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An Accounting Framework for Transfer Payments and Its Implications for the Size Distribution of Income

Edward C. Budd, Daniel B. Radner,
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2.1 Introduction

The purpose of this paper is to develop a framework for accounting for transfer payments for the household sector and for estimating the effect of transfers on the distribution of income by size and by selected socioeconomic characteristics, primarily for the year 1972, for which relatively complete and consistently estimated data exist. Section 2.2 discusses the accounting framework and some of the problems in distinguishing between income arising from production and that arising from income redistribution, or payments (and receipts) of transfers. The notion is that in an accounting system for the economy as a whole, although not necessarily for any individual sector of it, transfer payments simply

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The authors had originally planned to use the microdata files underlying the 1979 Income Survey Development Research Panel for most of the empirical estimates in this paper. Because the processing of these files was terminated while this paper was being prepared, it was necessary to place primary reliance at the last minute on the fully estimated Exact Match-Statistical Match file for 1972, produced by the Bureau of Economic Analysis in cooperation with the Office of Research and Statistics of the Social Security Administration and used with their permission. We are particularly indebted to Jean Karen Salter, Robert Yuskavage, and Daniel McCarron of BEA, Michael Vita, formerly of BEA, and Sharon Johnson of ORS for the major roles they played in creating the file, and to Sharon Johnson for preparing the tabulations used in this paper.

In addition to the preliminary results presented here for our specially defined income concepts and those for total money income presented in Budd and Salter (1981), BEA plans to publish more complete distributions for family personal income, together with comparisons with the Current Population Survey for 1972, in addition to a more complete description of the file than is presented in our appendix A. BEA also plans to release a public use file tape of the fully estimated Exact Match-Statistical Match file.

redistribute claims to income produced, without raising the total. Perhaps this is little more than a definition—although the indirect effect of transfers and taxes on production may well affect the level of production, a topic beyond the scope of this paper.¹

Section 2.3 gives a brief description of the microdata file—the fully estimated Exact Match-Statistical Match (EM-SM) file for 1972—from which the redistributive effects of transfers have been estimated and explains some of the further adjustments to the file that make possible the estimates presented in section 2.4. The basic microdata file used is fully corrected for under- and nonreporting of income, and the aggregates for particular income types are consistent with the aggregates for the corresponding income types included in total money and family personal income as estimated in the National Income and Product Accounts (NIPA). A more complete account of the file is provided in appendix A. Estimates of pre- and after-tax and transfer distributions are presented in section 2.4, although we should note that the estimates for taxes are not of the same quality as the other income and transfer components in the file.

While redistributive transfers are made by business, nonprofit, and household sectors of the economy, in addition to the government, the government is by far and away the most important. Two comments should be made at this point. First, our paper discusses government redistribution through the tax and transfer system, not all of its redistributive activities taken as a matter of deliberate policy, such as agricultural price supports, which raise the (pretax and transfer) incomes of farmers. Second, size and other distributions of pretax and transfer income concepts (such as our earnings and production-related income) should not be viewed as those that would have been generated in the absence of government activities and policies. The latter affect the demand for and supply of products and productive services in a variety of ways and, as a result, the wage and rental rates underlying our estimates of pretransfer incomes.²

2.2 An Accounting Framework for Transfers

In this section we develop a framework for the alternative income concepts used in this paper and their relation to an accounting framework for transfer payments for households. Our discussion will be restricted to the household sector; the development of an accounting framework for the economy as a whole and its various sectors is the subject of the Eisner paper in this volume. Our household sector is more narrowly defined than the traditional personal sector in the NIPA: for one thing, it excludes nonprofit institutions, such as philanthropic organizations; for another, its coverage is limited to units eligible for interview in census field surveys. Thus, the institutionalized population, military personnel

on post and overseas, civilians overseas, and decedents (persons who died before the survey week but whose incomes in the previous year were included in the income aggregates for that year) are excluded from the estimates.

Private insurance companies and uninsured pension funds, it should be noted, are included in the NIPA business sector, not its personal sector. Also, following the NIPA treatment, we include estates and trusts as part of the household sector and impute property income received by estates and trusts from the business and government sectors directly to beneficiary households, whether the income received by estates and trusts is paid out to beneficiaries or retained by the estate or trust for the latter's benefit.

2.2.1 Definitions of Transfer Income and Income from Production

There appears to be general agreement that transfer payments are defined as payments made for which there is no quid pro quo, that is, nothing of value is provided in exchange. Ingvar Ohlsson (1953, p. 13) refers to such transactions as "independent" or one-way, as contrasted with "combined" or two-way transactions in which there is an exchange of equal values. In the context of national income accounting, a transfer is "any income, either in money or in value in kind, accruing to persons or groups which is not in return for current services or products provided by them."³ Since by definition no current goods or services are being provided in return, transfers enter only the income side of the accounts and do not affect the product side. For a particular receipt or payment to be considered an income transfer, "two tests must be satisfied: (1) it must be income from the point of view of the recipient; and (2) it must be a payment for which no service or product is provided in return" (Rolph 1948, p. 329). A failure to meet the first test would be exemplified by a capital transfer, such as a gift of land by one person to another, or an insurance reimbursement for storm damage to a residence or an automobile.

The second test requires a definition of production or productive activity. The one adopted by Rolph, and implicit, if not explicit, in much of the literature, is the use of real resources, both physical assets and human beings, to produce goods and services over a specified time period. It lies behind the economist's model of a production function, which posits a relation between the flow of services of real resources, measured in physical units or units of time (e.g., man-hours), and the resulting flow of output.

2.2.2 Money Income vs. Income in Kind

Such a definition does not, of course, set rigid bounds on what is considered productive activity. For one thing, it is generally agreed that the goods and services do not necessarily have to be bought and sold in

markets to be eligible for inclusion in the output measure. We believe that the concept of income and product should be extended beyond that embodied in market transactions, although we do not attempt in this paper to determine the appropriate boundaries for inclusion of in-kind income. Although the boundary must be justified by the purpose of the particular study, we would probably draw it before reaching such frontiers of imputation as home production and leisure time.

Imputed income types for which we do have estimates, in particular those imputations that are part of NIPA and included in personal income, are also included in our empirical distributions, specifically, wages in kind, imputed food and fuel consumed on farms, imputed rent on owner-occupied dwellings, and imputed interest. From a distributional standpoint, the inclusion of imputed rent is necessary to give equal treatment to the owners of rented structures and owners who live in their own dwellings without any payment of cash rent. An argument similar to that for imputed rent can be made for the inclusion of imputed interest. Investors have the option either of investing in physical and financial assets directly or of acquiring claims to such assets indirectly through holding the deposits or claims of financial intermediaries. If investors select the latter option, they give up part of the interest return they would otherwise have received as an implicit payment for the services of such intermediaries. Imputing a value for these services and adding it to the return of those holding claims on financial intermediaries is one way of providing equivalent distributional treatment for the two groups of investors. Alternatively, one could deduct the (imputed) value of the equivalent services that those who invest directly provide for themselves, if such estimates existed.

Perhaps imputed wages are defined too narrowly in the NIPA. We see no objection, if estimates of their distribution were available, to broadening the concept to include other kinds of employee perquisites, particularly those enjoyed by many executives. Employer contributions to social insurance and private pensions and welfare funds (including group health and life insurance) are already included in employee compensation in the NIPA, although under the heading of supplements to wages and salaries rather than imputed wages. We confine our empirical work to wages and salaries, not on principle, but because we lack estimates of the distribution of supplements by income size.

2.2.3 Capital Gains and Losses

Capital gains and losses present another problem in defining production, since they do not appear to fit nicely with the notion of creation of values through the use of real resources. Insofar as these gains arise from changes in expectations of the future earning power of existing assets and not just from changes in the rates at which those earnings are discounted,

there is a good case for their inclusion. Such inclusion is particularly appropriate for income distribution measurement, since such gains are important in determining the relative well-offness or position of different households and groups in the distribution. We exclude them, not as a matter of principle, but simply because we have no comprehensive estimates of their distribution in our microdata file.⁴

2.2.4 Interest Payments

One of the more controversial issues in national income accounting is the treatment of interest: Are such payments to be viewed as transfers or as payments for productive services?⁵ Under current accounting methods employed in the NIPA, interest payments do not affect the size of net national product (NNP); interest is not treated as the purchase of a separate service which produces a value in addition to that already included on the product side. A residence, for example, does not render any more housing services to its occupant simply because there is a mortgage held against it on which interest must be paid. Viewed from the income side, interest is simply a transfer or redistribution of business income or income arising from the rental of physical assets (e.g., dwellings). Similarly, government output is measured independently of government interest paid. While it has often been argued that government output is understated by the omission of the value of the services of government-owned capital, it is usually not proposed to measure such services by interest paid on government debt.⁶

This does not mean, of course, that (net) interest paid, whether by business or government, should be excluded from a measure of income receipts simply because it does not give rise to independent values on the product side. The important issue is whether the totals for the various income types have been measured correctly, for example, whether business or rental incomes are shown net of interest paid if interest is shown as a separate income share (an application of Rolph's "deduct-add" rule), rather than whether the resulting interest (or dividend) share is to be called a productive payment of some sort or other, or simply what it is, a transfer payment.

2.2.5 Consumer Interest

One further problem is presented by consumer interest paid. In the NIPA such interest ("personal interest paid to business") is no longer included in NNP in consumer expenditure, but is treated as a separate allocation of personal income, along with personal taxes, consumption expenditure, net foreign remittances, and personal savings.⁷ Personal interest income is thus gross of such interest paid by consumers, rather than net. Given the fact that interest does not represent the value of some additional services purchased by consumers (otherwise it would be in-

cluded on the product side), it should be deducted from interest paid for purposes of showing the correct relative distribution of income among households. This can be seen most easily in connection with one form of consumer interest: installment credit to finance purchases of consumer durables. Suppose that Jones is sufficiently well-off to purchase an auto and finances it by reducing his holdings of other financial assets (e.g., savings deposits; shares in money market funds), thus foregoing the interest he would otherwise have received on those financial claims. Smith, on the other hand, finances the purchase of an identical auto through a loan either because (a) his net worth or wealth is insufficient, or (b) he chooses not to liquidate any of his financial assets and borrows instead. Unless we deduct the interest paid by Smith from the interest he receives,⁸ we will show Smith, on the basis of this consideration alone, just as well-off as Jones in case (a) and better-off than Jones in case (b). An identical argument can be made for borrowing against future earning power, or for loans used to purchase financial assets, for example, stocks purchased on margin accounts where the margin buyer is simply paying over to the broker part of his dividend income from the stock purchased.⁹

Of course, if the product side were to include imputed rental income from ownership of consumer durables such as autos, there would be no need to deduct the corresponding consumer interest paid; the latter would simply be a transfer to the creditor of part of the imputed rent (calculated gross of interest paid) from the durable, just as mortgage interest represents a transfer to the mortgage holder of income arising from the imputed rental value of owner-occupied dwellings. To return to our example of Jones and Smith, accounting for the imputed rental income of both persons and deducting the interest paid by Smith from Smith's rental income would show their correct relative income positions: Jones would have more net imputed rental income from the auto than would Smith. This is exactly the procedure followed in calculating net rental income from owner-occupied housing.

It might be noted that our accounting rules for interest are consistent with generally agreed on accounting rules for calculating net worth, as the difference between the value of a person's assets minus the value of his or her liabilities (debts and loans). Thus, if we draw up balance sheets for Jones and Smith, we should include Smith's installment loan among his liabilities, regardless of how we choose to account for consumer durables. Thus, Smith's net worth would always be shown correctly as less than Jones's, whether or not we choose to include the automobiles each of them owns among their assets. Obtaining a measure of net property income consistent with the measurement of net worth requires deducting consumer interest paid from total interest received even in the case where both the income and net worth concepts omit consumer durables and the income they generate.

2.2.5 Transfers in Kind and Collective Consumption

Just as with income from production, transfers may take the form of in-kind benefits—goods or services furnished free of charge by government to households, or whose cost is reimbursed in whole or in part by government when purchased by households in the market place. Again, there is a good case in principle for including such transfers in recipients' incomes and in practice for drawing the line among types to be included or excluded in ways similar to those for earnings in kind. For example, employing sweeping definitions of in-kind transfers, but unduly limiting types of in-kind income included in earnings, particularly those received by upper-income earners, will bias the resulting size distribution toward equality, or distributions by socioeconomic characteristics toward those groups more heavily reliant on transfer income than on earnings.

There is, however, a major difference between the two types of in-kind income: many in-kind earnings types are not now included in NNP, primarily because they are treated as intermediate products when paid for by employers (e.g., business lunches); in-kind transfers, on the other hand, are already counted on the product side as government purchases of goods and services or collective consumption (e.g., school lunches). The problem for government purchases then becomes one of determining which ones to classify as in-kind transfers and allocable to individual beneficiaries, and which ones as collective consumption and in principle not allocable, or, if allocated anyway, distributed in an essentially arbitrary way, as was done in many of the earlier studies of the redistributive effects of government budgets (e.g., Gillespie 1965; Reynolds and Smolensky 1977). The closer the goods are to pure public goods (e.g., national defense; creation of new knowledge), the weaker is the case for treating them as in-kind transfers. External effects generated by government expenditures on such potentially excludable and appropriable goods as education also complicate the problem. We include as in-kind transfers food stamps and Medicare, since they are part of NIPA's personal income and we have estimates of their distributions in our file; we would also include such things as Medicaid, public housing benefits, and rent subsidies if estimates in our file were available. A borderline case is furnished by education: it is farther along the continuum toward the conceptually unallocable pure public goods case, but there are specific beneficiaries who gain more than the public at large from such expenditures. For empirical work, part of the issue of inclusion must turn on whether there is enough information in the microdata file used to permit an estimate of their distribution on the basis of other than arbitrary, ad hoc assumptions.

Since the papers in this volume by Smeeding, and Olsen and York are concerned with the valuation of in-kind transfers, we do not deal with

that issue here. Our aggregate income controls for food stamps and Medicare are based on their cost to the government.

2.2.7 Tax Expenditures

Treating tax expenditures as in-kind transfers presents further problems. If the concern is only with the complete post-tax and transfer income distribution, it is unnecessary to take separate account of tax expenditures, since the final size distribution will already reflect the lower taxes paid by the beneficiaries of such expenditures.

If, on the other hand, the purpose is to show a pretax, post-transfer distribution (including tax expenditures as in-kind transfers), or to isolate the separate distributional effects of particular tax expenditures, estimates are needed. If, however, one then wants to arrive at the final post-tax and transfer distribution of income, some hypothetical, reference, or "counterfactual" tax function must be estimated and imposed that would, in the light of the tax expenditures assigned to recipients, achieve the final distribution. Of course, to derive the counterfactual tax function one could fall back on the expedient of simply adding tax expenditures assigned to recipients to the actual taxes they pay. This expedient might make more sense and result in fewer difficulties if income tax rates were proportional rather than, as in our economy, progressive.

2.2.8 Private Insurance

Most private insurance is designed to provide financial protection against catastrophic events, whether to property or persons. Insurance compensation for property damage, for example, a house lost in fire or an auto demolished in an accident, is simply a capital transfer, designed to make good a capital loss suffered by the claimant, and not part of his or her current income.

Households also purchase insurance to provide protection against loss of income, for example, life and disability insurance. In this case, we would add continuing benefits paid, such as private annuities and monthly disability payments (although not lump-sum settlements, which should be treated as capital transfers), and deduct premiums paid (net of insurance company operating expenses) from the post-transfer income concept (e.g., our household disposable income). This treatment corresponds with the way social insurance is handled in NIPA's definition of personal disposable income: social insurance benefits (e.g., Social Security, unemployment compensation) are included; personal and employer contributions to social insurance funds are excluded.

Another form of private insurance covers extraordinary expenses, such as medical and hospital outlays in connection with an accident or serious

illness. Benefits from this kind of insurance we would exclude from pre- and post-transfer income (and include premiums paid). Of course, having incurred a \$10,000 medical bill for a serious illness, Jones is better-off if he has insurance that will reimburse him for the bill than if he does not. However, in size distributions we are comparing, not Jones's position with and without insurance coverage for extraordinary expense, but Jones's position with that of others like Smith, who has remained healthy during the same period and hence received no settlement. It would be difficult to maintain, other things equal, that Jones is better-off than Smith to the extent of the \$10,000 reimbursement. Indeed, this is one of the reasons we assign Medicare benefits as an imputed premium to all those eligible and not as benefits to those actually receiving health care. (The other is that we have no way of distinguishing between the ill and the healthy aged in our file.)

2.2.9 Pre- and Post-Transfer Income Concepts

Our various income concepts are defined more precisely in table 2.1, and the aggregates for selected income and transfer types (for somewhat broader categories than in table 2.1) contained in our microdata file (the fully estimated EM-SM file) are shown in table 2.2. A description and rationale for each, together with a comparison with alternative concepts, is presented below.

It should perhaps be reemphasized that the accounting framework represented in these tables is restricted to the household sector. In an accounting system for the economy as a whole, by definition transfers paid must be equal to transfers received; since the algebraic sum of transfers paid and received equals zero, the economy's pretransfer income aggregate must equal its post-transfer income aggregate. On the other hand, since a sector's receipts from transfers may exceed or fall short of its payments of transfers to other sectors, there is no necessary relation between its pretransfer and post-transfer income aggregates. Thus, no particular significance should be attached to the virtual equality of our pre- and post-transfer concepts (earnings and household disposable income), quite apart from two intermediate concepts (production-related income and household income).

Primary Income or Earnings (EARN)

Our first concept includes income arising directly from participation by household members in the productive process, either as suppliers of labor services or as proprietors of enterprises (farm and nonfarm) furnishing their own labor services or the services of assets under their immediate control. It includes wages and salaries plus proprietors' income, and omits employer contributions to social insurance and to private health,

Table 2.1 Definitions of Pre- and Post-Transfer Income Aggregate

1. Primary income or earnings (EARN) =	<ul style="list-style-type: none"> Wages and salaries + Nonfarm proprietors' (self-employment) income + Farm proprietors' (self-employment) income + Money rental income + Imputed rent on owner-occupied dwellings (farm and nonfarm) + Imputed wages and salaries + Imputed food and fuel consumed on farms
2. Production-related income (PRI) =	<ul style="list-style-type: none"> EARN + Dividends + Money interest received + Imputed interest - Consumer interest paid (exclusive of mortgage interest) + Estate and trust income
3. Household income (HI) =	<ul style="list-style-type: none"> PRI + Public assistance + Unemployment compensation + Workers' compensation + Veterans' benefits + OASDI benefits* + Railroad retirement benefits* + Government pensions received* + Private pensions and annuities* + Food stamp bonuses + Medicare benefits*

welfare, and pension funds only because our file does not include estimates of the distribution by size of NIPA's supplements to wages and salaries.

Net rental income of persons is also included in EARN, since it is more nearly akin to income of unincorporated enterprises, the distinction between the two, so far as rental property is concerned, depending on whether rental receipts are the major, or merely an incidental, source of income to the recipient (Budd 1958, pp. 355-56). (In the former case, such "net rental income" is classified as proprietors' income originating in the real estate industry.) As previously noted, our household sector includes the results of business operations for proprietors, renters of property, and owner-occupants, not their entire business activities. While there is something to be said for including all the business activities of home ownership in the household sector, as Ruggles and Ruggles (1982) have suggested, and perhaps extending it to self-employed pro-

Table 2.1 (continued)

4. Household disposable income (HDI) =	HI – Personal contributions for social insurance* – Federal personal income tax – State and local income tax – Personal property tax + State income tax refund
5. Household disposable income exclusive of net age-related transfers (HDI – ART) =	HDI – OASDI benefits – Railroad retirement benefits* – Government pensions received* – Private pensions and annuities* – Medicare benefits + Personal contributions for social insurance
6. Production-related income inclusive of net age-related transfers (PRI + ART) =	PRI + OASDI benefits* + Railroad retirement benefits* + Government pensions received* + Private pensions and annuities* + Medicare benefits* – Personal contributions for social insurance*

*Age-related items.

prietors and landlords as well, it is not necessary for the purposes of this paper. In any case, such an extension should not be interpreted as undermining the case for the rental imputation, nor as precluding the handling of interest payments as transfers to other sectors or within the household sector itself.

With due allowance for possible transfer elements included in EARN that we cannot extract (e.g., deferred compensation of employees extending beyond the current year; income arising from long-term rental contracts), EARN is the closest we can get to a concept of income arising from current production and accruing directly to participants without the interposition of transfers or transfer-type payments. While there is nothing analogous to EARN in the NIPA, it is similar to the concept of primary income proposed by the United Nations (UN) for the collection and preparation of income distribution statistics, differing from the latter in its inclusion in primary income of rental income, which is classified by the UN as property income (1977, pp. 1, 11). The United Nations' proposal to define proprietors' or "entrepreneurial" income as well as rental income gross of capital consumption (whereas ours is net) seems to be more a matter of expediency in measurement than one of principle.

Table 2.2 Pre- and Post-Transfer Income Concepts for the Household Sector, 1972 (millions of dollars)

	Total	Money	In Kind
1. Wages and salaries	624,133	621,690	2,443
2. Proprietors' (self-employment) income	78,699	78,358	341
a. Farm	18,348	18,007	341
b. Nonfarm	60,351	60,351	—
3. Net rental and royalty income	19,928	7,535	12,393
4. <i>Primary income or earnings (EARN)</i> [1 + 2 + 3]	722,760	707,583	15,177
5. Dividend income	21,728	21,728	
6. Net interest income	40,777	27,779	12,998
a. Interest income received	60,363	47,365	12,998
b. Less consumer interest paid	-19,586	-19,586	—
7. Estate and trust income	4,418	4,298	120
8. <i>Production-related income (PRI)</i> (earnings plus property income) [4 + 5 + 6 + 7]	789,683	761,388	28,295
9. Government transfer payments	88,444	78,202	10,242
a. Non-age-related transfers	28,385	26,428	1,957
1) Unemployment and workers' compensation	7,814	7,814	—
2) Public assistance and food stamp bonuses	12,642	10,685	1,957
3) Veterans' benefits	7,929	7,929	—
b. Age-related transfers	60,059	51,774	8,285
1) Social Security, railroad retirement, and Medicare benefits	48,050	39,765	8,285
2) Government employee pensions (federal, state, and local)	12,009	12,009	—
10. Private pensions and annuities (age-related)	9,297	9,297	—
11. <i>Household income (HI)</i> [8 + 9 + 10]	887,424	848,887	38,537
12. Personal contributions for social insurance (age-related)	-33,265	-33,265	—
13. Taxes paid	-127,630	-127,630	—
a. Federal personal income	-90,956	-90,956	—
b. State and local	-18,337	-18,337	—
1) Personal income	-17,467	-17,467	—
2) Personal property	-870	-870	—
14. <i>Household disposable income (HDI)</i> [11 - 12 - 13]	726,529	687,992	38,537
Addenda			
Income Concepts for Age-Related Transfer Comparisons			
15. Household disposable income exclusive of net age-related transfers (HI - ART) [14 - 9b - 10 + 12]	690,438	660,186	30,252

Table 2.2 (continued)

	Total	Money	In Kind
16. Production-related income inclusive of net age-related transfers (PRI + ART) [8 + 9b + 10 - 12]	825,774	789,194	36,580

SOURCE: Computed from the fully adjusted EM-SM file described in section 2.3.

Production-Related Income (PRI)

Our second income concept takes account of transfers arising out of the nature and distribution of ownership rights in the economy. Since production originates in and income accrues directly to business firms outside the household sector, the transfer of a part of this income to households through interest and dividend payments (directly, or indirectly through estates and trusts), based on the particular kinds of ownership rights or claims that households have in or on business, must be accounted for. Production-related income (PRI) is thus the sum of earnings and property income. We use the term, *production-related* income, partly out of recognition of the transfer character of some privately distributed income, partly because of the necessity of including interest paid by governments to households. Government obligations are bought and sold in private markets; owners of debt instruments do not view their holdings, or the interest income received from them, differently simply because some of the obligations they own are claims against the government, as distinguished from claims on business firms or owners of rental properties. If one feels it necessary to find a production base for payment of government interest similar to that in the private sector, he or she may suppose that it is a distribution of (part of) the income arising from the (not-now-imputed) services of government-owned physical assets.

In accordance with our earlier discussion of consumer interest as a transfer payment, in calculating PRI we have deducted for each household or consumer unit in our file its payment of interest from interest it receives, to derive "net interest received," which may, of course, be negative for individual units.

While in our view EARN is the preferable pretransfer income concept and PRI a concept intermediate between pre- and post-transfer income, others, who are uncomfortable with the treatment of property income as transfer income, may wish to consider PRI as the appropriate pretransfer concept with which our later concepts are to be compared. Our tabulations permit such an alternative treatment. We should also note in passing that in the United Nations' conceptual framework for income

distribution statistics there is no concept similar to our PRI. Property income is simply added, along with other private and government transfers, to primary income to obtain the United Nations' total household income.

Production-related income is the concept by which consumer units are ranked for that set of distributions in section 2.4 in which the ranking of units is the same for all distributions, in contrast to the other set in which units are ranked by size of own income concept, that is, the income concept on which the distribution is based.

Household Income (HI)

Adding other government and private transfer payments to production-related income yields our household income. We restrict private transfers to private pension payments, although, as noted earlier in our discussion of private insurance, we would include estimates of benefits paid from private sickness and disability insurance (to replace losses in earnings) if we had them, as well as the imputed value of medical insurance premiums paid by employers. A similar remark applies to receipts of interfamily transfers.

With the exception of the treatment of capital consumption (noted above), consumer interest paid, and the coverage of the institutionalized population, which the United Nations recommends, HI is virtually identical with the United Nations concept of total household income (United Nations 1977, pp. 5, 9–11, 48). It is also similar to the Census Bureau's total money income (TMI), insofar as the latter concept can be said to have a precise definition; important differences are our inclusion of income in kind (excluded from TMI) and our netting of consumer interest paid against interest received. The Bureau of Economic Analysis's (BEA) concept of family personal income (FPI) differs from HI in our netting out interest paid by consumers and our inclusion of personal contributions for social insurance. So far as personal income (PI) is concerned, in addition to the differences already noted between HI and FPI, there are matters of population and sector coverage and the inclusion of employer contributions to private health, welfare, and pension funds ("other labor income") in, and exclusion of private pension payments from, PI. Further, a number of specific transfers in PI are excluded from both FPI and HI, partly for conceptual reasons, partly because of difficulties in estimating their distribution by income size. Examples are lump-sum settlements of various sorts (equivalent to capital transfers), consumer bad debts, and auto insurance liability for personal injuries.

It can be argued that HI and concepts similar to it, such as the United Nations' total household income and the Census Bureau's TMI, involve a form of double-counting, since they include both personal and employer contributions to private and social insurance, in addition to benefits

resulting from the latter. While this is true in part for HI, in our accounting system—as well as the United Nations’—household income is simply an intermediate concept between a pretransfer, purely production-oriented income concept (EARN) and a complete post-transfer income concept (HDI); its purpose is simply to show the effect of transfers received by the household sector before taking account of transfers household pay (including taxes).

Household Disposable Income (HDI)

Household disposable income is simply household income less personal contributions for social insurance and personal (income and property) taxes paid. It is virtually the same as the United Nations’ total available household income, with the exceptions noted above for differences between HI and the United Nations’ total household income. For a comparison with BEA’s personal disposable income, all the previous differences noted between HI and PI are relevant as well. In addition, BEA deducts estate and gift taxes (essentially capital transfers) and nontax payments (on whose distribution we have no information). We have not made a further deduction for sales and gasoline taxes in figuring HDI, partly because they are components of indirect business taxes, which have already been deducted in going from NNP to national income and personal income and hence implicitly to FPI and our HI, and partly because of the quality (or lack thereof) of the data available to us from the itemized deductions on individual tax returns.¹⁰

Income Concepts Associated with Age-Related Transfers (ART)

One problem in defining transfers is the time period over which the receipt of income and the furnishing of productive services are to be matched. At one extreme, most of the wages paid on the last day of a month for a entire month’s labor services ought to be considered a transfer, if for some reason we were interested in measuring income only for that one day. At the other extreme, it might be argued that pensions are simply deferred compensation for services rendered over one’s working life and ought to be counted as payments for productive services if the relevant time period were viewed as the entire life of the wage earner. One approach might be to measure either the present discounted value of future wages (net of employer and employee contributions to pension funds) plus pensions paid, or alternatively, the present value of wages inclusive of such contributions, but excluding pensions, although, for a given rate of discount, there is no assurance that these two different lifetime concepts would come to the same thing. Yet there are serious difficulties in such a lifetime approach, not the least of which are selecting the appropriate discount rate and making sense of the recipient unit concept in a lifetime context, unless the unit is taken to be the individual

earner. Even apart from these considerations, interpreting a size distribution of lifetime incomes for consumer units whose heads are in different stages of their life cycles is no easy matter either.¹¹

In any case, it is impossible for us to resolve these problems with the data at hand. We have therefore experimented with a more limited approach, showing the distributional effects of using two different methods of accounting for pensions and retirement contributions and retirement income.¹² One way is to include in current income employer and employee contributions to age-related social insurance and pension plans as employee compensation and to exclude pension payments and retirement benefits, both public and private, from transfer payments. An alternative accounting treatment is to deduct such contributions from employee compensation and add the retirement benefits and pensions paid to the current retirees. A comparison of these two different accounting schemes shows only the net effects of age-related transfers (ART) on the distribution of current year income, given the age distribution of (the heads of) households in the file; it does not show a distribution with a consistent treatment of units independent of or standardized for their age structure. Indeed, for reasons cited earlier, although our discussion of this issue is by no means complete, we doubt that this can be done.

Income concepts used in distributional work are more closely related to the second accounting scheme than the first. Family personal income is perhaps the best example, with the Census Bureau's TMI perhaps a close second, although the latter fails to deduct employee and self-employed contributions to social insurance from earnings. In addition, neither concept deducts—primarily for estimating reasons—employee contributions to private pension plans, although such contributions are of minor importance. On the other hand, the NIPA's concept of personal income does not give consistent treatment to government and private retirement plans—indeed, to social and private insurance schemes in general. Contributions to social insurance (including government employee contributions to federal, state, and local pension plans) are excluded from personal income and the corresponding benefit payments added, whereas employer (and any employee) contributions to provide pension plans are included in employee compensation and private pension payments are excluded. While there is a long-standing rationale in the NIPA for this treatment, it is of limited use in distributional analysis; indeed, personal income is not a concept that can be used without some modification in income size distribution work.

There are two ways to compare our distributions, inclusive and exclusive of age-related transfers. The first is by comparing the distribution of PRI with the distribution that results from deducting from PRI personal contributions for social insurance and adding age-related benefits (Social Security benefits, Medicare, and private pension and annuity payments),

denoted as $PRI + ART$ in our tables. The other is to take HDI as the base for the comparison, then deduct age-related benefits and add personal contributions (our $HDI - ART$). Whichever comparison is used, it will not be complicated by the net effect of *other* transfers—government transfers which are not age-related and personal taxes. In effect, the first method asks: How would the distribution of PRI look if we modified it *only* by including age-related transfers? In the second method, on the other hand, we ask: How would HDI be affected if we were to exclude only age-related transfers from it? Judging by the results in section 2.4, there is little actual difference between the two methods in the extent of change in inequality, pre- and post-transfer, whether measured by changes in selected quantile shares or by the change in the Gini concentration ratio. The implied Lorenz curves for the concepts, as distinguished from their shifts, are, of course, quite different.

Given the data available to us, the comparisons are not based on ideal concepts. For one thing, we lack size distribution estimates of employer and employee contributions to private pension plans; for another, while it would be possible to impute to wage and salary workers employer contributions for social insurance, we have had neither the time nor resources to do so. Thus, the PRI distribution is unfortunately *already* net of employer contributions to social insurance and pension plans, and we cannot show their distributional impact. Neither can we add these contributions back in going from HDI to $HDI - ART$. For another, our division between age- and non-age-related transfers is only an approximation, although a relatively close one. While nearly all personal contributions are for age-related programs, a few transfers, such as Social Security benefits and veterans' benefits, could not be separated into the two components, given the data in our file. Social Security was classified as age-related, veterans' benefits as non-age-related.

2.3 How the Estimates Were Made

This section provides a brief description of the data base underlying the tabulations in section 2.4. It is based on the fully estimated Exact Match-Statistical Match (EM-SM) file constructed by a joint effort of the Bureau of Economic Analysis (BEA) and the Office of Research and Statistics (ORS) of the Social Security Administration (SSA).

The starting point was the 1972 Exact Match (EM) file, which was an exact match of persons surveyed in the March 1973 Current Population Survey (CPS) with (extracts from) their SSA earnings and beneficiary records and information from their individual tax returns contained in the Internal Revenue Service (IRS) Individual Master File (IMF). Since the amount of tax return information in the IMF was quite limited, ORS carried out a statistical match between the EM file and a subsample of the

Statistics of Income file (which has relatively complete tax return information), itself exact-matched to SSA earnings records to incorporate certain demographic information (age, race, and sex) needed to improve the quality of the statistical match. The income types in each return in the file were then corrected for the effects of audit by using the results of the IRS Taxpayer Compliance Measurement Program for 1972. In our tabulations, wages and salaries, interest, and dividends were taken from the EM portion of the file; proprietor's income, rent, royalties, and estate and trust income, from the SM portion. Since state and local bond interest does not have to be reported on federal tax returns, its distribution had to be estimated separately by using the limited information available from other field surveys. The earnings and property income of nonfilers were taken from the CPS portion of the EM file. All the above earnings and property income types were then adjusted so that their aggregates would reflect their corresponding NIPA control totals. The latter were derived by adjusting the amount of each income type in the NIPA personal income to make it consistent with the CPS population universe and income concepts.

Since most cash transfer payments are not subject to federal income tax, they could not be estimated from the tax return part of the EM-SM file. The starting point was therefore the CPS portion of the file, the major exception being Social Security benefits. With some minor adjustments, the latter were taken from the benefit portion of the Social Security administrative record.

In-kind income, including imputed wages and imputed farm income, was distributed by a variety of methods, using information already in the EM-SM file, as well as information from the 1972 portion of the Consumer Expenditure Survey (CEX), the latter incorporated into the EM-SM file by means of a statistical match between the CEX and CPS portion of the EM-SM file. Imputed interest on checking and savings accounts was distributed on the basis of the value of asset holdings reported by consumer units in the CEX. Imputed net rental income for each owner-occupant was estimated from gross rental value and individual expense components (repair and maintenance, mortgage interest, insurance, and depreciation), from information from the CEX and control totals for gross rent and types of housing expenditures from the NIPA. Medicare benefits were treated as imputed insurance premiums for hospital and medical care and a mean amount assigned to each eligible aged person. Food stamp bonus values were assigned to eligible units based on family size and the number of weeks worked by the head.

Personal contributions for social insurance were based largely on the amount of wages and salaries reported on the tax return and occupational and employment information reported in the CPS, with numerous refinements introduced for specific kinds of contributions, such as contribu-

tions by state and local workers to retirement funds. Federal income taxes were taken off tax returns added to the file in the statistical match. State and local income and property tax liabilities were estimated from itemized deductions for those who itemized, with income tax amounts imputed to those who did not itemize, based on amounts reported by itemizers.

A more complete description of the EM-SM file is given in appendix A.

2.4 Pre- and Post-Transfer Income Distributions for 1972

In this section we present estimates of pre- and post-transfer income distributions for consumer units (families plus unrelated individuals) and for selected socioeconomic groups. Relative size distributions and relative mean incomes for all units are shown in tables 2.3 through 2.5, and relative means and shares for socioeconomic groups are given in tables 2.9 and 2.10. Estimates for families may be found in appendix B; since they are similar to those for consumer units, they are not discussed separately.

Table 2.3 gives the income share for each vigesimal and the top 1 percent in each of the six distributions; table 2.4 shows the corresponding relative means. Looking at the first two distributions, shifting the definition of income from earnings to production-related income raises the share, and hence the relative mean income, of the bottom two quintiles of the distribution by 20 percent, reduces the share of those in the 41st to 95th percentile range by 4 percent, increases the share of the top 1 percent by over 16 percent, and the share of the 4 percentiles immediately below it by 2 percent. The Lorenz curves for the two distributions intersect just above the 75th percentile. Because of this fact, not too much stress should be placed on the change in a single-valued measure of inequality such as the Gini concentration ratio, although the latter does fall slightly, from .49 to .48. The addition of property income to aged units with little or no earnings or rental income is a factor in the increase at the bottom, with the number of consumer units with zero income falling from 6.5 percent to 2.2 percent of all units. Substantial amounts of property income accrue to those units at the top of the distribution, producing the rather large increase in the share of the top 1 percent.

When the definition is changed from production-related income (PRI) to household income (HI), the income share of the bottom half of the distribution is increased by over 31 percent and by even greater proportions for the lower parts of the distribution, with the income share of the lowest 30 percent of consumer units being more than doubled. The share of the upper half of the distribution, on the other hand, is reduced by about 6 percent, with that of the top 5 percent falling by over 8 percent.

Table 2.3 Income Shares, Families and Unrelated Individuals Ranked by Size of the Income Definition, 1972 (percent)

Percentile Groups	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Total	100.00	100.00	100.00	100.00	100.00	100.00
1-5	-.52	-.41	.05	-.22	-.63	-.25
6-10	.01	.09	.90	1.01	.39	.58
11-15	.20	.37	1.25	1.40	.78	1.00
16-20	.46	.76	1.60	1.77	1.21	1.39
21-25	.91	1.26	1.95	2.14	1.70	1.79
26-30	1.50	1.78	2.32	2.50	2.17	2.19
31-35	2.14	2.29	2.69	2.87	2.63	2.59
36-40	2.76	2.81	3.07	3.23	3.09	2.99
41-45	3.35	3.31	3.47	3.61	3.54	3.40
46-50	3.90	3.82	3.87	4.00	4.00	3.81
51-55	4.46	4.29	4.27	4.39	4.46	4.24
56-60	5.02	4.81	4.69	4.79	4.93	4.69
61-65	5.60	5.35	5.15	5.22	5.42	5.16
66-70	6.21	5.90	5.63	5.68	5.94	5.66
71-75	6.87	6.51	6.17	6.20	6.50	6.21
76-80	7.59	7.23	6.83	6.82	7.16	6.91
81-85	8.52	8.14	7.64	7.61	7.98	7.76
86-90	9.73	9.35	8.73	8.66	9.12	8.89
91-95	11.67	11.35	10.55	10.43	10.94	10.82
96-100	19.60	21.00	19.20	17.90	18.66	20.17
100	6.70	7.81	7.06	6.14	6.37	7.54
Gini concentration ratio	.49	.48	.42	.40	.44	.44

The Lorenz curve for HI thus lies everywhere above the curve for PRI, implying an overall decrease in inequality; the Gini ratio is reduced from .48 to .42. This change in definition adds various government transfers, which tend to be concentrated in the bottom half of the distribution. The number of units with zero income is reduced from 2.2 percent to less than 0.2 percent of all units.

When the definition is shifted from household income to household disposable income (HDI), the share of the lower three quarters of the distribution rises, although by only a little over 3 percent. Even when the share of the bottom vigesile (whose share goes from positive to negative) is excluded from the calculation, the increase is still only 4 percent. For the top 1 percent the reduction is 13 percent. The Gini ratio falls slightly from .42 to .40. These results suggest that the combined effect of personal contributions for social insurance and personal taxes is only mildly progressive, at least for consumer units below the top 1 percent of the

Table 2.4 Relative Mean Incomes, Families and Unrelated Individuals Ranked by Size of the Income Definition, 1972

Percentile Groups	EARN	PRI	HI	HDI	HDI - ART	PRI + ART
Total	1.00	1.00	1.00	1.00	1.00	1.00
1-5	-.10	-.08	.01	-.04	-.13	-.05
6-10	.00	.02	.18	.20	.08	.12
11-15	.04	.07	.25	.28	.16	.20
16-20	.09	.15	.32	.35	.24	.28
21-25	.18	.25	.39	.43	.34	.36
26-30	.30	.36	.46	.50	.43	.44
31-35	.43	.46	.54	.57	.53	.52
36-40	.55	.56	.61	.65	.62	.60
41-45	.67	.66	.69	.72	.71	.68
46-50	.78	.76	.77	.80	.80	.76
51-55	.89	.86	.85	.88	.89	.85
56-60	1.00	.96	.94	.96	.99	.94
61-65	1.12	1.07	1.03	1.04	1.08	1.03
66-70	1.24	1.18	1.13	1.14	1.19	1.13
71-75	1.37	1.30	1.23	1.24	1.30	1.24
76-80	1.52	1.45	1.37	1.36	1.43	1.38
81-85	1.70	1.63	1.53	1.52	1.60	1.55
86-90	1.95	1.87	1.74	1.73	1.82	1.78
91-95	2.33	2.27	2.11	2.08	2.19	2.16
96-100	3.92	4.20	3.84	3.58	3.73	4.03
100	6.67	7.79	7.06	6.14	6.36	7.51

distribution. These comparisons are, of course, complicated by our inability to deduct personal income taxes on capital gains from the distribution, which may explain the perverse behavior of the share of the bottom vigesile.

The effect of age-related transfers on the distributions can be shown in two ways—by deducting such transfers from HDI, or by adding the transfers to PRI. When the definition is changed from HDI to HDI - ART, the share of the bottom 45 percent of the distribution falls, while the share of the top half rises. The Lorenz curve for HDI - ART lies below the curve for HDI, showing an increase in inequality; the Gini ratio rises from .40 to .44. In this definitional change, various retirement benefits, as well as personal contributions, are excluded, thus affecting the bottom of the distribution substantially.

When the definition is changed from PRI to PRI + ART, the share of the bottom 45 percent of the distribution rises, while the share of the top half falls, with the Lorenz curve for PRI + ART lying above the curve for PRI. The two sets of comparisons produce quite similar results, although, of course, opposite in sign; the (absolute value of the) percentage point

change in the Gini ratio for the two comparisons, for example, is identical.

The above comparisons are based on ranking individual consumer units by the size of income for the particular definition employed. Part of the difference in inequality between any two income concepts may be the result of the reranking of units when moving from one income concept to another. To measure this effect, relative distributions for all six definitions were recalculated, using the ranking of consumer units in just one concept (PRI) for each distribution. The results are shown in table 2.5. Each vigesile in this table is composed of exactly the same consumer units, for example, if Jones and Smith are both in the 5th vigesile based on their ranking in PRI, they will also be in the 5th vigesile for purposes of calculating shares in the other five income concepts, irrespective of what happens to the size of their incomes when the other definitions are applied.

As might be expected, for each of the five income types (other than PRI, of course) the degree of inequality is reduced as compared with its corresponding distribution in table 2.3. The largest differences between

Table 2.5 **Income Shares, Families and Unrelated Individuals Ranked by Size of Production-Related Income, 1972 (percent)**

Percentile Groups	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Total	100.00	100.00	100.00	100.00	100.00	100.00
1-5	-.42	-.41	.72	.78	.10	.22
6-10	.07	.09	1.17	1.37	.53	.87
11-15	.32	.37	1.38	1.60	.71	1.19
16-20	.66	.76	1.66	1.91	1.09	1.51
21-25	1.17	1.26	1.96	2.21	1.63	1.79
26-30	1.72	1.78	2.26	2.49	2.11	2.14
31-35	2.25	2.29	2.61	2.84	2.60	2.53
36-40	2.80	2.81	2.99	3.19	3.07	2.93
41-45	3.37	3.31	3.42	3.58	3.53	3.37
46-50	3.97	3.82	3.81	3.93	4.00	3.76
51-55	4.48	4.29	4.21	4.32	4.45	4.18
56-60	5.04	4.81	4.64	4.72	4.92	4.63
61-65	5.63	5.35	5.10	5.16	5.42	5.12
66-70	6.20	5.90	5.56	5.60	5.93	5.60
71-75	6.86	6.51	6.08	6.08	6.48	6.14
76-80	7.55	7.23	6.73	6.69	7.14	6.82
81-85	8.49	8.14	7.52	7.43	7.96	7.65
86-90	9.67	9.35	8.66	8.53	9.12	8.81
91-95	11.53	11.35	10.43	10.18	10.88	10.70
96-100	18.62	21.00	19.08	17.40	18.33	20.04
100	5.99	7.81	7.06	5.87	6.11	7.52

tables 2.3 and 2.5 may be found in the lowest part of the distribution. Ranking by size of PRI produces substantially larger shares for the bottom of the HI and HDI distributions, as well as HDI – ART and PRI + ART. Differences at the top of the distribution, on the other hand, are relatively small. Despite the changes for individual vigesiles, it should be noted that a given vigesile never ends up with a larger share than the one immediately above it in the distribution. The implied Lorenz curves for the five income concepts all preserve their normal shape, that is, their slopes are everywhere increasing.

On the other hand, as table 2.6 shows, substituting the PRI-ranked distributions for those ranked by own income concept does not result in uniformly *increasing* the degree of equality as one moves from EARN to HI to HDI. While the extent of equalization is greater in the HDI distribution as compared with HI when the two distributions are ranked by PRI rather than own income, the opposite is true when comparing EARN with either HI or HDI. (Comparisons of the distributions resulting from other concepts with that from PRI are not, of course, affected, since by definition the PRI distribution is not altered by reranking.)

Another way of looking at the effect of reranking units when shifting from one income concept to another is through a cross-tabulation between the two concepts. Table 2.7 contains such a cross-tabulation between PRI and HDI by deciles of consumer units. For all PRI deciles, at least three-fourths of the units remain in the same decile or move no more than one decile in the HDI distribution. Very few units are shifted downward more than one decile; more units are shifted upward more than one decile. Units in the middle of the PRI distribution are shifted downward much more often than upward.

Table 2.6 Ratios of Selected Quantile Shares in Earnings, Household Income, and Household Disposable Income, Families and Unrelated Individuals Ranked Alternatively by Size of Own Income Definition and by Production-related Income, 1972

Percentiles	(1) HI/EARN		(2) HDI/HI		(3) = (1) × (2) HDI/EARN	
	Own	PRI	Own	PRI	Own	PRI
1–20	25.33	7.83	1.04	1.15	26.40	8.98
21–40	1.37	1.24	1.07	1.09	1.47	1.35
41–60	.97	.95	1.03	1.03	1.00	.98
61–80	.91	.89	1.01	1.00	.91	.90
81–95	.90	.90	.99	.98	.89	.88
96–99	.94	.95	.97	.96	.91	.91
100	1.05	1.18	.87	.83	.92	.98

SOURCE: Calculated from tables 2.3 and 2.5.

Table 2.7 Joint Distribution of Production-Related Income and Household Disposable Income, Families and Unrelated Individuals, 1972 (percent)

PRI Percentile Groups	HDI Percentile Groups										Total
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	
1-10	54	27	11	5	2	1	0	0	0	0	100
11-20	36	29	17	10	4	2	1	0	0	0	100
21-30	9	39	23	14	7	5	2	1	0	0	100
31-40	0	5	47	24	11	6	4	2	1	0	100
41-50	0	0	3	45	30	11	5	3	2	0	100
51-60	0	0	0	2	43	36	10	6	2	1	100
61-70	0	0	0	0	2	37	43	12	5	1	100
71-80	0	0	0	0	0	1	34	52	11	2	100
81-90	0	0	0	0	0	0	1	24	64	10	100
91-100	0	0	0	0	0	0	0	0	14	85	100
Total	100	100	100	100	100	100	100	100	100	100	

Numbers may not sum to totals because of rounding.

It is interesting to ask, what kind of tax (and/or transfer) rate is implied by the difference between any set of pre- and post-transfer distributions. The difference, for example, between HI and HDI for any given quantile of the HI distribution can be expressed as a tax (actually, a combined tax and social insurance contribution) rate for that quantile. The implied tax rate for a quantile in HI is equal to one minus the ratio of its dollar mean HDI to its dollar mean HI. Table 2.8 shows, in addition to the pertinent relative mean incomes (RMI), two sets of rates: one, the (percentage) tax rate implied by the proportional difference between HI and HDI; the other, the combined (percentage) tax and transfer rate implied by the proportional difference between PRI and HDI. For each set, rates have

Table 2.8 Relative Mean Incomes and Implied Tax and Transfer Rates, Household Income and Production-related Income, Families and Unrelated Individuals Ranked Alternatively by Size of Own Income Definition and by Production-related Income, 1972

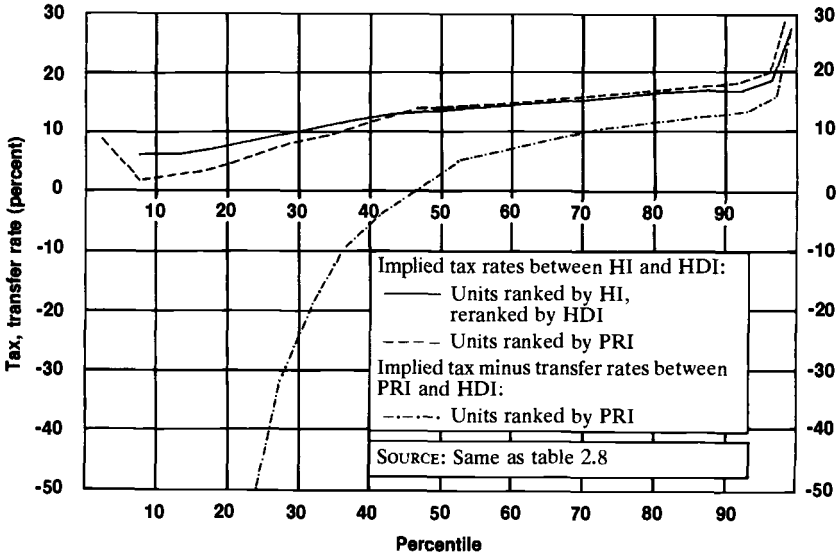
Per- centiles	(1) (2) (3) (4) Tax Rates, Units Ranked by Size of:				(5) (6) (7) Tax Minus Transfer Rates, Units Ranked by Size of:		
	Income Definition		PRI		Income Definition		PRI
	RMI	Rate	RMI	Rate	RMI	Rate	Rate
1-20	.19	12.8%	.25	4.0%	.04	-361.1%	-559.1
21-40	.50	10.4	.49	8.6	.41	-24.4	-24.3
41-60	.82	13.8	.80	13.9	.82	2.4	3.7
61-80	1.19	15.9	1.17	16.2	1.25	9.7	11.2
81-95	1.79	17.0	1.77	17.8	1.92	12.7	14.5
96-99	3.04	19.0	3.01	19.8	3.30	15.9	17.5
100	7.06	27.3	7.06	30.5	7.81	25.8	29.1
All units	1.00	16.4	1.00	16.4	1.00	5.7	5.7
Addendum:							
5-20	.25	6.8	.28	3.1	.08	-223.2	-277.3

SOURCE: Calculated from tables 2.3, 2.5, and 2.9.

KEY TO COLUMNS:

- (1) Relative mean income, HI, units ranked by HI.
- (2) Tax rate implied by the proportional difference between HI, units ranked by HI, and HDI, units ranked by HDI.
- (3) Relative mean income, HI, units ranked by PRI.
- (4) Tax rate implied by the proportional difference between HI and HDI, units ranked by PRI in both distributions.
- (5) Relative mean income, PRI, units ranked by PRI.
- (6) Tax minus transfer rate implied by the proportional difference between PRI, units ranked by PRI and HDI, units ranked by HDI.
- (7) Tax minus transfer rate implied by the proportional difference between PRI and HDI, units ranked by PRI in both distributions.

Fig. 2.1 Tax and transfer rates implied by relative size distributions of household income and household disposable income, 1972



been calculated for recipient units ranked by pretransfer income (HI or PRI) and reranked by post-transfer income (HDI), and for units ranked consistently by PRI. Three of the four tax, transfer rates are plotted in figure 2.1, using the data for vigesiles and the top 1 percent.

For the consistent PRI ranking, the implied tax rates increase uniformly with HI (except for the bottom vigesile in figure 2.1), although, as previously noted, the effect is only mildly progressive, except for the top 1 percent. The rates based on reranked units show the same behavior, except for the bottom quintile, whose rate (12.8 percent) exceeds that for the second quintile (10.4 percent). This difference is the result of the negative share in HDI of the bottom vigesile, precluding the calculation of a tax rate in figure 2.1; the rate for the next three vigesiles comprising the remainder of the bottom quintile is 6.8 percent.

The net tax (tax minus transfer) rates implied by the difference between PRI and HDI rise more steeply than the implied tax rates for HI, although remaining below the latter, even for the top 1 percent; for the bottom two quintiles transfers exceed the sum of taxes and personal contributions, and the implied tax rates shown in table 2.8 are negative. Little significance should be attached to very large negative rates at the bottom; consumer units in this part of the PRI distribution are so heavily dependent on transfers, and those transfers sufficiently unrelated to the small amounts of earnings and property income they receive, that the concept of an average negative tax rate has little interpretive value.

Table 2.9 shows relative mean incomes by socioeconomic groups for each of the six income concepts. The largest changes in relative means for six groups classified by age of head are for the age 65 and over group, with the relative mean for the latter group rising sharply from .35 for EARN to .85 for HDI. Of course, the inclusion or exclusion of age-related transfers can be expected to have a large impact on the relative mean for those 65 and over. The four youngest age groups, on the other hand, show declines as the definition is changed from EARN to HDI.

Female unrelated individuals, many of whom are aged, show the largest change among family type and sex of head groups—a large increase. Other female heads also show a substantial rise. The black group shows a decline from EARN to PRI, followed by a rise to HDI, with no significant change between EARN and HDI.

Income shares for the selected socioeconomic groups are shown in table 2.10. The impact of the shift from EARN to PRI differs greatly by age of head. The youngest age group shows little change in shares. The next three age groups all show a small increase in inequality, whereas for the age 65 and over group just the opposite is the case. Only in the 55–64 group is there evidence of a Lorenz curve intersection, which, as was noted earlier, characterizes the two distributions as a whole. For the younger age groups, the effect of including property income in the

Table 2.9 Relative Mean Incomes of Socioeconomic Groups, Families and Unrelated Individuals, 1972

Socioeconomic Group	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Age of head						
Less than 25	.56	.50	.48	.49	.54	.46
25–34	1.04	.95	.89	.88	.97	.87
35–44	1.35	1.26	1.18	1.17	1.26	1.18
45–54	1.45	1.39	1.31	1.28	1.36	1.32
55–64	1.11	1.14	1.12	1.11	1.12	1.13
65 and over	.35	.56	.80	.85	.57	.81
Family type & sex						
Families						
Headed by couples	1.31	1.28	1.24	1.23	1.26	1.25
Other male head	1.05	1.07	1.13	1.15	1.09	1.12
Other female head	.54	.56	.69	.73	.68	.61
Unrelated individuals						
Male	.57	.58	.60	.59	.58	.59
Female	.29	.39	.46	.48	.41	.46
Race of head						
Black	.67	.60	.65	.68	.69	.59
White & other	1.04	1.05	1.05	1.04	1.04	1.05
Total mean (\$)	9,955	10,876	12,221	10,258	9,762	11,372

Table 2.10 **Income Shares for Selected Socioeconomic Groups, Families and Unrelated Individuals, 1972**

Group	Percentiles	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Age of head Under 25	1-40	9.8	9.7	13.1	14.2	13.8	10.0
	41-80	44.4	44.4	43.2	43.4	43.7	44.0
	81-95	30.0	30.0	28.7	27.8	27.8	29.9
	96-100	15.7	15.9	15.0	14.6	14.6	16.1
25-34	1-40	16.5	16.3	18.7	19.6	19.4	16.4
	41-80	44.3	43.9	42.8	42.9	43.2	43.5
	81-95	25.3	25.4	24.6	24.1	24.1	25.4
	96-100	13.9	14.5	13.9	13.5	13.2	14.7
35-44	1-40	15.8	15.4	17.6	18.3	18.0	15.7
	41-80	42.5	41.7	41.0	41.5	41.9	41.3
	81-95	25.4	25.3	24.6	24.5	24.6	25.2
	96-100	16.3	17.6	16.8	15.7	15.5	17.8
45-54	1-40	14.6	14.5	16.4	17.1	16.5	15.2
	41-80	42.4	41.4	41.0	41.6	42.1	40.9
	81-95	26.4	26.2	25.5	25.4	25.5	25.9
	96-100	16.6	17.9	17.1	15.9	15.9	18.0
55-64	1-40	9.2	10.1	13.6	14.2	11.8	12.4
	41-80	41.3	40.3	39.9	40.7	41.3	39.7
	81-95	29.3	28.6	27.1	27.1	28.2	27.6
	96-100	20.3	21.0	19.4	18.0	18.7	20.3

65 or over							
	1-40	-1.1	1.8	12.1	12.8	3.6	10.8
	41-80	20.6	26.6	33.7	35.7	29.9	33.6
	81-95	39.9	33.5	28.0	28.1	33.4	28.4
	96-100	40.5	38.1	26.2	23.4	33.1	27.2
Families							
Married couples							
	1-40	14.6	15.1	18.3	19.1	16.8	17.3
	41-80	42.3	40.6	39.6	40.2	41.4	39.5
	81-95	26.2	25.7	24.6	24.5	25.3	25.0
	96-100	17.0	18.6	17.5	16.2	16.5	18.2
Other male head							
	1-40	11.2	11.8	16.6	17.5	14.8	14.7
	41-80	42.8	40.7	39.8	40.2	40.7	40.1
	81-95	28.5	27.8	25.6	25.2	26.5	26.5
	96-100	17.5	19.7	17.9	17.1	18.0	18.7
Other fem. head							
	1-40	3.0	3.9	14.9	15.9	13.5	7.1
	41-80	41.1	40.0	39.4	40.0	39.9	41.0
	81-95	34.4	33.2	27.9	27.1	28.3	31.3
	96-100	21.5	22.9	17.8	17.0	18.3	20.7
Unrelated individuals							
Male							
	1-40	4.3	5.8	12.2	13.3	8.6	10.3
	41-80	40.9	39.4	38.6	39.6	40.8	38.5
	81-95	32.0	30.4	27.5	27.0	29.0	28.3
	96-100	22.8	24.5	21.7	20.2	21.6	22.9
Female							
	1-40	.3	2.7	12.5	13.5	5.6	10.3
	41-80	33.5	34.8	36.1	37.0	36.8	36.3
	81-95	40.0	33.3	27.8	27.1	31.4	28.6
	96-100	26.1	29.2	23.6	22.4	26.2	24.8

Table 2.10 (continued)

Group	Percentiles	EARN	PRI	HI	HDI	HDI – ART	PRI + ART
Race of head							
Black							
	1–40	5.4	5.4	13.9	15.1	11.6	9.3
	41–80	42.9	42.7	41.1	41.6	42.4	42.0
	81–95	33.3	33.3	28.9	28.1	29.9	31.1
	96–100	18.4	18.6	16.1	15.2	16.1	17.6
White and other							
	1–40	8.0	9.6	14.2	15.0	11.6	13.0
	41–80	43.0	41.1	40.0	40.6	42.0	39.9
	81–95	29.5	28.4	26.6	26.5	27.8	27.1
	96–100	19.5	20.9	19.2	17.9	18.6	20.0
All units							
	1–40	7.5	9.0	13.8	14.7	11.3	12.3
	41–80	43.0	41.2	40.1	40.7	42.0	40.1
	81–95	29.9	28.8	26.9	26.7	28.0	27.5
	96–100	19.6	21.0	19.2	17.9	18.7	20.2

income concept is relatively small, since these groups are primarily dependent on earnings, particularly wages and salaries; further, perhaps not surprisingly, the property income that is received by these groups tends to be positively correlated with their earnings. For older groups the opposite is true: property income is more important as an income source, and the correlation is reversed—retired persons and those with limited earnings receive relatively more property income than those with larger earnings.

The shift from PRI to HI, on the other hand, produces a uniform movement to less inequality for all age groups, with a substantial increase in the share of the bottom two quintiles. The change is particularly large for the 65 and over group, although the degree of inequality within the aged group for HI is still greater than it is within any other age group. Going from HI to HDI produces a further reduction in inequality for every age group, with the share of the bottom 80 percent gaining at the expense of the top 5 percent.

Removing age-related transfers from HDI (i.e., comparing HDI – ART with HDI) results in very little change in shares for the three younger age groups, although what change there is suggests a Lorenz curve intersection phenomenon, resulting from the greater incidence of personal contributions for social insurance on middle income groups, which rely more heavily on wages and salaries, on which such contributions primarily impinge. As would be expected, for the two older age groups there is a movement toward more inequality, especially pronounced for the 65 and older group. The results in going from PRI to PRI + ART (i.e., adding only age-related—not all—transfers to production-related income) are virtually the same as those discussed above in comparing HDI and HDI – ART, whether one looks at percentage or at percentage point changes in shares, although the relevant changes are, of course, opposite in sign.

In contrast to the effects for age groups, those for family type and sex of head groups in general are similar to those for all units. The shift from EARN to PRI increases the shares of the bottom and top 5 percent and decreases the share in the 41–95 percentile range; that from PRI to HI increases the share of the bottom 40 percent and decreases the shares of the groups above it; that from HI to HDI increase the share of the bottom 80 percent and reduces that of the top 20. The only exception to the direction and extent of change is for female unrelated individuals. For that group the extent of change is generally greater in moving from one concept to another; in addition, the change for the 41–80 percentile group sometimes differs in sign, as compared with the other groups.

The effects for blacks are similar to those for the white and other group, except for the shift from EARN to PRI. The shift produces little

change in the shares for blacks because of the relatively small amount of property income received by blacks.

2.5 Conclusion

The major purposes of this paper have been to develop a consistent framework for the accounting of transfers, as receipts of, and payments by, the household sector from, and to, other sectors and to compare the effect of alternative definitions of pre- and post-transfer income on the distribution of income among households by size and by socioeconomic characteristics. We started from a concept of earnings (wages, proprietors' income, and net rental and royalty income), then added net transfers of property income from the business and government sectors (dividends received from corporate business, interest received from business and government net of interest paid to business, and estate and trust income) to obtain a concept reflecting primarily, although not entirely, the results of productive activities, including the resultant distribution of property income arising from the underlying ownership of property rights by the household sector. Our resulting concept of production-related income showed less inequality at the bottom, and more inequality at the top, of the distribution than earnings (i.e., a Lorenz curve intersection). Household income, another intermediate stopping point between our pure pretransfer income concept (earnings) and our complete post-transfer concept, added transfers received (government transfers from both entitlement and means-tested programs and private transfers), but did not deduct transfers paid. As compared with the two preceding concepts, it resulted in a substantial reduction in inequality at the bottom of the distribution and raised substantially the mean incomes of those socioeconomic groups heavily reliant on transfer income. The complete, post-transfer income concept, household disposable income, was net of transfers—personal contributions to social insurance programs and income property taxes—paid by households. Compared with the effect of adding transfers received, deducting transfers paid had only a relatively mild equalizing effect. Although their effects on our concepts are clear enough, we were not able to provide estimates of the redistributive effects of interhousehold receipts and payments of transfers.

Appendix A *Construction of the Estimates*

The estimates shown in this paper were tabulated from the fully estimated 1972 Exact Match-Statistical Match (EM-SM) file, which was constructed in a cooperative effort by the Bureau of Economic Analysis

(BEA), U.S. Department of Commerce, and the Office of Research and Statistics, Social Security Administration (SSA). That file contains estimates of income produced by adjusting estimates from several data sources to be consistent with independent control totals derived primarily from the National Income and Product Accounts (NIPA). The file also includes estimates of several types of tax liability. The construction of that file is described in this appendix.¹³

The 1972 Exact Match File

The starting point for the construction of the file was the 1972 Exact Match (EM) file, which is an exact match of the March 1973 Current Population Survey (CPS), the Internal Revenue Service's 1972 Individual Master File (IMF), an extract of the SSA Summary Earnings Record (SER), which contains earnings covered by the Social Security system, and SSA benefit data. Records from the IMF, SER, and benefit files were matched to CPS records by identifier linkage variables (Social Security number, name, address, sex, race, and date of birth). About 87 percent of the CPS file was finally matched, and the matched portion was reweighted to population control totals (Kilss and Scheuren 1978 and discussion by Budd). Not all records included in the three-way link contain all three types of records. For example, some CPS units did not file tax returns. The completed CPS-IMF-SER linked file includes approximately 38,600 matched families and unrelated individuals.

The Statistical Match of Statistics of Income Tax Return Data with the 1973 EM

While there is no doubt that the 1972 EM is superior to any individual microdata file hitherto available, the absence of complete tax return information is a serious limitation; in particular, tax liabilities and income amounts other than adjusted gross income (AGI), wages, interest, and dividends in AGI are missing from the file. To rectify this deficiency and bring in missing information on tax return income types and federal income tax liabilities, a statistical match (SM) was carried out between the EM and the 1972 Augmentation File (AF)¹⁴ The AF was a subsample of Statistics of Income tax returns, which was itself exact matched to SER records to obtain age, race, sex, and Social Security taxable earnings, primarily for the purpose of improving the quality of the statistical matching by adding more good matching variables. The SM was carried out in three steps: the initial match, the rematch, and the high-income match. The initial match and the rematch were similar matches whose purposes were to add tax liabilities and more accurate and complete income data to the EM; the rematch respecified and improved the initial matching for about 15 percent of the records in the file. The high-income match, on the other hand, was performed to add more high-income

returns to the statistically matched file to reduce the sampling variance for high-income records.

Twenty-two variables were employed in the match, either for defining "cells" within which matching of records was to occur, or for choosing AF records within the cells. These variables included (amounts) of AGI, interest, dividends in AGI, and Social Security taxable earnings; sex, race, age, number of tax return exemptions, and presence of various tax return schedules. In general, the AF record whose information most closely resembled the EM record's information was chosen as the match for that EM record.¹⁵

Correction of Tax Return Income Types for the Effects of Audit

The statistical match of the EM and the AF produced complete tax return income type information for each EM record, resulting in what we have previously referred to as the EM-SM file. The next step was the correction of each IRS income type in this file for the effects of audit, as evidenced in the 1973 Taxpayer Compliance Measurement Program (TCMP) file. The methodology proceeded along two related lines: (1) a ratio correction technique for returns in which income, by type of income, went from one amount to another amount, and (2) a net change procedure for returns in which the income type was changed from a loss to a positive amount, or from "none" to a nonzero amount, the latter being of primary importance for self-employment incomes, rent, and interest. Each of these two procedures was implemented separately, for each income type, for eight correction cells based on the type of tax return filed: joint, and all other; one or more exemptions for age 65 and over, and no such exemptions; and short and long tax form.¹⁶

Final Adjustment of Taxable Income Types to Aggregate NIPA Income Control Totals

Once the size distribution of each IRS income type had been estimated, the final step was to bring the level of each type implicit in the EM-SM file up to its corresponding NIPA control total. The control totals were derived by adjusting the amount of each taxable income type in the NIPA personal income account to make it consistent with the CPS population universe and income concepts. Income received by decedents (persons who died between 1 January 1972 and 15 March 1973), military personnel on post and overseas, and recipients other than persons, such as nonprofit institutions, were excluded. For some income types adjustments were carried out to make the control more nearly consistent with the ways in which the type is reported on the tax return. For example, interest, dividends, rent, and proprietors' income paid to estates and trusts were transferred to a separate control for estate and trust income,

since the latter, although not a separate income type in the NIPA, is reported separately on Schedule E of the tax return.

The blow-up procedure for income types with positive income only (no losses) was designed to leave the relative size distribution for each income type unaffected. A correction factor, defined as the ratio of the NIPA control total to the aggregate implicit in the IRS data base (after audit correction), was applied to each nonzero observation. For income types involving loss as well as gain incomes (self-employment incomes, rents, and royalties), losses were reduced in roughly the same proportion as gains were increased. In addition, for particular tax return types a small constant term was added to each record to make the proportion of losses more nearly consistent with evidence from other sources on the proportion of loss incomes.

Estimation of Nontaxable Money Income Types

Since most types of transfer income are not subject to federal income tax, the only estimates for such types are those in the CPS portion of the EM-SM records, with the important exception of Social Security benefits. For the latter, the amount contained in the benefit portion of the Social Security administrative record was substituted for the CPS reported amount. This substitution, together with a limited amount of file editing and inflation of individual amounts by less than 1 percent, brought the aggregate up to the independently derived BEA control.

The CPS was the starting point for the estimation of the remaining transfer payments, including railroad retirement, public assistance, other government transfer programs (unemployment compensation, workers' compensation, government pensions, and veterans' benefit payments), and private transfers (which were limited to private pensions and annuities). For these types of transfer income, the underestimates of aggregate income in the CPS appeared to be primarily the result of underestimates of the number of recipients. The basic strategy was therefore to select additional recipients among the potentially "false zeroes" (those who responded "none" even though they received an amount), rather than raising individual reported amounts.

Although there were some variations in the estimating procedures among individual program types, the following general steps were employed: (1) An income control total was derived from the NIPA estimates and adjusted for consistency with the CPS population coverage, and a recipient unit control was estimated for each program from program data. (2) CPS nonresidents were reallocated amounts and, where the CPS contained only combined amounts, amounts for specific transfer types were estimated. (3) Within cells defined by selected CPS demographic characteristics, additional recipients in each cell were drawn at random

from among nonrecipients to meet the recipient unit controls and were assigned amounts reported by or allocated to recipients. Each person drawn had a greater probability of being assigned a smaller amount reported by a recipient than a larger amount to take account of the fact that in field surveys smaller amounts of a transfer type more often go unreported than larger amounts. (4) For some types, assigned amounts were then inflated or deflated (by relatively small ratios) to meet the corresponding income control for the transfer type.¹⁷

For state and local bond interest, there were essentially no data in the EM-SM records. That income type was estimated using several other data sources—the 1972–73 Consumer Expenditure Survey (CEX), which had been statistically matched to the EM-SM file; the 1962 Survey of Financial Characteristics of Consumers; and the 1977 Michigan Survey of Consumer Attitudes.

Estimation of In-Kind Income

Free food and lodging (included in wages and salaries) were assigned to a small number of employees in a few selected industries. Food and fuel consumed on farms (included in farm income) were imputed to consumer units reporting farm residence in the CPS. The amounts assigned, averaging \$100, were a function of family size.

Both imputed rent and imputed interest were distributed on the basis of information collected in the CEX. A statistical match between the CEX and EM-SM files referred to earlier was used to incorporate the CEX estimates into the latter file. Size of consumer unit, race and sex of the head, home ownership, size of total money income, and the size of interest income were among the variables controlled for or used in the statistical match of these two separate files.

Imputed interest on checking and savings accounts was distributed in proportion to the value of these asset holdings reported by consumer units in the CEX. The distribution of imputed interest on equity in life insurance policies was not estimated in this file, and the corresponding amount of imputed interest (approximately \$7.1 billion) is not included in the aggregates in table 2.2.

The imputation for net rent on owner-occupied nonfarm dwellings was based on drawing up an income and expense, or production, statement and estimating its components separately for each home owner. Gross rental values and home owners' expenditures on repair and maintenance, mortgage interest, and property insurance were estimated from the CEX. Imputed rent on owner-occupied and tenant-occupied farm operator dwellings was estimated by a somewhat different technique to allow for differences in the method used by USDA to estimate aggregate rent, as compared with BEA methodology, and was incorporated in net rental income rather than in farm income.

Medicare benefits were treated as imputed insurance premiums for hospital and medical care whose full cost was paid by the federal government. The value of the full-year imputed premium assigned to aged persons was \$425.

Food stamp bonus values were assigned to eligible recipient units based on the size of the unit and the number of weeks worked by the head. Average bonus values as a function of these two characteristics were based on reported values computed from the CEX, as corrected for underreporting. Participating units were selected from among eligible units, with probabilities of selection a function of the size of the unit and whether it received public assistance.

Estimation of Personal Contributions for Social Insurance, Taxes, and Interest Paid

Assignments of OASDI tax to wage and salary workers were made at the statutory rate, up to the OASDI taxable limit, based on wages reported on the tax return and occupational information drawn from the CPS. The self-employment tax was assigned to persons filing a Schedule SE, based on the amount of self-employment income on the return before correction by audit. The assignment procedure took account of any OASDI tax which the self-employed person may have paid on his or her wage earnings. Contributions to railroad retirement were assigned at the statutory rate for this program.

Employee contributions to state and local retirement plans were distributed on the basis of the tax return amount of wages to those reporting such employment in the CPS. Account was taken of the joint coverage by both state and local plans and by Social Security of some workers, who were assumed to pay a somewhat lower contribution rate than employees covered only by a state or local plan. Retirement contributions of federal employees were based on the statutory contribution rate. The method used for allocating supplementary medical insurance premiums paid by the aged was virtually identical to that used in estimating Medicare benefits, as described above.

Federal personal income tax liabilities were taken without change from the tax returns added to the file in the statistical match. The definition used was total income tax (i.e., income tax after credits plus minimum tax).

For federal tax returns with itemized deductions, state and local income tax liability was estimated as the itemized deduction for state and local income tax less the state income tax refund. Personal property tax liability was estimated as the itemized deduction for the personal property tax.

For federal tax returns which had nonitemized deductions, itemized deductions for state and local income taxes and state income tax refunds

were assigned using a hot deck imputation procedure. The assignment was performed within sixteen cells based on type of return (joint, non-joint), number of dependent exemptions (0, 1, 2, 3+), and number of age or blind exemptions (0, 1+). Within each of these cells a return was chosen (with replacement) for each nonitemizer. The assignment of the items was based on percent of AGI—that is, if the item was X percent of AGI in the itemized return, X percent of the nonitemized return's AGI was assigned. All assigned amounts were decreased by about 5 percent to bring the aggregate down to the control.

Because of our resource constraints, units with no federal income tax returns were assumed to have no federal, state, and local, or personal property tax liability. In addition, it was not possible to estimate and deduct that portion of the federal personal income tax which was from tax liability on realized capital gains. Deduction of such tax liability would have been desirable since realized capital gains are not included in PRI or HI. This fact should be kept in mind in interpreting the results for the bottom vigesile for the HDI distributions shown in section 2.4.

For federal tax returns with itemized deductions, interest paid was estimated as the itemized deduction for interest (excluding mortgage interest). For federal tax returns with nonitemized deductions, the hot deck imputation procedure mentioned above in connection with taxes was used to impute interest paid. All assigned amounts were reduced by about 20 percent to bring the aggregate down to the control.

Appendix B *Tables for Families*

Table 2.A.1 **Income Shares, Families Ranked by Size of the Income Definition, 1972 (percent)**

Percentile Groups	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Total	100.00	100.00	100.00	100.00	100.00	100.00
1-5	-.47	-.37	.34	.10	-.44	-.16
6-10	.19	.33	1.30	1.45	.84	.94
11-15	.61	.88	1.70	1.89	1.40	1.47
16-20	1.23	1.45	2.06	2.25	1.89	1.90
21-25	1.85	1.96	2.40	2.59	2.33	2.29
26-30	2.43	2.44	2.74	2.91	2.74	2.65
31-35	2.92	2.88	3.09	3.24	3.13	3.01
36-40	3.37	3.30	3.41	3.55	3.51	3.35
41-45	3.81	3.68	3.73	3.86	3.87	3.68
46-50	4.23	4.07	4.04	4.15	4.22	4.03
51-55	4.65	4.47	4.37	4.46	4.57	4.37
56-60	5.07	4.86	4.72	4.79	4.95	4.73
61-65	5.51	5.28	5.08	5.14	5.33	5.10
66-70	5.98	5.72	5.49	5.53	5.74	5.52
71-75	6.49	6.24	5.97	5.99	6.21	6.04
76-80	7.11	6.86	6.53	6.53	6.76	6.62
81-85	7.87	7.63	7.21	7.18	7.47	7.34
86-90	8.90	8.68	8.20	8.16	8.46	8.37
91-95	10.57	10.45	9.83	9.70	10.05	10.09
96-100	17.68	19.21	17.78	16.51	16.97	18.69
100	6.01	7.07	6.48	5.60	5.73	6.91
Gini concentration ratio	.42	.42	.37	.35	.39	.40

Table 2.A.2 Relative Mean Incomes, Families Ranked by Size of the Income Definition, 1972

Percentile Groups	EARN	PRI	HI	HDI	HDI- ART	PRI+ ART
Total	1.00	1.00	1.00	1.00	1.00	1.00
1-5	-.09	-.07	.07	.02	-.09	-.03
6-10	.04	.07	.26	.29	.17	.19
11-15	.12	.18	.34	.38	.28	.29
16-20	.25	.29	.41	.45	.38	.38
21-25	.37	.39	.48	.52	.47	.46
26-30	.48	.49	.55	.58	.55	.53
31-35	.58	.57	.62	.65	.63	.60
36-40	.67	.66	.68	.71	.70	.67
41-45	.76	.73	.75	.77	.77	.74
46-50	.85	.81	.81	.83	.84	.81
51-55	.93	.89	.87	.89	.92	.87
56-60	1.01	.97	.94	.96	.99	.95
61-65	1.10	1.06	1.02	1.03	1.07	1.02
66-70	1.20	1.14	1.10	1.11	1.15	1.10
71-75	1.30	1.25	1.19	1.20	1.24	1.21
76-80	1.42	1.37	1.31	1.31	1.35	1.32
81-85	1.57	1.53	1.44	1.44	1.49	1.47
86-90	1.78	1.74	1.64	1.63	1.69	1.67
91-95	2.11	2.09	1.97	1.94	2.01	2.02
96-100	3.54	3.84	3.55	3.30	3.39	3.74
100	6.01	7.07	6.48	5.60	5.72	6.90

Table 2.A.3 Income Shares, Families Ranked by Size of Production-Related Income, 1972

Percentile Groups	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Total	100.00	100.00	100.00	100.00	100.00	100.00
1-5	-.37	-.37	.90	1.00	.27	.30
6-10	.30	.33	1.58	1.83	.80	1.28
11-15	.82	.88	1.86	2.13	1.32	1.62
16-20	1.41	1.45	2.05	2.29	1.83	1.89
21-25	1.93	1.96	2.37	2.60	2.29	2.25
26-30	2.46	2.44	2.70	2.91	2.72	2.62
31-35	2.97	2.88	3.05	3.23	3.13	2.97
36-40	3.42	3.30	3.39	3.54	3.51	3.32
41-45	3.84	3.68	3.68	3.81	3.87	3.63
46-50	4.27	4.07	4.01	4.11	4.21	3.99
51-55	4.68	4.47	4.33	4.42	4.57	4.33
56-60	5.10	4.86	4.69	4.77	4.95	4.69
61-65	5.55	5.28	5.01	5.06	5.33	5.04
66-70	5.97	5.72	5.43	5.45	5.72	5.47
71-75	6.46	6.24	5.89	5.87	6.18	5.96
76-80	7.15	6.86	6.42	6.37	6.74	6.52
81-85	7.85	7.63	7.14	7.05	7.46	7.25
86-90	8.80	8.68	8.13	8.03	8.45	8.30
91-95	10.49	10.45	9.70	9.46	9.99	9.96
96-100	16.92	19.21	17.69	16.07	16.66	18.61
100	5.41	7.07	6.47	5.32	5.46	6.89

Table 2.A.4 Joint Distribution of Production-Related Income and Household Disposable Income, Families, 1972 (percent)

PRI Percentile Groups	HDI Percentile Groups										
	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	
1-10	57	25	10	5	2	1	1	0	0	0	100
11-20	39	26	16	8	6	3	1	1	0	0	100
21-30	3	46	25	9	7	4	2	1	1	0	100
31-40	0	3	45	29	11	6	4	2	1	0	100
41-50	0	0	3	47	31	9	5	3	2	0	100
51-60	0	0	0	2	43	36	10	6	3	1	100
61-70	0	0	0	0	2	40	42	10	5	1	100
71-80	0	0	0	0	0	1	33	52	11	2	100
81-90	0	0	0	0	0	0	1	25	63	11	100
91-100	0	0	0	0	0	0	0	0	14	85	100
Total	100	100	100	100	100	100	100	100	100	100	

Numbers may not sum to totals because of rounding.

Table 2.A.5 Relative Mean Incomes of Socioeconomic Groups, Families, 1972

Socioeconomic Group	EARN	PRI	HI	HDI	HDI-ART	PRI+ART
Age of head						
Less than 25	.60	.55	.54	.55	.59	.51
25-34	.92	.86	.81	.82	.88	.80
35-44	1.18	1.12	1.06	1.06	1.13	1.06
45-54	1.33	1.29	1.24	1.21	1.27	1.24
55-64	1.11	1.14	1.13	1.11	1.11	1.14
65 and over	.45	.66	.91	.96	.66	.93
Family type & sex						
Families						
Headed by couples	1.09	1.09	1.07	1.06	1.07	1.08
Other male head	.87	.91	.97	.99	.93	.97
Other female head	.45	.47	.59	.63	.58	.53
Race of head						
Black	.67	.61	.66	.69	.70	.61
White & other	1.04	1.05	1.04	1.04	1.04	1.05
Total mean (\$)	11,937	12,812	14,203	11,879	11,471	13,220

Notes

1. For a review of the literature on the effects of transfers on labor supply and savings, as well as their purely redistributive effects, such as are examined in this paper, see Danziger, Haveman, and Plotnick (1981).

2. For an excellent discussion of the appropriate pretransfer income concept from which to measure the redistributive effect of government fiscal policy, see Behrens and Smolensky (1973).

3. Rolph (1948), p. 331. Our discussion of transfers draws heavily on Rolph's article. A criticism of Rolph's treatment, which we do not find convincing, may be found in Jaszi (1958), pp. 115–119.

4. The tax return data in our file do contain data on realized capital gains (Schedule D). However, they have not been corrected for audit, as have the other tax return types. Since real capital gains (money gains adjusted for changes in the price level) are the more meaningful concept, it would also be necessary to develop a method for deflating them, no easy task since the underlying asset values giving rise to such gains, on which such a correction would have to be based, are not included in microdata files of tax returns. Further, estimates of accrued capital gains are not available from this source. Realized capital gains are not likely to be a very good proxy for total gains (realized plus accrued) in any case.

5. For a fuller treatment of this issue than is necessary here, see Ohlsson (1953), pp. 160–62; and Rolph (1948), pp. 332–43. Ruggles and Ruggles (1982, pp. 14–16) present an opposite argument. Strangely enough, this controversy has not involved dividend payments, which constitute distributions of corporate earnings (net of interest and taxes) to shareholders. The latter receive such (transfer) income payments because, as legal owners of the corporation, they are entitled to participate in its earnings, not because in some sense or other they are furnishing productive services to the corporation. Such transfers are voluntary rather than legally required, in contrast to interest payments which Rolph defines as contractual transfers (Rolph 1948, pp. 332, 336–37).

6. E.g., Ohlsson (1953), pp. 82–83; Hagen and Budd (1958), pp. 269–70. In the same volume (*A Critique of the U.S. Income and Product Accounts*), Jaszi comments that “the decision [to exclude government interest payments] is a matter of common sense: since in practice there is no determinate relation between government interest payments and the use of government property, there is no realistic ground for including these payments as an approximation to the services rendered by government property” (Jaszi 1958, p. 50).

For an alternative view, see Ruggles and Ruggles (1982), p. 14. Perhaps they would be sympathetic with a further argument Jaszi makes, although not with the final conclusion he draws: “It is true, of course, that with only moderate ingenuity one could define a factor of production, such as lending or abstinence, as standing behind government interest. The concept of factor of production is vague in economic theory, and anyone is free to define it as it suits him best. But all these interpretations of government interest as a factor payment are highly artificial; such interest would be excluded regardless of them in any realistic analysis of resource use” (Jaszi 1958, pp. 50–51).

7. Interest paid by one consumer to another is presumably netted out as a transfer within the personal sector in the NIPA. Even though intrapersonal interest receipts and payments are netted out of this aggregate, their distributive effects should be accounted for in the post-transfer distribution.

8. Of course, net interest received (interest received minus interest paid) could well be negative for individual consumer units such as Smith.

9. Perhaps, as Ruggles and Ruggles (1982, p. 15) argue, part of the interest payment may be hidden in the purchase price of the car, so that Smith pays a higher price than Jones for the identical car. The theoretically correct procedure would be to count the two identical

cars that Jones and Smith purchased at the same price (i.e., with the same weight) in NNP and assign the difference Smith pays to consumer interest paid, although empirically this would be difficult to do. For this and other reasons, actually observed market prices are not always the most appropriate weights for counting individual products in NNP.

10. The argument that indirect business taxes have already been deducted is compelling only if we confine ourselves to the distribution of money income. Excise and sales taxes can affect relative wages and prices, and hence relative real incomes, depending on the composition of consumption expenditure of different households and groups of households (e.g., the aged vs. the non-aged). If one cannot deflate the money incomes of the relevant groups by price indexes which incorporate the effects of indirect taxes, the next best thing may be to deduct the taxes from each household's income.

11. For an excellent discussion of the issues associated with lifetime income accounting and, among other things, its relation to Social Security and age-related transfers, see Taussig (1976), pp. 34–42.

12. Social Security benefits are included along with pensions in retirement benefits. It is true that OASDI was originally conceived as a social insurance program which would insure covered workers against the loss of earnings because of age as well as other factors causing partial or total disability. However, it is well known that the problem of "moral hazard" is even greater for an age-related program such as Social Security than for other forms of insurance. Thus, workers may voluntarily retire, from age sixty-two on, and receive Social Security benefits, even though many could keep on working with possibly little loss of earning power. Mandatory retirement schemes and other institutional restrictions also complicate the interpretation of moral hazard in connection with Social Security. Here we simply assess the effects of Social Security when interpreted as a retirement system and leave aside its other elements.

13. This appendix draws heavily on a description by Budd and Salter (1981) of the EM-SM file and the methods used in its creation.

14. In a statistical match, observations in different files are matched on the basis of similar characteristics, rather than personal identifying information. Only in rare cases do the observations matched represent the same person.

15. A more complete discussion of the statistical match may be found in Radner (1981) and Salter (1980), chap. 6.

16. For a more complete discussion of the audit correction, see Salter (1980), chaps. 7 and 8.

17. While the work on public assistance was hampered by the absence of information on which particular program the respondent participated in, the results of a detailed study of (categorical and financial) eligibility for program participation (by state) for the March 1973 CPS file and exact matched to the EM file were used (Projector and Murray 1980).

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Comment Robert Lampman

This is a summary and discussion of the paper by Budd, Radner, and Whiteman (B-R-W). I will begin with their findings as presented in section 2.4 of the paper. If we take their production-related income (PRI) concept as close to what most people would call pretransfer income, we see that they find what sounds familiar to readers of other studies. That is, first, transfers reduce inequality—they double the share of the lowest 30% and reduce the share of the upper half by 6%. Second, personal taxes paid (which exceed transfers received) further reduce inequality but only slightly. Thus household disposable income (HDI) is less unequal in distribution than is household income (HI) than is PRI. Further, leaving out retirement benefits, which are over two-thirds of all transfers, hurts the share of low-income households.

The authors also state (and here we are in less familiar territory) that the Lorenz curves for PRI and primary income or earnings (EARN) intersect and reflect close to the same overall inequality. The difference between the two concepts is that PRI includes dividends, interest net of consumer interest paid, and estate and trust income. The authors suggest that the latter three items may be thought of as transfer income. Transfers received by the personal sector, including the three property income items, just about equal the negative transfer payments made by the personal sector. Compare lines 4 and 14 in table 2.2. The authors do comment on this near identity, but they do not supply any balancing items to equate transfers received and transfers paid. They do instruct us that “. . . for the economy as a whole, although not necessarily for any individual sector of it, transfer payments simply redistribute claims to income produced, without raising the total” (section 2.1). And “. . . transfers enter only the income side of the accounts and do not affect the product side” (section 2.2.1).

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Section 2.3 of the paper describes the process of producing the micro-data base underlying the findings summarized in section 2.4. The amount of work involved in preparing this data base is truly awesome. It started with a matched set of records for a sample of households from CPS, IRS, and SSA records. Further information was grafted on to this sample from tax audits, the Consumer Expenditure Survey, the Survey of Financial Characteristics of Consumers, and other sources. All items were brought into conformity with the totals in the NIPA after the latter were adjusted for the smaller population covered by CPS. (This explains why the totals in table 2.2 do not reconcile with those for similar concepts in NIPA.)

One wonders whether we should or will ever again have such a data file for another year. One also wonders whether a single sample survey directed at pre- and post-transfer income could produce a data base that is as useful as this one. It should be noted that numerous items of interest for such a study are not yet estimated in the file.

Section 2.2 is a presentation of the B-R-W accounting framework for transfer payments. In designing such a framework, we must decide what sectoring is important, what income items (positive and negative) will be included, and what income period is appropriate. B-R-W accept the personal sector as it exists in NIPA except that they throw out nonprofit (philanthropic) organizations. This leaves families and unrelated individuals, unincorporated business, estates and trusts, insurance and pension funds in their "personal sector." I suggest an alternative sectoring that would show separate sectors for families, an imaginary interfamily transfer fund, philanthropic organizations, and insurance and pensions. This would create a way to show transfers within the present personal sector as well as between that sector and the corporate business and government sectors.

Transfer income (positive and negative) must be distinguished from income arising out of production or exchange and also from changes on capital account. Decisions must be made about what in-kind items are to be included as income and how far to go in imputing income where there is no transaction. In considering these matters, B-R-W point us to controversies among experts and to differences in accounting practice in BEA, the Census Bureau, and the UN. They also refer to the different income concepts now employed in income size distribution work (section 2.2.9).

Where do we get an income measure for family pretransfer income? National income (production at factor cost) would seem to be a logical beginning, but certain transfer items are taken out in the move from net national product to national income. Further, B-R-W reminds us that some components of national income, such as interest, are identified by some as "transfers arising out of the nature and distribution of ownership rights." This classical view relies on a definition of production (nontrans-

fer) income as payment for the use of real as opposed to financial resources. For most real business assets, which are located in the corporate sector, the primary income payment goes to that sector. The payment from the corporation to the stockholder and bondholder in the personal sector (who have only provided money) is a secondary or transfer income item. With respect to corporate paid interest, productive income flows to the asset and is no greater simply because the asset may be encumbered by a bond issue. This concept guides the UN system of accounts. Somewhat related to this is the notion that income items that have no counterpart on the product side—government interest and consumer interest paid—should be identified as transfers.

Our search for a starting point of pretransfer income is not helped by going to personal income since that includes certain transfer payments and transfer contributions. We can get around this tangle by defining pretransfer family income as income arising out of market or two-way transactions, including certain financial transactions, where the income recipient provides something of value. This covers the case of the bondholder.

I have no great quarrel with the B-R-W concept of PRI as pretransfer income. That includes wages and salaries, proprietor's income, net rental and royalty income, dividends and net interest received, and estate and trust income. They also say they would include capital gains and losses and employer contributions to social insurance and private insurance.

Positive and negative transfer items are listed in lines 9, 10, 12, and 13 in table 2.2. The positive transfers include some but not all public and private transfers. Some of these shown are in kind. The negative transfers shown are personal taxes only. The positive transfers amounted to \$97.7 billion, which is equal to 8% of GNP. By contrast, the total of social welfare expenditures under public and private programs was equal to over 20% of GNP in that same year. This latter series, which was developed by the Social Security Administration, includes education, health care, and other services not included in table 2.2. B-R-W indicate that they would include some of these items if they had more data in their file. I agree with them that an arbitrary decision must be made about what in-kind items should be counted as personal income. I would also like to include contributions to and from both philanthropic organizations and an imaginary interfamily fund. I would like to see a double-entry account of where the funds come from to pay for the transfers to families. In this connection, I assume that B-R-W would, if they had the data, subtract employer contributions to social and private insurance in going from HI to HDI.

B-R-W rightly point out that the income period is an important issue in accounting for transfers. This is true not only with respect to old-age-related benefits, which they emphasize, but also for certain other episodic

benefits, including education. Virtually the whole set of transfers under consideration here can be considered as insurance or as a method of averaging payments over a long period for expenses that occur infrequently. But when is the benefit actually experienced? Consider schooling—does the benefit flow when one is a child in school or later in life? This raises questions about the equalizing effects of transfers suggested by use of a one-year accounting period. Surely, a longer income period would show less equalization.

The development of an accounting framework for transfers will require a consensus answer to the question: “Transfers for what?” If we can center attention on the redistribution that leads to a meaningful and limited concept of “consumer-power income,” then I think we can reach agreement on sectoring, distinguishing primary from secondary income, and selecting an income period. B-R-W have moved us a step closer to such a consensus.