

**THE SECTORAL ASPECTS OF TURKISH ECONOMY  
IN THE WAY THROUGH EU INTEGRATION:  
AN INPUT-OUTPUT ANALYSIS**

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# **THE SECTORAL ASPECTS OF TURKISH ECONOMY IN THE WAY THROUGH EU INTEGRATION: AN INPUT-OUTPUT ANALYSIS**

## **Abstract**

One of the most important economic events of the twentieth century in Europe has been the process of European economic integration. After the Customs Union Agreement in 1996, Turkey has taken an important step in economic integration with European countries in terms of free trade activities. Recently, Turkey has recorded a remarkable progress on the way of full membership to European Union (EU) and the negotiations with EU were officially launched on October 3, 2005.

The aim of this paper is to present an extensive sectoral analysis of Turkish economy in comparison to EU economies with the help of recent input-output tables. In this framework, both descriptive and econometric methods will be used. The OECD Input-Output Database will be utilized for the analysis. The differences in sectoral value added ratios, technological coefficients and multiplier effects will be analysed with sectoral interlinkages methods. On the other hand, the production structure of Turkey will be compared to that of EU, using regression analysis. Lastly, the production structures of some of the new member state countries, Czech Republic, Hungary, Poland and Slovakia, with Turkey will be compared within the data availability.

JEL Codes: C67, O10 and O14.

Key Words: Input-output; multiplier effect; convergence; EU integration; regression analysis; Turkey.

## **1. Introduction**

Turkey is a developing country, which acquired candidate statute after the Helsinki summit in December 1999 towards the EU membership. Moreover, the negotiations with the EU officially commenced on 3 October 2005. Since 2000, with the adjustment efforts to the EU acqurie and the convergence target to the Maastricht criteria, a structural change in the economy of Turkey has been experienced. The economy, with high and persistent inflation, volatile growth, high public deficits and structural problems in 1990's, is changing into economic stability with high and sustainable economic growth, declining inflation and tight fiscal policy. However, to determine the steps that should be taken further, for the transformation of the Turkish economy, it is important to set the targets of the economy. In this study, our aim is to compare the sectoral structure of the Turkish economy with the 13 old EU member states and 4 of the new member states in order to point out the weaker and stronger aspects of sectors in Turkey on the way to EU, by using the recent input-output tables.

There are various studies in Turkey analyzing the sectoral structure of the economy by using input-output (I-O) tables and they give valuable insights. Şenesen and Şenesen (2000), use the 1990 I-O table in order to study the import dependency of Turkey. In this paper, most import dependent sectors in terms of suppliers are detected by using import backward multipliers. They find the most dependent sector as the petroleum. To be specific, the ratio of imported inputs/total inputs for petroleum is 90 per cent. Besides, import dependency of the sectors such as other manufacturing, iron & steel, electrical machinery, rubber, and medicine are found to be high in comparison to the other sectors. On the other hand, both direct and indirect imported intermediate input requirement is investigated and the findings reveal that direct, and both direct and indirect intermediate input import

dependency induced by final demands are quite close to each other for the Turkish economy.

Tunç (2000) aims to reach to the basic components of the structural change process for the period of 1985-1996 by using the 1985, 1990, and 1996 I-O tables. It is revealed in the study that total production increase in the Turkish economy was mainly resulted from export and domestic demand in the 1985-1990 period. In addition, the effect of import substitution remained negative, both for intermediate and final goods. On the other hand, in the 1990-1996 period, it is seen that the main source of the total production increase was domestic final demand rise. Contribution of export increase remained negative in this period. Technological development made limited contribution to the total production in the 1985-1996 period, as a whole.

Günçavdi, Küçükçifçi and McKay (2002) aim to examine the effects of the structural adjustment program undertaken in Turkey from the early 1980s onwards on employment structure. In this paper, labor demand of the Turkish industries is calculated and changes in labor demand are analyzed by using two I-O tables (1973-1990) for the pre and post stabilization eras. Findings show that in the majority of industries, foreign trade in intermediate goods creates extra use of domestic labor in both periods, which can be considered as the labor cost of importing intermediate goods. On the other hand, the decrease of the capacity of using extra labor as a result of importing intermediate goods in the post-liberalization period is another finding of the paper.

Şenesen and Şenesen (2003), analyze the import dependency of production in Turkey using 1973, 1985, and 1996 I-O tables, in the context of economic policies implemented in the periods before and after 1980, where import substitution and export promotion strategies have come into existence. Their results show that the import dependency of the economy, as a whole, increased significantly from 1973 to 1985 and

changed little from 1985 to 1996. Besides, the fact that Turkish economy is structurally dependent on raw petroleum is another basic characteristic displayed in the study. On the other hand, one unexpected outcome for the post 1980 era is pointed out as the emergency of leading export sectors like agriculture, textiles and food as cases of significant import dependent sectors, obviously contrary to the expectations of the export promotion policy.

To the best of our knowledge, although there are studies analyzing the sectoral structure of the Turkish economy, there is no study comparing the sectoral structure of the Turkish economy with EU member states, which is the contribution of this study. Although there is no study on the comparison of the Turkish economy to other countries, Hoen (2002) compares the sectoral structure of six EU countries (Germany, France, Italy, Netherlands, Belgium, Denmark) between the years 1970 and 1985. Hoen (2002) uses the sign test and regression analysis to compare the technological structure of the six EU countries. Moreover, he decomposed the industry output of the countries and compared the sizes of these 6 EU countries to their average. Moreover he used the time dimension to analyze the convergence of these countries. Following Hoen (2002)'s methodology, we use the regression analysis and the decomposition of the industry output, value-added and intermediate consumption to the sectors, and we compare Turkey with the weighted average of the 13 old EU member states and with the 4 of the new EU member states.

The I-O tables used in this study are taken from OECD database 2006 edition, covering 48 sectors. We compare the weighted EU average and the new member states with Turkey. The I-O tables are available for Turkey and other countries for different years. This is the drawback of this study, however we used two different years for EU and Turkey and the comparison results are robust, which suggests that the year differences problem do not affect our study very much.

Our results suggest that Turkey's technological structure is different from EU for more than 30 sectors out of 48. On the other hand the difference between Turkey's technological structure and new member state countries is significant for only 13 sectors. The sectors in Turkey that are significantly different from EU and the new member states appeared to be, agriculture (1), textile (5), food and food products (4), wood and wood products (6), the sectors related to machinery (15-19) and most of the sectors contributing to total factor productivity (TFP). On the other hand, our findings for sectoral linkage analysis indicate that the sectoral inter-linkages are weak in Turkish economy, whereas they are stronger in the EU-13 compared to Turkey, which implies that the sectoral structures of EU-13 economies are more dynamic than the sectoral structures in Turkish economy. Additionally, the import dependency in the EU-13 economy is not less than that of Turkey, which is an interesting outcome.

The outline of the paper is as follows: Section 2 presents the data and methodology that is used in the study. Section 3 discusses the comparison of Turkish economy's sectoral structure with the weighted average of 13 EU member states. In Section 4, Turkey is compared with the new member states. Finally, Section 5 concludes.

## **2. Data**

The I-O tables used in this paper are taken from the OECD Input-Output database. The latest set includes 2006 Edition of I-O Matrices (ISIC Rev. 3) covering 48 sectors. The 13 old EU member states (hence forth EU-13), 4 new EU member states and Turkey are involved in the same data set, thus consistent and comparable data is utilized for this analysis. The 13 old member states in the data set are Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, Netherlands, Portugal, Spain and Sweden, whereas the 4 new member states in our analyses are Czech Republic, Hungary, Poland and Slovakia. The analysis of comparing the economic structure of countries may have some

difficulties, because of the fact that the I-O tables published for countries differ as of their base years. Nevertheless, OECD I-O data base covers a wide range of countries and it is very useful for I-O analysis. The data is available for all EU-13 member states for the year 1995; for Turkey for the years 1996 and 1998; for Greece and Portugal, for the year 1999; for Austria, Belgium, Denmark, Finland, France, Germany (Deutschland), Great Britain, Italy, Netherlands, Spain and Sweden, and the 4 new member states for the year 2000.

In order to compare the technology coefficients (input coefficients) of EU-13 countries with those of Turkey, the technology coefficients of 13 EU member states are aggregated to get the EU-13 weighted average for the years 1995 and 2000 as follows. Firstly, technology coefficients for the country  $r$  for sector  $j$  are calculated ( $a_{ij}^r$ ). Then, the weight of each member states for the sector  $j$  in the total output of the EU-13 is calculated ( $w_j^r$ ). Lastly, the weighted average of the technology coefficients of EU-13 ( $\tilde{a}_{ij}^{EU-13}$ ) is calculated as:

$$\tilde{a}_{ij}^{EU-13} = \sum_{r=1}^N w_j^r * a_{ij}^r \quad , \text{ where } N \text{ is the number of sectors in I-O}$$

tables.

Similarly, we use the weight of each country's output in sector  $j$  to calculate the EU-13 average value added, intermediate consumption and output for sector  $j$  as follows:

$$\tilde{x}_j^{EU-13} = \sum_{r=1}^N w_j^r * x_j^r$$

where the values that  $x$  can take are value added, intermediate consumption and output.

### **3. The Comparison of the Sectoral Structure of Turkish Economy to EU-13**

#### **3.1. The Comparison of the Production Structures of Turkey and EU-13**

After Turkey's candidacy acquired in 1999, the convergence and integration toward EU standards have been started in Turkish economy in every field. On the convergence issue, most of the international trade theories expect international trade and economic integration to lead to faster technological changes, as countries that lag behind in technology will easily catch up with the relatively advanced technologies of other countries. These so-called technological spillovers between countries lead to technological convergence between the countries as stated in Hoen (2002). In this section, our aim is to identify the sectors of the Turkish economy that have different production structures from EU so that these sectors will be the natural candidates for convergence in the production structure. If production structures are already similar, these sectors will not be converging. In the literature, there are two methodologies to compare the production structure of two countries; sign test and regression analysis.

Sign test is the method suggested by Kurtzweg (1977) to compare columns of the I-O tables of two countries. The logic behind this test is that if the production structures of two countries are different, then the input coefficients will be different.

Although sign test is a method to test the difference between two series, there is a drawback: cases in which the sign test fails to report different input structures are easy to construct. Hoen (2002) states the drawback of the sign test as follows: "...If twelve input coefficients are significantly smaller in one country than in the other country, and twelve other input coefficients are significantly larger, the sign test accept the null hypothesis that the two production structures are similar. Hence, the sign test provides a pessimistic count of the number of sectors with a different production structure....". Therefore, we do not use



sign test in our analysis. Alternatively, to identify the differences and similarities between Turkey and EU, we use the method of the regression analysis.

The logic behind the regression analysis is similar to the sign test, but the technique used is OLS instead of statistical comparison. The technological coefficients (production structure) in sector  $j$  in EU ( $a_{ij}^{EU}$ ) is regressed on the production structure of the same sector in Turkey  $a_{ij}^{TR}$  :

$$a_{ij}^{EU} = \alpha + \beta * a_{ij}^{TR} + u_j$$

If the production structure in sector  $j$  is similar in both countries, then  $\alpha=0$  and  $\beta=1$ . If  $\alpha$  or  $\beta$  are significantly different from the mentioned values then the production structures in the two countries are significantly different. Wald test is used to test whether the values hold or not. The significance levels of 1 per cent are reported in tables.

We repeated the analysis for two different sets of I-O tables of Turkey and EU-13. Table 1 reports the comparison of the production structures of Turkey for 1996 and EU-13 for 1995. On the other hand, Table 2 is constructed by using the I-O table of Turkey for the year 1998 and the I-O table of EU for the year 2000. One may argue that as the year of the I-O tables in our analyses are not similar, the relative prices in two tables are not the same and this would create problems in our interpretation. To account this problem we used two sets of I-O tables and the robustness of the results in both of them allows us to draw conclusions. However, as we use the two tables to overcome the problem of relative price differences, we do not have any chance to compare the structure between the years and this fact is due to the limitation of data.

One important note about the analysis that should be considered before evaluating the results is that accepting the null hypothesis of no significant differences does not mean

that the production structures are similar. However, rejection of the null hypothesis does indicate that production structures are significantly different.

[Insert Table 1 here]

[Insert Table 2 here]

Table 1 and Table 2 suggest that more than 30 sectors in Turkey and EU have different production structures. This result shows that with the integration to EU, Turkey would catch up the EU production structure in terms of technology as there are significant differences in the sectors such as agriculture, wood and wood products, pharmaceuticals, machinery and related sectors, construction and the sectors contributing to TFP.

Although these analyses help us to point out the sectors that are different in technology in the production stage, they do not give hints on how much is the difference between production structures of the sectors.

### **3.2. Comparison of the Shares of Sectors**

The shares of the sectors in total value added, intermediate consumption and industry output reflect the size of the sectors in an economy. Although a sector with a greater size would not give any hint about the efficiency of the sector or the production structure, comparing the sizes of the sectors in two countries would help us to understand the differences in the structure of the economy.

While comparing the size of the economies we use two sets of I-O tables as before. The I-O table for 1996 of Turkey is compared to the I-O table of the EU-13 for 1995 and the I-O table for 1998 of Turkey is compared with the I-O table of the EU-13 for 2000. The relative price differences would cause misleading conclusions arguments are also valid here. However, we ignored the relative price differences since the results of the two sets of

comparisons do not differ very much. Thus, we conclude that the results are robust and to get general conclusions from the results will be fruitful.

Table 3 and Table 4 present the size of the sectors for the EU economy and Turkish economy. As both tables suggest similar results we will continue to consider Table 4 (I-O tables of EU-13 for 2000 and of Turkey for 1998) during the rest of the section.

[Insert Table 3 here]

[Insert Table 4 here]

Agriculture, hunting, forestry and fishing (1) is the largest sector in Turkey (its share is more than 10 per cent, while its share in total economy is around 1.6 per cent in the EU-13). Moreover, the results of the regression analysis also support the fact that agriculture sector in Turkey and the EU-13 has different technological structures. On the other hand, the share of the agriculture sector has been declining in Turkey for two decades. However, when we compare it to the EU-13, there is still room to decrease the share of agriculture in Turkey. As a reflection of the greater size of agriculture in Turkey, the size of the food products, beverages and tobacco sector (4) is also high comparing to EU (6.7 per cent in Turkey, 3.5 per cent in EU-13). Although the regression analysis does not support the technological difference in this sector, this does not imply that these sectors are similar in two countries, this may be due to the weakness of the regression analysis, as we mentioned before.

The construction sector (30), has a share of around 8 per cent in total industry output in Turkey. In fact, when construction sector is analyzed, it is observed that the size of the sector is declining slowly since 1990's, although there was a declining trend in the sector during the beginning of 2000. On the other hand, the share of construction in industry output is around 5 per cent in EU. In addition, the regression analysis support that there is a

technological difference for this sector between two countries. In fact, the high share of the construction sector in Turkey would be interpreted as the sign of being a developing country.

Real estate activity has a higher share in EU compared to Turkey. This may be due to three facts. First, as Turkey is a developing country with a larger size of the construction sector, the real estate activity sector has not yet developed, and vice versa for EU. Second, the share of the real estate activity in Turkey would be higher but they may be unrecorded. Third, as the I-O tables are prepared based on the wages paid to employees, the sector would be functioning as family corporations and the wages of the workers would not be recorded in Turkey.

Another observation about the Turkish economy is the size of the textile sector (5) in economy (5.5 per cent in Turkey). As EU is the trading partner of Turkey in textiles, the sector's size is smaller in EU.

Iron and Steel (13) has a higher share in Turkey compared to EU. The share of it in Turkey is around 2 per cent whereas the size in EU is around 1 per cent.

Sectors 15 to 19 in the Tables are on machinery. EU is more intensive in machinery sectors compared to Turkey. This fact is one of the explanations of the import dependency of Turkey especially on intermediate goods, as machinery and related sectors constitute importance in production of many sectors.

Finally, the differences in the sectors contributing to total factor productivity is important for Turkey for catching-up with EU. The table shows that the sectors of education (45), health (46), R&D (42); computer & related activities (41) and post and telecommunications (37), which are defined as the components of TFP in the literature has smaller share in Turkey compared to EU. Therefore, for increasing TFP, for rapid catch-up

with EU and for higher future growth, these sectors appear to be the natural candidates to be developed and to be invested in especially by government.

### 3.3. Sectoral Linkage Analysis

In the literature, there are different methods to analyze the sectoral linkages. Multiplier approach is one of these methods for sectoral linkages using I-O tables which will be discussed in this section.

Rasmussen (1958) suggested using the Leontief inverse matrix to measure the intersectoral linkages in an economy. To obtain the Leontief inverse matrix, we first define the system as:

$$X = AX + Y \quad (1)$$

$$(1 - A)X = Y \quad (2)$$

$$X = (1 - A)^{-1}Y \quad (3)$$

where X is total supply, A is input coefficient matrix, AX is total intermediate inputs and Y is final demand.

The matrix  $(1-A)^{-1}$  is called the Leontief inverse matrix. The column sums of the Leontief inverse matrix is defined as the backward multiplier and shows us how much the total production will increase if the final demand of one sector increases by one unit. The increase in the production is caused by all the direct and indirect effects of the final demand increase.

Another important multiplier is the import dependency coefficient and can be derived as follows:

$$A = A^m + A^d$$

$$M = A^m X^d$$

$$M = A^m (I - A^d)^{-1} Y^d = A^m R Y^d = S Y^d$$

where M is for import,  $A^d$  and  $A^m$  are for domestic and import input coefficient matrices, respectively,  $X^d$  is for domestic supply,  $Y^d$  is for domestic demand and S is for import dependency matrix.

The column sums of the S matrix is defined as the import dependency coefficient. It shows the total imported input requirement in the economy generated by one unit increase in the final demand of a sector j. To be precise, the coefficient indicates the dependency of production of a sector on imports.

As in the previous sections, we used two sets of I-O tables for two countries. The backward linkage results are presented in Table 5 and 6, while the import dependency results are presented in Table 7 and 8. These are organized in a way to present the sectors for Turkey descending as of their backward multiplier and import dependency coefficients. As the years of the I-O tables for Turkey and EU-13 are different, one may argue that they are not comparable because of the relative price differences. However, the robustness of the two comparisons with different years suggest that the comparison give valuable insights of the economy, as in the previous sections. Henceforth, we will use Table 6 in our discussion.

[Insert Table 5 here]

[Insert Table 6 here]

When Table 6 is analyzed we observe that most of the backward multipliers for Turkey are smaller than that of the EU-13. This fact suggests that Turkey's economic structure is such that the sectoral linkages among sectors are weaker than that of the EU-13. To be more precise, the effect of one unit increase in the final demand for a sector on the whole economic production in the EU-13 is more than that of in Turkey. This implies that the EU-13's economy is more dynamic than the Turkish economy. As a matter of fact,

Drejer (2002) states that “...Economic systems with a high degree of interrelatedness and strong causal linkage effects are more dynamic than systems with few causal linkages due to few incentive-driving activities...”.

Table 6 suggests that the sectors that Turkey has higher backward coefficient than the EU-13 are sectors of chemicals (9), railroad & transport equipment (24), manufacture of gas& distribution of gaseous fuels (27), real estate activities (39), education (45) and private households with employed persons (48). In other words, only in these sectors, the sectoral linkages in Turkey are stronger than that of EU-13. However, the total size of these sectors are very small in the economy, in other words, their total share in industry output is less than 5 per cent. This suggests that the inter-linkages among the sectors within the economy should be improved to bring dynamism to the economy.

The backward multipliers for Turkey is very smaller than EU-13's for sectors such as mining & quarrying (3), coke, refined petroleum products & nuclear fuel (8), radio, television & communication equipment (19), motor vehicles, trailers & semi-trailers (21), building & repairing of ships & boats (22), aircraft & spacecraft (23), collection, purification & distribution of water (29), post & telecommunications (37) and research & development (42). To be precise, these sectors have very small intersectoral linkages in the economy compared with the EU-13. For example, in a period of the emergence of ICT related sectors in the world, lack of dynamism in research & development and post & telecommunication sectors of Turkey compared to that of the EU-13 is an obstacle against the future growth of Turkey. On the other hand, weaker sectoral linkages of the sectors such as mining and quarrying (non-energy); coke, refined petroleum products & nuclear fuel; and collection, purification & distribution of water in Turkey compared with that of the EU-13 suggests that natural resources in Turkey can not be used efficiently.

In terms of backward multipliers, the key backward linked sectors with the highest backward multipliers stand out as the sectors textiles & textile products (5), wood & products of wood and cork (6), chemicals (9), rubber & plastics products (11), iron & steel (13), non-ferrous metals (14), fabricated metal products (15), electrical machinery (18), motor vehicles, trailers & semi-trailers (21) and manufacturing nec & recycling (25) for Turkey. Most of these sectors are among the most important sectors in terms of their sizes in the Turkish economy. For example, textiles sector has a higher share in both industry output (see Table 4) and exports. Therefore, it is necessary for this sector to preserve its importance for the future growth of Turkish economy. As another example, the chemicals is an emerging sector in the world economy and it is standing out as a key sector in the Turkish economy giving a signal on the structural transformation of Turkey.

However, large sectors in terms of their size such as agriculture, hunting, forestry & fishing (1); and wholesale & retail trade (31); have small backward multipliers implying that their linkages with the other sectors are rather weak. The fact that these sectors are not dynamic enough, although they have high share in the economy, is a problem for Turkey. In addition, this analysis support the argument that Turkey should be decreasing the size of its agriculture sector to have higher future growth.

Furthermore, the key backward linked sectors for the EU-13 stand out as the sectors food products, beverages and tobacco (4), textiles & textile products (5), wood & products of wood and cork (6), coke, refined petroleum products & nuclear fuel (8), iron & steel (13), non-ferrous metals (14), office, accounting & computing machinery (17), radio, television & communication equipment (19), motor vehicles, trailers & semi-trailers (21) and building & repairing of ships & boats (22). We see that 5 of these sectors are same as in Turkey, which are textiles & textile products; wood & products of wood and cork; iron & steel; non-ferrous metals; and motor vehicles, trailers & semi-trailers.



The import dependency coefficients are presented in Table 7 and 8. We are going to discuss the results regarding the Table 8 for simplicity. The interesting point is that although Turkish economy is attributed as an economy which has high import dependency, the EU-13 also has higher import dependency, regarding to certain sectors. The sectors that have high import dependencies are sectors chemicals (9), rubber & plastics products (11), iron & steel (13), non-ferrous metals (14), fabricated metal products (15), electrical machinery (18), radio, television & communication equipment (19), medical, precision & optical instruments (20), manufacturing nec & recycling (25) and manufacture of gas& distribution of gaseous fuels (27) in Turkey, whereas sectors coke, refined petroleum products & nuclear fuel (8), chemicals (9), rubber & plastics products (11), iron & steel (13), non-ferrous metals (14), office, accounting & computing machinery (17), television & communication equipment (19), motor vehicles, trailers & semi-trailers (21), building & repairing of ships & boats (22), and aircraft & spacecraft (23) in EU-13. In other words, 5 of the most import dependent sectors are same for Turkey and EU-13, which are chemicals; rubber & plastic products; iron & steel; non ferrous metals; and radio, television & communication equipment. It is worth mentioning two of the sectors, which Turkey's import dependency is higher than EU-13; fabricated metal products and electrical machinery. In the previous section, we also indicated that the size of these sectors are also smaller in Turkey compared to the EU-13. However, as these sectors are very important for the production and the growth of the economy, this is a disadvantageous situation for Turkey. Moreover, Turkey is found to be more dependent on gas imports than EU-13 is, and this constitutes a risk for the Turkish economy when problems (especially political problems) arose with the countries that we import from.

[Insert Table 7 here]

[Insert Table 8 here]

#### **4. Comparison of Turkish Economy to the 4 New Member States of EU**

After completing the membership negotiations in December 1997, Czech Republic, Hungary, Poland and Slovakia joined the EU, in May 2004, with other 6 countries. We have the input-output tables of these countries for the year 2000, in other words during their candidacy period to EU. Therefore, comparing the Turkish economy with the economic structure of these countries before their integration to EU would give insights about the sectors of Turkish economy that should be focused on more for the development and integration perspective.

As the first stage, regression analysis of the four countries with Turkey is performed. The results are summarized in Table 9. The Wald test shows that 13 sectors of Turkey are significantly different from the 4 of the new member countries in terms of technology.

[Insert Table 9 here]

The sectors which have significantly different technological structures are sectors wood & products of wood and cork (6), pulp, paper, paper products, printing & publishing (7), coke, refined petroleum products & nuclear fuel (8), chemicals (9), iron & steel (13), medical, precision & optical instruments (20), manufacturing nec & recycling (25), land transport & transport via pipelines (33), auxiliary transport activities & activities of travel agencies (36), post & telecommunications (37), finance & insurance (38), real estate activities (39) and education (45). Moreover, it worth mentioning that the sectors that are different in technology between Turkey and new member states coincide with the sectors that have different technologies between Turkey and the EU-13. Although, the results of the regression analysis shows difference in sectors between two countries, it is not possible to comment how much is the difference.

Therefore, we compare the size of the sectors in Turkey and the four new member state countries by using the shares of the sectors in value added, intermediate consumption and industry output. The results are presented in Tables 10-12. For completeness, we included the EU shares also in Tables.

[Insert Table 10 here]

[Insert Table 11 here]

[Insert Table 12 here]

As the suggestions of Table 10-12 about the size of the sectors are similar, we will comment on Table 12, the shares of the sectors in industry output, for the rest of this section. Moreover, for the sake of simplicity we will be focusing on the sectors which are completely different in size with all the 4 new member states. The sectors which have different structures among the member states will not be discussed. In other words only the common characteristics of the new member states will be involved in to our comparisons with Turkey.

Agriculture (1) has the largest share in Turkey with 12.02 per cent, whereas it has a smaller share around 4 per cent in the other new member state economies. On the other hand, the share of agriculture in EU is around 1.6 per cent which is below the new member state countries. As we mentioned in the previous section agriculture sector is in a declining trend showing that Turkey is on the right track. The regression analysis suggest that the technological structure of Turkey in agriculture is different from the new member states except Hungary. Although the size of the sector in Hungary is much smaller than Turkey, the regression analysis do not imply difference but this may be the drawback of the test as we mentioned in Section 3.

Higher share of the sector food products, beverages and tobacco (4) in the economy is compatible with the large size of the agriculture sector. In this respect, Turkey has the highest share in the food sector compared with the new member states. However, the differences in sizes in food products sector among new member state countries and Turkey are smaller compared to the differences in the agriculture sector, which is unexpected and bring out the question of efficiency in Turkey. Although we may expect that the size of the wood & products of wood and cork sector (6) to display a similar trend with the food products sector, it is not the case. This sector has a smaller size in Turkey than that of the other countries. The sector, pulp, paper, paper products (7) has a smaller size in Turkey as it is in the sixth sector, in parallel with the expectations. This may be due to the fact that the size of forestry sector is smaller in Turkey and we can not observe the details or the efficiency problem would be the reason behind this fact.

The sector textiles & textile products (5), has a larger size in Turkish economy comparing to the new member states. The share of the textile sector in the economies of EU-13, Czech Republic, Hungary, Poland and Slovakia is around 2 percent, while it is around 5.5 per cent in Turkey.

Chemicals excluding Pharmaceuticals' (no. 9 in Tables) share in output is 1.67 per cent in Turkey whereas it is more than 2 per cent in new member countries as well as EU. As chemicals is an emerging sector in the world (Şenesen 2005), this sector should be prioritized more for investment. On the other hand the opposite is true for Pharmaceuticals (no.9 in Tables). The only production is in Turkey with a share of 0.6 per cent. This may be related to the EU legislation on patents that these countries have to obey in that period.

The sectors between 15 and 20 in OECD I-O table classification are about machinery and related production. The size of these sectors are smaller in Turkey compared to new member states and EU (although there are a few exceptions). This fact explains the

import dependency of Turkey in the production process, as mentioned in the previous section.

The sector production, collection and distribution of electricity (26), is an important sector for production. While its share is around 3 per cent to 5 per cent in new member countries, it is only 1.7 per cent in Turkey. Remembering that the share of this sector in the EU's industry output is around 1.9 per cent, we can attribute this fact to the prosperity of natural resources of the new member states.

The sector of hotel & restaurants (32) has a share of 3.31 per cent in the industry output in Turkey, while its share is less than 2 per cent in the new member states. This figure shows the importance of tourism sector in Turkey comparing to the other countries.

The sector of land transport and transport via pipelines (33) has a larger size in Turkey. Moreover land transport has a wider share in Turkey comparing to railways and sea transport. Therefore, it is natural for Turkey to have a larger sector on this issue compared with the new member states.

The sector of real estate activities (39), has a share of only 0.09 per cent in industry output of Turkey. Comparing to the new member states, where this figure is around 4 per cent, the low figure shows that this sector would be informal in Turkey.

Post & telecommunications sector (37) still have to be improved in Turkey. Its size in industry output is only 1.27 per cent. However, both in EU and new member states, this sector's share is around 2 per cent. Moreover, the sectors computer & related activities (41), research & development (42), education (45), and health & social work (46) besides post and communications would be evaluated as the sector contributing to total factor productivity of a country, in other words to long-term growth. Therefore having a higher share of these sectors in an economy would bring development to a country. On the other

hand, we observe that the size of all of these sectors is smallest in Turkey comparing to the new member states and the EU-13. The regression analysis also shows that the technology in these sectors significantly differ in most of the new member states and Turkey. This observation suggest that the sectors contributing to TFP should be prioritized in investment decisions for sustainable economic growth of Turkey.

## **5. Conclusion**

Turkey is transforming its economic structure by means of economy-wide reform policies as a developing country promising to converge towards EU averages. One of the targets of Turkey in the medium-term is the to accede as a member to the EU. In this respect, the aim of this paper is comparing the sectoral structure of the Turkish economy with the EU to point out the sectors that drive more attention and that are different from the EU average in various aspects.

The results of the regression analysis suggest that the technological (sectoral) structure of the Turkish economy is significantly different from that of the EU for at least 30 sectors out of 48. In fact, the decomposition of the economy by sectors support this argument. Some of the larger sectors that worth mentioning in Turkish economy stand out as agriculture, construction and textile. However, the sectoral decomposition in EU is more homogeneous.

Furthermore, the multiplier analysis suggest that the EU economy is more dynamic than the Turkish economy, in other words the sectoral inter-linkages are higher in EU compared with Turkey. This also supports the homogeneity of the sectoral decomposition of the EU unlike Turkey, where the total size of the 6 key sectors in the economy is less than 5 per cent. Although the Turkish economy is attributed to be an import dependent economy, our analysis suggests that the import dependency of the EU is also very high. However, the import dependency of the machinery related sectors in Turkey are higher than

that of the EU-13. As this sector is important for the economic growth, this fact is a disadvantageous situation for the economic development in Turkey.

Finally, we compare the sectoral structure of Turkey with the four new member states, namely, Czech Republic, Hungary, Poland and Slovakia, besides the comparison with the EU. The findings indicate that Turkish economy's technological structure is different from all of these economies for 13 sectors. The sectors in Turkey that are significantly different from EU and the new member states appeared to be, agriculture, textile, food and food products, wood and wood products, the sectors related to machinery and most of the sectors contributing to TFP.

Overall, the comparison of Turkey with EU shows that the sectors contributing to TFP are smaller in terms of their sizes in Turkey. However, this fact would have some disadvantages for the future economic growth of Turkey.

For further research, when the new I-O table for Turkey is released it will be possible to compare Turkey with EU including the time dimension. Moreover, the problem of relative prices arising from the usage of the I-O tables with different years may also be overcome. Finally, more countries can be included in the analysis which would give more insight about the future policies that Turkey would follow.

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**Table 1. The Results of the Regression Analysis on the Similarity of Technology Between Turkey (IO-1996) and EU-13 (IO-1995)**

Sectors	Regression Analysis <sup>†</sup>		
	$\alpha$	$\beta$	Wald Test <sup>††</sup>
1 Agriculture, hunting, forestry and fishing	0.01* (2.47)	0.59* (8.91)	20.22*
2 Mining and quarrying (energy)	0.01* (2.99)	0.54* (2.36)	4.69*
3 Mining and quarrying (non-energy)	0.01* (3.62)	0.68* (3.93)	6.63*
4 Food products, beverages and tobacco	0.00 (1.16)	1.02* (26.86)	0.97
5 Textiles, textile products, leather and footwear	0.00 (0.30)	0.95* (19.41)	0.56
6 Wood and products of wood and cork	0.00* (2.86)	0.80* (43.11)	57.90*
7 Pulp, paper, paper products, printing and publishing	-0.00 (-0.63)	1.22* (36.04)	21.57*
8 Coke, refined petroleum products and nuclear fuel	0.00* (2.21)	1.33* (30.57)	35.44*
9 Chemicals excluding pharmaceuticals	0.00 (1.13)	0.91* (25.97)	3.71*
10 Pharmaceuticals	0.01* (2.94)	0.36* (5.72)	51.33*
11 Rubber & plastics products	0.00 (1.62)	0.83* (27.90)	15.65*
12 Other non-metallic mineral products	0.00 (1.20)	0.96* (8.69)	0.76
13 Iron & steel	0.00 (0.73)	0.91* (24.74)	3.10
14 Non-ferrous metals	0.01 (1.98)	0.49* (5.51)	16.60*
15 Fabricated metal products, except machinery & equipment	0.00 (0.64)	0.85* (10.32)	1.71
16 Machinery & equipment, nec	0.00* (2.28)	0.72* (10.92)	9.47*
17 Office, accounting & computing machinery	0.00 (1.22)	1.57* (14.38)	17.86*
18 Electrical machinery & apparatus, nec	0.00 (0.88)	0.84* (8.27)	1.22
19 Radio, television & communication equipment	0.01* (4.20)	0.70* (18.86)	35.94*
20 Medical, precision & optical instruments	0.01* (2.72)	0.74* (8.76)	6.09*
21 Motor vehicles, trailers & semi-trailers	0.00 (0.09)	1.13* (10.93)	1.06
22 Building & repairing of ships & boats	0.00 (1.02)	1.90* (9.01)	14.61*
23 Aircraft & spacecraft	0.01* (3.59)	1.41* (6.45)	10.31*
24 Railroad equipment & transport equip n.e.c.	--	--	--
25 Manufacturing nec; recycling (include Furniture)	0.01* (2.48)	0.63* (7.55)	10.20*

26 Production, collection and distribution of electricity	0.01 (1.74)	0.72* (6.40)	3.69*
27 Manufacture of gas; distribution of gaseous fuels through mains	0.00 (1.36)	0.56* (41.30)	523.74*
28 Steam and hot water supply	--	--	--
29 Collection, purification and distribution of water	0.01* (3.34)	0.54* (3.99)	9.13*
30 Construction	0.01* (2.27)	0.42* (3.80)	13.40*
31 Wholesale & retail trade; repairs	0.00* (3.13)	0.55* (5.61)	11.73*
32 Hotels & restaurants	0.00 (0.34)	0.97* (12.32)	0.11
33 Land transport; transport via pipelines	0.01* (3.24)	0.29* (3.79)	41.46*
34 Water transport	0.01 (1.95)	0.29 (1.46)	8.00*
35 Air transport	0.01 (1.97)	0.25 (1.91)	16.68*
36 Supporting and auxiliary transport activities; activities of travel agencies	0.01* (2.16)	0.03 (0.42)	80.00*
37 Post & telecommunications	0.00* (3.07)	0.35* (3.61)	23.65*
38 Finance & insurance	-0.00 (-1.02)	1.61* (14.94)	16.88*
39 Real estate activities	0.00 (1.60)	0.23 (1.83)	20.31*
40 Renting of machinery & equipment	0.01* (2.21)	0.09 (0.46)	11.72*
41 Computer & related activities	0.01* (2.50)	0.13 (1.56)	58.76*
42 Research & development	0.01* (3.40)	2.00* (3.91)	14.41*
43 Other Business Activities	0.01 (1.36)	0.36 (1.42)	3.12
44 Public admin. & defence; compulsory social security	--	--	--
45 Education	0.00* (2.88)	0.12* (2.20)	144.94*
46 Health & social work	0.01* (2.99)	0.09 (0.68)	22.72*
47 Other community, social & personal services	-0.00 (-0.14)	1.43* (15.05)	12.71*
48 Private households with employed persons & extra-territorial organisations & bodies	--	--	--

\* denotes significance at 5 %.

† EU's technological coefficients calculated from 1995 I-O tables of the 13 EU countries are regressed on Turkey's technological coefficients from 1996 I-O table.  $\alpha$  is the constant term and  $\beta$  is the slope coefficient.

†† According to the null hypothesis of the Wald test, the constant term is 0 and the slope term is 1 representing the convergence between the two countries' technologies. When null is rejected, we can conclude that the technologies are divergent.

**Table 2. The Results of the Regression Analysis on the Similarity of Technology between Turkey (IO-98) and EU-13 (IO-2000)**

Sectors	Regression Analysis <sup>†</sup>		
	$\alpha$	$\beta$	Wald Test <sup>††</sup>
1 Agriculture, hunting, forestry and fishing	0.00* (2.76)	0.71* (10.79)	11.24*
2 Mining and quarrying (energy)	0.00* (2.14)	0.32* (3.09)	21.12*
3 Mining and quarrying (non-energy)	0.01* (3.41)	0.72* (3.82)	5.81*
4 Food products, beverages and tobacco	0.00 (1.90)	0.89* (29.98)	6.88*
5 Textiles, textile products, leather and footwear	0.00 (1.76)	0.87* (37.72)	16.26*
6 Wood and products of wood and cork	0.00 (1.67)	0.76* (25.15)	31.41*
7 Pulp, paper, paper products, printing and publishing	0.00 (0.08)	1.22* (21.46)	8.56*
8 Coke, refined petroleum products and nuclear fuel	0.00 (0.92)	2.39* (56.48)	564.37*
9 Chemicals excluding pharmaceuticals	0.00* (2.36)	0.66* (23.64)	71.86*
10 Pharmaceuticals	0.01 (0.34)	3.28* (6.18)	70.95*
11 Rubber & plastics products	0.00 (0.55)	0.90* (28.88)	5.05*
12 Other non-metallic mineral products	0.00 (1.09)	1.07* (12.04)	1.72
13 Iron & steel	0.00* (3.45)	0.64* (27.61)	125.16*
14 Non-ferrous metals	0.00 (0.77)	0.85* (17.63)	4.78*
15 Fabricated metal products, except machinery & equipment	0.00 (0.64)	0.82* (9.15)	1.94
16 Machinery & equipment, nec	0.00 (1.57)	0.75* (8.60)	4.02*
17 Office, accounting & computing machinery	0.01 (1.38)	1.07* (9.12)	1.48
18 Electrical machinery & apparatus, nec	0.00 (1.08)	0.73* (6.32)	2.85
19 Radio, television & communication equipment	0.01* (3.64)	0.68* (19.12)	41.23*
20 Medical, precision & optical instruments	0.01* (2.51)	0.51* (6.63)	20.48*
21 Motor vehicles, trailers & semi-trailers	0.00 (0.43)	1.11* (9.32)	0.80
22 Building & repairing of ships & boats	0.00 (0.80)	0.96* (4.17)	0.34
23 Aircraft & spacecraft	0.01* (2.86)	1.42* (10.63)	13.51*
24 Railroad equipment & transport equip n.e.c.	--	--	--
25 Manufacturing nec; recycling (include Furniture)	0.01* (3.19)	0.26* (3.00)	38.09*

26 Production, collection and distribution of electricity	0.01 (1.60)	0.73* (6.16)	3.25*
27 Manufacture of gas; distribution of gaseous fuels through mains	0.00 (0.43)	0.18* (73.45)	54924.51*
28 Steam and hot water supply	--	--	--
29 Collection, purification and distribution of water	0.01* (2.82)	1.00* (4.07)	4.43*
30 Construction	0.01* (2.27)	0.46* (3.61)	9.25*
31 Wholesale & retail trade; repairs	0.01* (2.97)	0.73* (4.43)	4.60*
32 Hotels & restaurants	-0.00 (-0.06)	1.00* (13.64)	0.00
33 Land transport; transport via pipelines	0.01* (3.10)	0.37* (4.37)	28.91*
34 Water transport	0.01 (1.60)	0.32 (1.53)	5.41*
35 Air transport	0.01* (2.03)	0.33* (2.08)	8.98*
36 Supporting and auxiliary transport activities; activities of travel agencies	0.01* (2.12)	0.03 (0.38)	66.58*
37 Post & telecommunications	0.00* (2.55)	1.76* (12.83)	23.72*
38 Finance & insurance	-0.00 (-0.93)	1.81* (10.90)	12.68*
39 Real estate activities	0.00 (1.58)	0.17 (1.63)	33.44*
40 Renting of machinery & equipment	0.01* (2.04)	0.18 (0.87)	7.87*
41 Computer & related activities	0.00 (0.13)	0.91* (4.88)	0.13
42 Research & development	0.01* (2.92)	0.90* (4.10)	4.67*
43 Other Business Activities	-0.00 (-0.60)	1.27* (14.37)	4.82*
44 Public admin. & defence; compulsory social security	--	--	--
45 Education	0.00* (2.92)	0.23* (4.74)	147.83*
46 Health & social work	0.00 (1.45)	0.92* (4.91)	1.14
47 Other community, social & personal services	-0.00 (-0.43)	1.18* (12.60)	1.96
48 Private households with employed persons & extra-territorial organisations & bodies	--	--	--

\* denotes significance at 5 %.

† EU's technological coefficients calculated from I-O tables for the year 2000 of the EU-13 countries are regressed on Turkey's technological coefficients from I-O table for the year 1998.  $\alpha$  is the constant term and  $\beta$  is the slope coefficient.

†† According to the null hypothesis of the Wald test, the constant term is zero and the slope term is one representing the convergence between the two countries' technologies. When null is rejected, we can conclude that the technologies are divergent.

**Table 3. The Size of Sectors: Shares of the Sectors in Intermediate Consumption, Value Added and Industry Output (%)**

Sectors	EU-95			TR-96		
	Int Cons	Value Added	Output	Int Cons	Value Added	Output
1 Agriculture, hunting, forestry and fishing	2.03	2.05	2.04	12.42	15.09	13.95
2 Mining and quarrying (energy)	0.77	1.12	0.94	0.20	0.67	0.47
3 Mining and quarrying (non-energy)	0.24	0.18	0.21	0.21	0.48	0.36
4 Food products, beverages and tobacco	6.40	2.12	4.12	10.40	4.36	6.94
5 Textiles, textile products, leather and footwear	3.38	1.52	2.44	9.18	3.66	6.01
6 Wood and products of wood and cork	0.86	0.44	0.64	1.27	0.49	0.82
7 Pulp, paper, paper products, printing and publishing	2.79	1.61	2.17	1.63	1.01	1.27
8 Coke, refined petroleum products and nuclear fuel	1.39	0.30	0.85	2.90	2.97	2.94
9 Chemicals excluding pharmaceuticals	4.24	2.12	3.15	2.80	1.40	2.00
10 Pharmaceuticals	0.10	0.10	0.10	0.65	0.52	0.57
11 Rubber & plastics products	1.79	1.01	1.37	1.65	0.70	1.11
12 Other non-metallic mineral products	1.56	1.00	1.27	1.83	1.44	1.60
13 Iron & steel	2.36	0.84	1.58	3.39	1.23	2.15
14 Non-ferrous metals	0.02	0.01	0.02	0.59	0.29	0.42
15 Fabricated metal products, except machinery & equipment	3.11	1.98	2.51	2.25	1.12	1.60
16 Machinery & equipment, nec	5.09	2.91	3.93	2.65	1.74	2.13
17 Office, accounting & computing machinery	0.76	0.29	0.52	0.02	0.03	0.03
18 Electrical machinery & apparatus, nec	2.55	1.53	2.00	1.07	0.55	0.77
19 Radio, television & communication equipment	1.01	0.48	0.74	0.72	0.62	0.66
20 Medical, precision & optical instruments	0.90	0.68	0.78	0.10	0.09	0.10
21 Motor vehicles, trailers & semi-trailers	5.63	2.23	3.85	2.68	1.34	1.91
22 Building & repairing of ships & boats	1.10	0.45	0.77	0.05	0.09	0.07
23 Aircraft & spacecraft	0.02	0.01	0.01	0.02	0.10	0.06
24 Railroad equipment & transport equip nec.	0.00	0.00	0.00	0.13	0.07	0.10
25 Manufacturing nec; recycling (include Furniture)	1.40	0.74	1.06	1.41	0.87	1.10
26 Production, collection and distribution of electricity	2.01	1.81	1.95	1.09	1.75	1.47
27 Manufacture of gas; distribution of gaseous fuels through mains	0.04	0.06	0.05	0.15	0.07	0.11
28 Steam and hot water supply	0.06	0.10	0.08	0.00	0.00	0.00
29 Collection, purification and distribution of water	0.19	0.26	0.22	0.13	0.51	0.35
30 Construction	8.13	5.80	6.89	9.24	5.45	7.06
31 Wholesale & retail trade; repairs	7.14	10.22	8.71	7.84	15.80	12.41
32 Hotels & restaurants	2.39	2.23	2.31	3.41	2.69	3.00
33 Land transport; transport via pipelines	1.81	2.10	2.05	6.56	9.56	8.28
34 Water transport	0.52	0.24	0.38	1.11	0.95	1.01
35 Air transport	0.52	0.36	0.45	1.05	0.49	0.73
36 Supporting and auxiliary transport activities; activities of travel agencies	1.95	1.10	1.51	1.25	0.38	0.75
37 Post & telecommunications	0.91	2.27	1.61	0.46	1.21	0.89
38 Finance & insurance	4.27	5.11	4.78	2.61	4.40	3.63
39 Real estate activities	3.37	11.01	7.26	0.07	0.13	0.10
40 Renting of machinery & equipment	0.78	1.41	1.10	0.02	0.03	0.03
41 Computer & related activities	0.80	1.11	0.96	0.11	0.06	0.08
42 Research & development	0.74	0.89	0.82	0.01	0.06	0.04
43 Other Business Activities	4.75	7.26	6.02	1.80	1.91	1.86
44 Public admin. & defence; compulsory social security	2.75	6.70	4.85	0.00	7.50	4.30
45 Education	1.09	4.26	2.73	0.46	0.45	0.46
46 Health & social work	3.28	5.61	4.51	0.39	0.54	0.48
47 Other community, social & personal services	2.98	3.88	3.46	1.02	1.66	1.38
48 Private households with employed persons & extra-territorial organisations & bodies	0.00	0.49	0.25	0.97	3.49	2.42

**Table 4. The Size of Sectors: Shares of the Sectors in Intermediate Consumption, Value Added and Industry Output (%)**

Sectors	EU-2000			TR-98		
	Int Cons	Value Added	Output	Int Cons	Value Added	Output
1 Agriculture, hunting, forestry and fishing	1.59	1.70	1.64	10.00	13.57	12.02
2 Mining and quarrying (energy)	0.65	2.03	1.31	0.29	0.48	0.40
3 Mining and quarrying (non-energy)	0.20	0.15	0.18	0.28	0.56	0.44
4 Food products, beverages and tobacco	4.92	1.96	3.50	10.66	3.63	6.68
5 Textiles, textile products, leather and footwear	2.69	1.30	2.02	8.29	3.40	5.52
6 Wood and products of wood and cork	0.66	0.37	0.52	1.21	0.36	0.73
7 Pulp, paper, paper products, printing and publishing	2.54	1.67	2.12	1.70	1.11	1.37
8 Coke, refined petroleum products and nuclear fuel	1.87	0.35	1.14	1.93	3.05	2.56
9 Chemicals excluding pharmaceuticals	3.77	1.83	2.84	2.83	0.78	1.67
10 Pharmaceuticals	0.15	0.15	0.15	0.73	0.53	0.62
11 Rubber & plastics products	1.54	0.94	1.25	1.89	0.64	1.18
12 Other non-metallic mineral products	1.26	0.83	1.05	1.93	1.43	1.65
13 Iron & steel	1.87	0.64	1.28	3.52	0.90	2.04
14 Non-ferrous metals	0.02	0.01	0.02	0.75	0.19	0.43
15 Fabricated metal products, except machinery & equipment	2.52	1.79	2.17	2.18	0.99	1.51
16 Machinery & equipment, nec	4.26	2.61	3.47	2.66	1.44	1.97
17 Office, accounting & computing machinery	0.91	0.26	0.59	0.05	0.04	0.05
18 Electrical machinery & apparatus, nec	2.13	1.40	1.78	1.28	0.54	0.86
19 Radio, television & communication equipment	1.48	0.61	1.06	0.68	0.40	0.52
20 Medical, precision & optical instruments	0.91	0.75	0.84	0.10	0.05	0.07
21 Motor vehicles, trailers & semi-trailers	7.19	2.17	4.77	2.45	1.16	1.72
22 Building & repairing of ships & boats	1.63	0.62	1.14	0.06	0.04	0.05
23 Aircraft & spacecraft	0.01	0.01	0.01	0.02	0.05	0.04
24 Railroad equipment & transport equip nec.	0.00	0.00	0.00	0.07	0.06	0.07
25 Manufacturing nec; recycling (include Furniture)	1.24	0.68	0.97	2.25	1.15	1.63
26 Production, collection and distribution of electricity	2.23	1.53	1.89	1.51	1.86	1.71
27 Manufacture of gas; distribution of gaseous fuels through mains	0.18	0.09	0.14	0.24	0.09	0.16
28 Steam and hot water supply	0.04	0.09	0.07	0.00	0.00	0.00
29 Collection, purification and distribution of water	0.21	0.27	0.24	0.10	0.48	0.31
30 Construction	6.63	4.69	5.69	10.46	7.29	8.67
31 Wholesale & retail trade; repairs	7.74	10.34	8.99	5.07	15.11	10.76
32 Hotels & restaurants	2.37	2.67	2.51	3.88	2.87	3.31
33 Land transport; transport via pipelines	1.99	2.03	2.01	7.74	8.42	8.12
34 Water transport	0.53	0.24	0.39	0.89	0.61	0.73
35 Air transport	0.69	0.45	0.57	1.05	0.64	0.81
36 Supporting and auxiliary transport activities; activities of travel agencies	2.11	1.38	1.76	1.43	0.78	1.06
37 Post & telecommunications	1.70	2.33	2.00	0.41	1.93	1.27
38 Finance & insurance	5.88	4.74	5.33	4.67	6.49	5.70
39 Real estate activities	2.83	10.81	6.67	0.08	0.09	0.09
40 Renting of machinery & equipment	0.80	1.57	1.17	0.02	0.03	0.03
41 Computer & related activities	1.34	1.92	1.62	0.20	0.20	0.20
42 Research & development	0.64	0.80	0.72	0.01	0.03	0.02
43 Other Business Activities	5.29	8.40	6.79	1.29	1.73	1.54
44 Public admin. & defence; compulsory social security	2.78	6.02	4.34	0.00	8.56	4.85
45 Education	1.28	4.46	2.81	0.31	0.32	0.31
46 Health & social work	3.46	5.65	4.51	0.66	1.44	1.10
47 Other community, social & personal services	3.25	4.15	3.68	1.33	1.40	1.37
48 Private households with employed persons & extra-territorial organisations & bodies	0.00	0.55	0.27	0.83	3.08	2.11

**Table 5 : Backward Multipliers for Turkey (IO-96) and EU-13 (IO-95)**

Sectors	TR-96	EU-95
6 Wood and products of wood and cork	2.33	2.40
36 Supporting and auxiliary transport activities; activities of travel agencies	2.30	2.14
5 Textiles, textile products, leather and footwear	2.29	2.44
13 Iron & steel	2.25	2.48
11 Rubber & plastics products	2.23	2.36
21 Motor vehicles, trailers & semi-trailers	2.17	2.59
15 Fabricated metal products, except machinery & equipment	2.16	2.30
18 Electrical machinery & apparatus, nec	2.16	2.35
14 Non-ferrous metals	2.13	2.55
25 Manufacturing nec; recycling (include Furniture)	2.12	2.35
4 Food products, beverages and tobacco	2.11	2.57
9 Chemicals excluding pharmaceuticals	2.10	2.30
24 Railroad equipment & transport equip n.e.c.	2.08	1.00
35 Air transport	2.04	2.20
16 Machinery & equipment, nec	2.04	2.34
30 Construction	2.03	2.22
7 Pulp, paper, paper products, printing and publishing	1.99	2.33
41 Computer & related activities	1.97	1.75
32 Hotels & restaurants	1.87	2.07
10 Pharmaceuticals	1.85	2.01
20 Medical, precision & optical instruments	1.83	2.22
19 Radio, television & communication equipment	1.82	2.41
27 Manufacture of gas; distribution of gaseous fuels through mains	1.81	1.75
12 Other non-metallic mineral products	1.80	2.22
34 Water transport	1.79	2.23
43 Other Business Activities	1.75	1.73
45 Education	1.74	1.36
1 Agriculture, hunting, forestry and fishing	1.64	1.95
17 Office, accounting & computing machinery	1.62	2.62
40 Renting of machinery & equipment	1.62	1.64
46 Health & social work	1.60	1.65
8 Coke, refined petroleum products and nuclear fuel	1.58	2.50
33 Land transport; transport via pipelines	1.56	1.81
47 Other community, social & personal services	1.53	1.83
38 Finance & insurance	1.50	1.71
22 Building & repairing of ships & boats	1.49	2.50
39 Real estate activities	1.47	1.40
26 Production, collection and distribution of electricity	1.46	1.89
31 Wholesale & retail trade; repairs	1.43	1.72
3 Mining and quarrying (non-energy)	1.42	2.08
37 Post & telecommunications	1.38	1.54
48 Private households with employed persons & extra-territorial organisations & bodies	1.31	1.00
2 Mining and quarrying (energy)	1.31	1.74
29 Collection, purification and distribution of water	1.25	1.80
23 Aircraft & spacecraft	1.17	2.34
42 Research & development	1.14	1.91
28 Steam and hot water supply	1.00	1.66
44 Public admin. & defence; compulsory social security	1.00	1.56

**Table 6 : Backward Multipliers for Turkey (IO-98) and EU-13 (IO-2000)**

Sectors	TR-98	EU-2000
14 Non-ferrous metals	2.61	2.80
13 Iron & steel	2.61	2.59
9 Chemicals excluding pharmaceuticals	2.42	2.37
11 Rubber & plastics products	2.42	2.42
6 Wood and products of wood and cork	2.38	2.46
18 Electrical machinery & apparatus, nec	2.37	2.42
25 Manufacturing nec; recycling (include Furniture)	2.35	2.42
15 Fabricated metal products, except machinery & equipment	2.33	2.34
5 Textiles, textile products, leather and footwear	2.30	2.46
21 Motor vehicles, trailers & semi-trailers	2.29	2.85
16 Machinery & equipment, nec	2.22	2.40
20 Medical, precision & optical instruments	2.20	2.27
4 Food products, beverages and tobacco	2.19	2.56
19 Radio, television & communication equipment	2.08	2.60
36 Supporting and auxiliary transport activities; activities of travel agencies	2.03	2.20
22 Building & repairing of ships & boats	2.01	2.65
30 Construction	2.00	2.27
24 Railroad equipment & transport equip n.e.c.	1.98	1.00
27 Manufacture of gas; distribution of gaseous fuels through mains	1.98	1.20
7 Pulp, paper, paper products, printing and publishing	1.97	2.40
10 Pharmaceuticals	1.94	2.06
34 Water transport	1.87	2.19
32 Hotels & restaurants	1.86	2.04
35 Air transport	1.85	2.30
12 Other non-metallic mineral products	1.84	2.30
17 Office, accounting & computing machinery	1.84	2.88
41 Computer & related activities	1.74	1.78
47 Other community, social & personal services	1.70	1.86
45 Education	1.65	1.41
39 Real estate activities	1.60	1.41
26 Production, collection and distribution of electricity	1.59	2.03
43 Other Business Activities	1.59	1.76
1 Agriculture, hunting, forestry and fishing	1.59	2.01
40 Renting of machinery & equipment	1.56	1.69
38 Finance & insurance	1.55	1.94
33 Land transport; transport via pipelines	1.52	1.90
8 Coke, refined petroleum products and nuclear fuel	1.49	2.40
2 Mining and quarrying (energy)	1.49	1.51
46 Health & social work	1.44	1.71
3 Mining and quarrying (non-energy)	1.42	2.18
23 Aircraft & spacecraft	1.40	2.44
42 Research & development	1.33	1.93
31 Wholesale & retail trade; repairs	1.32	1.80
48 Private households with employed persons & extra-territorial organisations & bodies	1.32	1.01
29 Collection, purification and distribution of water	1.24	1.88
37 Post & telecommunications	1.19	1.85
28 Steam and hot water supply	1.00	1.59
44 Public admin. & defence; compulsory social security	1.00	1.63



**Table 7. Import Dependency Coefficients for Turkey (IO-96) and EU-13 (IO-95)**

Sectors	TR-96	EU-95
27 Manufacture of gas; distribution of gaseous fuels through mains	0.54	0.05
8 Coke, refined petroleum products and nuclear fuel	0.36	0.52
11 Rubber & plastics products	0.34	0.28
9 Chemicals excluding pharmaceuticals	0.28	0.26
13 Iron & steel	0.27	0.30
14 Non-ferrous metals	0.26	0.44
24 Railroad equipment & transport equip n.e.c.	0.25	0.00
18 Electrical machinery & apparatus, nec	0.24	0.23
41 Computer & related activities	0.24	0.09
10 Pharmaceuticals	0.23	0.22
35 Air transport	0.22	0.24
15 Fabricated metal products, except machinery & equipment	0.22	0.22
19 Radio, television & communication equipment	0.22	0.30
25 Manufacturing nec; recycling (include Furniture)	0.21	0.23
21 Motor vehicles, trailers & semi-trailers	0.20	0.30
16 Machinery & equipment, nec	0.19	0.23
20 Medical, precision & optical instruments	0.18	0.22
5 Textiles, textile products, leather and footwear	0.18	0.27
7 Pulp, paper, paper products, printing and publishing	0.17	0.22
17 Office, accounting & computing machinery	0.16	0.41
6 Wood and products of wood and cork	0.16	0.21
30 Construction	0.15	0.15
36 Supporting and auxiliary transport activities; activities of travel agencies	0.15	0.10
26 Production, collection and distribution of electricity	0.14	0.12
43 Other Business Activities	0.13	0.08
34 Water transport	0.13	0.26
12 Other non-metallic mineral products	0.13	0.17
4 Food products, beverages and tobacco	0.12	0.21
45 Education	0.10	0.04
33 Land transport; transport via pipelines	0.10	0.10
32 Hotels & restaurants	0.09	0.12
39 Real estate activities	0.09	0.03
46 Health & social work	0.08	0.08
22 Building & repairing of ships & boats	0.08	0.32
40 Renting of machinery & equipment	0.08	0.05
47 Other community, social & personal services	0.08	0.09
1 Agriculture, hunting, forestry and fishing	0.08	0.12
3 Mining and quarrying (non-energy)	0.07	0.15
37 Post & telecommunications	0.06	0.08
23 Aircraft & spacecraft	0.06	0.38
38 Finance & insurance	0.05	0.07
2 Mining and quarrying (energy)	0.04	0.09
29 Collection, purification and distribution of water	0.04	0.08
31 Wholesale & retail trade; repairs	0.03	0.08
48 Private households with employed persons & extra-territorial organisations & bodies	0.03	0.00
42 Research & development	0.02	0.13
28 Steam and hot water supply	0.00	0.06
44 Public admin. & defence; compulsory social security	0.00	0.07

**Table 8. Import Dependency Coefficients for Turkey (IO-98) and EU-13 (IO-2000)**

Sectors	TR-98	EU-2000
27 Manufacture of gas; distribution of gaseous fuels through mains	0.53	0.01
14 Non-ferrous metals	0.37	0.47
13 Iron & steel	0.35	0.34
9 Chemicals excluding pharmaceuticals	0.35	0.30
11 Rubber & plastics products	0.31	0.30
19 Radio, television & communication equipment	0.30	0.35
25 Manufacturing nec; recycling (include Furniture)	0.30	0.25
18 Electrical machinery & apparatus, nec	0.30	0.27
20 Medical, precision & optical instruments	0.29	0.25
15 Fabricated metal products, except machinery & equipment	0.26	0.23
21 Motor vehicles, trailers & semi-trailers	0.25	0.35
8 Coke, refined petroleum products and nuclear fuel	0.24	0.62
16 Machinery & equipment, nec	0.23	0.26
17 Office, accounting & computing machinery	0.23	0.50
5 Textiles, textile products, leather and footwear	0.22	0.28
22 Building & repairing of ships & boats	0.22	0.35
34 Water transport	0.20	0.28
10 Pharmaceuticals	0.20	0.22
24 Railroad equipment & transport equip n.e.c.	0.20	0.00
7 Pulp, paper, paper products, printing and publishing	0.18	0.24
35 Air transport	0.18	0.26
6 Wood and products of wood and cork	0.15	0.24
26 Production, collection and distribution of electricity	0.15	0.18
30 Construction	0.15	0.17
4 Food products, beverages and tobacco	0.13	0.22
12 Other non-metallic mineral products	0.12	0.20
47 Other community, social & personal services	0.12	0.10
23 Aircraft & spacecraft	0.11	0.40
41 Computer & related activities	0.11	0.09
33 Land transport; transport via pipelines	0.10	0.12
32 Hotels & restaurants	0.08	0.12
40 Renting of machinery & equipment	0.08	0.06
46 Health & social work	0.07	0.09
1 Agriculture, hunting, forestry and fishing	0.07	0.14
38 Finance & insurance	0.06	0.09
45 Education	0.06	0.04
3 Mining and quarrying (non-energy)	0.06	0.19
39 Real estate activities	0.06	0.03
36 Supporting and auxiliary transport activities; activities of travel agencies	0.06	0.12
2 Mining and quarrying (energy)	0.05	0.08
43 Other Business Activities	0.05	0.08
29 Collection, purification and distribution of water	0.04	0.09
31 Wholesale & retail trade; repairs	0.03	0.10
48 Private households with employed persons & extra-territorial organisations & bodies	0.03	0.00
42 Research & development	0.03	0.14
37 Post & telecommunications	0.02	0.13
28 Steam and hot water supply	0.00	0.07
44 Public admin. & defence; compulsory social security	0.00	0.09

**Table 9. Regression Analysis on the Similarity of Technology Between Turkey (IO-98) and the 4 of the New Member Countries**

Sectors	Wald Test <sup>††</sup>			
	Czech	Poland	Slovakia	Hungary
1 Agriculture, hunting, forestry and fishing	3.42	15.33*	47.73*	2.56
2 Mining and quarrying (energy)	4.38	14.26*	4.89	5.23*
3 Mining and quarrying (non-energy)	4.89	--	3.62	4.05
4 Food products, beverages and tobacco	1.06*	0.33	10.56*	2.63
5 Textiles, textile products, leather and footwear	1.52	18.46*	114.57*	65.52*
6 Wood and products of wood and cork	19.14*	57.31*	108.56*	93.73*
7 Pulp, paper, paper products, printing and publishing	36.92*	24.69*	17.55*	24.60*
8 Coke, refined petroleum products and nuclear fuel	1059.29*	862.40*	2294.59*	251.57*
9 Chemicals excluding pharmaceuticals	14.09*	13.45*	12.37*	27.66*
10 Pharmaceuticals	--	--	--	--
11 Rubber & plastics products	8.43*	11.75*	11.57*	1.71
12 Other non-metallic mineral products	1.44	0.60	6.52*	2.00
13 Iron & steel	30.11*	--	15.65*	9.49*
14 Non-ferrous metals	--	--	--	--
15 Fabricated metal products, except machinery & equipment	0.12	1.47	0.03	0.79
16 Machinery & equipment, nec	1.02	6.91*	5.09	1.59
17 Office, accounting & computing machinery	3.80	20.25*	18.54*	4.32
18 Electrical machinery & apparatus, nec	0.46	13.11*	0.10	2.41
19 Radio, television & communication equipment	67.63*	5.74*	3.40	32.39*
20 Medical, precision & optical instruments	13.49*	29.10*	6.07*	17.01*
21 Motor vehicles, trailers & semi-trailers	1.21	1.27	1.88	1.83
22 Building & repairing of ships & boats	0.68	2.54	2.41	0.60
23 Aircraft & spacecraft	--	--	--	--
24 Railroad equipment & transport equip nec.	--	--	--	--
25 Manufacturing nec; recycling (include Furniture)	11.72*	28.96*	22.79*	27.34*
26 Production, collection and distribution of electricity	1.24	18.53*	2.50	63.33*
27 Manufacture of gas; distribution of gaseous fuels through mains	--	--	--	--
28 Steam and hot water supply	--	--	--	--
29 Collection, purification and distribution of water	4.50	5.71*	4.09	30.40*
30 Construction	2.21	7.80*	4.16	4.79
31 Wholesale & retail trade; repairs	2.94	8.48*	4.02	4.53
32 Hotels & restaurants	0.99	7.78*	16.22*	0.58
33 Land transport; transport via pipelines	10.63*	15.86*	5.18*	33.15*
34 Water transport	1.01	1.96	7.15*	3.90
35 Air transport	2.68	--	2.12	4.92
36 Supporting and auxiliary transport activities; activities of travel agencies	76.15*	112.17*	36.93*	525.67*
37 Post & telecommunications	19.79*	5.46*	60.29*	6.86*
38 Finance & insurance	8.39*	18.08*	5.39*	14.62*
39 Real estate activities	24.54*	5.92*	13.78*	72.79*
40 Renting of machinery & equipment	29.56*	31.43*	4.10	45.80*
41 Computer & related activities	0.33	0.47	0.22	0.26
42 Research & development	2.81	6.62*	8.65*	8.30*
43 Other Business Activities	15.14*	1.58	11.00*	3.91
44 Public admin. & defence; compulsory social security	--	--	--	--
45 Education	48.60*	124.67*	213.59*	111.90*
46 Health & social work	1.92	5.32*	1.65	2.29
47 Other community, social & personal services	6.89*	15.15*	7.09*	4.47
48 Private households with employed persons & extra-territorial organisations & bodies	--	--	--	--

\* denotes significance at 5 %.

† New member state countries' technological coefficients are calculated from 2000 I-O tables are regressed on Turkey's technological coefficients.  $\alpha$  is the constant term and  $\beta$  is the slope coefficient.

†† According to the null hypothesis of the Wald test, the constant term is zero and the slope term is one representing the convergence between the two countries' technologies. When null is rejected, we can conclude that the technologies are divergent.

**Table 10. The Size of Sectors: Shares of the Sectors in Value-Added (%)**

Sectors	Czech 2000	Poland 2000	Slovakia 2000	Hungary 2000	EU 2000	Turkey 1998
1 Agriculture, hunting, forestry and fishing	3.93	4.05	4.46	4.27	1.70	13.57
2 Mining and quarrying (energy)	1.17	2.63	0.58	0.10	2.03	0.48
3 Mining and quarrying (non-energy)	0.23	0.00	0.21	0.16	0.15	0.56
4 Food products, beverages and tobacco	3.75	2.53	2.77	3.42	1.96	3.63
5 Textiles, textile products, leather and footwear	1.47	1.49	2.05	1.60	1.30	3.40
6 Wood and products of wood and cork	0.85	0.68	0.82	0.47	0.37	0.36
7 Pulp, paper, paper products, printing and publishing	1.59	1.39	1.86	1.26	1.67	1.11
8 Coke, refined petroleum products and nuclear fuel	0.21	0.07	1.44	1.39	0.35	3.05
9 Chemicals excluding pharmaceuticals	1.90	1.23	1.82	2.27	1.83	0.78
10 Pharmaceuticals	0.00	0.00	0.00	0.00	0.15	0.53
11 Rubber & plastics products	1.17	1.15	0.94	0.94	0.94	0.64
12 Other non-metallic mineral products	2.14	1.47	1.50	1.11	0.83	1.43
13 Iron & steel	1.38	1.00	2.32	0.68	0.64	0.90
14 Non-ferrous metals	0.00	0.00	0.00	0.00	0.01	0.19
15 Fabricated metal products, except machinery & equipment	2.46	1.34	1.74	1.52	1.79	0.99
16 Machinery & equipment, nec	2.51	1.18	1.96	1.52	2.61	1.44
17 Office, accounting & computing machinery	0.15	0.12	0.06	0.52	0.26	0.04
18 Electrical machinery & apparatus, nec	1.73	0.88	1.32	2.13	1.40	0.54
19 Radio, television & communication equipment	0.47	0.30	0.48	1.29	0.61	0.40
20 Medical, precision & optical instruments	0.52	0.25	0.48	0.47	0.75	0.05
21 Motor vehicles, trailers & semi-trailers	2.36	1.20	1.72	2.65	2.17	1.16
22 Building & repairing of ships & boats	0.46	0.37	0.29	0.17	0.62	0.04
23 Aircraft & spacecraft	0.00	0.00	0.00	0.00	0.01	0.05
24 Railroad equipment & transport equip nec.	0.00	0.00	0.00	0.00	0.00	0.06
25 Manufacturing nec; recycling (include Furniture)	1.12	1.19	0.71	0.52	0.68	1.15
26 Production, collection and distribution of electricity	3.35	2.65	3.18	3.09	1.53	1.86
27 Manufacture of gas; distribution of gaseous fuels through mains	0.00	0.00	0.00	0.00	0.09	0.09
28 Steam and hot water supply	0.00	0.00	0.00	0.00	0.09	0.00
29 Collection, purification and distribution of water	0.72	0.38	0.49	0.49	0.27	0.48
30 Construction	6.78	7.61	7.00	5.18	4.69	7.29
31 Wholesale & retail trade; repairs	13.20	21.37	13.30	10.66	10.34	15.11
32 Hotels & restaurants	2.15	1.62	1.52	1.77	2.67	2.87
33 Land transport; transport via pipelines	3.56	3.43	6.03	3.48	2.03	8.42
34 Water transport	0.02	0.11	0.03	0.03	0.24	0.61
35 Air transport	0.31	0.00	0.01	0.10	0.45	0.64
36 Supporting and auxiliary transport activities; activities of travel agencies	2.94	1.51	1.12	1.18	1.38	0.78
37 Post & telecommunications	2.91	2.17	2.76	3.74	2.33	1.93
38 Finance & insurance	2.57	1.94	3.63	3.55	4.74	6.49
39 Real estate activities	6.71	5.58	8.33	8.78	10.81	0.09
40 Renting of machinery & equipment	0.71	0.48	0.32	0.52	1.57	0.03
41 Computer & related activities	1.20	0.68	0.82	1.28	1.92	0.20
42 Research & development	0.31	0.35	0.49	0.40	0.80	0.03
43 Other Business Activities	5.39	5.61	4.22	6.31	8.40	1.73
44 Public admin. & defence; compulsory social security	5.41	7.10	7.52	8.46	6.02	8.56
45 Education	3.70	4.98	3.67	4.73	4.46	0.32
46 Health & social work	3.73	4.42	3.61	4.58	5.65	1.44
47 Other community, social & personal services	2.76	3.49	2.44	3.21	4.15	1.40
48 Private households with employed persons & extra-territorial organisations & bodies	0.01	0.00	0.00	0.00	0.55	3.08

**Table 11. The Size of Sectors: Shares of the Sectors in Intermediate Consumption (%)**

Sectors	Czech	Poland	Slovakia	Hungary	EU	Turkey
	2000	2000	2000	2000	2000	1998
1 Agriculture, hunting, forestry and fishing	2.99	5.22	4.32	5.24	1.59	10.00
2 Mining and quarrying (energy)	0.80	1.43	0.28	0.11	0.65	0.29
3 Mining and quarrying (non-energy)	0.18	0.00	0.23	0.16	0.20	0.28
4 Food products, beverages and tobacco	6.54	8.66	5.49	8.11	4.92	10.66
5 Textiles, textile products, leather and footwear	2.40	2.22	1.40	3.31	2.69	8.29
6 Wood and products of wood and cork	1.23	1.52	0.96	0.72	0.66	1.21
7 Pulp, paper, paper products, printing and publishing	2.16	2.71	2.45	2.39	2.54	1.70
8 Coke, refined petroleum products and nuclear fuel	1.76	2.87	4.43	2.88	1.87	1.93
9 Chemicals excluding pharmaceuticals	2.66	2.77	2.45	3.07	3.77	2.83
10 Pharmaceuticals	0.00	0.00	0.00	0.00	0.15	0.73
11 Rubber & plastics products	1.94	1.84	1.48	1.89	1.54	1.89
12 Other non-metallic mineral products	2.16	1.77	1.82	1.15	1.26	1.93
13 Iron & steel	3.30	2.53	6.00	2.21	1.87	3.52
14 Non-ferrous metals	0.00	0.00	0.00	0.00	0.02	0.75
15 Fabricated metal products, except machinery & equipment	3.40	2.00	1.95	2.11	2.52	2.18
16 Machinery & equipment, nec	3.59	1.90	2.76	2.31	4.26	2.66
17 Office, accounting & computing machinery	0.65	0.15	0.08	4.15	0.91	0.05
18 Electrical machinery & apparatus, nec	3.37	1.17	1.86	6.29	2.13	1.28
19 Radio, television & communication equipment	1.86	1.06	0.64	5.55	1.48	0.68
20 Medical, precision & optical instruments	0.73	0.32	0.55	0.46	0.91	0.10
21 Motor vehicles, trailers & semi-trailers	6.83	3.71	5.93	7.62	7.19	2.45
22 Building & repairing of ships & boats	0.54	0.75	0.41	0.25	1.63	0.06
23 Aircraft & spacecraft	0.00	0.00	0.00	0.00	0.01	0.02
24 Railroad equipment & transport equip nec.	0.00	0.00	0.00	0.00	0.00	0.07
25 Manufacturing nec; recycling (include Furniture)	1.87	1.77	1.09	0.71	1.24	2.25
26 Production, collection and distribution of electricity	5.26	3.62	7.35	3.04	2.23	1.51
27 Manufacture of gas; distribution of gaseous fuels through mains	0.00	0.00	0.00	0.00	0.18	0.24
28 Steam and hot water supply	0.00	0.00	0.00	0.00	0.04	0.00
29 Collection, purification and distribution of water	0.51	0.27	0.37	0.35	0.21	0.10
30 Construction	10.35	10.40	7.99	4.64	6.63	10.46
31 Wholesale & retail trade; repairs	6.66	11.77	11.26	8.56	7.74	5.07
32 Hotels & restaurants	1.78	1.18	1.12	1.48	2.37	3.88
33 Land transport; transport via pipelines	2.83	3.03	6.80	2.42	1.99	7.74
34 Water transport	0.05	0.56	0.04	0.04	0.53	0.89
35 Air transport	0.44	0.00	0.08	0.56	0.69	1.05
36 Supporting and auxiliary transport activities; activities of travel agencies	2.31	1.93	2.05	0.79	2.11	1.43
37 Post & telecommunications	1.70	2.12	1.28	1.53	1.70	0.41
38 Finance & insurance	2.38	3.13	1.59	2.30	5.88	4.67
39 Real estate activities	2.23	4.05	1.96	1.98	2.83	0.08
40 Renting of machinery & equipment	0.18	0.15	0.18	0.15	0.80	0.02
41 Computer & related activities	0.84	0.43	0.56	0.69	1.34	0.20
42 Research & development	0.15	0.20	0.40	0.19	0.64	0.01
43 Other Business Activities	4.29	4.33	3.85	3.31	5.29	1.29
44 Public admin. & defence; compulsory social security	1.90	1.84	2.63	1.85	2.78	0.00
45 Education	0.84	1.01	0.51	1.02	1.28	0.31
46 Health & social work	1.57	1.38	1.37	1.77	3.46	0.66
47 Other community, social & personal services	2.77	2.22	2.02	2.59	3.25	1.33
48 Private households with employed persons & extra-territorial organisations & bodies	0.00	0.00	0.00	0.00	0.00	0.83

**Table 12. The Size of Sectors: Shares of the Sectors in Industry Output (%)**

Sectors	<u>Czech</u> 2000	<u>Poland</u> 2000	<u>Slovakia</u> 2000	<u>Hungary</u> 2000	<u>EU</u> 2000	<u>Turkey</u> 1998
1 Agriculture, hunting, forestry and fishing	3.33	4.70	4.37	4.87	1.64	12.02
2 Mining and quarrying (energy)	0.93	1.97	0.40	0.10	1.31	0.40
3 Mining and quarrying (non-energy)	0.20	0.00	0.22	0.16	0.18	0.44
4 Food products, beverages and tobacco	5.52	5.92	4.47	6.31	3.50	6.68
5 Textiles, textile products, leather and footwear	2.06	1.89	1.64	2.65	2.02	5.52
6 Wood and products of wood and cork	1.09	1.14	0.91	0.62	0.52	0.73
7 Pulp, paper, paper products, printing and publishing	1.95	2.12	2.23	1.95	2.12	1.37
8 Coke, refined petroleum products and nuclear fuel	1.19	1.62	3.31	2.31	1.14	2.56
9 Chemicals excluding pharmaceuticals	2.38	2.08	2.21	2.76	2.84	1.67
10 Pharmaceuticals	0.00	0.00	0.00	0.00	0.15	0.62
11 Rubber & plastics products	1.66	1.53	1.28	1.53	1.25	1.18
12 Other non-metallic mineral products	2.15	1.64	1.70	1.14	1.05	1.65
13 Iron & steel	2.60	1.85	4.62	1.63	1.28	2.04
14 Non-ferrous metals	0.00	0.00	0.00	0.00	0.02	0.43
15 Fabricated metal products, except machinery & equipment	3.06	1.71	1.87	1.88	2.17	1.51
16 Machinery & equipment, nec	3.19	1.58	2.46	2.01	3.47	1.97
17 Office, accounting & computing machinery	0.46	0.14	0.07	2.75	0.59	0.05
18 Electrical machinery & apparatus, nec	2.77	1.04	1.66	4.69	1.78	0.86
19 Radio, television & communication equipment	1.35	0.72	0.58	3.91	1.06	0.52
20 Medical, precision & optical instruments	0.65	0.29	0.52	0.46	0.84	0.07
21 Motor vehicles, trailers & semi-trailers	5.20	2.58	4.34	5.71	4.77	1.72
22 Building & repairing of ships & boats	0.51	0.58	0.36	0.22	1.14	0.05
23 Aircraft & spacecraft	0.00	0.00	0.00	0.00	0.01	0.04
24 Railroad equipment & transport equip nec.	0.00	0.00	0.00	0.00	0.00	0.07
25 Manufacturing nec; recycling (include Furniture)	1.59	1.51	0.95	0.64	0.97	1.63
26 Production, collection and distribution of electricity	4.56	3.19	5.78	3.06	1.89	1.71
27 Manufacture of gas; distribution of gaseous fuels through mains	0.00	0.00	0.00	0.00	0.14	0.16
28 Steam and hot water supply	0.00	0.00	0.00	0.00	0.07	0.00
29 Collection, purification and distribution of water	0.59	0.32	0.41	0.41	0.24	0.31
30 Construction	9.05	9.15	7.62	4.85	5.69	8.67
31 Wholesale & retail trade; repairs	9.05	16.06	12.03	9.36	8.99	10.76
32 Hotels & restaurants	1.92	1.37	1.27	1.59	2.51	3.31
33 Land transport; transport via pipelines	3.10	3.21	6.51	2.83	2.01	8.12
34 Water transport	0.04	0.36	0.04	0.04	0.39	0.73
35 Air transport	0.39	0.00	0.05	0.38	0.57	0.81
36 Supporting and auxiliary transport activities; activities of travel agencies	2.54	1.74	1.70	0.94	1.76	1.06
37 Post & telecommunications	2.14	2.14	1.83	2.38	2.00	1.27
38 Finance & insurance	2.45	2.60	2.36	2.78	5.33	5.70
39 Real estate activities	3.87	4.73	4.35	4.60	6.67	0.09
40 Renting of machinery & equipment	0.37	0.30	0.23	0.30	1.17	0.03
41 Computer & related activities	0.97	0.54	0.66	0.92	1.62	0.20
42 Research & development	0.21	0.27	0.44	0.27	0.72	0.02
43 Other Business Activities	4.69	4.90	3.99	4.47	6.79	1.54
44 Public admin. & defence; compulsory social security	3.18	4.19	4.47	4.40	4.34	4.85
45 Education	1.88	2.78	1.70	2.45	2.81	0.31
46 Health & social work	2.36	2.74	2.22	2.85	4.51	1.10
47 Other community, social & personal services	2.77	2.79	2.18	2.83	3.68	1.37
48 Private households with employed persons & extra-territorial organisations & bodies	0.01	0.00	0.00	0.00	0.27	2.11