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9. ABSTRACT

This paper analyzes the structural changes that took place in Turkey during the First Five-Year Plan period, 1962-1967. The authors used the 1963 and 1967 interindustry transaction tables of Turkey to determine changes that took place in the Turkish economy. The basic objective of the Plan was to increase the relative importance of the industrial sector, and to reduce the heavy dependence of agriculture on weather conditions. In practice, however, emphasis was placed on the industrial objective. The analysis showed that the production structure of Turkey did not change significantly during the five-year period. The production structure remained oriented to the first transformation of primary goods. The economy has remained dominated by the primary and services blocks, and the use of energy in the economy has remained very limited. No significant improvements have been recorded in the integration of sectors within many of the blocks. Finally, the dependence on imports has increased. The results of the I-O analysis suggest that key sectors were neglected and the relations of various sector were not fully understood. For example, the chemicals sector has strong impacts on many other sectors, yet large investment projects for this sector were delayed. The study illustrates how block triangulation can contribute to development planning by highlighting the key sectors connecting different blocks and the key relations linking sectors within a given block.

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STRUCTURAL CHANGES IN THE TURKISH ECONOMY: 1962-1967

by

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I. INTRODUCTION

Turkey has promoted industrialization since the early 1930's. The public sector has consistently played an important role in establishing new industries and providing the necessary infrastructure. It was not until 1961, however, that a comprehensive plan for coordinating the industrialization efforts was prepared. The First Five-Year Development Plan covered the period 1962-67 and aimed at rapid growth of industrial output.

The structural changes that took place during the First Five-Year Plan period are analyzed in this paper. Specifically, the 1963 and 1967 interindustry transactions tables of Turkey prepared by the State Planning Organization are used to determine the changes which took place in the Turkish economy during the First Five-Year Plan.

The objectives of the First Plan are outlined in Section II. The methodology of analysis is discussed in Section III and the results interpreted in Section IV. Section V summarizes the major results and conclusions.

II. OBJECTIVES OF THE FIRST FIVE-YEAR PLAN

At the beginning of the First Planning period, the Turkish economy was dominated by the agricultural sector which accounted for 41% of GNP.[1] The basic objective of the Plan was to increase the relative importance of the industrial sector. The Plan also aimed at reducing the heavy dependence of agriculture on weather conditions but this

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[1]This section draws heavily on [3].

objective was not weighted heavily during the First Plan period.

The industrialization policy of the First Plan emphasized import substitution. Since demand for commodities to be substituted already existed, it was thought that such a strategy would contribute to rapid growth. It was recognized that the import substitution strategy would increase dependence on imports of raw materials and investment goods but the Plan expected an increase in exports and a change in their structure. The majority of Turkey's exports had been agricultural commodities. By stimulating industrial production and encouraging exports of industrial goods, the Plan expected to change this trend. Textiles, mining, and rubber industries were considered to have good export potentials. The Plan focused on textiles, in particular, because the raw material needs of this industry could be met from domestic sources.

The industrial sector which was to serve as the "engine of growth" was a rather weak sector in 1962. The sector was oriented mainly to the production of consumer goods. The Plan aimed at increasing the share of intermediate and investment goods in total industrial production by encouraging investment in the machinery industry and the construction of new plants in the iron-steel, cement, and chemicals industries. It was realized that a great demand would be generated for the output of the chemicals industry due to planned developments in agriculture and other sectors. Prior to 1962 the chemicals industry was dominated by small enterprises producing pharmaceuticals and was oriented to the production of consumer goods. In 1962, consumer goods accounted for 57% of the total output of the chemicals sector. The production of industrial chemicals was emphasized in the First Plan.

Other basic problems of the industrial sector, in 1962, were the size of enterprises and the prevailing technology. In many industries, including those mentioned above, the majority of enterprises were small and used obsolete technology. Consequently, industrial commodities were high priced and of low quality. Small enterprises could not afford engineering services for project preparation or quality control.

The First Plan did not affect the size of enterprises in most industries because it encouraged production to meet domestic demand and emphasized physical balances rather than comparative cost. This strategy stimulated small-scale, high-cost plants producing for the narrow domestic market and protected from competition.

The Plan attempted to accelerate technological change by stimulating the use of modern equipment and other inputs in domestic enterprises, encouraging joint ventures, and foreign investment. Although not clearly stated in the Plan, policies were adopted during the implementation of the Plan to encourage the use of capital rather than labor: an overvalued exchange rate was permitted, import duty concessions were provided for capital imports, and long-term interest rates were kept very low, even lower than short-term rates.

In summary, the Plan aimed at rapid growth through an industrialization policy. The target growth rate of GNP was set at 7% a year. The most important goal was to change the structure of the Turkish economy. To what extent this goal has been achieved during the First Plan period is determined in the following sections.

III. THE METHODOLOGY

Input-output (I-O) analysis captures the internal structure of economies and reveals the prevailing technology. In this study the interindustry transactions tables of Turkey for 1963 and 1967 are used as the starting point to determine the changes that took place during the First Five-Year Plan period. Since the basic concern is with the overall pattern of production and key relationships between sectors, the transactions tables were converted to simplified I-O tables.

To accomplish this the transactions were first converted to coefficient matrices. These represent a system of linear production functions that reveal the technology used in each sector. Triangulation of the coefficient matrix helps expose the hierarchical relations that exist between sectors.[2] Triangulation helps identify sectors in terms of their functions as buyers and sellers in the production process. It helps trace the flow of inputs from earlier to later stages of production since triangulation entails ranking sectors in terms of their indirect impacts in a descending order. The sector at the top of the hierarchy has the highest indirect impacts. This sector is mainly a buyer sector in contrast to the last which is basically a seller sector. The hierarchy of sectors is usually obscured in the way transactions tables are presented.

Further simplification is achieved by eliminating coefficients smaller than a selected value. The effects of accounting distortions on the production structure are thus reduced and the key relations more

[2]One-way interdependence is the basis of triangulation. In perfectly triangular matrices, only zero elements appear above the diagonal. Circular relations prevent perfect triangularity.

clearly revealed. The rule suggested by Simpson and Tsukui (S-T) [5] is: eliminate a_{ij}'s $\leq \frac{1}{n}$ where n = the number of sectors in the coefficients matrix. S-T state that the remaining large coefficients tend to be measured more accurately and reveal the pattern of industries which are strongly related (i.e. the fundamental structure of production).[3]

The transactions tables of the Turkish economy for 1963 and 1967 cover 37 sectors. Entries are in current prices and in terms of Turkish lira (TL.).[4] Before attempting any simplification, the original tables were consolidated in order to obtain homogeneity in the size of sectors. At the 37 x 37 level, the size of some sectors such as steel and mining was very small. It must be noted that the desired level of aggregation depends on the objective of individual studies. Disaggregation might be necessary when the impacts of special projects are to be forecasted. A more aggregated table might be used when the nature of the overall pattern of production is to be analyzed. For the purposes of this study, homogeneity in size was desirable so that the importance of the effects of small sectors is not overstated.

Several aggregation levels such as the 26 x 26 and the 21 x 21 were tried. At the latter level, the consolidation resulted in rather heterogeneous sectors in terms of the product. For example, transportation, communications, and trade were lumped together. In particular, the services sector covered a variety of activities ranging from

[3]The fundamental structure of production is the network of key relationships that ties industries and groups of industries together and helps identify the basic nature of an economy. The network consists of coefficients above a certain level, the value of which is determined by the number of sectors in the I-O table.

[4]$1 = TL. 13.

banking to ownership of dwelling. The decision to work with a particular level of aggregation was not made until the consolidated tables were converted into coefficient matrices and triangulation completed.

Following the triangulation, the 26 x 26 level was chosen. This level provided homogeneity in size and also captured fundamental relations. At the 21 x 21 level, after the elimination of small coefficients, very few interindustry relations remained.[5] This result suggests that there might be an optimum level of aggregation for capturing the fundamental structure of an economy.

Figure 1 and 2 show the results of triangulating the coefficient matrices for 1963 and 1967, respectively. The sectors have been arranged to form blocks and lines drawn to depict the blocks. In the process of triangulation, the blocks and sectors within them were rearranged until the ordering shown in Figures 1 and 2 was obtained. In earlier studies, the ordering of sectors was rather mechanical. The basic objective was to give the matrices the best triangular shape. Chenery and Watanabe [1] showed that I-O tables are nearly triangular. However, their process resulted in the juxtaposition of sectors producing rather heterogeneous outputs. S-T [5] have suggested that the organization of sectors to form blocks of homogeneous outputs is more desirable than obtaining the perfect triangular shape for the matrix. S-T [5] have based the grouping of sectors, in their study, on physical characteristics. This criterion was used in grouping sectors for the

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[5]When S-T's [5] rule is used for eliminating coefficients, the minimum value increases with aggregation. In empirical coefficient matrices, there are few large coefficients. Therefore, very few relations remain at the end of the elimination process in highly-aggregated tables.

Turkish I-O table. Six blocks were distinguished. They are: construction, metal-mechanical, non-metal, primary, energy, and services in the order they appear in the hierarchy. The names of sectors included in each block are listed in the appendix.

The arrangement of sectors within the blocks is especially important when working with more than one matrix. The same ordering must be maintained to facilitate the comparison of matrices. S-T suggest that the best triangular form for a block be obtained in one matrix and the same ordering of industries be maintained in the corresponding block of the other matrix. This procedure was used in this study.

In Figures 1 and 2, coefficients equal to and greater than 0.0384 are reported. Those less than $\frac{1}{26}$ have been eliminated since a 26 sector matrix is used. The coefficients that are reported represent the fundamental structure of production. However, the question arises: what percentage of total intermediate inputs are accounted for by large coefficients? In other words, to what extent do large coefficients represent the production structure of the economy? Table 1 provides an answer to the question. In Table 1, the ratio of large coefficients in each sector to the sum of all the coefficients in the sector is reported

$$\left(\text{i.e. } \frac{\sum_{i=1}^{26} a_{ij} \geq 0.0384}{\sum_{i=1}^{26} a_{ij}}\right).$$

In 18 sectors, the large coefficients account for over 60% of total intermediate inputs of a sector in both 1963 and 1967. This suggests that no real loss is involved in capturing the production structure.

Block triangulation gives certain properties to the matrices. Note that both the 1963 and 1967 matrices are nearly triangular. Furthermore, the metal-mechanical and the non-metal blocks are almost orthogonal in both matrices. These blocks would have been independent in the 1967 matrix if Sectors 12 and 17 had not been related. The near independence of the metal-mechanical and non-metal blocks is not peculiar to the Turkish economy. This property has also been observed in the fundamental structure of the more advanced economies of Japan and the United States [5].

Table 1. Ratio of large coefficients to total coefficients: 1963, 1967.

Sector		1963	1967
1.	Agriculture and Forestry	.707	.637
2.	Livestock	.945	.955
3.	Mining	.638	0
4.	Food Products	.905	.839
5.	Tobacco	.890	.903
6.	Alcoholic Beverages	.398	.600
7.	Textiles	.804	.644
8.	Wood	.917	.851
9.	Paper and Printing	.775	.716
10.	Rubber	.869	.810
11.	Leather	.850	.306
12.	Chemicals	.671	.557
13.	Petroleum	.778	.772
14.	Non-Metal Products	.552	.737
15.	Basic Metals	.788	.717
16.	Metal Products	.788	.681
17.	Machinery	.748	.665
18.	Electrical Machinery	.558	.631
19.	Transportation Equipment	.786	.593
20.	Electricity	.563	.789
21.	Transportation and Communication	.687	.909
22.	Trade	.332	.325
23.	Services	.248	.247
24.	Construction	.682	.674
25.	Public Services	0	0
26.	Ownership of Dwelling	0	0

Source: Coefficient matrices of Turkey for 1963 and 1967.

Names of Sectors	24	19	18	17	16	15	5	6	10	11	8	7	12	4	14	9	3	2	1	20	13	21	22	25	23	26
Construction																										
Transportation Equipment		.0614																				.0672				
Electrical Machinery			.1272																							
Machinery		.0487		.1429																						
Metal Products	.0407	.1169			.0392																					
Basic Metals	.1088	.1462		.1516	.3128	.2597														.0822						
Tobacco							.1497																			
Alcoholic Beverages																										
Rubber									.2165																	
Leather		.0390								.1023																
Wood					.1033						.1662															
Textiles										.0735		.2874														
Chemicals			.0691							.1499			.1630													
Food Products								.0503	.1235				.0593	.0942												
Non-Metal Products	.0965							.0416																		
Paper and Printing													.0685			.2897										
Mining						.0901									.1077											
Livestock									.0594			.0868		.2182					.1024					.0496		
Agriculture and Forestry							.3315				.3142	.1079		.3224		.0661		.6536	.0796							
Electricity															.0439		.0436									
Petroleum	.0421																			.0779	.2037	.1641				
Transportation and Communication						.0427	.0541		.0396		.0433															
Trade	.0522	.0439							.0976	.0501	.0868		.0515	.0390	.0610	.0469				.0439		.0539				
Public Services																										
Services																							.0457			
Ownership of Dwelling																										

Figure 1. Network Coefficients in the 26 x 26 Triangular Matrix: Turkey 1963
(Current Prices)

Names of Sectors	24	19	18	17	16	15	5	6	10	11	8	7	12	4	14	9	3	2	1	20	13	21	22	25	23	26
Construction																										
Transportation Equipment		.1580																				.0494				
Electrical Machinery			.0798																							
Machinery				.1020																						
Metal Products		.0677			.0422																					
Basic Metals	.1163	.1168	.1123	.1599	.3530	.2165														.0414		.4146				
Tobacco																										
Alcoholic Beverages																										
Rubber									.1282																	
Leather																										
Wood											.1251															
Textiles												.1480														
Chemicals				.0867					.0548				.0660			.0613										
Food Products								.0571	.0979				.0411	.1098				.0443								
Non-Metal Products	.0925							.0523							.0547											
Paper and Printing													.0540			.2512										
Mining															.0854					.0725	.2787					
Livestock									.1399			.0637		.1342					.0747							
Agriculture and Forestry							.2815	.0698			.3132	.0792		.3043		.0733		.3767	.0684							
Electricity															.0542					.0469						
Petroleum					.1075										.0430						.0692					
Transportation and Communication	.0453				.0778		.0789				.0413															
Trade	.0920		.0680				.0444	.0571	.0944	.0711	.0676		.0582	.0423	.0621	.0601						.0606				
Public Services																										
Services															.0436					.0787		.0406	.0438		.0384	
Ownership of Dwelling																									.0855	

Figure 2. Network Coefficients in the 26 x 26 Triangular Matrix: Turkey 1967 (Current Prices)

The final step of the analysis consisted of computing the percentage changes in coefficients between 1963 and 1967. Two methods were used. First, the computation was carried out using matrices derived from transactions tables in current prices, namely, those presented in Figures 1 and 2. Then matrices in constant prices were used with the 1967 transactions table expressed in 1963 prices.

Transactions tables can be deflated by using either a vector or a matrix of prices [6]. A matrix of prices that represents the mix of each cell is desirable if the data are available. Lacking the required data, a vector of prices was computed and used for deflating the 1967 transactions table for Turkey. The vector was computed with the follow- expression:

$$p = v(I-A)^{-1} \tag{1}$$

where:

p = a vector of prices

v = vector of value added

$(I-A)^{-1}$ = inverted Leontief matrix

The coefficients derived from the deflated 1967 transactions table is shown in Figure 3.

The percentage changes were computed for all coefficients in the original I-O table without applying the S-T rule. In the process, three groups were distinguished. The first group consisted of large coefficients that make up the fundamental structure (i.e. $a_{ij} \geq 0.0384$). The second group contained coefficients between the values of 0.0384 (excluded) and 0.0192 (included).[6] The third group was made up of all

[6]The value of 0.0192 was obtained by modifying S-T's [5] rule to $\frac{1}{2n}$ where n in this study equals 26.

coefficients less than 0.0192. Under both methods, the smallest change was observed in Group II and the largest in Group III. The percentage change for Group II coefficients, in current prices, ranged from -23% and +59%. The percentage change of Group III coefficients varied between $-\infty$ and $+\infty$ for both constant and current prices. A wider spread was observed in Group I and II coefficients in constant prices. For example, Group I coefficients changed from -66% to +217% using constant prices and -66% to +157% using coefficients in current prices.

IV. INTERPRETATION OF RESULTS

In interpreting results and arriving at conclusions about the nature and extent of structural changes in the Turkish economy over 1963 and 1967, an important decision had to be made. That is: should the analysis be based on the change in the magnitudes of coefficients? If so, should the matrices in current or constant prices be considered? Or, should the emphasis be placed on overall patterns and matrices in current prices be used even though they reflect price effects? The values of individual coefficients change for various reasons such as changes in the aggregation level, accounting procedures, as well as changes in technology. The overall patterns, on the other hand, may not change even though individual coefficients do. It was decided to focus on overall patterns and block relationships rather than concentrate on individual coefficients and to use matrices in current prices.

The impact of prices is eliminated when transactions tables are expressed in constant prices. In addition, if the period of analysis is as short as it is in this study, coefficients in constant prices should not be expected to show large variations. Smaller percentage

Names of Sectors	24	19	18	17	16	15	5	6	10	11	8	7	12	4	14	9	3	2	1	20	13	21	22	25	23	26
Construction																										
Transportation Equipment		.1580																				0596				
Electrical Machinery			.0798																							
Machinery				.1020																						
Metal Products		.0775	.0420	.0391	.0422															.0461		.3871				
Basic Metals	.0994	.0904	.1155	.1664	.2387	.2165																				
Tobacco																										
Alcoholic Beverages																										
Rubber									.1282													.0855				
Leather		.0449	.0404	.0574																						
Wood	.0465										.1251															
Textiles												.1480														
Chemicals				.1425				.0397	.0601				.0660			.0884									.0499	
Food Products								.1108	.1081				.0414	.1098												
Non-Metal Products	.0836							.0675							.0547											
Paper and Printing																.2512										
Mining		.0435				.0458									.1447					.1445	.5085					
Livestock									.1886			.0661		.1637					.1060						.0504	
Agriculture and Forestry							.2243	.1165			.3011	.0580		.2616		.0916		.2656	.0884							
Electricity															.0461					.0469						
Petroleum						.1055									.0399					.1312	.0692	.0864				
Transportation and Communication	.0415					.0833	.0492	.0476							.0387						.0386					
Trade	.0981		.0873					.0870	.0818		.0593		.0460		.0733	.0685						.0706				
Public Services															.0481					.1022		.0442	.0409		.0384	
Services																									.0913	
Ownership of Dwelling																										

Figure 3. Deflated Network Coefficients: 26 x 26 Triangular Matrix for 1967

changes were expected in the coefficients of Group II after the deflation process. Coefficients in this group seemed to represent inputs for which no close substitutes exist. The larger spread observed in this study for Group II coefficients under constant prices suggests that the vector of prices used for deflation may not have been appropriate. Therefore, the comparison of the production structure was made with the matrices expressed in current prices.

The first block in the hierarchy, construction, does not show significant changes over the period 1963-67. The relations of this block with others are similar in both years except for a stronger relationship in 1967 with the services block through the trade sector. This reflects the rapid growth of the services block during the First Plan period. It must be noted that contrary to the practice of leaving the construction sector out of triangulation, this sector has been maintained and considered a block in itself heading the hierarchy due to the important role it plays in the Turkish economy. The construction sector draws inputs from almost all the other blocks. In addition, the coefficients linking the construction block to others are rather large. In 1963, 11% of inputs into construction was drawn from basic metals which are in the metal-mechanical block.[7]

The metal-mechanical block is second in the hierarchy. This block has rather limited relations with other blocks. There are closer relations between the sectors within this block than, for example, in the non-metal block. S-T [5] suggest that this might be the basis for the

[7]The input from Sector A to B is found by locating the diagonal element of A and moving in the row where it is located to the column of Sector B.

formation of complexes in metal industries. In 1967, the basic metals sector becomes completely connected with all other sectors in the block. The most interesting feature of this block is that in 1967 it becomes almost independent of the non-metal block. The limited relationships between the two blocks is most likely due to the physical nature of their outputs. It is also reasonable that in the process of development each block becomes specialized, in a sense, and the possible combinations of wood and iron, for example, are reduced.

There is no significant change in the non-metal block in terms of the integration of sectors within it. An interesting change, however, takes place in the relation of the paper and chemicals sectors. In 1963, the input from paper into chemicals was large. This indicates the chemicals sector was more oriented to the production of pharmaceuticals. Also, the input from chemicals to paper was limited. In 1967, the input of paper into chemicals declines and paper draws heavily from chemicals. This indicates that the paper sector is becoming more oriented to the fabrication of paper rather than simple transformation of it.

The basic relations within the primary block remained the same during 1963-67. This block has strong relations with the non-metal block, but it is almost orthogonal to the energy and services blocks. The most significant change in the primary block is the large input from food products to the livestock sector, in 1967, which indicates greater use of feeds.

Some interesting changes have taken place in the energy block. Inputs from mining into both the electricity and petroleum sectors have increased. At the same time, the diagonal element of petroleum has

declined. These observations indicate that: 1) more electricity is thermo-generated and 2) the classification of crude oil has changed. In 1963 crude oil seems to be included in the petroleum sector. In 1967, crude oil seems to be classified under mining. In both years, the energy block has very low relations with other blocks.

The services block which is the last in the hierarchy has strong relations with other blocks. In 1967, new relations are introduced between sectors within the block.

The First Plan expected the industrial sector to play a leading role in Turkey's development. The industrial sector represents the combination of mining, manufacturing, and energy sectors. It was, therefore, decided to determine how stimulating the industrial sector would affect the economy. This entailed the computation of indirect impacts by inverting the coefficient matrices. In both the 1963 and 1967 matrices, three sectors (chemicals, paper and printing, and textiles) showed high indirect impacts. In other words, an increase in the output of these sectors triggered a demand for the outputs of a number of other sectors.

The indirect impacts on the paper and printing and chemicals sectors are shown in Figures 4(a) and 4(b). The diagonal elements of these sectors are plotted first.[8] The indirect demands for the output of other sectors are plotted next. The numbers under the bars are

[8] Diagonal elements of the inverse matrices are equal to or greater than 1. They represent the direct plus the indirect demand for the output of the sector. The magnitudes of the indirect demands generated for the outputs of other sectors can be read from the coefficients down the column of a particular sector.

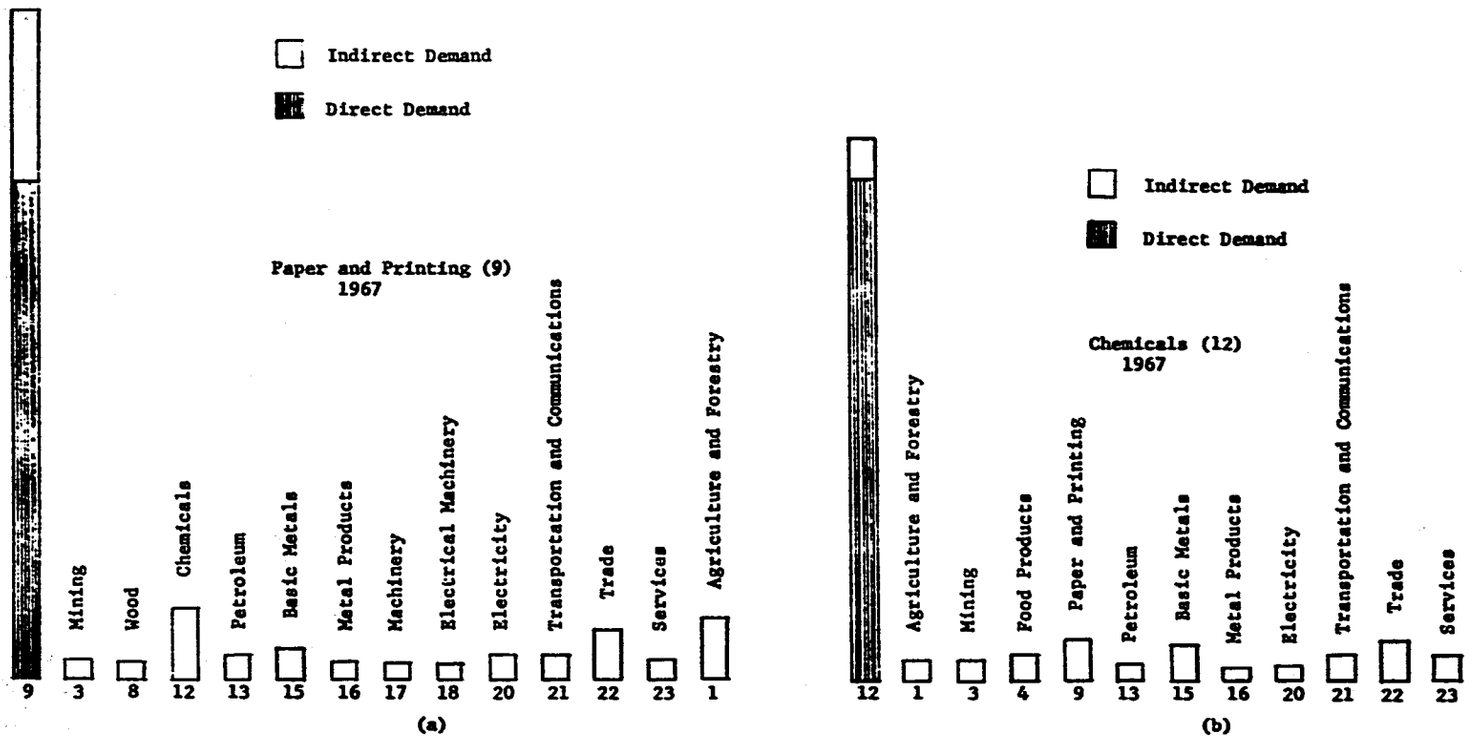

Figure 4. Indirect Impacts: 1967
(10 cm. = TL. 1 million)

sector numbers.[9] For example, an increase in the output of paper and printing generates major indirect demand for the outputs of 13 other sectors. Although the paper and printing and chemicals sectors create indirect demand for many sectors, only those whose inverse coefficients are equal to or greater than 0.02 are plotted. An increase of TL. 1 million in the output of paper and printing leads to an increase of TL. 140,000 in the output of the chemicals sector (number 12). At the same time, an indirect demand of TL. 340,000 is created within the paper and printing sector.

The First Plan emphasized import substitution. Therefore, the changes that took place in Turkey's dependence on imports between 1963 and 1967 were analyzed. This analysis is illustrated using a profile which shows actual production and the direct and indirect requirements to satisfy the final demand. Figures 5 and 6 show the production profiles of Turkey for 1963 and 1967, respectively. The ordering of sectors follows the hierarchy established earlier. The relative size of each sector is shown on the horizontal axis. On the vertical axis, the 100% line shows the level of production necessary to satisfy the final demand. The 100% line is obtained as:

$$(I-A)^{-1}F_i \qquad i = 1963,\ 1967 \tag{2}$$

where F is the final demand. The actual production level of sectors traces out a ratched line which either coincides with the 100% line, falls below it, or rises above it. The first case shows that the actual production of some sectors is enough to satisfy their final demand. The second case depicts sectors which have a gap between production and

[9] A listing of sectors and corresponding numbers is provided in the appendix.

consumption. The extent of the gap can be measured by the distance between production and the 100% line. The third case shows sectors that have an export surplus. This does not rule out the possibility of imports in those sectors but indicates that the export surplus may be enough to pay for imports by these sectors.

Figures 5 and 6 show that the actual output of sectors in the metal-mechanical block falls considerably below the 100% line in both 1963 and 1967. In both years, the lowest level of achievement is seen in Sector 17 which is machinery. It must be noted that the performance of this sector has improved in 1967. The level of production has increased from 42% in 1963 to 52% in 1967. But this has been accompanied by an increase in direct and indirect imports. Similar increases in imports are also observed in Sector 18, electrical machinery, where production has increased in 1967. The increase in imports is also seen in the non-metal block in sectors where output has increased. In 1967, Sector 1, agriculture, shows a surplus of production of 8% above the 100% line.

The production profiles for 1963 and 1967 indicate that Turkey has serious balance of trade problems. Very few sectors show export surpluses. Despite efforts to stimulate exports of industrial goods, Turkey remained dependent on agricultural goods exports at the end of the First Plan period. The balance of trade problems are augmented by the dependence of many sectors on imports of investment goods. Furthermore, attempts at increasing the production in sectors such as those in the metal-mechanical block result in larger demands for imports.

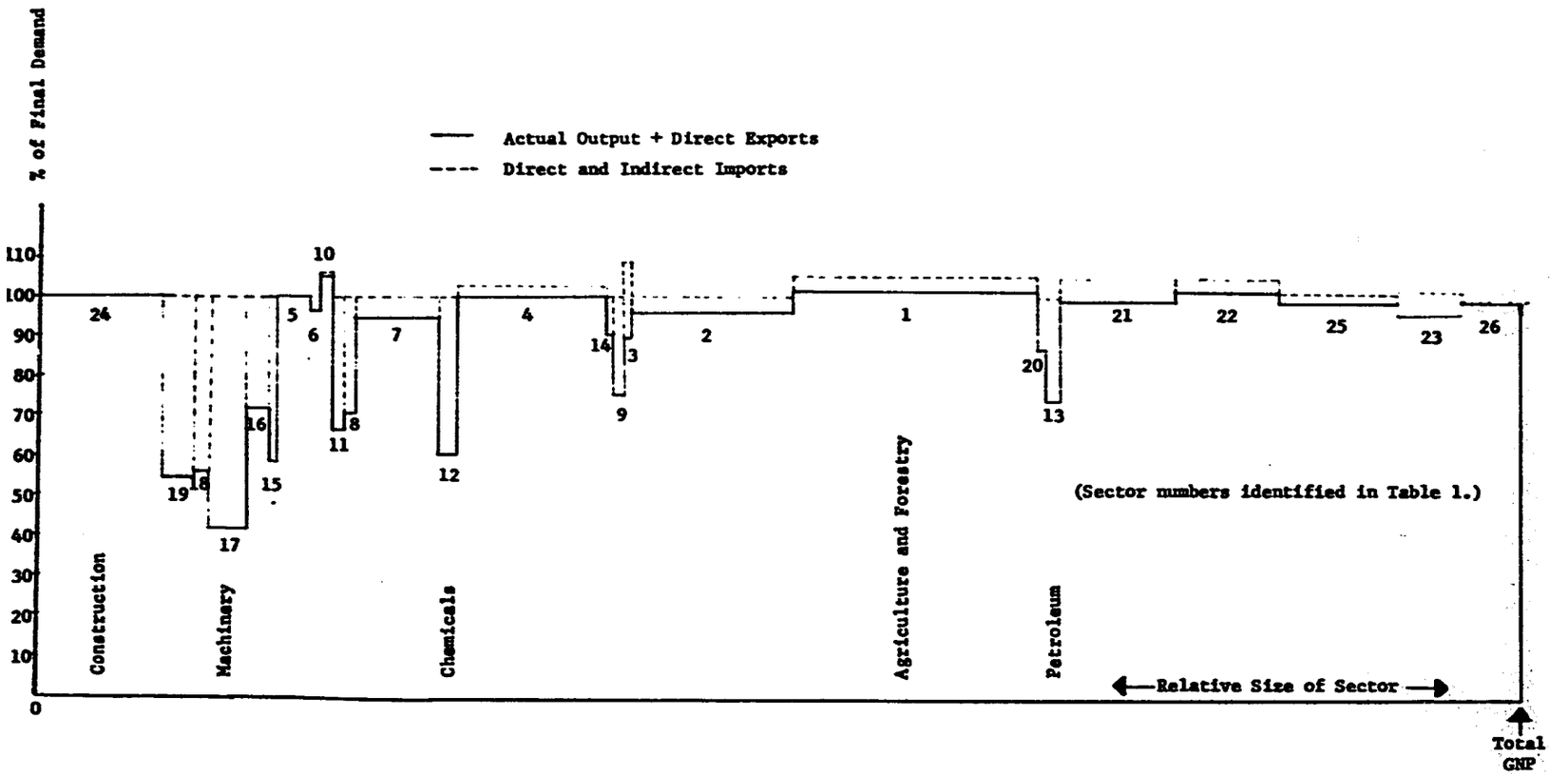

Figure 5. Production Profile: 1963

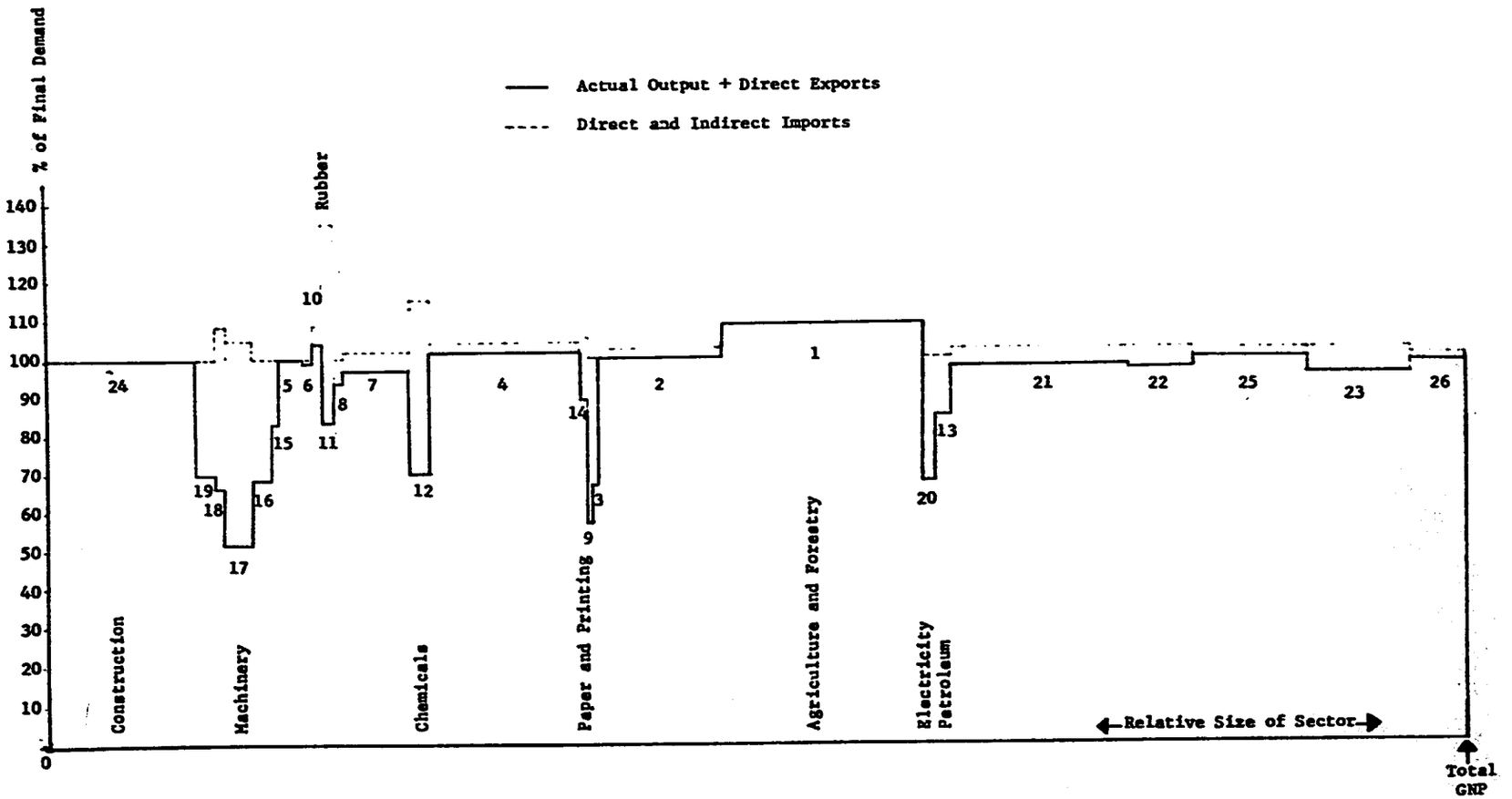

Figure 6: Production Profile: 1967

V. SUMMARY AND CONCLUSIONS

During the implementation period of the First Plan, the basic nature of the production structure of Turkey has not changed significantly. The production structure has remained oriented to the first transformation of primary goods. The economy has remained dominated by the primary and services blocks. At the beginning and end of the First Plan period, the use of energy in the economy has been very limited. No significant improvements have been recorded in the integration of sectors within many of the blocks. Finally, the dependence on imports has increased.

The results of the I-O analysis using the inverse matrices suggest that key sectors were neglected and the relations of various sectors were not fully understood. For example, the chemicals sector has strong impacts on many others yet during the First Plan period, large investment projects for this sector were delayed. On the other hand, investment in manufacturing, the bulk of which goes into textiles, exceeded Plan targets. Triangulation shows that the textiles sector is linked to the rest of the economy through the chemicals sector. Therefore, the impact of the growth of textiles depends heavily on chemicals. Failure to increase the capacity in the chemicals sector has, therefore, reduced the impacts of the growth of textiles on the rest of the economy.

This study illustrates how block triangulation can contribute to development planning by highlighting the key sectors connecting different blocks and the key relations linking sectors within a given block. Planners can then determine the impacts of planning for one sector on a block as well as on a particular sector in another block. Our results

suggest that discarding small coefficients does not result in any significant loss in capturing overall production patterns. On the contrary, their elimination contributes to the stability of the production structure and renders reliability to the results of the comparison of production structures. On the other hand, it might be desirable to include medium-size coefficients, Group II coefficients, in the fundamental structure. The results of this study suggests that they are the most stable group and that S-T's [5] rule could be modified to: discard a_{ij}'s $\leq \frac{1}{2n}$ where n = the number of sectors in the I-O table. It also appears that during the construction of I-O tables efforts should be concentrated on obtaining the most accurate possible estimates of the large and medium-size coefficients.

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VII. APPENDIX

Block	Sector Name	Sector No.
Construction	Construction	24
Metal-Mechanical	Transportation Equipment	19
	Electrical Machinery	18
	Machinery	17
	Metal Products	16
	Basic Metals	15
Non-Metal	Tobacco	5
	Alcoholic Beverages	6
	Rubber	10
	Leather	11
	Wood	8
	Textiles	7
	Chemicals	12
	Food Products	4
	Non-Metal Products	14
	Paper and Printing	9
Primary	Mining	3
	Livestock	2
	Agriculture and Forestry	1
Energy	Electricity	20
	Petroleum	13
Services	Transportation and Communications	21
	Trade	22
	Public Services	25
	Services	23
	Ownership of Dwelling	26