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INPUT-OUTPUT STRUCTURE OF TURKISH AGRICULTURE

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Abstract

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Product-by-product Input-Output structure models are well suited for specific analytical purposes, such as productivity, cost structure comparison, etc. These models show analytically the economic structure and the relations of sectors with each other in a national economy. In this study, input-output relations between agricultural and other sectors of national economy, amounted to 59, are analyzed on the data published by TurkStat (Turkish Statistical Institute), in order to determine cost (input) structure of the production and, backward - forward dependency of the sector. According to the 2002 results, agricultural activities produced the largest supply, besides second largest Gross Added Value among 59 sectors in the national economy. Agriculture was fourth biggest input user of the economy for this production on the contrary. However, 44% of the direct input requirement is provided by the sector itself and 56% of the direct inputs were bought from outer suppliers only. Mechanization Tools & Services have the biggest, 13% share, in supplying industries. This means that mechanization related products and services are the most important issues in cost composition of the agricultural production. It follows by Fertilizer & Chemicals, Trade & Finance, Transport, Electricity & Waterworks and others with 10, 7, 5, 2 and 13% shares sequentially. The shares of the outer sectors are decreased for the total inputs comparing with the direct inputs. Additionally, the total inputs required from energy related sectors have gain more importance than as the direct inputs is considered only. Agriculture has a fewer "Backward Dependency Coefficient" compared to other sectors; it is supported by mostly itself. The rank was 46 among 59 sectors. On the other hand, agriculture has a one of the highest "Forward Dependency Coefficient" compared to other sectors; it transfer most of its products to other sectors.

Key words: Input-output structure, input-output model, agriculture sector, direct and indirect inputs, input-output flow matrix, backward and forward dependency coefficients

Introductıon

The basic framework for input-output analysis was originated by François Quesenay in 1758. His tables numerically described the relationships between sales and purchases of the sectors of the economy. Leon Walras was adapted Quesenay's description by theoretical formulation almost a century later. Then, Wassily Leontief greatly simplified his theoretical formulation and developed a model to estimate the effects of the end of the World War I on national employment. He won the Nobel Prize in 1973. Depend on the recognizing its importance, US government started to use the

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model. Then, other nations followed US. Finally, United Nations keeps the records from many members.

Input-Output modeling focuses on the interrelationships of sales and purchases among sectors of the economy. Therefore, Supply-Use and Input-Output tables are used for analyzing interindustry structure. These tables show analytically the economic structure of a national economy. Input-Output models produce a main table based on an input-output flow matrix or transactions matrix. The main table records the flows of goods and services between industries, and is composed of four quadrants. The first quadrant depicts intermediate consumption or usage. The columns show the direct inputs of goods and services that must be purchased from other industries to produce its own products, and the rows show the industries that use the total production of this sector.

In addition to the input-output flow matrix, using the data placed in the first quadrant of the main table in order to obtain analytical and practical benefits from the model "Input Coefficient" and "Inverse Coefficient" matrixes are derived. The Input Coefficient Matrix contains elements show the direct input requirements from the supplying industries to the using industries as percentages. On the other hand, a column in the Inverse Coefficient Matrix measures total (i.e. the direct and indirect) input requirements from supplying industries to the final demand of using industry. Thus, it is possible to analyze inputs of agricultural production nationwide by products of Input-Output Models.

Experts have started to use the input-output tables in order to investigate the situation of their sectors in economies. The importance of Turkish forestry sector was examined by using input-output model (Turker, 1999). The foreign dependence of Turkish manufacturing sector was depicted by (Civi and Cakir, 2000) and Turkish Mining Sector was investigated by (Condur and Evlimoglu, 2007). On the other hand, Alcantara and Padilla (2006) were used this methodology for different approach to determine the key sector by means of CO_2 emissions.

Several studies related to agriculture were published to date. Evcim (2002) analyzed the shares of agricultural machinery and other related sectors in Turkish agriculture by the year of 1998. Ismail (2007) analysed the structural change of Malaysian Agricultural sector based on input-output tables. Lingyan and Zhongmin (2007) analysed the China's Agricultural input-output structure from 1997 to 2002.

In this study, input relations of the agricultural sector in Turkish economy consisting of 59 sectors are analyzed in order to examine input requirements to produce agricultural products and shares of the suppliers (such as agricultural machinery) in total input. The input-output tables and related coefficient matrixes, prepared by the Turkish Statistical Institute (TurkStat) for 2002, which is the latest unique source that can be obtained, was chosen for this purpose (Turkstat, 2008).

Methodology

In the Input-Output model, classification of goods and services, and aggregation of the sectors was employed according to the definitions set out by Statistical Classification of Economic Activities in the European Community (**NACE Rev. 1.1**) and Statistical Classification of Products in the European Community (**CPA 2002**) were used.

Input-Output Table: An input-output or transactions table records the flows of goods and services among industries. The columns in this table show the values of the direct inputs absorbed by the industries and payments to primary inputs, i.e. compensation of employees, indirect taxes and operating surplus. Along the rows, the distribution of products into various industries (Here it is neglected due to simplification.) and final demand categories are shown.

Input Coefficients Table: This matrix is obtained by dividing each entry in the input-output table into its column total, i.e. the total output of the

respective industry. Thus an element in this table expressed as a percentage shows the direct input requirement from the supplying industry (row industry) to the using industry (column industry, i.e. agriculture in our case).

Inverse Coefficients Table: A column in this matrix measures total (i.e. the direct and indirect) input requirements from supplying industries to the final demand of using industry (i.e. agriculture for this study.) Since it is obtained by the method known as matrix inversion, this matrix of total requirements frequently described as the inverse matrix and the coefficients therein as inverse coefficients.

The Supply-Use and Input-Output Tables published by TurkStat have been used as data source for this study. These tables were prepared at basic prices and derived to symmetric Input-Output tables according to European Systems of Accounts (ESA'95) and the Eurostat Input-Output Manual published in 2002. Supply and Use Tables were prepared by the compilation of the data which were collected by questionnaires with structural business statistics surveys belonging to 2002 that was applied in 2003 by the TurkStat. Census or survey techniques were applied for the compilation of data that were distinguished enterprises and local kind of activity. Data were analyzed according to local kind of activity and also the results of labor force survey were added for every activity to calculate exhaustiveness.

The 2002 Input-Output Tables (at basic prices) were extracted for agriculture sector and the tables have been produced for being able to examine input-out relations with respect to the requirements of this study (Tables 1 and 3). The shares of the suppliers in agricultural production are calculated and the ranks are determined in order to analyze the importance of the suppliers in this production.

Analysis of the direct and total inputs requirement revealed that agricultural production needs inputs from 52 industries in 59 national sectors that could be decreased into 20 by taking account the type and specifications of the goods and services. On the other hand, inputs used by agricultural activities were aggregated under 8 titles by product and service groups so that they can easily be analyzed by interacted sectors. Mechanization related products and services divided in 2 sub groups itself as "Fuel & Oil" and "Machinery & Equipment". "Fuel & Oil" includes " Crude and Refined petroleum products & services (Code:11 and 23)" and 50% of "Machinery & Equipment" comprise whole inputs received from "Basic metals (Code: 27)", "Manufacture of Machinery & Equipment n.e.c. (Code: 27)" and "Renting Services of Mach. & Equip. without operator (Code: 71)", besides 65% of "Rubber & Rubber Products (Code: 25)", 25% of "Manufacture of Motor Vehicles & Trailers (Code: 34)" and 50% of "Trade, maintenance and repair services of motor vehicles.., retail sale of auto. Fuels Code: 50)[1]. Thus, other extracted tables were derived from the input coefficients matrixes to meet the requirements of this study (Tables 2 and 4).

Results and Discussion

According to the data, agricultural activities produced the largest production and supply values among 59 activity groups in Turkish economy. In addition, second biggest gross value added was created by agriculture closely after "Real estate activities (Code: 70)" in the economy. Agriculture was 10 on the list with 7.7 % shares in the national gross value added and production values. These results move the sector in a prominent position in the national economy.

In 2002, agricultural supply was reached to 52.326.604 (Billion TL) at basic prices. It was greatly, at 95.53%, provided by domestic production, but only 4.47% was imported. Direct inputs used for domestic production was amounted to 16.819.836 (Billion TL) in total. Domestic production, which is amounted to 49.988.550 (Billion TL), consisted of 2.107.069 (Billion TL) payment for net taxes[2] on the products and 31.061.643 (Billion TL) gross values added, including compensa-

[1] *The percent shares of "Fuel & Oil" and "Machinery & Equipment" in the related sectors are based on assumptions made by the authors.*

[2] *Net taxes mean taxes less subsidies.*

Table 1

Direct Inputs used for Agricultural production, 2002 (at basic prices)

No	Code	Products (CPA)	Agriculture, hunting and related activities (at current prices, Billion TL)	Shares in Total Supply	Shares in Total Inputs, %
1	1	Products of agriculture, hunting and related services	7 296 542	0.13944	43.38
2	2	Products of forestry, logging and related services	2 419	0.00005	0.01
3	5	Fish and	235	0.00000	0.00
4	10	Coal and lignite; peat	12 746	0.00024	0.08
5	11	Crude petroleum ....; services...	109	0.00000	0.00
8	14	Other mining and quarrying products	19 805	0.00038	0.12
9	15	Food products and beverages	1 489 630	0.02847	8.86
11	17	Textiles	43 676	0.00083	0.26
12	18	Wearing apparel; furs	71	0.00000	0.00
13	19	Leather	10	0.00000	0.00
14	20	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials	32 849	0.00063	0.20
15	21	Pulp, paper and paper products	14 125	0.00027	0.08
16	22	Printed matter and recorded media	395	0.00001	0.00
17	23	Coke, refined petroleum products and nuclear fuels	824 700	0.01576	4.90
18	24	Chemicals, chemical products and man-made fibres	1 733 461	0.03313	10.31
19	25	Rubber and plastic products	226 582	0.00433	1.35
20	26	Other non-metallic mineral products	40 974	0.00078	0.24
21	27	Basic metals	1 807	0.00003	0.01
22	28	Fabricated metal products, except machinery and equipment	22 675	0.00043	0.13
23	29	Machinery and equipment n.e.c.	535 923	0.01024	3.19
24	30	Office machinery and computers	1 665	0.00003	0.01
25	31	Electrical machinery and apparatus n.e.c.	7 615	0.00015	0.05
26	32	Radio, television and communication equipment and apparatus	17 290	0.00033	0.10
27	33	Medical, precision and optical instruments, watches..	9	0.00000	0.00
28	34	Motor vehicles, trailers and semi-trailers	94 650	0.00181	0.56
29	35	Other transport equipment	11	0.00000	0.00
30	36	Furniture; other manufactured goods n.e.c.	35 936	0.00069	0.21
31	37	Secondary raw materials	2	0.00000	0.00
32	40	Electrical energy, gas, steam and hot water	233 149	0.00446	1.39

continued

Table 1 (continued)

33	41	Collected and purified water, distribution services of water	125 584	0.00240	0.75
34	45	Construction work	131 766	0.00252	0.78
35	50	Trade, maint.and repair serv.of mot. Veh.; retail sale of auto. fuel	602 707	0.01152	3.58
36	51	Wholesale trade and commission trade services, except of motor vehicles and motorcycles	927 776	0.01773	5.52
37	52	Retail trade services; except motor vehicles and ...	258 171	0.00493	1.53
38	55	Hotel and restaurant services	426	0.00001	0.00
39	60	Land transport; transport via pipeline services	670 454	0.01281	3.99
40	61	Water transport services	85 017	0.00162	0.51
41	62	Air transport services	1 443	0.00003	0.01
42	63	Supporting and auxiliary transport services; travel agency services	6 571	0.00013	0.04
43	64	Post and telecommunication services	3 025	0.00006	0.02
44	65	Financial intermediation services, except insurance and pension funding services	1 143 337	0.02185	6.80
45	66	Insurance and pension funding services, except compulsory social security services	38 592	0.00074	0.23
47	70	Real estate services	1 708	0.00003	0.01
48	71	Renting services of machinery and equipment without operator and of personal and household goods	38 282	0.00073	0.23
49	72	Computer and related services	56	0.00000	0.00
50	73	Research and development services	313	0.00001	0.00
51	74	Other business services	4 571	0.00009	0.03
52	75	Public administration and defense services; compulsory social security services	4 570	0.00009	0.03
53	80	Education services	213	0.00000	0.00
54	85	Health and social work services	67 202	0.00128	0.40
56	91	Membership organisation services n.e.c.	18 885	0.00036	0.11
57	92	Recreational, cultural and sporting services	106	0.00000	0.00
60		Total	16 819 836	0.32144	100.00
61		Taxes less subsidies on products	2 107 069	0.04027	
62		Total intermediate consumption	18 926 905	0.36171	
63		Compensation of employees	4 787 663	0.09150	
64		Other net taxes on production	-154 055	-154.055	
65		Other taxes on production	136 473	0.00261	
66		Other subsidies on production	-290 528	-0.00555	
67		Consumption of fixed capital	2 169 879	0.04147	

continued

Table 1 (continued)

68	Operating surplus, net	24 258 155	0.46359
69	Operating surplus, gross	26 428 034	0.50506
70	Value added at basic prices	31 061 642	0.59361
71	Output at basic prices	49 988 550	0.95532
72	Imports, cif	2 338 054	0.04468
73	Supply at basic prices	52 326 604	1.00000

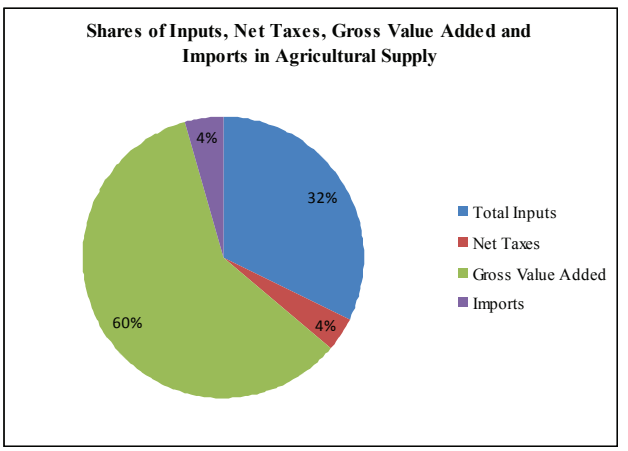

Fig. 1. Shares of Turkish agricultural supply

tion of employees, other net taxes on the production and gross operating surplus. In addition to this local production, total agricultural supply reached to the value given above by importing products of 2.238.054 (Billion TL) (Table 1).

The agricultural supply is composed as follow: direct inputs 32.14%, net taxes on the production 4.03%, gross value added (including payments for net taxes on the products) 59.36% and imports 4.47% (Figure 1).

Agriculture is the 4th largest input user of the economy after food, textile and transport sectors. As mentioned above, it was consumed direct inputs of 16.819.836 (Billion TL) at basic prices for agricultural production in 2002. This makes the sector attractive for numerous suppliers. However, 43.38% of the total direct input requirement was provided by agriculture sector itself. The rest part of the total direct inputs, which is 56.62% and amounted to 9.523.294 (Billion TL), was received

Table 2

Direct inputs used for the Agricultural Production by Aggregated Products and Services

No	Code	Products (CPA)	Agriculture, hunting and related activities (at current prices,Billion TL)	Shares in Total Supply	Shares in Total Inputs, %
1	1	**Products of agriculture, hunting and related services**	**7 296 542**	**0.13944**	**43.38**
		Mechanization tools&Services	**2 178 245**	**0.04163**	**12.95**
		Fuel&oil	**1 126 163**	**0.02152**	**6.70**
5	11	Crude petroleum ....; services...	109	0.00000	0.00
17	23	Coke, refined petroleum products and nuclear fuels	824 700	0.01576	4.90
35	50	..... retail sale of auto.fuel (50%)	301 354	0.00576	1.79
		Machinery and equipment	**1 052 083**	**0.02011**	**6.26**
21	27	Basic metals	1 807	0.00003	0.01
23	29	Machinery and equipment n.e.c.	535 923	0.01024	3.19

continued

Table 2 (continued)

19	25	Rubber and plastic products (65%)	151 055	0.00289	0.90
28	34	Motor vehicles, trailers and semi-trailers (1/4)	23 663	0.00045	0.14
48	71	Renting services of machinery and equipment without operator and of personal and household goods	38 282	0.00073	0.23
35	50	Trade, maint.and repair serv.of mot. Veh...(50%)	301 354	0.00576	1.79
		Fertilizers & Chemical Products	**1 733 461**	**0.03313**	**10.31**
18	24	Chemicals, chemical products and man-made fibres	1 733 461	0.03313	10.31
		Trade	**1 185 947**	**0.02266**	**7.05**
36	51	Wholesale trade and commission trade services, except of motor vehicles and motorcycles	927 776	0.01773	5.52
37	52	Retail trade services; except motor vehicles and ...	258 171	0.00493	1.53
		Finance	**1 143 337**	**0.02185**	**6.80**
44	65	Financial intermediation services, except insurance and pension funding services	1 143 337	0.02185	6.80
		Electricity & Waterworks	**358 733**	**0.00686**	**2.13**
32	40	Electrical energy, gas, steam and hot water	233 149	0.00446	1.39
33	41	Collected and purified water, distribution services of water	125 584	0.00240	0.75
		Transport	**763 485**	**0.01459**	**4.54**
39	60	Land transport; transport via pipeline services	670 454	0.01281	3.99
40	61	Water transport services	85 017	0.00162	0.51
41	62	Air transport services	1 443	0.00003	0.01
42	63	Supporting and auxiliary transport services; travel agency services	6 571	0.00013	0.04
		Others	**2 160 086**	**0.04128**	**12.84**
		Total	**16 819 836**	**0.32144**	**100**
61		Taxes less subsidies on products	2 107 069	0.04027	
62		**Total Intermediate Consumption /Final Use at Purchasers**	**18 926 905**	**0.36171**	
63		Compensation of employees	4 787 663	0.09150	
64		Other net taxes on production	-154 055	-0.00294	
65		Other taxes on production	136 473	0.00261	
66		Other subsidies on production	-290 528	-0.00555	
67		Consumption of fixed capital	2 169 879	0.04147	
68		Operating surplus, net	24 258 155	0.46359	
69		Operating surplus, gross	26 428 034	0.50506	
70		Value added at basic prices	31 061 642	0.59361	
71		Output at basic prices	49 988 550	0.95532	
72		Imports, cif	2 338 054	0.04468	
73		Supply at basic prices	52 326 604	1.00000	

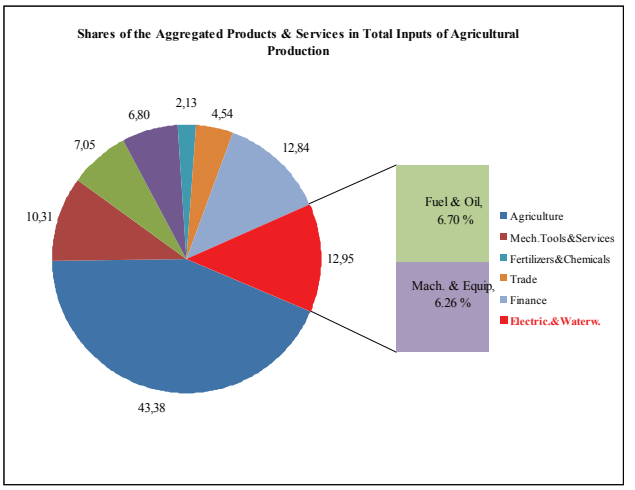

Fig. 2. Shares of direct inputs of Turkish agricultural production

from 52 outer sectors which are aggregated by kind of products & services as shown in Table 2.

"Mechanization Tools and Services" have first position between outer suppliers with 12.95% share and 2.178.240 (Billion TL) value.

It follows by "Fertilizer & Chemicals" with 10.31% share and 1.733.461 (Billion TL) value, "Trade" with 7.05% share and 1.185.947 (Billion TL) value, "Finance" with 6.80% share and 1.143.337 (Billion TL) value, "Transport" with 4.54% share and 763.485 (Billion TL) value, "Electricity & Waterworks" with 2.13% share and 358.733 (Billion TL) value and others with 12.84% share and 2.160.086 (Billion TL) value (Figure 2).

This means that mechanization related products

Table 3
Input Coefficients Inverse Matrix

No	Code	Products (CPA)	Agric. Activities	Total
1	1	Products of agriculture, hunting and related services	1.17980	2.71717
2	2	Products of forestry, logging and related services	0.00041	1.27699
3	5	Fish and	0.00009	1.03482
4	10	Coal and lignite; peat	0.00124	1.25596
5	11	Crude petroleum ....; services...	0.01235	2.60690
8	14	Other mining and quarrying products	0.00312	1.55613
9	15	Food products and beverages	0.04005	1.94180
11	17	Textiles	0.00336	2.80998
12	18	Wearing apparel; furs	0.00025	1.18659
13	19	Leather ...	0.00009	1.40141
14	20	Wood and products of wood....	0.00132	1.40147
15	21	Pulp, paper and paper products	0.00384	2.87784
16	22	Printed matter and recorded media	0.00148	1.42871
17	23	Coke, refined petroleum products and nuclear fuels	0.02370	2.18567
18	24	Chemicals, chemical products and man-made fibres	0.05308	4.20318
19	25	Rubber and plastic products	0.00877	2.02894
20	26	Other non-metallic mineral products	0.00322	1.87773
21	27	Basic metals	0.00672	4.09644
22	28	Fabricated metal products, exc.mach.and equipm.	0.00242	1.71350
23	29	Machinery and equipment n.e.c.	0.01439	1.79406

continued

Table 3 (continued)

24	30	Office machinery and computers	0.00023	1.12410
25	31	Electrical machinery and apparatus n.e.c.	0.00155	1.60567
26	32	Radio, telev. And comm.equipm.	0.00101	1.59706
27	33	Medical, precision and optical instruments, watches..	0.00015	1.11383
28	34	Motor vehicles, trailers and semi-trailers	0.00471	1.15936
29	35	Other transport equipment	0.00020	1.20466
30	36	Furniture; other manufactured goods n.e.c.	0.00119	1.15442
31	37	Secondary raw materials	0.00002	1.01238
32	40	Electrical energy, gas, steam and hot water	0.01432	3.82297
33	41	Collected and purified water, distribution serv.of water	0.00330	1.22331
34	45	Construction work	0.00355	1.31257
35	50	Trade, maint.and rep.serv.of Mot.Veh.; Ret.sale of aut. Fuel	0.01853	2.06831
36	51	Wholesale trade and comm.trade serv., exc.of mot.veh.	0.02819	3.25726
37	52	Retail trade services; except motor vehicles and ...	0.01018	2.35523
38	55	Hotel and restaurant services	0.00121	1.36789
39	60	Land transport; transport via pipeline services	0.02491	3.47090
40	61	Water transport services	0.00471	1.59254
41	62	Air transport services	0.00064	1.21937
42	63	Supp.and auxil.transport services....	0.00474	2.55880
43	64	Post and telecommunication services	0.00280	1.74815
44	65	Financial intermediation serv., exc.ins.serv	0.03319	3.17443
45	66	Ins.and pens.fund.serv., exc.compulsory soc.sec.serv.	0.00134	1.16363
47	70	Real estate services	0.00420	1.86421
48	71	Renting serv.of mach.and equip.w/o operator and ...	0.00123	1.11372
49	72	Computer and related services	0.00034	1.15751
50	73	Research and development services	0.00084	1.21791
51	74	Other business services	0.00881	3.29832
52	75	Public admin.and defense serv.; compul.soc.sec.serv.	0.00012	1.01121
53	80	Education services	0.00022	1.08230
54	85	Health and social work services	0.00164	1.06885
56	91	Membership organisation services n.e.c.	0.00101	1.27357
57	92	Recreational, cultural and sporting services	0.00167	1.43966
		Others	0.00185	8.16883
60		Total	1.54230	104.39822

& services are most important cost fraction of the agricultural production. Farmers spend money amounted to 1.126.163 (Billion TL) and 1.052.083 (Billion TL) for “Fuel & Oil” and “Machinery & Equipment” in 2002.

As mentioned above, a column in the inverse coefficients matrix measures total (i.e. the direct and indirect) input requirements from supplying

Table 4
Inputs Coefficients Inverse Matrix by Aggregated Sectors

No	Code	Products (CPA)	Agric. Activities
1	1	Products of agriculture, hunting and related services	1.17980
		Mechanization Tools & Services	0.08380
		Fuel&oil	0.04532
5	11	Crude petroleum ....; services...	0.01235
17	23	Coke, refined petroleum products and nuclear fuels	0.02370
35	50	..... Retail sale of auto.fuel (50%)	0.00927
		Machinery and equipment	0.03848
21	27	Basic metals	0.00672
23	29	Machinery and equipment n.e.c.	0.01439
19	25	Rubber and plastic products (65%)	0.00570
28	34	Motor vehicles, trailers and semi-trailers (0,25)	0.00118
48	71	Renting serv.of mach. and equip. w/o operator...	0.00123
35	50	Trade, maint.and repair serv.of mot. Veh...(50%)	0.00927
		Fertilizers & Chemical Products	0.05308
18	24	Chemicals, chemical products and man-made fibres trade	0.05308
		Trade	0.03837
36	51	Wholesale trade and comm.trade serv., exc.of mot.veh.	0.02819
37	52	Retail trade services; except motor vehicles and ...	0.01018
		Finance	0.03319
44	65	Financial intermediation serv., exc. İns.and pens.fund.serv.	0.03319
		Electricity & Waterworks	0.01762
32	40	Electrical energy, gas, steam and hot water	0.01432
33	41	Collected and purified water, distribution services of water	0.00330
		Transport	0.03500
39	60	Land transport; transport via pipeline services	0.02491
40	61	Water transport services	0.00471
41	62	Air transport services	0.00064
42	63	Supporting and auxil.transport services	0.00474
		Others (Living expenses exc.agric.prod.)	0.13981
		Total	1.54230

industries to the final demand of using industry. According to the results of this examination, total input requirements are reached to the factor of 1.54230 (Table 3).

As seen, at the tables above and the aggregated one below, the agriculture sector again, is at the first position to supply total input requirements with the factor of 1.17980 (Table 4).

Conclusion

The sectors related to mechanization are at the second in the rank with the factor of 0.08380 and followed by "Fertilizer & Chemical Products", "Trade", "Transport", "Finance", "Electricity & Waterworks" and "Others" with the factors of 0.5308, 0.03837, 0.03500, 0.03319, 0.01762 and 0.13981 sequentially.

As it is already given before total input requirements from supplying industries to the final demand of agriculture sector are reached to the factor of 1.54230. That means that Agriculture has a fewer "Back Dependence Coefficient" compared to other sectors; it is supported by mostly itself. The rank was 46 among 59 sectors.

On the other hand, sum of the row elements of the agriculture sector in the inverse coefficients matrix, which measures total supply (output) of the sector, was reached to the factor of 2.71717. Which means: Agriculture has a one of the highest forward dependence coefficient compared to other sectors; it transfer most of its products to other sectors. The rank is 10. According to results; the agriculture sector is a strategic industry for Turkey.

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