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Burden of Taxes in Turkey, 1968

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The Distribution of Income and the Short-run Burden of Taxes in Turkey, 1968*

by

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1. Earlier Studies in Income Distribution in Turkey and Our Own Objectives

Economic development reveals itself in many ways. Some changes during the process of development are clearly visible. Consider, for example, changes in the national product, in efficiency of the economy, and in the political, social and economic structure of a developing country. Other changes are not so visible. A substantial effort is often required to establish their existence. Nevertheless they may be more important than those which are more visible. Consider, for example, changes in the income distribution. Is it becoming more equal or unequal and at what rate of change? It is important to know this because in turn the country's accumulation of capital, employment levels and, what is perhaps most important, the country's political stability may be affected. We wanted to study this problem in the case of modern Turkey.

Change implies a comparison of situations at at least two points of time, but we are able to provide evidence as to the "proper" income distribution of Turkey at only one. Only further research could give information for another point in time.

Since the 1950s several studies of income distribution have been made for Turkey (see references). They relate incomes to income group sizes, occupations, households, persons in general or economically active persons only. None of these studies considers *factor* income distribution. In fact, even the

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national income accounts published by the State Institute of Statistics (later called SIS) have shown no interest in it.

Most of these studies were partial. They covered either one or a few sectors and occupations (mainly agriculture) only. Two of these studies, however, are truly comprehensive; namely, both those in 1963 (see [21]) and in 1968 (see [18]). Consequently, we give them our attention here. Were they using about the same approach and about the same quality data, their results would have been comparable, hence both usable in our approach. As their approaches differ greatly, any comparison of their results is meaningless.

Both these studies aim at measuring income distribution by income size groups *in current prices*. Insofar as these prices were distorted by government tax and expenditure policies, the estimates, to be useful, should be changed to those at factor cost. We do make the necessary adaptations and transformations, but only for the 1968 study data.

We have several reasons for disregarding the 1963 study: a) That study is already nine years old. b) The study is very eclectic. For major non-rural sectors it is based on income tax declarations statistics (see [48], [49] and [50]). Other sources were used for agriculture and some minor non-rural sectors that are largely exempted from income tax provisions. Because of substantial quality differences in the data from the various sources, any formal analysis of distributional inequality for the whole country, its sectors and occupations, as stated in *Lorenz* curves, and *Gini* coefficients is liable to be more misleading than revealing. c) Even the quality of income tax declarations as a data source on the income distributions of the population subject to income tax, their best source, is questionable. Turkish income tax declarations are probably unrepresentative of the "true" distribution on account of widespread tax evasion.¹

The 1968 study was attractive to us for the following reasons: a) With some qualifications (about which we speak later) the 1968 study is a comprehensive one, using the same technique and producing data of about the same quality for all regions. b) It will be followed by a similar effort by the same team of researchers in the year 1973, which may provide us in the future with income distribution data at a rather point of time. As these data will be comparable with the 1968 study, one will be able to make a comparative analysis as to the direction of changes in income distribution in Turkey, an objective we had to give up reluctantly in this study.

¹ *Ayygun* and *Düslüoğlu* [1, p. 250] claim that elimination of it would increase the income tax revenue by 75 percent. Other evidence points also in this direction. *Krzyzaniak* [10] found that on the average, the Turkish tax system was only proportional despite highly progressive income tax rates. "Bulletin of Ministry of Finance" ([47], p. 159) shows that over the 1950-1969 period, yields of direct taxes were a nearly constant fraction of the total tax revenue, and not a steeply rising one as suggested by progressive income tax rates, a high rate of growth and a steady rate of inflation.

Yürükoğlu [35] by consideration of legal income tax provisions alone finds the tax progressive except at the top bracket, but the latter feature alone would not explain the above-noted behavior of aggregate tax yields.

The 1968 study, however, is not without problems of its own:

a) It was conceived first as a family planning survey. Income distribution questions were added later, when the research plan was already frozen. As households made of one person, and households in which the wife was 45 years or older were of no interest to family planning researchers they were not included in the sample.

b) The survey technique, if used for economic studies, shows unavoidable built-in biases. If too specific questions as to the personal incomes are asked, people may fear unauthorized use of their answers by tax collectors. Then, of course, false reporting may occur and invalidate the findings. On the other side, if to placate these fears, the questions about the income position of the household are more vague and interspersed in the questionnaire (this was the technique they, in fact, used) the interviewees may easily omit less regular income sources, without intending to tell a lie. This, we feel, may have happened, for example, with regard to incomes from dividends.

In general, such weaknesses would bias the estimates of absolute incomes downward, and that was observed,¹ but such a bias need not have affected strongly the relative distribution of it.

c) The researchers recognized that peasants are very suspicious if asked directly about their incomes. So the questions were put rather indirectly by asking the size of the farm, the quality of the land and the size of livestock herds owned. The interviewers, with cooperation of local authorities, then determined the net physical product and using local prices, estimated the net incomes of households. It is possible, however, that previous year instead of current year prices were sometimes used. Because of the continuing inflation in Turkey a downward bias in estimates from this source alone could be up to 10 percent.

d) Finally, we have already noticed that the 1968 study offers estimates in current prices, which may be distorted by government tax and expenditure policies. Specifically, if a good or resource is taxed, the price of it (including the tax) may rise, with the owner of the resource or good trying to shift the burden of this tax towards consumers of the resource or good. Full forward shifting occurs if the resource or good price after the tax is restored to its pre-tax price. Insofar as this occurs the burden of the tax is still distorting the income position of a person measured in current prices and has to be excluded before the "true" income distribution is revealed.

¹ The authors of the 1968 study [18, p. 3] tried to reconcile their estimates of personal disposable income in Turkey with that one would get using SIS figures. A large downward bias became notable. The 1968 study figures add up to 56 billion TL for the whole of Turkey. If the missing omitted 17 percent of households had the same average income as the rest of the country, 68 billion TL would have been accounted for, but the SIS figure would be 88 billion TL, the discrepancy being 22.82 percent.

A possible upward bias in SIS figures cannot be excluded (see footnote 2, p. 77). (A study of computing techniques, statistical procedures and publication habits of Turkish institutions publishing statistical data is badly needed to help to evaluate the wide discrepancies between various sources). Nevertheless, we are sure, some downward bias of the 1968 study data will stand.

Our purpose was to take the 1968 study data, correct them for some biases, and then to remove the tax-induced distortion in the price system. In terms of national income accounting this is equivalent to a change from current pricing to factor cost pricing. Insofar as such a transformation aimed also at finding the short-run burden of taxes that were shifted forward and at relating that to income size groups, we decided to enlarge our study by taking up a second objective, namely finding the distribution of the total short-run tax burden by income size groups.

2. Earlier Estimates of the Short-Run Tax Burden in Turkey and Our Approach

Several studies of the tax burden in Turkey were published since 1949. That year under the auspices of the Ministry of Finance a pioneering pamphlet was published giving the estimates of the Turkish tax burden for the year 1948 (see [30]). This work has been periodically updated, the latest version of it being published in 1972. In a way it gave a pattern of analysis to most of the studies that followed. The pamphlet defined the tax burden as the ratio of the total tax revenue for all levels of government to either GNP or NI, and then proceeded to show what this division by GNP or NI yielded.

Turkey after discussion in economic publications (see for example *Neu-mark* [13] and [14]) introduced an income tax (see [10]) in 1950, and the resulting increased flow of economic data awoke more interest in the question what was the tax burden in Turkey and how it was distributed among the various sectors and groups. The tax was not a general one. Some sectors, of which the most important one was agriculture,¹ were nearly completely exempted. Nevertheless, this tax has had a rather modern look, compared with the remainder of the Turkish tax system.

The tax burden analysis soon developed in two directions. One was to study the burden of the income tax, the other to study the burden of other taxes, especially taxes on agriculture. (For the relevant literature see our references.)

The income tax burden studies had a clear genealogy in economic thought. The tax, being direct, was supposed to fall on taxed factor incomes with no possibility of shifting its burden away. Also only the short-run was considered. On the basis of income tax declarations the tax burden may be assigned to different income groups. As already mentioned before (see footnote 1, p. 70) these data need not be representative of the population obligated under the Turkish income tax laws because of a widespread tax evasion.

Studies of burdens of other taxes had a less distinguished genealogy. These taxes, whether on agriculture or not, were mainly indirect. For indirect taxes one has to consider first problems of excess burdens before the size of the global burden itself is established, then of possible shifting of it away

¹ In 1965, 71 percent of economically active persons in Turkey were occupied in agriculture (see [49], T. 147, p. 167).

from the taxed group or product and finally the problem of timing of the burden (short- or long-run) which may affect both the size and the amount of shift. These crucial problems were either not considered or skipped. The burden of these taxes by definition was equated with the revenue they produced and it was assumed not shifted, falling on the groups obligated to pay the tax. As for timing of the burden, only the short-run must have been considered, although most of the taxes in Turkey are permanent and have been introduced many years ago.

Such legalistic rather than economic analysis led to far-fetched inferences and claims. Agriculture supposedly was taxed at half, or even less than half the rate of the non-agricultural sectors. Calls were made to redress this inequality, as if the Turkish peasant, already very poor, neither consumed city goods nor produced for sale to the cities.¹

Much depends on what the taxes, especially indirect ones, did to the economy, its markets and especially its prices.² For this, extensive empirical works on the incidence and on the effects of taxes were needed. But this is a thorny patch. In the U.S.A., for example, empirical efforts at measuring incidence are few and controversial (see the *Krzyzaniak* and *Musgrave* findings [11], and the discussion they stirred). Turkey so far has had no such empirical studies.

How then should one resolve the problem of excess burdens and of possible shifting? Leave it to the "legal incidence" concept as the Turks have done in the past? We do not have a 100 percent correct answer, but believe that ours approximates the truth better than the one obtained with the help of the legal incidence concept. Our results might be perhaps crude and wrong in some places, but on the average they should be closer to the "true" distribution of the burden of taxes in Turkey. We settled not for perfection but for such an improvement.

In our approach we leaned on two well established economic ideas. First, we followed the idea of short-run shifting and incidence as adopted in "Western" national income accounts, which assume that "true" direct taxes fall completely on factors taxed and indirect ones are all shifted forward in full (passed to consumer in higher prices). Insofar as that happened, measuring incomes at current prices distorted their absolute and relative values and need

¹ One cannot conclude without doubt, however, that Turkish agriculture was not undertaxed. This may have been true, but in such a case the past studies offered an incorrect proof. The dispute is peripheral to our main thesis and we do not enter it. On the other hand, our approach, if applied to this problem, offers the proper tools of analysis.

² Subsidies are negative taxes. In Turkey a substantial amount of subsidization is hidden in form of artificially low pricing policies of some state enterprises. As these enterprises in some industries represent a large component these hidden subsidies may have been a significant factor in estimation of regressivity or progressivity of the Turkish tax system. Unfortunately, there are no studies showing the amount and the distribution of gains from such subsidies, and deficits of public enterprises are not a good measure of them. They may have been due to a combination of causes among which the well known inefficiency of public enterprises is one. We disregard these hidden subsidies, and our omission may have resulted in some underestimation of progressivity or overestimation of regressivity of the Turkish tax system.

be corrected. The national accounts do this by subtracting the revenue of indirect taxes first before making a more appropriate measure of incomes, the one at factor cost.

The second line of our ideas is also well established in economic thought. If indirect taxes were passed on in higher prices to the consumer, their burden was borne by the latter only to the extent he consumed the taxed goods (the prices of which have increased). Thus, the burden of such taxes should be apportioned according to the percentage a given income size group consumes of a particular taxed good or service. This we adopted in our approach, following in spirit at least, if not literally, *Bishop's* studies for the U.S.A. (see [2] and [3]).

The national income accounts convention as to the treatment of the burden of taxes may, however, be wrong. First, some of the direct taxes may be shifted.¹ The part of it shifted forward should then be treated as an indirect tax. Second, not all indirect taxes must be shifted forward in full, some of their burden may remain on the producer of the good or be shifted backwards to various factors of production. Then the national income accounts subtract too much from measured income to get the income at factor cost. Third, most of the taxes, especially indirect ones, are non-neutral, hence have excess burdens, possibly already even in the short-run. Here, subtracting the tax revenue only may not be enough, the global tax burden being larger than the direct one (i.e. the tax revenue). Fourth, most of the taxes are more or less permanent, being introduced several years ago and still in force. Because of this their burdens should not be evaluated as being short-run but as dynamic or already being in the longer run,² and these may differ very much from their short-run value. Fifth, one should not really speak of tax burdens and gains from government expenditures as if these were separable, identifiable concepts. Only their combined effects can be observed and measured.³ Obviously, in the above discussed national income accounts approach, all government expenditures associated with tax revenues are either thought to be complete waste or are used to produce or buy pure public goods which do not have any effect on the operations of the economic system.

¹ This claim has been made by *Krzyżaniak* and *Musgrave* [11] regarding the corporation income tax. In Variant B we assumed this to hold for Turkey as one of the possible alternatives.

² *Krzyżaniak* (see [5], [6], [7], [8], and [9]) and *Harberger* (see [4]) have theorized about the long-run consequences of a tax and government expenditures policy. Too little is known about dynamic and long-run tax burdens and what is known is too complex to be incorporated easily in national income accounting procedures.

³ We were tempted to show here also the distribution of benefits of government expenditures, by allocating them to various income brackets. To do so and to stay within the limits of a publishable paper we would have to aggregate the government expenditures by type highly; the resulting analysis would then be very crude and perhaps misleading. We found that the usual aggregation of government expenditures type combines subtypes with divergent distributional effects. By leaving the distributional effects of government expenditures aside we offer an analysis that is compatible with the assumption that all government expenditures were pure waste, or that their benefits accrued in proportion to personal incomes.

In a small way we considered some of these objections in the present work by estimating two variants. In Variant A we assumed in the more standard way that the income tax, the corporate tax and the gifts and inheritance tax were not shifted. In Variant B we assume the income tax falls proportionally on all incomes above the basic personal exemption (because of suspected heavy income tax evasion in higher income brackets), and that the corporate tax and gifts and inheritance tax like a sales tax are shifted forward. The possibility of such shifting in U.S. manufacturing industries was considered controversial (see [11]), but should be less so for Turkey, where the modern industrial sector consists of state enterprises (with presumed non-competitive price behavior) and a few private firms.

With these two variants, we believe that we estimated the distribution of the burden of taxes closer to the "true," than do the earlier studies of the tax burden in Turkey. Though a preference among these variants perhaps is a matter of taste, Variant B results are more credible to us.

3. Data and Their Uses

Essentially we rely on three sources of data, which we adapted first to the needs of our study and then suitably transformed to get answers we seek. These main sources are:

a) The 1968 study of distribution of households and personal disposable incomes by income size groups for eight regions: three big cities and five more rural ones.¹

b) Eleven consumer expenditures surveys² by SIS during the period 1964-70.

c) Tax revenue data for 1968.³

In a minor capacity we also used *Yürükoğlu's* ([35], p. 27) income tax burden study.⁴

Let us start with the first source. The 1968 study estimated personal disposable incomes by regions made of Turkish provinces. The regions are shown in Table 1. Regions differ in climate, geography, soil conditions, and also in

¹ The 1968 study offers also distributions we do not consider here (for example by persons, by economically active persons, and by occupations). We were tempted to use them but the consumer surveys supplying information on quantities consumed are relating only to households. Any transformation of this information into one related to persons, economically active persons, or occupations would involve us in making risky assumptions and the result would be less credible.

² See references. The main deficiency of surveys is their narrowness. Only cities (towns) were sampled.

³ Ministry of Finance data were preferred. SIS data whenever differing from them were judged less reliable or needing reconciliation which they often failed to offer. Even so data for local governments required some making up.

⁴ *Yürükoğlu* offers effective tax rates for selected years, the last being 1966. As these rates change little over time we use 1966 effective tax rates for the 1968 incomes. For various reasons we get a large overestimate (see also footnote 2, p. 77). Consequently the tax liabilities for various income and region cells had to be rescaled so that their sum adds up to 1968 income tax receipts.

social, economic and cultural background, but are presumed to be homogeneous internally.

We already noted the downward bias of estimates of the 1968 study. One of the reasons was omission of 17 percent of the households. The authors of the 1968 study considered the problem and did nothing.¹ It is because they assumed that the missing households represented the same percentage of households in each region and the same percentage of incomes of the region. Any correction for the missing numbers increased absolute numbers but did not change distributions either in the regions or in Turkey as a whole.

Table 1: Regions

No.	Name	Provinces
1	İç Anadolu (Central Anatolia)	Afyon, Çankırı, Çorum, Eskişehir, Kayseri, Kırşehir, Konya, Nevşehir, Niğde, Sivas, Tokat, Yozgat, altogether 12 provinces.
2	Karadeniz (Northern Seaboard)	Amasya, Artvin, Bolu, Giresun, Gümüşhane, Kastamonu, Ordu, Rize, Sakarya, Samsun, Sinop, Trabzon, Zonguldak, altogether 13 provinces.
3	Ege ve Marmara (Aegean and Marmara)	Aydın, Balıkesir, Bilecik, Bursa, Çanakkale, Edirne, Kırklareli, Kocaeli, Kütahya, Manisa, Tekirdağ, Uşak, altogether 12 provinces.
4	Akdeniz (Southern Seaboard)	Adana, Antalya, Burdur, Denizli, G. Antep, Hatay, Isparta, Içel, Maraş, Muğla, altogether 10 provinces.
5	Doğu Anadolu (Eastern Anatolia)	Adıyaman, Ağrı, Bingöl, Bitlis, Diyarbakır, Elazığ, Erzincan, Erzurum, Hakkâri, Kars, Malatya, Mardin, Muş, Siirt, Tunceli, Urfa, Van, altogether 17 provinces.
6	Ankara	Ankara
7	İstanbul	İstanbul
8	İzmir	İzmir

We were lucky to be beneficiaries of additional information. Dr. *Serim Timur*, one of the authors of the 1968 study, advised us that households made up of single persons were percentagewise twice as numerous in the bigger cities than in the more rural regions. She had, however, no information as to the distribution of missing households between cities and rural regions where the wife was 45 years or older. These were obviously made of older people, relatives, etc. We decided to assume that these households were also twice as numerous in the three big cities than in the more rural regions.² As to the incomes of missing households, we assumed them to be equal to averages for the two groupings.

¹ Only when trying to reconcile their total personal disposable incomes with that of SIS did they make the correction (see [18], p. 3 and our footnote 1, p. 71). It turned out to be inadequate to close the large gap between the two estimates.

² It may be argued that: a) people in big cities live longer than in rural areas because of availability of modern medical services in the cities and b) the army of civil servants in Turkey, having tasted Western city life, retire more often than not to live in cities.

This resulted in a non-proportional increase in numbers between regions. Increasing appropriately the absolute numbers for regions and summing them up for Turkey as a whole did not affect the regional distributions, but the distribution of personal disposable income for Turkey as a whole was affected. In the process we also slightly lowered the gap between the 1968 study and SIS estimates of the total personal disposable income in Turkey.¹

The second and a major source of a downward bias in the 1968 study estimates remains intractable as ever. In our view, people simply did not report their full incomes and we do not know how much that is. We had no choice but to expand the required totals proportionally to a benchmark of an outside datum, which is more trustworthy. We decided to equate this benchmark with SIS figures.² Even if such figures err upward we are better off for two reasons: a) we believe that if SIS figures have an upward bias, it is smaller in absolute terms than the downward bias of the 1968 study estimates,

¹ The assumption that the missing 17 percent of households are twice as numerous in the three big cities calls for increasing numbers of the actual accounted households and incomes in the three big cities by a factor 1.372 and in five more rural regions by a factor 1.186. As the average city income was higher than in the rural areas this procedure increased the estimate of the total personal disposable income according to the 1968 study base to 69 billion TL, 1 billion over the figure given by the authors of the 1968 study (see also footnote 1, p. 71).

² The SIS figure is most likely an overestimate. In the process of computing the tax burdens we stumbled on an indirect "proof." *Yürükoğlu* computed effective (legal) income tax rates for several years, the latest being 1966. We applied the latter to the 1968 study personal incomes expanded to be equal to the SIS figures. An overestimate of the income tax liability resulted, but unexpectedly it was very high, by a factor $F = 4.04$. We started searching for explanation. A simple one, that 1966 effective rates must yield an error if applied to 1968 incomes, explains nothing. *Yürükoğlu's* effective income tax rates differ little from year to year. Whatever error is due to this change over time is small and equally probably may be an underestimate. For lack of information we assumed this error to be negligible, i.e. that the factor due to use of 1966 effective tax rates, $f_1 = 1$.

It matters, however, that the Turkish income tax is non-general. Nearly all incomes from agriculture and from small business are tax-exempt. Thus one expects a corrective factor defined, $f_2 = PI/[PI - PI(\text{agriculture} + \text{small business})]$. The question is how reliable data for income from agriculture and from small business. We used the 1968 study data on incomes by occupations and expanded the figures to the SIS benchmark figure for personal incomes. We also assumed that incomes from small business represent 20 percent of incomes from commercial and professional activities. On these bases we got another corrective factor $f_2 = 1.67$.

Then, there is the matter of tax evasion. *Yürükoğlu's* effective rates are established on the basis of legal provisions. Following *Ayyun* and *Döslüoğlu* (see footnote 1, p. 70) we claim the tax evasion factor to be $f_3 = 1.75$. Unfortunately $f_1 \times f_2 \times f_3 = 2.92 < F = 4.04$.

There is still something to explain. Let us call it factor $f_4 = F/f_1 \times f_2 \times f_3 = 4.04/2.92 = 1.38$.

This remaining factor f_4 is probably a composite one, due to many causes. Errors, especially underestimation of f_1 , f_2 and f_3 may explain it a little, but not the whole thing. Here the idea that SIS estimates of personal incomes are too high becomes very credible. We warn, however, readers that one should not jump to the conclusion that SIS estimates of PI was too high by 38 percent. The precision of this figure is rather low to draw an exact numerically point inference.

and b) for the same absolute bias, the one downward distorts the relative distribution more.¹

Correcting for the two sources of bias in 1968 study data required increasing incomes in the three big cities by a factor $e = 1.7351$, and in the five rural regions by a factor $w = 1.4995$, with corresponding increases in households by factor $h = 1.372$ and $g = 1.186$.

Let us now turn to consumer reports. SIS made eleven of them during the period lasting from July 1964 to May 1970. For information on surveys see Table 2. For each region of the 1968 study at least one, sometimes two cities were surveyed.

Although only cities were surveyed, we assumed their information to have broader applicability.² In the case of the three big cities, they are the main source of data for the provinces named after them (regions 6, 7 and 8). In the remaining more rural regions some of the people involved in agriculture do reside in cities, especially smaller ones. True, our objective could have been served better if the SIS consumer surveys had a broader coverage than cities alone, but only their surveys are available. We had to assume their representativeness of more rural regions as well.

Having made this assumption we still faced problems. First, surveys recognized only five income groups and these lumped higher income brackets together.³ On the other side the 1968 study recognized 35 income group sizes. The problem was of mapping consumption by five income group sizes into 35 income group sizes. Consequently, whenever smaller income group size was completely contained by the larger, we gave it the consumption pattern of the

¹ Let "true" incomes be noted I_1, I_2 , indirect tax burdens on person 1 and person 2, T_1, T_2 , and the absolute biases α_1, α_2 , then the relative distributions are:

<i>with a downward bias</i>	<i>when correct</i>	<i>with an upward bias</i>
$(I_1 - T_1) \left(1 - \frac{\alpha_1}{I_1 - T_1} \right)$	$\frac{(I_1 - T_1)}{(I_2 - T_2)}$	$\frac{(I_1 - T_1) \left(1 + \frac{\alpha_1}{I_1 - T_1} \right)}{(I_2 - T_2) \left(1 + \frac{\alpha_2}{I_2 - T_2} \right)}$
$(I_2 - T_2) \left(1 - \frac{\alpha_2}{I_2 - T_2} \right)$		

Note that in case $\frac{\alpha_2}{I_2 - T_2} \rightarrow 1$, the downward biased estimate distorts the distribution tremendously, but the upward estimate is affected much less.

² Alternative procedure will be offered in *Tuncay Sunman's* (unfinished at the moment) Ph.D. dissertation at Rice University entitled "The Short-Run Effects of Income Distribution on Some Macro-economic Variables: The Case of Turkey."

Sunman restricts the use of SIS consumer surveys to city incomes. For the rural areas he uses *Boralar's* [16] estimates of income distribution by income brackets and applies *Ç. Çukurova's* "Consumer Budget Survey, Antalya Lake Region" (unpublished) and other spot studies, especially those done by the State Planning Organization.

Sunman finds that the consumption pattern in rural areas shows a higher percentage of expenditure on food. Low income levels explain this to a degree. The relevance of this finding may be further diminished by the fact that Turkish peasants grow their own food, thus escaping from various taxes on processing and distribution of such goods. We feel that we offer here a reasonable alternative estimate to *Sunman's*, our estimates probably differing little from his.

³ Only the Istanbul survey was more specific but for consistency with the other regions we had to collapse its income group sizes once more to five only.

larger. Whenever the smaller income group size (as it rarely happened) overlapped two adjacent larger group sizes we made a linear interpolation weighing the larger groups percentage consumption patterns in proportion to these overlaps.

Table 2: Cities and Dates of Consumer Surveys*

No.	City	Dates
1-2	Adana	July 1964 - June 1965
1-2	Izmir	July 1964 - June 1965
3	Ankara	Sept 1964 - May 1965
4	Istanbul	June 1965 - May 1966
5	Samsun	Jan 1966 - Dec 1966
6	Antalya	March 1966 - Feb 1967
7	Diyarbakir	May 1966 - April 1967
8-9	Bursa	June 1966 - May 1967
8-9	Ordu	June 1966 - May 1967
10	Erzurum	June 1967 - May 1968
11	Eskişehir	June 1969 - May 1970

Source: *Consumer Surveys* [36] to [46].

* These surveys group consumer goods as follows: a) food, b) housing, c) furniture, d) clothing, e) health, and personal care expenditures, f) transportation, g) culture and entertainment and h) others. Adding to this i) savings, one gets personal disposable incomes in current prices. To us, savings represent also the cost of purchase of investment goods.

The second problem was inflation. Our research aimed to find the income distribution at factor cost in the year 1968, but surveys were taken for periods starting from July 1964 and ending in May 1970. The purchasing power of the Turkish lira in 1964 was not that of the lira of 1968. One way to deal with the subject could have been to increase (decrease) the income group sizes to account for inflation between the meanpoint of time the survey was made and July 1, 1968. This would make, however, the income group sizes of the survey a numerical curiosity, very hard to deal with consistently. Moreover, such a correction might also be wrong. Inflation may have had its own ratchet effect, with people trying to preserve their older higher pattern of consumption, if needed, and sacrificing savings. Fearing this, we left the income size brackets in the surveys unchanged.

Third, there was "embarras de richesse." For region 2, we had two surveys, for Ordu and for Samsun, for region 4 we had surveys for Adana and for Antalya, and for region 5 we had surveys for Diyarbakir and for Erzurum. The problem was which of the two surveys to use, and if both are to be used, how to make up the average consumption data. If only one is to be used, the criterion should be either closeness to the 1968 year or smallness of the city surveyed (so that it is more representative of the rural areas proper). We decided to use both available surveys. Existence of larger cities in the region required recognition in our procedure. The question was of weighting. Should the absolute figures be added, we would have given more weight to the larger

city and that we did not want. Instead we used the percentage consumption patterns for each city and averaged them. This procedure gave equal weight to percentage consumption pattern of the smaller and of the larger city.

Finally let us turn to the problem of taxes in 1968. Turks have conventions regarding what is and what is not a tax, and what is a direct or an indirect tax. In distinction to the American convention, contribution of workers to the several pension plans are not considered a tax¹ but only an insurance premium on par with voluntary life insurance payments to purchase annuities. Also there are no data covering the whole set of returns to social insurance institutions. Short of doing research on the subject on our own, we had no option but to follow the Turkish convention and not treat such contributions as a tax. Insofar as these contributions were a legitimate tax, our estimate of the tax burden for 1968 was understated, the distribution of it showing less inequality than in fact there was. The same may be said about the personal disposable income at factor cost for 1968. The absolute income would be overstated, and the distribution measures underestimated its inequality.²

Another "non-tax" by Turkish standards was the compulsory savings plan introduced in 1962 as a companion to the already existing personal income tax. Income taxpayers were obligated, when paying income tax, to buy 6 percent state savings bonds in the amount of 3 percent of their taxable income (minus some exemptions). This was a proper tax on incomes, a transfer of command of resources from the private to the public sphere, and not a voluntary investment scheme. The plan was compulsory. Bonds could not be traded for the first five years. The first owner, when selling bonds, had to suffer a substantial loss of principal because the nominal interest rate was lower than the inflation rate in Turkey. The only question is how to evaluate the direct burden of this tax. One would be to consider as a loss the purchase price of the bond in the year of purchase, and as a gain the repayment whenever that occurred. Another would be to consider the resale value of the bond immediately after its purchase. Such resales, though illegal, seem to have been customary, and in our estimate were bringing no more than 30-40 percent of par. Although public officials might deny it, the tax nature of this plan was openly recognized in 1972. The government proposed abandoning this scheme (probably payments of bonds started already to pinch the budget) and substitute for it another tax on incomes at the rate of 3 percent.³

¹ The public nature of all social insurance institutions is revealed by their compulsory coverage, and an only loose connection between a properly accounted reserve fund built out of premiums and the actuarial value of annuities to be paid a given insured.

² These contributions are a sort of tax on labor incomes, and labor (including civil servants) is concentrated in lower to middle income brackets.

Lately (see *James Land* [52]) we found that the three major social security institutions collected in 1968 2,888 million TL in contributions and disbursed to pensioners 1,030 million TL. The remaining institutions are small, hence these numbers are rather representative of the numerical strength of our omission.

³ As if recognizing the substitution of one tax by another the new tax is called "appropriately" a "balance tax."

Lately we found (see *James Land* [52]) that in 1968 the Turkish state sold 626

Because of the non-recognition of this savings plan as a tax, we were unable to find the data showing the revenue from it in the year 1968. Once more we had no choice but to follow the Turkish convention and omit it from our accounting of the tax burden in 1968. As the burden of this tax has the same distribution as that of a personal income tax we can claim that because of this omission the total tax burden is understated. The personal disposable incomes at factor cost in absolute figures is probably¹ correct, the distribution of the tax burden and personal disposable income in Variant A is less unequal than stated by us and in Variant B the relative distributions are barely affected by our omission.

Another Turkish peculiarity is to claim that the income tax, corporation tax, inheritance and gifts tax, defense tax on buildings and the motor vehicles tax to be all direct taxes. To us the phrase "direct tax" means that these taxes are on factor incomes, which the obligated factors are unable to shift. We therefore moved the defense tax on buildings and the motor vehicles tax² to the category of indirect taxes.

The next question was the tax revenue data. There was no problem with such data for 1968 as far as central government revenue was concerned.³ Unfortunately, data for tax revenues of the local governments were badly missing after 1964. There are three forms of local government: "ils" (provinces, vilayets), "belediyeler" (municipalities) and köys (villages). Köys have a minimal taxing power and may be omitted. "Belediyeler" depend heavily on shares (percentages) in taxes collected by the central government but the shares are neither a constant over time nor are they related to the tax collections figures by the central government in a simple way. Finally, "ils" have a taxing power of their own. We already said that official data for the receipts of local taxes end up with the year 1964. There seems to be nobody in the central government systematically collecting these data. We were lucky to be given an unofficial estimate for the tax revenue of ils in 1968. For the shares of "belediyeler" we found the budgeted data for 1968 but not receipts.⁴ These we had to use. Fortunately, Turkish civil servants are good at predictions of receipts. So they say.⁵

millions TL in bonds, out of which 26 million was purchased by Turkish social security institutions. Out of the remaining 600 million TL, one must presume most was bought under provision of compulsory purchase by income taxpayers.

¹ In our view the interviewees when reporting their personal disposable income already deducted these bonds.

² Certain amount of this tax is collected from commercial vehicles. Moreover, owners when buying an automobile substitute some transportation expenditures by other means. On the other hand their enjoyment of the car increases their spending in travelling. Consequently we split the base of this tax into two. Fifty percent of the tax liability was assigned by us to "transportation" and the remaining fifty is a new consumption better enjoyed by the richer people according to their incomes.

³ See "Devlet Gelirleri Bülteni," 1969 ([47], pp. 18-19).

⁴ See [51].

⁵ "Devlet Gelirleri Bülteni," 1969 ([47], p. 8) claims that in 1969 the budgeted direct tax revenue was fulfilled in 97.8 percent, and with indirect taxes 100 percent. One wishes such perfect predictions could be made for the U.S.A. as well.

Finally we had to assign a commodity base or any other base to these taxes. This has been made in Tables 3A and 3B. Various taxes with the same base were lumped together. We realize that we assigned taxes to groups of consumer goods only crudely. More time could have been spent on these assignments, but with eight consumption groups in surveys, the final assignment could be only very crude anyway. In general, the first five consumer good groups were obviously necessities. Their percentage consumption in budgets of the poor people was higher than in budgets of the rich. Three groups, health and personal care, cultural and entertainment and others, and in addition to them savings (for us standing also for investment goods) were luxuries bought in higher percentages by the rich and lesser by the poor. Thus, assignment of a tax to a good in the former or the latter set of goods decided whether the tax is regressive or progressive. Any error in assignment within each category would have small distributional consequences.

Summing over regions we got the totals for Turkey as a whole, for the following series:

- a) the absolute burden of indirect taxes on households in income brackets, T_j ($j = 1, 2 \dots 35$);
- b) the absolute burden of direct taxes, D_j ;
- c) the absolute total burden of all taxes, R_j , defined as $(T_j + D_j) = R_j$;
- d) the absolute personal disposable incomes at current prices, I_j (corrected by us for size changes as stated here earlier);
- e) the absolute personal disposable incomes at factor price, Y_j , defined $Y_j = (I_j - T_j)$;
- f) the absolute numbers of households by income brackets and regions, H_j (corrected by us to account for households made of singles and those in which the wife was 45 years or older).

We then related:

- a) tax burdens to gross incomes, i.e. computed ratios of T_j , D_j and R_j to $(Y_j + R_j)$;
- b) personal disposable incomes at factor cost to households, i.e. Y_j to H_j .

In all distributions we also measure inequality by computing *Gini* coefficients. As we have 35 income size groups we assume that joining points of observation by straight lines approximate well the *Lorenz* curve. If the areas of trapezoids measured from these broken straight lines to the horizontal axis are noted q_j , then the *Gini* coefficient is defined as

$$G = 1 - 2 \sum_{j=1}^{35} q_j.$$

Table 3A: Indirect Taxes and Their Bases
Turkey, 1968, Variant A*

No.	Percent and description of taxes	Base	Millions TL		Remarks
			Itemized Total		
1	import petroleum production tax	trans- portation	992.0		unofficial data
	domestic petroleum production tax		637.0		
	duties on fuel oil		162.0		
	local fuel tax		59.0		
	subtotal		1850.0		
	less 25 percent applied to heating oil		462.5		
			1387.5		
	transportation tax		82.0		
	50 percent of motor vehicles tax		48.0		
	5 percent of fees (drivers licenses, etc.)		11.7	1529.2	
2	sugar tax	food	484.0		unofficial data
	25 percent of land tax		31.0	515.0	
3	local tax on buildings	housing	321.1		unofficial data
	local depression tax		83.3		unofficial data
	75 percent of land tax		93.0		unofficial data
	25 percent applied as tax on heating oil		462.5		
	defense tax on buildings		188.0	1147.9	
4	foreign travel exp. tax	others	200.0		
	50 percent PTT tax (telegrams, telephs.)		25.0	225.0	
5	50 percent banking and insurance tax	savings (investment goods)	342.5	342.5	
6	defense tax and net revenue of monopolies	food, housing, clothing, furniture, health & pers. care, transport.	1265.0	1265.0	

7	95 percent of fees	income	222.3		
	50 percent of PTT tax		25.0		
	50 percent of banking & insurance tax		342.5		
	stamp tax on imports		953.0		
	stamp tax		660.0		
	import prod. tax		1198.0		
	domestic prod. tax		1614.0		
	custom duties		1169.0		
	wharf duty		30.0		
	real estate purchasing tax		286.0		
	municipal expend. taxes		238.0		budget
	other municipal taxes		388.8	7126.6	budget
<hr/>					
8	50 percent of motor vehicles tax	on incomes > 50,000 TL	48.0	48,0	
<hr/>					
TOTAL			12199.2		

* In Variant B, the corporate and inheritance and gift taxes in the amount of 1038.1 million TL are added to the indirect taxes and allocated in proportion to incomes, i.e. the same way as group 7 above.

Sources: Tax receipts from "Devlet Gelirleri Bülteni" ([47], pp. 24-25); budget from "Türkiye İstatistik Yılı," 1968 (Ek Yayın [51], T. 332, p. 96).

Table 3B: Direct Taxes and Their Bases
1968, Variants A and B

No.	Tax	Base Variant A	Variant B	Million TL
1	income tax; (central govt. & share of municipalities)	as in <i>Yürüköçlü</i> ([33], T. 18, p. 27)	proportional to incomes from 2000 TL up	4668.4
2	corporation tax, inheritance & gifts tax (central govts. & share of municipalities)	on incomes from 100,000 TL up	indirect tax on all incomes	1038.1
TOTAL				5706.5

Sources: Central government receipts from "Devlet Gelirleri Bülteni" ([47], pp. 24-25). Shares of municipalities - budget, from "Türkiye İstatistik Yılı," 1968 (Ek Yayın [51], T. 332, p. 96).

4. Results and Evaluation

Our results are given in Tables 4, 5 and 6A and Graphs 1A, 1B, 2A, 3A and 4A. Table 4 shows distributions of households, incomes and indirect tax burdens by income brackets, for Variants A and B. The data are in absolute numbers, and in that raw form they are difficult to analyze. To remedy this Table 5 shows distributions of tax burdens by income brackets as a percentage of gross incomes (the latter defined as the personal disposable income at factor cost plus the total short-run tax burden). Table 6A shows the indirect tax burden disaggregated by taxes grouped according to common bases. Also we offer graphs of respective *Lorenz* curves. Graphs 1A and 1B relate the cumulative percentages of the direct tax burden to gross incomes. Graph 2A relates similarly the indirect tax burden for Variant A. Graph 3A relates the total tax burden. Graph 4A relates the cumulative percentages of personal disposable incomes at factor cost to households. If offered, Graphs 2B, 3B and 4B (i.e., for Variant B) would differ very little from the same for Variant A; hence we omitted them here.

Let us start with the findings regarding the distribution of the short-run burden of direct taxes. In Variant A these taxes show a marked degree of progressivity. The tax burden rate for lowest income brackets is nil (see Table 5) due to personal exemptions, and then it increases from 1 to about 22 percent. The increase is rather steep for the three highest income brackets. This is mainly due to our assumption that corporate, gift and inheritance taxes and 50 percent of the motor vehicles tax fall on the rich. The progressivity of these taxes is also reflected in convexity of the *Lorenz* curve¹ (see Graph 1A) and the value of the *Gini* coefficient, $G_{1A} = .4750$.

This picture of the incidence of direct taxes in the Variant A is, however, misleading on several counts. First, and mainly, the burden of the income tax, wherever it falls, has higher rates than shown in Table 5 because of non-generality of this tax. Within the same bracket, even in the highest one, there will be households that pay no tax at all because the major portion of incomes from agriculture and some other sectors of the economy is exempt and the remaining households in such a bracket pay correspondingly higher tax.²

¹ Economists who are not familiar with analysis of tax burden distributions by the *Lorenz* curve approach may note that on Graph 1A the cumulative percentage of tax burdens are shown on the vertical and of gross incomes brackets on the horizontal axes. If the tax burdens were distributed exactly proportionally to incomes, the observed points would lie on the 45° ray from the origin (0,0) to the unity (1,1) points.

This may be translated into values of *Gini* coefficients. Proportionally distributed burden would yield *Gini* coefficient, $G = 0$. For a tax burden that is consistently progressive the observed points would curve below the (0,0), (1,1) line, and the *Gini* coefficient would be a positive fraction. For a consistently regressive tax burden, falling, percentagewise heavier on the poorer people, the observed points would lie above the 45° ray; moreover, the *Gini* coefficients would become a negative fraction. Where the taxes yield separate regimes of regressivity and progressivity, the observed line may cross or even recross the 45° ray. The *Gini* coefficient would then take its sign according to the greater importance of the progressive or the regressive regime.

² When dealing with such averages one should remember the story of a man who drowned in a river on the average one foot deep.

Table 4: Distribution of Households, of Personal Disposable Incomes at Current Price and at Factor Cost, and of the Indirect and Direct Tax Burdens by Income Brackets, Turkey, 1968

Income bracket number	Income bracket		Number of households	Personal disposable income at current prices	Indirect tax burden*		Personal disposable income at factor cost*		Direct tax burden*	
					Variant A	Variant B	Variant A	Variant B	Variant A	Variant B
1	0-	249	10847.	2.6	.3	.4	2.2	2.2	0.	0.
2	250-	499	46092.	2.4	3.1	3.4	20.9	20.7	0.	0.
3	500-	999	167418	161.5	21.2	23.1	140.3	138.4	0.	0.
4	1000-	1499	271579.	432.4	57.0	62.1	375.5	370.4	9.	0.
5	1500-	1999	302224.	677.7	88.4	96.4	589.2	581.3	0.	0.
6	2000-	2499	373281.	1053.2	138.3	150.7	914.9	902.5	6.4	59.1
7	2500-	2999	277963.	964.7	127.4	138.8	837.3	826.0	12.6	54.1
8	3000-	3499	287335.	1183.5	155.7	169.7	1027.7	1013.8	15.4	66.4
9	3500-	3999	308096.	1450.5	192.6	209.7	1257.9	1240.8	18.9	81.5
10	4000-	4499	233046.	1250.5	165.9	180.6	1084.6	1069.8	16.3	70.0
11	4500-	4999	276891.	1662.0	223.4	243.0	1438.6	1419.0	21.7	91.9
12	5000-	5999	398126.	2771.6	369.2	401.8	2402.4	2369.8	36.1	153.6
13	6000-	6999	427592.	3529.8	476.6	518.2	3053.2	3011.6	46.0	196.8
14	7000-	7999	326764.	3077.9	417.9	454.2	2660.0	2623.7	44.4	170.0
15	8000-	8999	284507.	3079.3	419.7	456.0	2659.5	2623.3	88.6	168.8
16	9000-	9999	238593.	2860.9	387.5	421.2	2473.4	2439.7	82.3	158.4
17	10000-	10999	200763.	2655.9	360.7	392.0	2295.3	2264.0	76.4	144.7
18	11000-	11999	239760	3528.5	483.7	525.3	3044.8	3003.2	101.5	189.4

19	12000- 12999	93499.	1499.1	199.3	217.0	1299.7	1282.0	43.1	84.0
20	13000- 13999	150098.	2565.2	347.4	377.6	2217.8	2817.6	73.8	140.5
21	14000- 14999	82005.	1511.4	208.0	225.8	1303.4	1285.6	43.5	80.4
22	15000- 15999	79726.	1557.3	208.7	227.1	1348.6	1330.2	44.8	85.5
23	16000- 16999	104165.	2172.4	298.2	323.8	1874.1	1848.5	62.5	116.6
24	17000- 17999	99251.	2217.0	303.8	329.9	1913.2	1887.0	80.6	119.6
25	18000- 18999	36842.	859.8	118.9	129.0	740.9	730.8	37.0	46.7
26	19000- 19999	83313.	204.8	286.3	310.5	1761.8	1737.6	87.2	108.6
27	20000- 24999	154372.	4346.3	605.2	656.4	3741.1	3689.9	187.1	234.5
28	25000- 29999	186316.	6497.9	902.8	979.4	5595.1	5518.5	279.7	347.4
29	30000- 39999	156311.	6772.7	964.9	1044.7	5807.8	5728.0	317.3	354.0
30	40000- 49999	75828.	4323.7	591.8	642.8	3731.9	3680.9	254.6	234.0
31	50000- 74999	71168.	5435.4	771.6	835.7	4663.8	4599.8	377.6	289.1
32	75000- 99999	21428.	2280.7	323.1	350.0	1957.6	1930.8	200.6	119.5
33	100000-149999	50050.	7627.8	1114.1	1204.0	6513.7	6423.8	1386.4	388.3
34	150000-199999	5950.	1432.6	194.3	211.1	1238.3	12221.4	346.6	80.4
35	200000+	12734.	4585.6	671.9	725.9	3913.7	3859.6	1316.7	234.6
TOTAL		6133917.	88099.5	12199.1	13237.2	75900.3	74862.2	5706.5	4668.4

* In millions of Turkish lira (TL).

Household data expanded to cover households made of single persons and those in which the wife is 45 years or older. Income data expanded to equate the total with the SIS estimate.

Table 5: Ratios of the Direct, Indirect, and Total Tax Burden to Gross Incomes
(Tax Burden Added back to Incomes at Factor Cost), Turkey, 1968

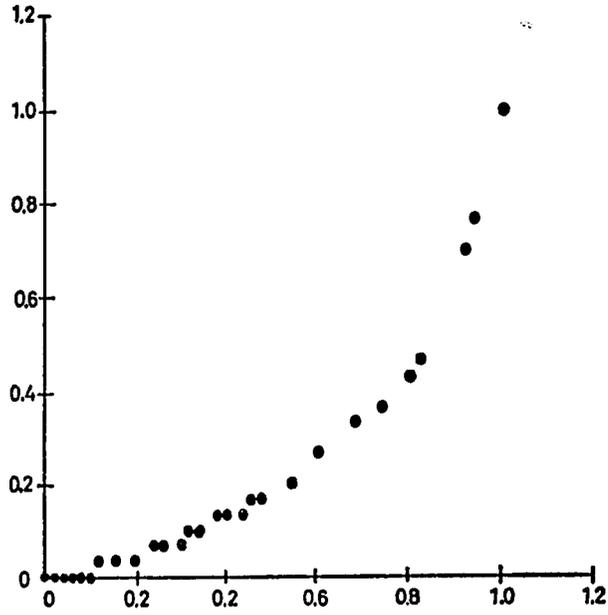
Income Size Group Numbers	Variant A			Variant B		
	Direct	Indirect	Total	Direct	Indirect	Total
1	0.	.1318	.1318	0.	.1435	.1435
2	0.	.1302	.1302	0.	.1420	.1420
3	0.	.1311	.1311	0.	.1429	.1429
4	0.	.1317	.1317	0.	.1435	.1435
5	0.	.1305	.1305	0.	.1423	.1423
6	.0060	.1305	.1366	.0531	.1355	.1887
7	.0129	.1304	.1432	.0531	.1362	.1893
8	.0129	.1299	.1428	.0531	.1258	.1889
9	.0129	.1311	.1439	.0531	.1369	.1900
10	.0129	.1310	.1438	.0530	.1368	.1898
11	.0129	.1327	.1456	.0524	.1385	.1909
12	.0129	.1315	.1444	.0525	.1374	.1899
13	.0129	.1333	.1462	.0528	.1391	.1919
14	.0142	.1339	.1481	.0523	.1398	.1922
14	.0280	.1325	.1604	.0520	.1404	.1924
16	.0280	.1317	.1596	.0525	.1395	.1920
17	.0280	.1320	.1600	.0517	.1400	.1916
18	.0280	.1333	.1612	.0509	.1413	.1922
19	.0280	.1293	.1572	.0531	.1371	.1901
20	.0280	.1316	.1596	.0519	.1396	.1915
21	.0280	.1338	.1617	.0505	.1418	.1924
22	.0280	.1303	.1582	.0520	.1382	.1902
23	.0280	.1334	.1614	.0509	.1415	.1924
24	.0351	.1322	.1673	.0512	.1412	.1924
25	.0413	.1325	.1738	.0515	.1423	.1938
26	.0413	.1340	.1753	.0504	.1440	.1943
27	.0413	.1335	.1748	.0512	.1433	.1945
28	.0413	.1332	.1745	.0507	.1431	.1938
29	.0447	.1361	.1868	.0497	.1466	.1963
30	.0556	.1293	.1849	.0514	.1410	.1924
31	.0650	.1327	.1977	.0505	.1460	.1965
32	.0808	.1302	.2111	.0498	.1458	.1956
33	.1538	.1236	.2774	.0484	.1502	.1986
34	.1948	.1092	.3040	.0532	.1395	.1927
35	.2231	.1138	.3369	.0487	.1506	.1993

Table 6A: Grouped Indirect Tax Burdens, as a Fraction of Gross Incomes, by Income Brackets, Variant A, Turkey, 1968*

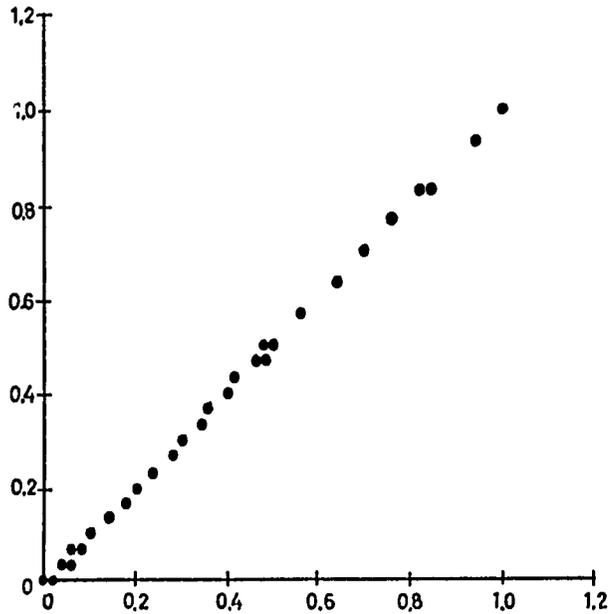
Income Bracket Number	Indirect Taxes Grouped by Base** (see Table 3A)							
	1	2	3	4	5	6	7	8
1	.0121	.0097	.0111	.0010	.001	.0173	.0808	-
2	.0105	.0105	.0094	.0009	.0009	.0171	.0809	-
3	.0117	.0102	.0095	.0010	.0007	.0171	.0809	-
4	.0124	.0100	.0097	.0010	.0006	.0172	.0809	-
5	.0107	.0104	.0096	.0009	.0008	.0172	.0809	-
6	.0116	.0100	.0099	.0010	.0006	.0171	.0804	-
7	.0121	.0097	.0103	.0010	.0005	.0170	.0799	-
8	.0115	.0098	.0103	.0010	.0005	.0170	.0799	-
9	.0131	.0094	.0104	.0010	.0003	.0169	.0799	-
10	.0128	.0096	.0104	.0010	.0004	.0169	.0799	-
11	.0143	.0093	.0110	.0010	.0001	.0170	.0799	-
12	.0130	.0097	.0106	.0010	.0004	.0170	.0799	-
13	.0143	.0075	.0127	.0017	.0014	.0159	.0799	-
14	.0146	.0076	.0130	.0017	.0013	.0159	.0797	-
15	.0146	.0074	.0131	.0016	.0014	.0157	.0786	-
16	.0142	.0075	.0127	.0016	.0013	.0157	.0786	-
17	.0143	.0075	.0129	.0015	.0014	.0157	.0786	-
18	.0150	.0075	.0137	.0014	.0011	.0159	.0786	-
19	.0132	.0060	.0122	.0021	.0024	.0148	.0786	-
20	.0151	.0060	.0132	.0020	.0018	.0150	.0786	-
21	.0166	.0062	.0137	.0019	.0015	.0152	.0786	-
22	.0138	.0061	.0130	.0019	.0017	.0151	.0786	-
23	.0169	.0061	.0129	.0020	.0018	.0150	.0786	-
24	.0157	.0061	.0137	.0019	.0018	.0150	.0781	-
25	.0155	.0051	.0149	.0021	.0030	.0142	.0776	-
26	.0177	.0050	.0146	.0022	.0029	.0140	.0776	-
27	.0174	.0049	.0140	.0026	.0034	.0137	.0776	-
28	.0186	.0037	.0115	.0036	.0067	.0117	.0776	-
29	.0206	.0036	.0122	.0036	.0075	.0114	.0773	-
30	.0164	.0035	.0122	.0034	.0069	.0113	.0765	-
31	.0181	.0035	.0116	.0036	.0070	.0112	.0756	.0021
32	.0073	.0033	.0115	.0033	.0075	.0110	.0744	.0021
33	.0195	.0033	.0126	.0026	.0039	.0113	.0685	.0019
34	.0079	.0029	.0100	.0025	.0095	.0102	.0651	.0018
35	.0180	.0031	.0115	.0029	.0038	.0099	.0628	.0020

* In Variant B, the fractions are changed only a little, but .0112 is then added in all income brackets to account for the assumed forward shifting of the corporation tax and inheritance and gift tax.

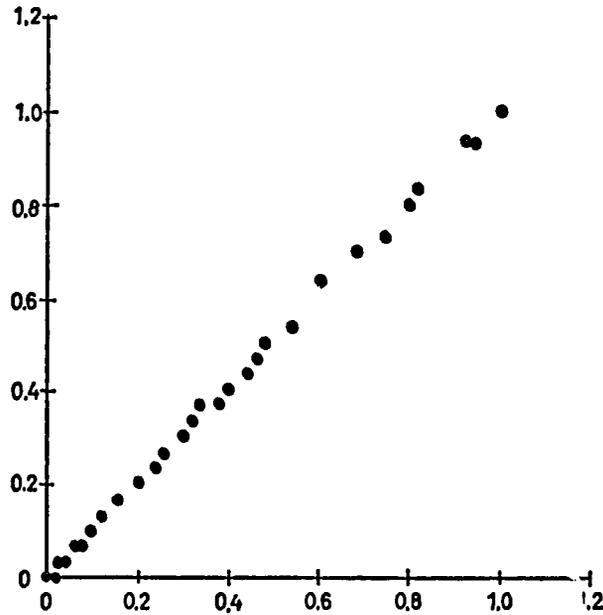
** Due to rounding, the figures add up with a slight error to the indirect tax burden shown in Table 5.



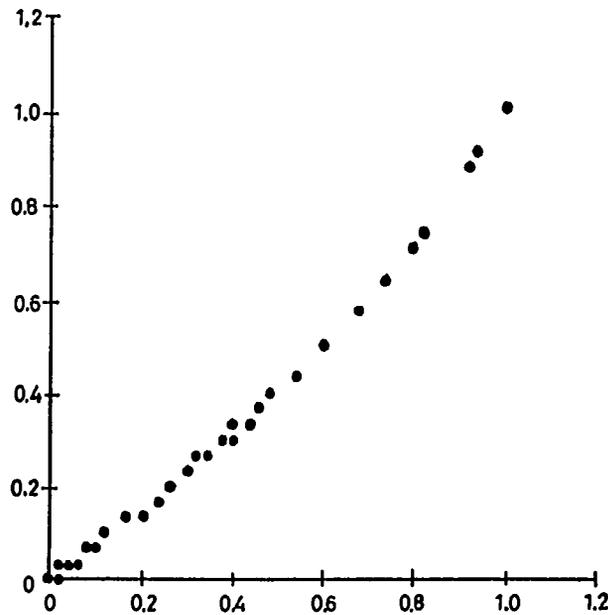
Graph 1A: The Direct Tax Burden (vertical axis) in Relation to the Gross Income (horizontal axis), Variant A, Turkey, 1968 (Gini coefficient $G = .4750$)



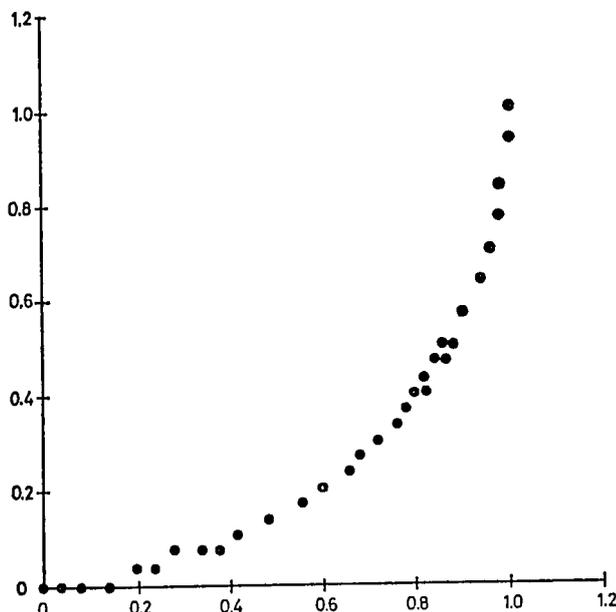
Graph 1B: The Direct Tax Burden (vertical axis) in Relation to the Gross Income (horizontal axis), Variant B, Turkey, 1968 (Gini coefficient $G = .0009$)



Graph 2A: The Indirect Tax Burden (vertical axis) in Relation to the Gross Income (horizontal axis), Variant A, Turkey, 1968 (Gini coefficient $G = .0153$)



Graph 3A: The Total Tax Burden (vertical axis) in Relation to the Gross Income (horizontal axis), Variant A, Turkey, 1968 (Gini coefficient $G = .1410$)



Graph 1A: The Personal Disposable Income at Factor Cost (vertical axis) in Relation to the Number of Households (horizontal axis), Variant A, Turkey, 1968 (Gini coefficient $G = .5659$)

Second, our accounting misses the social security contributions. These are a kind of income tax on wages and the missed part would fall near proportionately, but only on the lower and middle income brackets. Adding them would increase the burden of direct taxes at the lower end of income brackets substantially, reduce the progressivity of the direct taxes, and lower the respective Gini coefficient.¹ Third, we omitted consideration of subsidies hidden in low prices of goods and services produced by the state enterprise system (see also footnote 2, p. 5). This must have resulted in some underestimation of progressivity or overestimation of regressivity of the Turkish tax system, offsetting to a degree the error resulting from omission of taxes on labor income just mentioned. Fourth, the suspected high rate of evasion of income tax provisions (see footnote 1, p. 73) is not reflected in the computation of the tax burden in Variant A. It is reasonable to assume that this evasion will be concentrated in higher income tax brackets. This would make once more these taxes nearer to proportional, if not outright regressive. To get such a result from the relationships accounted in this paper² we introduced Variant B.

¹ Yürükoğlu [35] thinks that adding contributions to pension plans could make even these taxes regressive, but we doubt whether the Variant A would have shown this.

² To obtain this result we assumed that the income tax after the lowest income exemption is proportional to incomes and that the corporation tax and gifts and

The burden of direct taxes in Variant B is shown in Graph 1B. Observation points lie nearly on the 45° ray and the *Gini* coefficient, $G_{1B} = .0009$, i.e. for practical purposes is nil. Table 5 shows the direct tax burden in Variant B to be nil for the lowest income tax brackets, then rising to about 5 percent and varying only slightly around this level.

Usually one believes that indirect taxes are regressive, but much depends on which goods are taxed. Here the Turkish tax system corrects the overly proportional thrust of direct taxes to a degree by making indirect taxes near proportional. Table 5 shows this burden is about 13 per cent of gross income for all brackets in Variant A and 14 per cent in Variant B. Unlike the case of direct taxes in Variant A, the averages per income bracket are meaningful, everybody paying these taxes through his consumption. The *Lorenz* curve for the indirect tax burden is shown in Graph 2A. The points are nearly on the 45° ray and the *Gini* coefficient is virtually zero, namely $G_{2A} = -.0153$. For Variant B, $G_{2B} = .0144$.

Table 6A offers disaggregated indirect tax burdens for Variant A, grouped according to common bases. First we note minor fluctuations in each series, which have to be smoothed over before we can pass judgment whether this group of taxes is progressive or regressive. The fluctuations are due to composition. Our basic cell is income or tax burden in an income bracket of a given region, and incomes or tax burdens for the same income bracket differ between regions. The latter also differ in the respect to taste for different consumption goods. Aggregation of populations of regional cells for Turkey as a whole yields then locally irregular but clearly visible trends over all income brackets. Second, we find some grouped taxes falling progressively. Specifically this is observed with respect to taxes on transportation (group 1), on "other" consumption goods (group 4), on savings-investment goods (group 5) and with respect to 50 per cent of taxes on motor vehicles (group 8). Regressivity is shown by taxes on food (group 2), on housing (group 3), on food, housing, clothing, furniture, health and personal care, and transportation (group 6) and on personal disposable income (group 7). The last result is not a computational error. The burden of this tax was allocated in proportion to personal disposable income in each cell, but the percentage (fraction) was then computed by dividing the burden allocated to the cell by gross income of the cell made of personal disposable income plus the direct tax burden on such incomes. It is this fraction that, as expected, shows regressivity. In Variant B we found slightly differing numbers with the same trends. In addition to the burden of grouped taxes (1 to 8) we had to add also the burden of the corporate tax and of gifts and inheritance tax assumed shifted forward to consumers.

Combining the direct and indirect tax burdens together we get the distribution of the total tax burden. Its distribution because of the greater weight

Inheritance tax are shifted forward in full, hence are part and parcel of indirect taxes. These assumptions may sound "radical" to some of our readers, but considering our objections to the results in Variant A, the Variant B results become plausible. In other words, even if the two assumptions underlying our Variant B are not acceptable to some economists, their application yields results that are probably close to the truth.

(about 65 per cent) of indirect taxes is near proportional in Variant A and completely proportional in Variant B. In general, we find the poor in Turkey pay 13 to 14 per cent of their incomes in taxes and the rich, depending on the variant, 29 to 34 per cent. Graph 3A shows the near proportionality of the total tax burden. In terms of *Gini* coefficient, $G_{3A} = .1410$ and $G_{3B} = .0109$. Despite narrowing of the gap between the two variants our preference for Variant B still stands, though it no longer matters much. It is also obvious that the rather lightly tapped incomes of the rich and of the middle classes in Turkey provide Turkey with a large tax revenue potential.

These results, surprising as they may be, were not surprising to us. *Krzyżaniak* [10], studying Turkish expenditures over the period 1950-69, found that the Turkish tax structure on the average was proportional. He, however, qualified his findings, stating, "that, of course, does not mean that Turkish taxes and government expenditures had no redistributive effects on the average. Also, in the mix of tax and mix of expenditures some of these policies may have had strong redistributive effects, as long as other policies had compensating effects in the other direction." We are now in position to remove some of these qualifications. The Turkish government elected a tax policy (expenditure policy requires its own studies) that made it neutral as a redistributive force. This holds for its direct and especially for its indirect taxation.¹

Let us now consider what changes in the distribution of personal disposable income resulted from this policy. Once the proportionality of indirect taxation, and near proportionality, or more likely proportionality of the total taxation, in Turkey is established, it is not surprising to find that the distribution of incomes at factor cost differs little from that in current prices. There is even less difference between the distribution of personal disposable income at factor cost between the two variants.² Graph 4A shows the *Lorenz* curve for Variant A. In terms of *Gini* coefficients, we find that in current prices, relating incomes to number of households, $G = .5677$, and at factor cost for Variant A, $G_{1A} = .5659$, and for Variant B also $G_{1B} = .5659$.

All this points out that *at present, there exists a strong inequality of income distribution in Turkey* (public goods contribution to individual's welfare disregarding). The Turkish government in the past did not interfere in it, at least through its tax policies. Also, *the overall burden of taxes is rather low. Thus, there exists a substantial tax revenue potential* both in the form of possibilities of higher tax rates on all income groups and in possible progressive taxation of middle and upper income classes.³

¹ One should not read this as a condemnation of the Turkish government for pursuing socially and/or morally "wrong" objectives. As long as no internal disorder and weakening of state's cohesion resulted (and none seems to have occurred), this policy may have contributed to a faster rate of growth and economic development.

² Three factors are here at work. First, the personal disposable income was computed net of direct taxes. Second, the distribution of the indirect tax burden is proportional both in the Variant A and B. Third, indirect taxes in Turkey represent less than 10 per cent of GNP (see also [10]).

³ If the agricultural sector is undertaxed, a higher taxation rate on this sector is another possible aspect of this tax revenue potential.

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