METU Studies in Development 13 (1-2) 1986, 193-216

INCOME DISTRIBUTION AND DOMESTIC TERMS OF TRADE IN TURKEY, 1978–1983:

Estimated Measures of Inequality and Poverty

Merih CELASUN*

(received: February 1986)

1. INTRODUCTION

The three countrywide size distribution of income studies conducted for the years 1963, 1968 and 1973 shed considerable light on the equity aspects of Turkey's observed economic development in the 1963–73 period. Although their statistical bases are not strictly comparable, these three studies point to the existence of a high degree of relative income inequality in Turkey. The estimated Gini coefficients for 1963, 1968 and 1973 are 0.55, 0.56 and 0.51, respectively. As reviewed in SPO (1976), the data assembled in these three studies point out a distributional reversal after 1968, and a distinct improvement in the 1970–73 subperiod. The latter is largely attributed to (a) more favorable terms of trade for and accelerated productivity growth in agriculture in the early 1970's, and (b) improved balance of payments with reduced rent-seeking behavior in the economy. The historical roots, institutional context and sector-specific aspects of Turkey's income distribution in 1960–75 are examined in the interdisciplinary works collected in Özbudun and Ulusan (1980).[1]

In turn, the prolonged unavailability of a countrywide size distribution of income study since 1973 gives rise to numerous difficulties in the appraisal of Turkey's development and adjustment po-

*Professor, Department of Economics, Middle East Technical University, Ankara. The author is indebted to Sherman Robinson, Sibel Güven and Tevfik Yaprak for computer programming support, and helpful discussions. He also acknowledges the stimulating comments of Oktar Türel on the estimation of net disposable incomes in 1973–83.

1. For an incisive review of the papers in Özbudun and Ulusan (1980), see Erdilek (1983).

licies in the post-1973 world oil crisis period. The available evidence suggests possible gains for the poor in 1973–77 during which the Turkish economy expanded rapidly in inward-oriented ways through a massive accumulation of external debt by the year 1978. In response to the deep foreign exchange crisis of 1978–1979, and the world oil price shock of 1979, economic policies were substantially redesigned in 1980, generating favorable foreign trade outcomes as reviewed in detail by Şenses (1983). Despite the favorable response of the external sector, the Turkish economy appears to have experienced, however, a significant deterioration in income distribution during the Fourth Plan Period (1979–83) as evidenced by the observed shifts in the domestic terms of trade against agriculture, and the massive fall in urban real wages. Notwithstanding the broadly observed changes in the functional income distribution in favor of nonagricultural capital income, the stagnating nature of domestic private savings has become a stumbling block for a speedy economic recovery in the medium-run (see Celasun (1986)). A related issue pertains to the measurement of the extent of absolute poverty in the country, and the design of appropriate policy mixes for its effective alleviation in the future periods.

In response to the need for distributional information in the national policy debate, an attempt is made in the present paper to reconstruct ex-post estimates for size distribution of income in the benchmark years 1973, 1978 and 1983. The analytical core of the paper takes as its point of departure the 1973 sources of inequality analysis by Derviş and Robinson (1980). The latter analysis clearly brings out two major sources of overall inequality in Turkey: namely, (a) the large disparity between the mean incomes of agricultural and nonagricultural households, and (b) the exceedingly high degree of income inequality within the agricultural sector. Utilizing available national income accounts and population census data, the present paper explores the quantitative nature of the distributional shifts observed between the benchmark years 1973, 1978 and 1983 on the basis of within group inequality measures derived in earlier empirical studies.

The remaining part of the paper is in four sections. Section 2 reviews Turkey's domestic terms of trade and intersectoral productivity differentials in 1973–83. The review in Section 2 is coupled with an analysis which decomposes the effects of real growth, pure infla-

tion and terms of trade changes on sectoral incomes. Section 3 sketches the analytical framework adopted in the derivation of overall size distribution of income. Section 4 presents the estimated size distributions of income, exclusive and inclusive of workers' remittances, for the years 1973, 1978 and 1983. In Section 5, the estimated positions and structures of the poor and wealthy are analyzed. Finally, Section 6 provides a brief discussion of the policy implications of distribution and growth in Turkey. Appendix to the paper gives the data base assembled for the estimation of agricultural and nonagricultural household numbers, and net disposable incomes.

2. INTERSECTORAL PRODUCTIVITY DIFFERENTIALS AND DOMESTIC TERMS OF TRADE IN TURKEY 1973-83

Per worker value added (or, simply, productivity) differences between the agricultural and nonagricultural sectors have been investigated by Kuznets (1966), and Chenery and Syrquin (1975). The cross-country comparisons suggest that intersectoral productivity differences are substantial at earlier stages of development, and gradually narrow in a fairly systematic way at higher levels of income. The lower per capita income in agriculture is not necessarily attributable to purely technical requirements of agricultural production, but to a variety of socio-economic factors which retard labor reallocation process in the course of growth and structural change. Viewed from the supply side of development, the movement of labor from low productivity agriculture to higher productivity nonagricultural sectors (such as industry and services) has been an important source of value added expansion in most countries.

The cross-country average for the ratio of value added per labor unit in nonagricultural sectors to that in agriculture is estimated as 2.37 in Kuznets (1966), while the actual Turkish data shows this ratio to be 4 to 5 in 1953-73 as analyzed in Celasun (1983:90). The deviations of Turkey's sectoral productivity differentials from Kuznets' cross-country norms are unusually large, and generate a major impact on overall income inequality in Turkey. As shown by Dervis and Robinson (1980), the lower bound estimates for the contribution of intersectoral productivity differential to overall inequality (measured by log variance) for 1963, 1968 and 1973 are 63, 81 and 69 percent, respectively. The orders of magnitudes of these estimates warrant a close look at the intersectoral productivity differentials in the 1973-83 period as shown in Table 1.

TABLE 1. Sectoral Employment Levels and Productivity Differentials: 1978–83

	Employment (Thousand workers)			Productivity Differentials in constant 1973 prices			Productivity Differentials in current prices	
	1973	1978	1983	1973	1978	1983	1978	1983
1. Agriculture	9,580	9,537	9,451	1.0	1.0	1.0	1.0	1.0
2. Nonagriculture								
a. Mining and energy	160	217	226	5.9	7.3	4.7	6.0	10.2
b. Manufacturing	1,419	1,610	1,685	4.2	3.9	4.4	4.6	7.1
c. Construction	456	562	586	4.0	3.5	3.3	3.6	3.5
d. Trade	544	646	696	8.0	7.7	7.9	8.1	12.9
e. Public services	682	1,083	1,204	6.1	3.9	3.9	3.9	3.3
f. Other services	1,417	1,594	1,720	4.8	5.0	4.3	5.0	6.3
g. Subtotal (a to f)	4,678	5,712	6,126	5.1	4.7	4.6	4.9	6.5
3. Total	14,258	15,249	15,577					

1 Productivity differentials are measured by the ratios of per worker value added in agriculture to per worker value added in other sectors.

Source: World Bank (1982) and SPO (1984b) for employment data, where the figures for public services employment are the author's estimates.

The data provided in Table 1 show that the agriculture-non-agriculture productivity ratio measured in constant 1973 prices declines from 5.1 in 1973 to 4.7 in 1978 and 4.6 in 1983. However, measured in current prices, this ratio increases to 4.9 in 1978 and further to 6.5 in 1983, which is probably the highest figure ever observed in the cross-country context. In current prices, the productivity differentials for mining and energy, industry, and trade sectors are much larger than the average figure obtained for non-agricultural sectors as a whole. The comparison of these differentials under constant and current price cases reveals a massive deterioration in the domestic terms of trade for agriculture in 1978–83 with significant implications for distributional shifts in this subperiod.

The data assembled in Table 2 clarify further the adverse effects of movements in relative prices against agriculture, particularly in 1978–83. In this table, net prices denote indices of value added deflators at the sector level. Compared with the relative price position observed in 1973, it is evident that relative price changes in 1973–83 increasingly favored manufacturing and trade sectors, and moved against agriculture, public services and construction in significant degrees. In 1978–83, mining and energy sector benefitted most substantially from domestic terms of trade shifts as the government subsidies were substantially lowered in energy-related activities in the economy.

Tables 3 and 4 show for the 1973–78 and 1978–83 subperiods, respectively, the decomposition of total nominal changes in sectoral value added into the effects of three causal factors: (a) real growth (in constant prices), (b) pure inflation, and (c) movements in domestic terms of trade. The underlying scheme of computation is briefly outlined in Appendix. If domestic terms of trade were to remain constant at the base year proportions, the contributions of real growth and pure inflation would simply add to total nominal change in sectoral value added. Thus, the column (4) in these two tables shows the income shifts ($\pm$) among sectors due to the workings of relative price changes in the economy. By definition, the sectoral sum of these income shifts is zero, and thus agriculture's income loss (gain) is offset by nonagriculture's gain (loss) in both tables. As noted in Table 4, the cumulative income effect of changes in the terms of trade for agriculture is 662 billion TL during 1978–83, which is about 7 percent of GDP in 1983. The income loss of public services is also large, and

TABLE 2 Changes in Sectoral Value Added and Net Prices: 1973–83.

	Annual Rate (%) of Growth in Real Value Added		Net Price Indices (1973 = 1.0)			
			Absolute levels[2]		Deflated levels[2]	
	1973–78	1978–83	1978	1983	1978	1983
1. Agriculture	6.0	2.1	3.08	18.96	0.97	0.73
2. Nonagriculture						
a. Mining and energy	17.6	2.1	2.55	34.29	0.80	1.33
b. Manufacturing	7.1	2.3	3.56	35.29	1.12	1.38
c. Construction	6.5	1.3	3.16	20.73	1.00	0.80
d. Trade	7.7	3.1	3.26	32.46	1.03	1.26
e. Public services	6.3	4.7	3.01	15.60	0.96	0.60
f. Other services	7.3	1.4	3.12	27.33	0.98	1.06
g. Subtotal (a to f)	7.5	2.2	3.22	28.30	1.01	1.10
3. GDP (1 + 2g) (factor cost)	7.1	2.2	3.17	25.80	1.00	1.00

1 Indices of sectoral value added deflators recomputed by the author with 1973 = 1.0.

2 Absolute levels deflated by GDP price index (deflator).

Source: State Institute of Statistics national income series in constant 1968 prices and current prices as provided in SPO (1984b).

TABLE 3 Decomposition of Changes in Sectoral Value Added: 1973–78[1]
(Unit: Billion TL)

	1973	Changes in Value Added in 1973–78 Due to				1978
		Real Growth Effect	Pure inflation Effect	Domestic terms of Trade Effect	Total Change	
	(1)	(2)	(3)	(4)	(5)	(6)
1. Agriculture	73.2	24.6	212.4	8.9	228.2	301.3
2. Nonagriculture						
a. Mining and energy	7.2	9.0	35.2	10.1	34.1	41.3
b. Manufacturing	46.2	18.9	141.5	25.5	185.9	232.1
c. Construction	14.8	5.5	44.0	0.3	49.2	64.0
d. Trade	35.1	15.8	110.6	4.4	130.9	165.9
e. Public services	32.3	11.5	95.2	5.9	100.8	133.1
f. Other services	57.0	24.0	176.1	4.7	195.3	252.3
g. Subtotal (a to f)	192.5	84.7	602.6	8.9	696.3	888.8
2 GDP (1 + 2g) Factor cost)	265.7	109.3	815.1	0.0	924.4	1190.1

1 Some totals may not precisely add due to rounding.

Source: The author's estimates.

reflects the sharp fall in the real salaries of government employees (see Celasun (1986)).

A further critical observation relates to the position of the trade sector, whose employment level was about 7 percent of agricultural employment in 1978. In current prices, the ratio of trade value added to agricultural value added was 55 percent in 1978, and increased to 95 percent in 1983. The nominal value added increment of the trade sector exceeded the value added change in agriculture in 1978–83,

TABLE 1. Decomposition of Changes in Sectoral Value Added, 1978–83[†] (Unit: Billion TL)

	1978	Changes in Value Added in 1978–83 Due to				1983
		Real Growth Effect	Pure Inflation Effect	Domestic Terms of Trade Effect	Total Change	
	(1)	(2)	(3)	(4)	(5)	(6)
1. Agriculture	301.3	33.3	2385.5	662.0	1756.7	2058.0
2. Nonagriculture						
a. Mining and	41.3	4.1	265.6	198.2	459.7	501.0
b. Manufacturing	232.1	27.5	1850.9	484.5	2362.9	2595.0
c. Construction	64.0	4.2	486.3	106.9	383.6	447.6
d. Trade	165.9	29.8	1395.1	363.6	1788.5	1954.4
e. Public services	133.1	34.6	1195.4	502.2	727.8	860.9
f. Other services	252.3	11.3	1879.5	224.7	2115.4	2367.8
g. Subtotal (a to f)	888.8	103.3	7072.7	662.0	7838.0	8726.8
3. GDP (1 + 2g) (factor cost)	1190.1	136.5	9458.2	0.0	9594.7	10784.8

† See footnote on Table 2.

mainly as a result of the unprecedented rise in average trade margins in the economy. The relatively low savings propensity of income generated in the trade sector (covering both domestic and foreign trade activities) may partially explain the resource mobilization difficulties faced in the country in mid-1980's.

In sum, the sizeable shifts in the domestic terms of trade for agriculture in 1973–83 broadly justify our income distribution analysis in Section 4, which views agriculture-nonagriculture split as the major source of overall inequality in Turkey.

3. ANALYTICAL FRAMEWORK: DERIVATION OF THE OVERALL DISTRIBUTION OF INCOME

In the present study, the derivation of the overall distribution of income adopts the numerical technique designed in Robinson (1976). For the application of this technique, it is assumed that income groups are distinguished so as to provide a complete and mutually exclusive decomposition of the society. The distribution of income within each group is specified by the probability distribution function:

$$f_i(y;\theta_i) \qquad , \quad i = 1,\ldots,n$$

where y denotes income, θ_i is a vector of parameters for each distribution, and f_i designates the functional form for the distribution within group i. The overall income distribution is given by

$$f(y;\theta) \qquad \sum_{i=1}^{n} w_i f_i(y;\theta_i) \tag{1}$$

where θ is the set of all within group parameters θ_i, and the weight w_i is the population share of group i.

Furthermore, if the within-group distributions are assumed to be log-normal with log-variances σ^2_i, the log-mean incomes (γ_i) would be given by

$$\gamma_i \qquad l_n(y_i) \qquad \frac{1}{2}\sigma^2_i \quad , \quad i = 1,\ldots,n \tag{2}$$

where y_i is the arithmetic mean income. Then, the overall log-variance (σ^2) becomes

$$\sigma^2 \quad \sum_{i=1}^{n} w_i\sigma^2_i \quad \sum_{i=1}^{n} w_i(\gamma_i - \bar{\gamma})^2 \tag{3}$$

where $\bar{\gamma}$ is the arithmetic mean of γ_i.

Within the general framework sketched above, Robinson (1976) develops a technique to numerically aggregate the within group distributions which are assumed to be of the log-normal form. The technique involves the use of a variant of Newton's iterative method in finding the numerical values of benchmark points corresponding

to deciles, which are defined as the income ranges containing 10 percent shares of the overall distribution. The available computer program (also by Robinson) determines the mean incomes of deciles, and the Gini coefficients for the within-group distributions (G_j) and for the overall distribution (G) such that

$$G_j \quad 2.N\left(\frac{\sigma_j}{\sqrt{2}}\right) - 1 \quad , \quad j = 1,\ldots,n \tag{4}$$

and $$G \quad 1 - 2\int_0^{\infty} (y)\, dF(y) \tag{5}$$

where $N(.)$ is the cumulative normal distribution

$$F(y) \quad \int_0^{y} f(t\,|\,\theta)dt, \quad \text{and} \tag{6}$$

$$(y) \quad \int_0^{\infty} tf(t\,|\,\theta)dt \quad \int_0^{y} tf(t\,|\,\theta)dt \tag{7}$$

It should be noted that the numerically aggregated overall distribution does not need to be of the log-normal form. Its Gini coefficient (G) is also determined by numerical methods. On the basis of the size distributions generated by the computer program, it also becomes possible to explore the relative shares of group populations (as well as of total population) within specified levels of absolute income, which may be fixed so as to correspond to the poor, wealthy, etc. in the society.

4. SIZE DISTRIBUTIONS OF INCOME: 1973, 1978 AND 1983

4.1 Definitional Aspects and Assumptions

In the present paper, the application of the methodology outlined in Section 3 is based on the decomposition of the Turkish society into two income groups: namely, agricultural and nonagricultural households. Such a rather broad scheme of aggregation makes it feasible to derive numerically the overall size distribution of income

on the basis of a set of plausible estimates for the parameters of two within-group distributions, which are assumed to be of the log-normal from.

Table 5 presents the main data input assembled for the estimation of overall size distributions for the benchmark years 1973, 1978 and 1983. The 1973 distribution is numerically reestimated for purposes of comparison with the 1973 survey results as discussed in subsection 4.2. The details of data processing involved are summarized in Appendix Tables A.1 and A.2. The essential points and critical assumptions are the following:

(i) The census data (interpolated for the benchmark years) for rural-urban populations are mapped onto agricultural-nonagricultural categories on the basis of population share parameters projected (as trend values) from the historical data provided in Tümertekin (1975:120). As in the earlier distribution studies, households are regarded as income receiving units in the present analysis. The average agricultural and nonagricultural household sizes (namely, 6.23 and 5.21 persons, respectively, as estimated in the 1973 survey) are assumed to have remained constant in 1973–83. The household numbers for two income groups (and thus household group shares w_i) are then estimated for the benchmark years in our analysis.

(ii) To ensure comparability with the 1973 survey data, the net disposable income concept is used as the relevant income measure in the distributional analysis. The latter concept of income, besides excluding all taxes, also leaves out amortisations and undistributed enterprise profits. The net disposable income figures are treated in two steps. First, the economywide net disposable income (excluding workers' remittances) is broken down into two component parts by sector of origin, and labeled as agricultural and nonagricultural as shown in Appendix Table A.2. Secondly, these two component parts are distributed among agricultural households and nonagricultural households on the basis of the income share parameters shown in Table 5. For 1973, the income share parameters are directly obtained by aggregating the detailed income mapping matrix estimated by Dervis and Robinson (1980: 103-104). For 1978 and 1983, the income share parameters are gradually adjusted on the basis of shifting household proportions over time. For the intertemporal analysis of mean incomes and absolute poverty measures, all disposable income

figures are deflated to real values in constant 1973 prices by the price deflator for private disposable income derived from data given in SPO (1984a).

TABLE 5 Data Input in the Estimation of Distributional Statistics: 1973-83

	1973	1978	1983
1. Common Data for Estimates A and B[1]			
a. Agricultural net disp. income[2] by sector of origin (Billion TL)	70.84	291.79	1992.97
b. Nonagricultural net disp. income, by sector of origin (Billion TL)	139.23	639.70	6133.55
c. Workers' remittances (Billion TL)	16.62	23.64	348.10
d. Disposable income deflator (1973 = 1.0)	1.00	3.17	27.29
e. Share (%) of agricultural net disp. income			
Agricultural households	92.400	91.883	91.412
Nonagricultural households	7.600	8.117	8.588
f. Share (%) of nonagricultural net disp. income			
Agricultural households	8.685	8.129	7.625
Nonagricultural households	91.315	91.871	92.375
g. Household numbers (millions)			
Agricultural	3.430	3.619	3.858
Nonagricultural	3.206	3.857	4.647
h. Log variances			
Agricultural	1.26	1.26	1.26
Nonagricultural	0.65	0.65	0.71
2. Estimates A[3]			
Household mean incomes, (1973 Thousand TL per year)			
Agricultural	22.610	27.900	21.750
Nonagricultural	41.340	50.000	46.030
3. Estimates B[4]			
Household mean incomes, (1973 Thousand TL per year)			
Agricultural	25.110	28.900	23.250
Nonagricultural	43.840	51.000	47.530

1 The figures for net disposable incomes and workers' remittances are given in current prices.

2 The net disposable income figures exclude amortisation and undistributed enterprise profits.

3 Excluding workers' remittances.

4 Including workers' remittances.

Sources: Tables A.1 and A.2 in Appendix, and references cited in subsection 4.1.

(iii) The arithmetic real mean incomes of households in two income groups are obtained in two variant forms: Estimates A (exclusive of workers' remittances) and Estimates B (inclusive of workers' remittances). For Estimates B, workers' remittances are trea-

ted as additional income, and allocated to two income groups on the basis of household porportions estimated for each benchmark year.

(iv) The log-variance of within-group income distribution for agricultural households is maintained constant in 1973-83 at its 1973 survey value of 1.26. The log-variance for the nonagricultural household group is also assumed to be equal in 1973 and 1978 to the 1973 survey value of 0.65, but adjusted upwards to 0.715 in 1983 in the light of changes in the functional distribution of income estimated in the general equilibrium study by Celasun (1986) for the 1978-83 subperiod.[2] The log-variance estimates are based on rather strong assumptions, which are clearly stated here to facilitate possible critical assessments in the future. It may be noted that the overall size distribution of income is quite robust, and minor variations in our within-group log-variance estimates have not caused sizeable changes in the overall inequality measures.

On the basis of the data processing steps outlined above, the main data input arranged for the estimation of size distributions for 1973, 1978 and 1983 are summarized in Table 5.

4.2 Distributional Statistics

SPO (1976) and Dervis and Robinson (1980) provide two separate evaluations of the 1973 Hacettepe - SPO income distribution survey. Their estimates for the Gini coefficient for 1973 are 0.51 and 0.50, respectively. As pointed out by Dervis and Robinson (1980), the 1973 survey underestimates nonagricultural incomes and agricultural population, leading to a downward bias in the overall income equality. Viewed from such a perspective, our revised estimates for 1973 as compared with Dervis and Robinson figures in Table 6 provide the needed adjustment to the 1973 survey results. It may be reite-

2 In the interest of brevity, estimated changes in the functional distribution of income in 1978-83 are not reviewed in the present paper. For disaggregated data on factor incomes in this subperiod, including the shares of formal and informal nonagricultural labor incomes, see Celasun (1986).

TABLE 6 Distributional Statistics ,Agricultural and Nonagricultural Households, 1973

	1973 Survey Data[1]			1973 Estimates A[2]		
	Turkey	Agricultural	Nonagricultural	Turkey	Agricultural	Nonagricultural
Relative distribution (%)						
Quintile : 1	3.45	2.53	4.97	2.75	2.48	4.97
2	7.90	6.20	9.28	7.35	5.97	9.50
3	12.83	11.06	15.73	12.83	10.79	14.45
4	20.49	19.86	20.47	22.03	19.69	22.39
5	55.33	60.34	49.55	55.21	61.07	48.59
	100.00	100.00	100.00	100.00	100.00	100.00
Gini coefficient	0.50	0.56	0.45	0.5146	0.5726	0.432
Log variance	0.97	1.26	0.65	1.1714	1.26	0.65
Mean incomes (1973 TL)						
Overall	24,570	22,516	26,344	31,660	22,610	41,340
Top decile	96,090	97,009	95,282	118,120	95,780	131,180
Bottom decile	2,726	1,799	4,839	2,690	1,830	7,610
Ratio: Top decile-bottom decile	35.25	53.92	19.69	43.91	53.98	17.24
Ratio:Mean Turkey mean	1.00	0.92	1.07	1.00	0.71	1.31
Share (%) of						
Poor (< 12,000)	38.41	49.10	29.18	32.01	49.88	12.90
Wealthy (> 72,000)	5.11	5.31	4.93	9.52	5.56	13.76

1 Source : Dervis and Robinson (1980: 112) estimates aggregated from the 1973 survey data.

2 Source : The author's estimates (excluding workers' remittances).

3 Lowest (poorest) 20 percent

4 Highest (richest) 20 percent

rated that our adjustment retains their survey-based log-variance estimates, but adopts the national income accounts and population census data in the estimation of household numbers and main incomes. The revised estimate for the 1973 Gini coefficient is 0.5146. The poverty indicators associated with the 1973 revised distribution are discussed in subsection 5.2.

Table 7 gives the distributional statistics (exclusive of workers' remittances) for the benchmark years 1978 and 1983. The Gini coefficient decreases to 0.5089 in 1978 from 0.5146 in 1973, and then rises to 0.5224 in 1983. The overall log-variance of income estimated for 1973, 1978 and 1983 are 1.17, 1.14 and 1.22, respectively. The distributional shift in 1978-83 is quite significant, and attributed to (a) rapidly deteriorated terms of trade for agriculture, and (b) worsened inequality of income within the nonagricultural sector. The ratio of top decile-bottom decile mean incomes takes the values of 43.9, 42.0 and 47.3 in 1973, 1978 and 1983, respectively. Compared with the world standards of inequality as examined in Ahluwalia (1976) and Ahluwalia et al (1979), the distributional statistics in 1983 are quite disturbing with the bottom 40 percent of households receiving about 9.6 percent of net private disposable income generated in the economy.

Table 8 summarizes distributional statistics (Estimates B) based on household mean incomes inclusive of workers' remittances. As expected, the inclusion of remittances leads to higher mean incomes in both income groups in the society, and results in slightly reduced Gini coefficients. The share of remittances in total private disposable income varies in the benchmark years, and hence the minor differential effects on Gini coefficients. The evidence on the household distribution of workers' remittances is a mixed one, and it is possible that the share of agricultural households in remittances was higher than their share in the total number of households, particularly in the earlier part of the 1973-83 period. Thus, the overall inequality measures associated with Estimates B may have an upward bias, because of the proportionality assumption made in the allocation of remittances as indicated in subsection 4.1.

TABLE 7 *Distributional Statistics, Agricultural and Nonagricultural Households, 1978–83*

	1978 Estimates A[1]			1983 Estimates A[1]		
	Turkey	Agricultural	Nonagricultural	Turkey	Agricultural	Nonagricultural
Relative distribution (%)						
Quintile : 1	2.84	2.48	4.97	2.63	2.48	4.58
2	7.33	5.97	9.50	6.93	5.97	9.01
3	12.99	10.79	14.55	12.59	10.79	14.09
4	22.13	19.69	22.39	21.39	19.69	22.15
5	54.71	61.07	48.59	55.93	61.07	50.17
	100.00	100.00	100.00	100.00	100.00	100.00
Gini coefficient	0.5089	0.5726	0.432	0.5224	0.5726	0.4504
Log variance	1.1424	1.26	0.65	1.2212	1.26	0.515
Mean incomes (1973 TL)						
Overall	39,300	27,900	50,000	35,020	21,750	46,030
Top decile	144,940	121,890	158,660	132,830	95,020	152,570
Bottom decile	3,450	2,260	9,200	2,810	1,760	7,690
Ratio: Top decile-bottom decile	42.01	53.93	17.25	47.27	53.99	19.84
Ratio: Mean-Turkey mean	1.00	0.71	1.27	1.00	0.62	1.31
Share (%) of						
Poor (<12,000)	24.98	42.45	8.58	29.89	51.25	12.16
Wealthy (>72,000)	13.99	7.99	19.62	11.67	5.18	17.06

1 The author's estimates (excluding workers' remittances).

TABLE 8 Distributional Statistics with Workers' Remittances: 1973–83

	Turkey Estimates [1]		
	1973	1978	1983
Relative distribution(%)			
Quintile : 1	2.82	2.87	2.67
2	7.22	7.35	7.00
3	12.86	13.00	12.63
4	22.02	22.11	21.91
5	55.08	54.67	55.79
	100.00	100.00	100.00
Gini coefficient	0.5126	0.5033	0.5206
Log variance	1.151	1.1356	1.2039
Mean incomes (1973 TL)			
Overall	34,160	40,300	36,520
Top decile	127,220	148,540	138,180
Bottom decile	2,980	3,570	2,990
Ratio:Topdecile-bottom decile	42.69	41.61	46.21
Share (%) of			
Poor (≤ 12,000)	29.38	24.19	28.41
Wealthy (≥ 72,000)	10.91	14.57	19.50

1 Source : The author's estimates.

5. ESTIMATED POSITIONS OF THE POOR AND WEALTHY IN TURKEY: 1973–83

5.1 Relative Growth of Income of the Poorest 10 percent

In the intertemporal evaluations of income distribution data, a controversy exists as regards the extent to which the poor benefit from growth relative to the rich. Adelman and Morris (1973) advance the view of prolonged absolute impoverishment for the lower income groups in the course of development. Others, such as Ahluwalia (1976), suggest that "income levels of the poorer percentiles are likely to rise, but much more slowly than the average" (see also Ahluwalia et al (1979)). Hence a review of evidence is of interest in the context of the Turkish experience in 1973–83, which is admittedly not a sufficiently long historical period to draw definitive conclusions from.

The behavior of income of the poorest 10 percent, i.e., bottom decile, may usefully be examined on the basis of the growth rates of mean incomes of other subgroups in the society. As shown in Table 9, the countrywide bottom decile had experienced a higher rate of income growth in 1973–78 than average income mainly due to improved relative position of agriculture in the economy. In turn, the real fall in income of bottom decile was more pronounced in 1978–

TABLE 9 Real Income Growth of the Top and Bottom Deciles

	Percent Growth	
	1973–78	1978–83
Turkey	24.1	−10.9
Mean income	22.7	− 8.4
Top decile	28.2	−18.6
Bottom decile		−22.0
Agriculture	23.4	22.0
Mean income	23.4	−22.1
Top decile	23.5	
Bottom decile		− 7.9
Nonagriculture	20.9	− 3.8
Mean income	20.9	−16.4
Top decile	20.9	
Bottom decile		

Source: The author's estimates (excluding workers' remittances) in Tables 6 and 7.

83 than the decline of overall mean income reflecting the superimposed effects of (a) terms of trade shifts against agriculture, and (b) increased income inequality in nonagricultural sectors experiencing a sharp fall in real wages (see Celasun (1986)). It is evident that the social costs of economic crisis in 1978–80 and subsequent structural adjustment in 1981–83 have been high for Turkey's lower income groups in the 1978–83 subperiod.

5.2. Estimated Measures of Absolute Poverty

The evaluation of distributional changes in 1973–83 may further be extended by reexamining the estimated distributions on the basis of absolute income ranges defined by a number of cutoff points. Following the 1973 distribution study by Derviş and Robinson (1980), three cutoff points (namely, 12 000, 24 000 and 72 000 TL per year per household in 1973 prices) are defined to designate for groups of households: poor (< 12 000 TL), lower middle (between 12 000 TL and 24 000 TL), upper middle (between 24 000 TL and 72 000 TL) and wealthy (> 72 000 TL). The cutoff point for poor households, which may be regarded as the absolute poverty line, may also be expressed, in an approximate way, in different years' prices as follows:

	Poor Household Net Disposable Income per Year
In 1973 domestic prices	12,000 TL
In 1979 domestic prices	38,040 TL
In 1983 domestic prices	327,430 TL
In 1985 domestic prices	684,235 TL
In 1983 US $ (official exchange rate)	1,455 $

For economy of space, the present paper reports data only on poor and wealthy households. Before the interperiod review of relevant figures, it may be noted that the author's revised estimates for 1973 (as compared with the 1973 survey results shown in Table 6) indicate a notably smaller proportion of poor households within the nonagricultural sector, which results in a reduced share of poor in overall Turkey. Symmetrically, the overall proportion of wealthy households is significantly larger in the revised estimates. Despite the higher value of the Gini coefficient, the overall share of poor households is smaller in the revised 1973 distribution, because of the more consistent treatment of nonagricultural disposable income in the adjusted estimates.

As observed from data in Tables 6 and 7, for Turkey as a whole, the estimated share of poor households in total households for 1973, 1978 and 1983 is about 32, 25 and 30 percent, respectively. The generally downward trend in this share reflects to some extent the impact of rural-urban migration and the relatively smaller share of poor in nonagricultural households. The share of agricultural households in poverty is indeed very high, and estimated around 50, 42 and 51 percent in 1973, 1978 and 1983, respectively.

A closer look at the structure of poor and wealthy as shown in in Table 10 throws additional light on Turkey's persistent dualistic structure. The estimated share of agricultural poor in total poor is around 80 percent in 1973-83. In turn, wealthy households (earning more than 72 000 TL) are predominantly in nonagriculture, with the rapidly falling share of wealthy agriculturalists in rich households in Turkey.

It must be emphasized that our estimates for inequality and poverty measures are crude, and should be examined in terms of their trends and broad orders of magnitude. A more detailed analysis of poverty would involve the use of separate poverty levels and price deflators for agricultural and nonagricultural households as illustrated in a general equilibrium study by Güven (1986) for the 1973-79 period.

6. DISTRIBUTION AND GROWTH: POLICY IMPLICATIONS

In this paper, Turkey's domestic terms of trade and income distribution have been analyzed for the 1973-78 and 1978-83 subperi-

TABLE 10. Structure and Mean Incomes of Poor and Wealthy, 1973–83[1]

	Turkey	Agricultural	Nonagricultural
1. Composition (%) of			
a. Poor (< 12,000)			
1973	100.0	80.53	19.47
1978	100.0	82.27	17.47
1983	100.0	77.78	22.22
b. Wealthy (> 72,000)			
1973	100.0	30.17	69.83
1978	100.0	27.65	72.35
1983	100.0	20.13	79.87
2. Mean Incomes (1973 TL) of			
a. Poor (< 12,000)			
1973	6,400	5,900	8,440
1978	6,650	6,220	8,670
1983	6,400	5,840	8,360
b. Wealthy (> 72,000)			
1973	120,530	129,780	116,530
1978	126,100	135,670	122,450
1983	124,560	128,790	123,500

1. The author's estimates (excluding workers' remittances).

ods. It has been shown that the deterioration in the terms of trade for agriculture contributed heavily to the worsening of overall income distribution in 1978–83. In the latter period, which saw serious disruptions in the growth process, the absolute incomes of lower income groups also declined more substantially than the average incomes both within the agricultural and nonagricultural household categories.

The broad policy implications that emerge from the present study for distribution and growth in Turkey are the following:

(i) The major source of inequality in the overall size distribution of income remains to be the wide gap observed between the average incomes of the agricultural and nonagricultural households. In Turkey, the relative share of agriculture in total employment is still very high by cross-country standards, leading to a sizeable volume of underemployment in this sector.[3] Thus, in the long-run, the overall distributional problem must be addressed within the framework of a growth pattern which generates rapid expansion of productive employment in nonagricultural sectors. The future growth process

3. For 1978, the actual relative share of agriculture in total employment is 62.5 percent, while the predicted value of this share (by cross-country standards) is only 44.9 percent for a country of Turkey's population size and income level. See Celasun (1983: 17).

should provide more effective leakages to the poor, and be sustained by viable trade policies and noninflationary resource mobilization methods. As also argued in Celasun (1986), a higher tax burden on nonagricultural nonwage incomes is urgently needed in Turkey not only for purely distributional purposes, but also for the improvement of financial performance and resource mobilization in the public sector.

(ii) The income disparities within agriculture constitute also a significant source of overall inequality in the country. The inequality in agriculture may largely be attributed to (a) variations in regional conditions, and (b) uneven patterns of land ownership. For the near future, it seems unlikely that a socio-political consensus would emerge for a suitable land reform. To alleviate the prevailing poverty in agriculture, and reduce interregional income differences, rural development projects may be given an increased emphasis, which would require a rigorous use of planning methods formally integrating equity objectives in the project appraisal cycle. As illustrated in a case study by Akın (1985), properly structured development projects for the rural areas raise the productivity of the poor, and effectively attack the nonincome aspects of poverty. Furthermore, a broader participation of farmers' cooperatives in agro-industrial ventures and trading activities would provide an extended base for the growth of agricultural household incomes.

(iii) The growing income inequality within the nonagricultural household sector requires deeper empirical assessments in the future. The sizeable fall in the real incomes of the middle and lower income nonagricultural households in 1978–83, and their consequently reduced savings and investment efforts at the present shall likely impede a modest improvement in their property incomes from productive assets in the coming years. In urban areas, the struggle for shares between capital and labor is likely to intensify towards the 1990's. As extensively analyzed by Kasnakoğlu (1978), the socioeconomic background factors are also important in explaining nonagricultural income inequality in Turkey, and require an efficient mix of social policy measures to narrow earning and living differentials in the medium- and longer-runs.

(iv) As the decomposition of value added changes shows in Table 4, the sharply expanded share of the trade sector in national income in the inflationary subperiod of 1978–83 has resulted in a

rapid accumulation of economic rents in this sector. Public policy actions are required to overcome market imperfections, and rationalize marketing networks in domestic and export trade activities.

(v) In the distributional debate, it must be noted that there is a considerable scope for lowering fertility (and reductions in future population growth), which would reinforce other distributional measures. From a long-range perspective on poverty reduction, there is a need for a more explicit population policy in Turkey, aiming at lower rates of growth of the poorer segments of the population.

(vi) Finally, it is evident that the country's public planning efforts should strive to attain a more effective integration of growth, distributional and poverty alleviation processes. The 1973–83 experience suggests that the overall size distribution of income is more stable than the functional distribution in the face of policy changes. In Turkey's current stage of development, efficient policies for income and employment expansion appear to be the essential ingredients of an overall strategy which provides a larger scope for steady improvement in the positions of lower income groups in the society.

APPENDIX

A.1 Decomposition of Nominal Changes in Sectoral Value Added

Let subcript j denote sector of activity, and t time index, where t=0 designates the base year of a given time period (0, t). For the purposes of the present study, the total nominal change in sectoral value added during time period (0, t) is decomposed into three components as follows:

$$V_{jt} - V_{j0} = \Delta VA_j + \Delta VB_j + \Delta VC_j$$

(ΔVA_j: real growth effect; ΔVB_j: pure inflation effect; ΔVC_j: terms of trade effect)

with

$$\Delta VA_j = V_{j0}(R_{jt} - 1)$$
$$\Delta VB_j = V_{j0}R_{jt}(P_t - 1)$$
$$\Delta VC_j = V_{j0}R_{jt}(P_{jt} - P_t)$$

where V_{jt} = value added in sector j in current prices
R_{jt} = index of real value added in sector j
P_{jt} = index of net price (value added deflator) in sector j
P_t = index of aggregate net price (GDP deflator)

and $R_{j0} = P_{j0} = P_0 = 1.0$ at the base year t=0.

Table 4 in the paper summarizes the results of the value added decomposition for the consecutive subperiods 1973–78 and 1978–83, for which 1973 and 1978 serve as the base years, respectively.

A.2 Data Processing for Income Distribution

The data processing undertaken for the estimation of parameter values used in the derivation of size distributions of income is summarized in Tables A.1 and A.2. The footnotes on these tables indicate the data processing steps, and cite the main data cources. In the examination of Table A.2, it must be noted that the items (1c) and (2h) denote the net disposable incomes differentiated by sector of origin. Such a two-sector breakdown by source of income is made possible by (a) the available national income accounts data, and (b) a set of plausible assumptions on the growth of amortisations and undistributed enterprise profits. These two disposable income aggregates (namely, 1c and 2h in Table A.2) are then distributed among agricultural and nonagricultural household groups on the basis of income share parameters shown on Table 5 in the paper.

TABLE A.1 Structure of the Population and Households

	1973	1978	1983
1. Population (millions)[1]			
Urban	15.456	18.909	23.014
Rural	22.616	23.731	25.234
Total	38.072	42.640	48.248
2. Share (%) of Agricultural Population in[2]			
Urban pop.	9.500	9.380	9.163
Rural pop.	88.000	87.830	87.360
3. Population (millions)[3]			
Agricultural	21.370	22.543	24.035
Nonagricultural	16.702	20.097	24.213
Total	38.072	42.640	48.218
4. Households (millions)[4]			
Agricultural	3.430	3.619	3.858
Nonagricultural	3.206	3.857	4.647
Total	6.636	7.476	8.505

1 1973 and 1978 population data are interpolated figures from official census data. 1983 estimates for total and urban population assume 2.78 % and 4.2 % yearly growth from 1978 onwards, respectively. Places with population of 10,000 or more inhabitants are regarded as urban. Source: S.I.S. (1983: 33–37).

2 Projected trend figures from 1950–73 data of Tumertekin (1975 : 120) as cited in Dervis and Robinson (1980: 95).

3 Total agricultural population combines rural and urban populations with agricultural occupation. Nonagricultural population is a residual figure.

4 The average agricultural and nonagricultural households have 6.23 and 5.21 persons, respectively, as estimated from 1973 survey data in Dervis and Robinson (1980: 98).

TABLE A.2 Estimation of Net Disposable Incomes by Sector of Origin, 1973-83
(Billion TL, current prices)

	1973	1978	1983
1. Agricultural Sector[1]	73.15	301.31	2058.03
a. Value added (f.c.)	0.51	2.11	14.43
b. Direct taxes			
c. Gross agricultural disposable income (a −b)	72.64	299.20	2043.60
d. Amortisation	1.80	7.41	50.63
e. Net agricultural disposable income (c −d)	70.84	291.79	1992.97
2. Nonagricultural Sector[2]	192.51	883.76	8726.77
a. Value added (f.c.)			
b. Private disposable income (total)	245.80	1050.20	9487.30
c. Workers' remittances (total)	16.62	23.64	348.10
d. Gross agricultural disposable income	72.64	299.20	2043.60
e. Gross nonagricultural disposable income (b c a)	156.54	727.36	7095.60
f. Undistributed enterprise profits and amortisation	10.76	57.44	665.34
g. Other amortisation	6.55	30.33	296.71
h. Net nonagricultural disposable income (e f −g)	139.23	639.70	6133.55

1 For agriculture, the ratios of (1b / 1a) and (1d / 1a) are maintained constant in 1973-83.

2 For nonagriculture, the elasticity of item (2f) with respect to (2a) is taken as 1.2, and the ratio of (2g /2a) is maintained constant in 1973-83.

Sources : SPO (1976) for direct tax, amortisation and undistributed profit data. SPO (1984a) and various SPO Annual Programs for economic aggregates such as (1a), (2a), (2b) and (2c).

REFERENCES

ADELMAN, I. and MORRIS, C.T. (1973), **Economic Growth and Social Equity in Developing Countries**. Stanford, Stanford University Press.

AHLUWALIA, M.S. (1976), "Inequality, Poverty and Development," **Journal of Development Economics**, Vol. 3., 307-342.

AHLUWALIA, M.S., CARTER, N.G., and CHENERY, H.B. (1979), "Growth and Poverty in Developing Countries," **Journal of Development Economics**, Vol. 6, 299-341.

AKIN, Ü. (1985), Integration of Growth and Distributional Objectives in Project Appraisal: A Case Study of the Çorum-Çankırı Rural Development Project. A Master's Thesis in Operational Research, Ankara, Middle East Technical University.

CELASUN, M. (1983), Sources of Growth and Structural Change: The Case of Turkey. World Bank Staff Working Papers No. 614. Washington, D.S., World Bank.

CELASUN, M. (1986), "A General Equilibrium Model of the Turkish Economy, SIM-LOG-1: Validation Results (1978–83) and Counterfactual Experiments with Trade Liberalization, External Borrowing and Wage Policies (1981–83)," in this volume.

CHENERY, H.B. and SYRQUIN, M. (1975), **Patterns of Development: 1950–70**. London, Oxford University Press.

DERVİŞ, K. and ROBINSON, S. (1980), "The Structure of Income Inequality in Turkey (1950–73)," in Özbudun, E. and Ulusan, A., Eds. (1980).

ERDILEK, A. (1983), "Inequality Based on Inefficiency: The Turkish Case," Book Review, **Weltwirtschaftliches Archiv**, Band 119, Heft 4, J.C.B. Mohr (Paul Sieback) Tübingen.

GÜVEN, S. (1986), Income Distribution and Growth in Turkey: A General Equilibrium Analysis (1973–79). A Ph.D. Thesis in Operational Research, Middle East Technical University.

KASNAKOĞLU, Z. (1978), "A Simultaneous Model Approach to the Determinants of Male Earning Differentials in Turkey for 1968," **The Review of Economics and Statistics**, Vol. 60, 307–312.

KUZNETS, S. (1966), **Modern Economic Growth: Rate, Structure and Spread**. New Haven, Connecticut. Yale University Press.

ÖZBUDUN, E. and ULUSAN, A. Eds. (1980), **The Political Economy of Income Distribution in Turkey**. London, Holmes and Meier Publishers, Inc.

ROBINSON, S. (1976), Income Distribution within Groups, Among Groups, and Overall: A Technique of Analysis. Discussion Paper No. 65. Princeton, Woodrow Wilson School, Princeton University.

SIS (State Institute of Statistics) (1983), **Statistical Yearbook of Turkey**, 1983. Publication No. 1040. Ankara.

SPO (State Planning Organization) (1976), Income Distribution, 1973. Publication No. DPT: 1495-SPD: 290 (in Turkish). Ankara.

SPO (1984a) **Fifth Plan Supplementary Studies**, I. Ankara, July (in Turkish).

SPO (1984b) **Annual Program** 1985. Ankara.

ŞENSES, F. (1983), "An Assessment of Turkey's Liberalization Attempts since 1980 against the Background of her Stabilization Program," **METU Studies in Development**, 10 (3), 271–321.

TUMERTEKİN, E. (1975), **Urbanization and Urban Functions in Turkey**. İstanbul: Faculty of Letter Press, 1973.

WORLD BANK (1982), **TURKEY: Industrialization and Trade Strategy**. Washington, D.C.