INVESTIGATING THE ROLE OF EXTENSIVE MARGIN, INTENSIVE MARGIN, PRICE AND QUANTITY COMPONENTS ON TURKEY'S EXPORT GROWTH DURING 1998-2011

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Investigating the Role of Extensive Margin, Intensive Margin, Price and Quantity Components on Turkey's Export Growth during 1998-2011

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Abstract: Recent empirical research in international trade emphasizes the role of the extensive and intensive margin to the export growth. This paper examines the sources of export growth in Turkey. For this purpose, the study decomposes Turkey's export growth into extensive and intensive margins by using two methodologies, the count method and the decomposition method of export growth shares. The intensive margin into price and quantity components is further decomposed in order to evaluate the role of changes in price and changes in quantity. Detailed bilateral trade data, BACI, from CEPII are employed to analyze Turkey's export statistics with 209 countries at the HS-6 level over the period 1998–2011. Additionally, these methods are employed for different categories of goods (final goods and intermediate goods exports). The results suggest that the extensive margin, particularly geographic diversification, plays the most important role in Turkey's total goods export growth. Further, the growth in Turkey's total goods exports is mainly explained by quantity rather than price growth. The results further point out that growth in Turkey's final goods was driven by price growth, whereas growth in intermediate goods exports was mainly explained by quantity growth. Yet the results also suggested that product and geographic diversification of Turkey's have not been fully realized and thus many more opportunities exist for Turkey to expand product range or expand into new markets, which in turn will bring significant benefits in the form of stable, sustainable economic growth.

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1. Introduction

The decisions of 24 January 1980 have led to significant changes in the structure of Turkish exports. Through the 24 January decisions, Turkey adopted an export-led growth strategy to encourage exports by means of; tax rebates; export credits; export subsidies; and a more realistic (flexible) exchange rate system. In addition, Turkey became a member of the World Trade Organization in 1995. Another important development affecting the structure of Turkish exports since the trade liberalization measures in the 1980s (Saygılı, 2011), was the customs union (CU) between Turkey and the European Union (EU), which came into force in 1996. With the establishment of the CU, Turkey had to eliminate all tariffs and quantitative restrictions on the imports of industrial goods originating from members of the EU, which in turn guaranteed free access for its exporters to the EU market. An important component of the CU (which was expected to have a major impact on the Turkish export structure), was the process Turkey chose in order to align itself to the EU's commercial policy. To enable this, there was the expectation that Turkey adopt the preferential trade agreements (PTAs) and free trade agreements (FTAs) of the EU with third countries within a five year time frame, starting from 1996 (Çalışkan, 2009).[2] Harrison et al. (1997) suggest that improved access to third country markets are quantitatively the most important gains to Turkey from the CU arrangement, as PTAs and FTAs with third countries normally consist of reciprocal reductions in trade barriers by member countries.

Since the trade liberalization measures in the 1980s, Turkey's World Trade Organization membership and the establishment of the CU, Turkish exports have increased substantially. From 1998 to 2011, in particular, Turkey's exports have increased more than fivefold, (27.1 billion US dollars to 137.9 billion US dollars), at an annual compound rate of 13.31 percent (see Table 1). As noted by Amurgo-Pacheco and Pierola (2008), exports can

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[2] Since then, Turkey has signed 30 FTAs, 11 of which were repealed due to the accession of these countries to the EU. Currently, Turkey has 17 FTAs in force. For a detailed list of the FTAs signed by Turkey, see http://www.ekonomi.gov.tr/sta/.

grow due to a variety of reasons; exporting existing products to old destinations at higher volumes and/or higher prices (intensive margin) or by exporting existing products to new destinations or exporting new products to old and/or new destinations (extensive margin). Despite strong growth in exports, with the exception of Aldan and Çulha (2013) and Ekmen-Özçelik and Erlat (2013), empirical evidence on the role of extensive and intensive margins on Turkish export growth remains sparse. To bridge this gap in empirical evidence this study investigates the role of extensive and intensive margins to explain the substantial growth in Turkey's exports across different product types, and thereby adds to an increasing number of studies which consider in detail the export performance of a single country (Amiti and Freund, 2008; Bingzhan, 2011; Minondo and Requena, 2012).

This paper analyzes the sources of export growth in Turkey. For this purpose, it decomposes Turkey's exports to 209 importing countries over the period of 1998–2011 into extensive and intensive margins using two methods; the count method[3] and the decomposition method of export shares, developed by Hummels and Klenow (2005). The intensive margin is further broken down into price and quantity components to determine whether the rise in Turkey's exports is due to changes in price or to changes in quantity. Using two techniques allows robust and clear-cut results to be obtained on the role of extensive and intensive margins in the growth of Turkey's exports.

From a policy perspective, it is important to establish whether Turkish export growth is driven by the extensive or the intensive margin. Dutt et al. (2008) show export growth coming from the extensive margin can lead to more stable and sustainable economic growth through the diversification of risks across a wider range of products and markets.[4] [5] However,

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[3] This method was used by Dutt et al. (2011) and Bingzhan (2011).
[4] Using bilateral exports data for more than 150 countries over the period 1962-1999, Dutt et al. (2008) show that an increase in the extensive margin of exports is much more effective in raising per capita income than increasing the intensive margin of exports, especially if the initial pattern of export specialization is close to that of the US.

if the intensive margin, particularly the quantity component, plays a significant role in the growth of a country's exports, this would generally be seen as an unpleasant outcome in terms of sustainable economic growth. This is due to the growing demand for resources; such as, capital, labor, natural resources and imported inputs, as export quantities increase, putting further pressure on its current account balance. By contrast, if the price component of the intensive margin accounts for the most important share of export growth, (assuming higher prices are regarded as evidence of higher quality), this can be considered to be a helpful development for achieving sustainable economic growth, given the fact that research and development (R & D) spending, the level of human capital and technological innovation activities are key ingredients in improving the level of product quality. Hence, determining the true nature of Turkey's export growth assists policy-makers to make rational policy decisions to increase the global competitiveness of the country.

The remainder of the paper is organized as follows. Section 2 provides a brief literature review of the topic. Section 3 outlines the two methods used in the calculation of export margins; that is, the count method and the decomposition method of export shares. Section 4 presents the data used to calculate the export margins. The results from the two methods of calculation for Turkey's total goods exports (as well as for final and intermediate goods exports), are discussed in section 5. Section 6 summarizes the main findings and finally section 7 presents the conclusions from the research.

2. Literature Review

There is ongoing discussion in the trade literature about the relative importance of extensive and intensive margins in explaining export growth. For example, using data on shipments by 126 exporting countries to 59 importing countries, and involving 5000 product categories, Hummels and Klenow (2005) show that the extensive margin accounts for 60

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[5] A statistically significant long-run relationship between export diversification and economic growth for Turkey has been shown in many studies, including Erdoğan (2006) and Değer (2010).

percent of the increase in exports of larger economies. The importance of the extensive margin in export growth was also documented by; Evenett and Venables (2002) for exports of 23 developing countries; Berthou and Fontagne (2008) for French exports to the euro area countries; Bernard et al. (2009) for US exports; and Dutt et al. (2011) for more than 150 countries' exports. In contrast, several other studies have found that intensive margins played a more important role in export growth than the extensive margin.

Using data from 158 countries over the period 1970 to 1997, Helpman et al. (2008) show that the rapid growth of trade was mostly driven by the intensive margin. Further examples of studies that have shown the importance of the intensive margin in export growth include; Felbermayr and Kohler (2006) for world trade; Eaton et al. (2008) for Colombian exports; Amiti and Freund (2010) for Chinese exports; Amurgo-Pacheco and Pierola (2008) for the export growth of 24 developed and developing countries; Besedes and Prusa (2010) for manufacturing exports of 46 countries; and Bingzhan (2011) for Chinese exports. Overall, the empirical literature so far predominantly suggests that the growth of exports comes mainly from exporting more in existing products rather than from exporting new products

Besedes and Prusa (2010) suggest this contradictory evidence may be due to the use of different definitions of extensive and intensive margins through the empirical literature. There are many ways to measure the extensive and the intensive margins of exports. One of the most commonly used methods for calculation of the extensive and intensive margin is the count method. In this method, the extensive margin is defined as the count of the number of products or the number of trading partners to which a country exports, while the intensive margin is defined as average exports per product (Dutt et al., 2011). In a dynamic setting (time series context), however, the extensive and intensive margins are defined slightly differently; where the extensive margin refers to the growth of exports in new categories between two periods in time while the intensive margin is defined as the growth of exports in

goods that are already being exported in both periods (Flam and Nordström, 2006; Amiti and Freund, 2008; Bernard et al., 2009; Besedes and Prusa, 2010[6]; and Bingzhan, 2011). Time series measures changes in the extensive and intensive margins, therefore, more or less explain the relative contribution of each margin to the country's trade (export) growth over time. Recently, Amurgo-Pacheco and Pierola (2008) have added the geographic dimension into the calculation of the extensive and intensive margins in the time series context. Therefore in this study, the extensive margin refers to old products (existing varieties) being exported to new destinations, or new products being exported to old destinations or new products to new destinations. On the other hand, the intensive margin refers to old products being exported to old destinations in both periods.

As noted in Hummels and Klenow (2005), one drawback of the count method is that it gives equal weight to small and large products (markets), thereby assigning a large importance to product categories in which only a single country exports large quantities. Hummels and Klenow (2005) have proposed a method where each product is weighted according to its share in world trade (exports). Building on the methodology of Feenstra (1994), Hummels and Klenow (2005) decompose the shares of one country's exports in the world market into two margins; the extensive margin and intensive margin, (the intensive margin being further divided into price (quality) and quantity components). In this decomposition, the extensive margin is defined as a weighted count of the categories (products) in which a country exports relative to the categories exported by the rest of the world. In contrast, the intensive margin is defined as a country's nominal exports relative to world's nominal exports in a set of categories in which the country also exports. Therefore, the extensive margin can be thought of as a measure of export variety while the intensive

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[6] Besedes and Prusa (2010) define the extensive margin similarly to the existing literature but propose an alternative definition of the intensive margin in terms of survival and deepening.

margin as measure of the trade volume of each variety.[7] This method has two advantages; firstly, it takes into account the differences in the importance of product groups (in terms of market shares); secondly, it enables researchers to further decompose the intensive margin into price and quantity component, which is not possible when using the count method. Researchers who have employed this approach include; Bergin and Lin (2008, 2012), Van Hove (2010), Dutt et al. (2011), and Foster et al. (2011). Some empirical studies, however, have utilized both methods to check the robustness of their empirical calculations (Dutt et al., 2011; Kehoe and Ruhl, 2013).

Another method proposed by Amiti and Freund (2008) and further developed by Bingzhan (2011) to measure the extensive margin and intensive margin is mainly an extension of the decomposition in Hummels and Klenow (2005). Bingzhan (2011) extend the approach of the Hummels and Klenow's method by decomposing export growth into the extensive margin growth rate and the intensive margin growth rate, with the later being further decomposed into price growth rate and quantity growth rate. The major difference between these two methods is that the Hummels and Klenow method accurately decomposes the export shares, whereas Bingzhan's method accurately decomposes export growth.

From a theoretical perspective, traditional trade theories have been considered to be inadequate in explaining the source of the export growth. This is due to these traditional trade theories assuming goods are perfectly homogenous, that is, there is no trade in horizontally differentiated goods or vertically differentiated goods. Consequently, a country's export growth is solely the result of a higher quantity of exported goods, as there is no extensive margin, or price (quality) component of the intensive margin incorporated into these models. However, it is known that products have two attributes – variety and quality. Armington

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[7] Dutt et al. (2011) have examined the results of the count method and the Hummels and Klenow (2005) method and found that both methods produced comparable results; the correlation between the count measure and the Hummels and Klenow method, extensive margin equals 0.86 and correlation between exports per product measure and the Hummels-Klenow method, intensive margin measure equals 0.88.

(1969) emphasize the role of the intensive margin in explaining the growth of exports. In his model, it is assumed that products traded internationally are differentiated on the basis of their country of origin. He also assumes that each country produces only one variety in each category of goods and that product is different from the product of the same category from any other country, so that there is no export growth at the extensive margin. In addition this model suggests countries can only export more by decreasing their prices relative to those charged by other countries, leading to unfavorable terms of trade effects. On the other hand, the monopolistic competition model developed by Krugman (1979, 1980, and 1981) explains horizontal intra-industry trade by emphasizing the importance of economies of scale, product differentiation, and demand for variety within the setting of monopolistic competition type markets. The Krugman monopolistic competition model assumes each country specializes in a range of varieties and predicts that the number of varieties produced in a country is proportional to country size. In contrast with the Armington model, the Krugman model predicts that a country can only export more through the extensive margin (a greater range of varieties) in the sense that it exports the same quantity per variety and exports at the same unit prices. [8]

As suggested by Flam and Helpman (1987) and Falvey and Kierzkowski (1987), countries also engage in two-way trade (intra-industry trade) in vertically differentiated goods that are different in terms of quality. In particular, Falvey and Kierzkowski (1987) suggest that the amount of capital relative to labor used in the production of vertically differentiated goods indicates the quality of good. As a consequence, in an open economy, higher-quality products are produced in capital abundant countries whereas lower-quality products are produced in labor abundant countries. This will give rise to intra-industry trade in vertically

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[8] Hummels and Klenow (2005) have recently showed that the extensive margin accounts for a large fraction of total increase in exports of larger economies, which is inconsistent with the Armington model but consistent with the predictions of the Krugman model. However, the findings of Hummels and Klenow (2005) do not support the hypothesis of the Krugman model, that is the number of varieties produced in a country is proportional to country size.

differentiated goods; the capital abundant country exports higher-quality varieties and labor abundant country exports lower-quality products. The models of vertical intra-industry trade thus suggest that export growth can be result of the quality (price) differences of the traded products.[9]

More recently, based on the Krugman's (1980) model, Melitz (2003) has developed a dynamic industry model with heterogeneous firms to analyze the intra-industry effects of international trade.[10] According to this model, the firm participation in export markets is solely dependent on a firms productivity and export (or trade) costs (a combination of both fixed export costs and variable export costs). The model shows that the existence of export costs allows only the most productive firms to enter export markets when a country opens up to trade, forcing the least productive firms to exit. In this model, a fall in both variable and/or fixed export costs between all countries have a number of implications for export growth, which can be decomposed into extensive margin (that is, number of firms) and intensive margin (that is, average exports per firm). The Melitz model predicts that a decline in variable export costs raises the extensive margin because falling variable export costs allows new and less productive firms, those just below the productivity threshold, to enter the export markets. Moreover, a reduction in variable export costs enables existing exporters to increase their sales to export markets (intensive margin). On the other hand, reductions in both fixed and variable export costs also induces new and less efficient firms to enter the export markets, thus implying a drop in average sales per firm (intensive margin). As a result, a fall in export costs has an ambiguous effect on the intensive margin. In addition, a decline in the fixed

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[9]While Flam and Helpman (1987) also study vertical differentiation in products there is a slight difference from Falvey and Kierzkowski's (1987) model. In their model, labor is the only factor used to produce the differentiated goods and it is assumed that labor input per unit output of the differentiated product differs across countries, whereas in Falvey and Kierzkowski (1987) model, the capital is the major factor used to determine the quality of product. These labor-input requirements determine the level of quality. The pattern of trade is thus determined by cross-country differences in technology (labor-input requirements per unit of output), income and income distribution.

[10] Many extensions or applications of the Melitz model may be found in the literature; notably Helpman et al. (2008), Chaney (2008), Lawless (2010), and Besedes and Prusa (2010).

export costs will not affect the sales of existing exporters (intensive margin). Hence, the Melitz model predicts that a fall in both fixed and variable export costs have a positive effect on the extensive margin. However, the prediction of the model for the intensive margin is ambiguous (Lawless, 2010).

3. Decomposition methodologies

In this section the alternative decomposition methods employed are presented; the count method and the decomposition method of export shares by Hummels and Klenow (2005). Each method has its strengths and weaknesses. The count method is relatively easy to implement but gives only a rough indication of the role of each margin in export growth, since it assigns equal weight to all observed product categories. The approach by Hummels and Klenow (2005) addresses this shortcoming by weighting categories of goods by their overall importance in exports to a given country; hence, it prevents a category from appearing important solely because an exporter exports a large quantity in a certain category. Given that there is no particular approach (preferable priori), on theoretical grounds, and given the variety of results obtained in previous studies which have employed different approaches, the present paper investigates the evolution of Turkish exports using both approaches, allowing to identify results that are robust to the method used.

For both approaches, bilateral export relationships are classified as in Amurgo-Pacheco and Pierola (2008), accounting for both product diversification (introduction of new varieties) and geographic diversification (introduction of new export partners). More specifically, a bilateral export relationship is created when a country begins to export an existing product (variety) to a new destination country or a new product to old destination or new destination in both periods. With this comprehensive definition of the extensive margin, the estimated contributions of the extensive and intensive margin should be regarded as upper and lower bound respectively.

To give clarity to the description of the methods employed in this study, some of the notations used for the Turkish export data are listed. Individual product categories are indexed by $= , \dots , I$, time periods by $t = 1,2, \dots , T$, and destination countries by $m= 1, \dots , M$, and regions (that is, larger groups of countries) by $r = 1, \dots , R$. The variable p_{mit} is the price (in US dollars) of product i exported from Turkey to destination country m in period t and is calculated as the ratio of the export value to the quantity exported (q_{mit}). Since the focus is on a single exporter country (Turkey) in the empirical part of the paper, the index (j) for the exporting country is omitted for notational simplicity.

3.1 Count method

The count method essentially uses a descriptive approach by giving equal weight to all product categories and destination countries. The (static) bilateral extensive margin in year t, referred to as EM_{mt}^{I}, is then defined as the number of products i that have been exported from Turkey to trading partner m:

$$EM_{mt}^{I} = \sum_{i \in I_{mt}} n_{mit}, \qquad n_{mit} = \begin{cases} 1 & if \ p_{mit} q_{mit} > 0 \\ 0 & otherwise \end{cases} \tag{1}$$

I_{mt} is the set of the products for which bilateral export data between Turkey and destination country m are available in period t.[11] In addition, Turkey's multilateral extensive margin (EM_{mt}^{I}) is computed to each of the seven following destination regions r: (i) Europe, (ii) Asia, (iii) Africa, (iv) America, (v) Commonwealth of Independent States (CIS), (vi) Middle East and (vii) World. It is obtained accordingly, using partner regions r instead of individual partner countries m in definition (1).

Underlying equation (1) is a static concept, depicting the level of the extensive margin at a given point in time. Taking a dynamic perspective, the extensive margin $g_{EM_m^I}$ refers to

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[11] The analysis in this paper makes use of the CEPII's BACI database which covers more than 5,000 products at the six digit level of the Harmonized System. See the data description below.

the annual compound growth rate (ACGR) of number of product categories i exported by Turkey to destination country m (or regions r) between years t and $t+1$, i.e.,

$$g_{EM_{jm}^I} = \left(\frac{EM_{jmt+1}^I}{EM_{jmt}^I}\right)^{\left(\frac{1}{T}\right)} - 1 \tag{2}$$

where T is the number of years in the period being considered.

In contrast, the bilateral intensive margin (IM_{mt}^I) is defined as the export value of 'common' products that were exported by Turkey to country m in both periods, period t and period $t+1$, i.e.,

$$IM_{mt}^I = \sum_{i \in I_{mc}} p_{mit} q_{mit} \tag{3}$$

where $I_{mc} = (I_{mt} \cap I_{mt+1})$ represents the set of products that were exported to country m in both periods. Hence, the intensive margin is the value of 'common' products being exported to 'old' destinations.

Taking a dynamic perspective, the growth of intensive margin ($g_{IM_m^I}$) is given by

$$g_{IM_m^I} = \sum_{i \in I_{mc}} s_{mit+1}^I \left(g_{P_{mi}^I} + g_{Q_{mi}^I}\right) \tag{4}$$

where $g_{P_{jmi}^I} = \left(\frac{p_{jmit+1}}{p_{jmit}}\right)^{\left(\frac{1}{T}\right)} - 1$ and $g_{Q_{jmi}^I} = \left(\frac{q_{jmit+1}}{q_{jmit}}\right)^{\left(\frac{1}{T}\right)} - 1$ represent the price and quantity growth of exports of product i to destination country m, and $s_{mit+1}^I = \frac{p_{mit+1} q_{it+1}}{\sum_{i \in I_{mt+1}} p_{mit+1} q_{mit+1}}$ gives the export value shares of product category i in Turkey's total exports to country m in period $t+1$, with $\sum_{i \in I_{mt+1}} s_{mit+1}^I = 1$.

Hence, in equation (4) growth of intensive margin is decomposed into two parts; growth of price margin and growth of quantity margin. Thus, the overall growth rate of the bilateral intensive margin can be seen as export value share-weighted average of the growth rates of the price and quantity margins of all product categories exported to country m between the two periods. The growth rates of the multilateral price margin and quantity margin can then be calculated as export value share-weighted average of the growth rates of

the bilateral margins. Furthermore, the same calculations are also carried out for the intermediate and final goods to see whether their growth rates are quite different. Obviously, the growth rates of the extensive and intensive margin do not add up to the overall growth rate of the value of exports, given that the extensive margin is calculated by assigning the same weight to each product category.

3.2 Decomposition method of export shares

An alternative to the export value-based count approach to decompose bilateral exports into the extensive and intensive margins has been devised by Hummels and Klenow (2005). Their method is a cross-country analogue to Feenstra's (1994) approach to incorporate new varieties into a country's import price index. Using q_{mit} to denote the quantity of exports and p_{mit} to denote the price (unit values), the bilateral extensive margin of Turkey's exports to country m in period t is defined by

$$EM_{mt}^{II} = \frac{\sum_{i \in I_{mt}} p_{kmit} q_{kmit}}{\sum_{i \in I_t} p_{kmit} q_{kmit}} \tag{5}$$

where I_{mt} is the set of observable categories in which Turkey has positive exports to country m in period t. As a reference country, the rest of the world (k) is used throughout, such that I_t denotes all categories imported by the destination country m in period t. Hence, the extensive margin can be interpreted as a refined measure of the fraction of categories in which Turkey exports to country m, where each category is weighted by the importance of rest of world exports to destination country m, or, equivalently, by the importance of country m's imports from the rest of the world. EM_{mt}^{II} is positive and can take values between 0 and below 1.

The bilateral intensive margin, on the other hand, is defined as Turkey's nominal exports to country m, relative to exports from the rest of the world, summing over those categories in which Turkey exports to country m, (I_{mt}):

$$IM_{jmt}^{II} = \frac{\sum_{i \in I_{mt}} p_{mit} q_{mit}}{\sum_{i \in I_{mt}} p_{kmit} q_{kmit}} \tag{6}$$

Hence, the bilateral intensive margin calculates Turkey's export share in the rest of world exports to country m in those products in which Turkey exports to country m. IM_{mt}^{II} also can take values between 0 and 1. Note that the extensive margin will be large if Turkey exports many different products i to country m, while the intensive margin will be large if Turkey exports large amounts of a few categories i to m.

Following Hummels and Klenow (2005), the present paper further decomposes the bilateral intensive margin into a price (quality) and quantity component as follows:

$$IM_{mt}^{II} = P_{mt}^{II} \times Q_{mt}^{II} \tag{7}$$

where Q_{mt} is the implicit quantity index and P_{mt} is the price index. As in Hummels and Klenow (2005), a bilateral aggregate price index is constructed based on the contribution of Feenstra (1994). This price index is given by:

$$P_{mt}^{II} = \prod_{i \in I_{mt}} \left(\frac{p_{mit}}{p_{kmit}} \right)^{w_{mit}^{II}} \tag{8}$$

where w_{mit}^{II} is the logarithmic mean of w_{mit}^{II} (the share of category i in Turkey's exports to country m) and s_{kmit} (the share of category i in world (k) exports to country m):

$$s_{mit}^{II} = \frac{p_{mit} q_{mit}}{\sum_{i \in I_{mt}} p_{mit} q_{mit}} \tag{9a}$$

$$s_{kmit}^{II} = \frac{p_{kmit} q_{kmit}}{\sum_{i \in I_{mt}} p_{kmit} q_{kmit}} \tag{9b}$$

$$w_{mit}^{II} = \frac{\frac{s_{mit} - s_{kmit}}{\ln s_{mit} - \ln s_{kmit}}}{\sum_{i \in I_{mt}} \frac{s_{mit} - s_{kmit}}{\ln s_{mit} - \ln s_{kmit}}} \tag{9c}$$

On the other hand, the implicit quantity index, Q_{mt}^{II}, can be simply obtained by dividing the bilateral intensive margin over the price index. It should be added, however, that the decomposition into a price and quantity index relies on stronger assumptions than the decomposition into extensive and intensive margin, namely that quality and within-category variety vary across categories i for each destination country m.

Note that the multiplication of the extensive and the intensive margin gives the bilateral overall market share of Turkey's exports relative to rest of world exports to country m:

$$OV_{mt}^{II} = EM_{mt}^{II} \times IM_{mt}^{II} \tag{10}$$

Using equations (5) to (10) allows computing the overall share of bilateral exports, bilateral extensive margins, bilateral intensive margins, and the bilateral price and quantity components (margins) for Turkey's exports. The calculations for final goods and intermediate goods are carried out in the same manner.

Finally, as a multilateral measure of Turkey's export margins and components for each region r, weighted averages of the multilateral (extensive and intensive) margins and the multilateral (price and quantity) components over the set of destination countries belonging the same region r for period t are calculated.[12]

These measures are static measures, decomposing Turkey's bilateral exports into the extensive and intensive margin at a point in time. To get an idea of the growth of export shares of Turkey over time, annual growth rates of export shares of Turkey between 1998 and 2011 are also calculated. To do this, the bilateral extensive margin, the intensive margin and the price and quantity components for each destination country in 1998 and 2011 are computed and the compound annual growth rates of each margin, using a method similar to one given in the equation (2), is obtained. This exercise is also carried out at the regional level to compute the compound annual growth rates of multilateral margins. Note that the growth rate of the overall margin and that of export values are not exactly the same since the rest of

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[12] Note that at the country and regional level, the intensive margin may not equal to the product of the price and quantity components due to rounding (See Table 3a-c).

the world is the reference rather than the whole world, and since there is time variation in the rest of world exports to country m.[13]

Summing up, two different methodologies will be used to decompose Turkish export values (shares, growth) into the extensive and the intensive margins (including both bilateral dimension and multilateral dimension), the latter is further decomposed into price and quantity margins. All calculations will be carried out for total trade and for the subgroups of final goods and intermediate goods trade. The following section provides detailed information about Turkish export data and the categorization into final and intermediate goods trade, before discussion of the results.

4. Data

The BACI international trade database from the CEPII, which contains data for 245 countries and 5,066 product categories classified according to the Harmonized System (HS, Revision 1996) at the 6-digit level[14], was used in the decomposing of Turkey's export growth along the extensive and intensive margins, Data availability in the BACI HS-1996 database spans from 1998 to 2011. This database, constructed using the United Nations Commodity Trade Statistics original database (UN COMTRADE), provides detailed annual bilateral trade data for commodity exports in value (in thousands of US Dollars at the current prices), and in quantities at the 6-digit level of the HS 1996, which allows calculation of unit values for each product or item. As compared to the original database (UN COMTRADE), working with the BACI database has several advantages. Firstly, the BACI database reconciles mirror flows (for both values and quantities), which is reported by at least one of the partners, thus providing a more complete and refined geographical coverage. Secondly, unlike the UN COMTRADE database (where quantities are reported in different units of measure, such as

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[13] Hence, if the size of the destination market m grows (in terms of rest of world exports) a constant market share (overall margin) is associated with positive growth of export to country m.

[14] The BACI database is available for researchers already subscribing to the United Nations COMTRADE database at: http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=1.

meters, square meters, number of items, kilograms, liters, and such like), the quantities in the BACI database are registered in the same unit (tons) so that unit values are comparable at the world and product level.[15] Therefore, the BACI database is particularly convenient to decompose the Turkey's export growth into margins. It would be ideal to use intra-firm trade statistics to measure the growth in export margins. Unfortunately, these data are not available at the detail needed. Thus, data on exports by Turkey to 209 importing countries over the period 1998 to 2011, comprising of 5066 items at the 6-digit level of the HS-1996 was used (for a list of countries and information about each region, see Table A1).[16]

To distinguish intermediate goods from final goods, the United Nations Broad Economic Categories (BEC) classification scheme, as in Hummels et al. (2001), was used. Shown in Table A2, the BEC includes 19 basic categories, which are classified as capital goods (categories 41 and 521), consumption goods (categories 112,122, 522, and 6), intermediate goods (categories 111,121, 2, 31, 322, 42, and 53), and not classified (categories 321, 51 and 7). Categories, 321 (motor spirit) and 51 (passenger motor cars) could be consumed directly by consumers or used as intermediates; category 7 includes, among others, a range of military equipment, postal packages and special transactions and commodities not classified according to end-use classes. To address this issue, category 321, category 51, and category 7 are excluded from the calculations of the export margins for final goods and intermediate goods. In order to select the final and intermediate goods from the trade data, the correspondence table by the United Nations Statistics Division is used to map the HS-1996 codes to the BEC codes (http://unstats.un.org/unsd/default.htm). As a consequence, about 1238 items are considered as final goods and 3177 items are considered as intermediate goods out of 5066 items from the 6-digit level of the HS-1996.

5. Overview of the export values of Turkey

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[15] A detailed description of the BACI database can be given by Gaulier and Zignago (2010).
[16] Many small or island countries are not included in the calculations, often due to absence of trade or unreliable data. In addition, in the BACI database, Belgium and Luxembourg are a single entity.

Before presenting the results of the export margins, an overview of Turkey's exports to the selected destination countries and regions over the period 1998 to 2011, differentiated by product categories and distinguishing between total goods, final goods and intermediate goods is provided. The main focus is on differences across destination countries and regions, differences across different product categories and changes over time. The selected countries given in Table A1 were chosen based on their importance in the value of Turkey's total exports in 2011 and also the availability of the export data. Furthermore, as defined above, Turkey's total, final and intermediate exports are decomposed into seven destination regions r: Europe, Asia, Africa, America, CIS, Middle East and World.

Total exports by destination regions and countries

Values and growth rates of Turkey's total goods exports to the 23 destination countries and seven destination regions are reported in Table 1 for the period 1998-2011. Despite the economic downturn in 2001 and the global financial crisis in 2008, Turkey achieved remarkable export growth during the period of 1998-2011. As seen in Table 1, Turkey's total goods exports has more than doubled from 27.,1 billion US dollars in 1997 to 137.9 billion US dollars in 2011, rising at an average annual (compound) rate of 13.31 percent per year, which is well above the world average export growth, but trailing behind the BRIC economies (Brazil, Russia, China, and India).[17] As a result, Turkey's share in world exports has been substantially increased from 0.49 percent in 1998 to 0.73 percent in 2011.[18] [19] The literature has identified several factors accountable for this remarkable growth.

One of the major factors identified to explain the 'stellar' export performance, is the productivity improvements in the manufacturing industry. These productivity improvements

[17] For more information, see Gros and Selçuki (2013) and The World Bank's Trade Competitiveness in Turkey Report 2012 at www.ecb.europa.eu.
[18] Detailed information on the share of Turkey's exports in world merchandise exports can be found at the WTO's website: http://www.wto.org.
[19] Likewise, Kaminski and Ng (2006) report that Turkey's share in world exports rose 59 percent from 0.40 percent in 2000 to 0.70 percent in 2004. They also point out that Turkey's share in world imports grew less rapidly than its share in world exports, increasing only 24 percent from 0.83 percent in 2000 to 1.03 percent in 2004.

have arisen from Turkey's entry into a customs union with the EU in 1996, which brought stiff competition to Turkish companies (Bayar, 2002; Akkoyunlu-Wigley and Mihci, 2006; İzmen and Yılmaz, 2009; Gros and and Selçuki, 2013). In addition, Gros and Selçuki (2013) argue that the formation of the CU with the EU helped Turkish companies to import cheaper intermediate goods from these countries, thereby leading to competitive advantage for Turkish exporters in the global markets.

Beside the impact of the CU on Turkish exports, Turkey's spectacular export performance over the years is also due to a number of other factors; the depreciation of the Turkish Lira (TL); the need to search for new export destinations during the economic downturns in 2001 and 2008; the need to expand Turkey's export base forced by the fierce competition coming from low-wage countries which export similar products; and the inflow of foreign direct investment (FDI) into Turkey, mostly originating from the EU (İzmen and Yılmaz, 2009; Gros and and Selçuki, 2013).[20]

Another factor that has lead to this explosive growth is the entrance of Turkish companies into global production networks (Kaminski and Ng, 2006 and Saygılı and Saygılı, 2011). The combination of technological developments and trade liberalization through the 24 January 1980 decisions and the establishment of the CU with the EU, has allowed Turkish companies to join into global production networks based on fragmentation of production. This in turn has led to fundamental changes in production methods as well as trade patterns in Turkey. Through integration into global production networks, Turkish companies became more specialized in producing and then exporting medium and high-technology manufactured

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[20] Despite over-appreciation of the Turkish Lira (TL) after the 2001 economic crisis, the momentum of export growth continued during the period (İzmen and Yılmaz, 2009 and Saygılı and Saygılı, 2011). It seems that the real appreciation of the Turkish Lira has forced Turkish companies to use cheaper and high-quality imported inputs instead of expensive and low-quality domestic inputs, which in turn leads to the improvements in the productivity of the export-oriented companies, thereby offsetting adverse effects of the TL appreciation on Turkey's export performance in recent years.

goods, such as, machinery and equipment, consumer electronics, and transport vehicles.[21] These industries involve medium or high-skilled labor and exhibit a high degree of fragmentation. The successful transformation of Turkey's exports from low technology and unskilled labor-intensive products to medium and high-tech products, which required more skilled labor, has contributed to a large increase in Turkey's exports, particularly to the EU, in recent years (İzmen and Yılmaz, 2009; Saygılı and Saygılı, 2011; Özenç and Altaylıgil, 2013).[22] [23]

Table 1 also demonstrates the regional composition of Turkey's total exports from 1998 to 2011. It shows the regional distribution of Turkey's exports has changed considerably over the study period. Europe and America has decreased in importance, while regional trade, especially with the Middle East, Asia, the CIS and Africa, has increased.[24] The results show that the Middle East (19.56 percent), Asia (18.06 percent), the CIS (15.58 percent) and Africa (14.95 percent) have been the fastest-growing destination regions for Turkey's total exports, compared with 11.72 percent and 8.27 percent growth in Turkey's exports to Europe and America, respectively. Thus, the findings suggest that Turkey has successfully diversified its exports geographically to the Middle East, Asia, the CIS and Africa in recent years.[25] However, the bulk of Turkey's total goods exports were still destined for Europe, although

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[21] Despite the large decline in the share of low technology and unskilled labor intensive products in total exports, textiles and clothing sectors still remain the main source of export earnings in Turkey. According to Saygılı and Saygılı (2011), the top five items in which Turkey exported in 2006 are (87) Vehicles other than railway or tramway rolling stock, (61) Articles of apparel and clothing accessories knitted, (84) Nuclear reactors, boilers, machinery and mechanical appliances, (85) Electrical machinery and equipment and (72) Iron and steel. The shifting structure of Turkey's exports suggest that Turkish companies are attempting to move production to areas where they face less competition from low-cost producers, particularly after the Chinese accession to the WTO in 2001.

[22] However, as pointed out by Yükseler and Türkan (2008), İzmen and Yılmaz (2009), Saygılı and Saygılı (2011) and Gros and Selçuki (2013), the increasing fragmentation of production coupled with the appreciation of TL has led to a growing share of foreign value added contained in the Turkish exports in recent years, which in turn lead to a serious current account balance problem.

[23] Nowak-Lehmann et al. (2007) and Akkemik (2011) point another likely reason for the declining importance of the low-tech products, such as textiles and clothing, in Turkey's exports to Europe, that is the abolition of quotas on textiles and clothing on 1 January 2005 by the EU has led to an increase in Chinese exports to the EU at the expense of Turkey.

[24] Taymaz et al. (2011) document similar stylized facts on regional exports of Turkey.

[25] However, Berüment et al. (2014) argues that Turkey's diversification of export markets is very weak and mainly limited to EU countries.

this has changed over time. The European share of Turkey's exports declined from 62 percent to 42 percent between 1998 and 2011, with the Middle East (increasing from 8 percent to 17 percent), and Asia (increasing from 3 percent to 6 percent), absorbing a majority of that export decline. One reason for the re-orientation of Turkey's exports towards the Middle East and neighboring countries is the sharp increase in the number of FTAs concluded between Turkey and these countries in recent years (Gros and Selçuki, 2013). Another reason is the global financial crisis of 2008 in Europe and America which forced Turkish companies to redirect their exports towards more dynamic regions where the purchasing power has significantly increased in recent years.[26] The growing share of emerging markets in Turkish exports suggests that Turkish products have so much room to grow in markets untouched by competitors. This finding is consistent with a number of previous studies (Aldan et al., 2012; Akkemik, 2011; Gros and Selçuki, 2013).

Finally, a surge in total goods exports to these regions is also a natural outcome of the export diversification strategies adopted by Turkey in recent years (Göktürk et. al, 2013). Turkey has implemented several export diversification strategies since 2000. These are 'The Neighboring and Surrounding Countries Strategy' in 2000, 'African Countries Strategy' in 2003, 'The Asian-Pacific Countries Strategy' in 2005, 'The Americas Strategy' in 2006, and more recently 'Turkish Exports Strategy for 2023' in 2009. It is quite apparent that Turkey's export diversification strategy is paying off as its exports to all these aforementioned regions, except America, grew significantly during the study period despite the global economic downturn.

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[26] Berüment et al. (2014) have investigated the impact of the growth rates of Turkish trading partners on Turkish exports in various sectors for the period 1996:1 to 2009:12 and concluded that the income elasticities of developing countries are significantly higher than those of developed countries, particularly for the machinery sector.

The results further pointed out the impact of the CU on Turkey's exports has gradually faded away over time.[27] Yılmaz (2011) argue the impact of the EU on Turkey's exports did not become evident in until after the first five years because the tariffs between Turkey and the EU had already been removed prior to 1995. However, Turkey's exports to the EU have accelerated considerably since 2001. This was largely due to the depreciation of the TL and the decline in domestic demand caused by the 2001 economic crisis that compelled Turkish companies to speed up their search for new export markets. However, the latest data, from Table 1, shows the situation appears to have reversed once again after the 2008 global financial crisis, with a declining export share of the EU on Turkey's total exports. Furthermore, several studies highlight the fact that exports of medium and high-tech products, such as consumer electronics and automotive products, to Europe has tended to rise after 2001 (Kaminski and Ng, 2006; Doğan and Kaya, 2011; Yılmaz, 2011; Aldan et al., 2012). On the contrary, exports of low-tech products, such as textiles and clothing, to Europe have fallen in the same period due to the fierce competition coming from China.[28] In recent years, Turkey's low-tech producers are increasingly facing fierce competition in Europe from Chinese exports and have responded to this pressure by moving out of the low-tech sectors where China is more competitive (Akkemik, 2011). As a result, Turkey has reduced its comparative trade weakness in medium and high-tech industries, such as consumer electronics and automotive

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[27] Not surprisingly, the impact of the CU on Turkish exports has been extensively investigated in the literature. Examples of these studies are Harrison et al. (1997), Mercenier and Yeldan (1997), Bayar et al. (2000), Mardas and Moutos (2002), Akkoyunlu-Wigley and Mihci (2006), Antonucci and Manzocchi (2006), Nowak-Lehmann et al. (2007), Neyaptı et al. (2007), Adam and Moutos (2008), Seymen (2009), Doğan and Kaya (2011) and Yılmaz (2011). Despite the vast literature, there is still no general consensus concerning the benefits of the CU for Turkey's exports. While a few studies found a negative or zero relationship between the CU and Turkey's exports, some studies have found positive and large as well as small effects. After reviewing the existing literature, Yılmaz (2011) concluded that the CU has generally a beneficial effect on Turkey's export flows in the long run, thanks largely to continuing improvements in productivity.

[28] Kaminski and Ng (2006) report that the share of medium- and high tech products in Turkish exports to the EU-25 moved up from 13.3 percent in 1995 to 37.3 percent in 2004. In contrast, the share of low-tech labour intensive products dropped from 69.6 percent to 46.5 percent over the same period. Despite the changing pattern of exports, the low-tech products continued to play a major role in Turkish exports to Europe (Gros and Selçuki, 2013).

products, through increased productivity, while its comparative strength in low-tech industries, such as textiles and clothing, is waning.

Turning to the evolution of Turkey's total exports across destination markets, Table 1 shows export growth rates vary enormously across destinations during the study period. The results also suggest Turkey's exports to emerging economies grew more than exports to high-income countries. As can be clearly seen in Table 1 over the last few years Turkey has successfully re-oriented its exports to new destination countries, such as Iraq, China and UAE. Turkey's exports to Iraq exhibited the highest annual growth rate of 66.82 percent. Exports to China registered the second highest annual growth rate at 35.91 percent, followed by UAE at 23.71 percent, Iran at 22.75 percent and Bulgaria at 19.04 percent. Despite losing ground to new markets in the Middle East and Asia, four of the top five destination countries for Turkey's exports in 2011 are still from Europe. The largest export market for Turkish products is Germany. Compared with the base year 1998, Turkish exports to Germany have increased from 5.9 billion US dollars in 1998 to 15.4 billion US dollars in 2011, or at a 7.61 percent growth rate per year. Turkey's second largest export market is the United Kingdom (UK) (8.5 billion US dollars in 2011) with 12 percent growth rate per year from 1998 to 2011. With annual exports worth over 8.2 billion US dollars in 2011, Iraq ranked the third largest export market in Turkey, in part due to the lifting of the United Nations' international trade embargo against Iraq in 2003. Italy is the fourth largest market for Turkey's exports, 8.2 billion US dollars in 2011, an average growth of 12.77 percent per year over the same period. Turkey's exports to France in 2011 were 7.7 billion US dollars, with 12.80 percent growth rate per year from 1998 to in 2011, making France its fifth largest export market. Further, there has been notable increases in exports with Bulgaria (19.04 percent), Poland (18.99 percent) and Romania (18.46 percent) over the study period because of their close geographic proximity but also because of their establishment of Customs Union with the EU in the late

1990s, enabling Turkey to increase its exports by more than the world average export growth rate of 13.30 percent per annum.

To sum up, the results reveal that Turkish exporters successfully diversified their export markets with the emerging countries to offset the weakening demand in European and American markets in recent years. The share of exports to European countries appears to have gradually fallen over time, though there is still a high export concentration on European markets. This is likely due to the fact that these countries already had a high degree of integration with Turkey because of the establishment of the CU in 1995, leading to low export growth rates over the last decade. Nevertheless, it is important to keep in mind that Europe is still the largest and geographically close markets for Turkish exports. Hence, it is most likely that this situation could be reversed once economic conditions improve throughout Europe in the near future.

Final goods exports by destination regions and countries

Table 1 also illustrates the value and growth rates of Turkey's final goods exports by selected destination country and geographical region between 1998 and 2011. Turkey's final goods exports to the world increased from 13.8 billion US dollars in 1998 to 44.9 billion US dollars in 2011, an increase of 9.50 percent; a much slower rate than that of total goods exports. As can be seen from Table 1, the shares of final goods exports in Turkey's total goods exports has dropped from 48 percent in 1998 to 32 percent in 2011. By contrast, the shares of intermediate goods in total exports climbed to 48 percent from 42 percent. The causes for this relatively poor performance of Turkey's final goods exports are complex, but a major factor is the transformation of Turkey's manufacturing industries into global production networks that boosted the intermediate goods trade at a faster rate than that of final goods trade (Kaminski and Ng, 2006 and Saygılı and Saygılı, 2011). A very similar trend is observed by Jing (2012) who studied the performance of China's exports during the 2008-

2009 financial crises and found that the exports of products with high shares of processing trade demonstrated a much faster recovery from the recession than the low type.[29] Jing (2012) further found that exports of capital and intermediate goods collapse later than final consumption goods, but also recover faster. Another related factor would be a shift in the composition intermediate goods exports toward high-quality parts, such as auto parts.[30]

Table 1 exhibits the final goods exports to different geographic regions. Several points are worth mentioning. First, it is clear, not surprisingly, the value of Turkey's final goods exports to the Middle East, Africa, Asia and the CIS has been increasing more than that of Europe and America over the period considered in this study. In particular, the annual compound percentage change in the value of Turkey's final goods exports to the Middle East, Asia and the CIS over the study period have grown at 20.56 percent, 16.88 percent, 12.43 percent, respectively, surpassing the average export growth of Turkey's exports to the world (9.50 percent). The results imply Turkish companies have managed to redirect their final goods exports towards these regions in recent years, largely due to the more rapid economic growth in these regions. At the same there has been a relatively small increase in Turkey's final goods exports going to developed regions, such as Europe (8.16 percent) and America (2.81 percent), in part due to the worsening economic situation in Europe and America. Thus, the results clearly suggest that geographical diversification became more important for Turkish companies in the period of the latest global economic crisis.

Looking at the evolution of Turkey's final goods exports by selected destinations reveals that Turkey's exports to the emerging countries, except Spain, have exhibited

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[29] Jing (2012) argues that industries with higher shares of processing trade should fall into collapse earlier if this export contraction is driven by foreign demand shocks. When demand in foreign countries drops in recession, the production in foreign countries fall quickly, the demand for processed trade drops accordingly, given the fact these industries are more deeply integrated into foreign production. The results reported in Jing (2012) show that products with high shares of processing trade are found having higher hazard rates to collapse during the downturn and also tend to recover faster from the recession.

[30] In a recent study, Berthou and Emlinger (2010) show that high-quality imports are more responsive to GDP variations than low-quality imports. Their findings suggest that high-quality imports should benefit more from the recovery, due to their larger income elasticity.

particularly robust export growth rates, a pattern similar to the one observed in the case of total goods exports. Between 1998 and 2011, Turkey's final goods exports to Iraq and China increased by 63.88 percent and 32.81 percent, respectively. Exports to Iran, UAE and Spain grew by 31.78 percent, 22.17 percent and 19.88 percent, respectively. This 'stellar' export performance happened despite the 2008 global economic crises as Turkish companies search for new markets. During the same period, Turkey's final goods exports to the advanced countries, such as Belgium-Luxembourg (7.26 percent), France (8.15 percent) and Germany (4.26 percent), grew less rapidly than those to developing countries. Nevertheless, the developed countries remained the most important markets for Turkey's final goods exports. In 2011, Germany was Turkey's top export partner, importing 7.4 billion US dollars in final goods, a 4.26 percent increase from 1998. The UK was the second largest market for Turkey's final goods, importing 4.0 billion US dollars in 2011, a 10.58 percent increase since 1998. Iraq moved up to become the third largest export market for Turkey's final goods, with exports totaling over 3.4 billion US dollars in 2011, a 63.88 percent increase since 1998, presumably attributable to the lifting trade sanctions on that nation. France is Turkey's fourth largest final goods export partner with 2.7 billion US dollars in 2011, up 8.15 percent from 1998, while Russia is the fifth largest export market for Turkey's final goods exports, accounting for 2.4 billion US dollars, up 11.54 percent from 1998.

Intermediate goods exports by destination regions and countries

The value and average annual growth rates of Turkey's intermediate goods exports over the period of 1998-2011 are reported at the level of world, geographical regions and selected destination country in Table 1. At the aggregate level, Turkey's intermediate goods exports grew significantly by 14.42 percent, much larger than export of final goods exports (9.50 percent). The results thus reveal that Turkey's intermediate goods exports have recovered more quickly from the adverse effects of the global financial crisis, than final goods

exports, this is consistent with the findings of Jing (2012).[31] [32] The results thus imply that Turkey's total exports growth is mainly driven by intermediate goods rather than final goods. As discussed above, this high growth rates are driven largely by the rising importance of vertical international production sharing in the Turkey's manufacturing industry in recent years. Furthermore, despite global economic downturn, Turkey has managed to sustain high export growth rates in intermediate goods due to radical transformation of Turkey's trade structure from exporting low-value added intermediate goods, such as steel, to high-value added intermediate goods, such as automotive parts, triggered by the increasing participation of Turkish companies into the global value chains in recent years (Kaminsky and Ng, 2006). High growth rates in intermediate goods to the world also imply that Turkish firms are increasingly locating their production stages abroad to take advantage of lower labor costs in recent years, thus generating more intermediate goods exports from Turkey to its trade partners.

Turning to the regional level, the results show that there are significant discrepancies in growth rates across regions. The evidence indicates that despite maintaining strong linkages with Europe, Turkey's intermediate goods exports to non-traditional markets like the Middle East, Asia, the CIS and Africa has been growing at a much faster rate than Turkey's intermediate goods exports to the traditional markets like Europe and America during 1998-2011, suggesting that Turkish companies have successfully entered very large and previously untapped markets. The Middle East-destined exports grew by 17.81 percent on average during the 1998-2011 period, while exports to Asia grew by 17.58 percent. At the same time, the

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[31] In Jing (2012), it is argued that fragmented industries tend to recover much more quickly from the recession if this export boom is driven by a sharp rise in demand from foreign countries because the improved economic conditions can spread rapidly along the global value chain. When demand in foreign countries rise in the period of expansion, the demand for processed intermediate goods, which connects different stages of global value chains, rises quickly, resulting in a faster recovery compared to the final goods.
[32] Similarly, Freund (2009) examines the elasticity of global trade volumes to real world GDP and found that the increase in the world elasticity of trade compared to the 1960s is a result of greater fragmentation, especially for East Asia. The higher world elasticity of trade implies that trade would fall relatively more rapidly during downturns but also rebound sharply when the recession ends.

average annual growth rate of Turkey's exports to the CIS and Africa throughout the period was 17.10 percent and 16.27 percent, respectively, much higher than either Europe's rate of export growth of 12.92 percent or America's rate of export growth of 9.84 percent. Even though the traditional markets remained by far the major markets for Turkey's intermediate goods, the non-traditional markets have nevertheless become increasingly important markets for Turkish intermediate goods in recent years, which is largely simulated by the worsening economic situation in the traditional markets, more rapid growth in non-traditional markets, and the deepening integration of Turkish manufacturing industries into the global value chains.

Trends at country level are also reflected in Table 1. Looking at the level and the growth rate of Turkey's intermediate goods exports, the data shows the growth rates of Turkey's intermediate goods exports to the advanced countries have lagged far behind that of Turkey's exports to emerging countries. The fastest growing destinations were Iraq at 69.51 percent, followed by China at 36.80 percent, Bulgaria at 20.77 percent, UAE at 20.73 percent, and Romania at 20.53 percent. Also worth mentioning is, despite sluggish exports growth to Turkey's major trading partners in the EU, the growth rates of intermediate goods exports to the new member states of the EU like Bulgaria, Romania and Poland has been impressive; rising considerably above Turkey's overall average of 14.42 percent, which is quite consistent with the findings of Kaminsky and Ng (2006). Besides being geographically close to each other and increasing the export volume via the globally integrated production structure, particularly with Poland, which has a large established automotive industry, it is clear the CU had a significant impact on the increase in intermediate goods exports to these aforementioned countries.

However, Table 1 shows that while Turkey's dependency on trade with Europe is declining significantly, as new markets becomes much more important, European countries

remain key export destinations for Turkey's intermediate goods exports due to their size and large trading capacity. As of 2011, Germany was by far the largest and most important export market with Turkey's intermediate goods with 6.4 billion US dollars, an increase of 12.36 percent per annum over the period. Iraq was Turkey's second largest intermediate goods market in 2011, 4.1 billion US dollars in 2011, up 69.51 percent per annum from 1998. Italy was the third largest buyer of Turkey's intermediate goods exports, amounting to 4.1 billion US dollars in 2011, a growth rate of 10.69 percent per annum since 1998. The UK ranked the fourth largest export destination for Turkey's intermediate goods exports in 2011, with a value of 3.1 billion US dollars and an annual growth rate of 11.52 percent over the period, while Iran was in fifth place, with a value of 2.4 billion US dollars and an annual growth rate of 20.10 percent.

6. Extensive and intensive margins of Turkey's exports

As mentioned earlier, there have been various methods developed to decompose the growth of exports into extensive and intensive margins, and the latter further into price and quantity margins. In this paper, two methods were employed, the count method and decomposition method of export shares developed by Hummels and Klenow (2005), to analyze Turkey's export growth over the period 1998-2011. In addition, these methods were employed for different categories of goods (total goods exports, final goods exports, and intermediate goods exports).

6.1 The results of the count method

Extensive and Intensive Margins of Turkey's Total Goods Exports

The main results of the count method for each product groupings are presented in Table 2a and 2b at both regional level and country level. The left panel of Table 2a shows the result of the extensive margin growth of Turkey's exports while the left panel of Table 2b provides price and quantity growth in Turkey's exports over the sample period. As seen in

Table 2a, the first and second column of the left panel shows the number of products that Turkey exports to each destination country in 1998 and 2011, respectively. The left panel of Table 2a also reports the number of country-product relationships that Turkey has for each destination region. In addition, the third column of Table 2a gives the growth at the extensive margin between Turkey and its destination country or region using the equation (2).

It is worth recalling that the bilateral extensive margin is defined as the number of products that have been exported from Turkey to each destination country. Multilateral dimension of the extensive margin, on the other hand, refers to the number of product-destination pairs within a destination region, which allows for the geographical diversification of the extensive margin to be taken into account. As can be observed, the number of product-destinations relationships Turkey has with the world increased from 75.1 thousand in 1998 to 159.3 thousand in 2011, an annual average growth rate of 5.95 percent. The results thus indicate that the extensive margin have contributed positively to Turkey's export growth over the period, but its contribution to the overall export growth seems to be relatively small, because the former grew at a rate much smaller than the growth rate of the latter (13.30 percent) during this period. [33] [34] [35] Despite the fact the extensive margin explains a small

[33] Similarly, Aldan and Çulha (2013) has applied the count method to Turkey's export flows (at 4-digit level of SITC Revision 3) and found that the number of product-destination pairs grew significantly from 14.1 thousand to 52.6 thousand during 1998-2011. On the contrary, the number of products exported by Turkey to the world has risen slightly from 673 to 702 over the same period. Based on their evidence, they hence conclude that geographic diversification was the key driver of Turkey's export growth rather than product diversification. Likewise, using the count method Ekmen-Özçelik and Erlat (2013) showed that the number of products (out of 3049 possible products at 5-digit level of SITC Revision 3) that Turkey exported to the EU-15 market increased substantially from 2,205 in 1996 to 2,557 in 2006. They further concluded that Turkey, ranked 9th among 30 countries exporting to the EU, has exhibited good performance in terms of product diversification over the period. Last, using the count method, Yücel and Doğruel (2012) provided the evidence that average number of active export lines (at the 4-digit level of ISIC Revision 3) in Turkey grew from 102 in 2000 to 106 in 2010, a 3.72 percent change compared to the base year, indicating much higher percentage change than the percentage change of several emerging economies, including China, Brazil, India and Russia.

[34] Likewise, using the count method, Evenett and Venables (2002) found the export growth associated with the new products that Turkey started to export after 1970-4 accounted for only 16 percent of its total change in exports from 1970-4 to 1993-7. In addition, for continuing product lines, decomposition by trading partners implies that 37 percent of observed increase in Turkey's was attributed to exporting to new partners. In a recent study, Amurgo-Pacheco and Pierola (2008) has shown that the intensive margin accounts about 92 percent of Turkey's overall export growth during the period of 1995 and 2005. In addition, they found that at the extensive margin geographic diversification (old products being exported to the new destinations) is much more important than the product diversification (See Table 6 and 7 in Amurgo-Pacheco and Pierola, 2008).

share of the overall export growth, the extensive margin still plays an important role as a source of the export growth for Turkey.[36] Although Turkey has achieved significant export diversification through extensive margin (particularly geographic diversification) over the period, the available evidence indicates that it still has plenty of room for further progress; progress that if realized would likely lead to faster export growth.[37]

Furthermore, it is clear that the growth rates of extensive margin shown in Table 2 are generally higher for developing regions like Asia and Africa compared to the European countries, with particularly large increases found for the Asian countries (an increase from 4.4 thousand country-product relationships in 1998 to 17.8 thousand country-product relationships in 2011, indicating an annual growth rate of 11.40 percent over the period). The results further point out that the extensive margin, particularly product diversification, seems to be relatively more important for developing countries such as Iraq, China and Iran.[38] As can be observed, Turkey has achieved very high extensive margin growth rates with Iraq (24.10 percent), China (15.04 percent), Iran (9.17 percent), Poland (8.32 percent) and Ukraine (6.51 percent). Overall, the results suggest that Turkey's non-traditional exports markets tend to become more important than the traditional markets as it successfully creates new products and/or new markets during the past decade. The product diversification of Turkey's export

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[35] The empirical findings here are also consistent with the results of Brenton and Newfarmer (2007) and Amurgo-Pacheco and Pierola (2008) but inconsistent with the findings of Evenett and Venables (2002). Brenton and Newfarmer (2007) conclude that most export growth for 99 developing countries over the period 1995-2004 is due to the intensive margin, that is, an increase in exports of existing products to existing markets. Likewise, Amurgo-Pacheco and Pierola (2008) has shown that, including developed and developing countries. In contrast, Evenett and Venables (2002) suggest that extensive margin was more successful in explaining the growth of exports of developing countries between 1970 and 1997.

[36] Disdier et al. (2013) claims that growth in emerging economies' export at the extensive margin of trade has been mainly due to the upward shift in their comparative advantage and improvements to their infrastructure.

[37] Several studies have analyzed the product and country diversification (or concentration) of Turkey's trade, including Kösekahyaoğlu (2007), Bilici et al. (2008), Seymen (2009), Doğan and Kaya (2011), and Aldan et al. (2012). For example, Aldan et al. (2012) provided evidence that Turkey has successfully diversified its exports by products and destination markets during the period 2003-2011. Moreover, Kösekahyaoğlu (2007) has investigated the changes in both product and country concentration of Turkey's foreign trade over 1980-2005 period and found that product diversification has showed more dynamism than country diversification.

[38] Using highly disaggregated trade data of 18 emerging countries, Disdier et al. (2013) found that the second highest increase in the number of product-destination categories between 1996 and 2006 is observed for Turkey (89.2 percent) and the contribution of new advanced and new industrialized countries (27.2 percent) to this growth is larger than the contribution of advanced countries (62.0 percent), very similar to the findings of this study, of the relative importance of the emerging economies in the growth of the extensive margin in Turkey.

towards these new markets seems to be increased because of Turkey's proximity to these new markets and the strong domestic economic growth in these big emerging markets such as China.[39] At the same time, the number of goods exported to the traditional markets like Germany (0.79 percent) and France (1.41 percent) grew at a much slower rate than the overall extensive margin growth (5.95 percent) because Turkish exports have traditionally been strongly focused on Europe in the past and hence there is very limited opportunity to expand the export basket.

Utilizing the export dataset, which includes only observations that are present in both periods (1998 and 2011), the count method is applied to compute the price (as a proxy for quality) and quantity growth rate of Turkey's total goods exports by destination regions and countries for the period 1998 to 2011. As noted above, the growth in the intensive margin is itself given by the weighted average of the growth rates of the price and quantity components. This procedure allows assessment of whether Turkey's export growth is the result of higher prices or higher quantities. All these results (the results for the growth rates of the intensive margin are not shown to save space), by destination region and countries, are reported in Table 2b. The first striking fact is the overall growth rate of quantity component for total goods (26.82 percent) is much higher than that of price (5.40 percent). Additionally, from 1998 to 2011, the growth rate of the price component is smaller than that of the extensive margin. This shows that average quality of Turkey's exports has been slightly improved since 1998 despite the fact that Turkey switched from exporting low-tech products to high-tech products over the period, as discussed above.[40] Overall, the results thus suggest the relative contributions of the extensive margin and price component to Turkey's export growth has a

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[39] This is most likely due to the fact that fixed costs of entry to export markets declines as the market size becomes very large and also these markets are still not fully tapped.
[40] The small growth in the price component is most likely the result of depressed international prices in recent years owing to the global economic crisis.

clear downward trend in recent years but the quantity component shows an increasing trend.[41] Therefore, it is fair to conclude that Turkey's export growth is largely due to the increase in the quantity component, secondly due to the increase in the extensive margin and thirdly due to the increase in the price component.[42]

As indicated with Table 2b, the relative importance of the quantity component is high in Asia, the Middle East and Africa (40.57, 38.28 and 34.33 percent respectively). The evidence suggested that the strong growth of GDP and consumer demand in the emerging markets after the global economic crisis has led to a large increase in export volumes, while economic difficulties in American and European markets led to a small increase in export sales.[43] Furthermore, the growth rates of the quantity components vary among trading partners. In particular, the countries outside Europe and America have higher growth rates of quantity than the rest of the countries. As it can be observed in Table 2b, the growth rates of quantity component over the period are found to be highest in Iraq (73.22 percent). Other destination countries with relatively high average annual growth rates of the quantity component over the period of 1998-2011 include China (57.28 percent), Iran (39.72 percent), Belgium-Luxembourg (37.07 percent) and UAE (33.27 percent).

Next to be analyzed are the growth rates of the price component for total goods in Table 2b. Compared to the growth rate of quantity component for the world, the growth rate of price component in total goods over the past decade has been quite moderate at 5.40 percent, probably reflecting the slow recovery in the international prices after the onset of the 2008 global financial crisis. Thus, for Turkey's total goods exports, the results indicate that

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[41] The result that Turkey's export growth is mainly driven by the quantity component is in stark contrast to the results of İzmen and Yılmaz (2009) who found that strong export performance of Turkey between 1997 and 2008 is mainly due to the increase in the average international price of exports. However, they also argued that it became impossible to sustain growth in exports after the collapse of prices in international markets in 2008, that is exactly what was found in the current study. The results of the post-2001 crisis era reported in Saygılı and Saygılı (2011) also conform to the findings of İzmen and Yılmaz (2009).

[42] Similar results have been reported by Bingzhan (2011) and Gao et al. (2013) for Chinese exports.

[43] Didier et al. (2011) showed that emerging economies, but not all, did recover faster and more strongly from the 2008 global financial crisis than advanced countries, returning high growth rates more quickly.

changes in the intensive margins are mostly driven by the quantity changes rather than price changes. The results at the regional level show Africa and the Middle East have experienced much larger growth rates, averaging around 9.89 percent and 6.69 percent growth rates of the price margin per year respectively (as compared to the overall growth rate of 5.40 percent). The results reflect that stronger per capita income growth in emerging countries has boosted the demand for imports of high-quality products from Turkey. As expected, there were also found sizable differences in the growth rates of the price component across destination countries. The destination countries with the highest growth rates are Egypt (20.67 percent), UAE (15.65 percent), Syria (9.03 percent), Bulgaria (8.97 percent), and Greece (7.95 percent).

Overall, the results of the count method suggest the quantity growth rate has been the most important for Turkey's total goods export growth over 1998-2011. Although the count method is quite easy to implement, there is one disadvantage of the count method. The count method gives a rough indication of the role of each margin in the export growth because it gives equal weight to the product categories used in the calculations. A way to avoid this problem is to apply the decomposition method of export shares, which appropriately weights the product categories by their overall importance in exports to a given destination country or region.

Extensive and Intensive Margins of Turkey's Final Goods Exports

Using the count method, the growth rate of extensive margin of Turkey's final goods exports over the period 1998-2011 was also computed. The results are shown in the middle panel of Table 2a for each destination region and country. An inspection of the middle panel of Table 2a reveals the number of products Turkey exports to the world has increased from 26.0 thousand to 48.8 thousand during the study period, showing a 4.95 percent annual growth rate of the extensive margin. As is evident in Table 2a, the growth rate of the

extensive margin tends to be lower in final goods (4.95 percent) compared to intermediate goods (6.06 percent), suggesting that Turkey has tended to specialize more in producing and exporting intermediate goods during the past decade.[44] The relative importance of final goods exports in Turkey's total exports appears to be declining for a number of reasons but one of the most important is again the increasing participation of Turkish companies in global production networks.

Further, similar to the total goods, the growth rate of the extensive margin of final goods exports is much higher in the non-traditional markets (Asia, 10.53 percent; Africa, 9.51 percent; and the Middle East, 6.60 percent) than in the traditional markets (Europe, 2.19 percent; and America, 6.19 percent). With the global financial crisis, the emerging markets, particularly Asia, have become quite important destinations for Turkish final goods exports recently, due mainly to the rapid recovery in these markets, consistent with the results reported in Ando and Kimura (2012). Additionally, there are wide variations in the growth rates of extensive margins across destination countries. Table 2a indicates that the highest growth rate of extensive margin is seen for Iraq (19.62 percent). Syria (18.51 percent), China (16.45 percent), Iran (12.55 percent), and Ukraine (5.23 percent) are other important export partners with high extensive margin growth rates.

Study of the growth rates of the price component and quantity components for Turkey's final goods exports found that the price component grew moderately between 1998 and 2011 for the world (4.58 percent) while the quantity component increased significantly at 17.50 percent, as shown in the middle panel of Table 2b. Thus, the results for final goods

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[44] However, Ekmen-Özçelik and Erlat (2013) have reached the opposite conclusion; the number of primary goods (SITC 0-4) exported from Turkey to the EU have grown much more slowly than those of manufacturing goods (SITC 5-8). The difference was attributed to the classification of products into intermediate and final products. It should be noted that the current study have used the BEC classification to distinguish products into intermediate and final goods while Ekmen-Özçelik and Erlat (2013) used the Standard International Trade Classification (SITC). Most empirical studies, such as Yeats (2001), that aim to measure the degree of international fragmentation using trade statistics focus on SITC 7 and 8 categories rather than SITC 0-4 categories. Also, it is believed that the BEC has made separation of intermediate and final goods more accurate than the SITC.

suggest that export growth is caused by changes in the quantity component, changes in the extensive margin and changes in the price component, respectively, which are in line with the results of Turkey's total goods exports.[45]

Furthermore, at the regional level, changes in the price component are relatively larger for America (6.21 percent), Europe (4.90 percent), Asia (4.86 percent), and the CIS (4.62 percent), while these changes are slightly lower for the Middle East (2.24 percent) and Africa (1.00 percent). The relatively quick recovery of the export prices in advanced regions like Europe and America can be attributed to the fact that Turkish exports destined to those advanced regions have much better quality and higher prices than those destined to the emerging markets, which in turn implies that their prices are expected to be heavily depressed during the crisis but should also recover faster after the crisis, due to their larger income elasticity (Berthou and Emlinger, 2010). Further, the growth rates of the price component show substantial differences across countries, ranging from 0.55 percent to 13.65 percent. With the exception of Germany (4.56 percent) and Netherlands (4.48 percent), the growth rates of the price margin tends to be higher for developed countries, such as Belgium-Luxembourg (5.96 percent), France (6.32 percent), Italy (5.45 percent) and USA (4.85 percent).

However, in comparison with the results of the price margin at the regional level, the growth rate of the quantity margin for the Middle East (42.62 percent), Asia (31.07 percent) and Africa (30.15 percent) exhibit large growth rates compared with America (13.50 percent) and Europe (12.71 percent). For the growth rates of quantity margin, however, there was even wider variation across countries. Iraq (74.19 percent), Iran (54.55 percent), China (36.43 percent), Spain (32.86 percent) and Ukraine (32.31 percent) reported among the highest

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[45] The result is similar to the finding of Ando and Kimura (2012) who have decomposed the fall and recovery of Japanese exports into extensive and intensive margin following two massive shocks, the 2008-2008 global financial crisis and the 2011 East Japan Earthquake, and found that the recovery of machinery final goods and machinery parts and components exports mostly occurred at the quantity component of the intensive margin rather than the extensive margin.

growth rates of the quantity margin, while Syria (-1.38 percent), Germany (5.51 percent) and the Netherlands (6.40 percent) reported relatively low growth rates.

Extensive and Intensive Margins of Turkey's Intermediate Goods Exports

When examining the growth rate of extensive margin of Turkey's intermediate goods exports to the world, it was found that the extensive margin grew by 6.06 percent annually, from 38.9 thousand to 83.5 thousand, over the same period. As is evident in right panel of Table 2a, the overall growth rate of the extensive margins in intermediate goods is much higher than in final goods.[46] The data therefore indicates that Turkey's total export growth at the extensive margin is mainly driven by intermediate goods rather than final goods. This relatively quick recovery is closely tied to the increasing participation of Turkish companies in global production networks. As the global economy have begun to recover from the 2008 financial crisis, the establishment of new global production networks between Turkey and its partners has intensified, leading to the creation of new trade flows, which in turn has resulted in relatively higher growth rates in the extensive margin of intermediate goods exports.[47] This finding also suggests that Turkey's intermediate goods exports have increasingly become more sensitive to the changes in foreign demand and income due to the fragmentation of production, in line with the results of Freund (2009). Apart from the global production networks and the economic growth of its trading partners, other determinants may have played a role, including the productivity improvements of Turkish manufacturing industry and the shift in the composition intermediate goods exports toward high-quality parts.

Looking at the regional level and country level, the changes in the growth rates of the extensive margin in intermediate goods is found to be very similar to that of final goods.

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[46] In contrast, using the count method, Ekmen-Özçelik and Erlat (2013) suggest that in terms of diversifying its exports, Turkey is structurally more successful in the manufacturing industry than in primary products.
[47] The results thus support the predictions of Jing (2012) who argues that industries with higher shares of processing trade should recover quickly from the crisis than consumption goods due to the shock transmission mechanism of global production networks.

Specifically, Turkey has seen a sharp increase in intermediate goods exports to Asia (11.01 percent), Africa (10.54 percent) and the Middle East (6.98 percent). It seems the increasing globalization of production (that is international fragmentation of production activities), have induced more trade in intermediate goods between Turkey and Asian countries; this trend is particularly pronounced with respect to China. In addition, the contribution of the non-traditional markets to Turkey's extensive margin growth is relatively larger than those of traditional markets. Table 2a shows Iraq (25.46 percent) has the highest growth rate of the extensive margin in intermediate goods, but there are other partner countries with relatively high growth rates of the extensive margin too, such as China (13.88 percent), Poland (9.31 percent), Iran (8.26 percent) and Ukraine (7.51 percent).

The growth rates of the price and quantity components for Turkey's intermediate goods exports are now considered. For the world, the results shown in the right panel of Table 3 reveals the price component grew by 4.55 percent yearly from 1998 to 2011 while the quantity component grew by 28.07 percent. Overall, the results imply that the contributions of the quantity component (that is increasing exports of existing products through higher volumes), to Turkey's intermediate goods export growth is the most important followed by the extensive margin (that is exporting existing products to new destinations, and/or exporting new products to old destinations or new destinations), and then the price component (that is increasing exports of existing products through higher prices), which is broadly consistent with the results of total goods and final goods.

As can be seen in Table 2b, the results with respect to the regional level indicate that the growth rates of the price component for America (5.68 percent), Asia (5.24 percent), the Middle East (4.92 percent) and Europe (4.76 percent) are higher than its overall average, further indicating that, specializing in exports of higher quality intermediate goods to these regions has fostered price component growth. However, the growth rates of the quantity

component are larger for Asia (41.93 percent), the Middle East (36.51 percent), the CIS (34.09 percent) and Africa (29.45 percent), suggesting the establishment of the global production networks and strong economic growth in these regions has enhanced export growth through the quantity component. This pattern again underlines the fact that the recent growth in Turkey's exports to the relatively advanced countries was mainly driven by the changes in the price component, whereas Turkey's exports to the developing countries were primarily driven by the changes in the quantity component.

Furthermore, the results at the destination level show that the highest growth rates of the price component were found in Bulgaria (7.42 percent), UAE (7.38 percent), Spain (6.61 percent), Egypt (6.25 percent) and Italy (5.96 percent). Examining the growth rates of the quantity component, Iraq recorded the highest growth rates at 73.08 percent, followed by China (58.24 percent), Belgium-Luxembourg (44.76 percent), Iran (36.03 percent) and Romania (34.91 percent). As noted above, the results reflect that the structure of Turkey's exports is heavily re-oriented towards intermediate goods, making for steadily closer direct trading links with these new markets in recent years.

In summary, the results of the count method provide evidence that export growth across each product groupings in Turkey is mainly due to the quantity component. The extensive margin (both product and geographic market diversification) has also performed well. The results further suggest that Turkey needs larger contribution from price component (exports of high-quality final and intermediate goods) to achieve more rapid export growth in the future.

6.2 The results of the decomposition method of export shares

This section presents the results of the decomposition of Turkey's exports growth into extensive margins and intensive margins, and the latter further into price and quantity component for each destination country and region following the methodology of Hummels

and Klenow (2005), as defined in Section 3. A further decomposition of Turkey's export growth into the relevant margins was carried out according to the BEC classification (final goods and intermediate goods), in order to examine the heterogeneity of the growth rates in each category. The results of the second method are reported in Tables 3a-4c, with the first two columns reporting estimates for each margin (or component) and the final third column reporting the annual compound growth rates over 1998 to 2011 for each margin (or component).

Extensive and Intensive Margins of Turkey's Total Goods Exports

Table 3a presents the estimates of the extensive margin, the intensive margin and the price and quantity components of the intensive margin of Turkey's total goods exports at the destination level as well as regional level. The results suggest that growth into new products/ or new geographic markets (2.42 percent) appears to be more important than the growth on quantity component (0.89 percent) and the growth on price component (0.50 percent) in explaining Turkey's export growth.[48] Table 3a shows that Turkey has experienced a significant increase in the extensive margin of exports to the world from 46 percent in 1998 to 63 percent in 2011, with an average growth rate of 2.42 percent.[49] Several key factors that contributed to the relatively greater role of the extensive margin (particularly growth into new markets), and in explaining the rapid growth of Turkey's exports have been identified above, including the productivity improvements, the formation of the CU with the EU, the depreciation of the Turkish Lira, the need to search for new export destinations during the global financial crisis of 2008 in Europe and America, the entrance of Turkish companies into global production networks, the successful transformation of Turkey's exports from low technology and unskilled labor-intensive products to medium and high-tech products and the

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[48] By contrast, Besedes and Prusa (2010) show that new export relationships generate far less growth for developing countries due to poor survival performance of developing country exports.

[49] Using 1995 trade data, Hummels and Klenow (2005) found that the weighted average shares of the extensive and intensive margins as well as of the price and quantity components for Turkey's total goods exports to the world is 0.409, 0.035, 0.937 and 0.037, respectively (See Table A1 in Hummels and Klenow, 2005).

export diversification strategies adopted by Turkey in recent years.[50] Nevertheless, the results above suggest that the global financial crisis of 2008 in Europe and America stands out as the most important factor in explaining this rapid export growth, as it forced Turkish companies to redirect their exports towards more dynamic regions, where the purchasing power has significantly increased in recent years.

The findings of high contribution of the extensive margin to the overall export growth is in stark contrast to the results of the count method which shows the growth of the quantity component dominates that of the extensive margin.[51] One major limitation of the count method is that, unlike the Hummels and Klenow's decomposition methodology discussed earlier, it places equal weight on the product categories used in the calculations. Therefore, it seems a plausible claim that the extensive margin, particularly geographic diversification, is the main source of Turkey's export growth due to the efficiency of the Hummels and Klenow's method over the count method. The results also suggested that product and geographic diversification of Turkey's exports have not been fully realized and thus many more opportunities exist for Turkey to expand product range or expand into new markets, which in turn will bring significant benefits in the form of stable, sustainable economic growth.

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[50] High contribution of the extensive margin to Turkey's export growth has been also obtained by other research such as Aldan and Çulha (2013) and Ekmen-Özçelik and Erlat (2013). By employing the Hummels-Klenow decomposition methodology, Aldan and Çulha (2013) find that Turkey's extensive margin in product-country space without any threshold level increased very rapidly from around 45 percent in 1993 to 75 percent in 2011. Based on the methodology by Feenstra and Kee (2007), Ekmen-Özçelik and Erlat (2013) find that Turkey's extensive margin to the EU-15 market grew significantly from 74.8 percent in 1996 to 89.0 percent in 2006, indicating a growth rate of 17.33 percent. The results they obtain indicate that the majority of the Turkey's export growth is due to the extensive margin, that is, from exporting an existing product (variety) to a new destination country or a new product to old destination or new destination.

[51] The results obtained here also contradicted the results of the previous research, such as Ekmen-Özçelik and Erlat (2013) and Türkcan and Pişkin (2014). Using the decomposition methodology of Amiti and Freund (2008), Ekmen-Özçelik and Erlat (2013) found that the 96 percent of Turkey's export growth between 1996 and 2006 is due to the intensive margin rather than the extensive margin. In a recent study, Türkcan and Pişkin (2014) also analyzes the export growth of Turkey by the decomposition method of export growth rates proposed by Amiti and Freund (2008) and extended by Bingzhan (2011) and obtained that the intensive margin, particularly quantity component, plays the most important role (99% of total export growth) in Turkey's export growth between 1998 and 2011. Hence, these contradictory results suggest that researchers may come to different conclusions based on the same data if they employ different methods that can be used to determine which margin contribute most to Turkey's export growth.

In contrast, both price component and quantity component has contributed a somewhat smaller portion to the growing exports of Turkey to the world. Decomposing the intensive margin further into price and quantity components indicates that the increase in the intensive margin for Turkey's exports to the world is mainly driven by an increase in the quantity component (0.89 percent jump in the quantity component compared to 0.50 percent growth for the price component).[52] As seen in Table 3a, the price component increased from 1.018 in 1998 to 1.087 in 2011 while the quantity component rose from 0.012 to 0.014. Such a small change in the price component may suggest that the prices of Turkish exports have not risen as fast because of the collapse of international prices during the global financial crisis, the intensified competition from China and other emerging economies, and improved productivity in export sectors. This may have also occurred because Turkey's trade with emerging markets induced by the 2008 global financial crisis has risen considerably during this period. While the emerging markets are becoming increasingly important export markets for Turkish exports, the average quality of Turkey's exports would have fallen compared to the reference period because Turkish firms export relatively low quality goods to these low-income markets at lower prices, leaving only a small increase in the price component. The small increase in export prices is also attributed to the significant expansion in export quantities to these new markets which had a strong negative effect on export prices, and in turn leads to additional pressures on already depressed average prices of Turkey's exports, consistent with a negative terms-of-trade effect.[53] Global financial crises might also have contributed to increased quantity growth, as import demand is sensitive to changes in income. It is possible that prior to the global financial crisis in 2008, Turkish companies were mainly

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[52] Both Hummels and Klenow (2005) and Bingzhan (2011) find empirical evidence consistent with this last result that the intensive margin is driven by quantity growth rather than price growth, though employing different data sets.

[53] Similarly, Amiti and Freund (2008) found that Chinese export prices have declined by 12 percent between 1997 and 2005 argued that increased exports has indeed pushed down export prices, consistent with a negative terms-of-trade effect.

targeting only the more affluent parts of the world, particularly those in Europe and America. However, the global financial crisis has forced them to export more to the fast-growing emerging markets other than Europe and America, allowing Turkish firms to sell more at relatively lower prices.[54]

The evaluation of export margins at the regional level can be seen in Table 3a, from which there are several interesting features that can be drawn. The results show the extensive margin plays a more important role in the growth of Turkey's exports to Africa (9.2 percent), Asia (7.8 percent) and America (particularly Latin America, 2.7 percent) over the period, suggesting that Turkey has successfully diversified its export destinations to more distant and dynamic markets, after the global financial crisis. By contrast, the quantity component is the most important source of Turkey's export growth in the case of the Middle East (3.40 percent), Europe (3.36 percent) and the CIS (1.95 percent). This is probably due to the fact that Turkey and particularly Europe has already established nearly all country-product relationships and hence there is no room to increase the number of export relationships (in terms of new markets or products). This finding also confirms the empirical evidence that a deeper integration within the EU has induced some firms to specialize and produce more, but in fewer product lines (Badinger and Türkcan, 2014).[55] Overall, these findings suggest that the recent global financial crisis has dampened global demand which reduces prices for virtually all commodities, particularly labor-intensive manufactured goods in which Turkey has a unique comparative advantage. As result, Turkey's export revenues declined sharply because of the fall in global demand and in international prices, causing Turkish exporters to

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[54] Gros and Selçuki (2013) suggest that the decline in the EU's share in Turkey's exports from 56 percent in 2000 to 47 percent in 2011 is probably due to the relative decline of the EU economy compared to the more dynamic markets in the Middle East and other natural resource-rich countries.

[55] A closely related study in this respect is also that of Baier et al. (2013), who studies the effects of various types of economic integration agreements on the extensive and intensive margins using a panel of bilateral trade flows from 1962-2000 covering 98 percent of world exports and found that deeper integration agreements, such as customs union, common market and economic union, have larger impacts on aggregate trade flows, extensive margins and intensive margins than FTAs, but, interestingly, an even greater impact on the intensive margin than on the extensive margin, consistent with the findings of this study.

increase their export volume, headed towards new export markets at lower prices to offset the decline in its export revenues.

A further decomposition of the export margins at the country level are reported in Table 3a. The results show there is a large amount of heterogeneity of export margins across destination countries. For 11 out of 23 countries, the extensive margin plays a more important role in Turkey's exports growth over the study period and many of these destination countries are actually developing countries, with the exception of Germany.[56] The destination countries with the highest growth rates of the extensive margin are China (9.94 percent), Poland (5.68 percent), Iran (5.05 percent), Saudi Arabia (4.45 percent) and UAE (4.16 percent). On the other hand, further analysis shows a second interesting result at the destination level, for 9 out of 23 countries the changes in exports are relatively driven by the changes in quantity component rather than extensive margin or price component. The countries with the highest growth rates of the quantity component are Iraq (17.82 percent), UK (6.37 percent), China (5.21 percent), France (5.20 percent) and Spain (4.90 percent). It seems that the relative importance of the quantity component for Turkey's total goods exports increases for the traditional export markets, with the exception of China. Further, for 3 out of 23 countries such as the Netherlands (0.34 percent), Israel (1.41 percent) and USA (2.73 percent), the price component is the most important source of Turkey's export growth. This pattern underlines the fact that the recent growth in Turkey's exports to the relatively advanced countries was mainly driven by the changes in the price component, reflecting an upgrade in the quality of traded goods headed to these countries, whereas Turkey's exports to the new export markets,

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[56] This result is inconsistent with the findings of Nicita and Tumurchudur-Klok (2011) that show that the decline in global demand stemming from the economic crisis of 2008 and 2009 has affected relatively more trade at the extensive margin than the intensive margin by using the monthly data of the US imports from January 2007 to June 2009. In contrast, Berthelon (2011) shows that extensive margin is less sensitive to income fluctuations than the extensive margin using Chilean exports data from 1990 to 2007. An important caveat of these papers is that their analysis is based solely on the US imports data or the Chilean exports data and the results seem to be very sensitive to sample selection.

most of them developing countries and transition economies, were primarily driven by the changes in the quantity component.

Extensive and Intensive Margins of Turkey's Final Goods Exports

Variations in the extensive margins and the intensive margins of Turkey's final goods exports across destination regions and countries from the year of 1998 to 2011 are shown in Table 3b. The results indicate the extensive margin is also important in explaining the growth in final goods exports, yet couldn't maintain its dominant position as in the case of total goods exports. From 1998 to 2011, Turkey's final goods exports grew on average 1.36 percent per year, thus, the results suggest that extensive margin have been a major driver, but it is becoming relatively less important for Turkey's final goods exports. In addition, the results show the overall growth rates of extensive margin for final goods exports is much lower than in intermediate goods exports, implying that intermediate goods exports have been an important driver of overall export growth of Turkey.[57] This is similar to the findings of Besedes and Prusa (2006) who analyzes the role product differentiation on the duration of exporting spells and finds that differentiated goods have a higher duration (lower hazard) than homogenous products.[58]

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[57] Markusen (2013) suggests that innovations in communications, transportation and institutions have permitted a wider range of goods and services (extensive margin) to be traded recently and much of this new trade is in intermediates. He argues that this expansion of trade at the extensive margin is mainly due to the different types of fragmentation modes, such as vertical specialization, trade in tasks and off shoring.

[58] Many of the previous empirical studies on the duration of trade, including Besedes and Prusa (2006) and Chen (2012), found that differentiated goods exports last longer than homogenous goods exports while the opposite result is obtained in Obashi (2010) and Corcoles et al. (2012). Besedes and Prusa (2006) argue that search costs are lower in the case of homogenous goods because they are sold on organized markets and highly substitutable. In contrast, the search costs are higher in the case of differentiated goods because they are not sold on organized markets, not substitutable and tend to have a quality premium. Consequently, once the trade relationship has been established between the seller and buyer for a specific variety, it would be very difficult (or costly) to form another relationship for differentiated goods, leading to more stable trading relationships. As discussed in Cadot et al. (2011), this type of search cost force companies in poor countries to establish the kind of trade networks needed to export differentiated goods only progressively, leading over time a higher share of differentiated among new products than among traditional ones. Using large database of 159 countries with 17 years at the HS-6 level of product disaggregation, Cadot et al. (2011) have obtained a higher share of reference-priced and differentiated goods exports among new lines (extensive margin) than among traditional ones (intensive margin) while the opposite is true for homogenous goods exports. Additionally, they show that majority of diversification of exports in low and middle income countries is achieved along the extensive margin while in high income countries at the intensive margin.

The results of the growth rates of the price component and quantity component for Turkey's final goods exports are also presented in Table 3b. For the world, the results suggest final goods exports growth is indeed dominated by higher prices rather than by higher quantities. The price component recorded a growth of 1.85 percent annually, while the quantity component declined -1.64 percent over the period. This result stands stark contrast to that of the intermediate goods exports. The evaluation of the price and quantity component in final goods trade might be explained by the characteristics of the goods exported. Final goods are differentiated goods which are not very substitutable. From the consumer's perspective, if the prices of one producer rise, buyers don't switch to the producer offering the lowest price, which reduces price competition. This, in turn, enables final goods producers to charge higher prices to price in-sensitive customers in world markets once the markets recovered from the crisis. In contrast, producers of intermediate goods (highly substitutable products) do not readily raise their export prices because of fierce price competition among intermediate goods seller in world markets. In sum, the results show that the price component has been an important source of final goods export growth over the whole period.

In addition, Table 3b displays Turkey's export margins in final goods by destination region. As expected, for Africa (8.92 percent) and Asia (4.31 percent), export growth has occurred mainly at the extensive margin rather than the price or quantity component. By contrast, the large fraction of the growth of Turkey's final goods exports occurs through changes in the price component for America (4.73 percent) and Europe (1.59 percent). While, the greatest contribution to export growth from the quantity component came from the Middle East (4.48 percent) and the CIS (2.55 percent). Thus, as noted above in the case of total goods exports, the relatively strong growth of the price component would suggest Turkey tends to export a large variety of better-quality and higher-priced final goods to more developed regions whose buyers prefer higher quality products and are willing to pay, while

the quantity component contributed significantly to export growth in regions with lower average income. Further, it is interesting to note the quantity component was declining significantly for America, suggesting that Turkey has lost its market share of final goods exports to the countries belonging to the American region in the past decade.

Table 3b also reports these margins for the top 23 destination countries along with their annual growth rates over the past 13 years. First, the decomposition of final goods exports indicates that for 12 out of 23 countries, the extensive margin is the larger contributor to Turkey's export growth during the 1998 to 2011 period. The results therefore indicate Turkish firms have succeeded in producing new products or expanding into new markets to offset the adverse effects of the global financial crisis. The highest growth rates of the extensive margin are observed for China (8.99 percent), generating the same result obtained above for total goods exports. Other destination countries with relatively higher growth rates of the extensive margin are Iran (7.81 percent), Iraq (7.03 percent), Egypt (4.31 percent) and Poland (3.11 percent).

Moreover, the results in Table 3b indicate that for 7 out of the 23 Turkey's destination countries export growth is mainly due to the increase in the price component rather than in the extensive margin or quantity component. Destination countries that enjoy higher growth rates of the price component are Belgium-Luxembourg (8.21 percent), USA (3.11 percent), China (3.08 percent), Greece (3.06 percent) and Bulgaria (2.63 percent). However for 4 countries, the quantity component appears to be main source of export growth. Those destination countries showing substantial growth in the quantity component are Iraq (23.67 percent), Spain (3.82 percent), UK (2.16 percent) and Israel (1.48 percent). In addition, regarding the contribution of the price component to the export growth, there is a striking difference between Turkey's total goods exports and final goods exports. The relative contribution of the price component has become more prevalent for final goods exports, compared to total goods

exports reported above. Overall, the results hence confirm that the decline of the global demand prompted Turkish final goods producers to move upwards in the quality ladder, in which Turkey can still operate without severe competition coming from low-quality producers.

Extensive and Intensive Margins of Turkey's Intermediate Goods Exports

The average value and growth rates of the extensive margins and intensive margins as well as of the price and quantity components, measured across all destination regions and countries, for Turkey's intermediate goods exports over the period 1998 and 2011 are given in Table 3c. The results show the growth rates of extensive margin for intermediate goods are consistently higher than that of final goods.[59] Table 3c indicates that the extensive margin growth rate is 1.95 percent per year for intermediate goods over the period while it is just 1.36 percent for final goods.

Thus, one explanation of the higher growth rates of extensive margins might be that introducing new products or entering into new markets is less difficult in intermediate goods than in final goods due to probably lower search costs, detailed above. The higher growth rates could be also explained in part by the growing role of the fragmentation in Turkey's intermediate goods export growth in recent years. As the world markets have become increasingly integrated in the last few decades due to developments in transportation and communication technologies, the degree of product fragmentation (that is production sharing) increased across countries. Following in the footsteps of emerging economies, Turkey has also become more integrated with the rest of the world, resulting in an increase in production sharing activities in Turkey which led to an increase in the number of intermediate goods traded, as seen in Table 1.

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[59] Similarly, based on the method of Feenstra and Kee (2007), Ekmen-Özçelik (2013) found that the growth rates of the extensive margin in the primary sector are higher than those in overall and manufacturing sectors.

However, the biggest relative contribution to Turkey's intermediate goods exports over this time interval comes mainly from the quantity component; the quantity component grew at 2.47 percent per year in 1998-2011 as compared to the growth rate of the extensive margin of 1.95 percent. It seems existing trade relationships (intensive margin) are the main drivers of Turkey's intermediate goods exports growth during the period, suggesting that establishing trade relationships with new markets is much more difficult because of increasing competitive pressures stemming from rival exporting countries and substitutability nature of inputs in general, as discussed in more detail above. It is interesting to see the price component has declined -0.02 percent over this period, which is the opposite direction of final goods exports. It seems that intermediate goods producers in Turkey have extensively adjusted their prices in the world markets to compete for shrinking export markets. By contrast, with no close substitutes and substantial monopoly power over their differentiated products, final goods producers are less willing to make price adjustments to protect their markets shares, resulting in relatively higher prices, as has already been reported in the analysis of final goods exports.

In sum, the results clearly shows that most of the growth in Turkey's intermediate goods exports is not only coming from extensive margin (exports of new products being introduced to existing destinations, or from exports of existing products being sent to new destinations), and but also from quantity component (exports of existing products sent to existing destinations by higher quantities), while the latter one appears to have been more dominant in driving export growth. Hence, the results obtained by the decomposition method of export shares authenticate the findings of the count method which shows a very large increase in the number of varieties being exported to each destination country and even larger increase in the quantity component.

Results for the decomposition of Turkey's intermediate goods exports at the destination region level reported in Table 3c suggest the extensive margin plays the dominant role in export growth for three regions, Africa (9.25 percent), Asia (7.83 percent) and the Middle East (6.11 percent). This finding implies international production fragmentation has certainly played a pivotal role in the growth of Turkey's intermediate goods exports with these low-cost regions, especially Asia in which production sharing has developed so much in recent years (Ando, 2006). This finding also supports the anecdotal evidence that Turkish companies, in response to the global financial crisis which has hit the US and Europe un-proportionally hard, have been forced to re-orient their exports away from Western markets towards emerging markets in Africa, Asia and the Middle East. By contrast, the quantity component has been more dominant in driving intermediate goods exports growth for three regions, namely America (4.68 percent), Europe (4.53 percent) and the CIS (3.14 percent). The extensive margin has only a very small impact on the growth of Turkey's intermediate goods exports because Turkey and its traditional partners like Europe and America have already established most country-product relationships possible and hence there is no room for improvement along the extensive margin. Thus, existing trade relationships (particularly the quantity component of the intensive margin) are the main drivers of Turkey's export growth with these traditional partners.

Examination of the results at the regional level further shows that for regions, such as Asia, Africa and the Middle East, both price and quantity components have declined over the period, but the decline of quantity component was more severe. Results show that the onset of the global recession in 2008 and the subsequent decline in global demand led to the drastic fall in prices and volumes of Turkey's intermediate goods exports directed to Asia, Africa and the Middle East in recent years. Consequently, to compensate for the fall in prices and quantities directed to these regions, Turkish companies have made significant progress in

diversifying their exports, as seen in Table 3c. Attempts at diversification towards the emerging markets have made it possible for Turkish companies to buffer against the global price and demand fluctuations in times of uncertainty and economic turmoil.

Using the same set of 23 destination countries, Table 3c provides information on how Turkey's export margins on intermediate goods have changed over the 13-year period, in an attempt to highlight differences between advanced and developing countries. Despite the fact there are wide variations in growth rates of each margin across destination countries, it is obvious the main driver of the export growth in intermediate goods was generally quantity component for advanced countries and the extensive margin for the developing countries. Data shows the dominance of the quantity component for 9 destination countries, 8 of whom are classified as advanced countries, while for 12 out of 23 countries, 11 of whom are classified as developing countries, the extensive margin is found to take the dominant role in export growth. Iraq has the highest growth rates of the extensive margin at 22.6 percent, followed by China (8.9 percent), Bulgaria (5.2 percent), Iran (4.6 percent) and Poland (4.2 percent). In contrast, Belgium-Luxembourg recorded the highest growth rate of the quantity component (9.38 percent), followed by Iraq (7.06 percent), China (6.52 percent), UK (4.81 percent) and France (4.67 percent). Thus, the results point out that intermediate goods trade between Turkey and developed countries are much more likely shaped by trade in already established relationships while the situation is reversed with developing countries, that is, by the extensive margin.

The results further indicate that Turkey was able to increase its intermediate goods exports to those developed countries by exploiting its established trade relationships with more export volume and in some cases lower export prices. It seems that Turkish companies are less concerned with the possibility of lower prices in order to expand its exports (or keep its exports of goods stable), via the quantity component because the destination countries

where they were selling their products experienced lower rates of economic growth. In contrast, the results indicate that Turkish companies have expanded their exports to developing countries through higher export prices and in most cases lower export volumes. The implication is also that Turkish companies may opt to widen profit margins by charging higher export prices (less concerned about market share), to fastest-growing economies in emerging and newly developed markets where demand for intermediate goods is growing due to robust economic growth. As a result, Turkish intermediate goods producers are moving up the quality ladder to extract more profits from developing countries whereas they are moving down the quality ladders to maintain its competitiveness in developed countries. Summing up, these figures suggest international production activities and the onset of the global financial crisis had a strong influence on the patterns of Turkey's intermediate goods trade in recent years.

7. Conclusions

Turkey has experienced remarkable export growth, averaging 13.30 percent per year from 1998 to 2011, far higher than the world average over the same period. By using data on Turkey's exports of total goods, final goods and intermediate goods to 209 countries over the period 1998 to 2011, this study decomposes this remarkable export growth into the extensive margin and the intensive margin, with the latter further divided into price and quantity components. In this paper, two methodologies were adopted, namely the count method and the decomposition method of export shares developed by Hummels and Klenow (2005) in order to quantify the role of these three margins in Turkey's export growth.

The results obtained by the count method indicate export growth across each product category is mainly due to the quantity component, that is increasing volumes of existing products to existing market. Additionally, extensive margin, that is product and/or geographic diversification, has also performed well. However, the results of the decomposition method of

export shares show that extensive margin was the key driver of Turkey's total export growth over the period under consideration. The results from the second method further point out that growth in Turkey's final goods was driven by price growth, whereas growth in intermediate goods exports was mainly explained by quantity growth. The extensive margin has nevertheless remained an important source of Turkey's export growth across both product categories. Despite some differences, it seems a reasonable claim that the extensive margin, particularly geographic diversification, is the main source of Turkey's export growth due to the efficiency of the Hummels and Klenow's method over the count method. Yet the results also suggested that product and geographic diversification of Turkey's have not been fully realized and thus many more opportunities exist for Turkey to expand product range or expand into new markets, which in turn will bring significant benefits in the form of stable, sustainable economic growth.

Though Turkey has achieved remarkable export growth, particularly via extensive margin, over the past decade, it lags behind the BRIC economies (Brazil, Russia, China, and India) in terms of export values and export diversification. The evidence shows that Turkey's exports are still heavily concentrated on traditional markets even though Turkey's exports to the Asian, the Middle Eastern and African countries have been on a steady growth path over the past decade. Such a heavy concentration of exports in a few markets can make Turkey extremely vulnerable to external shocks, which in turn have adverse consequences for economic activity and financial stability. In order to mitigate these risks, Turkey should diversify its exports outside these traditional markets. The findings further suggest that Turkey has failed to achieve a substantial degree of product diversification during the study period. Lack of diversification may also increase Turkey's exposure to external shocks, which in turn results in greater instability in export earnings. Accordingly, Turkey should take appropriate policy actions and measures in diversifying its product base and geographical

scope, because concentration on a few markets or products cannot ensure long-term sustainable export growth and thereby economic growth.

Thus, Turkey should urgently take the following measures to promote export diversification. Policy-makers should use industrial and investment policies to gain a competitive advantage in sectors through which the country has the potential to compete in foreign markets. Policy instruments include tax and direct credit incentives, selective export subsidies, special tax privileges to attract FDI into non-traditional sectors, and local content requirements. Turkey should particularly focus policies on encouraging investments in higher-value-added export sectors, such as chemicals, pharmaceuticals, consumer electronics, motor vehicle and machinery, and equipment. Such a move towards higher-technology activities will improve Turkey's export competitiveness and foster export diversification, thereby reduce its vulnerability to external shocks.

Meanwhile, Turkey should aim to use export promotion agencies more effectively in order to enable Turkish firms to penetrate in a wide range of markets. By providing local firms with a broad range of services, such as, counseling, export assistance services and sponsoring their participation in international trade missions and fairs, export promotion agencies may remove any information asymmetries that have hindered the diversification of exports (Brenton et al., 2009). In addition, Turkey should provide a wide range of financial services at lower costs for new and small exporters who might have the potential to develop new export lines. In addition, it is important for Turkey to facilitate trade by simplifying and harmonizing custom procedures, which is essential for decreasing the cost of exports, thus enabling Turkish companies to export more and diversify its exports.

The findings further revealed relatively modest contribution of the intensive margin in the growth of Turkey's exports over the years in the sample period. This finding implies that measures aimed at stimulating export growth need to not only focus on penetrating in a wide

range of markets, but also sustaining its export expansion along the existing products over time (that is export growth at the intensive margin) because export survival is an important factor for successful export growth, particularly for developing countries (Besedes and Prusa, 2010). Turkey should engage in industrial and investment policies to increase productivity and also encourage the quality improvements of existing products to differentiate products from competitors' products (Brenton and Newfarmer, 2007). The presence of uncertainty for potential exporters can significantly reduce the probability of survival in export markets, therefore, export promotion agencies should be directed to provide information about destination countries and partner firms in order to minimize informational gaps and uncertainties (Besedes and Prusa, 2010). The policies should also help local companies to gain information about the technical norms and standards of the target market in order to access new markets. Furthermore, Turkey should establish institutional structures to ensure the efficient regulation and enforcement of contracts between exporters and importers, because stricter enforcement of contracts also increases the survival of new trade relationships (Gonzalez and Cirera, 2012).

This paper also found that growth in price component (assuming a high price means higher quality), has started to lag behind the growth in quantity component, where the main growth in price component is through export trade in final goods. This implies further steps are needed (on a policy level), to encourage higher quality production, (whether to produce intermediate or final goods), which in turn implies the need for a more highly skilled labor force. While some progress has been made in this area, shortage of a skilled trained labor force is still a major constraint on the ability for Turkey to export technologically sophisticated high-quality products. Skills shortages which reduce Turkey's ability to innovate new products, development or adaptation of the new technology and upgrade the quality of Turkey's exports can be addressed and resolved through better education,

appropriate training and labor market policies (Lall, 2000). Export growth through the price component may lead an improvement in quality, which enhances Turkey's competitiveness in export markets and expands its export volume.

Turkey must also focus on improving its infrastructure, such as communications technology, transportation and logistics, port facilities, and energy. Efficient infrastructure reduces the cost per transaction while enabling local firms to ship goods on time and in good condition, which are a crucial element for full integration into global value chains (Athukorala and Yamashita, 2006). In other words, there are significant pay-offs for improving the infrastructure in Turkey as reliable and inexpensive infrastructure is important in inducing fragmentation. The findings of this study further imply that policies which generate favorable economic conditions for FDI flows into Turkey can lead to important gains in terms of exports and export diversification if these flows are primarily driven by international production of fragmentation (Türkcan and Ateş, 2011). Additionally, Turkey should extensively engage in bilateral free trade agreements like FTAs with new emerging markets to spur the export in parts and components because FTAs can support FDIs inflows and international production of fragmentation through the further elimination of cross-border barriers. Overall, a combination of these policies would help Turkey to diversify its product range and geographic scope, improve the quality of its exports, foster export growth, stabilize its export earnings, attract more FDI inflows and thereby leading to sustainable long-run economic growth.

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Appendix

Table A1. List of countries and geographical composition of each region

Africa	Sudan	Saint Kitts& Nevis	Vanuatu	Latvia
Algeria	Togo	Anguilla	New Zealand	Lithuania
Angola	Tunisia	Saint Lucia	Niue	Malta
Burundi	Uganda	St. Pierre& Miquelon	No.Mariana Isds.	Netherlands
Cameroon	Egypt	St. Vincent &Grenadines	FS Microneasia	Norway
Cape Verde	Tanzania	Suriname	Marshall Isds	Poland
Central Afr. Rep.	Burkina Faso	Trinidad and Tobago	Palau	Portugal
Chad	Zambia	Turks&Caicos Isds.	Pakistan	Romania
Comoros	**America**	USA	Papua N. Guinea	San Marino
Congo	Antigua& Barbuda	Uruguay	Philippines	Slovak Rep.
Congo Dem. Rep.	Argentina	Venezuela	Pitcairn	Slovenia
Benin	Bahamas	Br. Virgin Isds.	Timor-Leste	Spain
Equatorial Guinea	Barbados	**Asia**	India	Sweden
Ethiopia	Bermuda	Afghanistan	Singapore	Switzerland
Eritrea	Bolivia	American Samoa	Viet Nam	UK
Djibouti	Brazil	Australia	Thailand	**Middle East**
Gabon	Belize	Bangladesh	Tokelau	Bahrain
Gambia	Canada	Bhutan	Tonga	Palestine
Ghana	Cayman Isds.	Solomon Isds.	Tuvalu	Iran
Guinea	Chile	Brunei	Wallis& Futuna	Iraq
Côte d'Ivoire	Colombia	Myanmar	Samoa	Israel
Kenya	Costa Rica	Cambodia	**Europe**	Jordan
Liberia	Cuba	Sri Lanka	Albania	Kuwait
Libya	Dominica	China	Andorra	Lebanon
Madagascar	Dominican Republic	Christmas Isds.	Austria	Oman
Malawi	Ecuador	Cook Isds.	Belgium-Lux.	Qatar
Mali	El Salvador	Fiji	Bosnia&Herzeg.	Saudi Arabia
Mauritania	Falkland Isds.	French Polynesia	Bulgaria	Syria
Mauritius	So. Geo& So. Sand. Isds.	Kiribati	Croatia	UAE
Morocco	Grenada	Guam	Cyprus	Yemen
Mozambique	Guatemala	Hong Kong	Czech Rep.	**CIS**
Niger	Guyana	Indonesia	Denmark	Azerbaijan
Nigeria	Haiti	Japan	Estonia	Armenia
Guinea-Bissau	Honduras	North Korea	Finland	Belarus
Rwanda	Jamaica	South Korea	France	Georgia
Saint Helena	Mexico	Laos	Germany	Kazakhstan
Sao Tome &Principe	Montserrat	Macao	Gibraltar	Kyrgyz Republic
Senegal	Neth. Antilles	Malaysia	Greece	Moldova
Seychelles	Aruba	Maldives	Greenland	Russia
Sierra Leone	Nicaragua	Mongolia	Hungary	Tajikistan
Somalia	Panama	Nauru	Iceland	Turkmenistan
So. Afr. Customs U.	Paraguay	Nepal	Ireland	Ukraine
Zimbabwe	Peru	New Caledonia	Italy	Uzbekistan

Notes: The country composition of regions is based on the World Trade Organization's analytical regions. CIS stands for Commonwealth of Independent States.

Table A2. *The United Nations Broad Economic Categories classification scheme*

Commodity categories	End-Use classes
1. Food categories	
11. Primary	
111. Mainly for industry	Intermediate goods
112. Mainly for household consumption	Consumption goods
12. Processed	
121. Mainly for industry	Intermediate goods
122. Mainly for household consumption	Consumption goods
2. Industrial supplies not elsewhere specified	
21. Primary	Intermediate goods
22. Processed	Intermediate goods
3. Fuels and lubricants	
31. Primary	Intermediate goods
32. Processed	Intermediate goods
321. Motor Spirit	Not classified
322. Other	Intermediate goods
4. Capital goods (except transport equipment), parts, and accessories thereof	
41. Capital goods (except transport equipment)	Capital goods
42. Parts and accessories	Intermediate goods
5. Transport equipment, parts and accessories thereof	
51. Passenger motor cars	Not classified
52. Other	
521. Industrial	Capital goods
522. Non-industrial	Consumption goods
53. Parts and accessories	Intermediate goods
6. Consumer goods not elsewhere specified	
61. Durable	Consumption goods
62. Semi-durable	Consumption goods
63 Non-durable	Consumption goods
7. Goods not elsewhere specified	Not classified

Table 1. The growth rate of Turkey's exports by main destination countries, regions and product groups (in million U.S. dollars), 1998-2011

Country	Total goods			Final goods			Intermediate goods		
	1998	2011	Growth	1998	2011	Growth	1998	2011	Growth
Azerbaijan	310	1,852	14.74	131	475	10.40	120	1,008	17.79
Belg-Lux	741	4,060	13.98	410	1,020	7.26	311	1,679	13.85
Bulgaria	159	1,531	19.04	42	289	16.10	95	1,104	20.77
China	47	2,520	35.91	5	195	32.81	38	2,212	36.80
France	1,570	7,518	12.80	1,010	2,798	8.15	491	2,123	11.92
Germany	5,965	15,476	7.61	4,341	7,470	4.26	1,412	6,422	12.36
Greece	386	1,625	11.68	90	444	13.08	276	922	9.71
Iran	266	3,822	22.75	22	792	31.78	230	2,493	20.10
Iraq	11	8,298	66.82	6	3,469	63.88	4	4,140	69.51
Israel	437	1,112	7.45	82	255	9.15	342	428	1.75
Italy	1,730	8,248	12.77	503	2,080	11.54	1,103	4,127	10.69
Netherlands	1,006	3,063	8.95	740	1,467	5.41	225	1,158	13.42
Poland	234	2,248	18.99	126	699	14.11	105	1,055	19.44
Romania	303	2,738	18.46	104	412	11.20	169	1,916	20.53
Russia	991	6,288	15.27	601	2,483	11.54	335	2,469	16.61
Saudi Arabia	472	2,694	14.34	231	739	9.36	227	1,587	16.13
Spain	625	4,517	16.44	224	2,170	19.08	361	1,607	12.18
Syria	308	1,470	12.78	71	193	8.04	173	891	13.43
UAE	229	3,649	23.71	78	1,051	22.17	143	1,651	20.73
Ukraine	273	1,583	14.47	137	544	11.17	117	744	15.28
Egypt	467	3,065	15.58	171	322	4.96	226	1,741	17.00
UK	1,931	8,500	12.07	1,092	4,037	10.58	753	3,105	11.52
USA	2,307	4,333	4.97	1,172	1,249	0.49	1,009	2,324	6.62
Europe	16,939	71,566	11.72	9,912	27,469	8.16	6,140	29,814	12.92
Asia	983	8,517	18.06	188	1,428	16.88	717	5,889	17.58
Africa	1,840	11,262	14.95	690	1,985	8.47	906	6,432	16.27
America	2,823	7,925	8.27	1,308	1,876	2.81	1,355	4,591	9.84
CIS	2,255	14,815	15.58	1,084	4,972	12.43	904	7,035	17.10
Middle East	2,323	23,698	19.56	636	7,229	20.56	1,504	12,670	17.81
World	27,164	137,783	13.30	13,817	44,961	9.50	11,527	66,430	14.42

Notes: The sum of export values of final products and intermediate products is not equal to total exports since some BEC categories (321, 51, and 7) cannot be categorized into intermediate and final goods. Growth represents Annual Compound Growth Rate (ACGR) over a 13-year period and is calculated using a formula similar to equation (2).
Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.

Table 2a. The growth rate of Turkey's extensive margin by main destination countries, regions and product groups, 1998-2011

Country	Total goods			Final goods			Intermediate goods		
	EM^I_{jmt}	EM^I_{jmt+1}	$g_{EM^I_{jm}}$	EM^I_{jmt}	EM^I_{jmt+1}	$g_{EM^I_{jm}}$	EM^I_{jmt}	EM^I_{jmt+1}	$g_{EM^I_{jm}}$
Azerbaijan	1,927	3,017	3.51	555	796	2.81	1,014	1,690	4.01
Belg-Lux	1,596	2,153	2.33	587	677	1.10	836	1,170	2.62
Bulgaria	1,696	2,574	3.26	507	637	1.77	934	1,518	3.81
China	268	1,657	15.04	62	449	16.45	177	959	13.88
France	1,946	2,335	1.41	661	725	0.71	1,052	1,210	1.08
Germany	2,817	3,121	0.79	872	864	-0.07	1,535	1,768	1.09
Greece	1,612	2,392	3.08	498	685	2.48	924	1,370	3.08
Iran	973	3,044	9.17	138	642	12.55	665	1,867	8.26
Iraq	175	2,897	24.10	81	832	19.62	82	1,564	25.46
Israel	1,468	1,273	-1.09	435	443	0.14	845	546	-3.30
Italy	2,031	2,658	2.09	541	693	1.92	1,192	1,526	1.92
Netherlands	1,814	2,247	1.66	657	728	0.79	916	1,190	2.03
Poland	716	2,023	8.32	305	580	5.07	351	1,116	9.31
Romania	2,149	2,599	1.47	608	673	0.78	1,177	1,496	1.86
Russia	2,598	2,674	0.22	799	695	-1.07	1,390	1,516	0.67
Saudi Arabia	1,106	2,114	5.11	439	631	2.83	488	1,083	6.32
Spain	1,309	2,168	3.96	417	593	2.75	734	1,244	4.14
Syria	723	1,948	7.92	51	464	18.51	522	1,149	6.26
UAE	855	1,819	5.98	329	600	4.73	408	897	6.25
Ukraine	949	2,155	6.51	300	582	5.23	474	1,215	7.51
Egypt	1,137	2,461	6.12	315	573	4.71	626	1,484	6.86
UK	2,207	2,671	1.48	694	793	1.03	1,197	1,466	1.57
USA	1,632	1,910	1.22	574	606	0.42	860	1,009	1.24
Europe	36,166	55,609	3.36	13,543	17,952	2.19	18,238	29,281	3.71
Asia	4,384	17,845	11.40	1,476	5,435	10.55	2,382	9,257	11.01
Africa	7,586	28,032	10.58	2,536	8,263	9.51	3,918	14,410	10.54
America	4,744	11,789	7.25	1,702	3,716	6.19	2,580	6,074	6.81
CIS	13,265	23,864	4.62	3,866	6,728	4.35	6,999	13,013	4.89
Middle East	9,038	22,250	7.18	2,930	6,722	6.60	4,805	11,547	6.98
World	75,183	159,389	5.95	26,053	48,816	4.95	38,922	83,582	6.06

Notes: The extensive margin (equation 1) refers to the number of products exported from Turkey to each destination country or region. The growth rates of the bilateral and multilateral extensive margin were calculated with the help of equation (2).
Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.

Table 2b. Growth rates of the price and quantity margin in Turkey's exports by main destination countries, regions and product groups, 1998-2011

Country	Total goods		Final goods		Intermediate goods	
	$g_{P^I_{jmi}}$	$g_{Q^I_{jmi}}$	$g_{P^I_{jmi}}$	$g_{Q^I_{jmi}}$	$g_{P^I_{jmi}}$	$g_{Q^I_{jmi}}$
Azerbaijan	0.23	31.15	1.38	25.22	-0.63	34.24
Belg-Lux	4.60	37.07	5.96	10.27	3.92	44.76
Bulgaria	8.97	28.28	13.65	14.15	7.42	32.66
China	3.25	57.28	8.10	36.43	3.16	58.24
France	4.92	26.12	6.32	8.40	4.67	22.88
Germany	4.41	12.02	4.56	5.51	4.34	16.60
Greece	7.95	19.90	4.79	23.46	4.44	20.79
Iran	3.16	39.72	3.28	54.55	2.75	36.03
Iraq	3.86	73.22	1.36	74.19	5.80	73.08
Israel	5.07	16.63	3.66	17.51	5.22	14.34
Italy	5.77	28.85	5.45	17.09	5.96	16.13
Netherlands	6.10	15.15	4.48	6.40	5.57	19.71
Poland	4.98	28.76	7.52	25.23	2.81	32.18
Romania	4.79	31.38	6.22	13.94	4.82	34.91
Russia	4.07	29.58	4.96	20.02	3.94	34.69
Saudi Arabia	4.97	20.59	1.16	14.96	5.36	21.21
Spain	3.77	28.14	1.69	32.86	6.61	19.05
Syria	9.03	15.04	5.05	-1.38	3.75	27.67
UAE	15.65	33.27	2.92	19.14	7.38	13.46
Ukraine	3.77	32.32	0.55	32.31	1.25	31.28
Egypt	20.67	30.64	2.73	16.95	6.25	17.58
UK	4.29	20.62	4.24	13.09	4.56	21.70
USA	5.89	24.60	4.85	12.51	5.25	18.77
Europe	4.90	22.02	4.90	12.71	4.76	22.89
Asia	5.58	40.57	4.86	31.07	5.24	41.93
Africa	9.89	34.33	1.00	30.15	3.37	29.45
America	6.16	26.30	6.21	13.50	5.68	24.37
CIS	3.82	30.41	4.62	23.91	2.87	34.09
Middle East	6.69	38.28	2.24	42.62	4.92	36.51
World	5.40	26.82	4.58	17.50	4.55	28.07

Notes: The weighted annual growth rates of price and quantity margin of the common products were obtained with the help of equation (4), where the weights are the export value shares of the product categories in total exports of Turkey to destination country/region in period 2011.
Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.

Table 3a. Decomposition of Turkey's export shares into extensive margin, price and quantity component by main destination countries and region, total goods trade, 1998-2011

Country	EM^{II}_{jmt}	EM^{II}_{jmt+1}	$g_{EM^{II}_{jm}}$	IM^{II}_{jmt}	IM^{II}_{jmt+1}	$g_{IM^{II}_{jm}}$	P^{II}_{jmt}	P^{II}_{jmt+1}	$g_{P^{II}_{jm}}$	Q^{II}_{jmt}	Q^{II}_{jmt+1}	$g_{Q^{II}_{jm}}$
Azerbaijan	0.767	0.834	0.641	0.318	0.170	-4.706	1.681	0.794	-5.604	0.189	0.214	0.952
Belg-Lux	0.465	0.627	2.331	0.010	0.014	2.556	1.291	1.133	-0.998	0.008	0.013	3.590
Bulgaria	0.501	0.818	3.838	0.061	0.067	0.682	0.779	0.891	1.034	0.078	0.075	-0.348
China	0.164	0.562	9.941	0.003	0.004	2.219	1.258	0.864	-2.848	0.002	0.004	5.215
France	0.610	0.722	1.305	0.009	0.017	4.867	0.904	1.113	1.612	0.010	0.015	3.203
Germany	0.761	0.792	0.314	0.018	0.018	-0.052	0.971	0.990	0.149	0.019	0.018	-0.200
Greece	0.527	0.622	1.286	0.024	0.044	4.666	0.691	0.869	1.780	0.035	0.051	2.835
Iran	0.435	0.826	5.052	0.041	0.061	3.207	0.912	1.090	1.380	0.045	0.056	1.803
Iraq	0.242	0.959	11.183	0.032	0.287	18.354	0.973	1.032	0.449	0.033	0.278	17.824
Israel	0.528	0.618	1.211	0.046	0.042	-0.842	0.987	1.185	1.414	0.047	0.035	-2.225
Italy	0.616	0.769	1.718	0.014	0.021	3.333	0.846	1.016	1.418	0.016	0.021	1.888
Netherlands	0.608	0.636	0.341	0.010	0.009	-0.662	1.096	1.146	0.345	0.009	0.008	-1.003
Poland	0.318	0.651	5.680	0.016	0.017	0.525	0.865	1.003	1.150	0.018	0.017	-0.619
Romania	0.697	0.793	0.996	0.037	0.051	2.377	0.740	0.787	0.468	0.050	0.064	1.900
Russia	0.698	0.763	0.696	0.028	0.027	-0.222	0.894	0.927	0.278	0.032	0.030	-0.499
Saudi Ar.	0.401	0.706	4.459	0.040	0.030	-2.050	0.986	0.981	-0.038	0.040	0.031	-2.012
Spain	0.484	0.726	3.177	0.010	0.019	5.387	0.946	1.004	0.460	0.010	0.019	4.905
Syria	0.456	0.728	3.668	0.183	0.127	-2.757	0.969	0.974	0.039	0.188	0.130	-2.795
UAE	0.449	0.764	4.167	0.023	0.033	2.710	0.999	1.137	1.002	0.023	0.029	1.691
Ukraine	0.354	0.544	3.359	0.058	0.035	-3.873	0.881	0.990	0.903	0.066	0.035	-4.734
Egypt	0.501	0.636	1.857	0.057	0.072	1.790	0.955	1.158	1.488	0.060	0.063	0.297
UK	0.737	0.789	0.533	0.009	0.018	5.502	1.011	0.908	-0.824	0.009	0.020	6.379
USA	0.559	0.641	1.062	0.005	0.004	-1.549	0.992	1.409	2.733	0.006	0.003	-4.169
Europe	0.597	0.728	1.545	0.013	0.022	3.749	0.868	0.911	0.375	0.015	0.024	3.362
Asia	0.206	0.547	7.811	0.006	0.004	-3.000	1.367	1.357	-0.055	0.005	0.003	-2.947
Africa	0.106	0.335	9.285	0.073	0.062	-1.183	1.644	1.203	-2.371	0.044	0.052	1.217
America	0.323	0.458	2.729	0.009	0.010	0.466	1.014	1.359	2.278	0.009	0.007	-1.772
CIS	0.412	0.498	1.463	0.040	0.052	1.950	1.292	1.292	0.000	0.031	0.040	1.950
Middle East	0.487	0.654	2.296	0.079	0.107	2.369	1.313	1.151	-1.005	0.060	0.093	3.408
World	0.467	0.638	2.425	0.012	0.015	1.408	1.018	1.087	0.508	0.012	0.014	0.895

Notes: For period t, EM^{II}_{jmt} represents the extensive margin (eq. 5), IM^{II}_{jmt} is the intensive margin (eq. 6), P^{II}_{jmt} is the price component (eq. 8), and Q^{II}_{jmt} is the quantity component (eq. 7). $g_{EM^{II}_{jm}}$, $g_{IM^{II}_{jm}}$, $g_{P^{II}_{jm}}$, and $g_{Q^{II}_{jm}}$ are the growth rates of the extensive margin, intensive margin, price component and quantity component. A formula similar to equation (2) was used to calculate the growth rates of each margin.
Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.

Table 3b. Decomposition of Turkey's export shares into extensive margin, price and quantity component by main destination countries and region, final goods trade, 1998-2011

Country	EM^{II}_{jmt}	EM^{II}_{jmt+1}	$g_{EM^{II}_{jm}}$	IM^{II}_{jmt}	IM^{II}_{jmt+1}	$g_{IM^{II}_{jm}}$	P^{II}_{jmt}	P^{II}_{jmt+1}	$g_{P^{II}_{jm}}$	Q^{II}_{jmt}	Q^{II}_{jmt+1}	$g_{Q^{II}_{jm}}$
Azerbaijan	0.766	0.904	1.282	0.344	0.169	-5.345	1.273	0.655	-4.983	0.271	0.257	-0.381
Belg-Lux	0.638	0.795	1.713	0.020	0.015	-2.304	0.985	2.748	8.213	0.020	0.005	-9.719
Bulgaria	0.718	0.614	-1.196	0.070	0.095	2.438	0.601	0.843	2.637	0.116	0.113	-0.194
China	0.171	0.524	8.997	0.005	0.007	2.763	0.809	1.200	3.080	0.006	0.006	-0.308
France	0.651	0.822	1.808	0.024	0.024	-0.013	0.964	1.318	2.439	0.025	0.018	-2.394
Germany	0.884	0.868	-0.137	0.050	0.040	-1.619	0.929	1.134	1.546	0.054	0.036	-3.117
Greece	0.517	0.702	2.376	0.022	0.037	4.064	0.621	0.920	3.068	0.036	0.040	0.966
Iran	0.302	0.802	7.813	0.066	0.088	2.260	0.795	1.074	2.340	0.083	0.082	-0.079
Iraq	0.405	0.981	7.053	0.024	0.335	22.602	1.173	1.047	-0.867	0.020	0.320	23.674
Israel	0.669	0.787	1.258	0.033	0.045	2.387	1.006	1.129	0.889	0.033	0.040	1.485
Italy	0.532	0.754	2.721	0.025	0.027	0.574	0.982	1.334	2.386	0.026	0.020	-1.769
Netherlands	0.715	0.780	0.666	0.029	0.020	-3.042	1.157	1.214	0.375	0.026	0.016	-3.404
Poland	0.509	0.758	3.110	0.032	0.026	-1.637	0.830	0.918	0.782	0.039	0.028	-2.400
Romania	0.792	0.817	0.235	0.063	0.042	-3.092	0.779	0.641	-1.490	0.081	0.066	-1.626
Russia	0.737	0.747	0.096	0.047	0.041	-1.051	0.869	0.965	0.805	0.054	0.043	-1.840
Saudi Ar.	0.564	0.755	2.270	0.060	0.037	-3.730	1.053	1.063	0.068	0.057	0.034	-3.795
Spain	0.514	0.743	2.875	0.017	0.038	6.112	0.901	1.197	2.207	0.019	0.031	3.821
Syria	0.551	0.715	2.030	0.244	0.098	-6.746	0.944	0.990	0.373	0.258	0.099	-7.093
UAE	0.583	0.863	3.061	0.022	0.032	2.840	0.995	1.249	1.765	0.022	0.026	1.057
Ukraine	0.586	0.747	1.889	0.099	0.053	-4.759	0.901	0.896	-0.045	0.110	0.059	-4.716
Egypt	0.428	0.741	4.319	0.175	0.053	-8.830	1.140	1.124	-0.113	0.153	0.047	-8.727
UK	0.772	0.831	0.568	0.022	0.032	2.936	0.895	0.986	0.752	0.024	0.032	2.168
USA	0.690	0.824	1.373	0.010	0.005	-5.967	1.133	1.687	3.111	0.009	0.003	-8.804
Europe	0.677	0.748	0.779	0.031	0.034	0.872	0.793	0.975	1.599	0.038	0.035	-0.715
Asia	0.316	0.547	4.317	0.004	0.007	3.962	1.718	2.510	2.958	0.002	0.003	0.975
Africa	0.138	0.420	8.926	0.085	0.059	-2.720	2.328	1.134	-5.385	0.037	0.052	2.817
America	0.521	0.508	-0.200	0.017	0.012	-2.486	1.149	2.096	4.736	0.015	0.006	-6.895
CIS	0.682	0.697	0.161	0.057	0.085	3.131	1.223	1.316	0.564	0.047	0.065	2.553
Middle East	0.586	0.814	2.559	0.084	0.110	2.079	1.543	1.140	-2.304	0.054	0.096	4.487
World	0.612	0.730	1.361	0.024	0.024	0.187	0.995	1.264	1.859	0.024	0.019	-1.642

Notes: For period t, EM^{II}_{jmt} represents the extensive margin (eq. 5), IM^{II}_{jmt} is the intensive margin (eq. 6), P^{II}_{jmt} is the price component (eq. 8), and Q^{II}_{jmt} is the quantity component (eq. 7). $g_{EM^{II}_{jm}}$, $g_{IM^{II}_{jm}}$, $g_{P^{II}_{jm}}$, and $g_{Q^{II}_{jm}}$ are the growth rates of the extensive margin, intensive margin, price component and quantity component. A formula similar to equation (2) was used to calculate the growth rates of each margin.

Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.

Table 3c. Decomposition of Turkey's export shares into extensive margin, price and quantity component by main destination countries and region, intermediate goods trade, 1998-2011

Country	EM^{II}_{jmt}	EM^{II}_{jmt+1}	$g_{EM^{II}_{jm}}$	IM^{II}_{jmt}	IM^{II}_{jmt+1}	$g_{IM^{II}_{jm}}$	P^{II}_{jmt}	P^{II}_{jmt+1}	$g_{P^{II}_{jm}}$	Q^{II}_{jmt}	Q^{II}_{jmt+1}	$g_{Q^{II}_{jm}}$
Azerbaijan	0.718	0.928	1.996	0.324	0.191	-3.984	1.206	0.869	-2.484	0.269	0.220	-1.537
Belg-Lux	0.454	0.484	0.501	0.008	0.013	4.137	1.732	0.914	-4.799	0.004	0.014	9.386
Bulgaria	0.441	0.861	5.281	0.062	0.073	1.186	0.763	0.905	1.322	0.082	0.080	-0.134
China	0.170	0.520	8.967	0.003	0.005	3.226	1.221	0.811	-3.097	0.002	0.006	6.526
France	0.555	0.609	0.713	0.006	0.011	5.176	0.886	0.942	0.476	0.007	0.012	4.677
Germany	0.716	0.730	0.142	0.009	0.014	3.956	0.960	0.956	-0.031	0.009	0.015	3.988
Greece	0.639	0.498	-1.903	0.031	0.061	5.276	0.767	0.864	0.926	0.041	0.070	4.311
Iran	0.445	0.798	4.605	0.050	0.063	1.790	0.917	1.120	1.545	0.055	0.057	0.241
Iraq	0.072	0.965	22.068	0.115	0.345	8.835	0.821	1.016	1.655	0.140	0.340	7.063
Israel	0.560	0.426	-2.087	0.064	0.050	-1.832	1.015	1.100	0.618	0.063	0.046	-2.435
Italy	0.572	0.725	1.836	0.016	0.018	0.726	0.823	0.933	0.968	0.020	0.019	-0.240
Netherlands	0.544	0.438	-1.658	0.005	0.009	5.437	1.083	1.305	1.442	0.004	0.007	3.938
Poland	0.333	0.570	4.233	0.012	0.015	1.927	0.913	1.073	1.252	0.013	0.014	0.666
Romania	0.657	0.775	1.280	0.036	0.058	3.755	0.695	0.817	1.252	0.052	0.071	2.472
Russia	0.672	0.771	1.066	0.025	0.027	0.527	0.902	0.935	0.272	0.028	0.029	0.254
Saudi Ar.	0.488	0.644	2.164	0.043	0.041	-0.376	0.915	0.937	0.187	0.047	0.043	-0.562
Spain	0.546	0.660	1.476	0.009	0.014	3.399	0.975	0.905	-0.566	0.009	0.015	3.988
Syria	0.425	0.651	3.338	0.188	0.152	-1.628	1.023	1.050	0.201	0.184	0.145	-1.826
UAE	0.422	0.655	3.442	0.035	0.040	0.960	0.931	1.057	0.980	0.038	0.038	-0.020
Ukraine	0.225	0.372	3.952	0.062	0.041	-3.229	0.937	0.927	-0.076	0.067	0.044	-3.155
Egypt	0.510	0.560	0.724	0.046	0.069	3.163	0.895	1.138	1.860	0.051	0.061	1.279
UK	0.669	0.724	0.613	0.008	0.014	4.621	0.957	0.934	-0.188	0.008	0.015	4.818
USA	0.494	0.430	-1.060	0.006	0.008	2.491	0.997	1.148	1.086	0.006	0.007	1.390
Europe	0.573	0.664	1.147	0.010	0.018	4.696	0.897	0.914	0.152	0.011	0.020	4.537
Asia	0.176	0.469	7.838	0.009	0.005	-4.783	1.151	1.060	-0.637	0.008	0.005	-4.172
Africa	0.068	0.215	9.255	0.105	0.065	-3.568	1.434	1.026	-2.547	0.073	0.064	-1.048
America	0.274	0.296	0.582	0.008	0.016	5.445	1.058	1.163	0.731	0.008	0.014	4.680
CIS	0.307	0.317	0.255	0.040	0.057	2.793	1.320	1.263	-0.338	0.030	0.045	3.141
Middle East	0.250	0.540	6.116	0.112	0.092	-1.450	1.292	1.271	-0.128	0.086	0.073	-1.324
World	0.409	0.526	1.957	0.011	0.015	2.449	1.001	0.997	-0.026	0.011	0.015	2.475

Notes: For period t, EM^{II}_{jmt} represents the extensive margin (eq. 5), IM^{II}_{jmt} is the intensive margin (eq. 6), P^{II}_{jmt} is the price component (eq. 8), and Q^{II}_{jmt} is the quantity component (eq. 7). $g_{EM^{II}_{jm}}$, $g_{IM^{II}_{jm}}$, $g_{P^{II}_{jm}}$, and $g_{Q^{II}_{jm}}$ are the growth rates of the extensive margin, intensive margin, price component and quantity component. A formula similar to equation (2) was used to calculate the growth rates of each margin.

Source: Authors' own calculations based on CEPII's BACI database at the 6-digit level of 1996 Harmonized System.