

Sources of Income Inequality in Pakistan

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1. INTRODUCTION

In a paper presented at the 1985 Conference of this Society [Kruijk and Leeuwen (1985)] we described some structural changes in poverty and income inequality in Pakistan during the 1970s. All inequality measures and poverty indicators pointed to the conclusion that poverty has declined while at the same time inequality has increased. However, the paper did not go deep enough into the reasons why inequality has increased. It did appear that neither the urban/rural distinction nor interprovincial income differences are important determinants of overall income inequality in Pakistan¹ so that these elements cannot contribute much to explaining changes in inequality. In his comments, Kemal, (1986) suggests to extend the applied decomposition technique by decomposing income also into its sources. This is precisely the purpose of the present paper.

In fact, total income of a household (or any other unit) is the sum of income derived from various sources like labour, property, remittances, etc. Accordingly, income inequality is the aggregate of inequalities of these sources and changes in overall inequality are made up of changes in its components. Decomposition analysis is a clear and consistent framework to investigate these issues. It provides a sense of proportion and avoids to suggest — as some authors do — that overall inequality may have decreased because inequality of one single component has decreased. This kind of speculation is not possible within a decomposition framework because the relative importance of that particular component is taken into account and related to the importance of other components together with their development over time.

The two main sources of income, viz. labour income and non-labour income are evaluated and additionally decomposed into various sub-sources. Labour is segregated into occupational groups and non-labour income is divided into income

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¹See also Kruijk (1986b).

from property, housing and other sources. The tool of analysis is the Theil coefficient which is a measure of income inequality that is additively decomposable. This means that the measure can be split up into the contributions of different sources of income.

The unit of measurement is neither household income nor per capita income. These concepts are not appropriate for comparing real welfare between households because the first measure ignores the size of the household and the second does not consider economies of scale within the household. Therefore, another norm – which is called the household equivalence scale – is used which takes these two factors into account.

The structure of the paper is as follows: Section 2 describes the methodology. Section 3 discusses the empirical results and Section 4 presents the conclusions of the study.

2. METHODOLOGY

The Income Unit

Measuring inequality on the basis of income per household ignores the reality that households differ in size and composition. A one-person household earning Rs 1000 per month is much better off, of course, than a six-person household with Rs 1000 per month. An often used remedy to adjust for household size is simply to deflate household income by household size, so that income is expressed in per capita terms. Such an approach, however, is equally unacceptable, because in that case it is believed that a single person with Rs 1000 is as well off as a two-person household with Rs 2000, a three-person household with Rs 3000 and a six-person household with Rs 6000, which obviously is not so.² Economies of scale in household consumption cannot be denied. Cooking for six persons is relatively cheaper than cooking for one person; the same applies for housing; clothes are passed down from older to younger children, etc. Neither household income nor per capita income is an appropriate concept for comparing and measuring welfare inequality. A key is required that takes both household size and household economies of scale into account.

Household equivalence scales are useful for comparing real welfare between households. These scales transform the cost of living of each household size into the cost of living of a reference household (e.g. a single-person household). In the first of its two extreme forms, the key is just a counting function representing the number of household members, which would imply that a household containing two adults and four children with six times the income of a one-person household has the same

² See also Krotki (1985).

level of welfare as that single-person household, which is unreasonable. In the other extreme the scale is a unit vector, which would imply that the size of a household does not play a role at all, so that a six-person household with Rs 3000 is as well off as a single person with Rs 3000, which is also absurd. The correct scale must be somewhere in between these two extremes. In this paper a translog function is used as approximation of the household equivalence scale.³

The Inequality Indicator

Theil's measure for overall inequality (T) is used because it is easily decomposable.⁴ T can be written as:

$$T = \sum_i \mu_i \frac{n_i}{n\mu} \log\left(\frac{\mu_i}{\mu}\right)$$

where

- μ_i = average income per household equivalent in class i ;
- n_i = number of household equivalents in income class i ;
- n = total number of household equivalents; and
- μ = overall average income per household equivalent.

Decomposing overall income into labour and non-labour income, the formula for T becomes⁵:

$$T = \sum_i \left[\mu_i^a + (\mu_i - \mu_i^a) \right] \frac{n_i}{n\mu} \log\left(\frac{\mu_i}{\mu}\right)$$

where

- μ_i^a = average labour income per household equivalent in class i
- $\mu_i^a - \mu_i$ = average non-labour income per household equivalent in class i

The part of overall inequality that is attributable to labour income (S^a) is then:

$$S^a = \sum_i \mu_i^a \frac{n_i}{n\mu} \log\left(\frac{\mu_i}{\mu}\right)$$

³For accurate calculation of a household equivalence scale empirical investigations of the expenditure behaviour of households of different sizes are needed [Deaton and Muelbauer (1980) present a review of the literature on this subject]. Since these data are not readily available for Pakistan yet, the present approximation of the scale is only based on practical grounds and, of course, is subject to improvement. In the absence of empirical data the present function will do; in any case it is a better approximation than one of the two extremes. The translog function is defined as: $\log(S) + 1$, where $\log(S)$ is the natural logarithm of the household size. According to this formula household equivalences of households with respectively 1, 2 and 7 members are respectively, 1.0, 1.7 and 3.0.

⁴T runs from zero (absolute equality) to the logarithm of the number of income classes which is 2.5 in this case (absolute inequality, meaning that one unit earns everything and the rest nothing).

⁵See also Shorrocks (1982).

and the part that is attributable to non-labour income (S^{na}) is:

$$S^{na} = T - S^a = \sum_i (\mu_i - \mu_i^a) \frac{n_i}{n\mu} \log\left(\frac{\mu_i}{\mu}\right)$$

Both sources of income are decomposed further. Labour income is subdivided according to occupational groups; non-labour income is split into income from property, income from housing and other income. The contribution of each separate component can be measured by utilizing similar formulas as described above.⁶

The Data Base

The only source publishing data on household composition and incomes and covering the entire income range is the Household Income and Expenditure Survey (HIES).⁷ Since we make use of published data in grouped form, inequality is slightly underestimated due to neglecting inequality within income brackets. However, with an aggregation level of twelve income classes this underestimation cannot be more than a few percentage points only.⁸

3. RESULTS

Tables 1 and 2 present the results of two decomposition exercises. The first exercise (Table 1) separates household (equivalent) income into eight categories, four in urban and four in rural areas. The components are labour income, property income, income from owner-occupied housing and income from other sources. The second exercise (Table 2, being discussed in Section 3) decomposes labour into various occupational groups.

Sources of Income Inequality

Table 1 presents for each income component, its income share, its Theil coefficient and its contribution to overall inequality. An overall Theil coefficient of 0.17 means a relatively equal distribution of income among households in Pakistan in 1969-70.⁹ The level of inequality usually does not change much within a decade. A moderate increase appears in Pakistan but inequality remains low ($T = 0.23$).

In evaluating grounds for this increase it should be realized that the level of overall inequality is determined by two factors, viz. (a) the relative importance of

⁶For these mathematical expressions see Kruijk (1986a).

⁷The present paper makes use of HIES 1979 income data for urban and rural areas at the provincial level but weighs these figures with provincial urban and rural population shares as reported by the Population Census 1981. This is the reason why aggregate income figures differ from HIES and from Kruijk (1985).

⁸See Kruijk (1986b).

⁹For international comparison of income distributions see (Jain and Tiemann 1973).

Table 1
The Sources of Income and Inequality in Pakistan, 1969-70 and 1979

Income from	1969-70				1979				Change	
	Income Share (Percent)	T	Contri. to T	In Percentage	Income Share (Percent)	T	Contri. to T	In Percentage	Contri. to T	In Percentage
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Urban Areas:										
Labour	28	0.18	0.05	30	30	0.21	0.06	27	0.012	20
Property	1	1.00	0.01	7	1	0.70	0.01	3	-0.004	-7
Housing	3	0.33	0.01	5	4	0.28	0.01	5	0.003	5
Other Income	1	0.41	0.01	4	3	1.02	0.03	12	0.020	35
Rural Areas:										
Labour	58	0.10	0.06	35	53	0.12	0.07	28	0.005	8
Property	3	0.84	0.02	14	2	0.60	0.01	5	-0.013	-23
Housing	3	0.03	0.00	1	3	0.05	0.00	1	0.001	1
Other Income	3	0.23	0.01	4	4	1.01	0.04	19	0.036	61
Total	100	0.17	0.17	100	100	0.23	0.23	100	0.059	100

Notes:

- (1) Sources of Income:
 - Labour income includes wages, salaries and income from self-employment.
 - Property income is income from property other than owner-occupied houses.
 - Housing income is income from owner occupied houses only.
 - Other income includes social insurance benefits, pensions, gifts (nazrana) and assistance (zakat), remittances and other sources.
- (2) The relative importances of each income source in 1969-70.
- (3) The coefficients by income source in 1969-70.
- (4) = (2) * (3); the absolute contribution of each income source to the overall Theil coefficient.
- (5) = (4)/0.17; the relative contribution of each income source to the overall Theil coefficient (in percentages).
- (6) the relative importances of each income source in 1979.
- (7) The coefficients by income source in 1979.
- (8) = (6) * (7); the absolute contribution of each income source to the overall Theil coefficient.
- (9) = (8)/0.23; the relative contribution of each income source to the overall Theil coefficient (in percentages).
- (10) = (8) - (4); decomposition of the change of inequality according to income source; the overall Theil coefficient has increased from 0.17 to 0.23.
- (11) is an expression of (10) in percentages.

Table 2a
Distribution of Income from Labour of Heads of Households by Occupational Groups, 1969-70

Occupational Groups	Rural			Urban		
	Labour Income	Theil Coeff.	Earners Share	Labour Income	Theil Coeff.	Earners Share
Prof, Adm, Cler	180	0.13	2%	340	0.35	13%
Sales Workers	160	0.13	5%	230	0.18	23%
Farmers	160	0.10	72%	190	0.18	7%
Transp. Workers	120	0.08	2%	190	0.12	6%
Production Workers	140	0.10	16%	180	0.11	41%
Service Workers	140	0.16	3%	170	0.12	10%
Total	155	0.10	100%	210	0.21	100%
T between occ.		0.002			0.03	

Table 2b
Distribution of Income from Labour of Heads of Households by Occupational Groups, 1979

Occupational Groups	Rural			Urban		
	Labour Income	Theil Coeff.	Earners Share	Labour Income	Theil Coeff.	Earners Share
Prof, adm, Cler	800	0.24	4%	1110	0.23	17%
Sales Workers	660	0.17	6%	880	0.20	22%
Farmers	630	0.14	67%	710	0.20	6%
Production Workers	570	0.13	20%	710	0.15	46%
Service Workers	570	0.15	3%	730	0.21	9%
Total	625	0.15	100%	820	0.20	100%
T between occ.		0.002			0.02	

Sources: —Average labour income and Theil coefficients are estimated on the basis of HIES.

—Earners share: Labour Force Surveys.

each income component, and (b) the inequality within each component. Ergo, the development of these two factors over time specify the development of overall income inequality.

Table 1 shows that more than 80 percent of total income comes from labour. It is not surprising, therefore, that labour income inequality generates the bulk of overall inequality, though its contribution (about 60 percent) is less than 80 percent because always – in any country at any time – labour incomes are more equally distributed than non-labour incomes. Accordingly, changing shares of labour and non-labour components affect the level of inequality. An increasing share of a more unequal income component raises overall inequality. Indeed, it seems that the share of non-labour income slightly increases in Pakistan during the decade and inequality within non-labour income appears to increase. These two effects raise the contribution of non-labour income inequality to overall inequality from 35 percent at the beginning of the decade to 45 percent at the end. The next Section examines this issue in more detail.

The Development of Non-labour Income Inequality

Non-labour income is disaggregated into three components viz. income from owner-occupied housing, income from property, and income from other sources. Table 1 presents evidence of the development of each of these components.

First, income from owner-occupied housing is negligible in rural areas, but in urban areas total income from owner-occupied housing expands and inequality within this income component steadily diminishes because more households can afford to own a house.

Secondly, the importance of income from property in rural areas (mainly income from land) reduces gradually. This is a normal long-run development in all countries of the world. An illustration of this phenomenon for England can be found in an excellent article by Lindert (1986) where he estimates that the share of land in total household net worth declines from 55 percent in 1740 via 18 percent in 1875 to 4 percent in 1973. Apart from the declining share of income from land, this income becomes less unequally distributed during the 1970s. More research is needed to analyze whether this decline is due to policies of the Bhutto administration.

Thirdly, inequality of income from other sources than labour or property increases substantially as well as its income share. These expansions generate the bulk of increased inequality during the 1970s. It is not easy to interpret the development of this opaque residual income. Surely, one of the new income sources are remittances from the Middle East, the impact of which is quite substantial considering its spectacular growth from being negligible at the beginning of the decade to almost eight percent of GNP in 1979.¹⁰ But the effect of remittances on the distribution of

¹⁰ *The State of Pakistan's Economy* (PIDE 1980).

income is not clear yet. Other substantial sources of income, very unequally distributed, might have come up to countervail a possible egalitarian effect of remittances.¹¹ More information and further research is required to lift the veil of this opaque residual income which seems to be underestimated by the HIES (seven per cent of household income in 1979 is not even sufficient to include remittances let alone other income sources).

The Development of Labour Income Inequality

As mentioned earlier, labour income inequality is the major source of overall inequality. Though its relative contribution to overall inequality is declining, in absolute terms its contribution slightly increases due to urbanization. Since labour income inequality is always higher in the urban areas, an enlarged urban weight makes overall inequality increase which is a normal long-run evolution taking place in all developing countries.¹²

Table 2 decomposes labour income of heads of households into occupational groups. Most striking is the small difference between mean incomes of various occupational groups. Nearly all labour income inequality is due to inequalities within (and not between) occupational groups.

Further, Table 2 shows that labour income inequality does not change in urban areas, which seems to contradict the results from Table 1. However, income from other household members (than the head of the household) are not included in Table 2. The contribution to household income of these members increases from 20 per cent in 1969-70 to 30 per cent in 1979 in the urban areas and from 10 to 15 per cent in the rural areas. Apparently, increased labour inequality in the urban areas is primarily due to increased differences in the labour force participation rate between households.

4. CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

This paper has presented a framework within which the structure of income distribution and its changes over time can be analysed. Overall inequality has been disaggregated into inequalities of various sources of income. The relative importance of each inequality component has been estimated so that a sense of proportion could be obtained. For instance, we now know that analyses on inequalities between occupational groups are irrelevant because its importance to overall inequality is negligible; the same applies to inequality between provinces and to inequality between urban

¹¹ Irfan's (1986) conclusion that remittances have led to a concentration of income does not contribute much to our knowledge because this result is the explicit effect of his assumption that remittances constitute 90 per cent of income reported under 'other sources'.

¹² See Kuznets (1955).

and rural areas; even the importance of inequality in property incomes declines to less than 10 percent of overall income inequality during the decade. The bulk of income inequality in Pakistan is generated by labour income inequalities within occupational groups and by inequalities of income from other sources than labour or property.

More information is required about this opaque residual income source, it being the most unequally distributed. Further research is needed to analyse causes of (changes in) inequalities. Some changes are resulting from normal evolution of a developing country (like urbanization, declining importance of income from land, rising modern sector, etc.); other changes result from exogenous (international) developments (like the oil crisis, the migration wave to the Middle East, etc.); and some changes are the outcome of domestic policies (like nationalizations during the Bhutto administration and privatizations thereafter, price policies, income policies for civil servants, etc.). The framework presented in this paper may be useful to keep the relevance of future research topics in perspective.

Finally, the result of the development of all these inequalities is a slight increase in overall income inequality in Pakistan during the 1970s. However, it should be noted that increasing income inequalities do not necessarily imply decreasing welfare. Poverty has substantially declined during this period and GNP has grown by about five percent per annum. It might be possible that this GNP growth necessarily resulted in increasing inequalities which is also a topic for further research.

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Comments on "Sources of Income Inequality in Pakistan"

Kruijk has made two important contributions in the paper. First, the focus of studies on income inequalities should be on differences in the level of welfare rather than just on the level of household income or the per capita income. Second, by separating income inequalities generated by property income from those generated by labour income, the author has gone beyond the estimation of income inequalities into the realm of explaining income inequalities. For these two important departures from the previous studies, the author needs to be complimented. My comments relating to examination of the methodology and data employed in the study and the conclusions drawn from the results, in no way, reduce the utility of the study.

The author has, very rightly argued, that because of scale economies, neither the differences in household incomes nor in per capita incomes are the correct indicators of inequalities in economic welfare. The attempts to measure income per adult equivalent, e.g. Irfan and Amjad (1986), only corrects for differences in age composition and as such does not take into consideration the scale economies. In order to reflect differences in economic welfare, a measure of household equivalence is required which takes into consideration the scale economies arising from an increase in the household size. The author has used the following translog function to transform the size of household into household equivalents:

$$H. E. = \log(S) + 1$$

where

H. E. is household equivalent; and

S is the size of household.

While there is no doubt about the need for transforming the number of persons in a household into household equivalents, the translog function used by the author is rather dubious. The scale economies are expected to increase at a falling rate rather than at an increasing rate implied in the translog function. More care needs

to be taken in the choice of such functions, and one possible better approximation would be the following function:

$$H. E. = S - \log(S)$$

The only data source to estimate income equalities is the Household Income and Expenditure Survey. While it contains data on labour and property incomes for the employees and the employers, the self-employed sector which forms a major proportion of the total labour force poses a serious problem. This is because their incomes consist of both labour and property incomes. The author has assumed that all of the income of the self-employed is labour income. On the other hand, (Burney 1986) has divided the income of the self-employed into labour and property income with the result that the share of wages in total income is much lower than that presented by the author.

Percentage Share of Labour in Income

	Burney	Present Study
1959-60	40	—
1969-70	45	86
1979-80	49	83

It needs to be noted that the author's conclusion that income inequality in Pakistan is generated by labour income is due to the very high share of labour income rather than the uneven distribution of labour income. As a matter of fact, the distribution of property incomes is much more skewed than that of labour income. In the urban areas, Theil's entropy coefficient is 0.21 for labour compared to 0.70 for property and 1.02 for other income. Similarly, for the rural areas, it was 0.12 for labour, 0.60 for property and 1.01 for other income in 1979.

Most inequitable has been the distribution of 'other' incomes. Because of the increase in its share and increase in 'other' income inequalities, almost one-fifth of inequalities in total income can be attributed to inequalities in 'other' incomes which also include remittances. The author has found it difficult to explain increasing inequalities mainly because he has assumed that remittances are equally distributed. This has also led him to explore the effects of 'heroin' money on income inequalities. At the very outset, it needs to be noted that no household would report incomes earned through illegal channels. As a matter of fact, the explanations of higher income inequalities in 'other incomes' can be explained with reference to the remittances. Irfan (1986) found remittances and income inequalities to be correlated as shown below:

Gini Coefficients

	Including Households Receiving Remittances	Excluding Households Receiving Remittances
Total	0.376	0.362
Rural	0.320	0.302
Urban	0.401	0.389

Source: Irfan (1986).

However, this paper does make an important contribution to the literature further refinement of the methodology and data would considerably enhance the utility of the study.

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