ANALYSING DISTRIBUTIONAL ISSUES USING

EQUIVALENT-ADULT DISPOSABLE INCOMES

by

Nisha Agrawal

IMPACT Research Centre
University of Melbourne

and

Industries Assistance Commission

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ABSTRACT

Joint research with the Institute of Applied
Economic and Social Research is currently being undertaken at
the IMPACT Research Centre on the development of a model
capable of analysing the distributional implications of a wide
variety of economic changes. This paper gives a further
progress report on this work. Previous results have been
reported in terms of changes in individual disposable incomes.
For certain groups, however, we know that this measure of
income is likely to be a very poor indicator of welfare levels.
In this paper, an income measure is constructed that is a more
appropriate indicator of welfare: equivalent-adult disposable
incomes. This measure takes into account not only family
incomes but family needs as well. A consistent methodology is
then developed for reporting distributional results in terms
of this measure.

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1   INTRODUCTION

Australia is currently going through a period of rapid economic changes. Some of the major factors responsible are: the recent collapse in Australia's terms of trade, the huge buildup of foreign debt, the change in the government's tax and transfer policies, and finally, the deregulation of the financial markets. All of these changes are likely to have important implications for the distribution of income in the economy. Research is currently underway at the IMPACT Project (together with the Institute of Applied Economic and Social Research) to extend the ORANI model[1] of the Australian economy, to make it capable of analysing the distributional implications of a wide variety of economic changes. This paper represents a continuation of that research.

In analysing the distributional consequences of any economic change, there might be three types of results that we are interested in:

(1) How does the change alter the inequality in the economy-wide distribution of income: does it make it more or less equal?

(2) How does it alter the composition of the rich and the poor with respect to characteristics such as occupation, principal source of income, age, sex and employment status; i.e. who are the gainers and losers from the change?

(3) How does it affect a particular group of persons, for example, single parents or textile workers, or any other group of interest?

Whether or not we are able to answer these questions depends, in part, on the methodology adopted to present the results of the analysis. In their analysis of the distributional effects of the proposed taxation reform in Australia, Meagher and Agrawal (1986) reported their results in terms of changes in aggregate measures of inequality, such as the Gini index and the Shorrocks index (1980). While these indices are useful tools for measuring the degree of inequality existing in an economy prior to an economic change, their aggregative nature makes them inadequate for capturing the type of distributional changes that are likely to occur following most of the shocks to which an economy is subjected.

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Conscious of these shortcomings, in a subsequent paper (Agrawal and Meagher (1987)) which analysed the distributional effects of the recent deterioration in Australia's terms of trade and of four alternative policy responses to the resulting balance of payments problem, they adopted a different strategy for reporting their results. By doing so, they were able to capture the differential effects of the various policies on the distribution of income across persons classified on the basis of their occupation, employment status, principal source of income, and demographic characteristics. They also examined the effect of the policies on the size distribution of individual incomes, and were able to rank the policies in terms of their economy-wide effect on the degree of inequality.

There was, however, one major limitation of their approach: because of the measure of income that was adopted in the study, i.e. individual disposable income, only very limited deductions could be made about the welfare implications of the various policies on the basis of their study. While it might be of some interest to examine the effect of a policy on low income versus high income recipients, ideally we would like to be able to draw conclusions with respect to its likely effect on groups with different initial welfare levels. For certain groups of persons, however, individual income is likely to be completely inadequate as an indicator of their welfare level. Married women who choose not to participate in the workforce, for example, could have low income levels and yet high welfare levels. Thus, family incomes will be a better indicator of welfare than individual incomes. This adjustment to income alone, however, is not sufficient to obtain an appropriate indicator of welfare. Since families differ in their size and composition, and hence in their needs, some adjustment needs to be made

ENDNOTES

1 ORANI is a computable general equilibrium model of the Australian economy and is fully documented in Dixon et al. (1982).

2 The work reported in this sub-section has been done jointly with Dr. G.A. Meagher of the Institute of Applied Economic and Social Research, University of Melbourne.

3 Dependent children are defined as all unmarried persons living with their parent(s) and either under 15 years of age, or full-time students aged 15-20 years. Any income received by dependent children is not included in the income of the income unit to which they belong.

to the income measure which will also take these differing needs into account.

In this paper we construct a size distribution of income that is based on a more appropriate indicator of welfare than individual disposable income: equivalent-adult disposable income. The approach we adopt for this purpose was proposed by Kakwani (1986). We then develop a methodology for reporting results that could be applied to answering questions at the various levels of disaggregation desired in questions of type (1) to (3). All analysis is based on unit record data for almost 30,000 individuals from the 1981-82 Income and Housing Survey (IHS) conducted by the Australian Bureau of Statistics (ABS).

The rest of the paper is set out as follows: in section 2 we define and construct the appropriate income measure. Section 3 presents the new size distribution of income, in terms of the measure developed in section 2. For purposes of illustration, this distribution is compared to the one constructed in terms of disposable incomes. Section 4 concludes the paper with a perspective for future research.

2 INCOME MEASURE

The Australian Bureau of Statistics distinguishes the terms 'household', 'family', and 'income unit' from one another. Below we use these terms loosely and interchangeably to mean an ABS income unit (defined below in section 2.3).

If our primary interest is to examine the effect of a policy on the personal distribution of income, one of the first things we need

will be to incorporate the size distribution of equivalent-adult income, and the methodology of reporting results as changes in this distribution, into our proposed general equilibrium model of income distribution.

to decide is whether we are interested in the distribution of income among individuals or among households. By working with the distribution of income among households, many conventional studies implicitly give an equal weight to each household, irrespective of its size. This means that a single-person household and one containing (say) six dependent children are treated alike. This is difficult to justify from a welfare point of view.

If our objective is to measure the distribution of the economic welfare of individuals, the best approach seems to be to weight each individual equally, irrespective of the size and composition of the household to which he or she belongs. Under this approach, the size distribution of individual welfare is constructed by assigning each individual in a household a welfare value equal to the average income per equivalent-adult for that household. This approach will be appropriate if we assume that every individual in a household enjoys exactly the same level of access to the resources of the household. The validity of this approach is difficult to assess because of the limited knowledge on intra-household transfers. If we assume, however, that the family members care about each other, then it may be reasonable to assume that the family will allocate its resources so that each family member enjoys about the same level of economic welfare.

In this study, we construct size distributions of income that treat all individuals alike, irrespective of the size and composition of the household to which they belong. In deriving an appropriate income measure, we take into account not just the family's income, but also its needs. We first describe the income data available from the 1981-82 IHS which forms the basis of this study. This database includes data on

this group belongs to each of the income deciles before the shock, and then seeing how these proportions change due to the shock. Thus, for example, if due to the shock a greater proportion of single parents belong to each of the first five lower income deciles and a smaller proportion to the remaining higher income deciles, we can surmise that their relative positions have deteriorated due to the shock.

4 CONCLUSION AND PERSPECTIVE FOR FUTURE RESEARCH

For the purpose of measuring welfare, it is important to have as comprehensive a definition of income as possible. All factors which affect the economic well-being of the recipient unit, both directly and indirectly, should be included in the definition. However, data limitations seldom permit the inclusion of some components of income such as the value of home production, capital gains, in-kind transfers and voluntary leisure, all of which obviously affect the economic well-being of the income recipient (Kakwani, 1986). Money income is instead used as an indicator of welfare, even though it has obvious limitations. In this study, although we adopt a fairly comprehensive concept of income, it is still deficient from the welfare point of view. Unfortunately, the 1981-82 IHS, which formed the basis of our study, does not provide enough information to take into account all the relevant factors affecting economic welfare.

Future research will proceed in two directions. First, the income measure adopted will be refined so that it is a better indicator of welfare than the current one. To do this, we plan to evaluate the benefits accruing to different groups from some of the major in-kind transfers due to government programs such as public housing, public education, the medical system etc. The second branch of the research

earned income as well as transfer payment receipts. It does not, however, have any information on the taxes paid by income recipients. We utilize additional data sources to calculate individual disposable incomes. Next, we pool the incomes of family members to obtain total disposable family income. Finally, we apply equivalent scales to take account of differences in the size and composition of families, and calculate the disposable income per equivalent-adult in each family. Each of these steps is described in detail below.

2.1 Total Annual Income

The income concept adopted in the IHS was total annual income from the following sources: wages or salary; business income; government cash benefits; superannuation; interest, dividends, rent, etc.; and other income. Each of these is defined below.

Income from wages or salary was defined as income from all wage or salary jobs before the deduction of tax. Workers' compensation payments (other than lump sum payments) for temporary loss of wages or salary were included. The value of items such as payments in kind, employer contributions to board or rent, gratuities or tips, etc., were not included.

Income from own business, farm, partnership, etc. was defined to be net of business expenses. If income had not been received in 1981-82 or a loss had been made, annual income from these sources was recorded as nil.

Thus, in addition to measuring changes in the respective income shares of the rich and the poor, it might be valuable to try to assess the changes in their composition with respect to characteristics of interest (such as age, ethnicity, workforce status, and so on). Hence, more often it is questions of type (2) that are likely to provide interesting answers rather than questions of type (1).

For example, we know from Agrawal and Meagher (1987) that the terms of trade shock alters the occupational and industrial composition of employment; it lowers employment in the traditional exporting industries and raises it in the import-substituting ones. Thus, it is likely to lead to lowered incomes for farmers and miners while leading to higher incomes for, say, textile workers. This, in turn, is likely to alter the occupational composition of the rich and the poor. This effect could be captured by examining the changes in the pre- and post-shock occupational compositions of the income deciles. This decomposition could similarly be used to identify the winners and losers from an economic change with respect to any characteristic of interest which is recorded in the IHS database.

Finally, changes in the size distribution of income could also be used to answer questions of type (3). Special interest groups are more concerned with evaluating the effect of a given change on a particular group in society, rather than in measuring its economy-wide effects. As a result, a significant proportion of the policy debate with respect to distributional issues seems to be devoted to answering questions of this type. Suppose, for example, that we are interested in analysing the effect of the terms of trade deterioration on single parents. This could be done by first finding out what proportion of parents.

Income from government cash benefits includes income received through programs of assistance to aged persons, incapacitated and handicapped persons, unemployed and sick persons, veterans and their dependants, widowed and single parents, families and children, and other social security and welfare programs. Family allowance payments are also included.

Income from superannuation comprises regular payments made to a retired person or his survivors by a former employer, either directly or through a superannuation fund, insurance company, etc. Any lump sum payment received by a person on his retirement was excluded.

Income from interest, dividends, rent, etc. includes: interest on savings, bonds, debentures, etc; dividends from stocks and shares; and net income from rental of a house or other property and net royalties.

Income from other sources comprises income from items such as educational scholarships; maintenance or alimony; a trust or will; and an annuity. Income paid at regular intervals and received by a beneficiary under a will, settlement, deed, gift or trust was included. However, a lump sum payment from any of these sources was not regarded as income.

Total annual income was defined as the sum of amounts received from these sources in 1981-82. Thus, the income data available from the IHS includes all transfer payments but excludes any information on taxes paid. To calculate post-tax or disposable incomes, we utilized

alternative sources for data on the Australian tax system. The derivation of post-tax incomes is described below. Since the Australian tax system levies taxes on individuals, rather than families, the tax paid by each individual was calculated separately.

2.2 Disposable Income

The first step in calculating post-tax incomes was to calculate the net income or the total annual income less the tax free incomes.[2] Certain types of incomes, including incomes from some government benefits, are tax exempt. The information on the tax status of the various income components was obtained from the Australian Master Tax Guide (1982). Government benefits that are tax exempt include: family allowances, disability pensions, child-education assistance, war widows' pensions, self-education assistance and 'other' government benefits. In addition, income from alimony or maintenance is also tax exempt. We subtract income from any of these sources from the total annual income to arrive at net income.

The next step was to calculate taxable income, which is defined as the difference between net income and deductions. Again, no information was available from the IHS data on the amount of deductions claimed by each individual. The Taxation Statistics for 1981-82 (Parliamentary Paper No. 42/1983 published by the Commissioner of Taxation) contains data on the various types of deductions claimed by seven groups of taxpayers, classified on the basis of their incomes. An average value of deductions per taxpayer in each of these 7 categories was calculated from this data, and applied to the IHS data. The values

TABLE 7

THE EFFECT OF THE TERMS OF TRADE SHOCK ON THE SIZE DISTRIBUTION
OF EQUIVALENT-ADULT DISPOSABLE INCOME

Income Deciles*	Mean Incomes	Shares of Total Income
1	-0.89	0.01
2	-0.39	0.01
3	-0.70	0.00
4	-0.72	-0.01
5	-0.53	0.00
6	-0.51	0.00
7	-0.53	0.00
8	-0.39	0.02
9	-0.44	0.02
10	-0.69	-0.03

* Results for mean incomes are expressed as percentage changes. Results for shares of total incomes are expressed as percentage point changes in the original shares.

3.2 A Methodology for Reporting Results

The size distribution of equivalent-adult income can be usefully adopted as a tool for reporting results at the various levels of disaggregation that might be desired. To answer questions of type (1) posed in the Introduction, i.e. to look at the economy-wide effect of an economic change, we could compare the pre- and post-shock size distributions of income. If we take the recent terms of trade shock as an example (see Agrawal and Meagher (1987) for details) we find that the Gini index is unable to capture any changes in the resulting distribution of income; its value remains unchanged at 32.6 in the pre- and post-shock distributions. Instead, changes in the size distribution of equivalent-adult income, as reported in Table 7, could give us a better indication of the absolute and relative changes in income due to the shock.

In terms of Table 7, it seems as if the distributional effects of the terms of trade shock are relatively minor. That conclusion is not surprising, however, given that we are reporting results in terms of overall changes in the size distribution of income. It has been noted in a number of earlier studies that the size distribution of income tends to be very stable:

"In general, it has been found to be the case that the overall size distribution of income can be substantially affected only by major shocks. However, the distribution among socio-economic groups is much more unstable and can be very policy responsive."

(Dervis et al., 1982, pp.425)

for these deductions are reported in Table 1. Taxable income was then calculated for each individual taxpayer in our data file.

Next, we applied the tax schedule for 1981-82 to the taxable income to obtain values for gross tax, or tax payable. Gross tax is the amount payable before any rebates are deducted. The tax schedule for 1981-82 is presented in Table 2.

The final step in our calculations was to evaluate the net tax paid, which is gross tax less rebates. There are two main categories of rebates that are available to taxpayers:

(1) rebates for dependants;

(2) rebates for concessional expenditures.

The two main rebates under the first category are the dependent spouse rebate and the sole parent rebate. Persons eligible for the former are those whose spouse's income was below $3602 in 1981-82. The maximum rebate is $830, and it falls by $1 for every $4 by which the dependant's net income exceeds $282. Persons eligible for the sole parent rebate are single parents with at least one dependent child in 1981-82. Persons eligible for this rebate can claim a fixed rebate of $580, irrespective of their income or of the number of dependent children they have. We apply these rebates to all individuals in our data who satisfy these criteria.

Rebates can also be claimed for various types of expenditures, which have been classified as concessional expenditures,

couple income units with no children, only about a fifth of the latter group fall into this category. The proportion of wage earners who belong to married couple families with either one, two or three children is higher than the corresponding proportions for government benefit recipients. Thus, since government benefit recipients have, on average, fewer dependents than wage earners, their adjusted incomes rise while those of wage earners fall.

One reason underlying the difference in the types of income units that these two groups belong to is the difference in their age structure. Wage and salary receivers, by definition, have to be active in the workforce and this is reflected in the fact that only 1 per cent of this group is above the age of 65. On the other hand, a large proportion of those primarily dependent on government benefits are retired persons; about 39 per cent of them are above the age of 65. Since the children of older couples are likely to be older and hence less likely to be dependent on them, the older group of government benefit recipients have fewer persons to support on their incomes than the younger group of wage and salary earners.

This adjustment for family size and composition may have important policy implications. Suppose, for example, we were evaluating the distributional effects of a possible cut in real wages proposed with the objective of generating increased output and employment. Since the proportion of wage receivers amongst the rich and the poor changes substantially after the adjustment for family size and composition, our results could depend significantly on whether we were examining the effect of the policy on the pre- or post-adjustment distribution of income.

TABLE 1

DEDUCTIONS AND REBATES PER TAXPAYER, 1981-82

Income Range	Deductions Per Taxpayer 1981-82 dollars	Other Rebates and Credits per Taxpayer 1981-82 dollars
Under 6000	98	31
6000 - 8999	166	64
9000 - 11999	239	82
12000 - 15999	327	108
16000 - 21999	459	169
22000 - 31999	649	293
32000 and above	936	527
Average	331	127

TABLE 2

PERSONAL INCOME TAX SCHEDULE, 1981-82

Taxable Income (dollars)	Marginal Tax Rate (per cent)
Up to 4195	0
4196 - 17893	32
17894 - 35787	46
35788 and above	60

TABLE 6

ALLOCATION OF PERSONS WITH DIFFERENT PRINCIPAL SOURCES OF INCOME
ACROSS TYPES OF INCOME UNITS

Type of Income Unit	Wages & Salary	Own-business, Farming	Own-business, Other	Government Benefits	Interest, Rent, etc.	Other Income
Single Person	35.0	13.6	12.8	31.6	19.0	41.0
Single Parent -						
with 1 child	1.6	0.1	0.7	3.1	0.6	4.6
with 2 children	0.8	0.7	0.5	1.7	0.9	1.9
with 3 children	0.3	0.0	0.3	0.8	0.2	1.6
with 4 or more children	0.1	0.0	0.0	0.3	0.0	0.8
Married Couple -						
with no children	21.5	31.6	24.5	31.9	53.7	36.8
with 1 child	13.1	17.4	17.2	7.1	11.7	5.7
with 2 children	18.0	18.6	23.9	12.8	9.4	4.0
with 3 children	7.4	12.6	14.4	7.1	3.7	2.2
with 4 children	1.7	3.3	4.2	2.3	0.6	0.9
with 5 children	0.4	1.1	1.1	0.7	0.2	0.3
with 6 or more children	0.1	1.0	0.5	0.4	0.1	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

if their total value exceeds $1590. These include, among others, medical expenses, educational expenses, and life insurance and superannuation payments. For most of these expenditures, a maximum value has been specified for the amount that can be claimed. For example, the maximum amount that can be taken into account for life insurance and superannuation payments is $1200. The concessional expenditure rebate equals 32 per cent of the excess of qualifying expenditures over and above $1590. The IHS database includes data on the life insurance and superannuation payments made by each individual. However, no data is available on any of the other items which classify as concessional expenditures. Therefore, it was not possible to evaluate the amount of concessional expenditures undertaken by an individual and hence, to calculate the rebate due each person. Again, data from the Taxation Statistics for 1981-82 was used to calculate the values of these rebates for persons classified into 7 income ranges. These values are also reported in Table 1.

Once we know the total rebates per person, we can calculate the total tax paid by each individual in our data. The post-tax or disposable income of each person can then be easily calculated as the difference between the person's total annual income and the tax he/she paid.

2.3   Equivalent-Adult Income

Once we have calculated individual disposable incomes, we need to pool the incomes of members of an income-receiving unit to determine the total disposable income of that unit. The IHS data relate to two types of income-receiving units: individuals and 'income units'.

For our study, we adopt the ABS classification of income units as the relevant one. Income units belong to the following types:

(1) married couple income units, which consist of a husband, wife and dependent children (if any) as defined.³ Stated de facto relationships are included;

(2) one parent income units, which consist of a parent and at least one dependent child;

(3) one person income units, which consist of persons who are not included in (1) or (2) above. Non-dependent children living with their parents are classed as one person income units.

Note that every individual in the IHS database must be classified as belonging to exactly one of the above types.

As noted earlier, the welfare of an individual who belongs to a given family depends not just on the size of that family's income, but also on its needs. One measure of income that partly takes into account the differences in the requirements of different families is per-capita family income. However, there are two problems with this measure:

(1) It assumes that all persons within a family have exactly the same needs, irrespective of age and sex. In other words, it takes account of the size but not the composition of the family. It is difficult to justify the assumption that both adults and children have the same needs.

TABLE 5

DISTRIBUTION OF DISPOSABLE INCOME ACROSS GROUPS WITH DIFFERENT PRINCIPAL SOURCES OF INCOME*

Deciles	Wages & Salary	Own-business, Farming	Own-business, Other	Government Benefits	Interest, Rent, etc.	Other Income Source	No Own Source
Original Income Ranges							
1 1 – 1239	5.8	0.2	1.0	70.5	20.8	1.8	–
2 1240 – 3329	20.6	1.4	5.0	60.0	9.3	3.8	–
3 3330 – 4214	13.2	1.1	5.1	76.1	3.2	1.2	–
4 4215 – 5598	32.0	2.3	11.6	47.2	4.7	2.2	–
5 5599 – 7436	54.0	3.7	14.4	17.1	6.7	4.1	–
6 7437 – 9404	70.2	2.8	14.4	4.7	4.5	3.4	–
7 9405 – 11114	83.2	1.6	9.2	1.0	2.7	2.3	–
8 11115 – 13217	86.2	2.1	8.3	0.2	1.9	1.3	–
9 13218 – 15908	87.3	1.8	8.0	0.0	1.7	1.2	–
10 15909 and above	78.5	3.1	14.5	0.0	2.9	1.1	–
Adjusted Income Ranges							
1 1 – 3540	17.1	2.3	7.2	51.8	8.5	4.7	3.4
2 3541 – 4161	10.7	0.9	5.1	80.1	1.5	0.7	1.0
3 4162 – 4976	25.5	1.4	8.1	60.1	2.2	1.7	1.0
4 4977 – 5929	45.7	2.2	11.1	32.0	4.5	2.8	1.7
5 5930 – 6934	57.7	2.0	9.7	18.9	6.1	2.8	2.8
6 6935 – 8022	62.4	1.5	9.2	14.3	6.9	2.2	3.5
7 8023 – 9401	71.8	1.8	8.0	5.8	8.2	2.0	2.4
8 9402 – 11073	76.4	1.9	7.8	3.7	6.2	2.0	2.0
9 11074 – 13487	79.9	2.2	9.1	1.4	5.3	2.0	0.8
10 13488 and above	72.7	3.2	14.0	0.6	7.6	1.4	0.5

* Note that each row in this table sums to 100 per cent.

incomes rather than individual incomes as indicators of welfare levels. We next want to demonstrate the importance of adjusting incomes for family size and composition. To do this, we breakdown the income deciles according to persons with differing principal sources of income. The pre- and post-adjustment compositions of each of the deciles are presented in Table 5.

To illustrate our point, we will concentrate on two groups: those whose principal source of income is either wages and salary or government benefits. We observe that, after the adjustment, the proportion of persons who depend on wages and salary rises in four of the first five lower income deciles and falls in each of the five highest income deciles. The opposite happens for those dependent on government benefits; they now move out of the relatively lower income deciles into the higher income ones. This change is especially pronounced in their move from the first to the second decile. Prior to the adjustment, they constituted 70.5 per cent and 60.0 per cent of the first two deciles. After the adjustment, they constitute only 51.8 per cent of the poorest decile, while their proportion goes up to 80.1 per cent in the second decile.

The explanation for this observation lies in the differences in the type of income unit these groups of persons belong to, and hence, in the number of dependents they each support. Table 6 shows how persons who differ on the basis of their principal source of income also differ on the basis of the type of income unit they belong to. One major difference between government benefit recipients and wage earners is that while almost a third of the former group belong to married

(2) A per-capita measure overlooks the economies of scale that operate for many items of consumption. It assumes that a household of four persons needs twice as much income as a household of two persons in order that both households enjoy the same standard of living, which clearly does not hold. The larger households can obviously economize by sharing several of the household durable goods like washing machines, refrigerators, cars, etc.

In order to cope with these problems, attempts have been made to construct equivalent-income scales that would facilitate the comparison of households of different sizes and age compositions. The equivalent-income scale, which is also referred to as the equivalent-adult scale, measures the relative income required by families of different size and composition to maintain the same level of satisfaction. It can be expressed as:

$$V_i(\lambda_1, \lambda_2) = 1 + \lambda_1(A_i-1) + \lambda_2 C_i \qquad (1)$$

where $V_i(\lambda_1, \lambda_2)$ is the number of equivalent-adults in the ith household consisting of A_i adults and C_i children; λ_1 is the weight given to the second and subsequent adult; and λ_2 is the weight given to each child in the household.

The head of the household is assigned the weight equal to unity. To take account of economies of scale, both λ_1 and λ_2 must be less than unity. Further, it seems reasonable to restrict that $\lambda_2 < \lambda_1$, on the assumption that children need less than adults in order to have the same level of economic welfare.

sentation in each of the five higher income ranges. In the two highest income deciles, their proportion rises from 12.1 per cent and 8.4 per cent to a considerably higher 32.1 per cent and 32.4 per cent. Corresponding by, the proportions of adult males in these deciles fall from 63.8 per cent and 70.5 per cent to 36.4 per cent and 40.4 per cent, respectively.

The reason for these changes is obvious; a high proportion (55 per cent) of married women do not participate in the workforce and hence, when classified on the basis of their own incomes, fall into the lower income ranges. However, when their husbands incomes are taken into account, a large number of them move into the upper income ranges. This illustrates the fact that for married women especially, their individual incomes would obviously be a very poor indicator of their welfare levels. In fact, since research indicates that the higher the husband's income, the less likely is a woman to participate in the workforce, own incomes and welfare levels might even be negatively correlated for married women.

Another result of interest here is the effect of the adjustment on female teenagers. Female teenagers, prior to the adjustment, represented a small proportion of persons in the three highest deciles. After the adjustment, however, their representation in each of these deciles rises. The reason is related to the marital status of this group. Our data reveal that 4.7 per cent of female teenagers are married. The pooling together of spouses' incomes tends to improve their relative status.

The adjusted household income, Y_{ki}, that is used as a proxy for the economic welfare of any individual k belonging to household i is defined as:

$$Y_{ki}(\lambda_1, \lambda_2) = X_i / v_i(\lambda_1, \lambda_2) \qquad (ik) \qquad (2)$$

where X_i is the total disposable income of household i. Note that when $\lambda_1 = \lambda_2 = 0$, the adjusted income is identical to the total household income. When $\lambda_1 = \lambda_2 = 1$, we obtain per capita household income, implying equal income for each member of the household.

The size distribution in our study was constructed by ranking individuals according to the size of their adjusted income. The adjustment was made by dividing the income of each household by the number of equivalent-adults in that household. This number was obtained by the use of the following scale:

First adult in the household	1.0
Second adult in the household (λ_1)	0.7
Each child in the household (λ_2)	0.4

This scale was adopted by Kakwani (1986) on the basis of its "reasonableness" after he evaluated several equivalence scales. We adopt this because, unlike some of the other scales that have been estimated, this one can be easily applied to each of our three categories of income units.

TABLE 4

DISTRIBUTION OF DISPOSABLE INCOME* ACROSS
DEMOGRAPHIC GROUPS*

Deciles	Male Teenagers (15-19)	Young Males (20-24)	Adult Males (25-54)	Senior Males (55+)	Female Teenagers (15-19)	Married Women (20+)	Single Women (20+)
Original Income Ranges							
1	1 - 1239	0.8	1.5	3.6	1.9	1.4	88.6	2.3
2	1240 - 3329	4.1	5.4	7.5	17.2	4.4	52.7	8.7
3	3330 - 4214	1.6	3.0	6.6	23.5	1.9	30.3	33.1
4	4215 - 5598	5.3	4.3	12.2	17.5	4.8	27.2	28.7
5	5599 - 7436	7.1	7.1	17.5	10.0	7.7	31.0	19.5
6	7437 - 9404	4.2	12.2	25.7	8.9	2.1	28.8	18.1
7	9405 - 11114	1.2	12.4	35.1	11.2	0.4	23.8	15.9
8	11115 - 13217	0.6	10.0	50.0	13.2	0.1	15.8	10.4
9	13218 - 15908	0.3	5.9	63.8	11.1	0.0	12.1	6.9
10	15909 and above	0.1	2.7	70.5	14.0	0.0	8.4	4.3
Adjusted Income Ranges							
1	1 - 3540	5.2	7.6	22.0	9.9	5.8	24.9	19.3
2	3541 - 4161	1.0	2.0	12.2	23.2	1.6	27.6	32.4
3	4162 - 4976	2.6	3.4	19.5	19.6	2.7	31.4	20.8
4	4977 - 5929	4.0	4.0	30.6	11.4	3.4	38.2	8.4
5	5930 - 6934	3.8	4.1	32.5	9.1	4.2	37.7	8.6
6	6935 - 8022	3.4	5.3	31.4	10.4	2.5	37.5	9.5
7	8023 - 9401	2.2	9.5	31.0	10.0	1.1	34.2	12.0
8	9402 - 9401	1.1	10.7	32.6	9.8	0.6	31.4	13.8
9	11074 - 13487	0.6	9.9	36.4	10.2	0.2	32.1	10.6
10	13488 and above	0.4	5.9	40.4	12.3	0.1	32.4	8.5

* Note that each row in this table sums to 100 per cent.

There is one problem with our data which should be noted here.

In the IHS database, income units are classified into 7 categories on the basis of the number of dependent children in each unit. The first 6 categories contain families with zero to five dependents, respectively. The seventh category contains all families with 6 or more dependents.

Since there is no way of determining the exact number of dependents in this last category, we just set it equal to 6. Thus, we will be overstating the adjusted income for individuals who actually belong to families with 7 or more dependents. However, since only 0.26 per cent of all individuals in our data fall into the seventh category, this should not lead to large inaccuracies in our results.

3 THE SIZE DISTRIBUTION OF EQUIVALENT-ADULT INCOME

Table 3 presents results for the size distribution of the original disposable income and the equivalent-adult or adjusted disposable income. It is immediately obvious that the pooling together of family incomes and the adjustment for household size and composition makes a great deal of difference to the inequality in the individual distribution of income; the inequality of adjusted household income per person is considerably lower than that of individual incomes. The value of the Gini index of inequality falls from 38.3 to 29.3 following the adjustment. The decrease in inequality is also reflected in the decile shares; shares of the first five deciles are increased and those of the remaining five are decreased as a result of the adjustment.

3.1 Significance of the Adjustments

The adjustment we made has two components: first, we use family incomes instead of individual incomes; and second, we take account of differences in the size and composition of various families. Both these adjustments have a striking effect on the composition of the rich and the poor. Next, we illustrate the importance of each type of adjustment with the help of examples.

To show how the use of family incomes instead of individual incomes alters the composition of the rich and the poor, we breakdown the pre- and post-adjustment size distributions across seven demographic groups. The composition of each decile with respect to these groups is shown in Table 4. If we look at the first two deciles we notice that prior to the adjustment, the majority of the persons belonging to these deciles were married women; they constituted 88.6 per cent of the first decile and 52.7 per cent of the second decile. After the adjustment, their representation amongst the poorest groups falls dramatically; they now constitute only 24.9 per cent and 27.6 per cent of the first and second deciles, respectively. The poorest two deciles are now made up of higher proportions of all the other groups. In particular, as the income of adult males is shared with their spouses and children, the income available to them for their own consumption falls significantly; their representation in the first and second decile goes up dramatically from 3.6 per cent and 7.5 per cent to 22.0 per cent and 12.2 per cent, respectively. After the adjustment married women increase their repre-

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* Note that the adjustment for economies of scale increases average income while the adjustment for children decreases it. The net effect here is a decrease in average income per income recipient.

TABLE 3

THE DISTRIBUTION OF ORIGINAL AND ADJUSTED DISPOSABLE INCOMES PER INCOME RECIPIENT

Decile Income	Mean Incomes		Shares of Total Income	
	Original Disposable Income	Adjusted Disposable Income	Original Disposable Income	Adjusted Disposable Income
1	552	2370	0.7	3.0
2	2561	3884	3.1	5.0
3	3798	4558	4.5	5.8
4	4832	5452	5.7	7.0
5	6530	6430	7.8	8.2
6	8446	7456	10.1	9.5
7	10262	8704	12.2	11.1
8	12098	10176	14.4	13.0
9	14536	12167	17.3	15.6
10	20353	17071	24.2	21.8
Total	8397	7827*	100	100