A Comparative Investigation of the Price Competitiveness of Turkish and Southeast Asian Exports in the European Union Market, 1990-1997

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Source: *Emerging Markets Finance & Trade*, Vol. 38, No. 4 (Jul. - Aug., 2002), pp. 59-85
Published by: Taylor & Francis, Ltd.
Stable URL: https://www.jstor.org/stable/27750301
Accessed: 30-12-2018 10:21 UTC

Emerging Markets Finance and Trade, vol. 38, no. 4,
July–August 2002, pp. 59–85.

ISSN 1540–496X / 2002 $9.50 + 0.00.

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Abstract: *The relative concentration with respect to export markets and products makes export receipts of Turkey vulnerable to fluctuations in the demand conditions. Given that most of the Turkish exports face intense competition from close substitutes produced in other countries, avoiding large fluctuations in export receipts, and maintenance/growth of market shares in such major export destinations as the EU market often require price competition. This paper investigates the significance and nature of price competition between Turkish and Southeast Asian exporters of selected manufacturing products in the EU market where this competition is particularly stiff. For this purpose, we estimate a model that posits that the relative market shares of Turkish and Southeast Asian exporters in the EU markets for commodities we consider are related to*

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the prices of imports from respective countries. Our analysis concentrates on "textiles and garments," a leading export category that brings in a considerable part of Turkey's export receipts, and "technology-intensive products," which has recently become an export category of increasing significance for Turkey. Our results indicate that price competition plays a significant role in explaining the EU market shares of Turkish and Southeast Asian exporters and provide useful information on the magnitudes of relative price elasticities. Furthermore, they provide grounds for an evaluation of the possible contributions of Turkey's geographic proximity to the EU market, and the Turkey–EU Customs Union agreement to the price competitiveness of Turkish products against their Southeast Asian competitors.

Key words: *European Union, exports, price competition, Southeast Asia, Turkey.*

The Turkish economy has experienced a considerable structural transformation within the past two decades. Liberalization of the economy began with the introduction of a far-reaching structural adjustment program in 1980. Implementation of the program started with a devaluation of the overvalued domestic currency and was later supported by a set of measures to liberalize trade and financial markets. The program represented a major switch for the Turkish economy away from an import substitution-based development strategy to an outward-oriented strategy based on promotion of exports (Uygur 1997). The switch to outward orientation led to a boom in Turkish exports, which were mostly concentrated in agricultural and livestock products, and the value of exports increased from $2.26 billion in 1979 to $12.96 billion in 1990 and to almost $27 billion in 1999. With such industries as textiles and garments, iron and steel, and food processing ranking among the leading contributors to this boom, the composition of exports began to change in favor of manufactured goods (Sayan and Demir 2001).

The changing composition of exports toward manufacturing products initially signaled increased diversity, particularly until 1988 (Erlat and Sahin 1998), and the diversification pattern achieved until 1988 was sustained throughout the 1990s (Erlat

1999). Yet, Turkish exports remained relatively concentrated in certain sectors of manufacturing industry. Textiles and garments, for example, gained remarkable shares (Erlat 1993), reaching about 44 percent of total exports after 1989. Likewise, the bulk of Turkish exports continued to be shipped to relatively few markets, particularly the European Union (EU), despite the increasing number export destinations after 1980.[1] Such concentration with respect to export markets and products makes export receipts vulnerable to fluctuations in the demand conditions. Given that most of the Turkish exports face intense competition from close substitutes produced in other countries, avoiding large fluctuations in export receipts, and maintenance/growth of market shares often require price competition. In addition to its traditional significance as a major export destination, the EU market is where Turkish exporters of various manufacturing products face a rather stiff competition, particularly from Southeast Asian producers.[2]

The purpose of this paper is to empirically investigate the significance and nature of price competition between Turkish and Southeast Asian exporters of selected manufacturing products in the EU market in the 1990s (more precisely, from 1990 to 1997, due to the lack of comparable data beyond 1997). For this purpose, we develop and estimate a model in the lines of Merkies and Van Der Meer (1988), relating the respective shares of Turkish and Southeast Asian exporters in the EU markets for commodities we consider to prices each country's exporters charge relative to others. Our analysis concentrates on two commodity groups: "textiles and garments," which has long been a major export category,[3] and commodities we classify as "technology-intensive products," which make up an up-and-coming export category—and has recently become even more important (see Appendix A for the commodity coverage of these sectors). The reason we consider these two product groups is obvious in the case of textiles and garments: due to the sizable share of these products in total exports, changes in the export performance of this sector affect Turkey's export receipts considerably. Yet, during the 1990s, the relative significance of textiles and garment exports for Turkey declined, whereas that of technology-intensive exports increased (Lohrmann 2000).

Exports of technology-intensive commodities significantly contribute to growth (Guerrieri and Milana 1995) and may potentially play an important role in improving a country's overall competitiveness in international markets (Daniels 1999). These are highly tradable goods with an increasing share, not only in the world trade, but also in total exports of Turkey and the Southeast Asian countries over recent years. Lohrmann (2000) shows that Turkey also managed to increase its share in the world markets for this product category during the 1990s.

As for the countries in our sample, we consider China, Hong Kong, South Korea, and Taiwan as main Southeast Asian competitors of Turkish exporters in the EU markets for product groups we are interested in.

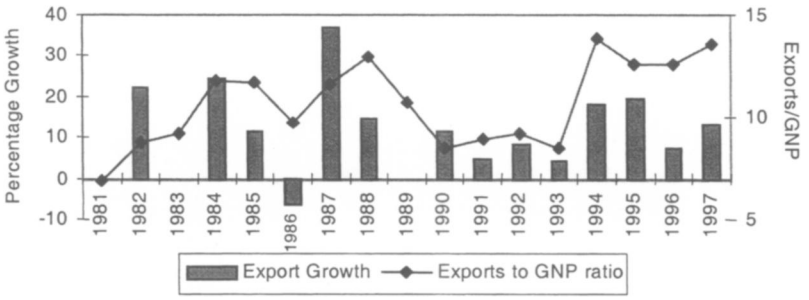
Our results reveal that price competition plays a significant role in explaining the EU market shares of Turkish and Southeast Asian exporters and provide useful information as to the magnitudes of relative price elasticities. Furthermore, they provide grounds for an evaluation of the possible contributions of Turkey's geographic proximity to the EU market, and the Turkey–EU Customs Union agreement to the price competitiveness of Turkish products in the EU markets against their Southeast Asian competitors.

Export Performance of Turkey in the 1990s

The empirical analysis in the paper focuses on the 1990s. The beginning of this decade marks a structural change in the forces behind the growth of, as well as the composition of, exports. Although the export boom of the 1980s was made possible, mainly by the use of excess production capacity available to the manufacturing sector, the removal of all controls over foreign capital movements after 1989 opened a new phase for Turkish trade (Uygur 1997).

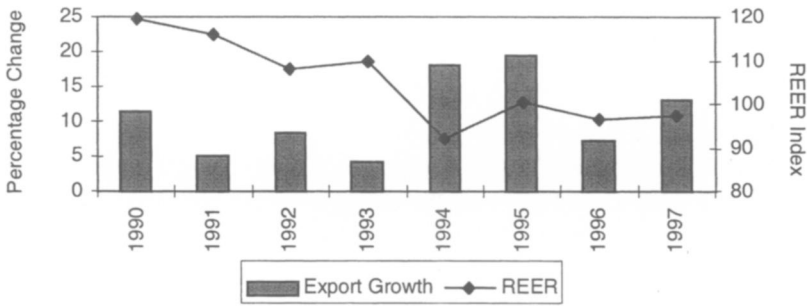
The data on export performance of Turkey during the 1990s highlight an episode of slower export growth between 1990 and 1993, followed by a period when the country picked the high growth rates of the 1980s (Figure 1). The low export growth episode corresponds to the overvaluation of domestic currency, whereas the period after the sizable real depreciation of 1994 is when high

Figure 1. **Export Growth and Exports to GNP Ratio, 1980–1997**



Source: SIS (2001) and CBRT (2001).

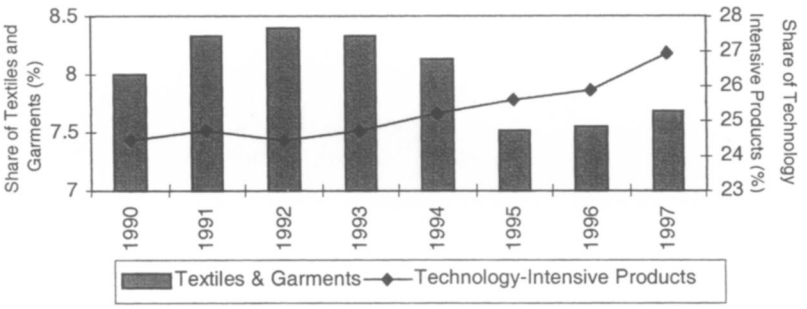
Figure 2. **Export Growth and Real Effective Exchange Rate, 1990–1997**



Source: SIS (2001) and CBRT (2001).

growth rates of exports were restored (Figure 2). In Figure 2, the real value of Turkish lira (TL) was calculated against a currency basket, which is composed of 1 US dollar and 1.5 German marks. Turkish private manufacturing prices were taken as an indicator of domestic inflation rate, whereas the foreign inflation rate was calculated as a weighted average of U.S. and German producer price indices, with respective weights set at 0.544 and 0.456. A fall (rise) in the index shows real depreciation (appreciation) of the TL against the currency basket. This matching between the periodicity of high (low) rates of export growth and real depreciations (appreciations) implies that the export performance and real exchange rate movements are strongly correlated (Brada et al. 1997).

Figure 3. **Shares of "Textiles and Garments" and "Technology-Intensive Products" in the EU Imports, 1990–1997**

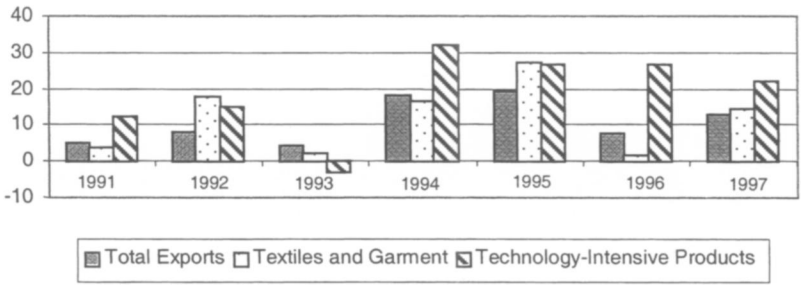


Source: OECD International Trade Statistics (2001).

In addition to changes in the real value of TL, the developments and changing demand conditions in major export markets, particularly the European Union, affected Turkey's performance during the period under consideration. A recent study by Kotan (2000), for example, shows, by using constant market share (CMS) analysis, that the EU's import growth lagging behind the expansion of imports in the rest of the world during 1990–1997 has impeded Turkish exports to some extent. The results in Kotan (2000) indicate further that the slowdown in the expansion of import demand by the European Union happened at the same time as a change in the composition of its imports. The EU's demand for textiles and garments declined during the second half of this period, whereas its demand for technology-intensive products increased, leading to a gradual increase in the share of technology-intensive goods imports (Figure 3).

Since textiles and garments are among Turkey's leading export products, the decline in the share of this product group in total imports by the European Union, Turkey's major market, affected the composition of Turkish exports as well. The average growth rate of manufacturing exports rose from 7.5 percent a year during 1990–1993 to 16.2 percent during 1994–1997 on average, thereby exceeding the growth of total exports in the second half of the 1990s. Although the growth of textiles and garment exports fol-

Figure 4. **Growth Rates of Turkish Exports by Sectors, 1991–1997**



Source: OECD International Trade Statistics (2001).

lowed a similar pattern, the exports of technology-intensive products showed remarkable progress, with their annual growth rate more than tripling from an average of 8.1 percent during 1990–1993 to an average of 26.8 percent during 1994–1997 (Figure 4).

Although a more careful and detailed examination is needed to derive stronger and more precise conclusions, the following observations can safely be made concerning the developments in Turkish exports and EU imports in the 1990s. Turkish exporters of technology-intensive products managed to increase their shipments to the European Union just when the demand for these products expanded there, thereby serving to counter the effects of the reductions in textiles and garments exports on Turkey's export receipts.[4] Had they not been able to increase their supply as quickly to meet part of the increased demand for technology-intensive products in the European Union, however, it might have been impossible to avoid fluctuations in Turkey's export receipts. Thus, even though the recent developments in the EU's demand for imports do not seem to have affected export receipts of Turkey in any alarming way, the relatively heavy dependence of the composition and volume of Turkish exports on these developments is a cause for concern for Turkish policymakers and exporters alike.

In general, concentration of exports with respect to markets and product groups has the potential to adversely affect the overall export performance of a country. As discussed by Lloyd (1994),

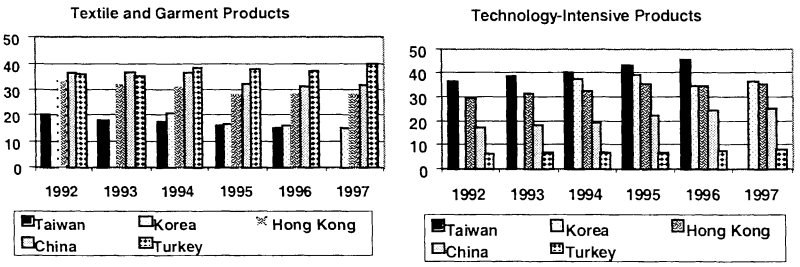
such concentration may be particularly troublesome for the exporting country when the world demand for the products in question or the total demand for imports in major markets contracts. In such cases, the exporting country can have serious difficulties in maintaining its market shares, or even face decreasing shares. Furthermore, there is little policymakers of the exporting country can do about such exogenous developments other than encourage product/market diversity, which, of course, will take time to accomplish. As far as the changes in export performance due to shifts in the degree of competitiveness are concerned, on the other hand, policy actions may be very effective. In fact, relative price disturbances may alter the competitive position of a country in the export market and have a considerable effect on the overall export performance (Lloyd 1994).[5] Evaluating the relative competitive position of Turkish exporters in the EU market for product groups in our sample, and potential improvements in this position requires that consideration be given to the performance of the Southeast Asian exporters of the same products. The results in the next section provide evidence concerning the importance of price competition in the EU market in the selected product groups, and discuss Turkey's additional advantages of geographic proximity and membership in the Customs Union with the European Union.

Data and Methodology

This section first describes how the estimations aim to investigate the significance of price competition between Turkey and the Southeast Asian countries in our sample are carried out for "textiles and garments" and "technology-intensive products."[6] Both commodity groups are among the leading export categories of the countries we consider (Figure 5).

We begin our analysis by considering homothetic import demand functions resulting from a two-stage utility maximization process (Merkies and Van Der Meer 1988).[7] At the first stage of the problem, a constant elasticity of substitution (CES) utility function is maximized subject to the import budget of the importing country (the European Union in this case) to be allocated between

Figure 5. **Shares of Product Groups Considered in Turkish and Southeast Asian Exports**



Source: OECD International Trade Statistics (2001).

a number of commodities indexed by $k \in \{1,2,\ldots,m\}$. The solution of this problem yields

$$M^k = \delta^k M \left(\frac{P^k}{P} \right)^{(1-\sigma)}, \tag{1}$$

where the optimum demand for commodity k imports by the European Union, M^k, depends on the total demand for imports, M; the ratio of the import price index of commodity k, P^k, to the overall import price level, P, and a parameter representing the stable taste pattern of the European Union, δ^k.[8] In addition, σ is defined to be the elasticity of substitution at the top level of utility maximization.

At the second stage, a utility function similar to the first stage is maximized subject to the budget allocated to the imports of commodity k (that is, M^k determined in the previous stage) so as to determine imports from individual country exporters. Letting the set of countries supplying commodity k to the European Union be indexed over $n \in$ {Turkey, China, Hong Kong, South Korea, and Taiwan}, the solution of this problem yields

$$M_n^k = \delta_n^k M^k \left(\frac{P_n^k}{P^k} \right)^{\left(1-\sigma^k\right)}. \tag{2a}$$

Equation (2a) shows that M_n^k, the optimum import demand for each commodity k by the European Union from each exporter n depends on M^k, the optimum level of import demand for commodity k—as determined through Equation (1); a price ratio and the corresponding stable taste pattern parameter, δ_n^k. The price ratio shows the price that exporting country n charges for commodity k relative to that commodity's average import price in the EU market. σ^k in Equation (2a) is the elasticity parameter that, when subtracted from one, measures the percentage change in the share of exporting country n in the commodity k imports resulting from a 1 percent increase in the price charged by country n exporters relative to the average import price. This interpretation of σ^k follows from

$$d\ln\left(\frac{M_n^k}{M^k}\right)=\left(1-\sigma^k\right)d\ln\left(\frac{P_n^k}{P^k}\right), \tag{2b}$$

which predicts that, when the price of commodity k imported from Turkey increases relative to the respective average import price of the same commodity in the EU market, the demand shifts away from Turkish exporters toward the other exporters of the same product. In other words, when the price of commodity k exported from Turkey to the European Union increases, Turkey loses its relative price competitiveness and, hence, its relative share in the EU market.

In order to proceed with the estimation, Equation (2a) is linearized by taking natural logarithms first. Total differentiation of both sides of the equation lets a stable taste pattern term disappear from the expression. Both sides of the equations are then multiplied by the base period values of the relevant dependent variable in order to obtain the error terms with equal variances.[9] The resulting equation is given as

$$M_n^k\left[d\ln\left(M_n^k\right)\right]=M_n^k\left[d\ln\left(M^k\right)+\left(1-\sigma^k\right)d\ln\left(\frac{P_n^k}{P^k}\right)\right]+\varepsilon_n^k. \tag{3}$$

In light of the previously discussed developments in the 1990s, Equation (3) was estimated using data for the period between 1990

and 1997, with the end of sample imposed by data restrictions. As for the commodity coverage, twenty subsectors were covered under textiles and garment exports and forty-eight subsectors under technology-intensive product exports.[10] The product coverage of each category is given in Appendix A in terms of three-digit Standard International Trade Classification (SITC) Revision 3. Values and prices of total imports and exports were taken from the International Monetary Fund's *International Financial Statistics* CD-ROM. Manufacturing exports of Turkey and Southeast Asian countries to the EU countries, as well as manufacturing imports of the European Union from Turkey, Southeast Asian countries and the rest of the world were obtained from the OECD *International Trade Statistics* CD-ROM in values and quantities. Export and import prices were calculated by dividing values by respective quantities and then indexing by Laspeyres method.[11]

Southeast Asian countries to be included in the sample were determined based on export similarity indices calculated for Turkey vis-à-vis China, Hong Kong, South Korea, and Taiwan (see Appendix B). A considerable degree of similarity was found in the case of textiles and garments. In this category, Turkey was found to exhibit the highest degree of export similarity with Hong Kong and China, but a relatively modest similarity of exports with Taiwan and South Korea. In the case of technology-intensive products, the highest index number for any Southeast Asian country in the 1990–1997 period was 22 percent, pointing to low export similarities. Unlike the export similarities for textiles and garments, however, similarity indices for technology-intensive exports turned out to be fairly stable throughout the 1990s. Furthermore, the remarkable progress of technology-intensive products in Turkish exports in the second half of 1990s justified the inclusion of all four Southeast Asian countries in the analysis.

A fixed-effects model was used in the panel data estimation of Equation (3) using ordinary least squares (OLS) (Hsiao 1989; Matyas 1995). The reason behind the choice of a fixed-effects model is that it estimates the model conditionally on errors using the simple OLS technique, thereby ignoring the dependence of the errors and regressors. Regardless of the errors that are initially

assumed to be random are correlated with one or more regressors,[12] the fixed effects estimator depends only on the deviations of the regressand and regressors from group means. Hence, although they may be inconsistent for the full sample, they remain consistent within the group (Davidson and MacKinnon 1993).

Empirical Findings

The empirical analysis was carried out first by considering the 1990–1997 period as a whole. Two successive subperiods, 1990–1993 and 1994–1997, were then considered separately to see if results would differ across these two periods, respectively corresponding to low- and high-export growth episodes of Turkish exports (and high and low values of real exchange rates).

Table 1 presents the panel data estimation results for textiles and garments. It is clear from the results that relative prices have a statistically significant effect on relative shares of Turkey, China, Hong Kong, South Korea, and Taiwan in the EU's textiles and garments imports with an expected sign during the period 1990–1997. In other words, when the exporters of a given country increase their own price relative to the price charged by others, that country loses part of its share in the EU market. Estimated values of parameters indicate that the EU's demand for textiles and garments imports from all countries in the sample is elastic—and even more so for imports from Turkey and Hong Kong. Furthermore, the R^2 values reported in Table 1 imply that price competition explains nearly one-half of the relative share movements of Turkey and the Southeast Asian countries in the EU's textiles and garments market.

When the estimation was repeated for two consecutive subperiods separately, the estimates of elasticities of substitution did not deviate much, implying that the textiles and garments exporters do not have wide margins for charging high markups over costs in the short to medium run. It is observed from the associated R^2 values that price competition better explains the share of each exporter in the EU market during the 1990–1993 period than the 1994–1997 period, except for Hong Kong. This, in turn, implies

Table 1

Estimation Results for Textiles and Garments

Periods/ countries	$1 - \sigma^k$	Elasticity of substitution	R^2	DW statistic
1990–1997				
Turkey	–0.8087*	1.8087	0.57	2.69
China	–0.4338*	1.4338	0.40	2.73
Hong Kong	–0.8570*	1.8570	0.68	2.72
South Korea	–0.3850*	1.3850	0.47	2.84
Taiwan	–0.4646*	1.4646	0.54	2.57
1990–1993				
Turkey	–0.7676*	1.7676	0.73	3.09
China	–0.4984*	1.4984	0.96	2.88
Hong Kong	–0.8952*	1.8952	0.71	2.85
South Korea	–0.2253*	1.2253	0.78	3.09
Taiwan	–0.3790*	1.3790	0.79	3.11
1994–1997				
Turkey	–0.9381*	1.9381	0.69	2.85
China	–0.4445*	1.4445	0.44	2.99
Hong Kong	–0.9846*	1.9846	0.82	2.80
South Korea	–0.3248*	1.3248	0.55	3.63
Taiwan	–0.3136*	1.3136	0.51	3.04

Note: * denotes significance at the 1 percent level.

that price competition for the maintenance of the existing market shares was stiffer in the former period than in the latter.

The estimation results presented in Table 2 indicate that a relatively higher price charged by an exporter will reduce its market share relative to others in the case of the technology-intensive products as well, and this effect is significant throughout the 1990–1997 period for all countries included in the sample. Although the EU's elasticities of substitution among the exporters of technology-intensive products turned out to be higher than that of textiles and garments during the same period, they decreased to some extent after 1993. This implies that the pressure of stiff price competition was somewhat relieved during the 1994–1997 period compared to the previous subperiod. Still, the elasticities of sub-

Table 2

Estimation Results for Technology-Intensive Products

Periods/ countries	$1-\sigma^{K}$	Elasticity of substitution	R^2	DW statistic
1990–1997				
Turkey	–0.9550*	1.9550	0.98	2.45
China	–0.5047*	1.5047	0.75	2.26
Hong Kong	–0.7655*	1.7655	0.71	2.60
South Korea	–0.7598*	1.7598	0.81	2.46
Taiwan	–0.6355*	1.6355	0.75	2.62
1990–1993				
Turkey	–0.9874*	1.9874	0.99	2.51
China	–0.6685*	1.6685	0.97	2.86
Hong Kong	–0.8203*	1.8203	0.90	2.82
South Korea	–0.8689*	1.8689	0.90	2.64
Taiwan	–0.6656*	1.6656	0.94	2.64
1994–1997				
Turkey	–0.8789*	1.8789	0.97	2.32
China	–0.3364*	1.3364	0.72	2.41
Hong Kong	–0.6722*	1.6722	0.73	2.65
South Korea	–0.7181*	1.7181	0.79	2.49
Taiwan	–0.5698*	1.5698	0.74	2.66

Note: * denotes significance at the 1 percent level.

stitution remain high and charging higher markups over costs seems rather difficult to do without losing relative market shares.

A comparison of results in Tables 1 and 2 reveals that price competition explains a greater portion of the alterations in the relative shares of Turkey and the Southeast Asian countries in the EU market for technology-intensive products as compared to textiles and garments—particularly in the 1990–1993 period as indicated by R^2 values that are close to one. However, the effect of relative prices on the relative shares of the Southeast Asian countries in the EU market decreases from 1990–1993 to 1994–1997. Turkey, on the other hand, could not reduce the pressure of relative prices on its market share during the two consecutive periods and, hence, continued to face a strong price competition during the entire period.

The increased intensity of price competition for Turkish prod-

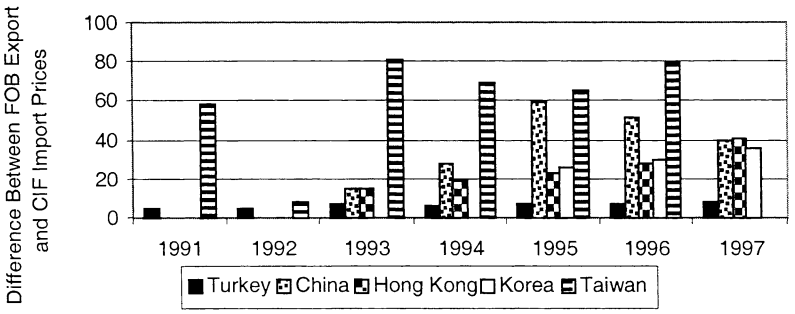
ucts over the 1990–1993 period is consistent with the relatively poor export performance of the country during this period when the overvaluation of domestic currency slowed down export growth. In addition, despite the visible increase in technology-intensive exports, especially after 1993, Turkey could not fully adapt its export structure to highly growing markets and to commodity groups (Lohrmann 2000) and remained mostly a spectator while the Southeast Asian countries gained a sizable share in the world trade of technology-intensive products (Noland 1997).

Still, Turkish exporters seem to have two potentially important advantages over their competitors from the Southeast Asian countries. First, the geographic proximity of Turkey to the EU markets is expected to enable Turkish exporters to charge relatively lower prices by reducing transportation costs.[13] Second, the Customs Union agreement signed between Turkey and the European Union makes it possible for Turkish manufacturing exports be imported into the European Union without the customs duties that Southeast Asian exports are subject to.

Although the cost advantage of Turkish exporters due to geographic proximity would have been expected to be equally applicable to both textiles and garments and technology-intensive products, our examination of the differences between cost of insurance and freight (CIF) and free on board (FOB) prices of EU imports led to an interesting observation.[14] The differences we calculated between CIF import and FOB export prices for the product groups and countries in our sample indicate that even though Turkish exporters of textiles and garments shipping to the EU market seemed to enjoy a proximity advantage over Southeast Asian countries, no such advantage was apparent in the case of technology-intensive products.

The calculated differences between CIF and FOB prices for textiles and garments for Turkey and the Southeast Asian countries in the EU market are presented in Figure 6. It can be clearly observed that the difference is markedly lower for Turkish exporters than that for all other countries in our sample, clearly pointing to a cost advantage Turkish exporters of textiles and garments enjoy due to their proximity to the EU market.

Figure 6. **The Difference Between Export (FOB) and Import (CIF) Prices for Textiles and Garments, 1992–1997**



Source: Authors' calculations based on OECD data.

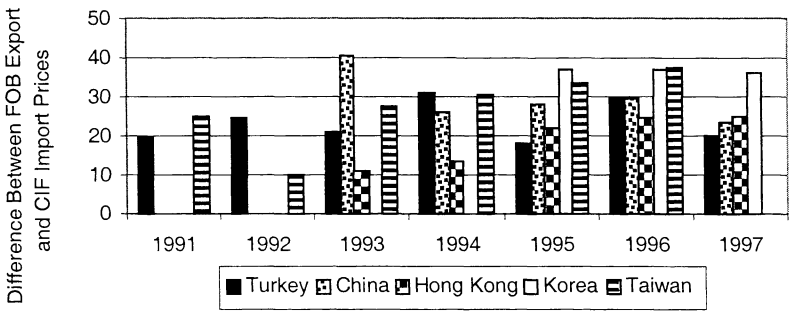
Note: The data was not available for the countries/years whose bars are missing from the figure.

When the difference between CIF import and FOB export prices of technology-intensive products by countries are considered, the situation is somewhat reversed. Figure 7 shows that the price difference of Turkey remains lower than some of the Southeast Asian countries in some years, but becomes larger in other years. Thus, Turkey's proximity advantage is not as strong in the case of technology-intensive products as in the case of textiles and garments.

One possible explanation for this disappearance of the cost advantage due to proximity of Turkey in some years could be the scale economies provided to Southeast Asian countries by the voluminous shipments of technology-intensive products to the European Union (Noland 1997). Hence, to the extent that the volume of shipments enables Southeast Asian exporters to enjoy economies of scale in the export of technology-intensive products, thereby reducing their costs, Turkish exporters may lose the cost advantages that their proximity to the EU market could potentially create.

As for the second advantage of Turkish exporters over their Southeast Asian competitors, the process leading to the Customs Union agreement signed between Turkey and the European Union witnessed a gradual abolishment of the customs duties on Turkish manufacturing exports that Southeast Asian exports remained subject to. The exemption of Turkish manufacturing products from

Figure 7. **The Difference Between Export (FOB) and Import (CIF) Prices for Technology-Intensive Products, 1991–1997**



Source: Authors' calculations based on OECD data.

Note: The data was not available for the countries/years whose bars are missing from the figure.

the EU's customs duties appears to provide a cost advantage to Turkish exporters. Yet the effects of the special status of Turkey as a candidate for EU membership on Turkey's price competitiveness could not be explored in detail here due to data restrictions and are therefore left for a future study.

Conclusions

This paper investigated the significance and nature of price competition between Turkish and Southeast Asian exporters of selected manufacturing products in the EU market between 1990 and 1997. For this purpose, we estimated a model that posits that the relative market shares of Turkish and Southeast Asian exporters in the EU markets for commodities we considered are related to prices of imports from respective countries. Our analysis concentrated on two commodity groups: "textiles and garments," which have long been a leading export category, and commodities we classified as "technology-intensive products," which have recently become an export category of increasing significance for Turkey. Textiles and garments were chosen since changes in the export performance of this sector affect Turkey's export receipts considerably, due to their sizable share in total exports. Exports of technology-intensive com-

modities, on the other hand, were considered due to their increasing share in the world trade and their potentially significant contributions to the improvements in a country's international competitiveness and, hence, to growth. We considered China, Hong Kong, South Korea, and Taiwan as main Southeast Asian competitors of Turkish exporters in the EU markets for these product groups.

The results of the panel data estimation suggested that relative price movements are an important factor affecting the relative shares of Turkey and the Southeast Asian countries in the EU market for both product groups considered, but especially for technology-intensive products. More precisely, our estimation results showed, for both commodity groups we considered, that an increase in the price charged by exporters from a particular country over prices charged by others will lead to a decline in that country's share in the EU imports. Furthermore, the EU's import demand for both product groups turned out to be elastic, implying that the exporters of these products would not be able to enjoy high margins between prices and costs. This further implies that the exporters who want to make headway against the competition should try to charge lower prices by reducing their costs.

Within this framework, Turkish exporters were noted to have two potential advantages over their Southeast Asian competitors in the EU market. The first one is the geographical proximity of Turkey to the European Union, which was presumed to enable Turkish exporters to charge lower prices by reducing the transportation costs. Yet, a further investigation of this issue led to a striking finding—which, we believe, is new to this study—revealing that the geographical proximity did not equally apply to the two product groups that we considered. Although Turkey's proximity advantage was clearly strong in the case of textiles and garments, it was hardly visible in the case of technology-intensive products. We explained this asymmetry by the economies of scale provided to the Southeast Asian producers of technology-intensive products through the large volumes of their shipments to the European Union.

The second advantage of Turkish exporters was thought to come from the special nature of the relationship between Turkey and the European Union, which led to a gradual abolishment of the cus-

toms duties on Turkish manufacturing exports to the European Union on the way to the Customs Union agreement signed between the two parties, to be followed by Turkey's full membership in the European Union. In fact, custom duties were bilaterally decreased to very low levels and abolished totally for certain products long before the 1996 Customs Union agreement (DPT 1995). However, the data restrictions did not allow for the effects of the preferential customs duties on Turkey's price competitiveness to be explored in detail here. Therefore, we cannot safely argue, based on the previously reported estimation results showing the intensity of price competition and the values of elasticities, that the elimination of duties on Turkish products has had a significant contribution to the competitive power of Turkish exports over the Southeast Asian products.

In conclusion, our results reveal that any cost-reducing effects that geographic proximity and custom advantages might inflict upon the competitiveness of Turkish manufacturing exports would be limited. The geographic proximity of Turkey to the EU markets is likely to provide some cost advantage by reducing freight costs, but such an advantage would not generally be applicable to all exports. So, the proximity alone is not likely to be sufficient to give Turkish exporters a leading edge in their competition against Southeast Asian exporters over various markets in the European Union. It is therefore necessary for Turkey to take steps toward increasing the export share of technology-intensive products whose markets grow increasingly faster than the others, for otherwise, the country will not be able to enjoy a sustained competitive advantage in the world markets in the long run.

Notes

1. Over the past decades, the EU's share in Turkey's exports has been around 50 percent, with Germany alone having an average share of 20 percent (Sayan 2000). For a more detailed analysis of the concentration of Turkey's foreign trade with respect to partner countries, see Erlat and Akyuz (2001).

2. The Turkish Exporters' Association often cites Southeast Asian producers as the main competitors in the EU market (see, for example, the statements of the Association released by Reuters on April 24, May 3, or July 12, 2000).

3. In light of the discussion by Erlat and Sahin (1998) around a more strict use of the terminology of "traditional" and "nontraditional" exports in the literature, we deliberately avoid calling textiles and garments a "traditional" export sector here.

4. In a study in which they analyze the effects of changes in commodity composition on export performance for developed countries, Ioannidis and Schreyer (1997) state that the overall export performance will be affected positively if the commodity composition is biased toward technology-intensive products.

5. When there is an increase in the export price of a commodity produced by a country, importers of that product will shift their demand to a possible substitute of that commodity, which has a relatively lower price. Such a substitute can usually be found through exporters from other countries who are able to charge relatively lower prices, due to a number of reasons such as lower transportation or insurance costs, lower tariff rate advantages, or some other cost advantages. In such cases, disturbances to relative prices charged by different exporters of the same commodity (or close substitutes) trigger a demand reaction.

6. In the literature, technology-intensive products are usually defined according to the stock knowledge by input-related measures—particularly, the level and intensity of R&D expenditures by firms (Ioannidis and Schreyer 1997). The products produced by firms with R&D expenditure to a sales ratio of higher than a 4 percent threshold value are divided into two subgroups: leading edge and high-level technology products. Technology-intensive commodities we consider here (as listed in Appendix A) correspond to what Grupp (1995) calls high-level technology products.

7. Theoretically, one could go one step further and employ the Armington assumption to differentiate imports from domestic production. This would allow for total imports and, hence, the import budget of the importing country to be determined endogenously first (that is, at a stage preceding the first stage above), but it would increase the number of parameters to be estimated, making the data restrictions even more problematic. Furthermore, given the purposes of this paper, there is little to be gained from such an exercise.

8. See Kotan (2000) for detailed derivations of Equations (1) and (2a).

9. Note that this transformation does not change the expected values of estimated parameters, but only the precision with which they are estimated. See Merkies and Van Der Meer (1988) for further discussion on this issue.

10. Ioannidis and Schreyer (1997) define technology intensities according to segmented and fragmented market structure of the industries, an approach also adopted by Oliveira-Martins et al. (1996). This division stems from the source of competition in industries, where the competition in segmented industries is by process innovation, whereas factor costs are the main determinants of competition for the fragmented industries. Even though the classification criterion they use is different than ours, the product coverage (by the ISIC-revision 2 classification) of technology-intensive commodities in Ioannidis and Schreyer (1997) is similar to that in this paper.

11. Although there is no consensus on the proper method of indexation in the literature, the Laspeyres method is relatively more common (Fagerberg and Sollie 1987; Lohrmann 2000).

12. The Wu-Hausman test statistic for textiles and garments turned out to be 0.04 and 0.03 for technology-intensive commodities, both of which accept the null hypothesis of independence of errors with at least one of the regressors at a 5 percent significance level.

13. Using a sample of non-EU trade partners of Turkey, Sayan (1998) and Sayan and Zaim (1998) showed, on the basis of results from gravity models, that the distance from Turkey to the country of destination is a significant factor affecting Turkish exports negatively.

14. Import and export prices are defined as inclusive of CIF and FOB, respectively. The difference between two prices comprises of freight and insurance costs. Although the freight costs are directly and positively related to the distance between exporting and importing countries, the distance affects insurance costs as one of several factors that insurance companies consider in determining the level of risk premium to be charged.

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Appendix A

Product Coverage

Three-Digit SITC Product Groups Covered Under Textiles and Garments

611	Leather
612	Manufactures of leather, n.e.s.; saddlery and harness
613	Fur skins, tanned or dressed, excluding 8483
651	Textile yarn
652	Cotton fabrics, woven
653	Fabrics, woven, of man made fabrics
654	Other textile fabrics, woven
655	Knitted or crocheted fabrics, n.e.s.
656	Tulles, trimmings, lace, ribbons, and other small wares
657	Special yarns, special textile fabrics and related products
658	Made-up articles of textile materials, n.e.s.
831	Travel goods, handbags, and similar containers
841	Men's clothing of textile fabrics, not knitted
842	Women's clothing, of textile fabrics
843	Men's or boys' clothing, of textile, knitted, crocheted
844	Women's clothing, of textile, knitted or crocheted
845	Articles of apparel, of textile fabrics, n.e.s.
846	Clothing accessories, of textile fabrics
848	Articles of apparel, clothing accessories, excluding textile
851	Footwear

Three-Digit SITC Product Groups Covered Under Technology-Intensive Products

522 Inorganic chemicals, oxides
523 Other inorganic chemicals
531 Synthetic dye, natural indigo, lakes, n.e.s.
541 Medicinal, pharmaceutical products
562 Manufactured fertilizers
582 Products of condensation, etc.
583 Polymerization products, etc.
591 Pesticides, disinfectants
711 Steam boilers and auxiliary plant
712 Steam engines, turbines
713 Internal combustion piston engines
714 Engines and motors, n.e.s.
716 Rotating electrical plant
718 Other power generating equipment
721 Agricultural machinery excluding tractors
722 Tractors non-road
723 Civil engineering equipment, etc.
724 Textiles, leather machinery
725 Paper mill machinery, etc.
726 Printing, book-binding machinery, etc.
727 Food-machinery, non-domestic
728 Other machinery for specialized industry
736 Metalworking machinery-tools
737 Metalworking machinery, n.e.s.
751 Office machines
752 Automatic data processing (ADP) equipment
759 Office, ADP machine parts, accessories
761 Television receivers
762 Radio broadcast receivers
763 Sound recorders, phonograph
764 Telecommunications equipment, parts, accessories
771 Electric power machinery, n.e.s.
772 Switch gear, etc., parts, n.e.s.

773 Electrical distributing equipment
774 Electro-medical, X-ray equipment
775 Household type equipment, n.e.s.
776 Transistors, valves, etc.
778 Electrical machinery, n.e.s.
792 Aircraft, etc.
871 Optical instruments
872 Medical instruments
873 Meters and counters, n.e.s.
874 Measuring, controlling instruments
881 Photo apparatus, equipment, n.e.s.
882 Photo, cinema supplies
883 Developed cinema film
884 Optical goods, n.e.s.
885 Watches and clocks

Appendix B

Export Similarities

The export similarity index is defined as

$$S(n,m)=\left\{\sum_{k}\text{minimum}\left[X_k(lm),X_k(2m)\right]\right\}*100,$$

where $X_k(nm)$ is the share of commodity k in country n's exports to country m for $n = 1,2$ (Finger and Krenin 1979).

It determines the proportion of the commodity basket of one exporter that is perfectly matched by that of the other exporter by removing the effects of relative scale of total exports.

Table B1

Similarity Indices for Textiles and Garments Exports to the EU: Turkey Versus Southeast Asian Countries, 1990–1997

Years	Turkey versus China	Turkey versus Taiwan	Turkey versus Hong Kong	Turkey versus South Korea	Total export similarity
1990	40.52	23.60	46.85	34.46	21.58
1991	43.84	23.67	47.77	35.18	21.94
1992	42.20	22.44	49.18	32.03	21.08
1993	41.14	21.75	50.17	29.37	19.86
1994	39.42	21.57	47.61	26.50	19.39
1995	35.03	20.62	47.01	23.74	18.54
1996	34.77	20.41	46.56	23.41	18.35
1997	34.38	21.62	44.94	24.29	18.97

Source: Authors' calculations based on OECD data.

Table B2

Similarity Indices for Technology-Intensive Exports to the EU Market: Turkey Versus Southeast Asian Countries, 1990–1997

Years	Turkey versus Hong Kong	Turkey versus China	Turkey versus South Korea	Turkey versus Taiwan	Total export similarity
1990	18.18	18.78	18.61	19.72	17.80
1991	17.93	19.07	18.50	20.00	17.55
1992	18.55	18.85	18.22	20.18	17.90
1993	18.84	18.26	18.26	19.52	17.54
1994	19.21	18.29	18.49	19.94	17.45
1995	19.11	18.31	18.37	19.65	17.39
1996	19.57	18.47	18.88	20.01	17.79
1997	20.08	18.93	18.96	19.98	17.88

Source: Authors' calculations based on OECD data.