

Analysis of the Transformation of Turkish Exports: From Trade Liberalization Until Today

Volkan SEZGİN¹

Abstract

Turkey implemented a structural adjustment program in the 1980's aiming to liberalize foreign trade and capital markets. The program was based on an "export-led growth" strategy and it helped Turkey to experience a notable trade transformation particularly in the last two-three decades. To illustrate it, although Turkey was considered to be a major exporter of low value-added textiles, clothing and agricultural products in the past; but she has become a major exporter in high-value added products such as motor vehicles, iron and steel products, electrical and non-electrical machinery at present. In this respect, this paper investigates the developments in Turkish trade, analyze the effects of foreign trade liberalization and assess in details the overall profile of Turkey's international comparative advantage. Within this framework, Turkish export performance is analyzed empirically and trade indices such as Normalized Revealed Comparative Advantage (NRCA; henceforth), Lafay index, Herfindahl - Hirschman and diversification indices are visited. All in all, the study aims to find out how the structure of Turkish trade has changed in the last three decades and how the exports performed in this period.

Key Words: Export Performance, Competitiveness, Trade Diversification, Trade Liberalization, Turkey.

Jel Codes : F10, F11, F14

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Türk İhracatında Yaşanan Dönüşümün Analizi: Ticaretin Serbestisinden Bugüne

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Özet

Türkiye, dış ticaretini ve sermaye piyasalarını serbestleştirmek amacıyla 1980’lerde yapısal bir dönüşüm programı uygulamıştır. Mezkur program “ihracata dayalı büyüme” stratejisini temel almış ve Türkiye’nin özellikle son yirmi-otuz yılda kayda değer bir ticaret dönüşümü yaşamasına yardımcı olmuştur. Örneğin, yakın zaman öncesine kadar Türkiye tekstil, giyim eşyası ve tarımsal ürünler gibi düşük katma değerli ürünler ihracatçısı iken, günümüzde ekseriyetle motorlu araçlar, demir-çelik ürünleri, elektrikli ve elektriksiz makineler ihracatçısı konumuna gelmiştir. Bu kapsamda, bu çalışma Türk ticaretindeki gelişmeleri tahkik etmekte, dış ticaret serbestisinin etkilerini analiz etmekte ve Türkiye’nin uluslararası mukayeseli üstünlük profilini detaylarıyla incelemektedir. Bu çerçevede, Türk ihracatının performansı ampirik olarak incelenmiş ve Normalize Edilmiş Karşılaştırmalı Üstünlük Endeksi, Lafay Endeksi, Herfindahl - Hirschmann ve Çeşitlilik Endeksi gibi göstergelere yer verilmiştir. Sonuç itibariyle, bu çalışma son 30 yılda Türk ticaret yapısının nasıl değiştiğini ve ihracatın nasıl bir performans gösterdiğini ortaya çıkarmayı amaçlamaktadır.

Anahtar Kelimeler : İhracat Performansı, Rekabet Edebilirlik, Ticaret Çeşitlendirmesi, Ticaret Serbestisi, Türkiye.

Jel Kodları : F10, F11, F14

1. Introduction

There are some regular factors which can be viewed as main elements in most of the developing countries before the start of trade liberalization. The most common are: (i) import substitution industrialization (ISI; henceforth) and the related policies which are import controls, high tariffs, credit subsidies for ISI enterprises, and the protection of specific products (ii) the implementation of import levies and exchange rate controls principally to deal with the BoP crisis in the 1970's and (iii) the use of anti-export strategies and implementing policies to protect infant industries.

In this respect, Turkey was one of these developing countries which experienced a similar transformation process. First of all, export-led growth was introduced in early 1980 instead of ISI. The implementation started in late 1983 under the control of military regime. It can be claimed that the effective execution of these policies began in early 1990s after the first democratic elections following the control of military regime. In line with the trade reforms, tariffs were reduced and exports were promoted through cheap credits and tax rebates. Besides, direct import controls were eliminated and competitive exchange rates were maintained via devaluation. The negotiations of bilateral trade agreements started particularly with other Islamic countries as well.

From this point of view, firstly, the journey of Turkish exports in the last 30 years is summarized in five main successive periods in order to give the reader a broad view about historical transformation of Turkish exports. Then, various trade performance indicators are visited in order to expose how Turkish exports performed after the trade liberalization and selected diversification, sophistication indices are applied to the Turkish trade data. Apart from applying the indices, we also employed a time series analysis in order to reveal how the export growth of Turkey are effected by various factors like world income growth, real exchange rate, tariffs and we used annual data for 1975-2015. All of the data except the real exchange rate are taken from the World Bank World Development Indicators (World Bank, 18.06.2017). The real exchange rate data are gathered from databank of Central Bank of Turkey (Central Bank of Turkey, 11.11.2017).

2. Evolution of Trade Policy Reforms in Turkey

2.1.ISI Period: Pre-1980

The Turkish economy accomplished extensively high development and growth rates in the 1970's under the development regime so-called ISI. This developmental strategy was applied more intensively during the planned economy throughout 1960s and 1970s. Actually, the strategy was successful in its first phase and substitution of consumer goods was achieved. But in the second phase (i.e. mid 1970's), substitution of intermediate and capital goods was aimed while the economy experienced several external and internal shocks (Şahinbeyoğlu and Ulaşan, 1998a: 2). Notwithstanding, as seen in numerous different countries that had implemented similar policies, the procedure of fast development turned out to be unsustainable in 1970's. The main reason for this failure was mainly due to the problems concerning the balance of

payments. As opposed to the expectations, expanding trade deficits occurred after ISI was implemented. Political problems and ideological conflicts exacerbated the financial condition. In the end, the trade deficits achieved record levels. Thus, the economy confronted a very substantial crisis at the end of 1970s along with the severe political crisis, which led to a military regime to control the government.

2.2.From Crisis to Liberalization: 1980 – 1988

Turkish government reported a well-defined adjustment and structural change program on January 24, 1980 which was completely actualized under the military administration. The program depended on a "export-led growth" instead of ISI and it was mainly aiming to liberalize foreign trade and capital markets. The program was supported by major international institutions including the World Bank (WB; henceforth) and IMF, and aimed at providing free market mechanism conditions in Turkey. To this end, the promotion for exports and the liberalization of imports were adopted as major objectives (Şahinbeyoğlu and Ulaşan, 1998b: 3). After the initial steps were taken, incentives on exports were introduced pursuing devaluation. In November 1983, the new government after the military administration took important measures promptly. In a couple of years, a steep increase in exports were realized thanks to export promotions and rising foreign demand particularly from Arab countries. Moreover, huge devaluations and the decrease in real wages brought about decreases in the purchasing power but it enhanced the competitiveness of Turkey in trade consequently.

2.3. Back to Period of Crisis: 1989 – 1993

Starting from the beginning of 1990's, many developing countries actualized reforms which can be considered as fundamental for further economic development. Important improvements took place after these reforms were introduced. However, economic diversification which is required for long-lasting prosperousness didn't ensue ex-post changes in various countries.

Restless to diversify, some governments like Turkey declared strategies focused on industries that they thought that could convey quicker and more comprehensive economic development.

Some important strategy changes occurred in 1989 in Turkey such as the foreign capital movement controls were tightened. Throughout the 1989-1993 period, the performance of exports worsened due to the appreciation of Turkish Lira and rises in the domestic demand which was triggered by the upsurge of the real wages. Thus, the export to GDP level decreased back to its levels in the mid 1980s. In the meantime, trade incentives were expelled to a huge degree in 1988 following the budgetary problems of the government. This caused the current account deficit of Turkey to reach its historical levels and a severe financial crisis to burst out. In 1994, Turkey experienced negative growth rates after a successful decade with steep GDP increases. These incidents caused striking ascents in inflation, while the real wages decreased sharply.

2.4.Period of Accessions: 1994 – 2001

After the crisis, a new adjustment program was declared by the authorities in April, 1994. Similar to the decisions on January 24, 1980; the main aim was to increase exports through devaluation and to domineer domestic demand. After the start of the program, the exports rose significantly but the growth in exports was not continuous. Other milestones for Turkish trade in this period were the accession of Turkey to World Trade Organization (WTO; henceforth) in 1995 and the accession of Turkey to the Customs Union (CU; henceforth) with the

European Union (EU; henceforth) in 1996. These were apparently noteworthy steps on the way to a more liberalized trade patterns. Accessions to WTO and CU have rolled out fundamental auxiliary improvements to be made as per Turkey's commitments which brought about critical ramifications for Turkey's international trade. However, the accession to CU did not prompt extensive effects on Turkish exports very quickly. It was actually after 2001 when another severe economic crisis hit Turkey following another huge depreciation of Turkish Lira. Besides, the domestic demand shrank substantially which caused Turkish producers to seek other export markets. The 2001 crisis can be considered as a milestone for Turkish economy since it was one of the worst crisis that Turkey ever had which caused Turkish economy to be restructured again.

2.5.2001 - Onwards

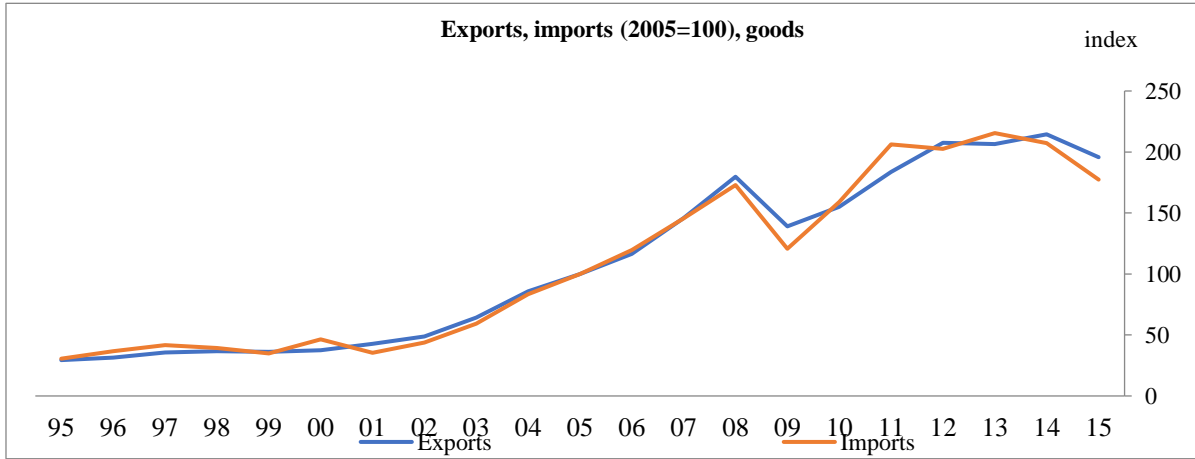
Instability and unconfident economic environment encompassed Turkey after the crisis in 2001. Then the domestic demand decreased heavily and this made Turkish producers to shift their attention to the exports. In the mid-2000s, thanks to the rises in demand for Turkish products in the world and the reduction in labor costs helped Turkey to spurt. Export Strategic Plan, which was introduced in 2004-2006 period, helped Turkey to become an important actor in international trade. By this means, Turkey achieved reasonable growth rates in exports. The exports started to be diversified in these years and new markets like Africa and Middle East became popular destinations for Turkish exporters. Besides, in this period, Turkey started its accession negotiations with the EU in 2004 which helped the Turkish economy to get back its strength. Turkey became a popular destination for international investors because of the trust towards Turkish economy after the beginning of the accession negotiations. It can be considered that these incidents have major impacts on the wellbeing of Turkish trade as well as the political stability in the last 15 years.

3. Analysis of Export Performance of Turkey after the Trade Liberalization

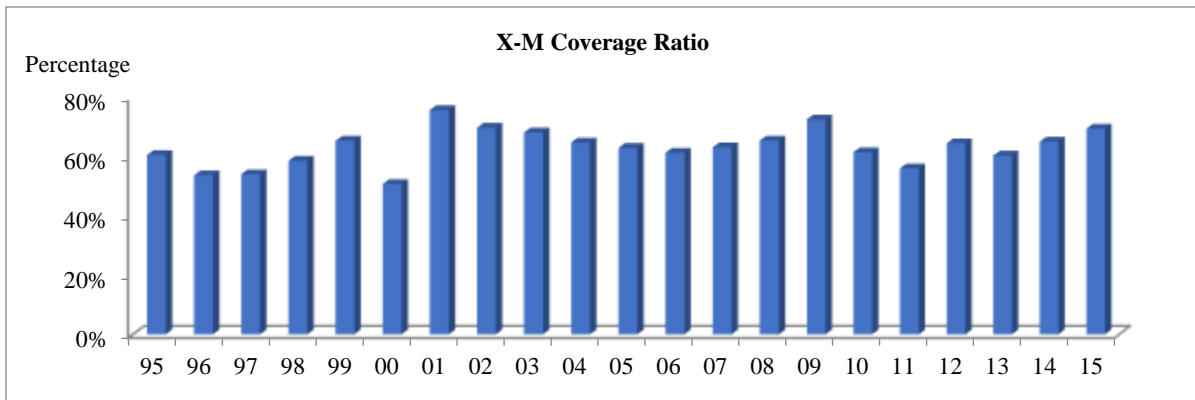
Thanks to the reforms in international trade, Turkey experienced an evolution in exports particularly in the last three decades although it had heavy turbulences in the same period. It has to be noted that there were some important descent and ascents in the export levels of Turkey in the mentioned period.

To illustrate it, there were sharp decreases particularly in the exports after the domestic financial crisis in Turkey in 1994 and 2001. Moreover, the total exports along with the growth rates of the Turkish economy declined severely following the global financial crisis in 2009 as outlined below. Besides, export-import coverage ratio decreased to its minimum level in 2000 when considering the last 20 years, which might be also, associated being another reason for the severe crisis in 2001.

Graph 1. Total Exports and Imports of Turkey (1995-2015)



Graph 2. Export - Import Coverage Ratio for Turkey (1995-2015)



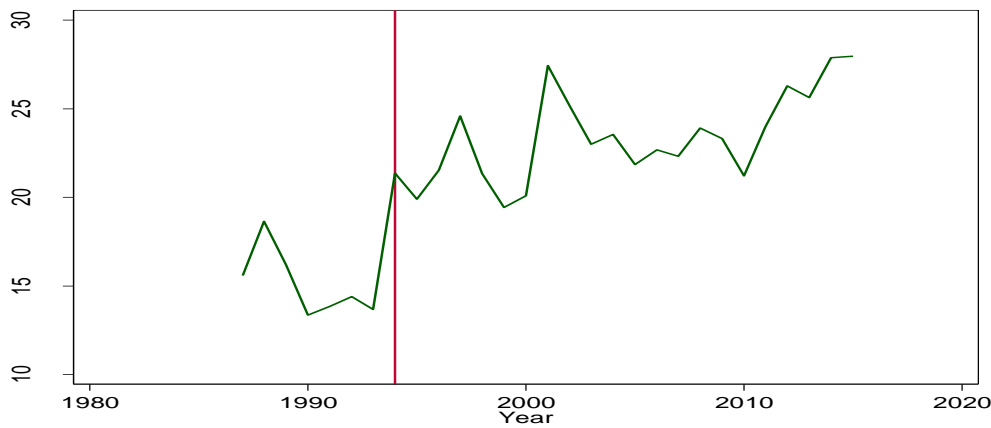
An important period throughout the evolution of Turkish trade dates back to January 1996 when Turkey formed a CU with the EU. Touching upon the historical framework of the Turkish exports, in this part of the study we aim to find out the potential breakpoints of Turkish exports in order to evaluate the trade performance of Turkey aright. One useful test of whether Turkish trade liberalization is associated with an improvement in export performance is a Chow breakpoint test designed to identify a potential breakpoint in Turkish export performance.

Two measures of export performance which are: (a) exports of goods and services as % of GDP and (b) exports of goods and services in constant 2010\$ - were tested for breakpoints. The

breakpoint for exports of goods and services as % of GDP came in 1994, two years before Turkey entered into the CU with EU after Turkey announced adjustment program which was declared by the authorities in April, 1994 following a severe crisis. The breakpoint analysis is based on annual WDI data by WB for Turkey that begin in 1987 and continue until 2015. For exports of goods and services as % of GDP, the supremum Wald statistic for 1994 is 21.1564 ($p < .0001$). The breakpoint is superimposed on Figure 1 below.

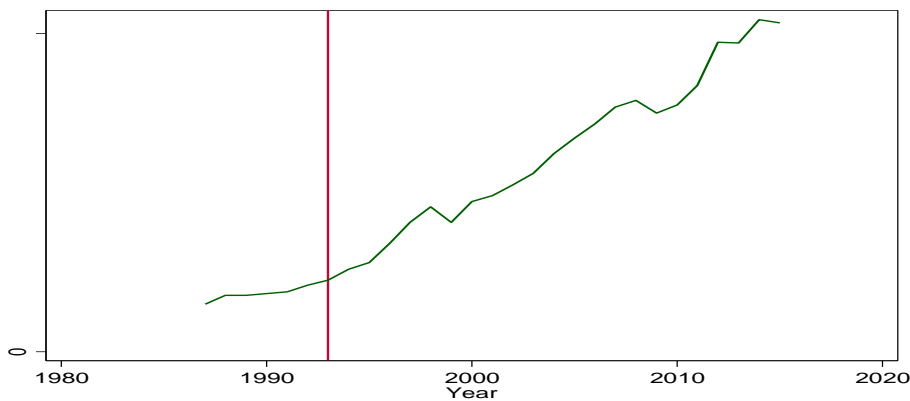
The breakpoint for exports of goods and services in constant 2010\$ came in 1993, three years before Turkey entered into the CU with EU. Similarly, the analysis based on annual WDI data by WB for Turkey that begin in 1987 and continue until 2015. For exports of goods and services in constant 2010\$, the supremum Wald statistic for 1993 is 28.1228 ($p < .0001$). The breakpoint has been superimposed on Figure 2 below. Cumulatively, these analyses suggest that Turkish export performance was on the rise after the serious hit by the crisis in 1993-1994 just before the accession to the CU, because the breakpoints appeared some years before 1996.

Figure 1. Breakpoint, Turkish exports of goods and services as % of GDP, 1987-2015. Note that breakpoint is at 1994.



Source: Author's own calculations

Figure 2. Breakpoint, Turkish exports of goods and services in constant 2010\$, 1987-2015. Note that the breakpoint is at 1993.



Source: Author's own calculations

When viewed from the general aspect, the total merchandise exports were only 21 billion USD in 1995; it increased to 73 billion USD in 2005 and reached to 144 billion USD in 2015. It is important to underline that export diversification has had a considerable impact on the export growth in Turkey recently. This can be related with the success of Turkish exporters to diversify the export products and export markets. Besides, the rise in the export sophistication, competitiveness and the quality of the export products also played crucial roles in the success of Turkish exports. For instance, as the shares of the exports are assayed, it becomes apparent that the shares of exports to EU, which is still the best trade partner of Turkey, declined recently while the shares of MENA and Africa have been on the rise.

Further analysis of the structure of the Turkish exports reveals that the primary boost behind the rise in exports in the last 30 years was the increase of the shares of the industrial goods exports which substituted the shares of agricultural products. Across the increasing exports of industrial goods, during the last three decades, the share of mining, agriculture and textile within total exports stagnated, which implies that Turkey moved from being mainly an agricultural goods exporter to an industrial goods exporter (Vural and Zortuk, 2011: 19).

3.2. Literature Review on Measuring Export Performance

Trade liberalization draws a high attention on reshaping of international trade recently. The last three decades demonstrated that the developing countries, which have opened their economies to the networks of world trade, have developed even faster than some of the developed countries.

Trade liberalization actually rises the total welfare of the participant countries via increasing the competition among the producers and rising the products that are available for consumption. Since the number of products available are more in numbers than in the past, the producer countries are required to compete with other countries to get a higher market share in world's trade. Within this framework, the link between the trade liberalization and the performance of the countries in exporting various products are investigated thoroughly in the literature.

The link between the trade liberalization and export performance can be analyzed in two main categories: the applications of the traditional and the new measures. The traditional measures generally focus on the export diversification which can be arranged in three main pillars: The export diversification of the firms by product in a selected country; the export diversification of the sectors in a chosen country concentrating on the reallocation of resources to the most productive sectors and export diversification of the countries by product.

The export diversification of the firms by products were measured by Mayer, Melitz, and Ottaviano (2014), Lelarge and Nefussi (2010) by using country-firm-product level data. They aimed at analyzing the changes of the firm's market shares by product. Measuring export diversification of the sectors for a country was carried out by Imbs and Wacziarg (2003) through using measures of sectoral concentration such as Gini or Herfindahl indexes. The export diversification of the countries by product, which is overlaid on the reallocation of resources to

most performant products, are analyzed by using diversification cones by Cadot, Carrère, and Strauss-Kahn in 2011.

Apart from the traditional measures, some new measures of export performance are being widely used in the literature. For instance, export sophistication which is a better approach for characterizing products in view of the level of income in every exporter country and on the RCA of every exporter country. Hausmann, Hwang, and Rodrik (2007) can be considered as the pioneers of this approach by introducing two new measures for export sophistication which are called PRODY and EXPY. Lall, Weiss, and Zhang (2006) also contributed to the literature by investigating the characteristics of exporter countries and promotion of exports. Another new measure is the product space approach which is based on the network of relatedness between each pair of products. Revealed proximity and density indexes are employed in this approach by Hidalgo, Klinger, Barabasi, and Hausmann (2007). Besides, Hausman and Hidalgo (2009) introduced economic complexity method as a new measure aiming to reveal the structure of networks linking the country to its products.

3.3. Application Of Selected Indices To Measure Turkish Export Performance

In this part of the study, some of abovementioned measures are applied for Turkish exports in order to realize the performance on Turkish exports after the trade liberalization. First, selected specialization measures are visited to be able to expose the sectors in which Turkey became more specialized after the trade liberalization. Henceforth, selected diversification and sophistication measures are performed to find out whether Turkey is performing well in diversifying its exports.

In order to reveal the changes in the structures of the exports, Revealing Comparative Advantage by Balassa (1965), Normalized Revealing Comparative Index (NRCA; henceforth) by Laursen (2000) and Lafay index are visited. These indices are used to identify industries which have comparative advantages in international competition when compared with the other sectors. The formulation of RCA and NRCA indices are as follows:

$$RCA_{ij} = \frac{X_{ij} / X_j}{X_{iw} / X_w} \quad NRCA_i = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

Table 1. Normalized Revealing Comparative Advantages (NRCA) For Turkey (1995-2015)

3 digit ISIC Classification	Top 5 NRCA s in 1995	3 digit ISIC Classification	Top 5 NRCA s in 2000	3 digit ISIC Classification	Top 5 NRCA s in 2005	3 digit ISIC Classification	Top 5 NRCA s in 2010	3 digit ISIC Classification	Top 5 NRCA s in 2015
[844] Women's clothing, of textile	0,904	[121] Tobacco, unmanufactured	0,876	[046] Meal and flour of wheat	0,919	[046] Meal and flour of wheat	0,900	[046] Meal and flour of wheat	0,914
[091] Margarine and shortening	0,902	[658] Made-up articles, of textile materials	0,860	[058] Fruit, preserved, and fruit preparations	0,838	[273] Stone, sand and gravel	0,854	[659] Floor coverings, etc.	0,874
[046] Meal and flour of wheat	0,848	[844] Women's clothing, of textile	0,838	[121] Tobacco, unmanufactured	0,806	[659] Floor coverings, etc.	0,846	[273] Stone, sand and gravel	0,832
[121] Tobacco, unmanufactured	0,830	[058] Fruit, preserved, and fruit preparations	0,823	[658] Made-up articles, of textile materials.	0,794	[661] Lime, cement, fabrica. constr. mat.	0,820	[058] Fruit, preserved, and fruit preparations	0,769
[057] Fruits and nuts fresh or dried	0,824	[676] Iron & steel bars, rods, angles, shapes	0,821	[661] Lime, cement, fabrica. constr. mat.	0,793	[676] Iron & steel bars, rods, angles, shapes	0,813	[676] Iron & steel bars, rods, angles, shapes	0,749

Source: Author's own calculations by using data from UNCTAD.

Unlike RCA and NRCA, Lafay index concentrates both on the exports and imports, thus corrects a possible bias of these indices. Lafay index shows the specialization and it is therefore more suitable for a country with intra-industry trade. If the score is bigger than zero, it shows that the country is specialized in that product while a score smaller than zero exhibits the de-specialization. The formulation of Lafay index is as follows:

$$LFI_j = 100 * \left[\frac{(x_j - m_j)}{(x_j + m_j)} - \frac{\sum_{j=1}^N (x_j - m_j)}{\sum_{j=1}^N (x_j + m_j)} \right] \frac{(x_j + m_j)}{\sum_{j=1}^N (x_j + m_j)}$$

Table 2. Lafay Scores for Turkey (1995-2015)

3 digit ISIC Classification	Top 5 Lafay Scores in 1995	3 digit ISIC Classification	Top 5 Lafay Scores in 2000	3 digit ISIC Classification	Top 5 Lafay Scores in 2005	3 digit ISIC Classification	Top 5 Lafay Scores in 2010	3 digit ISIC Classification	Top 5 Lafay Scores in 2015
[845] Articles of apparel, of textile fabrics	4,236	[845] Articles of apparel, of textile fabrics	3,796	[845] Articles of apparel, of textile fabrics	2,186	[676] Iron & steel bars, rods, angles, shapes	1,909	[971] Gold, non-monetary (excluding gold ores)	1,682
[057] Fruits and nuts, fresh or dried	2,574	[842] Women's clothing, of textile fabrics	2,357	[761] Television receivers, whether or not combined	1,425	[845] Articles of apparel, of textile fabrics	1,627	[845] Articles of apparel, of textile fabrics	1,539
[844] Women's clothing, of textile	2,520	[658] Made-up articles, of textile materials	1,597	[842] Women's clothing, of textile fabrics	1,379	[057] Fruits and nuts, fresh or dried	1,345	[057] Fruits and nuts, fresh or dried	1,333
[842] Women's clothing, of textile fabrics	2,494	[057] Fruits and nuts, fresh or dried	1,575	[676] Iron & steel bars, rods, angles, shapes	1,335	[782] Motor vehic. for transport of goods	1,187	[676] Iron & steel bars, rods, angles, shapes	1,247
[676] Iron & steel bars, rods, angles, shapes	2,176	[676] Iron & steel bars, rods, angles, shapes	1,531	[057] Fruits and nuts, fresh or dried	1,217	[775] Household equipment, electrical or not	0,991	[782] Motor vehic. for transport of goods	1,149

Source: Author's own calculations bu using data from UNCTAD.

The tables illustrate the top five products with highest NRCA and Lafay scores. Results provide two key findings: First, low-value added products such as textiles and clothing were among the most important export products for Turkish trade but they started to lose their significance year by year and they have been replaced by some higher-value added products such as motor

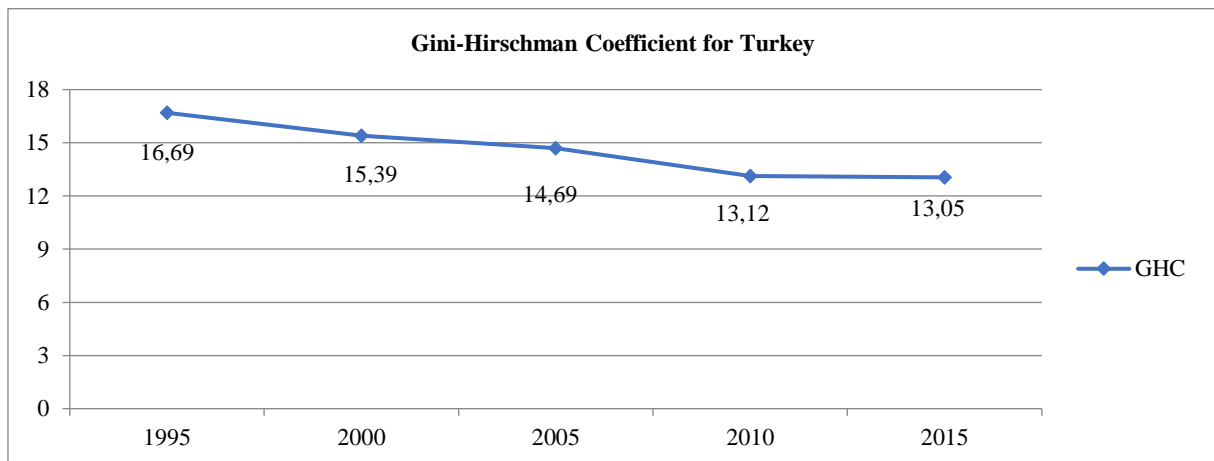
vehicles, iron and steel products, electrical and non-electrical machinery. Second, Turkey started to specialize more in the high-value added products instead of agricultural products.

In this respect, the diversification indices which constitute another important measure to assay the evolution of Turkish exports after the trade liberalization are also applied for Turkish exports. In order to do that, Gini-Hirschman coefficient, Herfindahl- Hirschman coefficient and diversification index by UNCTAD are employed for Turkish trade between 1995 and 2015.

Gini-Hirschman coefficient (GHC; henceforth) shows the degree of concentration. The highest value that the coefficient can take is 100 which implies that the country exports only one good. As the coefficient gets smaller, it demonstrates that the exports are evenly distributed over all possible commodities. The formulation of the coefficient can be depicted as in the following format:

$$GHC_j = \sqrt{\sum_{i=1}^n [(100 * (X_{ij} / X_j))^2]}$$

Graph 3: Gini-Hirschman Coefficient For Turkey (1995-2015)



Source: Author’s own calculations by using data from UNCTAD.

The table demonstrates that the GHC for Turkey has decreased consistently showing that Turkey’s exports are becoming to be concentrated on various goods.

Concentration index (i.e Herfindahl-Hirschmann Index-Product HHI) is a measure of the degree of product concentration and shows the dispersion of exporter’s products. It takes values between 0 and 1. Values closer to 1 indicate that a country’s exports are highly concentrated on a few products while the index is close 0 if country’s exports are more homogeneously distributed among a bunch of products. Besides, diversification index, which takes values between 0 and 1, reveals the extent of differences between a country’s trade and world average. A value closer to 0 demonstrates a greater convergence to the world pattern.

The formulas for the concentration and diversification indices are depicted below:

$$HHI_i = \left(\sqrt{\sum_{j=1}^n \left(\frac{x_{ij}}{\sum_{j=1}^n x_{ij}} \right)^2} - \sqrt{\frac{1}{n}} \right) / \left(1 - \sqrt{\frac{1}{n}} \right) \quad S_j = \frac{\sum_i |h_{ij} - h_i|}{2}$$

Table 3. HHI and diversification indices for Turkey (1995-2015)

1995		2000		2005		2010		2015	
Concentration Index	Diversification Index	Concentration Index	Diversification Index	Concentration Index	Diversification Index	Concentration Index	Diversification Index	Concentration Index	Diversification Index
0,111	0,632	0,098	0,582	0,09	0,528	0,074	0,462	0,073	0,437

Source: UNCTAD.

The findings reveal that Turkish exports are becoming more homogeneously distributed among various products and there is a great convergence to the world pattern between 1995 and 2015.

4. Empirical Investigation

After employing various trade indices, the aim of this part of the study is to realize whether there is a recovery in the exports in Turkey as the indices indicated above. Export performance of Turkey has been investigated particularly in the last two decades in the literature. There are important numbers of research which have examined the cause and effects of the Turkish export sectors, but there are not many researches done about the link between the trade liberalization and export performance. In this respect, this study is one of the first ones dealing with this specific topic.

Arslan and Wijnberger (1993) investigated the main reasons for the export booms in Turkey between 1980 and 1987. Moreover, Uygur (1997) evaluated the short and long terms effects of export policies pursued in Turkey starting from late 1970's to mid 1990's. Şahinbeyoğlu and Ulaşan (1999) applied an Error Correction Mechanism in order to find out the supply and demand side determinants of Turkish export from 1987 until 1998. Moreover, Aysan and Hacıhasanoğlu (2007) used a dynamic panel data method at the sectoral level to examine the causes of manufacturing export increase in Turkey for a 10 years period starting from 1996 till 2006. In 2014, Balcılar et al. (2014) investigated the relationship between the changes of real exchange rate and the export performance in Turkey throughout the period 1995-2012.

Different factors and determinants are considered to have crucial impacts on determining the export performance of a country. In this respect, there is still no consensus regarding which factors to select in order to reveal the link between the trade liberalization and the export

performance. In order to reveal this relationship, a detailed multivariate time series analysis approach has been adopted in the following part of the paper in order to evaluate the export performance of Turkey in a better way. A similar strategy to Santos-Paulino (2002) is developed to explore the impacts of liberalization on export performance of Turkey. In order to reveal the details of the link, independent variables such as real effective exchange rate, world real income, tariffs and trade liberalization are put into the regressions.

The empirical investigation measures the effect of trade liberalization in Turkey on its export performance. Conventionally, it is assumed that the country's export demand depends on the global competitiveness, which is estimated by home vs abroad average prices measured in common currencies such as USD and the world demand. The specification model will take the form of the traditional export demand equation, correlating the export level and the world real income. If the prices and demand income elasticities are taken constant, the equation will have the following form:

$$EXP_i = A \left(\frac{E P_{ex}}{P_{im}^*} \right)_i^\delta W_i^\gamma \quad (1)$$

where EXP_i represents Turkey's export level; A is taken as constant; E is a given exchange rate of foreign to domestic currency. The ratio $\frac{P_{ex}}{P_{im}^*}$ expresses the relation of export-import prices during the trade process, which can be identified in the form of the real exchange rate (RexR) taken as the following ratio $\left(\frac{P_{ex}}{P_{im}^*} \right)^\delta$. Further, the world real income in this export demand equation is given as W_i^γ , where γ is a demand income elasticity indicator being positive in the equation. In case of domestic currency devaluation or dropdown of export-import prices ratio, a significant reduction of RexR (real exchange rate) may occur leading to export growth making the price elasticity δ negative. Considering the given information, the first equation can be transformed in the form of natural logarithm considering the time aspect:

$$x_i = \alpha + \delta(e + p_{ex} - p_{im}^*)_t + \gamma (W_t) \quad (2)$$

This equation can further be changed with regard to the static panel condition:

$$epg_{it} = \alpha_i + \beta_1 rex_{it} + \beta_2 wgdpg_{it} + \varepsilon_{it} \quad (3)$$

The third equation has not only the time indicator but the country specific effect for Turkey, such as α_i , while the epg_{it} is the indicator of the real export growth. RexR variable estimates the change delta of the real exchange rate whereas $wgdpg_{it}$ is the variation of the world real income. The error term is denoted by the variable ε . The variables β_1 and β_2 reflect the demand price and elasticity indicators. This equation can be transformed further to include certain liberalization effects applied to export policies.

$$epg_{it} = \alpha_i + \beta_1 rexr_{it} + \beta_2 wgdpg_{it} + \beta_3 Liber_{it} + \beta_4 tar_{it} + \varepsilon_{it} \quad (4)$$

This equation introduces the important dummy variable $Liber_{it}$, which denotes the trade liberalization reforms. This variable takes the value of 1 when the reforms in trade sphere are adopted by the government and the value of zero for the period prior to the reforms. It should be noted that the liberalization of trade is an effective measure able to decrease the variable biasedness related to export. The variable $Liber_{it}$ is expected to have a positive correlation with the real export growth. Another additional indicator added to the equation (tar_{it}) is assumed to estimate the tariffs change rate. The effects of liberalization on the indicators of price and income elasticity are expected to contain the structural changes such as transformation of resources base, redistribution of sources between the industrial sectors, which implies high income elasticity of demand for exports.

Additionally, the liberalization reforms are able to boost the volatility of exports to price and income adjustments. These measures can significantly stimulate the trade efficiency and economic structural transformation helping the manufacturing organizations to redistribute the resources in a more effective way. Therefore, the two interaction dummy variables are included into the new equation to analyze the effect of liberalization on the export growth responsiveness. In order to understand whether the trade liberalization increased or decreased the export performance in Turkey regarding the world income and price change, the following equation will be suggested:

$$epg_{it} = \alpha_i + \beta_1 rexr_{it} + \beta_2 wgdpg_{it} + \beta_3 Liber_{it} + \beta_4 tar_{it} + \beta_5 rexrlib_{it} + \beta_6 wlib_{it} + \varepsilon_{it} \quad (5)$$

This equation reveals the two liberalization dummies: $rexrlib_{it}$ representing the linkage between the change delta of the real exchange rate and trade liberalization variable while $wlib_{it}$ is the interaction of the world income and trade liberalization variable.

4.2. The Results of Data Analysis

For the analysis of the presented equations, the two regression models will be applied: the Ordinary Least Squares (OLS; henceforth) model and the VAR model as the optimal instruments for the investigation of time-series data carried out for multiple variables. Thus, OLS reveals the following results during the estimation of the 4th and 5th equations (Table 4).

Table 4. Trade Liberalization and Export Growth

Independent Variables	Dependent Variable:	Export Growth
	OLS (I)	OLS (II)
<i>Rexr</i>	0.03 (0.01)*	0.02 (0.02)***
<i>Wgdp_g</i>	-0.19 (0,16)**	-0.021 (0.18)
<i>Liber</i>	11.43 (2.21)**	10.34 (4.95)
<i>Tar</i>	0.71 (0.38)	0.72 (0.4)
<i>Rexr_{lib}</i>		0.006 (0.037)**
<i>Wlib</i>		0.16 (0.68)
Diagnostic statistics		
Prob>F	[0.0000]	[0.0000]
R^2	0.71	0.71
No. of Observations	41	41
*, ** and *** denotes that the coefficient is reliable at 1%, 5% and 10% level of significance.		

Source: Author's own calculations.

From the presented table, it becomes obvious that the trade liberalization in Turkey has significantly increased the export growth by 11.43 while a 10% increase in tariffs stimulates the Turkey's export growth by 0.71. The income elasticity of demand for export (*wgdp_g*) composes -0.19, which can be explained by the fact that a change in the world real income may result in a subsequent change in the export demand for Turkey. As the world's income increases, the share of total consumer demand on products that Turkey export seems to decline.² The price elasticity of demand (*rexr*) equals to 0.03, meaning that Turkish export is not convincingly responsive to the relative price change. It identifies the situation, in which Turkey still might be considered as an exporter of low-value added goods and services than high-value added goods. Actually, this contradicts with the findings of the trade indices employed above.

² For inferior goods, a negative income elasticity is also typical.

The second OLS regression carried out for the equation 5, which includes the dummy interaction variables: $rexlib$ and $wlib$ reveal similar results and variables' signs. The price elasticity of demand for export ($rexr$) has the level of 0.02, which can't be treated as significant. There are no reliable findings proving that there is a sufficient effect of Turkish liberalization in trade on the income elasticity of demand for export. Its coefficient equals to -0.021 representing a slightly negative result, which might take place for the reasons described earlier.

5. Conclusion

In order to analyze the link between trade liberalization and the export performance of Turkey, we searched for the factors which are expected to have an impact on the efficient export performance. In this paper, we endeavored to make such an examination for the evolution of Turkish exports after the trade liberalization which took place in late 1983. Firstly, we employed selected diversification, sophistication and specialization indices to analyze the overall performance of Turkish exports. Apart from the indices, we employed a time series analysis in order to reveal how the exports are effected by various factors like world income growth, real exchange rate, tariffs etc. and we used annual data for 1975-2015.

First of all, the consequences of the investigations using trade indices uncover that Turkish exports are becoming more homogeneously distributed among various products and there is a great convergence to the world pattern between 1995 and 2015. Furthermore, it seems that low-value added products such as textiles and clothing were among the most important export products for Turkish trade in the past but they started to lose their significance year by year and they have been replaced by some higher-value added products such as motor vehicles, iron and steel products, electrical and non-electrical machinery.

Apart from the indications via various indices, the primary findings of the empirical analysis are as follows:

- World income growth is expected to have a positive impact on the export growth. However, we found that it is not the case for Turkey. As the world's income increases, the share of total consumer demand on products that Turkey export seems to decline.
- The import tariffs appear to affect the export growth positively in Turkey.
- Turkish export performance is positively affected by the trade liberalization.
- There is a positive relationship between real exchange rate depreciation and export growth although size of the elasticity is insignificant and small. Besides, Turkish export is not convincingly responsive to the relative price changes.

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