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Editors:
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Dr Vian Ahmed
Professor David Eaton
Dr Monty Sutrisna

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PROCEEDINGS OF THE BUHU 8TH INTERNATIONAL POSTGRADUATE RESEARCH CONFERENCE 2008

Part I

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Built and Human Environment

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International Council for Research and
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These are the proceedings of IPGRC2008 which took place at the Czech Technical University in Prague from 26th to 27th June 2008.

The aim of the conference is an exchange of information and attitudes to the problems of studying for and completing a Post Graduate Higher Degree.

The organizing committee has selected a total of 94 contributions divided into 9 different areas or themes of interest:

- Theme 1: Business, Economics and Financial Management;
- Theme 2: People, Culture and Skills;
- Theme 3: Design and Urban Development;
- Theme 4: Procurement;
- Theme 5: Project Management;
- Theme 6: Structure and Material Science;
- Theme 7: ICT and Technology;
- Theme 8: Real Estate and Facilities Management;
- Theme 9: Sustainability.

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CONTENTS

An Input-Output Analysis and Import Dependency of the Turkish Construction Sector

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Abstract:
The objective of the paper is to determine the construction sector's role in Turkish economy, to analyze its interactions with other sectors and to examine its import dependency. This paper extends earlier analysis by using six input-output (IO) tables between the years of 1973-1998. The results of the analysis indicated the increasing tendency of the share of the construction sector in Gross National Product (GNP) and national income (NI) in general sense. The tendency of GNP share of manufacturing is on the reverse direction of the construction sector while GNP share of services tends to increase; backward linkage indicators and output multipliers are high and stable, forward linkage indicators and input multipliers are lower; while construction inputs from manufacturing tend to decrease, the inputs from services increase. It is also indicated that import dependency of the construction sector tends to increase recently. Differences between Turkish construction sector and that of OECD countries are compared through the findings of the IO analysis.

Keywords:
Construction Sector, Forward and Backward Linkage Indicators, Import Dependency, Input-Output Analysis, Turkish Economy

1. Introduction

This paper examines the economic role and import dependency of Turkish construction sector using six input-output (IO) tables compiled to date. Construction sector which is directly proportional with national economy is one of the most important sectors in the economy due to its share in GNP, its input-output relation with other sectors, employment volume and its effect on exportation. Construction sector is called as the impulsive, driving, stimulating sector since it activates more than two hundred industry branches affiliated to it. The construction sector as a determinant force on economic and social environment has an important role in national economy apart from the development level of the country. Examining the construction sector as an important sector in Turkey is especially important due to its place in the national economy and its interactions with other sectors. In this paper the construction sector from different points of view is analyzed using IO tables between the years of 1973 and 1998 following the method used in the article by Bon et al. (1999). Turkish construction sector is analyzed using four IO tables compiled between the years of 1973–1990 by Bon et al. This paper extends earlier analysis by using the six input-output (IO) tables between the years of 1973–1998.

The theoretical structure, the importance of IO analysis and the construction sector are studied. The content and structure of Turkish IO tables and IO import tables are introduced. The results of the IO analysis of the Turkish construction sector are interpreted and presented

by histograms. Then, the comparison between the Turkish construction sector and that of OECD countries (for further details see, Pietroforte and Gregori, 2003) are pointed out in conclusion.

2. Input-Output Analysis and The Construction Sector

Input-output model defines and analyzes economic structure in terms of interactions with each other and household (Suh and Kagawa, 2005). IO tables are used widely for defining and explaining economic, social and environmental issues. For instance, the IO model presenting inter-sectoral relations and supply-demand relations with quantitative values is the most efficient tool used for analyzing existing economic situation, determining next economic model and estimating (Chiang et al., 2006). Inter-sectoral approach collects information reflecting structural characteristics of the national economy on a table known as input-output table which covers raw data, in accordance with a specific technique. Economic structure is analysed by means of coefficient matrixes and inverted matrix derived from this table.

Each sector takes place on the table for two times, once in the row as the producing sector and once in the column as resource consuming sector. Order of the sectors on the table must be the same as on the row and column. Rows on the table show output of the sector, in other words usage areas of the product and services; the columns show input, in other words where the product and services are supplied from. Although the construction sector uses considerable amount of input from other sectors, particularly from manufacturing sector, it does not supply goods to any other sector. It means that the construction sector needs output of the other sectors in order to produce and when the production of the construction sector increases outputs of the other sectors increase simultaneously.

2.1. Construction Sector in OECD Countries

Pietroforte and Gregori (2003) studied the performances of the construction sector of eight developed OECD countries, which are Australia, Canada, Denmark, France, Germany, the Netherlands, Japan and USA between 1970 and 1990. The role of the construction sector within the economy and its relationship with other sectors are analyzed by using OECD IO tables covering the twenty years period. It is examined the share of the construction sector in GNP and in NI; and the construction technologies depending on the change of construction inputs from manufacturing and services and finally linkage indicators of the construction sector. The IO tables used in the analysis are aggregated to seven major sectors which are agriculture, mining, construction, manufacturing, trade, transport and services. It is shown that all value of the countries tends to decrease between 1970 and 1990 in terms of the construction sector. The continuous decrease of the construction sector shares in GNP and NI except Canada, Japan and Australia, supports the argument that the bigger the economy the smaller the construction sector. It is also stated that the amount of the construction inputs from manufacturing and services are mutually replacing. This also means that construction technologies are changing in time.

2.2. Turkish Input-Output Tables

The role and importance of the construction sector in the national economy, its interactions with other sectors and import dependency is analysed in this paper using IO tables issued by

Turkish Statistical Institute (TUIK) between the years of 1973 and 1998. IO tables of 1973, 1979, 1985, 1990, 1996 and 1998 are aggregated to nine major sectors so as to analyse the Turkish construction sector. IO tables of 1973, 1979, 1985 and 1990 consist of 64 sectors and 1996 and 1998 IO tables consist of 97 sectors. **Input coefficient matrix** (A), **Leontief Matrix** (I-A) and **Leontief invert matrix** $(I-A)^{-1}$ (See Appendix) are derived via aggregated IO tables so as to determine mutual interaction and effects of the construction sector with the other sectors, total and direct effects of the other sectors on the construction sector. Then the outputs of the matrixes are interpreted.

2.3. Input-Output Tables for Imports

Imported inputs supplied from the other sectors, backward and forward linkage indicator in importation, importation rate of input in GNP and imported input share in total input are analyzed in order to determine the import dependency of the construction sector. IO tables for imported product and services issued by TUIK are used to examine the import structure and import dependency of the sector. IO tables for import are issued as an addition to IO tables and show imported intermediate inputs. Import dependency can be measured using **Importation invert matrix** derived from aggregated IO tables and that of imported product and services.

3. Data Acquired From Input-Output Tables

Data series acquired from six IO tables between the years of 1973 and 1998 are shown in Table 1. Key findings are depicted and interpreted using histograms.

Table 1: Data acquired from IO tables, 1973-1998

	1973	1979	1985	1990	1996	1998
Share of Construction in GNP	0,0867	0,1021	0,0891	0,1250	0,0967	0,1184
Share of Construction in NI	0,0506	0,0409	0,0510	0,0656	0,0545	0,0656
Share of Agriculture in GNP	0,1709	0,1726	0,1196	0,1293	0,1059	0,1155
Share of Mining in GNP	0,0038	0,0062	0,0067	0,0075	0,0062	0,0018
Share of Food Processing in GNP	0,1068	0,1105	0,1096	0,0798	0,0878	0,0775
Share of Manufacturing in GNP	0,2574	0,2308	0,2814	0,2577	0,2812	0,2253
Share of Trade in GNP	0,0818	0,0754	0,1045	0,1010	0,1256	0,1064
Share of Transport in GNP	0,0836	0,0939	0,1316	0,1174	0,0884	0,1017
Share of Services in GNP	0,1976	0,2006	0,1440	0,1701	0,1997	0,2375
Share of Utilities in GNP	0,0115	0,0079	0,0135	0,0122	0,0085	0,0160
Construction Backward Linkage Indicators	0,4770	0,6307	0,5322	0,5692	0,5575	0,4860
Construction Output Multipliers	1,8902	2,1548	2,0810	2,1285	2,0306	1,7837
Construction Forward Linkage Indicators	0,0000	0,0000	0,0000	0,0000	0,0072	0,0208
Construction Input Multipliers	1,0000	1,0000	1,0000	1,0000	1,0129	1,0319
Direct Construction Inputs from Manufacturing	0,3682	0,3836	0,3965	0,3915	0,3578	0,3206
Total Construction Inputs from Manufacturing	0,5791	0,6689	0,6707	0,6858	0,5970	0,4699
Direct Construction Inputs from Services	0,0252	0,0099	0,0079	0,0281	0,0495	0,0400
Total Construction Inputs from Services	0,0582	0,0476	0,0436	0,0753	0,1026	0,0828

Share of construction in GNP and national income can be defined as the indicator of its role changing in various stages of economic growth and development of construction sector. It is determined that construction sector follows the bell-shaped pattern of the manufacturing sector as being the old engine sector of economy and supporter of the sector uses for

production and development model (Bon, 1992). Figure 1 shows share of the construction sector in GNP and NI. The share of construction sector in GNP and NI shows an increasing tendency in general sense. Increases and decreases occurring in the construction sector are closely related with the economic status of the country. Oil crises breaking out in 1973-1974 and in 1979-1980 affected construction sector negatively as well as all sectors. Shrinkage is seen in construction sector in 1990s due to the global crisis of 1994.

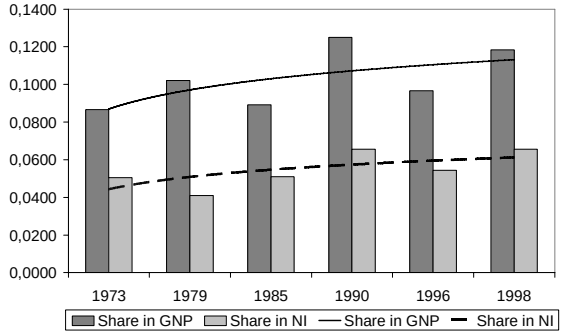

Fig. 1. Construction Sector's Share in GNP and NI

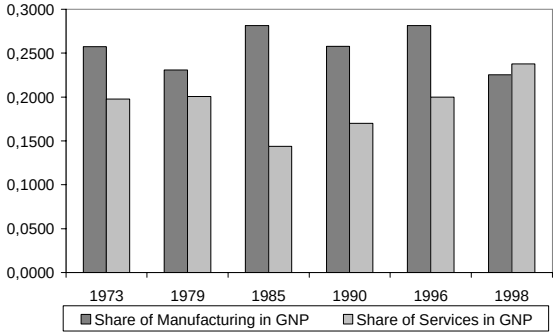

Fig. 2. Share of Manufacturing and Services in GNP

GNP share of manufacturing and services can be seen in Figure 2. The share of manufacturing in GNP declines between the years of 1973 and 1979, 1985 and 1990, 1996 and 1998, and increases between the years of 1979 and 1985, 1990 and 1996. This tendency of manufacturing is on the reverse direction of the construction sector. Manufacturing generates 25% of GNP maintaining its sector position of having the biggest share in GNP again. The share of services in GNP tends to increase as the construction sector. It means that manufacturing and services sectors will shift in near future in terms of input quantities they supplied for the construction sector.

The backward linkage indicators measure the proportion of a sector's direct inputs that come from other sectors of the national economy, rather than primary inputs. The output multipliers measure the total effect of a monetary unit change in final demand for the goods and services of the construction sector on the output of all sectors. The forward linkage indicator shows the proportion of a sector's direct output that goes to other sectors of the national economy rather than to final consumption. The input multiplier measures the effect of a monetary unit change in primary input available to a sector on the input of all industries (Bon et al., 1999). Output multipliers are also called total backward linkage indicators and input multipliers are called forward linkage indicators. Forward and backward linkage indicators reflecting the "pull" and "push" power of sectors for other sectors must be taken into consideration for investment decisions.

Figure 3 shows the 'pull effect' of the construction sector. Minor increases and decreases of backward linkage indicator of the construction sector do not change much. Total production increase given rise by one-unit final demand increase in construction sector shows similar tendency with backward linkage indicator. It may be said that the construction sector is one of the sectors in the economy having the strongest backward linkage indicator. If the backward linkage indicator is high, it means that the sector supplies many inputs from other sectors.

If output multiplier is high, it means that one-unit final demand increase in the sector increases total production, in other words, it activates the other sectors by providing input. It means that total production increases as a result of the production increases of the mentioned sectors.

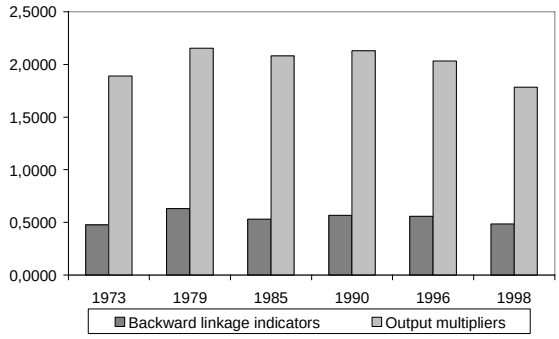

Fig. 3. Construction Backward Linkage Indicators and Output Multipliers

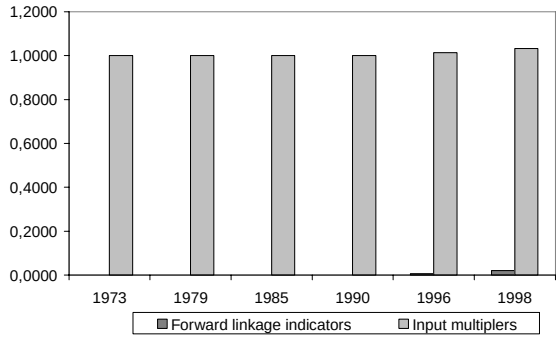

Fig. 4. Construction Forward Linkage Indicators and Input Multipliers

The result of the "push effect" (power of feeding other sectors) analysis of the construction sector can be seen in Figure 4. The contribution for development of the sectors using output of one sector as input is defined as the forward linkage indicator. The increase of one-unit final demand in all sectors in a specific sector production is described as input multiplier of the sector.

Forward linkage indicator of the construction sector, in other words, the contribution of the construction sector to the production of the other sectors equals to zero between the years of 1973 and 1990. It means that the construction sector does not provide input to the other sectors. An increase occurs between 1990 and 1998 in forward linkage indicator even minor. Input multiplier of the construction sector, in other words, increases in the production of the construction sector given rise by one-unit final demand increases in all sectors is fixed between 1973 and 1979 and shows 1. After 1990, it is seen that the value increases together with increasing of forward linkage indicator. Lower forward linkage indicator indicates that maintenance and repair sector as a sub-sector of the construction sector in Turkey has not developed yet.

Direct and total construction input coming from manufacturing is shown in Figure 5. It can be seen that direct and total manufacturing input does not show any changes between 1973 and 1990 and remain approximately in the same levels. Goods of manufacturing needed to produce 1 unite in the construction sector called as "direct manufacturing input" or as technical coefficient. It is 0,38 in average. Increase in goods of manufacturing caused by one-unit final demand increase in the construction sector, called as "total manufacturing inputs". It is 0,60 in average. However, it is seen that direct and total manufacturing input decrease between 1990 and 1998.

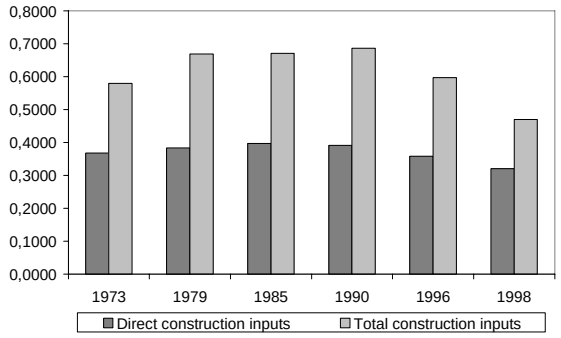

Fig. 5. Direct and Total Construction Inputs from Manufacturing

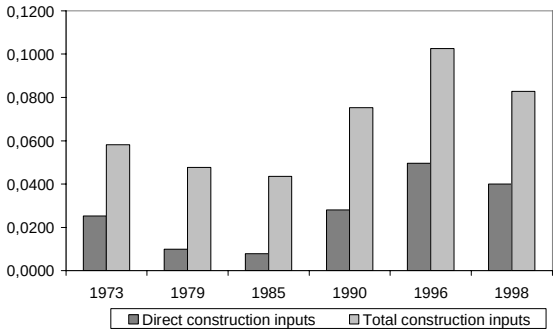

Fig. 6. Direct and Total Construction Inputs from Services

Figure 6 shows the direct and total construction inputs from services. The input that the construction sector provides from services directly, in other words services needed to produce 1 unit in the construction sector decrease between 1973 and 1995 and the value is 0,02 in average. Input provided by services to the construction sector increases after 1985. Although the input is approximately 0,05 in 1996, it decreased to 0,04 in 1998 it is quite higher compared with the value between 1973-1985. The input increase ensured in services led by the increase of one-unit final demand in the construction sector, total construction input from services shows parallelism with direct services input. Total input which is decreasing between 1973-1985 increases after 1985.

4. Data Acquired From Input-Output Tables for Imports

Data series acquired from six IO tables for imports between the years of 1973 and 1998 are shown in Table 2. Key findings are depicted and interpreted using histograms. The backward and forward linkage indicators in importation, construction sector's share of imported input in GNP production and the construction sector's share of importation in total input usage are analyzed in order to determine the import dependency of the construction sector.

Table 2: Data acquired from IO tables for importation, 1973-1998

	1973	1979	1985	1990	1996	1998
Direct Imported Construction Inputs from Manufacturing Sector	0,0468	0,0021	0,0514	0,0404	0,0713	0,0696
Direct Imported Construction Inputs from Services Sector	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Direct Imported Construction Inputs from Mining Sector	0,0000	0,0000	0,0000	0,0000	0,0013	0,0015
Construction Backward Linkage Indicators in Importation	0,1130	0,0682	0,1802	0,1551	0,1774	0,1749
Construction Forward Linkage Indicators in Importation	0,0000	0,0000	0,0000	0,0000	0,0000	0,0000
Construction Sector's Share of Imported Input in GNP Production	0,0468	0,0021	0,0517	0,0404	0,0726	0,0775
Construction Sector's Share of Importation in Total Input Usage	0,0980	0,0033	0,0971	0,0709	0,1302	0,1595

Figure 7 shows the direct imported construction inputs from manufacturing. While direct imported manufacturing input appears as lumpy between 1973-1998, it shows increase tendency in general sense. Import dependency of the construction sector as per input provided from manufacturing has been increasing.

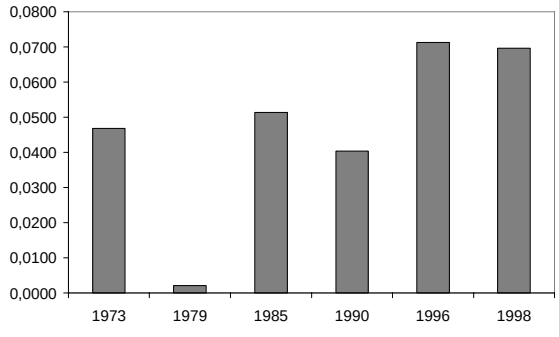

Fig. 7. Direct Imported Construction Inputs from Manufacturing

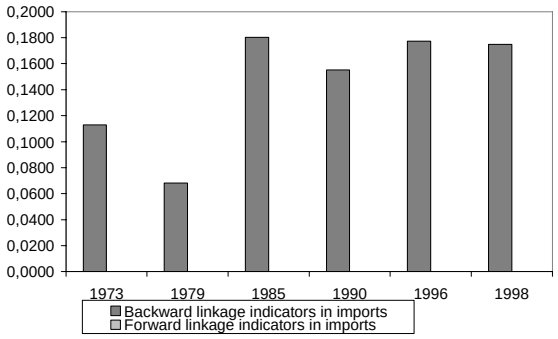

Fig. 8. Construction Backward and Forward Linkage Indicators in Importation

When final demand of the construction sector increases one unit, total direct and indirect imported input needed from abroad shows "backward linkage indicator" of the construction sector in importation .When final demand of all sectors increase one unit, input needed from abroad for the construction sector shows "forward linkage indicator" in importation. High backward linkage indicator equal to column totals in importation invert matrixes and forward linkage indicator equal to row totals. It means that the dependency on importation is very high.

Backward and forward linkage indicators in importation between 1973-1998 are shown in Figure 8. It is seen that backward linkage indicator of the construction sector between 1973-1998 are lumpy. Backward linkage indicator showing a decreasing tendency between 1973-1979 turns to an increasing tendency between 1979-1985. It is seen that forward linkage indicator in importation shows the input needed to be imported from abroad due to the one-unit increase in final demand of all sectors. It is zero between 1973 and 1998. This is because of zero input from construction sector to the other ones. However, forward linkage indicator in importation of the construction sector of that outputs go to the other sectors via maintenance and repair sub-sector which is developing slightly in recent years, being zero means that construction sector is not dependent on importation in this field.

Figure 9 presents the construction sector's share of imported input in GNP production. It tends to increase in general between the years of 1973-1998.

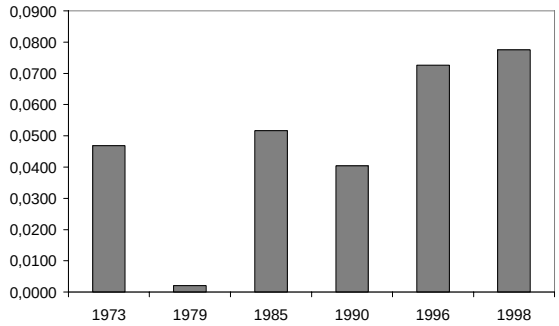

Fig. 9. Construction Sector's Share of Imported Input in GNP Production

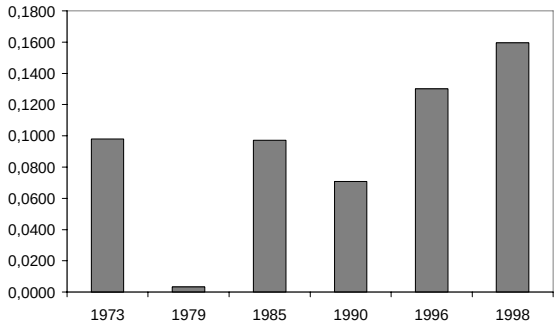

Fig. 10. Construction Sector's Share of Importation in Total Input Usage

The share of importation in total input usage is shown in Figure 10. It is seen that share of importation in total input used by construction sector shows an increase tendency between 1973 and 1998. It lies parallel with the share of importation of construction input in GNP. The share of imported input in the GNP of the construction sector is increasing regularly. It means that the construction sector is getting more and more dependent on importation.

5. Conclusions

The results of the IO analysis of construction sector in Turkish economy indicate that the backward linkage indicators of the sector are high while the forward linkage indicators are low. In other words, while its power to stimulating other sectors is high, its push effect is quite lower. Contribution of services to the construction sector has shown an increasing tendency in recent years while the inputs supplied from manufacturing decrease. However, this increase does not mean that services and manufacturing sector will replace with each other in terms of inputs which are provided for the construction sector. Although direct and total inputs from manufacturing sector have decreased in recent years, it is ten times bigger than the inputs supplied from services. Thus, manufacturing sector still provides the greatest input for the construction sector. Imported inputs supplied from other sectors, forward and backward linkage indicators in importation, the construction sector's share of imported input in GNP production and share of importation in total input usage which are examined as indicators of import dependency show that Turkish construction sector is becoming more and more dependent on importation.

Findings of the IO analysis of Turkish construction sector show that the construction sector has an important role in Turkish economy. The construction sector accelerates other sectors by means of inputs it supplies from them. Promoting studies for the construction sector and the other sectors which are fostering it should be carried out in order to develop national economy and to increase employment. However, imported inputs need to be used in case of increasing demand of construction sector when domestic inputs are not meeting the demand. Thus construction sector can be considered to be in a critical position in the usage of imported inputs.

It is a well-known fact that the construction sector has an important share in GNP; it provides a wide variety of employment possibilities embodies capital and has strong links with the other sectors. However the characteristics of the construction sector in OECD and developing countries are very different.

One of the most important differences is the status of the maintenance and repair sub-sector. It is observed that the maintenance and repair sector is a sub-sector of the construction sector in OECD countries. Those have robust infrastructure and construction sector grows gradually. Although construction sector in Turkey grows dramatically and residential and infrastructure investments have a considerable share in national economy recently, the maintenance and repair sub-sector does not develop as it should be. It indicates that the share of construction sector in GNP in OECD countries shows a decreasing tendency, while there is an increasing tendency in Turkey's GNP.

The construction sector is also different in OECD and developing countries in terms of inputs provided to the sector. Manufacturing sector provides the greatest input for the Turkish construction sector. It is observed in OECD countries that manufacturing sector changes its role with services. It means that characteristics of the construction input have undergone a considerable change. The construction sector in OECD countries and Turkey has differences in terms of construction methods and technologies used. Another major difference is the contribution of the construction sector to the other sectors. The construction sector in OECD countries supplies goods and services to the other sectors as intermediate input via maintenance and repair sub-sector. This is not applicable for Turkish construction sector since maintenance and repair sector has not been developed in Turkey as much as necessary.

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APPENDIX: Input-Output Tables

1973 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
1 Agriculture	17.825	102	19.269	9.860	0	341	448	0	37	104.236	103.202
2 Mining	0	20	180	6.662	0	231	153	352	266	9.104	5.376
3 Food Processing	1.317	3	5.350	693	0	70	2.883	0	0	45.531	45.177
4 Manufacturing	4.465	626	2.894	41.645	1.012	10.258	1.627	969	10.520	158.869	131.932
5 Trade	862	135	2.690	7.798	283	859	999	137	1.074	41.815	41.815
6 Transport	1.428	82	1.522	4.037	49	1.119	780	388	1.012	37.984	37.317
7 Services	3.250	425	966	4.189	3.066	856	2.470	444	719	81.517	80.209
8 Utilities	15	173	345	2.094	574	20	834	239	0	8.075	7.914
9 Construction	0	0	0	0	0	0	0	0	0	28.570	28.570
Value Added	74.040	3.810	11.961	54.954	36.831	23.563	70.015	5.385	14.942		
Total Output	103.202	5.376	45.177	131.932	41.815	37.317	80.209	7.914	28.570		

1979 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
1 Agriculture	90.525	422	174.986	46.651	123	1.681	1.659	8	320	774.263	772.023
2 Mining	0	289	1.433	56.715	30	208	1.227	1.563	5.848	83.870	41.950
3 Food Processing	16.651	68	32.085	6.328	0	534	17.302	16	0	366.067	362.014
4 Manufacturing	49.099	5.868	24.539	371.265	7.460	111.980	21.280	7.710	103.929	1.315.488	1.169.274
5 Trade	14.345	1.059	18.940	91.491	1.356	9.764	13.217	346	16.069	366.552	366.315
6 Transport	13.816	1.693	11.816	58.462	5.732	21.360	8.511	2.020	42.019	414.627	408.231
7 Services	22.318	2.493	5.201	36.922	17.558	9.353	13.479	2.575	2.685	644.799	639.293
8 Utilities	183	1.373	2.795	15.902	3.264	1.398	5.811	1.673	0	53.488	52.193
9 Construction	0	0	0	0	0	0	0	0	0	270.918	270.918
Value Added	565.086	28.685	90.219	485.538	330.792	251.953	556.807	36.282	100.048		
Total Output	772.023	41.950	362.014	1.169.274	366.315	408.231	639.293	52.193	270.918		

1985 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
Agriculture	953.947	17.377	1.642.312	546.862	9.269	2.852	33.898	1.285	36	7.614.591	7.436.137
Mining	12	1.874	17.203	2.207.846	2.384	3.804	10.217	94.775	92.082	2.675.563	777.944
Food Processing	173.567	183	617.454	107.557	0	5.664	200.651	1.826	0	5.147.578	4.885.795
Manufacturing	845.937	93.810	331.251	5.511.807	195.802	2.028.079	337.283	285.312	1.301.750	21.302.542	17.458.949
Trade	52.154	3.052	438.279	849.830	68.811	198.884	123.728	28.614	90.833	5.705.890	5.697.679
Transport	236.140	32.832	134.858	669.093	115.067	388.920	93.704	43.727	217.824	6.782.020	6.615.859
Services	184.981	21.881	96.601	599.123	383.298	128.942	135.548	40.020	25.963	6.924.489	6.660.485
Utilities	24.150	28.755	83.721	613.884	139.298	30.031	133.763	81.624	18.755	1.651.196	1.560.259
Construction	0	0	0	0	0	0	0	0	0	3.283.373	3.283.117
Value Added	4.965.249	578.180	1.524.116	6.352.947	4.783.750	3.828.683	5.591.693	983.076	1.535.874		
Total Output	7.436.137	777.944	4.885.795	17.458.949	5.697.679	6.615.859	6.660.485	1.560.259	3.283.117		

1990 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
Agriculture	14.926.387	58.962	15.874.331	6.241.122	20.173	107.244	2.826.792	4.984	660	99.519.373	96.440.491
Mining	12.621	14.410	172.144	12.586.471	33.939	303.768	74.412	1.350.424	1.227.334	19.218.486	7.942.583
Food Processing	2.062.461	3.498	7.397.854	841.724	2.780	579.501	2.807.304	2.101	0	50.397.956	45.065.887
Manufacturing	6.348.082	804.307	2.981.011	68.556.980	2.128.541	17.389.004	6.427.805	2.033.170	22.512.136	247.722.742	189.079.966
Trade	1.663.125	161.238	1.895.855	11.135.791	1.170.295	3.570.348	2.308.652	565.460	3.563.907	72.501.042	72.501.042
Transport	2.653.528	212.666	2.037.547	8.339.862	2.525.425	3.389.022	2.114.602	565.365	3.500.713	79.332.224	77.204.657
Services	3.111.546	224.956	1.143.836	6.680.906	7.430.972	2.846.459	5.163.178	216.363	1.614.116	106.681.241	104.799.464
Utilities	237.636	248.845	755.327	5.989.901	1.685.937	441.621	2.231.489	827.283	309.417	18.333.369	18.241.140
Construction	0	0	0	0	0	0	0	0	0	57.500.429	57.500.429
Value Added	65.425.105	6.213.701	12.807.982	68.707.209	57.502.980	48.577.690	80.845.230	12.675.990	24.772.146		
Total Output	96.440.491	7.942.583	45.065.887	189.079.966	72.501.042	77.204.657	104.799.464	18.241.140	57.500.429		

1996 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
1 Agriculture	753.594.350	995.391	523.854.560	181.642.515	3.359.575	3.216.637	66.357.447	257.224	6.879.511	3.655.110.186	3.848.812.547
2 Mining	853.115	163.118	4.349.600	386.579.907	5.487.798	1.049.173	5.510.939	83.327.568	35.980.260	646.646.377	230.598.994
3 Food Processing	80.387.953	7.618	259.407.150	31.764.136	2.458.859	42.954.188	151.900.772	404.244	0	2.321.507.898	1.913.320.216
4 Manufacturing	281.208.774	20.278.002	126.907.243	2.534.903.759	101.659.087	578.522.923	345.971.283	61.866.052	697.159.877	10.361.950.629	7.566.493.628
5 Trade	87.615.500	4.148.857	141.777.895	380.383.388	105.507.580	197.735.747	101.000.605	16.539.838	129.287.760	3.671.423.550	3.422.920.099
6 Transport	53.563.540	5.932.302	91.406.392	310.802.606	76.914.705	117.438.530	130.160.229	20.476.552	95.166.528	2.667.021.505	2.766.385.898
7 Services	184.642.151	10.959.526	40.916.575	270.758.843	492.085.089	77.172.382	437.353.116	7.806.930	96.449.729	5.605.368.853	5.113.502.663
8 Utilities	18.105.305	6.139.807	34.035.578	250.256.754	134.145.699	6.447.939	150.925.712	25.178.511	25.207.197	819.472.850	775.101.797
9 Construction	0	0	0	0	0	0	36.686.796	0	0	1.966.804.998	1.948.276.451
Value Added	2.388.841.859	181.974.372	690.665.222	3.219.401.721	2.501.301.707	1.741.848.379	3.687.635.762	559.244.879	862.145.588		
Total Output	3.848.812.547	230.598.994	1.913.320.216	7.566.493.628	3.422.920.099	2.766.385.898	5.113.502.663	775.101.797	1.948.276.451		

1998 INPUT-OUTPUT TABLE (current Turkish Liras)

	1	2	3	4	5	6	7	8	9		
	Agriculture	Mining	Food Processing	Manufacturing	Trade	Transport	Services	Utilities	Construction	Total Demand	Total Output
1 Agriculture	1.731.016.133	2.677.563	1.681.500.024	279.189.149	2.559.041	13.468.065	249.786.379	423.111	17.940.159	11.407.897.949	11.012.759.491
2 Mining	789.573	244.076	31.024.368	328.247.574	1.844.300	585.417	14.299.497	183.436.371	137.650.814	816.722.173	799.709.134
3 Food Processing	265.196.550	779.303	907.046.211	82.685.931	5.310.331	142.847.060	471.554.347	2.620.031	3.059.486	6.867.073.709	6.481.370.724
4 Manufacturing	650.243.232	78.001.783	411.409.863	5.962.804.844	208.705.581	1.947.069.856	731.671.251	136.335.804	2.342.824.004	26.961.750.660	22.817.651.834
5 Trade	227.471.938	15.039.921	300.713.513	1.112.838.323	144.750.766	501.038.239	312.924.384	33.849.444	347.177.624	9.839.178.556	9.672.751.311
6 Transport	225.797.288	17.568.528	261.366.307	812.273.836	187.058.769	266.983.802	406.545.846	48.184.234	287.981.240	9.053.730.264	8.457.287.129
7 Services	411.577.410	69.903.837	109.321.478	972.351.590	988.938.733	258.221.687	2.185.021.508	49.051.554	292.356.403	20.611.133.269	20.096.070.647
8 Utilities	34.122.737	22.128.869	103.497.515	710.535.598	254.349.162	80.873.902	762.646.205	152.442.769	96.120.874	3.242.961.694	2.961.795.584
9 Construction	745.234	1.040.930	10.124.421	23.066.994	38.208.290	6.853.231	158.143.693	1.762.910	26.639.873	7.881.941.446	7.307.784.804
Value Added	7.465.799.396	592.324.324	2.665.367.024	12.533.657.995	7.841.026.338	5.239.345.870	14.803.477.537	2.353.689.356	3.756.034.326		
Total Output	11.012.759.491	799.709.134	6.481.370.724	22.817.651.834	9.672.751.311	8.457.287.129	20.096.070.647	2.961.795.584	7.307.784.804		