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Short-run Effects of Income Distribution on Some Macro-Economic Variables: The Case of Turkey

by

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1. Introduction

Much of traditional economic development literature assumes that a redistribution of income from the rich to the poor will result in a decline in the rate of economic growth.[1] Most empirical studies, such as that by Cline[2], have tended to verify this assumption. However these studies have omitted a rigorous analysis of the demand composition effects of income redistribution. Recently the assumed trade-off between income redistribution and growth has been challenged in a revival of interest in income distribution as it relates to the development process.[3]

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[1] James W. Land and Ronald Soligo, "Models of Development Incorporating Income Distribution," Discussion Paper No. 22, Program of Development Studies, Rice University, Houston, Texas (1972).

[2] William R. Cline, "The Potential Effects of Income Redistribution on Economic Growth in Six Latin American Countries," AID Development Digest, Vol. 9, No. 4 (October 1971), p. 22.

[3] International Labour Office, Towards Full Employment (Geneva: International Labour Office, 1971), pp. 145-150; and James W. Land and Ronald Soligo, "Income Distribution, Employment and Growth in Labor Redundant Economies," Discussion Paper No. 9, Program of Development Studies, Rice University, Houston, Texas (1971).

In a simple model relating income distribution, composition of demand, and factor usage, Land and Soligo suggest that it is the relationship between income distribution and the composition of demand that may undermine the traditionally assumed trade-off between economic growth and distribution of income. If, for example, poorer income classes consume relatively more labor-intensive goods and/or goods with lower import content, then an income redistribution from the rich to the poor, provided certain conditions are met, might occur without any decrease in the growth rate.

The present study explores certain ramifications of this model for Turkey. Using an input-output table with 37 production sectors, information about consumer expenditures and savings classified both by income class and rural-urban groups, and data on factor usage for each production sector, the analysis shows that the basic assumptions and implications of the Land-Soligo model are empirically verified for Turkey for the year 1965. Specifically, it is shown that:

1) both total and incremental output[1] consumed by higher income classes has a higher aggregate capital-labor (K/L) ratio than that consumed by the poorer income classes,

2) both total and incremental output consumed in the urban regions have a higher aggregate K/L ratio than that by consumers in rural regions, and

3) the imported intermediate input intensity of output (imported input use per unit of output) is higher for urban consumers than for

[1] Three different measures of output are distinguished in the study. The measure of output used plays a crucial role in determining the results For definitions of the measure of the output see p 4

rural consumers, and is higher for upper income classes than for lower income classes within each of the consumer groups (rural, urban).

Using the findings outlined above two simulation experiments for one year have been carried out. One set keeps the relative income shares of the urban and rural consumer groups the same, distributing the incremental disposable income of each consumer group among its income classes in different ways. Here distribution alternatives favoring the lower income classes result in a greater amount of consumption and output than the distribution alternatives favoring the upper income classes. This output is produced with a lower aggregate K/L ratio, creating more aggregate employment of labor, particularly unskilled labor. The contribution by consumers to the foreign exchange gap is decreased; their contribution to the overall savings gap is increased.

A second set of simulation experiments keeps the relative income shares of disaggregated income classes constant within each of the rural and urban consumer groups but alters the relative shares of disposable income between urban and rural areas. Here, distribution alternatives which favor the rural consumer group produce analagous results as those favoring the poorer income classes above, although the magnitudes of the effects are smaller.[1]

2. Theoretical Framework

The whole range of goods and services available to the economy is classified into a limited number of productive sectors, ($i = 1,\ldots s$), each comprised of industries with similar technologies and production

[1]This second simulation is not reported in detail in this paper. These results are included in the author's dissertation along with the mathematical formulations and additional explanations and extensions of this paper.

functions. A subset of the i = 1 ... s sectors constitutes the sectors from which consumers make final purchases.

Consumers are disaggregated into urban and rural groups; each group is further disaggregated into income classes with markedly different consumption patterns. Each income class is considered a separate micro-consumer unit uniquely identified by the following three characteristics: 1) urban or rural classification, 2) average income, and 3) the sectoral mix or pattern of its consumption.

Three different measures of output are considered in linking final domestic consumption to the output necessary to provide the goods available for consumption. The purpose of these measures of output is to assess the separate and joint roles of consumption patterns, inter-industry dependencies in production, and domestic production of capital goods on aggregate factor intensity.

The first is "final consumption output," (Q^*), which is equivalent to final purchases by consumers from the various productive sectors. The second is "gross consumption output," (Q^{**}), which includes both Q^* above and the production of direct and indirect inputs required to produce Q^*. The third measure of ourput is "gross consumption investment output," Q^{***}, which includes Q^{**}, plus the final and intermediate output requirements of final demand for domestically produced investment goods induced by incremental Q^{**}. Q^{***} is then obtained as the sum of the aggregate gross output necessary to meet final demand for domestic investment induced by incremental final consumption and the aggregate gross output necessary for final consumption.

The putty clay assumption is used to link sectoral output to the use of capital and labor.[1] Capital and investment refer only to fixed capital and investment, excluding working capital, with the capital stock in each sector assumed fully utilized. It is assumed for convenience and consistency with the "putty clay" assumption that in a given sector, capital and labor are in fixed proportions regardless of the relative prices of the components and the level of sectoral output. In order to account at least partially for the effects of the nonhomogeneity of capital and labor, these variables are disaggregated.

Fixed capital in each sector i is disaggregated into two components: (1) construction, and (2) machinery and equipment. The ratio of each is assumed fixed for the chosen fixed coefficient production function. Labor is disaggregated into three general components with distinctly different characteristics, skilled, semi-skilled and unskilled labor.

Two different fixed coefficient production functions are considered, one relating to the total capital stock, and another relating to additions to capital stock, each having different capital-labor ratios.

Using the definitions and relationships above, separate influences on the factor intensity of output necessary to meet consumption for individual urban and rural income classes and for the aggregate urban and

[1] The putty clay assumption consists of two parts: (a) Ex ante: before the capital stock takes shape (putty) there is substitutability between capital and labor. The entrepreneur views the plans for various technological alternatives with different capital-labor ratios for producing a given amount of output and chooses the most economical one in accordance with neoclassical production function and capital theory; (b) Ex post: once the choice is made and machinery is installed (clay) the relevant production function is a fixed coefficient type with no possibility of substitution between capital and labor in order to produce a given amount of output.

rural consumer groups can be isolated. Strong emphasis is placed on revealing the role of aggregation and weighting in determining aggregate factor intensities.

3. Empirical Results

We are now ready to probe empirically into the relationship between the composition of consumption and the distribution of income for Turkey within the theoretical framework outlined above. This analysis is based on 1965 Turkish data, showing how income classes differ in their domestic consumption patterns and in their aggregate propensities to consume domestic goods and services; how sectoral capital and labor coefficients differ from each other; how interindustry dependencies affect the size and sectoral mix of aggregate output for different income classes; and how total disposable income is divided among the constituent income classes of the urban and rural consumer groups.

a) Consumption patterns

The initial step identifies urban and rural income classes with markedly different consumption patterns as the micro consumer units of the study. Four urban income classes are constructed using data drawn from ten urban consumer expenditure surveys published by the State Institute of Statistics.[1] Four rural income classes were constructed from a rural agricultural consumption survey[2] during 1965 and various independent

[1] Republic of Turkey, Prime Ministry, State Institute of Statistics, Results of the Survey of Consumer Expenditures in Ankara--Erzurum, Adana, Samsun, Ordu, Bursa, Diyarbakir, Antalya, İstanbul, İzmir, publication nos. 538, 596, 512, 558, 549, 573, 550, 551, 548, 531 (Ankara: State Institute of Statistics Printing Office, 1968, 1969, 1966, 1969, 1969, 1969, 1969, 1969, 1967).

[2] Edgar Z. Palmer, ed., Agriculture in Turkey: Long Term Projections of Supply and Demand (İstanbul: Robert College, School of Business Administration, 1966), pp. 20-30.

piecemeal studies.[1] The data on urban consumers is considered better than that on rural consumers.

How did consumption patterns differ? Table 1 depicts the relative importance of each production sector in supplying a unit of total consumption by each urban and rural income class, i.e., the average consumption pattern for each income class.

To facilitate analysis, sectors are classified into two groups: 1) those sectors the relative importance of which increases systematally across income classes (with the possible exception of one ratio), and 2) those sectors the relative importance of which decreases systematically across income classes (with the possible exception of one ratio). Within the decreasing category, sectors are ranked highest to lowest according to their relative importance in the consumption of the poorest income class. Within the increasing category, sectors are ranked highest to lowest according to their relative importance in the sectoral mix of consumption for the richest income class.

It can be observed from Table 1 that:

(1) both for urban and rural consumers, the decreasing sectors are mainly sectors which can be classified into the broad category food. On the other hand, certain manufacturing sectors and service sectors,

[1]These studies were: (a) Mubeccel B. Kıray, Eregli, Agır Sanayiden Önce Bir Sahil Kasabası (Ankara: State Planning Organization, 1964). pp. 86-104: (b) Jan Hinderink and Mübeccel B. Kiray, Social Stratification as an Obstacle to Development: A Study of Four Turkish Villages (New York: Praeger Publishers, 1970), Chap. 6; (c) Unpublished results of: an experimental survey by the State Institute of Statistics in five villages of the Antalya Lake region; a recent survey conducted by a team headed by Icen Börtöcene of the State Planning Organization in the squatter neighborhoods of Konya, Samsun, and Diyabakir; and a survey by Dr. Orhan Köksal of Hifzisihha Enstitusu and Hacettepe University, undertaken in the village of Ankara mainly to determine nutrition levels of various income groups.

TABLE 1: Sectoral Mix of a Unit of Total Consumption by Each Urban and Rural Income Class (1965)

Sector Code in input-output table	Name and classification of sector	Urban 1 (poorest)	Urban 2	Urban 3	Urban 4 (richest)	Rural 1 (poorest)	Rural 2	Rural 3	Rural 4 (richest)
	λ decreasing:								
10	Other food products	0.2912	0.2143	0.1441	0.0925	0.1470	0.0900	0.0700	0.0500
1	Agriculture	0.1334	0.1221	0.0983	0.0714	0.4270	0.2900	0.1900	0.1500
3	Animal husbandry and fishing	0.1252	0.1340	0.1301	0.1047	0.1170	0.0900	0.0300	0.0800
8	Tobacco proc. and products	0.0393	0.0352	0.0275	0.0232	0.0450	0.0300	0.0200	0.0200
7	Sugar	0.0289	0.0227	0.0218	0.0143	0.0360	0.0200	0.0200	0.0100
23	Metal products[1]	0.0201	0.0158	0.0157	0.0087	0.0086	0.0030	0.0092	0.0100
28	Railway transport.	0.0075	0.0074	0.0071	0.0070	n.a.	n.a.	n.a.	n.a.
	Total λ decreasing sectors	0.6456	0.5515	0.4446	0.3218	0.7720	0.5200	0.3900	0.3100
	λ increasing:								
33	Professions and personal services	0.0410	0.0663	0.0814	0.1444	0.0300	0.0700	0.0930	0.1040
37	Ownership of dwellings	0.0741	0.0901	0.1166	0.1210	0.0510	0.0840	0.1125	0.1250
11	Textiles and Apparel	0.0826	0.0921	0.1074	0.1148	0.0560	0.1005	0.1135	0.1240
29	Other transportation	0.0293	0.0294	0.0369	0.0530	0.0030	0.0415	0.0560	0.0640
16	Chemicals and pharmaceuticals	0.0292	0.0293	0.0305	0.0465	0.0100	0.0300	0.0430	0.0430
14	Leather and products	0.0191	0.0368	0.0399	0.0335	0.0100	0.0180	0.0200	0.0220
13	Paper, printing and stationery	0.0049	0.0118	0.0186	0.0303	0.0041	0.0040	0.0045	0.0048
12	Wood prod. incl. furniture	0.0253	0.0240	0.0272	0.0255	0.0110	0.0130	0.0145	0.0130
36	Public services	0.0059	0.0103	0.0144	0.0168	n.a.	n.a.	n.a.	n.a.
31	Communications	0.0011	0.0018	0.0043	0.0162	0.0018	0.0020	0.0022	0.0040
24	Agricult. and non-elect. machinery	0.0000	0.0064	0.0175	0.0156	n.a.	0.0090	0.0105	0.0162
18	Petroleum refineries	0.0117	0.0128	0.0143	0.0140	n.a.	n.a.	n.a.	n.a.
27	Elect. gener. and dist.	0.0082	0.0100	0.0107	0.0108	0.0010	0.0020	0.0030	0.0040
4	Coal mining	0.0079	0.0129	0.0101	0.0098	0.0065	0.0070	0.0085	0.0085
9	Ceramics, glass and nonmetals	0.0111	0.0088	0.0089	0.0097	0.0040	0.0170	0.0200	0.0210
25	Elect. machin. and appliances	0.0000	0.0000	0.0095	0.0096	n.a.	0.0090	0.0126	0.0185
15	Rubber, plastics	0.0030	0.0057	0.0066	0.0067	0.0200	0.0210	0.0230	0.0250
2	Forestry	n.a.	n.a.	n.a.	n.a.	0.0110	0.0430	0.0640	0.0710
	Total increasing sectors	0.3544	0.4485	0.5554	0.6782	0.2280	0.4800	0.6100	0.6900
	All sectors	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

[1] This sector is classified as a λ decreasing sector although it is a λ increasing sector for rural consumers. This is taken into account when calculating the relative importance in the sectoral mix of all λ decreasing, and all λ increasing sectors.

Basis Sources: Republic of Turkey, Prime Ministry, State Institute of Statistics, Results of the Survey of Consumer Expenditures in Ankara, Erzurum, Adana, Samsun, Ordu, Bursa, Diyarkakir, Antalya, İstanbul, İzmir, publication nos. 538, 596, 512, 558, 549, 573, 550, 551, 548, 531 (Ankara: State Institute of Statistics Printing Office, 1968, 1969, 1966, 1969, 1969, 1969, 1969, 1967); State Institute of Statistics, October 25, 1970 Population Census (Ankara: Devlet Istatistik Enstitüsü Matbaası, 1971), pp. 5-6; Edgar Z. Palmer, ed., Agriculture in Turkey: Long Term Projections of Supply and Demand (Istanbul: Robert College School of Business Administration, 1966), pp. 20-30; Mübeccel B. Kıray, Ereğli, Ağir Sanayıdan Önce Bir Sahir Kasabası (Ankara: State Planning Organization, 1964), pp. 86-104; Jan Hinderink and Mübeccel B. Kıray, Social Stratification as an Obstacle to Development: A Study of Four Turkish Villages (New York: Praeger Publishers, 1970), Chap. 6; Unpublished results of an experimental survey by the State Institute of Statistics in five villages of the Antalya Lake region; a recent survey conducted by a team headed by Icen Börtöcene of the State Planning Organization in the squatter neighborhoods of Konya, Samsun, and Diyabakir; and a survey by Dr. Orhan Köksal of Hifzisihha Enstitüsü and Hacettepe University, undertaken in the village of Ankara mainly to determine nutrition levels of various income groups; A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbassı, 1968).

particularly professions and personal services and ownership of dwellings, rise in relative prominence as income increases;

(2) there is recorded final consumption for only 23 of the 37 productive sectors differentiated by the 1963 input-output table; and

(3) urban and rural differences in consumption patterns are reflected mainly in the fact that certain input-output sectors are fairly important for urban consumers but non-existent or negligible for rural consumers or vice versa.

b) Factor usage by production sectors, by income classes, and by aggregate urban-rural consumer groups

Table 2 presents the capital and labor coefficients and the K/L ratio for each productive sector. The important observation to note now is that there are some sectors with equal K or L coefficients but the K/L ratio of each input-output sector differ.

We are now ready to examine how the K/L ratio and the capital and labor intensities (K/Q and L/Q ratios) of each of the three measures of output, Q*, Q**, and Q***, differ from each other.

In graphs 1 and 2, these ratios are plotted against average per capita income of each of the urban and rural income classes. The graphs show that both for urban and rural consumers, the capital intensity of output increases and its labor intensity decreases steadily across income classes. Consequently, the aggregate K/L ratio shows sharp increases across income classes. This is true for all three measures of total and incremental output, although the magnitude of the change differs. For each income class, (1) the capital intensity of "gross consumption output" is lower than that of the "final consumption output," and "gross consumption investment output" is lowest; (2) the labor intensity of "gross

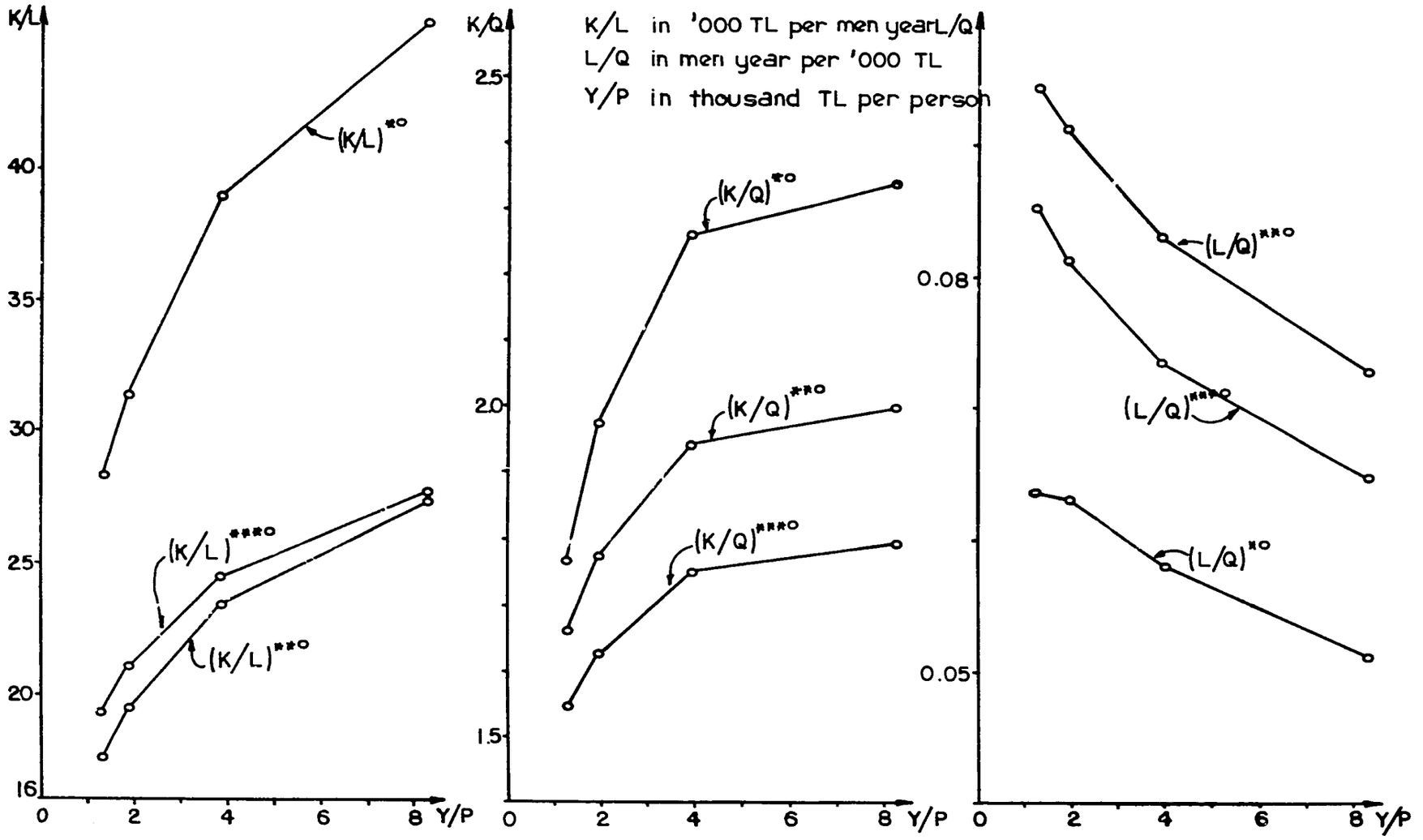
TABLE 2: Sectoral Capital and Labor Coefficients with Ranks

	Total K						Total L									
	K1	Rank	K11	Rank	K21	Rank	L1	Rank	L11	Rank	L21	Rank	L31	Rank	K/L	Rank
1. Agriculture	2.3000	10	1.4030	8	0.8970	13	0.2459	1	0.0025	13	0.0246	2	0.2188	1	.0093	33
2. Forestry	3.0490	9	1.2196	10	1.8294	5	0.0357	14	0.0003	34	0.0036	26	0.0318	10	.0854	13
3. Animal husbandry & fishery	0.4302	34	0.1764	23	0.2538	33	0.1206	2	0.0012	23	0.0121	9	0.1073	2	.0036	37
4. Coal mining	3.1710	6	1.6489	5	1.5221	9	0.0596	6	0.0024	14	0.0185	3	0.0387	6	.0532	21
5. Iron-ore mining	3.1710	7	1.5538	7	1.6172	8	0.0393	11	0.0016	19	0.0122	8	0.0255	12	.0807	15
6. Other mining & quarrying	3.1710	8	1.3635	9	1.8075	6	0.0326	15	0.0013	21	0.0101	10	0.0212	15	.0973	10
7. Sugar	0.6000	27	0.2280	22	0.3720	28	0.0034	35	0.0001	36	0.0009	34	0.0024	34	.1765	6
8. Tobacco processing & prod.	0.9430	19	0.3772	16	0.5658	21	0.0217	21	0.0004	33	0.0041	24	0.0172	18	.0435	23
9. Alcoholic beverages	1.1488	15	0.3102	17	0.8386	17	0.0119	25	0.0007	29	0.0035	27	0.0077	23	.0965	11
10. Other food products	0.4426	33	0.1284	32	0.3142	32	0.0094	32	0.0007	30	0.0018	32	0.0069	26	.0471	22
11. Textiles & Appar. (ex.shoes)	0.8000	21	0.1360	29	.6640	20	0.0115	27	0.0006	31	0.0038	25	0.0071	25	.0696	16
12. Wood prod. (inc. furn.)	0.6319	26	0.2717	18	0.3602	30	0.0538	7	0.0032	9	0.0129	7	0.0377	8	.0117	30
13. Paper, prtg. & stat.	0.9870	18	0.1579	24	0.8291	18	0.0316	16	0.0041	6	0.0092	12	0.0183	17	.0312	25
14. Leather & products	0.6410	24	0.1538	25	0.4872	24	0.0784	4	0.0047	5	0.0180	4	0.0557	5	.0082	34
15. Rubber, plastics & prod.	0.5342	30	0.1015	33	0.4327	27	0.0079	33	0.0005	32	0.0018	33	0.0056	27	.0676	18
16. Chem. & pharmaceuticals	0.9022	20	0.1353	30	0.7669	19	0.0097	30	0.0019	17	0.0025	30	0.0053	29	.0930	12
17. Fertilizers	0.9996	17	0.1499	26	0.8497	16	0.0097	31	0.0019	18	0.0025	31	0.0053	30	.1030	9
18. Petroleum refineries	1.0420	16	0.1459	27	0.8961	14	0.0007	36	0.0002	35	0.0003	36	0.0002	37	1.4886	2
19. Cer., glass & other non-met.	0.6770	23	0.1354	28	0.5416	22	0.0287	17	0.0023	15	0.0077	16	0.0187	16	.0236	26
20. Cement	1.4254	13	0.5702	13	0.8552	15	0.0118	26	0.0009	28	0.0032	29	0.0077	24	.1208	7
21. Iron & Steel (inc.met.coke)	2.0902	11	1.0451	11	1.0451	11	0.0106	29	0.0013	22	0.0046	23	0.0049	32	.1972	4
22. Non-ferrous metals	2.0658	12	0.2686	19	1.7972	7	0.0113	28	0.0012	24	0.0049	21	0.0052	31	.1828	5
23. Metal prod. (inc. appl.)	0.5522	29	0.0552	37	0.4970	23	0.1163	3	0.0116	1	0.0407	1	0.0640	3	.0047	36
24. Agr. & non-elec. mach.	0.6993	22	0.2308	21	0.4685	26	0.0128	23	0.0027	12	0.0047	22	0.0054	28	.0546	20
25. Elec. mach. & appliances	0.5000	31	0.1300	31	0.3700	29	0.0242	19	0.0038	7	0.0056	19	0.0148	19	.0207	28
26. Trans. equip(inc. repairs)	0.5619	28	0.0787	34	0.4832	25	0.0255	18	0.0020	16	0.0150	5	0.0085	22	.0220	27
27. Elec. gen. & distribution	7.5000	2	2.9250	2	4.5750	1	0.0075	34	0.0011	27	0.0052	20	0.0012	35	1.0000	3
28. Railway transportation	4.8750	3	2.6325	3	2.2425	4	0.0701	5	0.0056	4	0.0035	28	0.0610	4	.0695	17
29. Other transportation	1.2500	14	0.2375	20	1.0125	12	0.0149	22	0.0012	25	0.0007	35	0.0130	21	.0839	14
30. Trade	0.4000	35	1.5600	6	2.4400	3	0.0375	12	0.0033	8	0.0098	11	0.0244	13	.0107	31
31. Communications	3.8000	4	0.7980	12	3.0020	2	0.0359	13	0.0028	11	0.0090	13	0.0241	14	.1058	8
32. Banking, ins. & co-op.	0.5000	32	0.4750	14	0.0250	37	0.0128	24	0.0012	26	0.0083	14	0.0033	33	.0391	24
33. Profl. per. serv., etc.	0.6320	25	0.4234	15	0.2086	34	0.0536	8	0.0080	2	0.0075	17	0.0381	7	.0118	29
34. Building construction	0.2340	36	0.0702	35	0.1638	35	0.0449	10	0.0031	10	0.0144	6	0.0274	11	.0052	35
35. Non-bldg. construction	0.2340	37	0.0702	36	0.1638	36	0.0224	20	0.0016	20	0.0072	18	0.0136	20	.0104	32
36. Pub. serv.(inc.water & gas)	3.2000	5	1.8560	4	1.3440	10	0.0510	9	0.0077	3	0.0077	15	0.0356	9	.0627	19
37. Ownership of dwellings	1.4900	1	11.1453	1	0.3447	31	0.0007	37	0.0001	37	0.0001	37	0.0005	36	16.4143	1

Basis Sources: A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968); Nazmi Demir, Employment Interdependency among Sectors of the Turkish Economy, unpublished report to the State Planning Organization; Nuran Uras and Sevim Yayin, Ucüncü Beş Yillik Kalkinma Plani Döneminin Marjinal Servaye-Uretim Ilişkileri (Ankara: State Planning Organization, 1971).

GRAPH 1

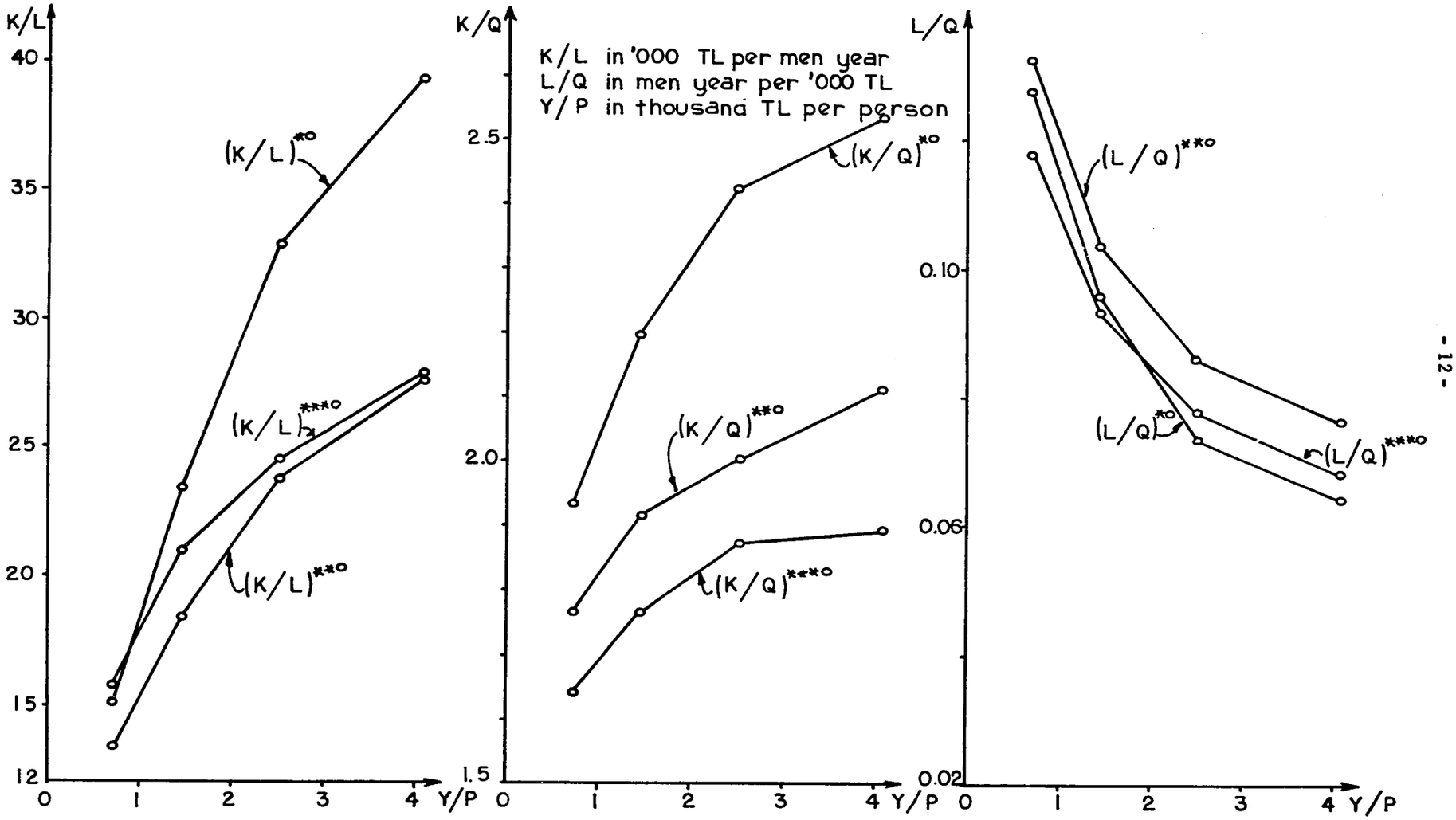
AGGREGATE CAPITAL LABOR RATIO AND THE CAPITAL AND LABOR INTENSITIES OF OUTPUT FOR URBAN INCOME CLASSES



Basis Sources: Tables 1 and 2.

GRAPH 2

AGGREGATE CAPITAL LABOR RATIO AND THE CAPITAL AND LABOR INTENSITIES OF OUTPUT FOR RURAL INCOME CLASSES



Basis Sources: Tables 1 and 2.

consumption output" is highest, followed by "gross consumption investment output," and "final consumption output" is lowest; (3) the aggregate K/L ratio is lower for "gross consumption output" than for "final consumption output" and for "gross consumption investment output."

In what follows, the underlying reasons for the trends observed and the role of influential sectors are analyzed for each of the three measures of output, starting from the least comprehensive measure, Q*, and going to the most comprehensive, Q***. Special emphasis is placed on the aggregation aspects of the issue, since all observed tendencies seem to be explainable by aggregation of one kind or another.

(1) Final consumption output

Six sectors are particularly influential for the (K/Q)* ratio and together account for 70 to 75% of this weighted average. Ownership of dwellings, textiles and electricity have relatively high (K/Q) ratios and increase in importance as income increases. On the other hand, agriculture, meat and animal husbandry, and other food products are productive sectors which work to reduce the sharp increase in the aggregate capital intensity. Agriculture, meat, fish and animal husbandry, and other food products are responsible for the decrease in the L/Q ratio across income classes. Professions and personal services, leather products, textiles and apparel, however, partially act to offset the decrease. Ownership of dwellings has a high relative importance in the sectoral mix but has the lowest labor coefficient and contributes very little to the overall L/Q weighted average.

(2) Gross consumption output

All but the building and nonbuilding construction sectors of the input-output table serve as inputs to at least one other sector. Thus, the sectoral mix of gross consumption output includes 35 of the 37 productive sectors instead of the 24 sectors included in the sectoral mix of "final consumption output," and most of the new sectors rise in importance as income rises. On the other hand, for each income class those productive sectors which account for a decreasing proportion of consumption as income rises are more important than they are for the final consumption output.

For each income class, the agriculture and animal husbandry and fish sectors continue to decrease across income classes, but they are more prominent in the sectoral mix for gross consumption output than for final consumption output. All other productive sectors that declined in importance for final consumption output also decline for gross consumption output but their relative importance is smaller.

By and large, the same sectors which are most important for declining shares of final consumption output are also most important for gross consumption output. However, the ownership of dwellings sector and, to a lesser extent, professions and personal services and textiles are less important for each income class.

Rural vs. urban

Income classes are not perfectly comparable for the urban and rural consumer groups. As we can see from the graphs presented earlier, both the capital and labor intensity of consumption for rural income classes

is higher than for urban. This is explained mainly by the greater importance of agriculture in the consumption of rural income classes, which has a much higher labor intensity and a moderately higher capital intensity than the sectors which make up the difference for urban income classes. Yet as can be observed from Table 3 below, for both final and gross consumption output, the aggregate capital labor ratio and capital intensity were slightly higher and the labor intensity lower for the aggregate urban consumer group relative to the aggregate rural consumer group.

To understand this paradox, remember that each of the capital and labor intensities relating to the two aggregate consumer groups are weighted averages of the same intensities which relate to the constituent income classes. The weights for final consumption output depend on the aggregate propensity to consume and the relative income share of each income class, and for gross consumption output on these two factors plus the size of gross output generated by a unit of aggregate consumption by

TABLE 3: The Aggregate Capital Labor Ratio and Capital and Labor Intensities of Output for Each of the Aggregate Urban and Rural Consumer Groups

		Urban consumers	Rural consumers
Ratios which relate to "final consumption output"	(K/Q)*	2.1775	2.1537
	(L/Q)*	.0573	.1026
	(K/L)*	38.0097	20.9990
Ratios which relate to "gross consumption output"	(K/Q)**	1.8942	1.8906
	(L/Q)**	.0831	.1102
	(K/L)**	22.7917	17.1611

Basis Sources: Table 2; Appendix Tables A-1 and A-2.

each income class. Table 4 below depicts these weights for the two measures of output, decomposed into the separate factors mentioned above.

Why do the weights behave as they do and how do they affect aggregate factor intensity? Table 4 reveals that within the urban consumer group, the two richest urban income classes consuming the highest capital intensity but lowest labor intensity products together accounted for approximately 67% of aggregate final consumption output and 66% of "gross consumption output." The poorest income class accounted for only 7.1% and 7.5% of the two measures of output respectively. The relative share of the upper income classes in final consumption output would have been even larger if the tendency for relative income shares to increase across urban income classes had not been partially offset by the tendency for aggregate propensity to consume domestic output to decrease across income classes. The relative shares of the lower income classes in gross consumption output were slightly higher and that of the upper income classes slightly lower owing to the additional influence of the tendency for the size of gross output generated by a unit of aggregate consumption to decrease across income classes. Nevertheless, it was the higher income classes which bore most heavily on the weighted average.

In contrast, within the rural consumer group, the lower income classes whose consumption patterns lead to the lowest capital intensity and highest labor intensity put their mark on the weighted average for the group. The lowest two income classes accounted for 74% of final consumption output and 76% of gross consumption output. In this case, not only the relative income shares of lower income classes are greater than that of upper income classes but also they had higher marginal propensities to consume which

TABLE 4: The Weight of Each Urban and Rural Income Class In Aggregate Output for the Consumer Group As a Whole

Influential factors:	Urban Consumers 1 (poorest)	2	3	4 (richest)	Rural Consumers 1 (poorest)	2	3	4 (richest)
(1) Relative income share	.06	.23	.34	.37	.41	.32	.19	.08
(2) Aggregate propensity to consume domestic output	.93	.89	.84	.66	.99	.98	.95	.90
(3) Size of aggregate gross output required by unit aggregate consumption	1.8800	1.8242	1.7623	1.6983	1.7035	1.6621	1.6485	1.6349
Weights:								
(4) Relative share in "final consumption output"	.071	.259	.361	.309	.417	.323	.186	.074
(5) Relative share in gross consumption output	.075	.267	.360	.298	.401	.359	.172	.068

Basis Sources: A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968); Table 1.

gave them an even greater relative share in final consumption output. They accounted for a slightly greater share of gross consumption output than of final consumption output

The interesting fact that the size of gross output necessary to meet aggregate unit consumption decreases across income classes for both consumer groups is worthy of further examination. This phenomenon, referred to as the interindustry dependency effect, can be explained by considering the sectoral mix of consumption for each urban and rural income class together with the column totals of the Leontieff inverse matrix in Table 5. Each column total of the matrix shows how much in aggregate is needed from all the sectors in order to meet unit final demand from sector i. The more consumption is oriented towards sectors which have relatively higher column totals, the higher will be the absolute value of gross output requirements for a constant, unit, value of aggregate consumption demand.

Viewing Table 5 in conjunction with Table 1 on consumption patterns of urban and rural income classes, it is seen that the consumption of the lower income classes is generally biased more towards the sectors which rank higher in Table 5 than that of upper income classes. The sectors which increase in importance over income classes, such as professions and personal services and ownership of dwellings, generate less gross output than the sectors, such as agriculture and other food products, which decrease in importance over income classes. The contrast between other food products, 2.362, and ownership of dwellings, 1.089, is especially marked.

TABLE 5: Aggregate Gross Output TL Generated by Unit Sectoral Final Demand Ranking (from Low to High) of Column Totals of the Inverse Matrix $(I - A)^{-1}$

Rank	Sector Codes and Name		Magnitude[1]
1	36	Public services	1.030
2	37	Ownership of dwellings	1.089
3	6	Other mining and quarrying	1.154
4	30	Trade	1.182
5	31	Communications	1.280
6	32	Banking and insurance	1.304
7	33	Professional and personal services	1.370
8	9	Alcoholic beverages	1.375
9	18	Petroleum references	1.381
10	1	Agriculture	1.416
11	2	Forestry	1.420
12	19	Ceramics, glass and other nonmetalic	1.472
13	4	Coal mining	1.568
14	25	Elect. mach. and appliances	1.569
15	29	Transportation	1.594
16	22	Nonferrous metals	1.620
17	27	Electricity generation & distribution	1.640
18	35	Nonbuilding construction	1.647
19	7	Sugar	1.666
20	24	Agric. and nonelect. machinery	1.686
21	20	Cement	1.723
22	5	Iron ore mining	1.733
23	15	Rubber, plastics, and prod.	1.798
24	17	Fertilizers	1.805
25	23	Metal products	1.840
26	13	Paper, print, and stationery	1.891
27	16	Chemicals & pharmaceuticals	1.891
28	34	Building construction	1.916
29	8	Tobacco processing and prod.	1.947
30	21	Iron and steel	1.963
31	11	Textiles	1.970
32	3	Animal husbandry and fishing	1.997
33	26	Transportation equip.	2.023
34	28	Railway transportation	2.230
35	12	Wood products incl. furniture	2.052
36	14	Leather & products	2.194
37	10	Other food products	2.362

[1] These magnitudes indicate TL of aggregate gross output generated by unit final demand for the relevant sector.

Source: A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968).

4. Simulation Analysis

The effects of alternative redistributions of incremental incomes are analyzed in this section. In the model on which this section depends, it is assumed that the growth rates for GNP and population of each urban and rural income class are exogenously given. There are two assumptions underlying the approach: (1) there is continuous growth of aggregate disposable income over time, and (2) the government can enforce a policy which effects only incremental incomes of the urban and rural consumer groups and/or of income classes within these groups.

Two types of redistribution policies have been investigated separately, but only one of these is reported here. In the first the relative shares of the urban and rural consumer groups in incremental disposable income is kept the same as in the base year but the shares of income classes within each group are altered in various ways. In the second the shares of income classes within each consumer group are kept the same as in the base year but the shares of the aggregate consumer groups (rural and urban) in total disposable income are changed in alternative ways.

The values of the following parameters in subsequent years remain unchanged from their values in the base year: (a) the capital and labor coefficients of each productive sector; (b) the consumption patterns of each income class; (c) the aggregate average and marginal propensities to consume domestic output, to consume imported output and to save by each income class; (d) the interindustry technology; and (e) the import coefficients for each productive sector.

It is inferred that the factor intensity of incremental "final consumption output" and of incremental "gross consumption output" for each income class will be the same as in the base year. Aggregate factor intensity will change, however, if the weights of the income classes are altered.

The social justice and economic effects of the redistribution policies are investigated empirically through simulation. The analysis concentrates on the effects on certain selected magnitudes emanating from consumption by all consumers. Moreover, only "gross consumption output" and its capital, labor, and imported intermediate input requirements are treated.[1]

It should be noted that the relationship between income class and factor usage documented in the preceding section is not sufficient to insure that a redistribution giving heavier weight to lower income classes will necessarily result in a lower level of aggregate investment requirements. Likewise, such a redistribution will not necessarily result in higher aggregate labor requirements. The effect on aggregate capital or labor requirements depends also on the average propensity to consume domestic output of each income class and the aggregate gross output requirements of a unit of consumption by each income class.

A redistribution policy will affect the foreign exchange gap and the savings gap. The foreign exchange gap is the gap between total exports and imports. While the demand for exports comes from the foreign sector and is independent of domestic consumers, the demand for imports is closely

[1]This is because "gross consumption output" is considered a more adequate and comprehensive measure of output necessary to meet consumption than "final consumption output" and rests on a sounder empirical basis than the "gross consumption investment output."

related to consumers and their income distribution in the following three ways: (1) through final consumer expenditures on imported goods, (2) through imports of intermediate inputs necessary for "gross consumption output," and (3) through imports of capital goods necessary to produce "gross consumption output."

The savings gap for the economy is the ex ante gap between total savings and investment. The contribution of consumers to this gap is defined as the net balance between household savings and the domestic investment necessary to produce incremental "gross consumption output."

Income generated--value added--by consumption is also affected by income redistribution. In input-output analysis, for each productive sector final use plus intermediate use must balance with gross output, and intermediate input purchases plus value added must balance with gross output. However, value added by and the final uses of output by sectors must only balance for the whole economy. Consequently, as the size and sectoral composition of consumption changes with changes in income distribution so does value added associated with output necessary to meet consumption.

It is hypothesized that the effect of the redistribution scheme specified above is (1) to increase demand for employment of labor and for capital accumulation, while at the same time lowering the capital intensity of output and increasing its labor intensity; (2) to decrease the contribution of consumers to the overall foreign exchange gap while increasing their contribution to the savings gap; and (3) to increase value added generated by "gross consumption output."

What are the effects of subsequent short-run changes in the distribution of income? To answer this question the 1965 income distribution and its skewness, as measured by the T coefficient are first analyzed and then changes in the skewness and economic effects brought about by subsequent redistribution are examined.

Income distribution and inequality during 1965

As can be seen from Table 6 below, while 72% of the population resided in rural areas in 1965, they claimed only 45% of total income. On the other hand, only 28% resided in urban areas but claimed 55% of total disposable income. The average per capita income of urban consumers was more than three times the average per capita income of the rural consumers.

TABLE 6: Distribution of Disposable Income Between Urban and Rural Consumers, 1965

	Relative Shares in population (in percent)	Relative Shares in income (in percent)	Average Per Capita annual income (in '000 TL)
Urban	28	55	3.415
Rural	72	45	1.076
All consumers	100	100	1.737

Basis Sources: Appendix Tables A-1 and A-2.

The distribution of income among the constituent income classes of each of the urban and rural consumer groups is depicted by Table 7 below. The population shares of the richest and poorest urban income class are the same at 15% each, but their weights in terms of purchasing power are 37% and 6% respectively. The middle two income classes constituted the bulk of urban population, while the richest two income classes had the highest relative income shares. The pattern of distribution among rural income classes was different. The poorest rural income class had the greatest weight within the rural consumer group in terms of purchasing power (41%) although this weight was much less than commensurate with its importance in total rural population (66%). The richest two income classes comprised such a minor proportion of rural population that their relative income shares were the lowest.

TABLE 7: Distribution of Income among Income Classes Within Each of the Urban and Rural Consumer Groups (1965)

Income classes	Percent of population	Percent of income	Average per capita annual income (in '000 TL)
URBAN:			
1	15	6	1.310
2	40	23	1.968
3	30	34	3.942
4	15	37	8.367
All urban consumers	100	100	3.415
RURAL:			
1	66	41	0.669
2	24	32	1.457
3	8	19	2.551
4	2	8	4.122
All rural consumers	100	100	1.076

Basis Source: Appendix Tables A-1 and A-2.

The T coefficient, which has been adopted in this study to measure income inequality, indicates that the poorest two rural income classes and the poorest urban income class had average per capita incomes less than the average per capita income for all consumers (1,737 TL per year) These three income classes are called, arbitrarily, the "poor," relative to all consumers. It can be calculated from the figures underlying Table 2 that the "poor" constituted 69% of all consumers in Turkey but received only 36% of total incomes, giving an overall T coefficient of .33.

Economic consequences of the redistribution of income

For the redistribution simulations, the 1965 relative shares of base year disposable incomes for the two aggregate consumer groups and for their constituent income classes are maintained. However, three different hypothetical alternatives are considered for the distribution of incremental income of each consumer groups to its constituent income classes:

(1) distribution of all incremental income of each consumer group to the poorest income class, referred to as the "poorest biased alternative,"

(2) distribution of incremental income of each group to the constituent income classes according to their relative income shares in 1965, referred to as the "status quo alternative," and

(3) distribution of all incremental income of each consumer group to the richest income class, referred to as the "richest biased alternative."

By simulating the model discussed earlier, the effect of each of these distribution alternatives is measured, as shown in Table 8 below:

TABLE 8: Short-run Effect of Redistribution From Growth on Selected Macrovariables

As Percentage of base year values:	Poorest Biased alternative	Status Quo alternative	Richest Biased alternative
On skewness as measured by the T coefficient	-9.3	0.1	7.9
On labor employment	7.3	4.6	2.6
On the aggregate K/L ratio	-1.3	0.6	2.2
On value added	6.4	5.0	4.0
As Percentage of GNP:			
Contribution of households to the foreign exchange gap	10.5	11.03	12.0
Contribution of households to the saving gap	- .6	1.5	2.2

Basis Sources: Appendix Tables A-1, A-2 and A-3; Table 2; A.K. Chakraverti, Çemil Çinar and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968); OECD, Economic Surveys Turkey, 1972.

Compared to the 7.3% increase in employment of labor necessary to meet consumption by the poorest biased alternative, only a 4.6% increase is required by the status quo alternative and merely 2.6% for the "richest biased alternative." These rather significant differences are explained by the following influential factors: First of all, the poorest income class tends to consume a greater proportion of its incremental

income than the richer income classes do. Moreover, the incremental consumption patterns of the poorest income class and the interindustry technology together generate the largest amount of gross output per unit of aggregate incremental consumption and the largest demand for labor per unit of gross output necessary to meet incremental consumption. For analogous reasons, giving all incremental income to the richest class generates the smallest demand for labor.

As can be expected, the differential effects on the use of incremental capital relative to incremental labor are also significant. If the "poorest biased alternative" is pursued by policy in 1966, the aggregate K/L ratio involved in meeting total consumption in 1966 is 1.3% less than that involved in 1965. In contrast, the status quo alternative increases the aggregate K/L ratio by 0.6% and the "richest biased alternative" by 2.2%. This outcome is due mainly to the heavy weight given incremental output consumed by the poorest income classes, which has the lowest aggregate capital intensity and highest labor intensity of output.

The fact that value added by aggregate consumption increases most if the given incremental income is distributed all to the poorest income class has important implications. Part of this increase is due to the larger consumption by the poorest income class which has the highest propensity to consume incremental income. However, the same increase would have been observed even if there were no differences in the aggregate incremental propensities to consume among different income classes.

If the MPC were the same for income classes, then the size of aggregate consumption and saving would not be altered by different distribution

alternatives. This somewhat surprising result is due to two effects both caused by differences in consumption patterns which reinforce each other: (1) the interindustry dependence effect on output, i.e. tendency of gross output generated by a unit of aggregate incremental consumption to decrease across income classes, and (2) the tendency of value added by aggregate gross consumption output to decrease across income classes. While aggregate final consumption demand is unaffected, highest net income is generated by the poorest biased alternative because each unit of consumption by the poorest income class generates more gross consumption output than unit consumption by other income classes. Also each unit of gross consumption output generated by the consumption of the poorest income class has more value added than that generated by the consumption of richer income classes.

5. Conclusions

The Turkish data give clear evidence that income distribution is highly skewed between urban and rural household entities as well as among income classes within each entity. For each consumer group, the capital and imported intermediate input content of the gross output bundles is larger for the upper income classes than for the lower income classes, while the labor content is smaller. This can be attributed to the differences in the composition of the consumption bundles for the various income groups, the nature and magnitudes of the capital, labor, and imported intermediate input coefficients, and in the nature of the interindustry technology.

If the technology and average and marginal consumption patterns of the different income classes are assumed to be constant for a one year period, simulation of alternative distributions of a given incremental

income produce significantly different effects on total household savings, level and composition of household demand for goods and services, and consequently on the level and composition of derived demand for fixed capital investments, labor and imports.

It can be stated rather strongly on the basis of the simulation experiments that if incremental incomes are distributed more equally a more economical use of scarce capital and foreign exchange and more liberal use of labor is potentially possible. If relative scarcity of capital and foreign exchange and relative abundance of labor can be assumed for Turkey, all of the effects due to changes in the composition of demand upon redistribution are beneficial effects for efficiency in the utilization of factors of production. A lower rate of increase in household savings and its possible negative effect on growth should be outweighed by greater equity as well as efficiency in satisfying more of the wants of a larger number of people.

TABLE A-1: Sectoral Consumption Patterns
by Urban Income Class

Sector	1	2	3	4	Total
1	209,767.82	752,483.79	736,230.28	486,088.12	2,184,570
2	0.0	0.0	0.0	0.0	0
3	196,810.77	825,862.43	974,484.79	712,911.59	2,710,070
4	12,411.49	79,375.93	75,531.18	66,736.15	234,055
5	--	--	--	--	--
6	--	--	--	--	--
7	45,417.87	139,701.63	163,253.37	97,323.56	445,697
8	61,784.67	216,960.87	205,921.86	157,968.71	642,637
9	17,457.92	54,328.41	66,520.45	66,074.09	204,381
10	457,861.23	1,320,815.43	1,079,168.36	629,756.23	3,487,600
11	129,843.28	567,626.08	804,340.86	781,633.94	2,283,444
12	39,825.88	147,815.62	203,801.69	173,593.44	565,037
13	7,637.84	72,673.07	139,401.41	206,299.45	426,012
14	30,005.80	226,838.76	298,944.48	228,147.60	783,938
15	4,773.65	35,278.19	49,294.07	45,550.07	134,896
16	45,963.43	180,624.33	228,448.71	316,599.48	771,636
17	--	--	--	--	--
18	18,412.65	79,023.15	107,068.77	95,337.36	299,842
19	--	--	--	--	--
20	--	--	--	--	--
21	--	--	--	--	--
22	--	--	--	--	--
23	31,642.48	97,367.80	117,669.63	59,321.02	306,002
24	0.0	39,511.57	131,185.74	106,195.23	276,893
25	0.0	0.0	71,025.82	65,412.02	136,438
26	--	--	--	--	--
27	12,820.66	61,736.83	80,036.55	73,489.22	228.084
28	11,729.54	45,508.87	53,269.36	47,668.68	158,177
29	46,099.82	181,329.90	276,417.63	360,825.43	804,673
30	--	--	--	--	--
31	1,773.07	10,936.24	36,572.99	110,300.03	159.582
32	--	--	--	--	--
33	64,512.47	408,521.44	609,549.91	983,166.53	2,065,751
34	--	--	--	--	--
35	--	--	--	--	--
36	9,274.52	63,500.74	107,863.83	114,404.83	295,045
37	116,477.06	555,278.71	873,246.50	823,873.69	2,368,877
TOTAL	1,572,308.00	6,163,100.00	7,489,251.00	6,808,678.00	22,033,337

Basis Sources: Republic of Turkey, Prime Ministry, State Institute of Statistics, Results of the Survey of Consumer Expenditures in Ankara, Erzurum, Adana, Samsun, Ordu, Bursa, Diyarkakir, Antalya, İstanbul, İzmir, publication nos. 538, 596, 512, 558, 549, 573, 550, 551, 548, 531 (Ankara: State Institute of Statistics Printing Office, 1968, 1969, 1966, 1969, 1969, 1969, 1969, 1969, 1967); State Institute of Statistics, October 25, 1970 Population Census (Ankara: Devlet Istatistik Enstitüsu Matbaası, 1971), pp. 5-6; A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968)

TABLE A-2: Sectoral Consumption Patterns
by Rural Income Class

Sector	1	2	3		Total
1	4,260,820.29	2,370,568.27	881,928.51	272,149.47	7,785,467
2	110,014.20	351,395.53	287,040.30	128,806.31	887,256
3	1,167,042.54	735,768.17	417,803.04	145,098.38	2,465,712
4	65,413.85	57,304.50	39,473.20	15,436.96	177,629
5	--	--	--	--	--
6	--	--	--	--	--
7	359,776.17	163,263.77	92,825.09	18,137.30	634,002
8	448,976.88	245,436.26	92,825.09	36,274.59	823,513
9	40,140.32	138,936.38	92,825.09	38,074.82	309,976
10	1,465,864.90	735,768.17	324,977.95	90,686.49	2,617,298
11	558,991.08	821,724.92	526,850.00	224,983.49	2,132,550
12	110,014.20	106,499.87	67,230.60	34,474.37	318,219
13	40,140.32	32,436.51	20,908.18	8,686.10	102,171
14	99,607.45	147,045.51	92,825.09	39,920.06	379,399
15	199,214.91	171,372.89	106,703.80	45,365.75	522,658
16	99,607.45	245,436.26	199,528.89	88,886.26	633,459
17	--	--	--	--	--
18	--	--	--	--	--
19	--	--	--	--	--
20	--	--	--	--	--
21	--	--	--	--	--
22	--	--	--	--	--
23	86,227.35	73,522.76	42,717.57	18,137.30	220,605
24	--	73,522.76	48,665.58	29,388.72	151,578
25	--	73,522.76	58,398.70	33,574.25	105,496
26	---	--	--	--	--
27	10,406.75	16,218.26	13,878.70	7,245.92	47,750
28	n.a.	n.a.	n.a.	n.a.	n.a.
29	29,733.57	338,961.53	259,910.26	116,114.71	744,721
30	--	--	--	--	--
31	17,840.14	16,218.26	10,273.85	7,245.92	51,578
32	--	--	--	--	--
33	298,822.36	571,963.79	431,681.75	188,663.89	1,491,132
34	--	--	--	--	--
35	--	--	--	--	--
36	--	--	--	--	--
37	508,444.01	686,572.80	522,163.68	226,783.72	1,443,965
TOTAL	9,977,099.00	8,173,462.00	4,641,437.00	1,814,136.00	24,606,134

Basis Sources: Edgar Z. Palmer, ed., Agriculture in Turkey: Long-term Projections of Supply and Demand (İstanbul: Robert College School of Business Administration, 1966), pp. 20-30; Mübeccel B. Kıray, Eregli, Ağir Sanayıdan Önce Bir Sahir Kasabası (Ankara: State Planning Organization, 1964), pp. 86-104; Jan Hinderink and Mübeccel B. Kıray, Social Stratification as an Obstacle to Development: A Study of Four Turkish Villages (New York: Praeger Publishers, 1970), Chap. 6; unpublished results of an experimental survey by the State Institute of Statistics in five villages of the Antalya Lake region; a recent survey conducted by a team headed by Icen Börtöcene of the State Planning Organization in the squatter neighborhoods of Konya, Samsun, and Diyabakir; and a survey by Dr. Orhan Köksal of Hifzisihha Enstitüsü and Hacettepe University, undertaken in the village of Ankara mainly to determine nutrition levels of various income groups; A.K. Chakraverti, Çemil Çinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbassı, 1968).

TABLE A-3: Sectoral Import, Value Added and Foreign Exchange Coefficients

I-O Sector	M	V	F
1. Agriculture	0.0214	0.7520	0.1140
2. Forestry	0.0004	0.7320	0.3250
3. Animal husbandry & fishery	0.0184	0.3090	0.1500
4. Coal mining	0.0015	0.5990	0.3920
5. Iron-ore mining	0.0	0.5450	0.3920
6. Other mining & quarrying	0.0491	0.8890	0.3920
7. Sugar	0.0	0.5200	0.3260
8. Tobacco processing & prod.	0.0	0.3990	0.3260
9. Alcoholic beverages	0.0034	0.7690	0.3260
10. Other food products	0.0306	0.2110	0.3260
11. Textiles & appar. (exc. shoes)	0.0336	0.4510	0.4210
12. Wood prod. (inc. furniture)	0.0274	0.3340	0.3250
13. Paper, prtg. & stationeries	0.1158	0.4810	0.5620
14. Leather & products	0.0030	0.3830	0.3580
15. Rubber, plastics & prod.	0.2617	0.5490	0.4390
16. Chemicals & pharmaceuticals	0.3322	0.4990	0.5350
17. Fertilizers	0.2041	0.5130	0.5350
18. Petroleum refineries	0.2011	0.7380	0.5000
19. Cer., glass & other non-met.	0.1013	0.6740	0.4210
20. Cement	0.0215	0.5220	0.3000
21. Iron & steel (inc. met. coke)	0.2045	0.4720	0.4960
22. Non-ferrous metals	0.1235	0.6000	0.3200
23. Metal prod. (inc. appliances)	0.1942	0.5230	0.3190
24. Agr. & non-elec. machinery	0.5180	0.6070	0.4410
25. Elec. mach. & appliances	0.3898	0.6480	0.3630
26. Trans. equip. (inc. repairs)	0.4197	0.4200	0.4630
27. Elec. gen. & distribution	0.0	0.5540	0.3450
28. Railway transportation	0.0385	0.3100	0.2230
29. Other transportation	0.0372	0.6000	0.2230
30. Trade	0.0017	0.8630	0.0300
31. Communications	0.0	0.8210	0.2000
32. Banking, ins. & co-operatives	0.0125	0.8010	0.1000
33. Prof., per. serv., etc.	0.0403	0.7810	0.2000
34. Building construction	0.0	0.4570	0.3000
35. Non-building construction	0.0	0.5840	0.3000
36. Pub. serv. (inc. water & gas)	0.0218	0.9810	0.3000
37. Ownership of dwellings	0.0	0.9350	0.0060

Basis Sources: A.K. Chakraverti, Çemil Cinar, and Güler Canalp, Structural Interdependence of the Turkish Economy (Ankara: Türk Tarih Kurumu Matbaası, 1968); James W. Land, Economic Accounts of Public Enterprises in Turkey, 1939-63 (Ankara: State Institute of Statistics, 1969).

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