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ABSTRACT

Input-output (I-O) tables provide a snapshot of an economy, with details on i) intersectoral exchange of intermediate inputs, ii) components of final demand for sectoral outputs, and iii) components of sectoral value added and production. The tables are generally prepared by national statistics institutes at a national level. Even though their policy and academic value are not refuted, regional tables and regional models are seldom produced. This paper presents a 36 sector regional I-O table, the 2008 IZKA (Izmir Kalkınma Ajansı, Izmir Development Agency) Izmir Table, and a model for the Izmir province of Turkey. Table construction process requires an update of the available Turkish national table. The update of the national table and the construction of the regional model are detailed. A structural analysis of the Izmir province is performed through the constructed table.

Key Words: Input-output models, planning policy, regional economics

JEL Codes: C67, C81, O21, R11, R15, R58

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1. INTRODUCTION

Input-output (I-O) tables provide a detailed snapshot of an economy. Through an I-O table, it is possible to examine the intermediate input trade between sectors, observe the components of final demand by sectors and isolate components of created value added and the production process. The I-O tables provide information on not only the absolute magnitudes of intersectoral exchange, but also dependencies across sectors. Interactions of sectors with various agents of the economy can also be observed, for underlying the concept of an I-O table is a circular flow of the economy (Aydoğuş, 2010:7-13).

I-O tables are generally generated by national statistics institutions and are aimed to provide a nationwide level analysis of the economy. Academic scrutiny has also yielded tables constructed to address specific research questions. However, detailed regional I-O tables are few in number, primarily due to regional data collection problems. With their potential for policy contribution and academic research recognized but not fulfilled, regional I-O tables are yet to make a grand entry to the realm of economic policy analysis.

In Turkey, TurkStat (Turkish Statistical Institute) provides national I-O tables. However, the most recent table is based on year 2002 and is therefore 10 years old. A more recent table is yet to be published. To the best knowledge of the authors, a regional I-O table for Turkey has not been publicly available, implying a gap in the field.

This article aims to fulfill this gap by constructing a regional I-O model for Izmir, Turkey. This aim requires an update of the 2002 Turkey I-O Table; therefore, this task has also been undertaken. The article details the following tasks: i) The 2002 Turkey I-O Table has been updated to year 2008, ii) a regional I-O table, 2008 IZKA (Izmir Kalkınma Ajansı, Izmir Development Agency) Izmir Table and a related model have been constructed for Izmir, Turkey, iii) A brief structural analysis of Izmir region has been conducted. The article contributes to the field by outlining the regional I-O table construction process through an example and provides a valuable policy analysis tool for the Izmir region in the form of a regional I-O table.

The article proceeds as follows: Next section outlines a regional I-O model. Section 3 summarizes the adopted regional table construction method. Section 4 outlines the steps taken in order to update the 2002 Turkey I-O Table to year 2008. Section 5 explains the construction of the 2008 IZKA Izmir I-O Table, given the 2008 Turkey I-O Table. A brief structural analysis of the Izmir region is conducted in Section 6. Section 7 concludes.

2. A REGIONAL I-O MODEL

Within this study, a standard static, open Leontief model is considered. The model is static in the sense that there is no time dimension. It is open for both final demands and basic inputs are exogenous.

For a typical sector i, the equilibrium condition is written as the equality of supply and demand in the considered region for each sector. Supply of sectoral outputs is due to regional production and purchases from the rest of the world (i.e. other countries) and other regions in the economy. Demand, on the other hand, has an intermediate and a final component. Intermediate demand is the demand by any sector j to the output of sector i is for production purposes. That is, in order to produce, sector j requires the output of sector i as an input. Final demand items include consumption demand, investment demand, government demand, demand from other regions of the economy and the demand from the rest of the world. Specifically, for the typical i^{th} sector;

(1) $X_i + M_i^{TR} + M_i^{D} = \sum_j^N X_{ij} + C_i + Z_i + G_i + E_i^{TR} + E_i^{D}$ (for i = 1, 2, ..., N)

where,

X_i : output of sector i
M_i^{TR} : purchases of sector i from the rest of Turkey
M_i^{D} : imports of sector i
X_{ij} : intermediate sales of sector i to sector j
C_i : consumption demand for output of sector i
Z_i : investment demand for output of sector i
G_i : government demand for output of sector i
E_i^{TR} : sales of sector i to the rest of Turkey
E_i^{D} : exports of sector i

Rearrangement yields

(2) $X_i = \sum_j X_{ij} + C_i + Z_i + G_i + E_i^{D} - M_i^{D} + NE_i^{TR}$ (for i = 1, ..., N)

where, $NE_i^{TR} = E_i^{TR} - M_i^{TR}$.

With the assumption of linearity in intermediate input usage, $X_{ij} = a_{ij}X_j$ where a_{ij} represents the *technical coefficients*. This equation can be written as:

(3) $X_i = \sum_j a_{ij}Xij + C_{i0} + Z_{i0} + G_{i0} + E_{i0}^{D} - M_{i0}^{D} + NE_{i0}^{TR}$ (for i = 1, ..., N)

where the subindex 0 represents an exogenous variable. This system of equations can be summarized by matrix notation:

(4) $\mathbf{X} = \mathbf{AX} + \mathbf{C}_0 + \mathbf{Z}_0 + \mathbf{G}_0 + \mathbf{E}_0^{D} - \mathbf{M}_0^{D} + \mathbf{NE}_0^{TR}$

And the solution is obtained as:

(5) $\mathbf{X^* = (I - A)^{-1} (C_0 + Z_0 + G_0 + E^D - M_0^D + NE_0^{TR})}$

where $\mathbf{(I - A)^{-1}}$ is the Leontief inverse.

The theoretical construction has two implications. Firstly, Equation (5) can be used to analyze the effects of any exogenous shocks on the considered region; İzmir in this case. Secondly, given total supply and total demand, net exports of Izmir to the rest of Turkey can be calculated as a residual. However, any analysis to be conducted requires a data gathering process that aims to construct a regional I-O table for İzmir.

Following the table in Aydoğuş (2010: 21), basic components of a regional I-O table are presented in Table 1. Following columns, one can track the items that contribute to the regional supply. Section II records intermediate uses; i.e. how much a given sector j uses intermediate inputs from all other sectors, indexed i. This is followed by basic inputs, like capital and labor, and tax payments; all recorded in Section III for each sector j. Intermediate inputs and basic inputs are used to create regional output of each sector, X_j. Adding imports to regional output yields regional supply for each sector.

Table 1 – Components of a Regional I-O Table

	Intermediate Uses		Regional Final Uses	Net Sales to the Rest of Turkey	Exports	Imports
	Sectors (j)	**Sum**				
Sectors (i)	**SECTION II** X_{ij}	. . $\sum_i X_{ij}$ . .	**SECTION I** C_i, Z_i, G_i	$E_i^{TR} - M_i^{TR}$	E_i^D	M_i^D
Sum	. . . $\sum_j X_{ij}$ . . .					
Basic Inputs and Taxes on Production	**SECTION III**					
Regional Output	. . . X_j . . .					

Tracking rows, one can determine how the output of each sector is used. Firstly, the output of any sector i is demanded as intermediate input. Additionally, there is the final demand. Output of any sector i is demanded for consumption purposes (C_i), for investment purposes (Z_i), by government for public consumption (G_i) and by other countries as exports (E_i^D). Sum of final and intermediate demand is regional demand. Finally, Equation 4 implies that any difference between regional demand and regional supply is net export of the region to the rest of the country. As will be seen in the following sections, this point will be crucial in balancing 2008 IZKA Izmir I-O Table, the regional I-O table for Izmir.

3. REGIONAL I-O TABLE CONSTRUCTION METHODOLOGY

Three main methods can be identified for the construction of regional I-O tables (Bonfiglio, 2005; Statistics New Zealand 2003). The first method is the *survey method*, and includes detailed surveys of the region in question. Addressed to the firms of the region, conducted surveys may be *full surveys*. Full surveys aim to obtain all possible information about sales and purchases of the firms. However, full surveys are prohibitively costly and the alternatives of *rows-only* or *column-only* survey methods may be adopted. Rows-only surveys aim to gather information on sales whereas columns-only surveys question the details of purchases. But, costs remain considerably high for rows-only and column-only alternatives as well.

The second method of regional I-O table construction is the *non-survey method*. The non-survey method relies on constructing the regional table from a national table through various transformations, where transformations are based on adopted assumptions. The non-survey method has a considerable cost advantage over the survey method; Boster and Martin (1972) claim that the ratio of the cost of a survey table to the cost of a non-survey table may be as high as 20 to 1. However, the accuracy of the adopted assumptions is a major concern.

The third major approach is the *hybrid method*. The hybrid method, as the name implies, lies between the survey and non-survey methods. The first step of the hybrid method is to form a regional I-O table from the national table through assumptions. Then, the constructed table is fine-tuned through the employment of *superior data*, i.e. data gathered on the region through alternative sources including but not limited to various public and private institutions and interviews with representative members of sectoral organizations.

The hybrid method merges the advantages of the survey and non-survey methods, while eliminating their major disadvantages. It is less costly than the survey method for detailed surveys are not needed and is more accurate than the non-survey method for any errors due to adopted assumptions can be

corrected through the use of superior data. Due to these advantages and the general opinion that the hybrid method is the most feasible method among alternatives (Lahr, 2001; Fritz et. al. 2002), the hybrid method has been adopted to construct a regional I-O table for the Izmir region.

The adopted methodology requires a national I-O table. Currently, the most recent and publicly available national table for Turkey is the 2002 table prepared by TurkStat. The table is 10 years old and an update is necessary. As summarized in the next section, the first undertaken task is the update of the national I-O table of Turkey, which has resulted in the 2008 Turkey I-O Table.

4. UPDATING TURKEY'S 2002 INPUT-OUTPUT TABLE TO 2008

Turkey's 2002 national I-O table includes 59 sectors and is based on the NACE Rev 1.1 classification. Before updating the national table, a target year has to be identified. That is, the year to which the national table will be updated must be determined. The choices are limited by the availability of detailed sectoral data. Though lacking details in some sectors, the most comprehensive and publicly available source of data is Annual Industry and Service Statistics of TurkStat (AISS). The AISS conducted for year 2008 is publicly available from TurkStat's webpage and is based on NACE Rev 1.1 classification. Due to the relatively rich data detail and classification consistency potential presented by this survey, year 2008 is chosen as the target year and the 2002 Turkey I-O Table is updated to year 2008.

The AISS database and the 2002 Turkey I-O Table have been further supplemented by the following data sources:

- TurkStat's GDP by production approach (includes value added and tax net of subsidies data on 17 branches of economic activity)
- TurkStat's GDP by expenditure approach (includes details on components of final demand)
- TurkStat's GDP by income approach (includes data on compensation of employees)
- TurkStat's 2008 Household Budget Survey Database (includes data on sectoral division of final consumption expenditures by households)
- Budget Statistics, Ministry of Finance (includes data on gathered taxes and government expenditures)
- TurkStat's Foreign Trade Database (includes sectoral trade data, excluding certain service sectors)
- Central Bank of Republic of Turkey, Balance of Payments Service Trade Statistics (includes data on international trade in services),
- Social Security Institution Formal Employment data on sectoral formal employment

Due to data availability, the 59 sectors of the 2002 Turkey I-O Table has been aggregated to 36 sectors; see Appendix Table 1 for the correspondence table. For these 36 sectors, the update process aims to gather data on final uses (Section I of Table 1) and basic inputs (Section III of Table 1).

For a national I-O table, there is international trade but there is no inter*regional* trade, for the national economy is treated as a single entity. Therefore, once data on final uses and basic inputs (and therefore output) is gathered, sums of intermediate transactions for each sector can be gathered. The remaining task is to fill the cells of Section II, performed through the employment of the RAS algorithm. Details of the procedure are as follows.

Updating Final Uses (Section I)

Section I includes sectoral detail on final consumption expenditure by households, final consumption expenditure by government, capital formation and exports. These items, in aggregate, can be obtained from national accounts. Sectoral distribution of final consumption expenditure by households is based on TurkStat's Household Budget Surveys. Distribution of 2008 government consumption is based on the sectoral distribution in 2002. Capital formation uses are also distributed according to the 2002 Turkey I-O Table sectoral distribution. However, sectoral fine-tuning based on sectoral investment figures in Ministry of Development's Economic and Social Indicators has been performed.

The last item of final uses is export and exports are treated together with imports. The basic foreign trade data source is TurkStat, but augmentation from Central Bank's Balance of Payment Statistics has been necessary in order to obtain trade in services.

Updating Basic Inputs (Section III)

The calculations for the basic inputs (Section III) start with the distribution of year 2008 value added in to sectors. A limited sectoral distribution of value added is available from the national accounts. This available sectoral distribution is enhanced with relatively more sectoral detail from AISS. Sectoral production values have been updated with sectoral output growths implied by the AISS from 2004 to 2008; the 2002 to 2004 growth has been taken into account through inflation.

Net taxes on products have been obtained from TurkStat's national income accounts. Distribution of net taxes has been based on the 2002 Turkey I-O Table; with limited rearrangements due to tax data from Ministry of Finance.

Compensation of employees is based on the national accounts, with sectoral distribution based on both the national accounts and the data on labor costs in TurkStat's AISS. Given labor costs and value added, operating surplus is

obtained by deducting compensation of employees from gross value added. Finally, sectoral supplies are calculated by summing production and imports.

As this task is performed, it becomes important to maintain a clear definition of items such as operating surplus and net taxes. In order to maintain definition consistency, the metadata of TurkStat's 2002 Turkey I-O Table has been adopted for definitions[6].

Updating Intermediate Inputs (Section II)

The data gathering effort yields output for each sector and expenditure on basic inputs, including tax. Deducting basic input usage and net taxes from output yields expenditure on intermediate inputs; that is, the column sums of Section II. Similarly, given final demand and total supply for each sector, row sums of Section II can be obtained as well; for what is not used to meet final demand is used to meet intermediate input demand.

The method to update intermediate uses (elements of Section II) is based on the RAS algorithm. The RAS algorithm is essentially an iterative table balancing algorithm (Bacharach, 1965; Bachem ve Korte, 1979). The method starts from a source table and reaches a destination table, given the sums of rows and columns of the destination table (Altan and Ediz, 2009). The approach is most appropriate for this step of the study. The 2002 Turkey I-O Table has the inter-industry flows of intermediate inputs as a table, with row and column sums. The update of the national table to year 2008 has also yielded row and column sums of Section II (intermediate uses region) for year 2008. Given Section II row and column sums for 2008 and 2002 sectoral intermediate input use distributions, RAS algorithm has been implemented through Octave. The algorithm has yielded intermediate input trade between the 36 sectors in Turkey for year 2008. Thus the update of the national table to year 2008 has been completed.

5. CONSTRUCTION OF 2008 IZKA IZMIR I-O TABLE

Given the calculated 2008 Turkey I-O Table, it is now possible to obtain Izmir region's I-O table, the 2008 IZKA Izmir Table. Izmir's I-O table has been constructed in two stages. The first stage includes estimation of Izmir's technical (direct input) coefficients (a_{ij}) from national table. Then the calculated coefficients are confirmed through interviews of regional representative sector members. The second stage involves gathering data to fill Section I (final uses in Izmir) and Section III (basic inputs).

The calculation of Izmir's technical coefficients relies on a basic assumption: If a sector is concentrated in a region, then that sector's technical coefficients are

[6] For the metadata on 2002 National I-O Table of Turkey, see www.turkstat.gov.tr/VeriBilgi.do?alt_id=58

equal to the national technical coefficients. If a sector is not concentrated in a region, then that sector's regional technical coefficient is equal to the national coefficient multiplied by the measure of regional concentration.

Previously employed for regional concentration of manufacturing industry sectors in Turkey (Kumral and Deger, 2004), the LQ (Location Quotient) is a commonly adopted measure of regional concentration. The LQ has been scrutinized repeatedly and has been deemed an appropriate tool to generate regional technical coefficients (Kronenberg, 2012; Flegg and Webber, 1997; Schaffer and Chu, 1969). Therefore, LQ values for the 36 sectors have been calculated using formal employment data from the Social Security Institution.

Once the technical coefficients have been obtained, opinions on the coefficients from representative sector members have been seeked. By making appointments, executive officers of various companies, sector commitees of various businessmen associations and commerce chambers, university researchers and experts from public institutions have been visited. A total of 29 meetings were held for 36 sectors.

During these meetings, the participants were informed of the conducted research, the structure of I-O tables was briefly presented and then the concept of technical coefficients were explained. Then the calculated technical coefficients were presented to the participants and their opinions were asked. Based on these meetings, a number of changes have been introduced to the technical coefficients. This concludes the first stage of the construction of 2008 IZKA Izmir I-O Table.

The second stage involves filling out Section I (final uses) and Section III (basic inputs) for 2008 IZKA Izmir I-O Table. Details of these operations are summarized below, with special emphasis on international trade.

Calculation of Final Uses (Section I)

Final consumption by households is based on the rate of per capita value added in Izmir to per capita value added in Turkey; the ratio is assumed to represent the ratio of per capita consumption as well. Thus given populations of Izmir and Turkey and the consumption for Turkey, Izmir's total final consumption expenditure is calculated. The sectoral distribution is based on Household Budget Surveys and the distribution in 2008 Turkey I-O Table.

The sum of government final consumption expenditure in Izmir is based on the ratio of government spending in Izmir to government spending in Turkey, calculated from Ministry of Finance statistics. Capital formation is based on Izmir's share of private investment incentives and public investment; data is based on public investment figures by Ministry of Development and investment subsidies from Ministry of Economy.

Calculation of Basic Inputs (Section III)

The calculations for Section III have been started from output at basic prices. It is assumed that output for any sector in Izmir is a share of output of the same sector in Turkey, where shares are based on sales figures provided by Ministry of Finance. As for created value added; it is assumed that if a sector is concentrated in the region, as measured by the LQ indices, value added to output share in the region is the same as the share in Turkey. This enables calculation of value added for a number of sectors in Izmir. Also, the total value added in Izmir is calculated from national accounts to be about 7% of national value added; thus the total value added created in Izmir is obtained. The difference between Izmir's value added and the value added obtained for a subset of sectors is distributed to the un-concentrated sectors proportional to their sales in Izmir, where sales figures are obtained from Ministry of Finance.

The sum of net taxes on products in Izmir is calculated by the rate of indirect taxes collected in Izmir to the indirect taxes collected in Turkey; the rate is calculated from budget statistics of Ministry of Finance. Distribution of taxes to intermediate uses and final uses is done in accordance with the rates for the 2008 Turkey I-O Table. In order to distribute net taxes on intermediate uses to sectors, ratio of output in Izmir to output in Turkey has been employed.

Next, value added has been divided to compensation of employees and operating surplus. National sectoral ratios of compensation of employees to value added have been used to obtain compensation of employees in the sectors in Izmir. Operating surplus is obtained as a residual from the value added.

International Trade

Foreign trade is a difficult concept in regional I-O tables, especially for port regions like Izmir. Any recorded export from Izmir could be an export of Izmir itself, or the export of a firm located in another region in the hinterland of Izmir. Unfortunately, available data from TurkStat's Foreign Trade Statistics is based on customs declarations and it is not possible to isolate trade data as trade of Izmir and trade of other regions. However, for the provinces in the hinterland of Izmir have their own customs, it is assumed that the hinterland regions record their foreign trade in their own customs offices and foreign trade data for Izmir is not a serious overestimation.

TurkStat's Foreign Trade Statistics database lacks detailed data on some sectors; therefore, these sectors have required special attention. For "electricity, gas, steam and hot water supply sector", regional trade is calculated as a ratio of national trade, where the ratio is due to the number of establishments in Izmir divided by the number of establishments in Turkey. Same approach has been adopted for "construction", "retail and wholesale trade", "land, water and air transport and transport via pipelines and communications", and, "other services"

sectors. “The hotels and restaurants” sector is assumed to reflect tourism. Therefore, calculations on international trade in hotel and restaurant services are based on the number of visitor arrivals and departures by residence. Data is available through TurkStat. Izmir’s ratio to Turkey has been once more adopted to obtain Izmir’s international trade in hotel and restaurant related services; this time the key variable is the number of visitor arrivals.

Given output values for all the 36 sectors and the technical coefficients, it is possible to obtain intermediate uses in Izmir. Section II of 2008 IZKA Izmir I-O Table can be filled by multiplying output values with technical coefficients. Thus the construction of the 2008 IZKA Izmir I-O Table has been completed. The updated 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table are provided in the statistical annex.

6. STRUCTURAL ANALYSIS OF IZMIR REGION

This section conducts a structural analysis of the Izmir region through 2008 IZKA Izmir I-O Table and 2008 Turkey I-O Table. The section is divided into two subsections. Firstly, for a number of indicators and for each sector, the share of the sector as represented in Izmir in the total size of the sector in Turkey is considered. In other words, the first part of the structural analysis compares the sector in Izmir to the same sector in Turkey; examined figures are basically the share of Izmir to Turkey.

Second subsection considers comparisons within Izmir. Share of each sector in Izmir, for a number of variables is considered. Thus the analysis reveals which sectors in Izmir account for a considerable portion of output, value added, compensation of employees, trade etc. in Izmir.

6.1 Izmir’s Share in Turkey

Table 2 shows the share of Izmir Region in Turkish economy in terms of output at basic prices, value added at basic prices, taxes less subsidies on products, net operating surplus, exports, imports, net exports and net sales outside the Izmir Region. It can be seen that, in contrast to Turkey, Izmir is a net exporter with an export value of 15 billion TL and an import value of 14.6 billion TL. High share of Izmir in taxes less subsidies on product is another remarkable point stressed in Table 2. Broadly speaking, it is observed that Izmir accounts for about 7% of Turkish economy.

Table 2 - Share of İzmir Region in Turkish Economy: 2008 (Billion TL)

	Turkey	İzmir	İzmir's Share (%)
Output at basic prices	1859,3	129,3	6.96
Value added at basic prices	839,7	55,8	6.64
Taxes less subsidies on products	32,7	5,4	19.94
Compensation of employees	252,3	14,8	5.87
Operating surplus, net	513,1	35,5	6.92
Exports, fob	227,4	15,0	6.58
İmports, cif	269,4	14,6	5.41
Net exports, fob	-42	0,6	-
Net Sales to the rest of Turkey	-	14,4	-
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.			

Furthermore, shares of sectors of İzmir region in Turkish economy are also calculated in terms of output, value added, exports, imports, taxes less subsidies on product, compensation of employees and net operating surplus. Sectors with the highest share are listed briefly.

Output

The five sectors of İzmir with the highest share of the same sector's output in Turkey are presented in Table 3. The table shows that 67.3% of Turkey's manufacture of tobacco products sector production takes place in Izmir. Other important sectors of İzmir with the highest share of output in Turkey are manufacture of coke, refined petroleum products and nuclear fuels; fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing; manufacture of chemicals and chemical products, manufacture of pulp, paper and paper products.

Table 3 - Share of İzmir Region's Sectors in Output of Turkey (%)

Manufacture of tobacco products	67.3
Manufacture of coke, refined petroleum products and nuclear fuels	25.0
Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	16.3
Manufacture of chemicals and chemical products	14.9
Manufacture of pulp, paper and paper products	14,8
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Table 4 - Share of İzmir Region's Sectors in Value Added of Turkey (%)

Manufacture of tobacco products	81.7
Manufacture of coke, refined petroleum products and nuclear fuels	25.0
Manufacture of pulp, paper and paper products	19.5
Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	16.9
Manufacture of chemicals and chemical products	14.5
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Value added

Manufacture of tobacco products sector of İzmir has the highest share of value added in Turkish economy. Table 4 shows that 81% of value added generated by manufacture of tobacco products sector in Turkey are from Izmir region. The other sectors of İzmir that follow manufacture of tobacco products are manufacture of coke, refined petroleum products and nuclear fuels; manufacture of pulp, paper and paper products; fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing and manufacture of chemicals and chemical products.

Exports

Within the performed structural analysis; the ratio of İzmir's exports in Turkish exports is also calculated for 36 sectors. This ratio shows the sectors which have the greatest share by means of exports. In this respect, manufacture of tobacco products accounts for the largest portion of national exports. In other words, majority of exports of this sector is generated in İzmir. Other essential exporting sectors in İzmir are manufacture of coke, refined petroleum products and nuclear fuels; recycling; agriculture, hunting and forestry and manufacture of chemicals and chemical products.

Table 5 - Share of İzmir Region's Sectors in Exports of Turkey (%)

Manufacture of tobacco products	80.4
Manufacture of coke, refined petroleum products and nuclear fuels	25.0
Recycling	17.6
Agriculture, hunting and forestry	16.6
Manufacture of chemicals and chemical products	13.3
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Imports

Table 6 presents the share of sectoral imports of İzmir in Turkey's total imports. It can be seen that manufacture of tobacco products sector has the highest share in Turkey among other sectors. Respectively, manufacture of coke, refined petroleum products and nuclear fuels; manufacture of pulp, paper and paper products; manufacture of food products and beverages and recycling are the other important sectors by means of imports share.

Table 6 - Share of İzmir Region's Sectors in Imports of Turkey (%)

Manufacture of tobacco products	84.2
Manufacture of coke, refined petroleum products and nuclear fuels	25.0
Manufacture of pulp, paper and paper products	13.7
Manufacture of food products and beverages	11.0
Recycling	10.6
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Compensation of Employees

The ratio of compensation of employees is derived by dividing sectoral compensation of employees of İzmir to sectoral compensation of employees of Turkey. Hence, sectors which have a leading role in Turkey in terms of compensation of employees are observed. From this perspective, the highest impact comes from manufacture of tobacco products. On the other hand, other essential sectors are manufacture of coke, refined petroleum products and nuclear fuels; manufacture of pulp, paper and paper products; fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing and manufacture of chemicals and chemical products.

Table 7 - The Share of İzmir Region's Sectors in Compensation of Employees of Turkey (%)

Manufacture of tobacco products	77.8
Manufacture of coke, refined petroleum products and nuclear fuels	23.8
Manufacture of pulp, paper and paper products	18.5
Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	18.0
Manufacture of chemicals and chemical products	13.2
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Net operating surplus

As part of analyzing value of net operating surplus, values in Table 8 are obtained. It is observed that manufacture of tobacco products has the highest share in terms of net operating surplus. Respectively, the other sectors of İzmir that follows manufacture of tobacco products are manufacture of coke, refined petroleum products and nuclear fuels; manufacture of pulp, paper and paper products; fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing and manufacture of chemicals and chemical products.

Table 8 - The Share of İzmir Region's Sectors in Net Operating Surplus of Turkey (%)

Manufacture of tobacco products	84.1
Manufacture of coke, refined petroleum products and nuclear fuels	25.2
Manufacture of pulp, paper and paper products	20.5
Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	16.7
Manufacture of chemicals and chemical products	15.3
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

6.2 Leading Sectors within Izmir

Further analysis highlights the sectors that are important in Izmir due to their high shares in output, value added, exports, imports, compensation of employees net operating surplus and net sales from Izmir to the rest of Turkey. It should be emphasized that this second step of the analysis considers sectors in Izmir with respect to their shares ***within*** Izmir, whereas the previous step focused on the sectors in Izmir in comparison to the sector's aggregates for the ***whole*** Turkish economy.

Table 9 - Share of Sectoral Output in İzmir Region (%)

Land, water, air transport and transport via pipelines and communication	17.7
Retail and wholesale trade	14.3
Other services	11.2
Hotels and restaurants	7.4
Manufacture of coke, refined petroleum products and nuclear fuels	6.1
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Output

The 5 sectors with the highest share of output in Izmir are presented in Table 9. The Table shows that 17.7% of İzmir's total output takes place in land, water, air transport and transport via pipelines and communication sector. Other important sectors with the highest share of output in İzmir are retail and wholesale trade; other services; hotels and restaurants and manufacture of coke, refined petroleum products and nuclear fuels.

Value Added

Land, water, air transport and transport via pipelines and communication sector generates the highest value added in İzmir by 19.1%. Respectively; other essential sectors in terms of value added are retail and wholesale trade; other services; agriculture, hunting and forestry and hotels and restaurants.

Table 10 - Share of Sectoral Value Added in İzmir Region (%)

Land, water, air transport and transport via pipelines and communication	19.1
Retail and wholesale trade	18.7
Other services	16.8
Agriculture, hunting and forestry	5.1
Hotels and restaurants	4.8
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Exports

In this section the sectoral exports ratio in İzmir's total exports is calculated for 36 sectors. As part of this ratio, manufacture of coke, refined petroleum products and nuclear fuels sector has the highest exports value in İzmir. Other essential exporting sectors in İzmir are manufacture of basic metals; hotels and restaurants; manufacture of wearing apparel; dressing and dyeing of fur and manufacture of food products and beverages.

Table 11 - Share of Sectoral Exports in İzmir Region (%)

Manufacture of coke, refined petroleum products and nuclear fuels	15.7
Manufacture of basic metals	11.5
Hotels and restaurants	9.4
Manufacture of wearing apparel; dressing and dyeing of fur	8.1
Manufacture of food products and beverages	7.3
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Imports

In addition to the calculation of sectoral exports ratio in İzmir, ratio of imports of the sectors in İzmir to İzmir's total import is derived. The results are presented in Table 12. It is observed that 30% of İzmir's imports come from manufacture of coke, refined petroleum products and nuclear fuels sector. Manufacture of chemicals and chemical products, recycling, manufacture of machinery and equipment n.e.c. and manufacture of motor vehicles, trailers and semi-trailers are the other important importing sectors in İzmir.

Table 12 - Share of Sectoral Imports in İzmir Region (%)

Manufacture of coke, refined petroleum products and nuclear fuels	30.3
Manufacture of chemicals and chemical products	11.3
Recycling	8.7
Manufacture of machinery and equipment n.e.c.	6.4
Manufacture of motor vehicles, trailers and semi-trailers	6.2
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Compensation of Employees

To be able to understand which sector has a highest share of compensation of employees in İzmir, compensation of employees for each sector is divided to total compensation of employees in Izmir. The results show that other services sector has a highest share of compensation of employees in İzmir with the ratio of %20. Other essential sectors are retail and wholesale trade, land, water, air transport and transport via pipelines and communication, construction and education.

Table 13 - Share of Sectoral Compensation of Employees in İzmir Region (%)

Other services	21.0
Retail and wholesale trade	16.7
Land, water, air transport and transport via pipelines and communication	10.7
Construction	5.4
Education	5.4
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Net Operating Surplus

The top five sectors with the highest share of net operating surplus are presented in Table 14. Land, water, air transport and transport via pipelines and communication has a highest share of net operating surplus. The other important sectors are retail and wholesale trade, other services, agriculture, hunting and forestry and hotels and restaurants.

Table 14 - Share of Sectoral Net Operating Surplus in İzmir Region (%)

Land, water, air transport and transport via pipelines and communication	20.9
Retail and wholesale trade	20.8
Other services	16.7
Agriculture, hunting and forestry	6.4
Hotels and restaurants	5.0
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

Net Sales from İzmir Region to the Rest of Turkey

The highest value of net sales from İzmir Region to the rest of Turkey are realized by the land, water, air transport and transport via pipelines and communication with the value 7,2 million TL. In the framework of net sales out of the region, the other essential sectors are respectively, retail and wholesale trade, hotels and restaurants, manufacture of coke, refined petroleum products and nuclear fuels and manufacture of tobacco products

Table 15 - Net Sales from İzmir Region to the Rest of Turkey (billion TL)

Land, water, air transport and transport via pipelines and communication	7.2
Retail and wholesale trade	6.4
Hotels and restaurants	5.9
Manufacture of coke, refined petroleum products and nuclear fuels	4.3
Manufacture of tobacco products	2.1
Source: Authors' own calculations based on 2008 Turkey I-O Table and 2008 IZKA Izmir I-O Table.	

7. CONCLUSION

A crucial task for an in-depth analysis of an economy is to examine the interactions between sectors. The basic tool for this task is the I-O table. Table constructed for a region of an economy enable a detailed examination of the region's economy. However, this task is not undertaken frequently.

This study presents 2008 IZKA Izmir I-O Table, a 36 sector I-O table for the Izmir region of the Turkish economy. In order to prepare 2008 IZKA Izmir I-O Table, 2002 Turkey 2002 Table has first been updated to year 2008, leading to 2008 Turkey I-O Table. Following the update of the national table, the hybrid approach to the construction of a regional table has been adopted.

The table construction process is based on a regional model. The data is obtained from various institutions. Adopted assumptions and obtained regional technical coefficients have been verified through interviews with sector representatives, members of professional organizations and experts from various institutions. Obtained table is related to an open regional model.

A structural analysis of Izmir region has been performed through the 2008 IZKA Izmir I-O Table and 2008 Turkey I-O Table. Manufacture of pulp, paper and paper products; fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing; and, manufacture of chemicals and chemical products sectors of Izmir account for a considerable share of output, value added, compensation of employees and operating surplus of the same sectors for Turkey. Recycling leads in terms of import and export. Agriculture, hunting and forestry sector and manufacture of food products and beverages sector take a lead in imports. This enables one to consider that Izmir region exports unprocessed agricultural products and imports processed food products.

On the other hand, services sectors take the lead in terms of production in Izmir. Land, water, air transport and transport via pipelines and communication sector and retail and wholesale trade sectors account for more than %30 of production in Izmir. As a reflection of tourism activities, hotels and restaurants sector also has an important share. These sectors are also important in terms of created value added.

In Izmir's exports, manufacture of coke, refined petroleum products and nuclear fuels, manufacture of basic metals and hotels and restaurants sectors are important. Manufacture of coke, refined petroleum products and nuclear fuels, manufacture of chemicals and chemical products and recycling sectors have relatively large shares in terms of imports. Service sectors take the lead for compensation of employees. In addition to service sectors, agriculture, hunting and forestry sector becomes important in terms of operating surplus.

Conducted analysis reveals that the production of basic inputs like metal, petroleum related inputs and chemicals are important in Izmir. Also, business

supports services like logistics and trade are observed to be important as well. An examination of absolute magnitudes reveals that Izmir region's economy focuses on the production of unprocessed or relatively less processed inputs and related service sectors rather than the production of processed goods.

This conclusion points to the importance of services sectors for Izmir and highlights the need for detailed analysis of these sectors. Another main observation is that Izmir provides easy access to basic inputs and business support services. Therefore Izmir economy can be restructured as an attraction for investment and may turn into a brand as an investment region. A third observation is that the revealed importance of the services sector requires a more detailed analysis of these sectors in Izmir. However, this is difficult to perform due to lack of detailed service sector data at a regional level. Therefore, it is difficult to identify the services sectors in Izmir that would be subject of support programs.

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APPENDIX: TABLES

Appendix Table 1: Sectoral Aggregation Key

Sector No	Sector Name	2002 National I-O Table Code
1	Agriculture, hunting and forestry	1, 2
2	Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	3
3	Manufacture of coke, refined petroleum products and nuclear fuels	4,5,6,7,8
4	Manufacture of food products and beverages	9
5	Manufacture of tobacco products	10
6	Manufacture of textiles	11
7	Manufacture of wearing apparel; dressing and dyeing of fur	12
8	Manufacture of leather and leather products	13
9	Manufacture of wood and products of wood and cork (except furniture); articles of straw and plaiting materials	14
10	Manufacture of pulp, paper and paper products	15
11	Manufacture of printed matter and recorded media	16
12	Manufacture of coke, refined petroleum products and nuclear fuels	17
13	Manufacture of chemicals and chemical products	18
14	Manufacture of rubber and plastic products	19
15	Manufacture of other non-metallic mineral products	20
16	Manufacture of basic metals	21
17	Manufacture of fabricated metal products, except machinery and equipment	22
18	Manufacture of machinery and equipment n.e.c.	23
19	Manufacture of office machinery and computers	24

20	Manufacture of electrical machinery and apparatus n.e.c.	25
21	Manufacture of radio, television and communication equipment and apparatus	26
22	Manufacture of medical, precision and optical instruments, watches and clocks	27
23	Manufacture of motor vehicles, trailers and semi-trailers	28
24	Manufacture of other transport equipment	29
25	Manufacture of furniture; other manufactured goods n.e.c.	30
26	Recycling	31
27	Electrical energy, gas, steam and hot water	32
28	Collected and purified water, distribution services of water	33
29	Construction	34
30	Retail and wholesale trade	35,36,37
31	Hotels and restaurants	38
32	Land, water, air transport and transport via pipelines and communication	40,41,42,43
33	Financial intermediation services, except insurance and pension funding services	44,45,46
34	Education	53
35	Health and social work	54
36	Other services	47,48,49,50,51,52, 55,56,57,58,59

Table 1: 2008 Turkey Input-Output Table Revised with Superior Information (Million TL)

| | PRODUCTS | INTERMEDIATE USES (INTERMEDIATE DEMAND) | | |

Table 2: Izmir 2008 Input-Output Table Revised with Superior Information (Million TL)

	PRODUCTS	Agriculture, hunting and forestry	Fishing , operating of fish hatcheries and fish farms; service activities incidental to fishing	Manufacture of coke, refined petroleum products and nuclear fuels	Manufacture of food products and beverages	Manufacture of tobacco products	Manufacture of textiles	Manufacture of wearing apparel; dressing and dyeing of fur	Manufacture of leather and leather products	Manufacture of wood and products of wood and cork, (except furniture); articles of straw and plaiting materials	Manufacture of pulp, paper and paper products	Manufacture of printed matter and recorded media	Manufacture of coke, refined petroleum products and nuclear fuels	Manufacture of chemicals and chemical products	Manufacture of rubber and plastic products	Manufacture of other non-metallic mineral products	Manufacture of basic metals	Manufacture of fabricated metal products, except machinery and equipment	Manufacture of machinery and equipment n.e.c.	Manufacture of office machinery and computers	Manufacture of electrical machinery and apparatus n.e.c.	Manufacture of radio, television and communication equipment and apparatus	Manufacture of medical, precision and optical instruments, watches and clocks	Manufacture of motor vehicles, trailers and semi-trailers	Manufacture of other transport equipment	Manufacture of furniture; other manufactured goods n.e.c.	Recycling	Electrical energy, gas, steam and hot water	Collected and purified water, distribution services of water	Construction	Retail and wholesale trade	Hotels and restaurants	Land, water, air transport and transport via pipelines; auxiliary and supporting activities; activities of travel agencies; post and communications	Financial intermediation services, except insurance and pension funding services	Education	Health and social work	Other services	TOTAL	Final consumption expenditure by households, (including tax)	Final consumption expenditure by government (excluding tax)	Gross capital formation (excluding tax)	Regional final consumption expenditure	Exports, fob (excluding tax)	Total use at basic prices (excluding tax) **	Imports, cif	Total use at basic prices ***	Supply at basic prices *	Domestic Net Sales (Supply - Use)	International Net Export (Export - Import)	Total Net Export
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
1	Agriculture, hunting and forestry	937.4	0.0	1.6	1724.8	292.6	28.8	0.4	0.0	10.5	12.2	0.5	11.9	891.2	1.3	0.3	0.5	2.9	0.0	2.9	0.0	0.4	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	50.0	694.6	2.5	0.1	0.0	0.2	1.0	23.3	5,970	4,008	4	0	1,044	409	2,194	582	6,488	12,582	794	293	1,087
2	Fishing, operating of fish hatcheries and fish farms; service activities incidental to fishing	0.0	7.6	0.0	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	49.0	0.0	0.0	0.0	0.0	0.2	1.0	64	95	3	0	99	10	528	5	592	656	64	0	64
3	Manufacture of coke, refined petroleum products and nuclear fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
4	Manufacture of food products and beverages	79.2	14.3	0.5	476.3	0.1	0.5	7.0	30.2	0.1	4.5	0.2	1.0	18.9	0.5	0.1	0.1	0.4	1.5	0.0	0.2	0.0	0.0	0.4	0.0	0.5	0.1	0.2	0.0	1.0	25.2	837.3	5.8	0.3	1.1	9.8	41.0	1,256	9,037	28	5	9,940	1,049	65,149	156	11,407	6,948	1,807	553	4,936
5	Manufacture of tobacco products	0.0	0.0	0.0	0.0	691.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0	0.1	693	531	0	0	531	268	822	115	1,916	2,916	1,114	181	2,295
6	Manufacture of textiles	0.3	0.2	0.0	1.5	0.1	40.8	376.6	1.6	0.2	2.5	0.1	0.7	5.2	1.9	0.1	0.1	0.2	0.9	0.0	0.0	0.0	0.0	2.6	0.1	0.2	0.1	0.0	0.0	0.6	16.8	2.6	2.9	0.0	0.1	0.3	0.8	455	666	0	0	1,194	245	1,894	1,170	426	222	1,396
7	Manufacture of wearing apparel; dressing and dyeing of fur	0.0	0.0	0.0	1.2	0.2	1.4	27.4	0.5	0.1	0.5	0.1	1.0	5.2	0.4	0.3	0.2	0.6	0.9	0.0	0.3	0.2	0.0	1.2	0.0	0.5	0.0	0.2	0.0	0.6	13.4	9.4	6.2	0.1	1.0	1.9	16.5	98	1,935	22	1,096	3,319	2,276	77	2,382	1,981	909	1,141	2,050
8	Manufacture of leather and leather products	0.0	0.0	0.0	0.2	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	1	2,165	2	0	2,167	1,000	3,168	77	4,245	4,246	1,001	0	1,001
9	Manufacture of wood and products of wood and cork, (except furniture); articles of straw and plaiting materials	1.7	0.2	0.1	0.8	0.1	0.0	0.1	17.6	6.7	0.1	0.0	0.0	0.9	1.1	0.0	10.1	2.0	1.9	0.0	0.1	0.1	0.0	1.4	0.3	47.8	0.6	0.1	0.1	0.3	0.2	0.3	7.9	1.9	0.0	0.1	0.2	0.3	1.0	170	169	2	0	172	28	45	352	398	108	50	158
10	Manufacture of pulp, paper and paper products	0.5	0.7	0.3	26.5	90.2	1.8	3.1	1.6	1.2	157.4	100.1	0.9	17.7	5.5	7.2	1.9	3.6	7.3	0.0	2.2	0.1	0.3	2.0	0.1	3.7	7.9	0.3	0.3	2.9	13.2	17.4	2.9	40.5	2.7	3.8	42.4	570	343		0	343	173	514	333	1,084	1,988	797	362	1,159
11	Manufacture of printed matter and recorded media	0.2	0.1	0.0	0.8	0.1	0.1	0.2	0.1	0.0	0.3	0.1	0.1	0.4	0.1	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
12	Manufacture of coke, refined petroleum products and nuclear fuels	133.4	21.8	23.1	41.8	0.1	21.5	10.9	9.8	1.7	23.7	1.8	486.3	137.1	15.4	41.2	29.9	13.9	10.4	0.0	4.7	0.1	0.2	11.5	0.5	4.8	0.1	0.9	2.4	147.9	196.2	111.4	513.0	185.0	0.0	9.9	101.3	1,948	527	3	758	2,360	2,417	9,020	12,760	4,301	1,977	2,977
13	Manufacture of chemicals and chemical products	174.4	2.3	9.1	88.1	62.7	99.2	27.4	28.0	21.1	90.0	43.5	92.6	1081.9	402.4	36.9	33.5	32.7	10.7	0.1	39.5	0.5	3.7	43.8	2.3	29.9	0.3	1.4	15.6	43.6	160.9	152.4	13.1	1.7	8.1	84.2	176.6	3,706	876	31	986	3,706	1,650	5,473	6,359	886	780	1,666
14	Manufacture of rubber and plastic products	22.6	1.1	3.0	113.7	84.7	12.9	26.4	10.0	3.4	27.4	10.7	13.5	90.5	146.7	19.2	4.7	15.5	35.1	0.1	37.6	1.1	3.2	220.0	2.8	76.1	1.9	0.5	9.6	87.5	70.9	23.5	46.9	0.2	1.1	5.2	102.2	1,373	60		0	60	399	260	1,761	2,060	2,121	70	310
15	Manufacture of other non-metallic mineral products	5.0	0.0	1.4	22.8	0.1	2.8	0.8	0.0	0.6	2.2	0.3	24.8	15.8	70.1	78.5	55.4	7.4	15.9	0.0	7.5	0.0	1.1	26.7	0.6	4.0	0.0	0.3	0.1	295.2	18.5	30.0	0.2	0.3	4.8	20.4	139.9	842	66		99	425	498	128	1,113	1,152	20	297	317
16	Manufacture of basic metals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
17	Manufacture of fabricated metal products, except machinery and equipment	12.7	1.2	1.6	12.5	4.8	1.6	2.3	1.7	1.3	3.0	1.5	9.7	26.5	12.0	7.9	11.3	19.5	118.5	0.0	10.7	0.1	0.8	119.1	5.1	12.9	1.1	5.7	0.2	279.6	40.2	27.2	6.8	0.4	4.4	2.3	45.8	1,256	49		0	49	1,955	758	2,262	4,975	2,713	1,459	4,172
18	Manufacture of machinery and equipment n.e.c.	1.2	0.0	0.3	0.5	0.8	0.1	0.1	0.0	0.0	0.4	0.2	0.8	0.5	0.3	0.4	1.0	0.6	20.4	0.0	0.3	0.0	0.1	0.1	0.1	0.3	0.3	2.1	1.9	0.2	0.4	0.0	0.1	0.0	3.2	1.9	0.6	35	453	1,192	1,955	706	2,396	927	2,428	2,985	264	171	435
19	Manufacture of office machinery and computers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
20	Manufacture of electrical machinery and apparatus n.e.c.	0.9	0.0	0.8	0.6	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1	0.4	0.1	0.0	0.0	0.1	0.2	0.0	0.2	0.0	0.0	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
21	Manufacture of radio, television and communication equipment and apparatus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
22	Manufacture of medical, precision and optical instruments, watches and clocks	0.1	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.1	0.0	0.2	0.4	3.4	1.0	0.2	0.4	3.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
23	Manufacture of motor vehicles, trailers and semi-trailers	5.2	0.0	1.0	1.5	0.1	0.2	0.3	0.0	0.1	0.4	0.2	1.7	1.2	1.5	1.0	1.0	2.1	5.2	0.0	1.8	0.0	0.1	83.2	1.0	0.7	0.1	1.0	0.5	4.2	104.9	11.3	96.2	1.7	0.2	0.9	9.4	340	1,730	474	2,198	748	2,804	910	3,229	3,957	327	170	497
24	Manufacture of other transport equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
25	Manufacture of furniture; other manufactured goods n.e.c.	2.8	0.3	0.4	5.5	0.1	1.0	7.8	0.4	0.2	0.5	0.4	1.8	2.5	0.4	0.3	1.4	1.3	1.6	0.0	0.5	0.2	0.0	0.7	0.0	21.8	0.4	0.2	0.2	3.6	16.7	69.2	25.8	0.3	1.2	2.1	16.9	194	541		84	625	339	764	87	995	1,758	636	51	687
26	Recycling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	66.6	0.7	16.9	4.7	1.1	0.2	1160.5	1.3	2.0	0.0	0.0	0.0	0.0	0.1	0.0	0.9	12.3	0.2	0.0	0.1	4.8	0.0	0.0	0.0	0.0	0.0	2.4	1,275			98	98	1,275	1,372	1,375	- 1,177	- 1,177
27	Electrical energy, gas, steam and hot water	20.1	0.7	12.4	27.6	9.8	11.9	13.3	2.9	2.2	41.4	17.5	33.4	129.8	87.5	22.6	229.2	206.2	13.3	23.3	0.0	20.9	0.1	9.6	155.1	13.9	4.8	6.9	0.9	688.6	23.3	10.2	117.4	19.8	21.6	9.7	33.9	1,510	2,819	1,168		3,987	1,794	1	4,996	1,982	- 1,923	2	- 1,921
28	Collected and purified water, distribution services of water	13.2	0.1	0.5	6.3	1.6	1.6	1.3	0.3	0.2	1.4	1.6	2.5	7.1	3.0	1.8	1.3	1.3	1.8	0.0	0.5	0.0	0.1	1.8	0.1	0.8	0.1	0.3	1.0	75.0	63.5	612.0	6.3	1.0	6.7	4.0	43.2	859	261			261	26	1,108	6	1,380	739	26	0	26
29	Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0
30	Retail and wholesale trade	279.6	77.9	43.6	680.8	414.8	131.5	166.1	55.6	172.2	191.8	554.5	666.0	473.8	200.5	116.2	63.6	155.2	378.6	0.7	140.4	8.5	13.9	171.5	8.4	200.2	16.4	95.1	24.2	320.4	2899.4	999.0	1810.4	51.7	28.1	107.4	518.8	9,238	2,728	16	208	2,950	58	2,989	116	12,216	10,930	4,418	61	4,532
31	Hotels and restaurants	0.0	2.2	10.1	4.9	4.2	1.2	2.3	1.1	0.5	2.3	2.3	2.2	16.7	37.2	2.5	4.2	2.8	6.0	0.1	2.2	0.0	0.4	5.0	0.4	1.8	0.1	4.7	0.7	17.1	255.4	37.9	104.2	33.8	10.3	12.6	84.8	667	1,921		1,416	3,338	321	3,992	9,845	13,831	6,922
32	Land, water, air transport and transport via pipelines	77.6	1.1	7.6	22.3	20.8	17.5	23.5	12.8	7.4	69.0	28.5	96.1	99.9	27.1	14.4	16.4	18.8	61.1	12.5	5.8	7.2	9.6	12.5	2.8	7.2	0.6	12.9	3.5	47.4	197.0	108.4	700.9	15.5	6.1	12.9	162.3	1,948	965		1,447	52	2,717	2,769	5,538	3,590	893	2,697
33	Financial intermediation services, except insurance and pension funding services	77.0	1.2	5.6	22.1	20.8	17.5	23.5	12.8	7.4	69.0	28.5	96.1	99.9	27.1	14.4	16.4	18.8	61.1	12.5	5.8	7.2	9.6	12.5	2.8	7.2	0.6	12.9	3.5	47.4	197.0	108.4	700.9	15.5	6.1	12.9	162.3	1,948	965		1,447	52	2,717	2,769	5,538	3,590	893	2,697
34	Education	0.1	0.0	1.9	2.3	0.8	0.5	0.4	0.1	0.1	1.1	1.3	2.8	11.8	1.1	0.9	2.8	0.9	4.0	0.0	1.5	0.0	0.2	9.4	0.0	0.7	0.0	0.5	0.1	1.3	101.7	10.0	11.2	6.5	22.1	172.1	93.5	426	768	431	1	1,200	1	1,200	1,628	1,250	368	- 368
35	Health and social work	26.4	0.0	2.9	2.4	9.0	0.9	1.6	1.0	0.5	3.7	0.5	6.7	10.0	6.5	2.5	11.1	3.3	7.4	0.0	1.8	0.1	0.0	3.2	0.0	0.0	0.0	0.1	0.1	2.1	0.0	22.4	2.6	9.3	179.0	22.4	246	942	274		944	1	1,216	1,196	2,396	899	- 899
36	Other services	19.8	7.1	19.2	179.0	127.7	29.8	161.4	19.2	8.6	83.1	74.9	115.9	388.8	58.3	45.9	75.7	46.7	133.9	1.7	44.2	8.2	8.5	217.7	5.6	76.0	9.4	28.8	26.5	293.4	2066.5	1326.8	1331.8	240.3	1245.1	1265.7	1,170.1	10,264	9,416	2,245	156	11,816	794	12,610	10,798	23,408	14,856	- 989	52	- 936
37	TOTAL	2,539	151	182	5,000	2,000	369	1,000	200	250	1,000	500	1,500	3,000	1,000	500	1,500	1,000	1,000	100	500	100	100	1,000	100	500	100	500	100	1,000	5,000	5,000	5,000	1,000	5,000	5,000	5,000	60,000	42,000	10,000	2,000	54,000	10,000	74,000	15,000	89,000	143,000	54,000	0	54,000
38	Taxes less subsidies on products	676	17.1	92	599	99	99	94	17	15	89	25	109	310	116	54	176	79	195	10	69	9	15	225	10	179	90	126	35	255	630	207	2,716	189	72	76	556.7	8,554	11,965	196	3,944	12,104	2,000	14,104	2,000	16,104	24,658	8,554	0	8,554
39	Total intermediate consumption(Final use at basic prices)	2159	201	502	4115	2254	553	997	304	129	867	381	7697	5211	1227	645	3433	951	1085	4	719	28	62	2038	47	1062	80	1271	197	3040	8078	6842	12595	995	326	1108	5112	75262	50568	2170	5246	57984	14,000	72,000	14,000	86,000	143,000	57,000	0	57,000
40	Compensation of employees	299	35.00	91	495	306	120	188	38	33	146	60	191	296	180	126	226	120	150	10	108	7	13	138	10	170	4	288	25	305	2,000	827	1,705	497	709	980	3,088	13,871											
41	Consumption of fixed capital	201	10.53	47	168	116	83	65	11	15	84	35	274	209	101	137	196	58	88	1	45	2	6	144	7	30	1	166	25	65	576	265	1,401	83	23	110	325	5,410											
42	Net taxes on products	676	17.1	92	599	99	99	94	17	15	89	25	109	310	116	54	176	79	195	10	69	9	15	225	10	179	90	126	35	255	630	207	2,716	189	72	76	556.7	8,554											
43	Operating surplus, gross	2 469	215.93	244	1 264	980	265	291	71	58	334	134	785	1 081	378	414	1 586	289	691	1	275	9	35	431	31	271	15	627	159	1 020	7 935	2 542	9 043	1 190	135	442	4 250	40 963											
44	Value added, (Basic prices)	3 621	294.83	335	1 931	1 385	382	478	109	72	480	194	939	1 478	594	544	1 822	410	880	1	376	18	50	690	47	471	19	821	196	1 420	10 655	3 476	10 825	1 887	934	1 086	9 050	55 766											
45	Output (base prices)	5 260	457.61	621	7 026	3 535	935	1 576	413	202	1 567	575	8 636	8 789	1 740	1 189	5 255	1 370	1 965	5	1 095	37	112	2 728	94	1 533	99	1 797	222	4 460	18 733	9 723	23 420	2 882	1 259	2 194	14 162	130 824											
46	Imports, cif	1 740	12.02	54	114	113	243	77	164	41	333	112	4 417	8 950	260	128	196	209	827	15	368	11	214	910	564	87	7 373		116	321		32				236	19 761											
47	Total use at basic prices (Use at purchasers' prices) (*)	7 000	469.63	675	7 140	3 648	1 178	1 653	577	243	1 900	687	13 054	17 739	2 000	1 317	5 451	1 579	2 792	20	1 463	48	326	3 638	658	1 620	198	3 170	2 683	5 461	19 054	13 455	24 152	4 684	1 393	2 196	14 398	150 586											

(*) Total Supply: The sum of the region's production and imports from abroad, plus or less basic purchases from the rest of Turkey.
(**) Total use: The sum of intermediate use and total final use; does not include sales to the rest of Turkey.
(***) Total use: The sum of total intermediate use and total final use; does not include sales to the rest of Turkey.