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# Openness and Regional Distribution of Turkish Manufacturing Industries

Fatma Dogruel  
*Marmara University*

A. Suut Dogruel  
*Marmara University*

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**OPENNESS AND REGIONAL DISTRIBUTION OF TURKISH  
MANUFACTURING INDUSTRIES (\*)**

**Fatma DOĞRUEL (\*\*)** and **A.Suut DOĞRUEL (\*\*)**

**ABSTRACT**

The paper focuses on the effects of the trade liberalization in Turkey on the spatial distribution of the manufacturing industries at the three-digit ISIC level. In order to measure the regional distribution of the industrial activities we calculated coefficients of variation for annual value added and employment. The study shows that trade liberalization do not create systematic change in the spatial distribution of the manufacturing industries.

\*) We thank to Yasemin Baştürkçü and Esra Çeviker for research assistances.

\*\*) Marmara University, Department of Economics, Goztepe Campus, Kadikoy, 34722  
Istanbul, Turkey  
e-mail: [fatma.dogrueel@marmara.edu.tr](mailto:fatma.dogrueel@marmara.edu.tr) and [suut.dogrueel@marmara.edu.tr](mailto:suut.dogrueel@marmara.edu.tr)

## 1. INTRODUCTION

By the 1980s, Turkey has launched a widespread outward-oriented policy regime, reversing the import-substitution policies of earlier years. Over the more than two decades following this policy shift, the share of manufacturing sector in GDP and in exports has increased considerably in Turkey. Consequently, one can argue that openness has influential effects on Turkish economy and the economy has grown up in some extent. Another important change in the Turkish economy is the customs union agreement signed between the European Union (EU) and Turkey, which came into effect in 1996. These developments opened up the Turkish manufacturing industries to foreign competition. However, there are contradictory views about the positive impacts of openness. Welfare and growth effects of openness have been argued for a long time. Number of empirical works has shown that, there is no systematic nexus between openness and both welfare and growth. The effects of this period on regional distribution of economic activity have also attracted attention of researches.<sup>1</sup> In this study, the effect of trade liberalization on composition of manufacturing industries at regional level and regional distribution of selected sectors in manufacturing industries are examined.

Sources and nature of regional differences have been one of the leading concerns of the growth and development economists. During the last few decades, different aspects of the regional differences have also been discussed in the field of economic geography. In spite of all efforts to find a universal model to explain the issue, economists are still far from a consensus. This is, probably, an outcome of the complexity of the regional differences within a country.

The following section is devoted to the discussions on the effects of openness on the regional distribution of the industrial activities. In the third section, data and the method used in the study are explained. The results of the analysis on the regional distribution of the Turkish manufacturing industry are given in the fourth section. The last section summarizes the findings of the study.

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<sup>1</sup> Examples of researches on regional disparities are Altınbaş et al (2002), Doğruel and Doğruel (2003a and 2005), Erlat (2005) and Filiztekin (1998 and 2005). In Dinçer et al (2003) regional disparities are studied by considering economic as well as social variables.

## 2. THE INTERACTION BETWEEN FOREIGN TRADE AND REGIONAL DISTRIBUTION OF MANUFACTURING INDUSTRIES

There are several approaches to analyze the spatial distribution of economic activities. The most popular model in “the new economic geography” which was pioneered by Krugman (1991a) and (1991b) has attracted great attention.<sup>2</sup> Krugman model is based on Marshall’s externality theory (Marshall, 1920). According to this model, spatial preferences of the industries are explained by push and pull forces in the region. The relative power of these forces determines degree of concentration in the region. Factors which lead to industrial concentration (centripetal forces) are market size, labor market depth and pure externalities. These are the sources of the Marshallian external economies. Centrifugal forces, which lead to industrial dispersion, are immobility of factors of production, high rents and pure external diseconomies (Krugman, 1999). Some weaknesses of Krugman’s model have been widely criticized.<sup>3</sup>

Although the study is not intended to focus on the debates on new economic geography, the concepts in the heart of these debates, such as externalities and market size, are closely related to foreign trade policies and openness. The effects of trade policies on growth are a controversial issue in economic theory. Conventional wisdom expects that openness has a positive effect on growth and wealth. One of the expected outcomes of trade liberalization in developing countries is to push the industrial sector, which produce for protected markets and thus stays away from competition, through internationally competitive environment. This expectation is particularly widespread among economists who prefer export-led industrialization to import substitution industrialization. The main assumption behind this expectation is that deteriorated relative price structure due to protection causes inefficient investment and production decision, and opening an industry to international markets will lead to more efficient allocation of resources. Therefore, it is believed that instead of a market structure where few firms operate under optimum level, pulling resources into industries with more comparative advantage will result in a market structure with many firms operating at an optimum level thereby faster growth (Doğruel and Doğruel 2003b: 14).

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<sup>2</sup> These two studies are jointly cited as references more than 1000 times (Head and Mayer, 2004)

<sup>3</sup> Among others, for the critique of Krugman Model see Neary (2001) and Schiff and Winters (2003: Section 5).

However, some economists claim that their empirical findings do not support a strong relation between growth and openness.<sup>4</sup>

On the other hand, openness may indirectly affect growth and wealth through its consequences on the spatial distribution of industries and regional disparities, assuming that there exists negative relationship between growth and regional inequalities. Thus, consequences of trade policies on wealth and regional inequalities are discussed by scrutinizing the way in which spatial distribution of industry changes during the course of trade liberalization. It is widely accepted that protective trade policies during the import substitution and inward oriented industrialization strategies lead concentration of industrial activity in one or a few centers. Although it is not merely owed to protectionist policies, Mexico City, which was an important industrial centre before outward-oriented policies were adopted, is used as an example of such a concentration. It is claimed that industrial activity shifted from Mexico to different regions after liberal trade regime was introduced (Krugman 1999).<sup>5</sup> Similar reallocations of industrial activities are also observed in Brazil (Krugman 1999). In Indonesia and China, on the other hand, opposite outcome is observed after the liberalization. In Indonesia, it has been observed that protectionism lead to concentration, but trade expansion did not reverse this trend. On the contrary, it accelerated the concentration of industrial activities in existing industrial sectors which cause further disparities between regions within the country (Sjöberg and Sjöholm, 2001). In China, on the other hand, the industries that are dependent on foreign trade and foreign investment tend to locate in regions with easy access to foreign markets (Ge, undated).

Regional economic integration is another external driving force which has effects on the distribution of economic activities in member countries. Regional economic integration may affect domestic regional distribution through its effects on economic growth of member countries.<sup>6</sup> However, discussions on this issue basically focus on the redistribution of resources among member countries to explain the interaction between regional integration and

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<sup>4</sup> Rodrik and Rodriguez (1999) did not find a strong relation between openness and growth in the cross section study. However, the method used by Rodrik and Rodriguez (1999) is criticized by Bhagvati and Srinivasan (1999). See Rodriguez and Rodrik (1999) for successful examples of import substitution industrialization and Baldwin et al (2003: Section 12) for the analyses of the trade policies.

<sup>5</sup> Krugman (1999) made this comment referring to Hanson (1992), while Hanson (1998) explains redirection of industry from Mexico City to Northern regions of Mexico as a result of NAFTA.

<sup>6</sup> In contrast to the discussions on new economic geography, the studies on this issue do not intend to develop an alternative model. For NAFTA see Hanson (1998).

growth. Regional integration puts some trade limitations on member countries with non member countries. These trade limitations have traditional and non-traditional effects.<sup>7</sup> Some of these effects may positively affect member country's wealth, while some may not. Mexico, Poland, and Portugal can be given as examples of North-South regional cooperation to stimulate growth. Nevertheless, correlation between regional integration and growth is ambiguous (Schiff and Winters, 2003: 123-24 and 136).

Above discussion shows that the correlation between trade policies and the spatial distribution of manufacturing industry is not lucid. The studies show that openness produces unidentical consequences on spatial distribution of industry in Asian and Southeast Asian countries such as Indonesia and China, and in Latin American countries. Our findings also do not give a systematic relationship between openness and spatial distribution of the Turkish manufacturing industries. Basic reason behind this is that the factors other than the trade policies, such as initial conditions of openness period, and social and geographical characteristics, may have stronger effects on spatial distribution of economic activities. Sjöberg and Sjöholm (2001) argue that the effect of trade liberalization on spatial concentration of economic activities is a complex issue and defining it straightforwardly is a difficult task.

### **3. DATA AND EMPIRICAL APPROACH**

First, we calculate the coefficient of variation in order to measure the change in the composition of the manufacturing industry in a region. Level 2 classification which defines the territorial organization of Turkey by 26 regions is taken as the units of the region in the study. The new level 2 regions group the 81 provinces into clusters with geographical or economic similarities. 81 provinces represent the level 3 in the classification. Level 1 consists of 12 regions.<sup>8</sup> We choose 10 Level 2 regions out of 26 to as to represent three types of regions in terms of industrialization characteristics: The regions in the first group, TR10,

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<sup>7</sup> A new member of the integration must prefer the products of high-cost member to low-cost non-member. Same situation is also valid for the existing member countries. This effect of the integration is called "trade diverting effect" which reduces the economic efficiency in the world scale (Fernandez and Portes, 1998). Therefore regional integration is criticized due to the fact that it forces the member countries to choose the second best, defined by Jacob Viner in 1950. For further discussion on this issue see Fernandez and Portes (1998).

<sup>8</sup> This classification is given in Annex.

TR31, TR41, TR42 and TR62, are leading industrial centers of Turkey. The regions in the second group, TR21 and TR33 are selected as the hinterlands of the TR10 and TR31 respectively. And, the regions in the third group, TR31, TR72 and TRC1, are the regions which are emerged after 1980 as the new industrial centers. First group regions include the leading industrial provinces such as Istanbul, İzmir, Adana, Kocaeli and Bursa. Istanbul and Kocaeli is the “industrial belt” of Turkey. Initially, Bursa and Kocaeli have grown as the industrial hinterland of Istanbul. During the last two decades, Bursa has become more important business district than Adana. Kocaeli, on the other hand, became eastern part of the “industrial belt” of Turkey. Denizli in Region TR32, Kayseri in Region TR72 and Gaziantep in TRC1 are new industrial cluster emerged during the openness period.

The changes in the composition of the manufacturing industries can be explained by the reallocation of the manufacturing at the national level. Therefore, as the second stage of the analysis, we chose four manufacturing industries and calibrated how the distribution of these industries has changed.

We examine the regional distributions of the following sectors of the Turkish manufacturing industry that classified by ISIC Rev.2: Food manufacturing (except beverage) (311), manufacture of textiles (321), manufacture of wearing apparel (except footwear) (322), and manufacture of transport equipment (384). These are leading sectors in manufacturing industry in Turkey in terms of value added and employment. Considering their sectoral shares in total manufacturing value added, manufacture of textiles, food manufacturing, and manufacture of transport equipment are second, third and fourth largest industries, respectively, following the petroleum refineries (353) which takes the first place. On the other hand, manufacture of textile, manufacture of wearing apparel and manufacture of transport equipment take first three places in manufacturing exports. Manufacture of textile and manufacture of wearing apparel are **net exporter sectors** in Turkey. Although manufacture of transport equipment is an important in export, imports of transportation equipments is also very large comparing to the domestic production. Therefore, the **openness ratio of this sector** is very high comparing the other sectors that we consider in the study. In contrast to transportation equipment, manufacture of food sector is the **most protected and closed sector** of the Turkish manufacturing industry. Considering these properties, we expect

to observe, if any, the diversified effects of transition from protected trade regime to open trade regime on the regional distribution of the manufacturing industries.

Various measures can be used for the analyses of regional distribution of economic activities. One of the most widely used one is Krugman's "locational Gini coefficient" (Krugman, 1991b: 54).<sup>9</sup> Another commonly used measure is the index developed by Ellison and Glaeser (1997), which is used for measuring concentration of industrial activity in a certain area.<sup>10</sup> Herfindahl Index is also another measure.<sup>11</sup> In the study, we used "coefficient of variation" as a statistical measure which is defined as:

$$\text{COEFFICIENT OF VARIATION} = \text{STANDARD DEVIATION} / \text{ARITHMETIC MEAN}$$

Coefficient of variation is calculated for sectoral value added and labor for each year. The increase in coefficient of variation implies that diversification diminishes during the period covered. Coefficient of variation is not evidently superior to the other criteria in terms of reflecting dispersion. We prefer coefficient of variation due to the fact that standard deviation is widely used as a convergence criterion in economic growth analyses.<sup>12</sup> However, standard deviation has a weakness when it is used for the time series data: any change in the mean transmitted to the value of standard deviation without any change in distribution. Sectoral and regional averages of the data we use tend to increase due to economic growth. Therefore, consequent increase in standard deviation would show higher concentration level. In order to resolve this problem, we employ coefficient of variation by dividing standard deviation by arithmetic mean.

The study covers the period of 1980-2000. Value added and number of worker employed are used in the analyses. Only data for the private firms were taken into account. Data source is Annual Manufacturing Industry Statistics of State Institute of Statistics.

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<sup>9</sup> This coefficient is explained in detail in (Krugman, 1991b: 55). Krugman employed this coefficient in order to analyze location of a typical US' industry in a region.

<sup>10</sup> See Head and Mayer (2003) for the alternative use of indexes to measure concentration of industrial activity in a region, and for the limitations of the indexes.

<sup>11</sup> Sjöberg and Fredrik Sjöholm (2001) used this index for Indonesia.

<sup>12</sup> See for example, Barro ve Sala-i Martin (2004: 461-509)



#### **4. SOME OBSERVATIONS ON THE SPATIAL DISTRIBUTION OF THE TURKISH MANUFACTURING INDUSTRIES**

Regional disparities have a long history in Turkey. In the late 19<sup>th</sup> century and early 20<sup>th</sup> century, provinces have been differing in terms of merchantization and production varieties in agriculture.<sup>13</sup> Aegean Region and Adana (South Region of Turkey) have been the most integrated regions into the World economy. Marmara Region and Istanbul were important industrial centers of the Ottoman Empire. The main pattern of regional disparities of Turkey did not significantly change over the last century. Today, the West side of Turkey is still the most developed area of the country. During the last two decades, new industrial centers have emerged in the Eastern part of Turkey such as Gaziantep, Kayseri and Malatya. However, reallocation of the industrial activities within the Western part of the country dominates the overall changes.

Coefficient of variation for value added and employment are calculated in order to pursue the changes in the sectoral composition in each region. However, changes in the coefficients of variation are outcome of the changes at national and regional levels. In order to eliminate the changes at national level, we divide the values of the coefficient of variation by the annual average. Therefore, resulting indicator shows the relative change in the sectoral composition of the manufacturing industries in the region. Estimated relative values of the coefficient of variation are displayed in the graph 1 to 10.

When we examine the major industrial regions, annual coefficients of variations of Region TR10, TR31 and TR42 are very low during the entire period in contrast to Region TR41 Graph 1, 2, 3 and 4). A common characteristic of these four regions is that the composition of the industrial activities does not show significant change. On the other hand, we observe a decrease in coefficient of variation in Region TR62 (Graph 5). In general, decrease in coefficient of variation reflects diversification of the activities as a result of industrial development in the region. However, in this case, basic reason behind the decline in coefficient of variation is an outcome of the reallocation of the textile industry in the

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<sup>13</sup> For further information please look at Keyder (1982:34-35) and Çeçen et al (1990)

country: Initially, this region is specialized in textile industry. For example, in the year 1987, Region TR62 was second important center of the textile production in term of value added. However, in the year 2000 Region TR62 declined to 6th place (Table 1). Consequently, in contrast to other major industry regions, initial level of specialization was very high in this region (high coefficient of variation). It seems that adverse effect of the openness is substituted by transport equipment industry: Region TR62 shows significant improvement in this activities and its place jumped from 12th place in the year 1987 to 6th place in the year 2000.

Two industrial hinterlands show diverse response to trade liberalization (Graph 6 and 7). In Region TR21 we observe a diversification in the industrial activities. During the period analyzed, particularly eastern part of the Region TR21 has integrated to the Turkish manufacturing belt in the Marmara region of Turkey. On the other hand, in Region TR33 there is no significant change in the composition of the manufacturing industries.

Liberalization has also different effect on the emerging industrial regions (Graph 8, 9 and 10). In region TR72 we observe a slight diversification. In terms of value added, the shares food, textile and transport equipment industries of this region in national level are almost same in the years 1987 and 2000. In Region TRC1 there is a specialization: Textile industry of the Region TRC1 stay at 5th place, but share of total production rose from 5.4 percent in the year 1987 to 9.1 percent in the year 2000. In Region TR32 there is a significant change in sectoral composition of the manufacturing industry, toward specialization in textile and wearing industries.

Graph 11, 12, 13 and 14 display the changes in the coefficient of variation for value added and employment for food, textile, wearing apparel and transport equipment industries. Smooth decreases in the values of the coefficient of variation show a modest improvement in regional distribution of these industries. Considering that these industries have displayed different performances during the openness period, these changes can not be attributed to trade liberalization. Leading regions for these industries are located in the western part of the country, and the changes in the orders of the regions either are not important or take place within the western regions (Table 1). It seems that the reductions in the differences between

the leading regions are the basic source of the decreases in the values of the coefficient of variation.

## **5. CONCLUSION**

It seems that trade liberalization do not create systematic change in the sectoral distribution of the manufacturing industries. The changes in some regions that we observe are basically outcome of the reallocation of the textile industry. Interesting point is that the textile is one of the most perversely effected industries in Turkey during this period and Turkish textile industry lost its competitive power in the international markets as well as in the domestic market. During this period, textile industry shift from major industrial regions to newly developed industrial regions. Another source of changes in the sectoral composition in the regions is wearing industry. Wearing production which displayed successful performance in the international markets shifted from major industrial region to industrial hinterlands. On the other hand, trade liberalization has similar effect on most open and most protected industries: There are modest changes in the regional distribution of transportation equipment and food industries.

The results show that there is no deterioration in the spatial distribution of most of the industrial activities during the last two decades. On the contrary, we observe slight decrease in regional inequality. However, closer examination shows that this is a misleading result, and the small decreases in the coefficients of variation are mainly outcome of the reallocation of the industries within the relatively developed western region of the country.

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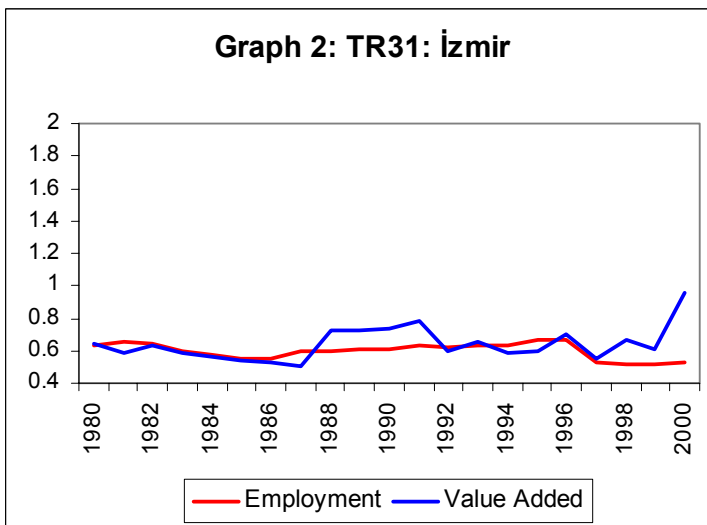
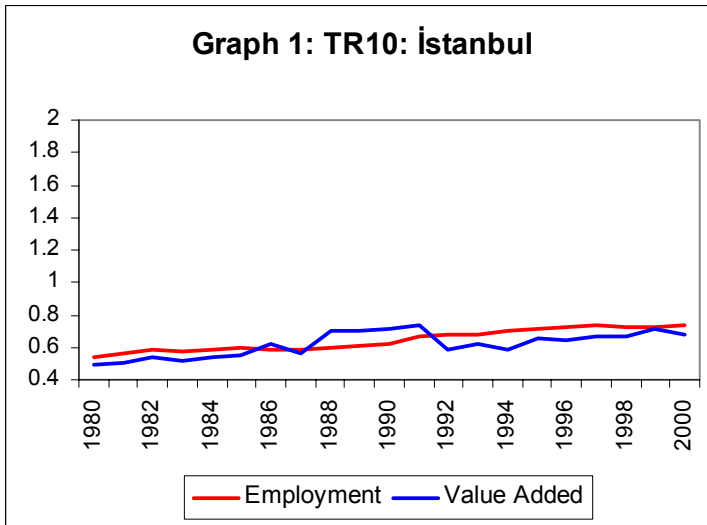
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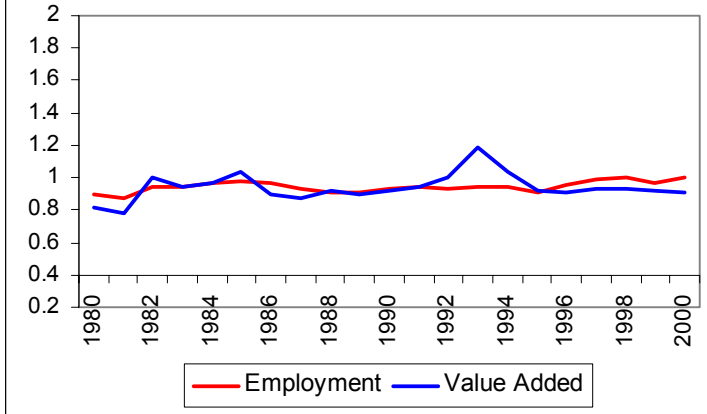
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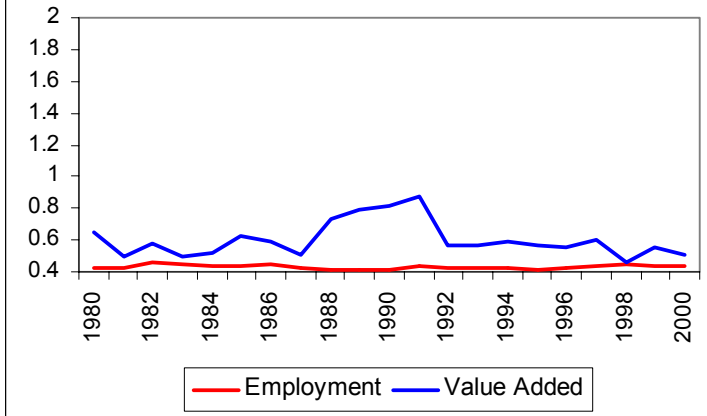
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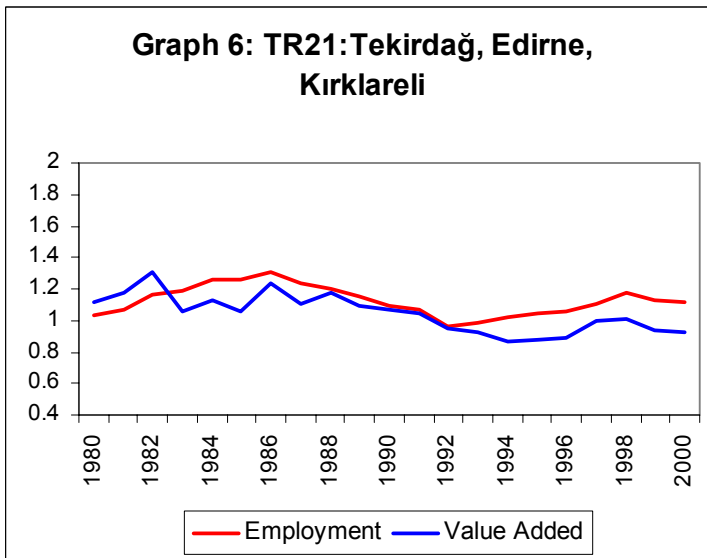
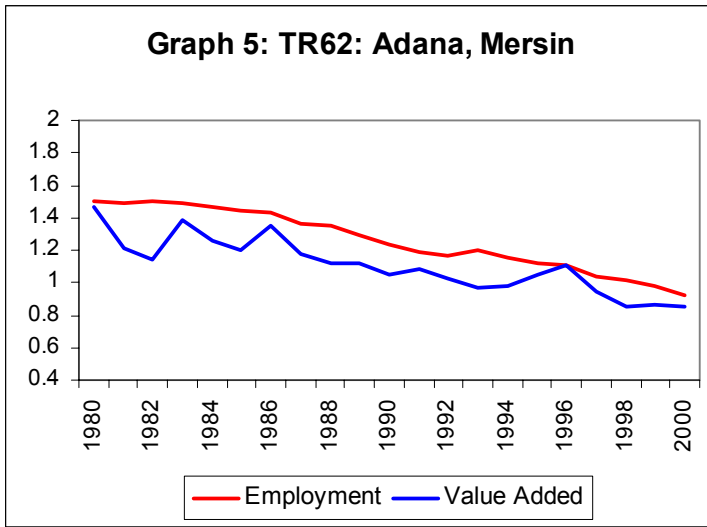
**Graph 3: TR41: Bursa, Eskişehir,  
Bilecik**



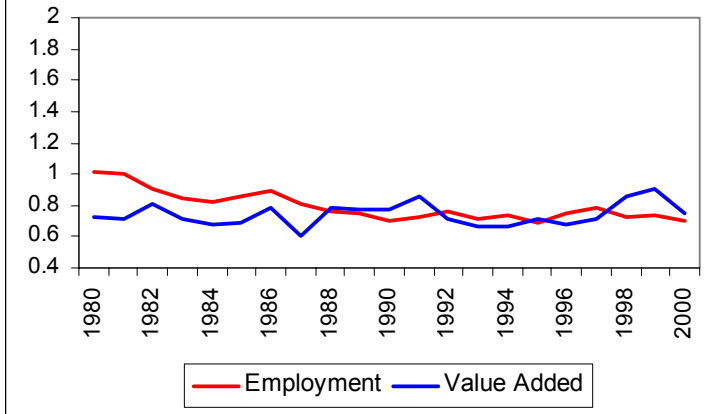
**Graph 4: TR42: Kocaeli, Sakarya,  
Düzce, Bolu, Yalova**



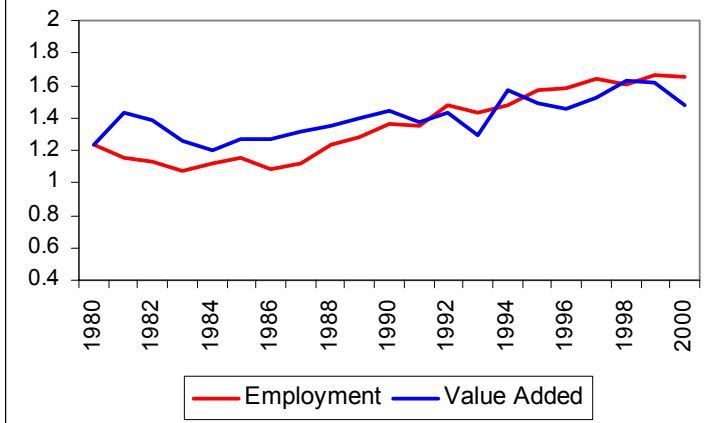




**Graph 7: TR33: Manisa, Afyon,  
Kütahya, Uşak**



**Graph 8: TR32: Aydın, Denizli, Muğla**



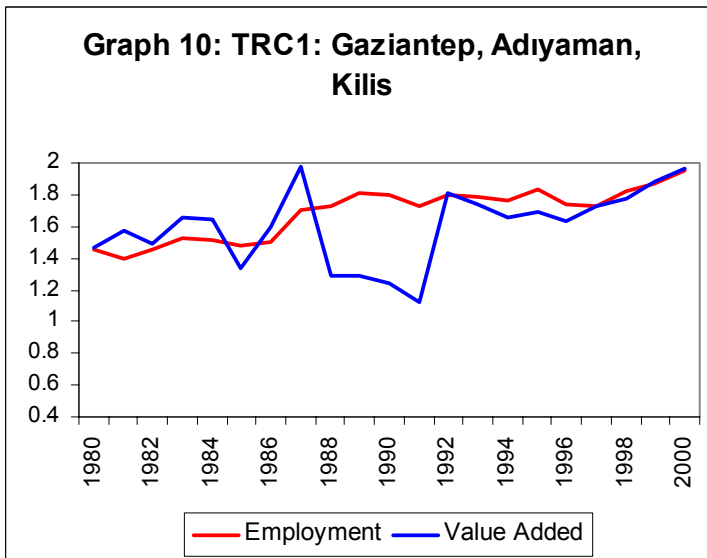
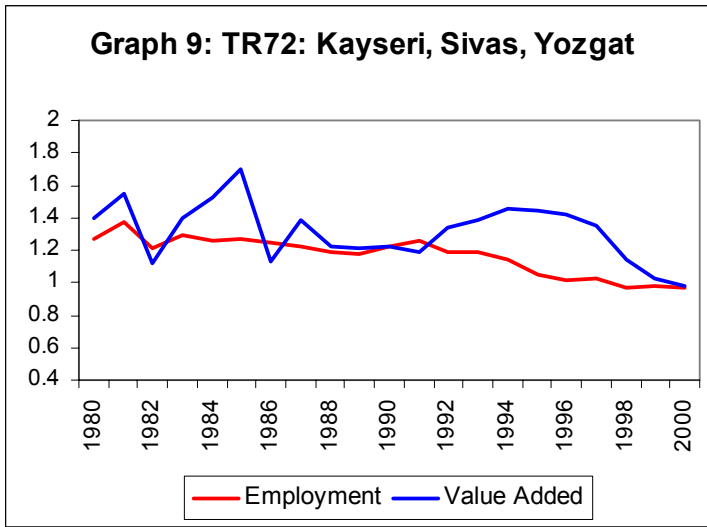


Table 1: Shares of Regions in Selected Manufacturing Industries

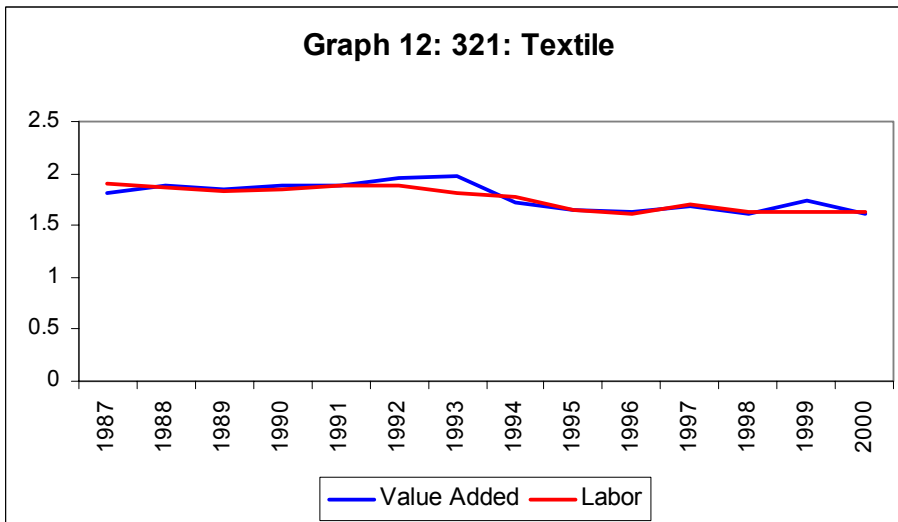
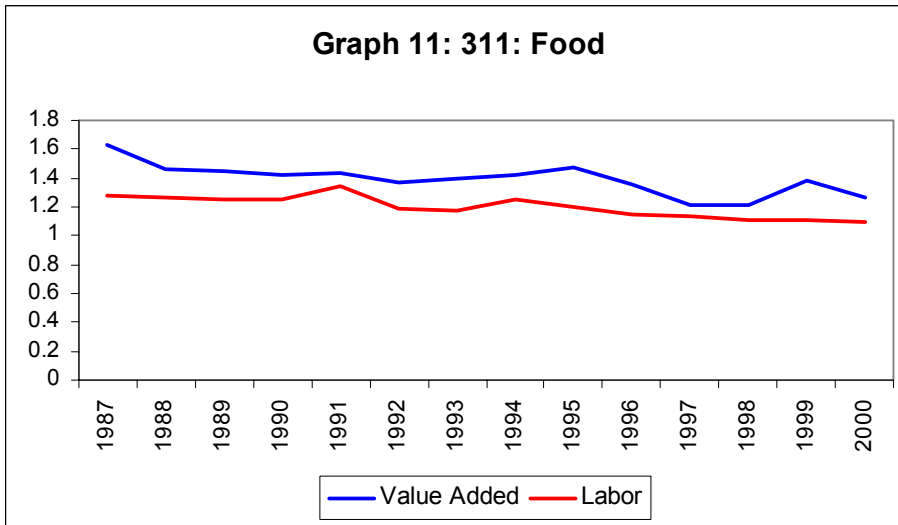
<b>311: Food</b>				<b>321: Textile</b>			
Region	1987	Region	2000	Region	1987	Region	2000
<b>TR10</b>	0.2879	<b>TR10</b>	0.1496	<b>TR10</b>	0.3000	<b>TR10</b>	0.2347
<b>TR31</b>	0.1632	<b>TR41</b>	0.1485	<b>TR62</b>	0.1695	<b>TR41</b>	0.1815
<b>TR41</b>	0.0875	<b>TR31</b>	0.1319	<b>TR41</b>	0.1486	<b>TR21</b>	0.1431
<b>TR21</b>	0.0660	<b>TR21</b>	0.1091	<b>TR21</b>	0.0846	<b>TR32</b>	0.1051
<b>TR62</b>	0.0634	<b>TR42</b>	0.0894	<b>TRC1</b>	0.0542	<b>TRC1</b>	0.0905
TR52	0.0552	TR22	0.0712	<b>TR32</b>	0.0429	<b>TR62</b>	0.0528
TR51	0.0472	TR52	0.0594	<b>TR31</b>	0.0414	<b>TR72</b>	0.0393
<b>TR42</b>	0.0428	TR51	0.0542	<b>TR72</b>	0.0399	<b>TR42</b>	0.0338
TR22	0.0409	<b>TR62</b>	0.0379	<b>TR42</b>	0.0337	TR63	0.0279
<b>TR33</b>	0.0324	<b>TR33</b>	0.0358	TR61	0.0308	<b>TR31</b>	0.0258
TR83	0.0289	<b>TR72</b>	0.0206	<b>TR33</b>	0.0143	TR61	0.0185
<b>TR72</b>	0.0209	TR82	0.0182	TR51	0.0128	<b>TR33</b>	0.0138
TR61	0.0107	TR90	0.0160	TR71	0.0107	TR51	0.0107
<b>TRC1</b>	0.0098	<b>TRC1</b>	0.0091	TR63	0.0060	TRC2	0.0059
<b>TR32</b>	0.0075	TR61	0.0090	TR22	0.0055	TR71	0.0054
TR63	0.0059	TR83	0.0081	TR83	0.0022	TR52	0.0030
TR90	0.0057	<b>TR32</b>	0.0079	TRC2	0.0012	TR83	0.0028
TRA1	0.0045	TRB1	0.0060	TRB1	0.0010	TR22	0.0025
TRB1	0.0043	TR63	0.0048	TR52	0.0003	TR82	0.0021
TR71	0.0040	TRA1	0.0045	TR82	0.0002	TR81	0.0016
TR81	0.0036	TRC2	0.0028	TRB2	0.0001	TR90	0.0002
TRB2	0.0035	TR71	0.0025	TR90	0.0001	TRA1	0.0001
TRC2	0.0025	TR81	0.0014	TRA2	0.0000	TRC3	0.0000
TR82	0.0015	TRC3	0.0009	TRA1		TRA2	
TRA2	0.0004	TRA2	0.0006	TRC3		TRB2	
TRC3		TRB2	0.0005	TR81		TRB1	

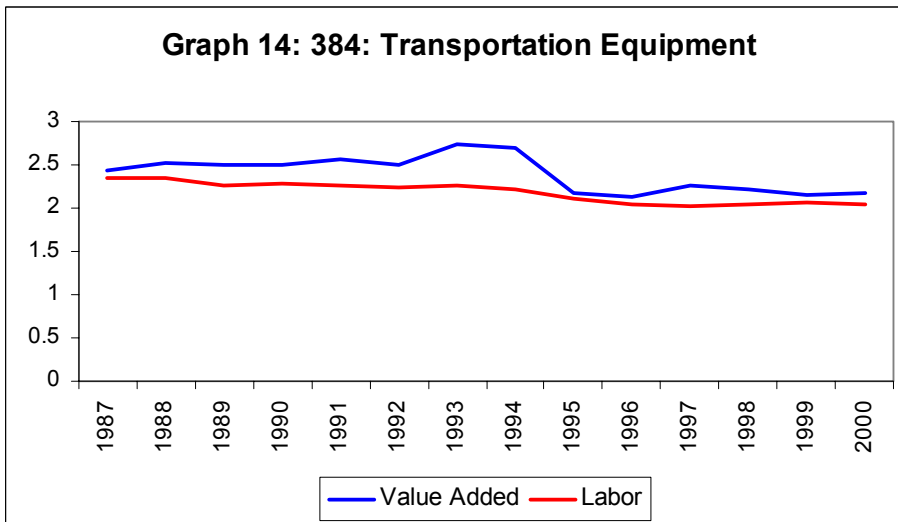
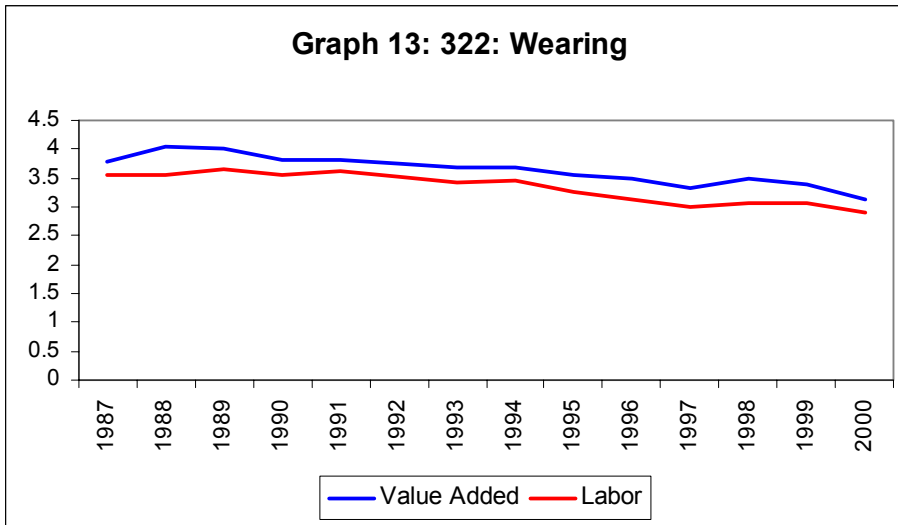
**322: Wearing Appeal**

Region	1987	Region	2000
<b>TR10</b>	0.7176	<b>TR10</b>	0.6111
<b>TR31</b>	0.2271	<b>TR21</b>	0.1094
<b>TR33</b>	0.0218	<b>TR31</b>	0.0853
<b>TR41</b>	0.0130	<b>TR32</b>	0.0510
<b>TR62</b>	0.0067	<b>TR62</b>	0.0382
TR51	0.0050	<b>TR41</b>	0.0319
TR82	0.0040	TR51	0.0261
<b>TR21</b>	0.0029	<b>TR42</b>	0.0132
<b>TR32</b>	0.0008	TR82	0.0112
TR61	0.0004	TR81	0.0091
TRB1	0.0003	TR83	0.0061
TR63	0.0003	TR22	0.0018
<b>TR42</b>	0.0001	TR71	0.0016
TRC3		<b>TR33</b>	0.0013
TRC2		<b>TR72</b>	0.0007
<b>TRC1</b>		TR63	0.0006
TRB2		TRA1	0.0005
TRA2		TRB2	0.0005
TRA1		TR52	0.0001
TR90		TRA2	0.0001
TR83		<b>TRC1</b>	0.0001
TR81		TR61	0.0000
TR22		TR90	
TR52		TRB1	
TR71		TRC2	
<b>TR72</b>		TRC3	

**384: Transportation Equipment**

Region	1987	Region	2000
<b>TR10</b>	0.3639	<b>TR41</b>	0.2961
<b>TR41</b>	0.3073	<b>TR10</b>	0.2850
<b>TR42</b>	0.1219	<b>TR42</b>	0.1466
<b>TR31</b>	0.0874	<b>TR31</b>	0.1285
TR51	0.0867	TR51	0.0677
TR63	0.0105	<b>TR62</b>	0.0303
<b>TR33</b>	0.0063	<b>TR21</b>	0.0177
TR71	0.0033	<b>TR33</b>	0.0103
<b>TR21</b>	0.0032	TR71	0.0036
<b>TR32</b>	0.0030	TR81	0.0036
TR52	0.0017	TR52	0.0032
<b>TR62</b>	0.0015	TR63	0.0024
<b>TR72</b>	0.0014	<b>TR32</b>	0.0021
TR81	0.0009	<b>TR72</b>	0.0014
TR82	0.0003	TR82	0.0003
TR90	0.0002	TR83	0.0003
<b>TRC1</b>	0.0002	TR22	0.0002
TRA1	0.0001	TR90	0.0002
TR83	0.0001	TR61	0.0002
TR22	0.0001	<b>TRC1</b>	0.0001
TR61		TRA1	
TRA2		TRA2	
TRB1		TRB1	
TRB2		TRB2	
TRC2		TRC2	
TRC3		TRC3	





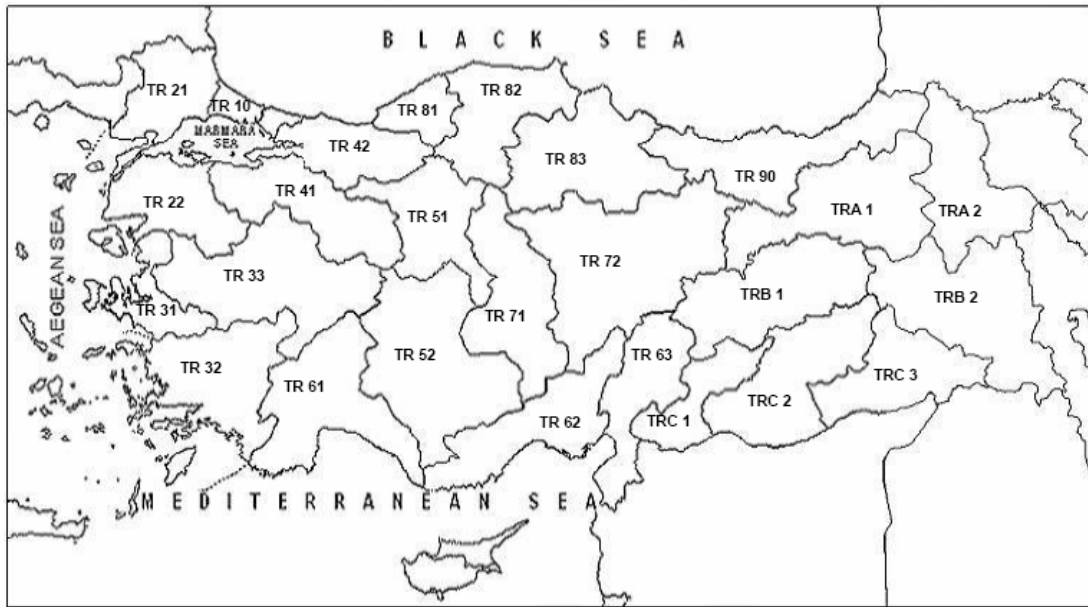
## ANNEX: Statistical Regional Classification

CODE	LEVEL1	LEVEL2	LEVEL3
TR	TURKEY		
TR1 TR10 TR100	Istanbul	<b>Istanbul</b>	Istanbul
TR2 TR21 TR211 TR212 TR213 TR22 TR221 TR222	Western Marmara	<b>Tekirdağ</b>	Tekirdağ Edirne Kırklareli
		<b>Balıkesir</b>	Balıkesir Çanakkale
TR3 TR31 TR310 TR32 TR321 TR322 TR323 TR33 TR331 TR332 TR333 TR334	Aegean	<b>İzmir</b>	İzmir
		<b>Aydın</b>	Aydın Denizli Muğla
		<b>Manisa</b>	Manisa Afyon Kütahya Uşak
TR4 TR41 TR411 TR412 TR413 TR42 TR421 TR422 TR423 TR424 TR425	Eastern Marmara	<b>Bursa</b>	Bursa Eskişehir Bilecik
		<b>Kocaeli</b>	Kocaeli Sakarya Düzce Bolu Yalova
TR5 TR51 TR510 TR52 TR521 TR522	Western Anatolia	<b>Ankara</b>	Ankara
		<b>Konya</b>	Konya Karaman
TR6 TR61 TR611 TR612 TR613 TR62 TR621 TR622 TR63 TR631 TR632 TR633	Mediterranean	<b>Antalya</b>	Antalya Isparta Burdur
		<b>Adana</b>	Adana Mersin
		<b>Hatay</b>	Hatay Kahramanmaraş Osmaniye
TR7 TR71 TR711 TR712 TR713 TR714 TR715 TR72 TR721 TR722 TR723	Middle Anatolia	<b>Kırıkkale</b>	Kırıkkale Aksaray Niğde Nevşehir Kırşehir
		<b>Kayseri</b>	Kayseri Sivas Yozgat

CODE	LEVEL1	LEVEL2	LEVEL3
TR8 TR81 TR811 TR812 TR813 TR82 TR821 TR822 TR823 TR83 TR831 TR832 TR833 TR834	Western Black Sea	<b>Zonguldak</b>	Zonguldak Karabük Bartın
		<b>Kastamonu</b>	Kastamonu Çankırı Sinop
		<b>Samsun</b>	Samsun Tokat Çorum Amasya
TR9 TR90 TR901 TR902 TR903 TR904 TR905 TR906	Eastern Black Sea	<b>Trabzon</b>	Trabzon Ordu Giresun Rize Artvin Gümüşhane
TRA TRA1 TRA11 TRA12 TRA13 TRA2 TRA21 TRA22 TRA23 TRA24	North Eastern Anatolia	<b>Erzurum</b>	Erzurum Erzincan Bayburt
		<b>Ağrı</b>	Ağrı Kars İğdır Ardahan
TRB TRB1 TRB11 TRB12 TRB13 TRB14 TRB2 TRB21 TRB22 TRB23 TRB24	Middleeastern Anatolia	<b>Malatya</b>	Malatya Elazığ Bingöl Tunceli
		<b>Van</b>	Van Muş Bitlis Hakkari
TRC TRC1 TRC11 TRC12 TRC13 TRC2 TRC21 TRC22 TRC3 TRC31 TRC32 TRC33 TRC34	Southeastern Anatolia	<b>Gaziantep</b>	Gaziantep Adıyaman Kilis
		<b>Şanlıurfa</b>	Şanlıurfa Diyarbakır
		<b>Mardin</b>	Mardin Batman Şırnak Siirt

Source: SPO





Source: SPO