Structural Change in Turkey's Foreign Trade: 1990-2014 Period

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Abstract

The macroeconomic policy change which Turkey imposed after 1980 has caused significant structural changes in foreign trade. After this fundamental change in the policy, "Import-Substitute Economic Policy" came to an end and Turkey switched to the new policy called "Export-Oriented Industrialization". This Strategy foresaw a structural transformation in many areas of the Turkish economy, especially in foreign trade. The period from 1980 to 1990 has been a period of adapting to these policy changes. During this period, macroeconomic policies of Turkey have been tried to be harmonized with global economic policies. After this period, foreign trade oriented policies have been developed. The aim of this study is to determine whether a structural transformation has taken place in Turkey's foreign trade between the years 1990 and 2014 over a period of 25 years. This is the first study that evaluates the structural transformation of Turkey's foreign trade using the new formula for the Constant Market Share (CMS) analysis method. For the analysis, we used Turkey's foreign trade data with 23 countries which have the largest part among Turkey's trade partners. World Integrated Trade Solution (WITS) data has been used for the analysis and the data compiled by the United Nations (UN) Classification of Broad Economic Groups. According to the results, there are some significant positive developments in Turkey's foreign trade in 1990-2004 area. However, these developments are not unique, purely country-based and independent of trends in the world. To sum up, there is no structural transformation in Turkey's export performance in the context of product, technological composition and geographical market diversity.

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1. Introduction

After 1980, Turkey implemented some macro-economic policy reforms. These changes caused some significant structural changes in Turkish economy. These reforms also changed the structure of Turkish foreign trade.

Together with the legal regulations in foreign trade law, Turkey's foreign trade perspective has also changed. During this period, Turkey replaced its import substitution industrialization policy with the export-oriented growth policy. Liberalization of imports and export incentive policies are among the most important changes brought by Tukey's post 1980 foreign trade policies. These policy changes represent a clear proof of an Open Economy Growth Strategy that adopted in 1980s. These policy changes are supported with some other changes (such as fiscal policy, interest rate and exchange rate policies) too, and the history of Turkish economy separated into two important periods: before 1980 and after 1980.

Economic actors tried to integrate these structural changes during the 1980-1990 period. In this decade, policy makers managed to change Turkish economic policy according to the global economic trends.

In the 1980-1990 period, neoliberal economic policies imposed on all developing countries, and Turkey has got its share from this situation. As a matter of fact, the worsening economic conditions of the countries of the Eastern Bloc (after the collapse) in the early 1990s declared a victory of neoliberal economic policies in the world.

After 1990, Turkey's foreign trade has affected by some other global and local developments. As a result of the economic crisis that began in 5 April 1994, the country has experienced devaluation. The World Trade Organization was established at the beginning of 1995, and Turkey joined this organization as a founding member. In 1996, Turkey and the European Union signed the Customs Union agreement, and this agreement has been one of the most important incident that shaped Turkey's foreign trade (Nart, 2010; Karakaş, 2012). Thr stabilization program that implemented in 1999 by reaching agreement with the International Monetary Fund was one of the most important break points for Turkish economy.

After the IMF's 1999 stabilization program has failed, Turkey faced the biggest economic crisis in her history in 2001. The 2001 economic crisis has opened serious wounds on the Turkish economy. However, the Turkish economy has achieved a sustainable growth after healing the wounds caused by the 2001 crisis by revising its public finance, monetary policy and the banking sector (Ay & Karaçor, 2006). With the sustainable growth rates, Turkey has been achieving high rates of growth in the trade volume until another crisis hit the economy again in 2008; known as The Global Financial Crisis. During the 2008 crisis, the export volume went back but raised up again in the following year. It should be noted that Turkey's export performance has negatively impacted from the slowdown in the world economy after 2008 (Öcal, 2011; Yıldırım, 2010). In addition to all these, Turkey increased the volume of trade with her neighbor countries, especially in the Middle-East and that came with a structural change in Turkey's foreign trade (Akal, 2008).

In parallel with the given developments in Turkish economy, many academic studies discussed the structural transformation in the production process. Most of these studies focused on the structural change in Turkey's foreign trade (Nart, 2010; Karakaş 2012; Doğan & Kaya, 2011; Akal, 2008). However different approaches and different methodologies used in these studies. As far as our knowledge, this study is the very first study that analyzed the structural change in Turkish foreign trade with the new formula of CMS analysis that Memedovic and Iapadre (2010) developed.

This paper is organized as follows: Section 2 gives detailed information about the data and Constant Market Share (CMS) analysis. Section 3 gives the results of CMS analysis of Turkey between 1990-2014 period and Section 4 gives the concluding remarks.

2. Data and Methodology

CMS analysis is used in this study to determine the structural changes in Turkish exports in 1990-2014 period. Turkish exports data is used to determine the structural change in Turkish foreign trade because there is not a significant change occurred in Turkish imports between 1990-2014 period. Additionally, the data of Turkey's exports to 23 countries which holds 75% of Turkish exports. The World Integrated Trade Solution (WITS) data is used with the UN Broad Economic Categorization (BEC) classification in the analysis.

CMS helps to measure the relative contribution competitiveness and structural factors to export performances. Starting with an accounting identity which a decomposition formula applied, CMS includes variations of a country's total exports or changes in total market share over time. Because of the definition, CMS analysis should not be applied for forecasting. However, it is used for ex-post accounting measurement of each factor's contribution to the behavior of an aggregate variable (Memedovic & Iapadre, 2010).

Constant market share model was first applied to export growth by Tyszynski (1951). Tyszynski (1951) calculated what would have been the aggregate market share of a country if its market shares in individual commodity groups had remained constant, to find out to what degree the changes in the market shares of different countries on the world market could be explained by the initial commodity composition of each country's exports (Fagerberg & Sollie, 1987). Later on, the method became popular among economic studies and called "Constant Market Share Analysis". Lerner and Stern (1907) used this model with a slight difference by adding "intermediate effect" into the analysis which shows the market share of a country's exports.

Empirical studies and debates on CMS analysis lead to some developments of the model. Studies of Richardson (1971), Magee (1975) and Fagerberg & Sollie (1987) contributed to the methodology of the CMS analysis. Study of Milena (1988) about the economic theory of index numbers improved by Gurrieri & Milena (1990) afterwards. Gurrieri & Milena developed a new approach to the CMS model (Memedovic & Iapadre, 2010).

Memedovic & Iapadre (2010) presented a new specification of decomposition formula by combining traditional and recent techniques. Following part is summarized from study of Memedovic & Iapadre (2010) which is a reference article for this study's methodology.

2.1.The Choice of the Base Accounting Identity

The baseline calculation identity is the starting point of the CMS analysis. The basic calculation identity as an aggregated variable that express exports or market share, allows to decompose on a product or target market basis. The decomposition formula applied to this basic identity is extremely important in that it shows the change in the aggregated variable over time and it makes it easier to determine the main elements that provides the change in that variable over time (Memedovic & Iapadre, 2010).

2.2.The Decomposition Object

The creation of the decomposition object (that forms the left side of the basic computational identity) depends on the purpose of the research. The CMS analysis is a method to assess the competitiveness of the international trading performance of a country and the effectiveness of the structural elements. In this context, the growth rate of exports is

the main variable that represents trade performance. However, to perfectly determine the position of the country in international trade, it is necessary to formulate a decomposition formula covering the foreign trade balance or export-import ratio. The main question at this point is how to express trade trends?

In the economic literature, without any comparison, the absolute or relative change in the export volume of the country was used as the variable showing commercial performance in some studies. On the other hand, the change in market share of a country's target markets is used as a variable indicating commercial performance in some studies.

Using real or nominal trade variables is another debate topic for the CMS analysis. Although it makes more sense to use real prices to determine the price-based competitiveness, it is less reliable with decomposition and it is not always possible to find the data based on real prices. In addition to that factors, competitiveness is not only a subject of price but also quality, image and sales network. For all the reasons above, we use current prices to come up with more reliable conclusions.

2.3. Disaggregation Criteria

Number of the disaggregation criteria is the second most important aspect of the base accounting identity. Total exports may be classified by product, destination country, firm size and production region (Memedovic & Iapadre, 2010). First , studies that used the CMS analysis just used classification by product but later, on destination markets taken into the analysis.

To simplify, model starts with a single disaggregation criterion applied to a single country's aggregate share in a destination market's imports by following Memedovic & Iapadre, (2010):

$$S^t \equiv \frac{\sum_k m_k^t}{\sum_k M_k^t} \tag{1}$$

In which S^t is the exporting country's aggregate market share at time t, m_k^t is the destination market imports from the exporting country in the kth product (k = 1 ... p) and M_k^t is the destination market imports from the world in the kth product.

The following base accounting identity expresses the aggregate market share as the weighted arithmetic mean of the elementary shares recorded for each product:

$$S^t \equiv \sum_k s_k^t w_k^t \tag{2}$$

In which s_k^t is the exporting country's share in the destination market's imports by k^{th} product and w_k^t is the weight of the kth product over the destination market's total imports from the world.

On the other hand, there are two classification criteria, for instance by product and importing country, if the destination market is a geographic area or the world, the aggregate share of an exporting country in the destination market imports may be expressed as:

$$S^t \equiv \frac{\sum_i \sum_j m_{ij}^t}{\sum_i \sum_j M_{ij}^t} \tag{3}$$

In which m_{ij}^t represents imports of the jth country (j = 1…m) from the exporting country in the ith product and M_{ij}^t stands for imports of the jth country from the world in the ith product. From the identity (3), five more alternative specifications are derived:

$$S^t \equiv \sum_i \sum_j s_{ij}^t w_{ij}^t \tag{4}$$

$$S^t \equiv \sum_i \sum_j s_{ij}^t g_{ij}^t p_{i.}^t \tag{5}$$

$$S^t \equiv \sum_i \sum_j s_{ij}^t g_{.j}^t p_{ij}^t \tag{6}$$

$$S^t \equiv \sum_i \sum_j s_{ij}^t g_{.j}^t p_{i.}^t d_{ij}^t \tag{7}$$

$$S^t \equiv \sum_i \sum_j s_{ij}^t g_{ij}^t p_{ij}^t \frac{1}{d_{ij}^t} \tag{8}$$

In which s_{ij}^t represents the exporting country's share of the jth country's imports from the world in the ith product, w_{ij}^t represents weight of the jth country's imports from the world in the ith product over the destination market's total imports from the world, g_{ij}^t represents weight of the jth country's imports over the destination market's imports from the world in the ith product, $g_{.j}^t$ represents weight of the jth country's imports over the destination market's total imports from the world, p_{ij}^t represents weight of the ith product over the jth country's total imports from the world, $p_{i.}^t$ represents weight of the ith product over the destination market total imports from the world and d_{ij}^t represents Structural Diversification Index (SDI).

Identity (5) and identity (6) are the identities that most commonly used in the CMS analysis. In identity (5), the data on the destination market's imports are first disaggregated according to product type and then, for each one of these, by importing country, while in identity (6) the opposite occurs. This is evident because identity (5) can also be expressed as follows:

$$S^t \equiv \sum_i s_{i.}^t p_{i.}^t \tag{9}$$

In which $s_{i.}^t$ represents the exporting country's share of the destination market's imports from the world in the ith product. Similarly, identity (5) can be expressed as follows:

$$S^t \equiv \sum_i s_{.j}^t g_{.j}^t \tag{10}$$

In which $s_{.j}^t$ represents the exporting country's share of the jth country's total imports from the world.

Identity (5) is obtained by composing two identities that is similar to identity (2) at different disaggregation levels: first, the aggregate market share is expressed as the weighted average of market shares by product (identity (9)) and second, each of these is treated as the weighted average of the elementary market shares by each product in each importing country (identity (10)). This process is also applied to identity (6).

This situation shows that the identities (5) and (6) are characterized by an internal asymmetry in the degree of data disaggregation by product and by country. That causes the results to vary according to decomposition order which is one of the important problems of CMS analysis.

Guerrieri and Milana (1990) figured out the way out of this problem by proposing accounting identities (7) and (8), yet that does not give the way out of getting disaggregation order dependent results (Memedovic & Iapadre, 2010). In order to eliminate this problem, Memedovic and Iapadre (2010) introduced a new decomposition formula to use in CMS analysis. In this context, Memedovic & Iapadre (2010) suggesets to use the disaggregated version of the identity (7).

$$S^t - S^0 = \sum_i \sum_j (s_{ij}^t - s_{ij}^0) w_{ij}^0 +$$
$$[CE]$$
$$\sum_i (p_{i.}^t - p_{i.}^0) s_{i.}^0 +$$
$$[CSE]$$
$$\sum_i \sum_j [\, (d_{ij}^t - d_{ij}^0) s_{ij}^0 p_{i.}^0 g_{.j}^0 +$$
$$(p_{i.}^t - p_{i.}^0)(g_{.j}^t - g_{.j}^0) s_{ij}^0 d_{ij}^0 +$$
$$(p_{i.}^t - p_{i.}^0)(d_{ij}^t - d_{ij}^0) s_{ij}^0 g_{.j}^0 +$$
$$(g_{.j}^t - g_{.j}^0)(d_{ij}^t - d_{ij}^0) s_{ij}^0 p_{i.}^0 +$$
$$(p_{i.}^t - p_{i.}^0)(g_{.j}^t - g_{.j}^0)(d_{ij}^t - d_{ij}^0) s_{ij}^0 \,] + \tag{21}$$
$$[SIE]$$
$$\sum_i \sum_j (s_{ij}^t - s_{ij}^0)(p_{i.}^t - p_{i.}^0) g_{.j}^0 d_{ij}^0 +$$
$$[CAE]$$
$$\sum_i \sum_j (s_{ij}^t - s_{ij}^0)(g_{.j}^t - g_{.j}^0) p_{i.}^0 d_{ij}^0 +$$

$$[\text{GAE}]$$
$$\sum_i \sum_j [\ (s_{ij}^t - s_{ij}^0)(d_{ij}^t - d_{ij}^0) \ p_{i.}^0 g_{.j}^0 \ +$$
$$(s_{ij}^t - s_{ij}^0)(p_{i.}^t - p_{i.}^0)(g_{.j}^t - g_{.j}^0)d_{ij}^0 \ +$$
$$(s_{ij}^t - s_{ij}^0)(p_{i.}^t - p_{i.}^0)(d_{ij}^t - d_{ij}^0)g_{.j}^0 \ +$$
$$(s_{ij}^t - s_{ij}^0)(g_{.j}^t - g_{.j}^0)(d_{ij}^t - d_{ij}^0)p_{i.}^0 \ +$$
$$(s_{ij}^t - s_{ij}^0)(p_{i.}^t - p_{i.}^0)(g_{.j}^t - g_{.j}^0)(d_{ij}^t - d_{ij}^0) \ ]$$
$$[\text{RAE}]$$

The first term in this equation is called Competitiveness Effect (CE). CE is defined as the weighted average of the change in the market shares of the exporting country in terms of all products or countries. This term refers to the changes like quality, image and distribution network that make a country's products more preferred than others (Memedovic & Iapadre, 2010).

CSE (Commodity Structure Effect), GSE (Geographic Structure Effect) and SIE (Structural Interaction Effect) represents the structural effect. CSE measures how the changes in the composition of the products that target markets based on affect the total market share of the exporting country. Likewise, GSE shows how much the total market share of the exporting country is affected by the changes in the distribution of the target market demand determined by the importing country. The "Structural Interaction Effect (SIE)" depends on the relation of commodity and geographic structure of the imports of the target country (Memedovic & Iapadre, 2010).

SIE consists of five different terms. The first of these is the "Structural Diversification Effect (SDE), which depends on how the SDIs of import requirements of target markets change over time. The SDE (Structural Diversification Effect) will give results in favor of the exporting country as long as the import demand for products specializing in the exporting country increase (Memedovic & Iapadre, 2010).

CAE (Commodity Adaptation Effect) shows the interaction between the impact of competitiveness linked to each product of the exporting country and the changes in the product structure of target market's import demand (Memedovic & Iapadre, 2010).

GAE (Geographic Adaptation Effect) shows how much the market share gains of the exporting country are concentrated in the most dynamic countries in terms of import demand.

RAE (Residual Adaptation Effect) covers five separate terms. These terms reflect the correlation between differentiated market shares, changes in the effect of structural diversification, and the combination of geographic and product weights.

3. CMS analysis results

CMS analysis developed by Memedovic and Iapadre (2010) is used to determine the structural changes in Turkish foreign trade. Table 1 shows the CMS analysis results for Turkey for 1990-2014 (25 years) period.

When consider the 1990-2014 period as a whole, Turkey's market share substantially increased by 25.48%. As we have seen in similar studies, the greatest part of this increase stems from the competitiveness effect. During 1990-2014 period, price and exchange rates developments in favor of Turkey contributed to a significant increase of the competitiveness effect as well. Increasing foreign direct investments and production activities from developed countries to developing countries like Turkey is another reason that increases the competitiveness effect.

On the other hand, the sign of the structural effects (CSE, GSE, SIE) as known as the static effects, is negative except for SIE. Therefore, we can conclude as the improvement in Turkish foreign trade occurred in 1990-2014 period is not a result of structural changes.

Despite all the government incentives given to the research and development and product development activities in Turkey, CSE has a negative sign in the analysis. We can conclude that Turkey experienced a market share loss of 5.02% in terms of commodity structure. Turkey's labor incentive production is the reason of this result.

Moreover, the sign of GSE is also negative despite all the efforts Turkey to increase her market diversity (i.e. "Neighboring Countries Strategy"). This result also shows that the Customs Union agreement between European Union and Turkey did not have a significant positive impact on Turkey's Geographical Structure of exports. On the other side, the positive sign of SIE shows that the export-oriented growth model of Turkey is a correct model. Considering the dynamic side of the CMS analysis, we can conclude as Turkey's export structure is flexible and dynamic. The positive CAE term shows the competitiveness of Turkey and flexible structure the Turkey's exports. The negative GAE term shows that Turkey is not successfully adopted to the dynamic market changes. The positive and high RAE values show that Turkey's importance and share in world trade is increasing.

Table 1. CMS Analysis results for Turkey (1990-2014)

Market Shares		Change in CMS	CE	CSE	GSE	SIE	CAE	GAE	RAE
1990	**2014**	**2014-1990**							
0.53	0.78	25.48	28.77	-5.02	-38.05	2.63	2.67	-20.94	55.42

Source: Own elaborations from WITS, WTO & TURKSTAT Databases

Table 2 shows the CMS analysis results for Turkey for sub-periods. According to the results, Turkey experienced a market share loss during 1990-1995 period. However, Turkey has regained her lost market share during 1996-2001 period thanks to some positive local and international developments during that period. Despite the heavy economic crisis occurred in 2001, Turkey experienced the most dramatic increase in her market share during 2001-2008 period. When to consider the 2009-2014 period (post financial crisis period) we can see how the Global Financial Crisis has affected the increasing rate of Turkey's export performance. Yet, Turkey experienced a small but important market share gain during this period. This increment is small but important because of the slowdown in the world trade.

Graph 1 shows the CMS analysis results and Turkey's export performance between 1990-2014 period. Graph shows that CMS of Turkey and her competitive performance are moving together along the time. One can see the important break points of Turkish economy whilst looking the graph. 2001 and 2008 crises are affected both Turkey's total market share and her competitive performance in foreign trade.

Table 2. CMS Analysis results for Turkey (1990-1995)

Market Shares		Change in CMS	CE	CSE	GSE	SIE	CAE	GAE	RAE
1990	**1995**	**1995-1990**							
0.53	0.45	-7.77	8.26	2.09	-34.71	-2.12	1.46	-5.82	23.08
1996	**2001**	**2001-1996**							
0.46	0.53	7.22	11.87	-1.82	-2.83	-0.88	0.12	-0.43	1.19
2002	**2008**	**2008-2002**							
0.61	0.74	13.82	13.78	-7.08	0.62	3.76	-0.11	3.55	-0.70
2009	**2014**	**2014-2009**							
0.75	0.78	3.23	9.29	-1.25	-6.47	0.34	-0.53	-1.52	3.37

Source: Own elaborations from WITS, WTO & TURKSTAT Databases

Graph 1. CMS Analysis of Turkey's Export Performance (1990-2014)
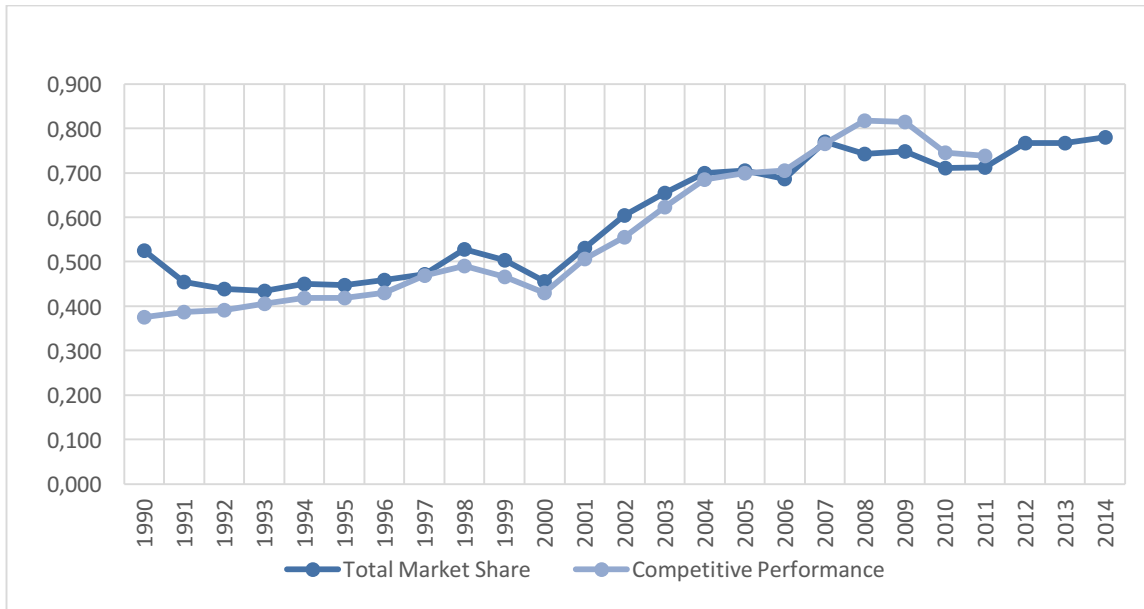
Source: Own   elaborations   from   WITS,   WTO   &   TURKSTAT   Databases

4. Conclusion and policy recommendations

In this study we focused on the structural transformation of Turkey's foreign trade after 1990. We analyzed Turkish foreign trade for the period of 1990-2014 based on its sector share, technology and geography. After evaluating these factors, we used the CMS analysis method to investigate whether there is a structural transformation in Turkey's foreign trade or not.

In 1995, the establishment of the World Trade Organization, and a year after the Customs Union agreement of Turkey and EU has led Turkey to a change her trade legislation. The expansive and somewhat uncontrolled export incentive arrangements had to be reconsidered in a gradual way. These developments led us to conclude as there is a structural transformation in Turkey's foreign trade legislation after 1990.

From the beginning of the 2000's there is an enormous increase in the volume of exports and imports of Turkey, which is similar to other developing countries. However, this increment in imports and exports did not occurred with the same rates. Between 2001-2008, imports increased more than exports which widen the current account deficit gap. As the most important fragility source of Turkish economy, the high current account deficit rates are being reported in all OECD and European Union sourced reports about Turkish economy since then.

In this study, the structural change in Turkish exports is reconsidered by using the new formula of CMS developed by Memedovic & Iapadre (2010). To achieve this objective 1990-2014 WITS data set is used. The data of 23 countries that covers almost 75% of Turkish exports are included in the CMS analysis. According to the results, Turkey's constant market share is increased from 0.53 to 0.78 during 1990-2014 period. Price and exchange rate developments in favor of Turkish economy contributed this situation. But the structural effects present a better explanation of this increment. As one can see from the CMS analysis results, these increment is caused from increasing competitiveness of Turkey, not from the changes in technological, geographical and product structures of Turkish exports.

To achieve a better export performance, Turkish firms should increase research and development activities and start to produce high-value-added, technology intensive products instead of low-value-added labor intensive products. Moreover, Turkish firms should focus on trading in new markets to avoid regional interdependence and achieve a better geographic structure.

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