides And Skins (Except Furskins), Raw
212	Furskins, Raw (Including Furskin Heads, Tails And Other Pieces Or Cuttings, Suitable For Furriers' Use)
222	Oil Seeds And Oleaginous Fruits Used For The Extraction Of Soft Fixed Vegetable Oils
223	Oil Seeds and Oleaginous Fruits, Whole or Broken, of A Kind Used For Extracting Other Fixed Vegetalbe Oils
231	Natural Rubber, Balata, Gutta-Percha, Guayule, Chicle And Similar Natural Gums, In Primary Forms
232	Synthetic Rubber; Reclaimed Rubber; Waste, Pairings And Scrap Of Unhardened Rubber
244	Cork, Natural, Raw And Waste (Including Natural Cork In Blocks Or Sheets)
245	Fuel Wood (Excluding Wood Waste) And Wood Charcoal
246	Wood In Chips Or Particles And Wood Waste
247	Wood In The Rough Or Roughly Squared
248	Wood, Simply Worked And Railway Sleepers Of Wood

251 Pulp And Waste Paper
272 Fertilizer, Crude, Except Those Of Division 56, (Imports Only)
273 Stone, Sand And Gravel
274 Sulfur And Unroasted Iron Pyrites
277 Natural Abrasives, N.E.S. (Including Industrial Diamonds)
278 Crude Minerals, N.E.S.
281 Iron Ore And Concentrates
282 Ferrous Waste And Scrap; Remelting Ingots Of Iron Or Steel
283 Copper Ores And Concentrates; Copper Mattes; Cement Copper
284 Nickel Ores And Concentrates; Nickel Mattes, Nickel Oxide Sinters And Other Intermediate Products
285 Aluminum Ores And Concentrates (Including Alumina)
286 Uranium, Thorium Ores
287 Ores And Concentrates Of Base Metals, N.E.S.
288 Nonferrous Base Metal Waste And Scrap, N.E.S.
289 Ores And Concentrates Of Precious Metals; Waste, Scrap And Sweepings Of Precious Metals (Other Than Gold)
291 Crude Animal Materials, N.E.S.
292 Crude Vegetable Materials, N.E.S.
321 Coal, Pulverized Or Not, But Not Agglomerated
322 Briquettes, Lignite And Peat
325 Coke And Semicoke (Including Char) Of Coal, Of Lignite Or Of Peat, Agglomerated Or Not; Retort Carbon
333 Petroleum Oils And Oils From Bituminous Minerals, Crude
334 Petroleum Oils And Oils From Bituminous Minerals, N.E.S.
335 Residual Petroleum Products, N.E.S. And Related Materials
342 Liquefied Propane And Butane
343 Natural Gas, Whether Or Not Liquefied
344 Petroleum Gases And Other Gaseous Hydrocarbons, N.E.S.
345 Coal Gas, Water Gas, etc.
411 Animal Oils And Fats
421 Fixed Vegetable Fats And Oils, Soft, Crude, Refined Or Fractionated
422 Fixed Vegetable Fats And Oils (Other Than Soft), Crude, Refined Or Fractionated
431 Animal Or Vegetable Fats And Oils Processed; Waxes And Inedible Mixtures Oils, N.E.S.
562 Fertilizers (Exports Include Group 272; Imports Exclude Group 272)

LIG

261 Silk Textile Fibers
263 Cotton Textile Fibers
264 Jute And Other Textile Bast Fibers, N.E.S., Raw Or Processed But Not Spun; Tow And Waste Of These Fibres
265 Vegetable Textile Fibers (Other Than Cotton And Jute), Raw Or Processed But Not Spun; Waste Of These Fibers
266 Synthetic Fibers Suitable For Spinning
267 Manmade Fibers, N.E.S. Suitable For Spinning And Waste Of Manmade Fibers
268 Wool And Other Animal Hair (Including Wool Tops)
269 Worn Clothing And Other Worn Textile Articles; Rags
611 Leather
612 Manufactures Of Leather Or Composition Leather, N.E.S.; Saddlery And Harness
613 Furskins, Tanned Or Dressed, Assembled Or Unassembled Without The Addition Of Other Materials
633 Cork Manufactures
634 Veneers, Plywood, Particle Board, And Other Wood, Worked, N.E.S.
635 Wood Manufactures, N.E.S.
641 Paper And Paperboard
642 Paper And Paperboard, Cut To Size Or Shape, And Articles Of Paper Or Paperboard
651 Textile Yarn
652 Cotton Fabrics, Woven (Not Including Narrow Or Special Fabrics)
653 Woven Fabrics Of Manmade Textile Materials (Not Including Narrow Or Special Fabrics)
654 Woven Fabrics Of Textile Materials, Other Than Cotton Or Manmade Fibers And Narrow Or Special Fabrics
655 Knitted Or Crocheted Fabrics (Including Tubular Knit Fabrics, N.E.S., Pile Fabrics And Open-Work Fabrics)
656 Tulles, Lace, Embroidery, Ribbons, Trimmings And Other Small Wares
657 Special Yarns, Special Textile Fabrics And Related Products
658 Made-Up Articles, Wholly Or Chiefly Of Textile Materials, N.E.S.
659 Floor Coverings, Etc.
661 Lime, Cement, And Fabricated Construction Materials, Except Glass And Clay Materials

662 Clay Construction Materials And Refractory Construction Materials
663 Mineral Manufactures, N.E.S.
664 Glass
665 Glassware
666 Pottery
667 Pearls, Precious And Semiprecious Stones, Unworked Or Worked
691 Metal Structures And Parts, N.E.S., Of Iron, Steel Or Aluminum
692 Metal Containers For Storage Or Transport
693 Wire Products (Excluding Insulated Electrical Wiring) And Fencing Grills
694 Nails, Screws, Nuts, Bolts, Rivets And Similar Articles, Of Iron, Steel, Copper Or Aluminum
695 Tools For Use In The Hand Or In Machines
696 Cutlery
697 Household Equipment Of Base Metal, N.E.S.
699 Manufactures Of Base Metal, N.E.S.
811 Prefabricated Buildings
812 Sanitary, Plumbing And Heating Fixtures And Fittings, N.E.S.
813 Lighting Fixtures And Fittings, N.E.S.
821 Furniture And Parts Thereof; Bedding, Mattresses, Mattress Supports, Cushions And Similar Stuffed Furnishings
831 Trunks, Suitcases, Vanity Cases, Binocular And Camera Cases, Handbags, Wallets, Etc. Of Leather, Etc.
841 Men's Or Boys' Coats, Jackets, Suits, Trousers, Shirts, Underwear Etc. Of Woven Textile Fabrics
842 Women's Or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Skirts, Underwear, Etc. Of Woven Textiles
843 Men's Or Boys' Coats, Capes, Jackets, Suits, Blazers, Trousers, Shirts, Etc. , Knitted Or Crocheted Textile Fabric
844 Women's Or Girls' Coats, Capes, Jackets, Suits, Trousers, Dresses, Underwear, Etc. , Knitted Or Crocheted
845 Articles Of Apparel, Of Textile Fabrics, Whether Or Not Knitted Or Crocheted, N.E.S.
846 Clothing Accessories, Of Textile Fabrics, Whether Or Not Knitted Or Crocheted (Other Than Those For Babies)
848 Articles Of Apparel And Clothing Accessories Of Other Than Textile Fabrics; Headgear Of All Materials
851 Footwear
891 Arms And Ammunition
892 Printed Matter
893 Articles, N.E.S. Of Plastics
894 Baby Carriages, Toys, Games And Sporting Goods
895 Office And Stationery Supplies, N.E.S.
896 Works Of Art, Collectors' Pieces And Antiques
897 Jewelry, Goldsmiths' And Silversmiths' Wares, And Other Articles Of Precious Or Semiprecious Materials, N.E.S.
898 Musical Instruments, Parts And Accessories Thereof; Records, Tapes And Other Sound Or Similar Recordings
899 Miscellaneous Manufactured Articles, N.E.S.

CIG

111 Nonalcoholic Beverages, N.E.S.
112 Alcoholic Beverages
121 Tobacco, Unmanufactured; Tobacco Refuse
122 Tobacco, Manufactured (Whether Or Not Containing Tobacco Substitutes)
351 Electric Current
531 Synthetic Organic Coloring Matter And Color Lakes And Preparations Based Thereon
532 Dyeing And Tanning Extracts, And Synthetic Tanning Materials
533 Pigments, Paints, Varnishes And Related Materials
551 Essential Oils, Perfume And Flavor Materials
553 Perfumery, Cosmetics, Or Toilet Preparations, Excluding Soaps
554 Soap, Cleansing And Polishing Preparations
621 Materials Of Rubber, Including Pastes, Plates, Sheets, Rods, Thread, Tubes, Etc.
625 Rubber Tires, Interchangeable Tire Treads, Tire Flaps And Inner Tubes For Wheels Of All Kinds
629 Articles Of Rubber, N.E.S.
671 Pig Iron And Spiegeleisen, Sponge Iron, Iron Or Steel Granules And Powders And Ferroalloys
672 Iron Or Steel Ingots And Other Primary Forms, And Semifinished Products Of Iron Or Steel
673 Iron Or Nonalloy Steel Flat-Rolled Products, Not Clad, Plated Or Coated
674 Iron And Nonalloy Steel Flat-Rolled Products, Clad, Plated Or Coated
675 Alloy Steel Flat-Rolled Products
676 Iron And Steel Bars, Rods, Angles, Shapes And Sections, Including Sheet Piling
677 Iron And Steel Rails And Railway Track Construction Material
678 Iron And Steel Wire

679 Iron And Steel Tubes, Pipes And Hollow Profiles, Fittings For Tubes And Pipes
681 Silver, Platinum And Other Platinum Group Metals
682 Copper
683 Nickel
684 Aluminum
685 Lead
686 Zinc
687 Tin
689 Miscellaneous Nonferrous Base Metals Employed In Metallurgy And Cermets
781 Motor Cars And Other Motor Vehicles Principally Designed For The Transport Of Persons , Including Station Wagons
782 Motor Vehicles For The Transport Of Goods And Special Purpose Motor Vehicles
783 Road Motor Vehicles, N.E.S.
784 Parts And Accessories For Tractors, Motor Cars And Other Motor Vehicles, Trucks, Public-Transport Vehicles
785 Motorcycles (Including Mopeds) And Cycles, Motorized And Not Motorized; Invalid Carriages
786 Trailers And Semi-Trailers; Other Vehicles;Specially Designed And Equipped Transport Containers

EIRG

511 Hydrocarbons, N.E.S. And Their Halogenated, Sulfonated, Nitrated Or Nitrosated Derivatives
512 Alcohols, Phenols, Phenol-Alcohols And Their Halogenated, Sulfonated, Nitrated Or Nitrosated Derivatives
513 Carboxylic Acids And Anhydrides, Halides, Peroxides And Peroxyacids; Their Halogenated, Sulfonated, Derivatives
514 Nitrogen-Function Compounds
515 Organo-Inorganic Compounds, Heterocyclic Compounds, Nucleic Acids And Their Salts
516 Organic Chemicals, N.E.S.
522 Inorganic Chemical Elements, Oxides And Halogen Salts
523 Metallic Salts And Peroxysalts Of Inorganic Acids
524 Inorganic Chemicals, N.E.S.; Organic And Inorganic Compounds Of Precious Metals
525 Radioactive And Associated Materials
541 Medicinal And Pharmaceutical Products, Other Than Medicaments (Of Group 542)
542 Medicaments (Including Veterinary Medicaments)
581 Tubes, Pipes And Hoses Of Plastics
582 Plates, Sheets, Film, Foil And Strip Of Plastics
583 Monofilament With A Cross-Sectional Dimension Exceeding 1 Mm, Rods, Sticks And Profile Shapes Of Plastics
591 Insecticides, Fungicides, Herbicides, Plant Growth Regulators, Etc., Disinfectants And Similar Products
592 Starches, Inulin And Wheat Gluten; Albuminoidal Substances; Glues
593 Explosives And Pyrotechnic Products
597 Prepared Additives For Mineral Oils Etc.; Liquids For Hydraulic Transmissions; Antifreezes And Deicing Fluids
598 Miscellaneous Chemical Products, N.E.S.
751 Office Machines
752 Automatic Data Processing Machines And Units Thereof; Magnetic Or Optical Readers
759 Parts, For Office Machines
761 Tv Receivers Wheth R Nt Incorp Radiobroadcast Receivers Or Sound Or Video Recording Or Reproducing Apparatus
762 Radio-Broadcast Receivers, Whether Or Not Incorporating Sound Recording Or Reproducing Apparatus Or A Clock
763 Sound Recorders Or Reproducers; Television Image And Sound Recorders Or Reproducers
764 Telecommunications Equipment, N.E.S.; And Parts, N.E.S., And Accessories Of Apparatus Etc.

DIRG

571 Polymers Of Ethylene, In Primary Forms
572 Polymers Of Styrene, In Primary Forms
573 Polymers Of Vinyl Chloride Or Other Halogenated Olefins, In Primary Forms
574 Polyacetals, Other Polyethers And Epoxide Resins,Polycarbonates, Alkyd Resins And Other Polyesters
575 Plastics, N.E.S., In Primary Forms
579 Waste, Parings And Scrap, Of Plastics
711 Steam Or Other Vapor Generating Boilers, Super-Heated Water Boilers ; And Parts Thereof
712 Steam Turbines And Other Vapor Turbines, And Parts Thereof, N.E.S.
713 Internal Combustion Piston Engines And Parts Thereof, N.E.S.
714 Engines And Motors, Nonelectric ; Parts Thereof, N.E.S.
716 Rotating Electric Plant And Parts Thereof, N.E.S.
718 Power Generating Machinery And Parts Thereof, N.E.S.
721 Agricultural Machinery (Excluding Tractors) And Parts Thereof
722 Tractors (Other Than Mechanical Handling Equipment)

723 Civil Engineering And Contractors' Plant And Equipment
724 Textile And Leather Machinery, And Parts Thereof, N.E.S.
725 Paper Mill And Pulp Mill Machinery, Paper Cutting Machines And Machinery For The Manufacture Of Paper Articles
726 Printing And Bookbinding Machinery, And Parts Thereof
727 Food-Processing Machines (Excluding Domestic)
728 Machinery And Equipment Specialized For Particular Industries, And Parts Thhereof, N.E.S.
731 Machine Tools Working By Removing Metal Or Other Material
733 Machine Tools For Working Metal, Sintered Metal Carbides Or Cermets, Without Removing Material
735 Parts And Accessories Suitable For Use Solely Or Principally With Metal Working Machine Tools
737 Metalworking Machinery (Other Than Machine Tools) And Parts Thereof, N.E.S.
741 Heating And Cooling Equipment And Parts Thereof, N.E.S.
742 Pumps For Liquids, Whether Or Not Fitted With A Measuring Device; Liquid Elevators
743 Pumps , Air Or Gas Compressors And Fans; Ventilating Hoods Incorporating A Fan; Filtering Etc. Apparatus
744 Mechanical Handling Equipment, And Parts Thereof, N.E.S.
745 Nonelectrical Machinery, Tools And Mechanical Apparatus, And Parts Thereof, N.E.S.
746 Ball Or Roller Bearings
747 Taps, Cocks, Valves And Similar Appliances For Pipes, Boiler Shells, Tanks, Etc.
748 Transmission Shafts And Cranks; Bearing Housings And Plain Shaft Bearings; Gears And Gearing; Clutches, Etc.
749 Nonelectric Parts And Accessories Of Machinery, N.E.S.
771 Electric Power Machinery (Other Than Rotating Electric Plant Of Power Generating Machinery) And Parts Thereof
772 Electrical Apparatus For Switching Or Protecting Electrical Circuits Or For Making Connections
773 Equipment For Distributing Electricity, N.E.S.
774 Electro-Diagnostic Apparatus For Medical, Surgical, Dental Or Veterinary Sciences And Radiological Apparatus
775 Household Type Electrical And Nonelectrical Equipment, N.E.S.
776 Thermionic, Cold Cathode; Diodes, Transistors And Similar Semiconductor Devices; Integrated Circuits, Etc.; Parts
778 Electrical Machinery And Apparatus, N.E.S.
791 Railway Vehicles (Including Hovertrains) And Associated Equipment
792 Aircraft And Associated Equipment; Spacecraft (Including Satellites) And Spacecraft Launch Vehicles; Parts Thereof
793 Ships, Boats (Including Hovercraft) And Floating Structures
871 Optical Instruments And Apparatus, N.E.S.
872 Instruments And Appliances, N.E.S., For Medical, Surgical, Dental Or Veterinary Purposes
873 Meters And Counters, N.E.S.
874 Measuring, Checking, Analysing And Controlling Instruments And Apparatus, N.E.S.
881 Photographic Apparatus And Equipment, N.E.S.
882 Photographic And Cinematographic Supplies
883 Cinematographic Film, Exposed And Developed, Whether Or Not Incorporating Sound Track
884 Optical Goods, N.E.S.
885 Watches And Clocks

APPENDIX B

TURKISH SUMMARY

TÜRKİYE İHRACATININ AB-15 PİYASASINDA REKABET GÜCÜ

Bu tezin amacı, Türkiye'nin Avrupa Birliği'nin ilk üyeleri olan 15 ülkeye (AB-15 piyasasına) yaptığı ihracatta rekabet gücünün AB-15 dışındaki rakip ülkelere karşı analiz edilmesidir. Çalışmamız, 1996 yılından günümüze kadar geçen zamanı kapsamaktadır. Türkiye'nin Gümrük Birliği'ne üye olmasıyla birlikte oluşturulan yeni ekonomik ve bölgesel bütünleşmenin başlangıç yılı olması dolayısıyla 1996 yılı Türk dış ticaretinde önemli bir dönüm noktasıdır. Analizlerimizde 2004 yılından günümüze kadar olan dönemi de ayrıca incelemekteyiz. Bu sayede hem dünyadaki son gelişmelerin, hem de AB'nin 2004 ve 2007 yıllarında yeni üye olarak kabul ettiği 12 ülkeyle birlikte genişlemesinin Türkiye'nin AB-15 piyasasındaki rekabet edebilirliğine etkilerini gözlemlemekteyiz.

Analizlerimiz SITC Rev.3 sınıflandırılmasında en ayrıntılı ürün düzeyi olan 5-basamaklı 3000'in üzerinde ürünü ve 30 kadar ülkeyi kapsamaktadır. Veriler oldukça kapsamlı bir dış ticaret veri seti olan Birleşmiş Milletler-*COMTRADE*'den (*UNCOMTRADE*) ve Türkiye İstatistik Kurumu'ndan (TÜİK) alınmıştır.

Türkiye'nin ihracatta rekabet gücünü ortaya çıkarırken sektörleri teknolojik özelliklerine göre de sınıflandırarak analizimize teknolojik bir boyut eklemekteyiz. Günümüzün dinamik ve küreselleşen dünyasında, ileri teknoloji içeren malları üretmek ve ihraç etmek, ihracatçı ülkeye düşük teknoloji içeren mallara kıyasla daha yüksek katma değer kazandıracağı için bu mallarda uzmanlaşma, rekabet gücü kazanmak açısından her geçen gün giderek çok daha önemli olmaktadır. İhracatta rekabet gücü kazanmak için teknolojik olarak rakiplerinizden daha iyi durumda olmanızın ya da teknolojik ilerleme kaydetme konusunda onlardan daha başarılı olmanızın iktisadi üretkenlik ve etkinlik ile maliyet avantajları bakımından yaşamsal bir önem taşıdığı bilinen bir gerçektir. Bu konuda Türkiye'nin rakiplerine kıyasla ne durumda olduğunun saptanmasının da rekabet politikalarının şekillendirilmesi açısından önemi büyüktür. Biz de tezimizin konusuna uygun olarak, sektörlerin

teknolojik özelliklerine göre sınıflandırıldığı bir analiz çerçevesi içinde ülkenin rekabet edebilirliğini teknolojik açıdan da analiz etmekteyiz. Bu amaçla Hufbauer and Chilas (1974) tarafından yapılan bir çalışmanın öncülük ettiği ve Erlat ve Erlat (2003, 2005) gibi çalışmalarda da kullanılan beşli teknolojik sınıflandırmayı esas aldık. Bu sınıflandırmada sektörler "hammadde-yoğun", "emek-yoğun", "sermaye-yoğun", "kolay taklit edilebilir araştırma-yoğun" ve "zor taklit edilebilir araştırma-yoğun" sektörler olarak beş gruba ayrılmaktadır.

Bu tezde hedef piyasa olarak AB-15'i seçmemizin sebebi AB-15'in Türkiye'nin geleneksel olarak en önemli dış ticaret ortağı ve ihracat piyasası olmasıdır. Şöyle ki Türkiye, çok uzun yıllardır tüm dünyaya yaptığı ihracatın yaklaşık olarak yarısını bu piyasaya gerçekleştirmektedir. Türkiye'ye rakip ülkeler olarak AB-15'in dışında kalan ülkeleri seçmemizin sebebi ise, Türkiye'nin bu ülkelerle rekabetinde kullanamadığı fırsatları olduğunu ve bu fırsatların ortaya çıkarılarak kullanılmasını sağlamanın ülkenin hem AB-15'e hem de dünya piyasasına ihracatındaki rekabet gücüne yarar sağlayacağını düşünmemizdir.

Dünyanın içinde bulunduğu küreselleşme sürecine paralel olarak dış ticaret engellerinin önemli ölçüde kaldırılmasıyla birlikte özellikle gelişmekte olan ülkeler, ihracatlarına öncelik vererek dünya piyasalarında rekabet edebilme güçlerini artırmaya çalışmaktadırlar. Türkiye de bu ülkelerden biridir. Yukarıda da vurguladığımız üzere, AB-15 piyasası Türkiye için bu süreçte en önemli ihracat piyasasıdır. Özellikle 1996 yılından itibaren Türkiye-AB arasındaki dış ticaret ilişkileri yeni ve önemli bir dönemece girmiştir. Diğer yandan, AB-15 piyasasındaki genel rekabet ortamı da son yıllarda hem daha da genişlemiş hem de yapısal olarak önemli değişimlere uğramıştır. Merkez ve Doğu Avrupa ülkelerinin 2004 ve 2007 yılında Avrupa Birliği'ne üye olması, Çin'in dünya piyasalarındaki gelişmelere paralel olarak AB-15 piyasasında da hızla yükselmesi ve bu yükselişe karşılık veremeyen gelişmiş ülkelerin, özellikle de ABD'nin düşüşü ve bunun gibi gelişmelerle birlikte Türkiye açısından da bu piyasadaki rekabet koşulları değişmiş ve karşısında yeni ve farklı fırsatlar ve tehditler belirmiştir. Bu fırsatlar ve tehditler karşısında Türkiye bu piyasadaki ihracatından alabileceği en büyük payı almak için rekabet gücünü artırmaya çalışmaktadır. Tezimiz Türkiye'nin bu çabasına akademik bir katkıda bulunmak amacı ile yazılmıştır.

Esasında iktisat yazınında rekabet gücü kavramının kabul gören tek ve ortak bir tanımı bulunmamaktadır. Ancak genel olarak rekabet gücü, ihracat yapabilme kapasitesi, verimlilik düzeyi, yüksek yaşam kalitesini sağlayabilme gibi ölçütlere dayanarak ülkelerin genel ekonomik performanslarını tanımlayan bir kavramdır. Rekabet gücünün ölçülmesi de çok çeşitli biçimlerde yapılabilir. Dolayısıyla ülkelerin herhangi bir piyasada rakiplerine kıyasla rekabetçi konumunun belirlenmesi de bu tanım ve ölçüm çeşitlerine göre farklılık gösterir. Genel olarak rekabet gücü ülke, sektör ve firma düzeyinde ölçülebilir. Diğer yandan bu kavram makro, mikro ve dış ticaret açılarından da incelenebilir. Bizim çalışmamızda konu ve amaca uygun olarak rekabet gücü, ülkelerin dış ticareti açısından incelenmiş ve Uluslararası Ticaret Merkezi'nin rekabet gücü tanımıyla uyumlu olarak "bir ülkenin bir malı ihraç etmekte diğer ülkelere kıyasla sahip olduğu avantaj" olarak ele alınmıştır. Başka bir deyişle, çalışmamızda ülkelerin ihracat performansları, rekabet güçlerinin bir göstergesi olarak kabul edilmiştir. Buna uygun olarak ülkelerin rekabet gücü; ihracat performansı ölçümlerinde kullanılan ve genel kabul gören "ihracatta benzerlik", "ihracatta çeşitlenme", "yoğun ve yaygın marjlar" *(intensive and extensive margins)*, "açıklanmış karşılaştırmalı üstünlükler", "dinamik piyasa konumlanması" ve "rekabetçi tehdit" kavramları açısından ele alınmış ve ölçülmüştür. Bu kavramlar göz önüne alınarak Türkiye'nin AB-15 piyasasında AB-15-dışı ülkelere karşı rekabetçi konumunun ve bu konumdan hareket ederek Türkiye'nin öne çıkan ihracat sektörlerinin belirlenmesi amaçlanmıştır.

Bu amacı gerçekleştirirken ilk olarak Türkiye'nin diğer AB-15-dışı ülkelerle "ihracat benzerliği"ne bakılmıştır. "İhracatta benzerlik" önemli bir başlangıç noktasıdır, çünkü birbirinden çok farklı ihracat yapıları ve ihracat kalıpları olan ülkeler arasındaki rekabeti incelemek ve buradan çıkan sonuçlara dayanarak geleceğe ilişkin rekabet politikaları üretmek çok da anlamlı olmayacaktır. Diğer bir deyişle, aynı piyasada birbirlerine rakip olarak boy gösteren ve rekabet güçlerini geliştirmeye yönelik bir dış ticaret politikası izleyen ülkelerin ihracat yapılarının ve ihracat kalıplarının az çok benzer olması gerekmektedir. Bu benzerlik arttıkça ülkeler arasındaki rekabet de güçlenmektedir. Dolayısıyla "ihracat benzerliği" incelenirken öncelikli amaç Türkiye'nin en güçlü rakiplerinin saptanmasıdır.

Dış ticaret yazınında "ihracat benzerliği" hesaplanmasında en sık kullanılan endekslerden biri Finger ve Kreinin'in (1979) bir çalışmalarında geliştirdikleri benzerlik endeksidir (F-K endeksi). Biz de ilk olarak Türkiye ve AB-15 dışında kalan 26 diğer ülke arasında F-K endeksini mümkün olan en ayrıntılı düzeyde, yaklaşık 3000'in üzerinde ürün için hesapladık. Bu endeksin hesaplanmasında ayrıntılı bir veri düzeyi kullanmak önem taşımaktadır, çünkü verilerin ayrıntı düzeyi azaldıkça endeks katsayısı da yukarı doğru bir sapma eğilimi sergilemektedir. Bu analizde bizim çalışmamızı ilgili yazındaki diğer çalışmalardan ayıran önemli bir husus, kullandığımız bu ayrıntılı veri düzeyi ve endekse dâhil ettiğimiz ülkelerin sayıca çokluğudur.

İkinci olarak yazında daha önce "endüstri-içi ticaret" ölçümünde kullanılan ve daha sonra Antimiani ve Henke (2007) tarafından ihracatta benzerlik endeksi olarak uyarlanan "ürün benzerlik endeksini" hesapladık. Bu endeks daha önce sadece Antimiani ve Henke (2007) tarafından kullanılmıştır. Türkiye ile AB-15 dışında kalan diğer 26 ülkenin benzerliğine bakmak amacıyla ilk olarak bizim çalışmamızda yer almıştır.

Son olarak, Antimiani ve Henke'nin (2007) "kalite benzerlik endeksi"nden esinlenerek ürünleri fiyatlarına göre "Türkiye fiyatları ile benzer fiyatlı mallar", "Türkiye fiyatlarından yüksek fiyatlı mallar" ve "Türkiye fiyatlarından düşük fiyatlı mallar" olarak ayrıştırıp her bir kategori için ayrı bir "fiyat benzerlik endeksi" oluşturduk. Bu ayrıştırma ve her bir kategori için türettiğimiz "fiyat benzerlik endeksi" çalışmamızın ilgili yazına özgün bir katkısıdır. Türettiğimiz "fiyat benzerlik endeksi" sayesinde, Türkiye'nin en muhtemel rakiplerini belirlemekle kalmayıp, bu rekabetin kaynağının fiyat farklılıkları mı yoksa fiyat-dışı faktörler mi olduğunu ortaya çıkarabilmekteyiz. Bunun yanı sıra, Türkiye'nin diğer ülkelerle ihracat benzerliğinin teknolojik boyutunu saptamak amacıyla analizimizi teknolojik kategoriler için de tekrarladık.

Çalışmamızın bu bölümünde yaptığımız analizden çıkan en genel sonuçlar şöyle özetlenebilir: Türkiye AB-15 piyasasında diğer ülkelerle birlikte güçlü bir rekabet ortamında bulunmaktadır; ihracat benzerliğinin en yüksek olduğu rakipler, Merkez ve Doğu Avrupa bölgesinden özellikle Polonya, Çek Cumhuriyeti, Slovakya, Slovenya ve Bulgaristan ile Orta Doğu bölgesinden Fas ve Tunus gibi ülkelerdir;

Merkez ve Doğu Avrupa ülkeleri ile benzerlik son yıllarda ve özellikle de 2004 sonrasında artarken, Fas ve Tunus ile benzerlik azalmıştır. Türkiye'nin gelişmiş ülkeler ile ihracat benzerliğinin ise son yıllarda az da olsa artmasına rağmen diğer ülkelere kıyasla oldukça düşük seviyelerde olduğunu görmekteyiz. Bu sonuç Türkiye'nin teknolojik gelişmişlik düzeyinin son yıllarda artmış olsa bile henüz gelişmiş ülkelerle rekabet edebilmeye yetecek kadar ileri olmadığını ifade etmektedir.

Analiz sonuçlarını teknolojik açıdan değerlendirdiğimizde, Türkiye'nin diğer ülkeler ile ihracat benzerliğinin genel olarak emek-yoğun ve sermaye-yoğun kategorilerde yoğunlaştığını, araştırma-yoğun kategorilerde ise genelde Çek Cumhuriyeti, Polonya, Slovakya, Slovenya gibi Merkez ve Doğu Avrupa ülkeleri ile benzer olduğunu görüyoruz. Hammadde-yoğun sektörlerde Çin, Fas, ve Macaristan; emek-yoğun sektörlerde Romanya, Hindistan ve Fas; sermaye-yoğun sektörlerde Polonya, Macaristan ve Çek Cumhuriyeti; kolay taklit edilebilir araştırma-yoğun sektörlerde Polonya, Slovakya ve Çek Cumhuriyeti; zor taklit edilebilir araştırma-yoğun sektörlerde ise Slovenya, Polonya ve Brezilya ihracat kalıpları açısından Türkiye'ye en çok benzeyen ülkelerdir.

Analizimizden çıkan diğer bir sonuç ise 2004 sonrasındaki dönemde Türkiye'nin özellikle Polonya, Çek Cumhuriyeti ve Slovenya gibi Merkez ve Doğu Avrupa ülkeleri ile ihracat benzerliğinin benzer fiyatlı mallardan göreli olarak Türkiye'nin fiyatının daha düşük olduğu mallara kaymış olmasıdır. Diğer bir deyişle 2004 yılı sonrasında bu ülkelerin malları daha pahalı hale gelmesine rağmen Türkiye ile ihracat benzerlikleri artmaya devam etmiştir. Bu sektörlere örnek olarak "İşlenmiş tütün", "Kauçuktan iç ve dış lastikler", "Demir veya çelikten (alaşımlı, alaşımsız) filmaşin, çubuk ve profiller" ve "Toprağın tesviyesi, cevherleri taşıma, yayılması, kar küreyicileri vb." verilebilir. Bu durumu bu ülkelerin AB'ye girdikten sonra mal kalitelerinin artması ya da AB üyesi oldukları için AB-15 tüketicileri tarafından doğrudan kendi mallarına olan talebin artması ile açıklayabiliriz. Her iki durumda da Türk ihracatçıları bu ülkelerle rekabet edebilmek için fiyat kırmak zorunda kalmışlardır. Daha açık şekliyle, Türkiye'nin AB'ye tam üyeliği henüz gerçekleşmediğinden dolayı Türk ihracatçıları kendi mallarına olan talebi aynı seviyede tutmak ya da arttırmak için ya kalitelerini arttırmayı ya da fiyatlarını

düşürüp kalite rekabeti yerine fiyat rekabeti yapmayı tercih edeceklerdi. Sonuçlar gösteriyor ki Türk ihracatçıları fiyat kırma yoluna gittiler. Bu bulgumuz 2004 sonrasındaki dönemde araştırma-yoğun sektörlerde daha belirgin olarak karşımıza çıkmaktadır. Sermaye-yoğun sektörlerde ise çoğu malda son yıllarda dahi Türkiye, fiyat rekabeti yerine kalite rekabeti yapmaya devam etmektedir.

Diğer yandan Türkiye'nin 3 Asya ülkesi olan Çin, Hindistan ve Endonezya ile benzerliğinin, Türk ihraç ürünlerinin göreli olarak pahalı olduğu mallarda yoğunlaştığını görüyoruz. Yüksek fiyatın yüksek kalitenin bir göstergesi olduğu varsayımı altında, Türk ihraç mallarının bu üç ülkenin ihraç mallarından daha kaliteli olduğu sonucuna ulaşabiliriz.

Gelişmiş ülkeler ile Türkiye'nin rekabetinin niteliğine baktığımızda, bu ülkeler ile rekabet edilen mallarda Türkiye'nin fiyatlarının göreli olarak daha ucuz olduğunu görüyoruz. Bu sonuç Türkiye'nin gelişmiş ülkelerle kalite rekabeti yerine fiyat rekabeti yaptığını teyit etmektedir.

Daha önce de belirttiğimiz gibi "ihracat benzerliği" bir ülkenin rekabetçi pozisyonunun belirlenmesinde başlangıç aşaması olarak ana unsurlardan biridir. Ülkelerin rekabet edebilirliklerinde önem taşıyan diğer bir unsur "ihracatta çeşitlenme" sağlayabilmeleridir. Diğer bir deyişle, bir ülkenin rakiplerine kıyasla rekabette avantajlı konuma geçebilmesi için sadece hâlihazırda ihraç ettiği malların ihraç gelirlerini artırması yeterli olmamakta, aynı zamanda ihracat portföyüne yeni ürünleri de eklemesi gerekmektedir. Bu gereklilik bizi "ihracatta çeşitlenme" kavramına götürmektedir. İhracatta çeşitlenme hâlihazırda ihraç edilen malların paylarının artırılması ("yoğun marj") ve yeni mallar ihraç edilmesi ("yaygın marj") ile sağlanabilir. Aslında ilgili yazında ihracatta çeşitlenme farklı biçimlerde de tanımlanıp analiz edilmektedir. Erlat ve Şahin (1998) ile Erlat (1999), bu konudaki alternatif ölçümler ve onların Türk dış ticaretine uygulamalarını konu alan çalışmalara örnektir. Ancak biz çalışmamızda ihracatta çeşitlenmeyi "yoğun ve yaygın marjlar" analizi ile inceledik ve bu haliyle çalışmamız bu yöntemin Türkiye'ye uygulanan ilk örneğini sunmaktadır. Çalışmamızda bu amaçla yine 3000'in üzerinde ürün ve 30 ülke, 1996 ve 2006 yılları arasında oldukça ayrıntılı bir düzeyde incelenmektedir. Kapsam ve verilerin elverişliliği göz önünde bulundurularak çalışmamızda başlangıç yılı 1996, bitiş yılı ise 2006 olarak

belirlenmiştir. Daha önceki kısımlarda olduğu gibi yine sektörlerin teknolojik özelliklerini dikkate alarak her bir teknolojik kategori için yapılan hesaplamalarla sonuçlarımızı genişletmekteyiz.

Çalışmamızda "yoğun ve yaygın marjları" 3 farklı yöntem kullanarak hesaplamaktayız. Birincisi ihraç edilen ürünlerin sayılmasıdır. Bu yöntem yeni ihraç edilen ürünler ve dolayısıyla ülkelerin ürün çeşitliliği hakkında bilgi veren en basit yöntemdir. İhraç edilen ürün sayılarına bakarak çıkardığımız sonuçlarda, 1996'dan 2006'ya ihraç edilen ürün sayısında artış sıralamasında Türkiye kolay taklit edilebilir araştırma-yoğun sektörlerde 30 ülke arasında 72 yeni ürünle birinci sırada yer almaktadır. Zor taklit edilebilir araştırma-yoğun sektörlerde 96 yeni ürün ile tüm ülkeler arasında 4., sermaye-yoğun sektörlerde de 70 yeni ürünle 6. olmayı başarmıştır. Ancak ürün sayısındaki bu başarılı artışlara rağmen 2006 yılında kolay taklit edilebilir araştırma-yoğun sektörlerde tüm ürünlerin sayısının henüz % 65'ini, zor taklit edilebilir araştırma-yoğun sektörlerde % 89'unu, sermaye-yoğun sektörlerde ise %80'ini ihraç edebilmektedir. Bu sonuç da Türkiye'nin 2006 sonrası dönemde özellikle kolay taklit edilebilir araştırma-yoğun sektörlerde, ardından daha kısıtlı da olsa diğer iki kategoride ürün çeşitliliğini artırma konusunda önemli fırsatları olduğunu göstermektedir.

Ancak sadece ürün sayılarına bakmak ve ürünlerin ihraç değerlerini ihmal etmek yanıltıcı sonuçlara yol açabilir. Bu nedenle, uygulanan diğer iki yöntem sadece ürün sayılarını değil, onların ihraç değerlerini de hesaba katmaktadır. Dolayısıyla ikinci olarak, Hummels ve Klenow (2005) tarafından ortaya atılan, daha sonra Feenstra ve Kee (2007) tarafından "yaygın marjlar" hesaplamasındaki sorunlu kısımları tekrar gözden geçirilerek sorunsuz hale getirilen bir yöntemi analizlerimizde kullandık. Hummels ve Klenow'un (2005) çalışmasında yer alan "yoğun marjlar" yöntemindeki sorunlarla bizim çalışmamızda da karşılaştığımız için, biz de Feenstra ve Kee'nin (2007) çalışmasında olduğu biçimiyle sadece "yaygın marjlar"ı hesapladık. Kısacası, bu yöntem ile yeni ürünlerin Türkiye ve diğer ülkelerin rekabetçi pozisyonlarındaki önemini ortaya koymuş olduk.

Feenstra ve Kee (2007) endeksinde "yaygın marjlar" ürün çeşitliliği üzerinden ölçülmektedir. Daha açık şekliyle "yaygın marj" ürün çeşitliliğinin başlangıç ve bitiş yılları arasındaki büyüme oranını göstermektedir. Ürün çeşitliliği ise her bir ürünün

AB-15'e olan dünya ihracatının, AB-15'e yapılan toplam dünya ihracatındaki payı göz önüne alınarak hesaplanmaktadır. Çalışmamızın konusuna uygun olarak, burada 'dünya' AB-15 dışı ülkeleri temsil etmektedir. Bu endeks, ürünlerin AB-15 piyasasındaki dünya ihracat değerleri dikkate alınarak hesaplandığı için ülkeler arası kıyaslamaya oldukça elverişlidir.

Feenstra ve Kee (2007) endeksi, yeni ürünlerin önemini AB-15 piyasasındaki payları cinsinden ortaya çıkarmaktadır. Bu endeksin sonuçlarını yorumlarken dikkat edilmesi gereken önemli bir nokta, ürün çeşitliliği ile yaygın marj katsayısının birlikte değerlendirilmesi gerektiğidir. Daha açık bir deyişle, bir ülkenin diğer bir ülkeye kıyasla yeni ürün ihraç etmekte başarılı olduğunun kesin olarak belirlenebilmesi için o ülkenin hem başlangıç yılındaki ürün çeşitliliği hem de yaygın marj katsayısı diğer ülkeye göre daha yüksek olmalıdır.

Feenstra ve Kee (2007) endeksinin sonuçlarına göre Türkiye, tüm sektörler bazında, 30 ülke arasında yaygın marjı en yüksek olan ülkedir. Ayrıca, yüksek yaygın marjının yanı sıra 1996 yılındaki ürün çeşitliliği de Letonya, Romanya, Litvanya, Ukrayna, Güney Kore, Slovenya, Malezya, Tunus, Bulgaristan ve Hırvatistan'dan daha yüksek olduğu için yeni ürün üretme konusunda bu ülkelerden kesin olarak daha başarılıdır.

Bu endeksin sonuçlarına teknolojik kategoriler açısından bakacak olursak, Türkiye'nin yaygın marjının en yüksek olduğu kategori hammadde-yoğun sektörler kategorisidir. Ancak bu sonuç, Türkiye'nin bu kategoride 1996 yılında ürün çeşitliliğinin çok düşük olmasından kaynaklanan doğal bir durum olarak açıklanabilir. Yaygın marjın yüksek olduğu diğer bir teknolojik kategori ise kolay taklit edilebilir araştırma-yoğun sektörler kategorisidir ve bu kategoride Türkiye 30 ihracatçı ülke arasında 7. sırayı almıştır.

Yaygın ve yoğun marjlar analizinde üçüncü ve son olarak da ürünlerin AB-15 piyasasındaki paylarını değil, ülkelerin kendi ihracatlarındaki paylarını esas alan Amiti ve Freund (2008) endeksini hesapladık. Amiti ve Freund (2008), bir ülkenin bir yıldan öteki yıla ihracatındaki büyümeyi "yoğun marj", "yeni ürünler" ve "yok olan ürünler" olarak 3 bölüme ayrıştırır. Bu ayrıştırmada yoğun marj, hem başlangıç yılında hem de bitiş yılında ihraç edilen ürünlerden kaynaklı ihracat büyümesini gösterirken, "yeni ürünler" başlangıç yılında ihraç edilmeyip bitiş yılında ihraç edilen

ürünleri, “yok olan ürünler” ise başlangıç yılında ihraç edilirken bitiş yılında ihraç edilmeyen ürünleri gösterir. “Yaygın marj” ise “yeni ürünler”den kaynaklanan büyüme ile “yok olan ürünlerden” doğan kaybın bileşimi olarak tanımlanır.

Çalışmamızda Amiti ve Freund (2008) endeksi yardımı ile Türkiye’nin ihracat büyümesinde yaygın ve yoğun marjların etkilerini saptadık. Diğer bir deyişle, bu büyümenin ne kadarı hâlihazırda ihraç edilen ürünlerden, ne kadarı da yeni ürünlerden kaynaklanıyor sorusuna cevap aradık. Diğer endekslerde olduğu gibi bu endeksi de her teknolojik kategori ve her ülke için ayrıca hesapladık.

Çıkan sonuçlara göre, Türkiye’nin 1996-2006 dönemindeki ihracat büyümesinin çok büyük bir bölümü “yoğun marj”dan oluşuyor. Diğer bir deyişle, bu büyümenin önemli bir bölümü her iki yılda da ihraç edilen ürünlerin ihracatındaki artıştan kaynaklanıyor. Özellikle sermaye-yoğun ve kolay taklit edilebilir araştırma-yoğun sektörlerdeki ihracat büyümesinde “yoğun marj”ın “yaygın marj”a oranla baskınlığı göze çarpmaktadır. Feenstra ve Kee (2007) endeksinde bu sektörlerde yaygın marj yüksek çıkarken, Amiti ve Freund (2008) endeksinde oldukça düşük çıkmasını şu şekilde açıklayabiliriz: Türkiye’nin bu kategorilerdeki sektörlerde yeni ihraç etmeye başladığı ürünlerin dünya ihracatı çok yüksek iken Türkiye’nin ihracatı oldukça düşük kalmaktadır. Yani Türkiye yeni ürün belirleme konusunda başarılıdır, ancak bu yeni ürünlerin Türkiye’nin rekabet gücüne katkıda bulunabilmesi için ihracat değerlerinin artması gerekmektedir.

Amiti ve Freund (2008) endeksine göre, zor taklit edilebilir araştırma-yoğun kategorideki sektörlerin yaygın marjı diğer sektörlerin yaygın marjından daha yüksektir. Bu kategorideki sektörlerin ihracatlarındaki büyümenin % 7’si yaygın marj kaynaklıdır. Bu % 7’nin % 10’u “yeni ürün”lerden kaynaklanırken, % 3’lük kayıp ise “yok olan ürünler”den kaynaklanmaktadır.

Bu üç yöntemden çıkarılan genel bir sonuç olarak diyebiliriz ki, Türkiye ihracatta çeşitlenme yapabilme konusunda oldukça iyi bir performans sergilemektedir ve geleneksel emek-yoğun sektörlere olan bağımlılığını kırarak sermaye-yoğun ve hatta nispeten daha yüksek teknolojili sektörlere doğru yönelmektedir. Dolayısıyla, gelecekte ihracatta çeşitlenmeyi ve buna bağlı olarak rekabet gücünü arttırmayı gerçekleştirecek önemli fırsatlara sahiptir.

Çalışmamızda rekabet gücünün önemli boyutlarından olan "ihracat benzerliği" ve "ihracatta çeşitlenme"nin ayrıntılı olarak incelenmesinde sonra, dış ticaret yazınında rekabet edebilirlik konusunda oldukça popüler ve yaygın olarak kullanılan "karşılaştırmalı üstünlükler" kavramına dayanan bir analiz yapmaktayız. Bu amaçla öncelikle Balassa (1965) tarafından ortaya atılmış olan "açıklanmış karşılaştırmalı üstünlükler"i (AKÜ), daha sonra da dinamik piyasa konumlanmasını Türkiye ve rakipleri için incelemekteyiz. Son olarak da AKÜ endekslerini kullanarak Türkiye üzerinde rakipleri tarafından yaratılan ve aynı zamanda Türkiye'nin rakipleri üzerinde yarattığı "rekabetçi tehdit"i incelemekteyiz. Bu amaçla ilgili yazındaki yöntemlere ek olarak kendi geliştirdiğimiz "rekabetçi tehdit/fırsat endeksi"nden yararlanmaktayız.

Bu bölümde 1996-2010 döneminde 32 ülke için 3-basamaklı ihracat verisi kullanmaktayız. Bu bölüm, AB-15 piyasasında Türkiye'nin dinamik piyasa konumlamasını analiz eden ilk çalışmadır. Ayrıca, AKÜ endeksi kullanarak oluşturduğumuz rekabetçi tehdit/fırsat endeksi de yazına bir katkı amacı taşımaktadır.

AKÜ endeksi dış ticaret yazınında sık kullanılan bir endekstir ve bir ürünün, bir ülkenin toplam ihracatındaki payı ile o ürünün dünya ihracatındaki payını kıyaslamaktadır. Çalışmamızın konusuna uygun olarak, 'dünya' AB-15 dışında kalan ülkeleri temsil etmektedir. AKÜ endeksinin katsayısının 1'den büyük olması o ülkenin o üründe açıklanmış karşılaştırmalı üstünlüğü olduğunu göstermektedir.

Analiz sonuçlarına göre, ülkelerin toplam ihracatlarının içinde AKÜ katsayısı 1'den büyük olan sektörlerin payının teknolojik kategorilere göre dağılımını şöyle özetleyebiliriz: Hammadde-yoğun sektörlerde Brezilya, Mısır, Letonya, Litvanya, Meksika, Norveç, Rusya, Güney Afrika ve Ukrayna; emek-yoğun sektörlerde Bulgaristan, Hırvatistan, Çek Cumhuriyeti, Hindistan, Endonezya, İsrail, Polonya, Romanya ve Türkiye; sermaye-yoğun sektörlerde Slovakya ve Slovenya; kolay taklit edilebilir araştırma-yoğun sektörlerde Güney Kore, Malezya ve Singapur; zor taklit edilebilir araştırma-yoğun sektörlerde ise Macaristan, Japonya, Malta, İsviçre ve Amerika Birleşik Devletleri toplam ihracatları içinde AKÜ katsayısı 1'den büyük sektörlerinin payı en yüksek olan ülkelerdir.

Türkiye'nin AKÜ katsayısı 1'den büyük olan sektörlerinin toplam ihracattaki payını teknolojik kategoriler açısından her yıl için incelediğimizde ise öncelikle göze çarpan bir husus, emek-yoğun sektörlerin tüm dönem boyunca en yüksek paya sahip olduğu fakat bu payın yıldan yıla giderek azaldığıdır. Dahası, emek-yoğun sektörlerin payındaki bu azalışa sermaye-yoğun sektörlerin payındaki benzer orandaki artış eşlik etmektedir. Diğer bir deyişle emek-yoğun sektörlerdeki azalış ile sermaye-yoğun sektörlerdeki artış birbirlerinin aynadaki görüntüleri izlenimini vermektedir. Zor taklit edilebilir araştırma-yoğun sektörlerin payında ise son yıllarda yavaş da olsa bir artış gözlemlenmektedir. Diğer yandan kolay taklit edilebilir araştırma-yoğun sektörlerin payı tüm teknolojik kategoriler arasında en düşük paya sahiptir.

AKÜ endeksi dış ticaret yazınında oldukça popüler bir endeks olmakla birlikte, rekabet kavramına statik açıdan yaklaştığı için yıllar itibarıyla değişen karşılaştırmalı üstünlükleri açıklamakta yetersiz kalabilmektedir. Bu nedenle, dinamik piyasa konumlanması olarak adlandırılan yöntemi kullanmaktayız. Bu yöntem, Tsinaka (1999) tarafından ortaya atılmış ve Edward ve Schoer (2002) tarafından geliştirilmiş olup, yöntemin temeli yine AKÜ endeksine dayanmaktadır. Edward ve Schoer (2002) iki yıl arasında AKÜ endeksinde gerçekleşen büyümeyi kısımlara ayırmış ve bu kısımlara dayanarak ihraç ürünlerini dinamik piyasa konumlanmalarına göre "yükselen yıldızlar" (*rising stars*), "düşen yıldızlar" (*falling stars*), "dünya pazarının önceleyerek gerilediği sektörler" (*leading retreat*), "dünya pazarının gecikerek gerilediği sektörler" (*lagging retreat*), "gecikilmiş fırsatlar" (*lagging opportunities*) ve "kaybedilmiş fırsatlar" (*lost opportunity*) olarak sınıflandırmışlardır. Dinamik piyasa konumlanması analizinde, iki yıl arasında bir malın bir ülkenin toplam ihracatındaki payında gerçekleşen artış ya da azalış ile o malın dünyanın toplam ihracatındaki payında geçekleşen artış ya da azalış ile kıyaslanır. Diğer bir deyişle, bu yöntem bize ülkenin ihracat yapısında ortaya çıkan değişimler ile dünyanın ihracat yapısındaki değişimleri ayrı ayrı değerlendirme olanağı sunar. Böylece bir sektördeki değişimin ülkenin ihracatındaki değişimlerden mi, yoksa dünya piyasasındaki genel gidişattan mı kaynaklandığı öngörülebilir.

Edward ve Schoer'den (2002) farklı olarak biz hesaplamamızda sadece iki yıl arasındaki artışı değil, 1996-2010 dönemindeki tüm yıllık artışların ortalamasını

alarak ‘ortalama yıllık artış’ı kullandık. Böylece yıldan yıla gerçekleşen tüm değişiklikleri hesaplamamıza dâhil etmiş olduk.

Eğer bir sektörün hem ülkenin toplam ihracatındaki payı hem de dünyanın toplam ihracatındaki payı artmakta ve dahası ülkenin payı dünyanın payından daha fazla artmakta ise o sektörün konumu “yükselen yıldızlar” olarak isimlendirilmektedir. Eğer bir sektörde ülkenin payındaki artış dünyanın payındaki artıştan daha az ise o sektörün konumu “gecikilmiş fırsatlar” olarak isimlendirilmektedir. Tam tersine, eğer bir sektörde her iki pay da azalmakta ama ülkenin payındaki azalma dünyanın payındaki azalmadan daha küçük ise o sektörün konumu “dünya pazarının önceleyerek gerilediği sektörler”; eğer ülkenin payındaki azalma dünyanın payındaki azalmadan daha büyük ise, “dünya pazarının gecikerek gerilediği sektörler” olarak tanımlanmaktadır. Eğer bir sektörde ülkenin payı yıldan yıla artarken dünyanın payı yıldan yıla azalıyorsa o sektörün konumu “düşen yıldızlar”; tam tersine, ülkenin payı azalırken dünyanın payı artıyorsa “kaybedilmiş fırsatlar” olarak tanımlanmaktadır.

İsminden de anlaşılabileceği üzere, bir sektör için en çok tercih edilen konum “yükselen yıldızlar”dır. Bu konumdaki bir sektörün ihracat payında yıldan yıla gerçekleşen artış AB-15’in yıldan yıla artan talebine cevap vermektedir. Bu nedenle en başarılı konum olarak görülmektedir.

“Dünya pazarının önceleyerek gerilediği sektörler” konumunda ise, AB-15 tarafından azalan talebe karşılık olarak söz konusu ülke de bu sektörlerdeki ihracatını azaltmaya başlamıştır. Dolayısıyla talebi azalan sektörlerden başka sektörlere doğru yeniden yapılanmanın gerçekleştiği bir konum olmasından dolayı bu konum da başarılı bir piyasa konumlanmasına işaret eder. “Kaybedilmiş fırsat” konumundaki sektörler ise en az arzu edilen piyasa konumlanmasında olan sektörlerdir. Bu konumdaki sektörlerde AB-15 talebi yıldan yıla artarken, o sektörün ülkenin toplam ihracatı içindeki payı giderek azalmaktadır.

Dinamik piyasa konumlanması analizimizin sonuçlarına göre, Türkiye’nin toplam ihracatının % 37’si “yükselen yıldızlar”, % 7’si “düşen yıldızlar”, % 11’i “dünya pazarının önceleyerek gerilediği sektörler”, % 32’si “dünya pazarının gecikerek gerilediği sektörler”, % 7’si “gecikilmiş fırsatlar”, % 6’sı ise “kaybedilmiş fırsatlar” konumundadır. Başarılı olarak kabul edilen dinamik piyasa konumlarının

"yükselen yıldızlar" ve "dünya pazarının önceleyerek gerilediği sektörler" olması sebebiyle, Türkiye'nin ihracatının yaklaşık yarısı başarılı piyasa konumlanmasındadır diyebiliriz.

Dinamik piyasa konumlanmasının her bir teknolojik kategori için analiz edilmesi sonucunda ise, Türkiye'nin hammadde-yoğun ve emek-yoğun kategorilerdeki sektörlerinin çoğunun "gerileyen sektörler" konumunda; sermaye-yoğun ve zor taklit edilebilir araştırma-yoğun kategorilerinde ise sektörlerin çoğunun "yükselen yıldızlar" konumunda yer aldığını gözlemlemekteyiz. Bu konumlanma Türkiye'nin iyi tasarlanmış endüstri ve dış ticaret politikaları sonucunda düşük katma değerli sektörlerden daha yüksek katma değerli sektörlere doğru başarılı bir yeniden yapılandırma gerçekleştirdiğinin göstergesidir. Kolay taklit edilebilir araştırma-yoğun kategorideki sektörlerin çoğu ise dinamik olarak "gecikilmiş fırsatlar" kategorisindedir. Yani geç kalınmış da olsa bu kategoride hâlâ kullanılabilecek fırsatlar bulunmaktadır ve Türkiye AB-15 tarafından talebi artan sektörlerde ihracatını arttırma yönünde yükselen bir eğilim yakalamıştır. Ancak, bu yükselen eğilimin Türkiye'yi istenilen konuma taşımak için henüz yeterli olmadığı gözlemlenmektedir.

Son olarak, AGÜ endekslerine dayanarak yaptığımız rekabetçi tehdit/fırsat analizine değinecek olursak, bu amaçla "Spearman sıralı-korelasyon" (*Speraman rank correlation*) katsayısı, Jenkins (2008) tarafından oluşturulan rekabetçi tehdit endeksi ve Jenkins'ten esinlenerek bizim yazına katkı olarak sunduğumuz "tehdit/fırsat endeksi" yardımıyla Türkiye'nin AB-15 piyasasında üçüncü ülkeler tarafından maruz kaldığı rekabetçi tehdit ve Türkiye'nin yine aynı piyasada bu ülkelere uyguladığı rekabetçi tehdit ayrı ayrı saptanmaktadır. Yazına katkı olarak sunduğumuz endekste rekabetçi tehdidin yanı sıra ülkelerin birbirleri için yarattığı rekabetçi fırsatlar da ortaya konmaktadır.

Rekabetçi tehdit analizinin sonuçları gösteriyor ki, Türkiye için AB-15 piyasasında en sert tehditler Polonya, Bulgaristan, Romanya, Çek Cumhuriyeti gibi Merkez ve Doğu Avrupa ülkeleri ile Tunus ve Fas gibi Ortadoğu ülkeleri ve Çin'den gelmektedir. Diğer yandan Fas, Tunus, Slovakya, Romanya ve Bulgaristan, Türkiye'nin bu piyasada en fazla tehdit ettiği ülkelerdir. Ülkelerin karşılıklı olarak yarattıkları fırsatlara bakacak olursak Türkiye'nin rakipleri için yarattığı fırsatlar,

rakiplerinin kendisi için yarattığı fırsatlardan daha fazladır. Özellikle Norveç, Rusya, Kanada ve Singapur AB-15 piyasasında Türkiye'yi rekabet açısından tehdit etmekten ziyade Türkiye için fırsat yaratan ülkeler olarak saptanmaktadır.

Rekabet gücü analizlerimizden elde ettiğimiz sonuçları toparlayacak olursak, çalışmamızın sonuçları AB-15 piyasasında Türkiye'nin AB-15 dışındaki ülkelerle rekabetinde var olan ve Türkiye tarafından yeteri kadar kullanılamamış fırsatlar olduğuna ilişkin hipotezimizi doğruluyor. Bu rekabetin niteliği ve niceliği, rakip ülkelere, sektörlere ve malların fiyatlarına göre değişiklik göstermektedir. Dolayısıyla Türkiye'nin rakiplerine karşı rekabet politikası belirlerken dikkatli olması ve bu faktörlerin her birini göz önüne alması gerekmektedir. Çalışmamız gösteriyor ki Türkiye hâlihazırda düşük katma değerli sektörlerden sermaye-yoğun ve araştırma-yoğun sektörler gibi daha yüksek katma değerli olanlarına doğru bir yeniden yapılanma dinamiğini yakalamış durumdadır. Ancak bu süreçte kendisi için uygun olmayan bazı sektörlerin ihracatında da uzmanlaşmaya devam etmektedir.

Oldukça ayrıntılı düzeyde veri ile yaptığımız analiz sonuçlarına göre, Türkiye'nin bu piyasadaki en yakın rakipleri Merkez ve Doğu Avrupa ülkeleri ile Ortadoğu ülkeleridir. Türkiye'nin gelişmiş ülkeler ile rekabetine baktığımızda ise ülkenin henüz gelişmiş ülkelerle rekabet edebilecek teknolojik gelişmişlik düzeyine ulaşamadığını gözlemlemekteyiz.

Türkiye'nin Merkez ve Doğu Avrupa ülkeleri ile rekabetinde ise 2004 sonrası dönemde, bu ülkelerin AB üyesi olmasından sonra artan fiyat ve kalite koşullarıyla rekabet edebilmek için Türkiyeli ihracatçılar fiyat düşürmeyi tercih etmişlerdir. Ancak analizlerimizden çıkan sonuçlar bu fiyat düşürme politikasının Türkiye'ye bu ülkelerle rekabetinde bir avantaj sağlamadığını ortaya koymaktadır. Dolayısıyla Türkiye'nin bu en yakın rakipleriyle rekabetinde kalite artırmayı sağlaması gerekmektedir.

Teknolojik kategorilere göre Türkiye'nin AB-15 piyasasında rekabet gücünün iyileştirilmesinde uzun dönemli öncelikleri ise şöyle özetlenebilir: Genel olarak, Türkiye'nin ulusal düzeyde bir çaba göstererek endüstriyel ve teknolojik programlarını yeniden düzenlemesinde yarar vardır. Böyle bir çaba, esasen üretim alt yapısının hammadde-yoğun ve emek-yoğun mallar üreten düşük katma değerli sektörlerden sermaye-yoğun mallar üreten sektörlere doğru bir dönüşümü

hedeflemelidir. Bu dönüşüme aynı zamanda hem kolay taklit edilebilir hem de zor taklit edilebilir araştırma-yoğun kategorisindeki sektörlerin üretim ve ihracat açısından desteklenip teşvik edilmesi eşlik etmelidir. Türkiye'nin geleneksel ihracat sektörlerinin ağırlığını azaltıp, sermaye- ve araştırma-yoğun sektörlere daha çok önem vermesi gerekmektedir. Ancak bu süreçte emek- ve hammade-yoğun mallar üreten sektörlerden büsbütün vazgeçilmesini önerdiğimiz sonucu çıkartılmamalıdır. Bu sektörlerde de Türkiye'nin ihracat gelirlerine anlamlı katkı yapmayı sürdürebilecek ürün grupları hâlen mevcuttur. Örneğin, emek-yoğun kategorisinin Türkiye ihracatındaki payı hâlâ en yüksek olmasına rağmen, bu payın giderek azaldığı ve bu kategorideki sektörlerin çoğunun gelecekte ülkenin rekabet edebilirliğine katkıda bulunacak yeni fırsatlar yaratamayacağı gözlenmektedir; ama Türkiye'nin bu kategoride "yükselen yıldızlar" olarak belirlenen sektörlerde ihracatına devam edip, diğer sektörler için kullanılan kaynakları daha yüksek katma değerli kategorilere aktarması Türkiye'nin AB-15 piyasasında rekabet gücünü artırmasına katkı yapacaktır. Hammadde-yoğun kategoride ise statik olarak açıklanmış karşılaştırmalı üstünlüğe sahip ve dinamik olarak da "yükselen yıldızlar" konumunda yer alarak gelecek vadeden sektörlere örnek olarak "Ekmekçilik ve pastacılık ürünleri, makarna" ve "Buğday ve mahlut"u verebiliriz. Emek-yoğun kategoride gelecek vadeden sektörlerden bazıları ise "Örme mensucat", "Giyim eşyası iç aksesuar ve giyim eşyası parçaları (çorap, mendil, eldiven vb.)", "Demir çelik veya aluminyumdan depo, sarnıç, vb. kaplar", "Diğer adi metallerden eşya (kilit, zincir, yay, fermuar, dikiş, nakış aletleri vb.)" gibi sektörlerdir.

Sermaye-yoğun kategorisindeki sektörler ise en başarılı piyasa konumlanmasını gerçekleştirmiş sektörler olarak karşımıza çıkmaktadırlar. Şöyle ki, bu kategorideki sektörlerin hemen hemen tümü "yükselen yıldızlar" konumunda yer almaktadırlar. Bu kategorinin Türkiye'nin toplam ihracatı içindeki yükselen payını da göz önüne aldığımızda, Türkiye'nin rekabet edebilirliğinde gelecekte bu kategorideki sektörlerin kilit rol oynayacağını öngörmekteyiz. Bu kategorideki sektörlerde ise Türkiye çoğu ülke ile kalite açısından da benzer mallar ihraç ettiği için, ihracatının belirlediğimiz sektörlerde hız kesmeden devam etmesi uygun görünmektedir. Bu kategoride gelecek vadeden sektörlerden bazılarına örnek olarak, "10 ve daha fazla kişi taşımaya mahsus motorlu taşıtlar, çekiciler", "Eşya taşımaya

mahsus motorlu taşıtlar", "Kauçuk ve kauçuktan eşya", "Demir veya çelikten teller", "Alüminyum ve alüminyumdan çubuk, profil, tel, saç, şerit, boru vb." sektörlerini verebiliriz. "Eşya taşımaya mahsus motorlu taşıtlar" sektörünün altını özellikle çizmek isteriz. Bu sektörün Türkiye'nin toplam ihracatında sermaye-yoğun sektörlerin giderek artan payına önemli katkısı bulunmaktadır. "Demir veya çelikten teller" sektöründe ise 2004 sonrası dönemde AKÜ endeksi oldukça yükselmiş ve sektör bu dönemde "açıklanmış karşılaştırmalı üstünlük" kazanmıştır. Dahası, Türkiye'nin en güçlü rakiplerinin, yani Çek Cumhuriyeti ve Ukrayna'nın AKÜ endeksleri 2004 sonrası dönemde oldukça düşmüştür. Bu da 2004 sonrasında Türkiye'nin rakiplerine karşı bu sektörde önemli bir avantaj sağladığı ve 2010 sonrası dönemde de bu avantajı kullanmaya devam etmesinin rekabet gücüne katkısı olacağı anlamını taşımaktadır.

Kolay taklit edilebilir araştırma-yoğun kategorideki sektörlerde, ki bunlar yüksek katma değerli sektörler olmalarından dolayı rekabet gücü kazanmakta önemli rol oynamaktadırlar, izlenmesi gereken en belirgin strateji, Merkez ve Doğu Avrupa ülkelerinin güçlü ve artan rekabetçi baskılarına karşı bu kategorideki ürünlerin kalitelerinin artırılmasıdır. Kayda değer bir diğer strateji ise bu kategoride yeni ürün ihracatını teşvik etmektir. Bu yollarla Türkiye'nin AB-15 piyasasında günümüze kadar uğradığı kayıplar ve kaçırdığı fırsatlar telafi edilebilir. Bu kategoride gelecek vadeden sektörlere örnek olarak "Televizyon alıcıları (kombine olsun olmasın)", "Plastikten monofil, çubuk, profiller-enine kesiti 1 mm'yi geçen", "Plastikten tüpler, borular, hortumlar; conta, dirsek, rakor vb." sektörlerini verebiliriz. Aslında bu son 2 sektörde Türkiye'nin AKÜ endeksi 1'e çok yakın olmakla birlikte 1'den küçüktür. Ancak dinamik olarak bu sektörler tüm dönem boyunca "yükselen yıldızlar" konumunda yer almaktadır. Dolayısıyla kolay taklit edilebilir araştırma-yoğun kategorisinde bu sektörlere odaklanıp bu sektörlerin ihracatını artırarak kolayca karşılaştırmalı üstünlük kazanmak Türkiye için akılcı ve gerçekçi bir hedef olarak görülmektedir. Bu kategoride dikkat edilmesi gereken diğer bir husus ise, AB-15 piyasasındaki gelişmelerin iyi takip edilmesi gerekliliğidir. Örneğin "Plastiklerden levhalar ve plakalar" sektörünün ihracatımızdaki payı yıldan yıla artmaktadır. Ancak AB-15'in bu sektörde dünyadan talebi ise yıldan yıla azalmaktadır. Diğer bir deyişle, Türkiye daralan bir pazarda genişlemeye çalışmaktadır. Bu durum kısa vadede

Türkiye'ye bu sektörde diğer ülkelerle rekabetinde yarar sağlayabilir, ancak uzun vadede bu sektördeki genişlemeyi sürdürmek pek akılcı bir seçim olarak gözükmemektedir.

Zor taklit edilebilir araştırma-yoğun kategorisindeki sektörlerin ise, Türkiye'nin toplam ihracatı içindeki payı düşük olmasına rağmen dinamik piyasa konumlanmasına göre bu sektörler Türkiye için umut vadeden bir konumdadır. Bu kategoride gelecek vadeden sektörlere örnek olarak "Motorlar ve aksamı", " Buhar kazanları, kızgın su kazanları ve aksamı" ve "Dişli sistemleri ve aksamı"nı verebiliriz. Aslında "Motorlar ve aksamı" dışındaki sektörlerde AKÜ endeksi 1'e çok yakın olmakla birlikte henüz 1'den küçüktür. Yani Türkiye statik olarak açıklanmış karşılaştırmalı üstünlüğe sahip değildir. Ancak dinamik olarak bu sektörler Türkiye'nin bu kategorideki "yükselen yıldızlar"ıdır. Dolayısıyla bunlar, bu kategoride öncelik verilmesi gereken ve gelecekte Türkiye'nin rekabet gücüne katkı yapabilecek önemli sektörlerdir.

Dolayısıyla kolay ve zor taklit edilebilir araştırma-yoğun sektörlerde, yani yüksek teknolojili sektörlerde bu iyileşme eğilimleri göz önüne alındığında, akılcı bilim ve teknoloji politikaları ile birlikte iyi tasarlanmış dış ticaret politikalarının da yardımıyla Türkiye'nin orta ve uzun vadede uluslararası rekabet gücünü yükseltmesi açısından kayda değer bir potansiyelinin olduğunu saptamaktayız.

Sonuç olarak, bu çalışmada Türkiye, AB-15 piyasasındaki rakip ülkelerle ihracat benzerliği, ihracatta çeşitlenme, yoğun-yaygın marjlar, açıklanmış karşılaştırmalı üstünlükler, dinamik piyasa konumlanması, rekabetçi tehdit gibi ihracatta rekabet gücünün temel boyutları itibarıyla ayrıntılı olarak karşılaştırılmıştır. Bu özette belirtilenlerin ışığında, çalışmanın bulguları ve sonuçları genel olarak göstermiştir ki, ihracat mallarının fiyatı ve kalitesi, zaman içinde yeni mallar ihraç edebilme kapasitesi ve dinamik piyasa konumlanması bakımlarından Türkiye'nin rakip ülkelere karşı belirli sektörlerde dikkat çeken ve ümit veren ihracat kalemleri bulunmaktadır. Bunların yanı sıra, önemini giderek yitiren ve ümit vadetmeyen sektörler de belirlenmiştir. Bu bakımdan, bu çalışmada Türkiye'nin hangi ihracat sektörlerinde hangi mal gruplarına daha fazla önem ve destek vermesi gerektiği konusunda yol gösterebilecek ayrıntılı bir analiz çerçevesi ortaya konmuştur. Böylece ilgili bilimsel yazında yaygın olarak yer alan temel endekslerin yanı sıra,

kendi geliştirdiğimiz özgün endekslerin de yardımıyla Türkiye'nin rekabet gücünü akılcı ve bilimsel bir bakış açısıyla artırmaya yarayabilecek dış ticaret politikalarına işaret etmiş olduk. Dolayısıyla, bu tezin, Türkiye'nin ihracattaki rekabet gücünün özelde AB-15 piyasasında ve genelde tüm dünya piyasalarında artırılmasına yardımcı olabilecek yararlı bir kaynak olarak kullanılmasını ümit ediyor ve böylece Türkiye'nin büyüme ve kalkınma olanaklarını kalıcı biçimde pekiştirebilmesini ve genişletebilmesini diliyoruz.

APPENDIX C

CURRICULUM VITAE

PERSONAL INFORMATION

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EDUCATION

M.Sc. in Economics: September 2002 – Department of Economics, METU, Ankara, Turkey

B.Sc. in Economics: June 2000 – Department of Economics, Hacettepe U., Ankara, Turkey

EMPLOYMENT RECORD

August 2002 – Present: Teaching & Research Assistant, Department of Economics, METU, Ankara, Turkey.

CONFERENCE PRESENTATIONS

Erlat, G. and Ekmen, S. (2009, 2010), "Export Similarity and Competitiveness: The Case of Turkey in the EU Market", Anadolu International Conference in Economics, June 17-19, Eskisehir, Turkey & 30th Annual Meeting of the Middle East Economic Association, January 2-6, Atlanta, U.S.

Erlat, G. and Ekmen, S. (2011), "Intensive and Extensive Margins: The Case of Turkey and its Competitors in the EU market", 31st Annual Meeting of The Middle East Economic Association, January 6-9, Denver,U.S.A.

Erlat, G. and Ekmen, S. (2011), "What Can We Say About Turkey and its Competitors in the EU Market? An Analysis by Extensive and Intensive Margins ", 10th International Conference of the Middle East Economic Association in collaboration with CREMed ", June 23-24, Barcelona, Spain.

Erlat, G. and Ekmen, S. (2011), "An Analysis of Turkey's Competitiveness in the EU Market Based on Intensive and Extensive Margins", Anadolu International Conference in Economics, June 15-17, Eskisehir, Turkey.

Erlat, G. and Ekmen, S. (2011), "Intensive and Extensive Margins: The Case of Turkey and its Competitors in the EU market", EBES 2011 Zagreb Conference, October 13-15, Zagreb, Croatia.

Ekmen-Ozcelik, S. and Erlat, G. (2012)," Turkey's Comparative Advantages and Dynamic Market Positioning in the EU market", 11th International Conference of the Middle East Economic Association Hosted by the Arab Academy for Sciences and Technology , June 25-27, Alexandria, Egypt.

APPENDIX D

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü [ ]

Sosyal Bilimler Enstitüsü [x]

Uygulamalı Matematik Enstitüsü [ ]

Enformatik Enstitüsü [ ]

Deniz Bilimleri Enstitüsü [ ]

YAZARIN

Soyadı : Ekmen-Özçelik
Adı : Seda
Bölümü: İktisat

TEZİN ADI (İngilizce) : Turkey's Export Competitiveness in the EU-15 Market

TEZİN TÜRÜ : Yüksek Lisans [ ] Doktora [x]

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