THE DEFINITION OF INCOME IN STUDIES OF BUDGET INCIDENCE AND INCOME DISTRIBUTION

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INTRODUCTION

Interest in distribution has recently revived. In developed countries there is increasing explicit concern with the size-distribution of incomes, particularly with respect to their high and low extremes. In developing economies, growth of output as the overriding goal of public policy has been subordinated to concern with the distribution of the benefits from growth, and particularly with the persistence of deep low end poverty. Since governments directly allocate anywhere from an eighth to a third of total output, increasing concern with income distribution carries with it, logically, increasing concern with the incidence of public activity in the distribution of income. As a consequence the need to estimate such incidence correctly is also increasing.

Numerous researchers have estimated aspects of budget incidence through allocation by income bracket of tax burden and, occasionally, expenditure benefit.[1] The logic of such allocation requires that the techniques used have certain common elements. Thus, to determine tax-burden by income level, income per family before taxes must be estimated. There is no agreement on what income would be before government budget effects or after all such budget effects have been accounted for; i.e., after reducing income by tax burdens and increasing them by benefits received from public expenditure.[2] Moreover studies whose focus is income distribution *per se* frequently, if not usually, ignore budget effects and define a concept of income which neither includes total taxes as a part of income nor in any way concerns itself with the benefits of government spending. Given the magnitude of public budgets, such cavalier treatment is a serious defect in much empirical work on income distribution.

[1] In some recent work, I approached this topic from another direction: How do those studying size distribution of income handle fiscal incidence? In 1971, we received more than four dozen empirical distributions of income. Of this total, only 13 considered any aspect of budget incidence. Nine of these 13 countries were in Latin America, and seven of these nine were primarily studies of public finances. The typical size distribution study implicitly assumes neutral budget incidence. It is noteworthy that in many of the studies of income distribution, it was impossible to determine how the concept of aggregate income was derived.

[2] The focus is budget incidence rather than general fiscal incidence. It assumes that the effects of government budget activity can be separated and analyzed independently of all the other effects of government policies on economic activity and hence the distribution of incomes. The continuing controversy on to what degree recent empirical work on budget incidence and income distribution, both statistical and analytical, is necessarily invalid because of a failure to generate a general equilibrium approach is not the subject of this paper. The presumption is that the actual approaches commonly used are sufficiently valid to make them worthwhile.

This confusion concerning the proper definition of income is obviously undesirable. For example, the estimated distribution of tax burden depends in part on how aggregate income is defined. Nevertheless, it is not an irresolvable matter. This paper proposes to rekindle an interest in it. Hopefully it will help lead to consensus on the best definition of income in such work. Even if we had such consensus, the multifarious problems of using actual data in estimating household and other incomes corresponding to the best definition—not to mention the still more intractable problem of estimating the locus of tax burdens and expenditure benefits—would still be with us. Nevertheless it would be a step forward if everyone at least agreed on the basic concept to be manipulated.

I use the phrase rekindle interest since, as usual, the matter is not without antecedents. In the early 1960's, there were two basic approaches in empirical studies of budget incidence. The "Adjusted National Income Approach" [2],[7] engaged in something of a debate with the "Net National Product Approach", [1],[9] but they did not arrive at an agreement. In general however analysts studying tax or budget incidence have used the invalid approach, that is defined the aggregate as national income, or used an even less defensible concept.

The most systematic use of the Adjusted National Income Approach is that of the United Nations Statistical Commission which in 1972 published draft guidelines for empirical country work in compiling data on income distribution [10]. In these guidelines, one focus is budget incidence. "Primary Income" is the basic concept of aggregate income before government effects. It is defined as total factor payments before subtracting direct taxes. In contrast, "consumption" by household is defined as total factor payments less direct taxes, plus government transfer payments and benefits from government expenditures, plus an estimate of similar flows within the private economy.[3] The guidelines exclude indirect taxes from pre-tax income. It is argued below that this treatment invalidates the approach.

Part I of this paper discusses the Adjusted National Income Approach, and Part II the Net National Product Approach. Part III presents an analysis of the differences, and gives the author's conclusions as to the appropriate concept.

1. THE ADJUSTED NATIONAL INCOME APPROACH

In constructing aggregate pre-tax income (the magnitude to be divided among income brackets), the Adjusted National Income Approach uses personal income as the pivotal concept.[4] This magnitude is then increased by (1) those taxes which are assumed to burden factors of production directly (unshifted corporate profits tax, unshifted export taxes, backward shifted portion of the employer's social security contribution); and (2) other income (undistributed profits, capital gains); and decreased by (3) personal transfer payments. The resulting augmented magnitude is referred to by different authors as "adjusted income", or "broad income". The distinguishing feature of the concept is exclusion from aggregate income of all taxes which are believed shifted forward to consumers.

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[3]The UN guidelines assume that there are no benefits to households from public general expenditures, such as defense and administration.

[4]National income concepts used are those of the U.S. Department of Commerce.

Hence it excludes all indirect business taxes. But it also excludes items such as that part of social security taxes and corporate income taxes which are assumed to be shifted forward to final consumers. The rationale for this procedure is that were taxation eliminated, the (money) income of factors, e.g., corporation sharehol- ders, would increase only by the amount of the unshifted burden. This procedure is illustrated in Table 1, which compares components of the "broad income" concept with corresponding national accounts data. It is taken from a very careful study of U.S. budget incidence for the year 1960 [2]. The major tax components which the study assumed shifted forward to consumers are:

(a) forward shifted corporation income taxes (22.3–14.1)   8.2
(b) social security taxes not shifted back to employer
(20.7–6.6)   14.1
(c) indirect business taxes   44.3

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      66.6

TABLE 1

NATIONAL ACCOUNTS AND BROAD INCOME CONCEPTS, 1960
(billions of dollars)

National Accounts		Broad Income Concept	
351.8	Disposable income		
50.4	Personal taxes		
402.2	Personal income	Family personal income	383.7[a]
−36.6	Transfer payments[b]	Personal transfer payments	−26.8
8.6	Undistributed corporate profits	Undistributed corporate profits	8.6
22.3	Corporation income taxes	Unshifted portion of the corporation income tax	14.1
20.7	Social security taxes		
		Backward shifted portion of the employer's social security contribution	6.6
		Capital gains	11.7
417.0	National income	Broad income	398.0
44.3	Indirect business taxes		
461.3	Net national product		
504.4	Gross national product		

[a]Differs from personal income in excluding income received by institutional residents, military personnel overseas, and those not living with their families, and income retained by non-profit institutions and private trust, pension and welfare funds.
[b]Includes interest payments.
Sources: National Accounts: [11], p. 66; Broad Income Concept: [2], pp. 173–175.

Items (a) and (b) are defined as part of factor incomes in national income accounting. Item (c) accounts for most of the difference between National Income and Net National Product. Although all three of these components are excluded from aggregate income before taxes in the Adjusted National Income Approach, they are included as reducing income in calculating tax incidence. Attempts are made to estimate who bears their burden in accordance with information on how different income brackets or groups use their income to purchase the relevant

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taxed products. In other words, to compare incomes after estimating tax-incidence, "broad income" or "adjusted national income" in the various income brackets is reduced by "direct" taxes, defined as all taxes which burden factors of production directly, plus the amount of the estimated forward shifted tax (items (a), (b) and (c) above) "embodied" in the goods and services consumed by the various income brackets.

We are left with the paradox that magnitudes corresponding to certain taxes which are included as factor income in national accounts data—that is included in national income, defined as the sum of factor incomes—are treated as not existing in studies of tax incidence using this approach.

The Meaning of the National Income Concept

To this point the argument has proceeded as though national income does provide a measure of total factor incomes. An implication of the Adjusted National Income Approach is that taxes other than indirect taxes have the same economic effects, i.e., they burden the *consumers* of products taxed. To the extent that this is true, then the distinction between NI and NNP as conventionally defined and empirically applied is not meaningful for economic analysis. In other words the "forward shifted" corporation income tax and social security tax are just as "indirect" in their incidence as an excise or sales tax. Note that neither the shifted or unshifted parts of the corporate income tax are ever received as income by the shareholders. The important distinction is that with respect to the unshifted part, elimination of the tax presumably would result in shareholder income increasing, in the unshifted amount. But in the case of the part shifted forward to the consumer, elimination would result in increased real incomes of consumers. In this view the whole notion that conventionally defined national income is equal to the sum of factor incomes is seen as misleading. It would be useful to redefine the concept to exclude *all* taxes "shifted forward to consumers". The result might be very close to the adjusted national income concept. Since we are a long way from a consensus on this point, the second best will be to recognize fully this short-coming of national income as currently defined.

If we leave to the side the treatment of capital gains, thus far the analysis leads to the conclusion that the Adjusted National Income Approach can really be regarded as an attempt to define a meaningful concept of total factor incomes, or a more valid measure of "national income", than the conventional one. As a consequence it might be more meaningful to describe this as the Corrected National Income Approach.[5]

2. The Net National Product Approach

Given a "corrected" NI concept, the question remains whether "corrected" NI is the appropriate income concept in measuring fiscal incidence. At first approximation, this appears to be the case. Corrected NI would add to factor incomes, which are the total incomes households have to spend. Nevertheless many researchers use NNP as the relevant concept. The problem here is again

[5]In 1964 Musgrave took the position that "net-national product at factor cost" was precisely the wrong concept, although his approach amounts to redefining that concept in a more logical and meaningful fashion ([7], p. 54).

treatment of "corrected" indirect taxes (defined to include all taxes which burden consumption). Since they are paid for out of household disposable incomes, how can they be imputed on the income side? As Bishop recognized, this appears to be "double counting" ([1], p. 383). In short, factor incomes do not sum to the market value of output, but to national income, which must be increased by indirect taxes to get output valued at market prices (NNP). Any size distribution of net final output at market prices (NNP) will therefore exceed factor payments by the "corrected" indirect taxes. Hence apparently distributing NNP means distributing "income" which factors would not earn even if taxes and public expenditures disappeared. Moreover some individuals reason that factors do not consume the entire NNP, even after assigning all benefits of public expenditures to them. Assume purchases of goods and services are burdened solely by indirect taxes.[6] When that burden is distributed in the process of defining income after payment of taxes, the result is after tax income less than national income by the indirect tax burden. Adding to this government outlays—assumed equal to indirect taxes—gives a magnitude less than NNP, again by the amount of indirect taxes. Making the exercise more realistic by also considering direct taxes and incomes, and the corresponding increased public expenditures, in no way affects this outcome.

Nevertheless in an earlier article addressed to this topic Bishop ([1], p. 388) defended the NNP Approach by arguing in effect that the "income base" should be NNP with

> imputed items of income being allocated in proportion to some index of the assumed distribution of the benefits of the output involved. This conclusion is drawn on the assumption that it is a useful procedure to attribute the burden of all taxes and the benefits of all government expenditures to individuals or families in their individual capacities.

However, as shown above, allocation of all taxes and all benefits from public outlays is consistent with the "corrected" national income approach. To do so one need not assume a NNP concept of income.

3. THE ANALYSIS AND CONCLUSIONS

The analysis which follows approaches the question of the appropriate income concept in a different manner. It focuses on the difference in aggregate tax-burden implied by using the two alternative aggregate income concepts, "corrected" NI or NNP.
The analysis uses the following notation.

    FI: total factor payments
 NNP: net national product (market value)
    NI: "corrected" national income
    IT: "corrected" indirect taxes
   DT: "corrected" direct taxes
     G: government expenditures including personal transfer payments
     D: capital consumption allowances
 GNP: gross national product

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[6]Here and after indirect taxes means "corrected" indirect taxes.

Assumptions:

  (a) All resources are fully employed.
  (b) All government revenues are taxes.
  (c) The budget is always balanced.
  (d) Indirect taxes are defined as those taxes which burden consumption.
  (e) FI = NI

Given the above assumptions, since FI = NI, if we use the National Income Approach post-tax factor income will be FI − (IT + DT). Distributing first FI and then FI − (IT + DT) by income brackets gives a measure of the tax burden on the different income groups permitting researchers to compute pre- and post-tax income inequality. This in essence is the Adjusted National Income Approach. Applying this reasoning to those studies which use NNP as the concept of income to be distributed gives the following:

  (1) NNP = FI + IT
  (2) FI + IT − (IT + DT) = FI − DT

Post-tax income is now larger by IT than in the national income case. In countries with no direct taxes, we end up with a post-tax distribution summing to NI[7]; in short a near reverse of the earlier paradox. In the same countries, the post-tax magnitude of the National Income Approach would be less than the corresponding magnitude of the NNP Approach by the value of indirect taxes. Since DT are treated the same in both approaches, the above example is relevant to the basic question of which is better.

A simple way to examine this involves use of a hypothetical example as illustrated in Table 2 below. Using NNP as the basic concept of income to be

TABLE 2

TAX BURDEN UNDER VARIOUS INCOME CONCEPTS

Situation	I	II	III
Direct Taxes	33	20	00
Indirect Taxes	00	20	50
NNP	100	120	150
NI	100	100	100
Income after Taxes (Current Prices)	67	80	100
Income after taxes (Prices of III)	100	100	100
NNP Approach (IT + DT)/(FI + IT)	0.33	0.33	0.33
"Corrected" NI Approach (IT + DT)/FI	0.33	0.40	0.50

measured, a common measure of tax burden (taxes/NNP) gives that burden as a third of NNP for each of the three tax situations. However, use of the national-income measure (taxes/NI) results in increasing tax burden as the tax system becomes increasingly indirect.

Assume that the change in tax mix is neutral in moving from Situation I through III, in the sense that the mix and total of output remain unchanged. (The

[7]Throughout the paper relevant elements in the equations can refer to individual households by adding the proper subscripts. Hence NNP $= \sum_i (FP_i + IT_i)$.

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assumption of unchanged output is unrealistic, but it is not crucial. A more realistic, i.e., complicated, example would yield similar although less obvious results.) Under these circumstances, the difference in NNP between situations III and I would be solely that prices would be 50 percent higher in III than in I.

The table implies that after tax income in I is 67, or 100 in prices of III. This also equals III's NI. By the same token NNP in I is 100, equal to 150 in III. If there were no indirect taxes, the factor incomes in III at III's price level would be equivalent to 150. In a situation where all taxes are indirect, NI already is a measure of total income after payment of taxes. More generally, the buying power of FI will be such that relative to NNP it will always equal total income after deducting indirect taxes. At the inflated prices (relative to I) of III, to get the pre-tax income concept we need to add back indirect taxes to FI to arrive at NNP. Specifically, this consists of allocating IT (all taxes which burden consumption) according to the received canons of tax incidence to the various income brackets.

This becomes even more obvious on considering a variant on the change from Situation I to III: Assume resources continue fully employed, and the tax-burden remains one third in terms of NNP. Assume one change, namely that prices remain stable, i.e., NNP continues at 100. This implies that on removal of DT and imposition of IT in the new equilibrium the tax burden is reflected in decreased factor incomes: producers—under the assumptions—will not increase prices, but must forward the IT receipts to government. As a consequence, factor incomes fall in the amount of the tax-burden or tax receipts.

Clearly the resulting national income would equal post-tax income. To estimate pre-tax income it will be necessary to distribute and add back IT among the various income brackets, according to assumptions concerning tax incidence.

All of this leads to the unequivocal conclusion that the NNP Approach is the more appropriate of the two. Use of the National Income Approach implies a total income concept before taxes which is already net of indirect taxes. Use of the NNP Approach in effect includes indirect taxes in the basic pre-tax income. Operationally the significance of this distinction is avoidance of an exaggerated measure of average tax burden.[8]

From another perspective, the resource claims called indirect taxes represent purchasing power for government. Corresponding to these claims payments neither are made nor can they be imputed to the factors of production. However, since the logic of budget incidence analysis requires that all output be distributed to private claimants, NNP becomes the relevant concept precisely because it exceeds factor payments or national income by IT, in other words, by the amount of such resource claims.[9]

This conclusion makes even more difficult the task of generating pre-tax incomes to estimate tax incidence or for other uses. Most researchers assume that indirect taxes usually reduce incomes of households consuming the taxed items. In this new argument, we see that factor incomes are already net of indirect taxes and need to be increased to what they would be, i.e., NNP, were there no indirect

[8]It is understood that the discussion is in terms of the basic conceptual approach. I am not arguing that one should necessarily use unadjusted NNP as the basic concept of income to be distributed. Certain alterations, e.g., inclusion of capital gains, may be desirable.

[9]Bishop expressed the same idea ([1], p. 388).

taxes. This involves thinking about incidence very differently from the usual approach. In other words, indirect taxes are now regarded as overwhelmingly burdening consumption, at least in empirical work on tax incidence. There is no reason to believe that the pattern of incidence of such taxes as now conceived—which is derived from patterns of consumption—would be the same pattern implicit in "restoring" factor incomes to NNP to get a conceptually more valid measure of total pre-tax income. In short, increasing the factor incomes of various income brackets by the presumed incidence of indirect taxes according to current canons of tax incidence would not be a valid procedure.

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