THE INTEGRATION OF MACRO AND MICRO DATA FOR THE HOUSEHOLD SECTOR[1]

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National accounts in their present form do not serve very well as a framework for microdata, largely because of differing concepts and coverage in the macro and micro data. This article identifies the differences in sectoring and the handling of imputations and attributions between macro and micro data, and then proposes a form of presentation of the macro accounts that will facilitate their integration. Data for the United States in 1980 are used as an illustrative example. The final section explores the consequences of the proposed alterations in the macro accounts for the analysis of saving and investment and the accumulation and distribution of wealth, using U.S. data for the period since 1947. The article concludes that the proposed alterations do lead to new analytical insights, and further, that in their present form the national accounts are both misleading and inadequate.

I. THE SETTING AND THE PROBLEM

A. *The Macro/Micro Split*

Despite the comprehensive conceptual framework provided by general equilibrium theory, economics in practice has split into the two distinct disciplines of micro and macro economics. Microeconomics focuses on the decision-making behavior of individual units, in a partial equilibrium, *ceteris paribus* world. There is no interaction among the individual units, no feedback from the economic system itself. Macroeconomics, on the other hand, focuses on aggregate economic constructs and takes feedbacks into account, but it is unable to relate the overall changes with which it deals to what is happening to individual units. The "aggregation problem" is usually swept under the rug by assuming that aggregate change reflects microbehavior, without considering the role of compositional or structural change.

The theoretical split between the macro and micro worlds is mirrored in the statistical resources that are used. Macro modeling relies mainly on the national accounts and related data. This provides a comprehensive and consistent framework, but the data are not easily disaggregated and they are not conducive to examining structural or behavioral questions. Microanalysis, in contrast, often uses survey data that are heterogeneous and conflicting; and they seldom match, either conceptually or statistically, the aggregate data available at the macro level. Although microdata bases are increasingly becoming available, there has to date been no consistent framework for them.

[1]This paper is a revision of the paper "The Household Sector Account and the Integration of Social and Economic Data", presented at the Nineteenth General Conference of the International Association for Research in Income and Wealth, Noordwijkerhout, Netherlands, August 1985.

Microanalytic simulation can provide a means of bridging the macro/micro gap. [8] It can model the behavior of individual units, aggregate the units to determine their effect on the economic system, and in turn transmit the feedback from other units or aggregate constraints back to the individual units. Before microanalytic simulation can become a generally applicable tool, however, there are severe data problems that must be solved. The problems are not primarily statistical. What must be sorted out first is the conceptual relationship between the microdata and the macro frame. The statistical problems *per se* are not insurmountable: if we once decide what data we want, we can probably get it, in a form that is at least as satisfactory as what we now have on the macro level—and indeed, in the process we will improve the macro data.

This conceptual question is what this paper is about. How can we construct an integrated and coherent data framework that will encompass both macro and micro data needs? Starting from where we are, what changes are needed? The discussion is mainly about the macro framework—the national accounts—since that is where the overall frame must be found. But its point of departure is the need to construct a total system into which microdata will fit in a logical way.

B. *The Need for Integration*

The development of microdata to date has generally taken place without reference to the national accounts. While this is quite understandable—the people involved came from a different background and faced different demands—it has meant that the discipline that a more generalized national accounting approach could have contributed has been absent. The strength of national accounting is that it constructs a comprehensive and consistent framework into which data can be fitted. In contrast, many microdata sets, although they provide a wealth of detailed data, are found when compared with other sources to be missing important categories of information, or to be biased and fragmentary. The coverage of microdata is often partial, and research workers may not be aware of this if they do not have appropriate control totals against which to match the data. Partly for these reasons, the large amount of microdata research now being carried out often comes up with conflicting and contradictory results.

Conversely, the development of the national accounts has also suffered from the lack of interaction. The transactor/transaction approach used by the United Nations System of National Accounts (SNA) [14]—that is, dividing the economy into sectors representing groups of transactors, and recording the transactions of each sector in accounts—is a relatively simple principle which could provide the basis for integrating microdata with the national accounts. Because of the circumstances in which the accounts developed, however, the application of the transactor/transaction principle has not always been straightforward, and some changes are needed to allow the simplicity to come through. The experience with microdata files can be helpful in suggesting what these ought to be.

It is apparent that microdata files are here to stay; they offer the simplest way to relate social, economic, and demographic variables to one another in analytically meaningful terms, and they provide the key to an understanding of

the aggregation process. But is is equally apparent that the overall framework provided by the national accounts is needed, both to define the elements that should be included in microdata sets and to establish the basic control totals and to relate the various parts of the system to one another.

Such a marriage of macro and micro data requires adjustments on both sides. In the first place, the universe of reporting units covered in the macrodata and the microdata should be the same. On the macro side, what is needed are sectors composed of well-defined and institutionally similar reporting units; the household sector accounts, for example, should contain only the transactions of households. On the micro side, the concern should be with comprehensiveness of coverage and the appropriateness of reporting units. This does not mean that every microdata set must correspond in coverage to the entire macro sector to which it relates, but rather that it should correspond to an identifiable segment of that sector, for which it is possible to establish control totals. It should, further, be composed of reporting units that can be related, in an identifiable way, to the units included in the macro account.

Second, the basic concepts of income and expenditure employed in the macro and micro data need attention. Microdata sets constructed without reference to any aggregate frame often omit important components. Conversely, the macro accounts include numerous imputations and attributions that are not found in any microdata set—usually for the very good reason that they are unobtainable from the reporting units involved. Ways and means need to be found of bringing the definitions of income, expenditure, and related concepts used in the macro and micro data into congruence, if the integration of social and economic microdata with the macro accounts is to progress.

C. *The Recording of Transactions in the National Accounts*

The question of what to include in income and where to draw the production boundary is as old as the topic of national accounting itself. The general principle adopted in SNA is that comparability, over both time and space, will be improved if all goods and services that commonly enter the market in industrial economics are included, whether or not in a particular instance they actually are bought and sold. Although it is generally agreed that imputations should be made for the subsistence production of goods and for the services of owner-occupied housing, the precise definitions and methods of valuation to be applied are still controversial. Most countries in practice impute as subsistence production only the activity of farmers producing agricultural products which they consume, valued at farm gate prices. In principle, SNA calls for somewhat broader imputations, including provision of fuel, water supply, owner-built housing and even wine making. However, such things as housewives' services, do-it-yourself activities, the services of consumer durables, volunteer work, and students' time have traditionally been excluded from the measurement of production and consumption, although a number of national accountants have made estimates for them.

The attribution of transactions entered into by one group of transactors to another group has also raised questions. The attribution of employers' pension

fund contributions as current income of employees has been generally accepted in the macro accounts, but questions have been raised about the appropriateness of this treatment, both because of the difficulties it creates in measuring the distribution of income and because of its lack of parallelism with the treatment of public pensions (social security) [11]. The attribution of the costs of financial intermediaries to the users of banking services is also nearly universal. This attribution arises because the treatment of interest as a transfer rather than the sale of a service leaves financial institutions with low or negative value added—output—unless an attribution of the costs of banking services to their users is made. But there has never been a consensus on who the users of banking services are—i.e. to whom the costs should be attributed. More recently, questions are also being raised about the appropriateness of the basic concept of interest as a transfer.

It is not only the difficulty of defining and measuring imputations and attributions that causes problems, however. There is a difference in kind between activities reflected in actual monetary transactions and those that are not; they react to different stimuli, and have different repercussions. It is now generally coming to be recognized that showing imputations and attributions explicitly in the national accounts would be desirable. Various ways of doing this have been proposed. In articles that appeared in the last (June 1986) issue of this *Review*, Heinrich Lutzel [7] recommended parallel accounts, and André Vanoli [19] proposed intermediate accounts containing actual transactions.

What seems to the authors of this paper to be the most promising approach is that reflected in the proposal of C. A. van Bochove and H. K. van Tuinen of the Dutch Central Bureau of Statistics, also published in that issue [18]. They envisage a system composed of a "core" with associated supplementary modules. The core contains only monetary transactions, but it constitutes a comprehensive framework capable of recording all the monetary transactions which take place in the economy. To this core they then add supplementary modules containing the imputations and attributions required for various analytic purposes. In their paper, van Bochove and van Tuinen argue that in the core the conception and perception of the transactors should be accepted as they are, and the transactions described as they appear. In the supplementary modules, in contrast, the analyst's alternative economic theories and national accountants' own views may be drawn upon to obtain analytic descriptions of the economy or special parts of it. Thus, whereas the core has maximum *institutional* content, the supplementary modules would transform the core data to any desired *functional* system. In particular, the existing SNA is one such functional system, but other variants are also possible and can easily be derived.

A system conceived in this way is well suited to serve as a basis for the integration of macro and micro data, and this conception is therefore the one adopted in the remainder of this paper. The first step in pursuing this conception of the accounts is to determine what modifications would be needed in order to construct "core" accounts. The next is to explore what supplementary modules would be desirable. In order to provide a concrete example, the paper discusses the U.S. national accounts, as published by the Bureau of Economic Analysis of

the Department of Commerce[2]. To keep the discussion within manageable bounds, it covers only the household sector; it is for this sector that the most significant modifications are needed. The same principles, of course, apply to the enterprise and government sectors.

The rest of this paper therefore discusses proposed modifications of the BEA Personal Income Account, illustrated by the figures for the United States in 1980. The BEA account differs in some respects from SNA; the differences are noted where they are important.

II. Changes Required to Derive Household Current Core Accounts

A. *Sectoring: The Treatment of Non-Profit Institutions*

The BEA personal income account includes the transactions of non-profit institutions as well as those of households. This means that the property income of non-profit institutions is combined with household property income, and non-profit institution expenditures on goods and services are included in personal consumption expenditure. SNA in principle provides for a separate non-profit sector, but in practice most countries do as the U.S. does, and include non-profit institutions with households. Household microdata files, in contrast, never include non-profit institutions.

The argument usually advanced against a separate sector for non-profit institutions is that in most countries it would be very small and data are very difficult to obtain. In this connection, however, it should be noted that non-profit philanthropic institution employment in 1982 in the U.S. has been estimated to be about 7 percent of total employment—more than double that in agriculture and about equal to Federal and State governments [10]. There is, of course, the alternative of including non-profit institution transactions in the enterprise sector. The argument usually cited against this solution is that non-profit institutions are not operated on the same basis as profit-making enterprises, and that including them in the enterprise sector would distort that sector. This argument loses a good deal of its force, however, in view of the fact that the enterprise sector already includes, in addition to private profit-making enterprises, a great many public enterprises, co-operatives, mutual organizations, and trade associations that are not operated as profit-making enterprises. It is difficult to see any reason to keep non-profit organizations in the household sector, apart from lethargy. Non-profit institutions include schools and hospitals, labor unions, political parties, religious organizations (where these are not State-established), and charitable and research foundations—none of which behaves remotely like a household, but which, like profit-making enterprises, may employ staff and engage in commercial activities. The preference of national accountants for putting non-

[2]The figures are drawn mainly from the official National Income and Product Accounts published by the Bureau of Economic Analysis (BEA), supplemented in a few cases by unpublished figures supplied by them, figures from the Federal Reserve flow of funds, or other sources. The detailed sources are given in Table 9 below. The figures used here are those published before the most recent BEA benchmark revision.

profit institutions into the household sector really has statistical origins. The household sector usually was initially compiled as a residual—and in many cases it still is. But from an analytic point of view the result is unfortunate, since it precludes meaningful study of such topics as income distribution and the determinants of consumption expenditure.

Excluding non-profit institutions from the household sector account would, of course, remove non-profit income and expenditure transactions with business and government, but this would not be the only consequence. It would also make explicit the transactions taking place between households and non-profit institutions, which are consolidated out by BEA. Thus both household contributions to churches, political parties, and unions and household receipts of benefits in kind provided by non-profit institutions would appear explicitly.

Table 1 presents the income and outlay account of private non-profit institutions for the U.S. in 1980, in so far as it can be determined from the available figures. Owing to data limitations, expenditures of non-profit institutions have been estimated net of their receipts from sales. As a consequence, this account shows only that part of the activity of non-profit institutions that is supported by contributions and investment income.

TABLE 1

PRIVATE NON-PROFIT IINSTITUTION INCOME AND OUTLAY, U.S., 1980
(BILLIONS OF DOLLARS)

	Outlays	Receipts
Interest income		4.0
Dividend income		2.7
Transfers from government		7.0
Corporate contributions		2.8
Household contributions		39.9
Imputed space rent on buildings owned and occupied by non-profit institutions	9.7	
Non-profit institution expenditures (net)	48.8	
Net saving	−2.1	
Total	56.4	56.4

On the basis of these figures, removing non-profit instiitutions from the household account would lower household income by $16.5 billion, the difference between total non-profit receipts and the amount of household contributions to these institutions. Household outlays would be lowered by $18.6 billion, and so household saving would be increased by $2.1 billion.

B. *Imputations and Attributions*

Imputations and attributions in the U.S. national accounts are relatively small in number, but they make a major difference in the analytic content of the accounts. Although they are well documented in BEA's supplementary tables, they are hidden in the aggregates of personal income, consumption expenditures and personal saving in such a way that the normal user is quite unaware of them.

The categories primarily affected are (a) owner-occupied housing, (b) employer financed pensions and insurance, (c) financial services, and (d) health care services, with a few other small items.

1. *Owner-occupied housing*

BEA, like SNA, treats the services of owner-occupied housing differently from other components of consumption. Households as occupants are considered to be renting their dwellings from themselves as real estate owners. Their activities as owners are considered to be those of unincorporated enterprises. These fictitious unincorporated enterprises own the dwellings and pay all of the costs associated with them. To offset these outlays, the unincorporated enterprises receive an imputed space rental from the households as occupiers. The difference between the imputed space rental and the current costs of providing the housing services is returned by the fictitious unincorporated enterprises to households, as imputed rental income.

As a consequence of this treatment, what appears in the BEA personal income account (and in the SNA household income and outlay account) is (1) on the outlay side, imputed space rental (effectively the shadow price) as a part of consumption expenditure, and (2) on the income side, imputed rental income on owner-occupied housing, as a part of total rental income. The actual costs of owner-occupancy, including maintenance expenditures, property taxes, insurance, mortgage interest, imputed interest on the owner's equity, and capital consumption, would appear in SNA as part of the outlays on the production account of the real estate industry (not, however, in most countries identified separately from the outlays of actual real estate management firms). Because the BEA system does not include either sector or industry production accounts, the actual expenditures do not appear explicitly anywhere in the main BEA accounts. They are shown, however, in one of the supplementary tables on imputations.

Although this method of imputation gets the services of owner-occupied housing into output, it does so at the cost of distorting the accounts of both households and business. In fact it is households that pay the property taxes, the interest on the mortgage debt, and the expenses of repair and upkeep, not businesses in the real estate industry, and it is households, not businesses, that do the gross saving reflected by the depreciation charge. The distortion is particularly evident in an inflationary period, when the shadow price which is imputed for space rental may rise much more than the homeowner's actual costs. The homeowner's situation would then be directly comparable to that of a renter who benefits from rent control. In the case of rent control, both BEA and SNA report the actual rent paid, not its shadow market price, and it would seem logical to do the same for owner-occupied housing. (In fact, owner-occupied housing is the only instance in which SNA or BEA substitutes a shadow price for a set of actually observable market prices.)

Household survey data usually adopt an approach that is quite different from that of the macro accounts. Costs of owner-occupancy are considered to be household outlays like any others. Neither space rental nor income from owner-occupancy is imputed. Capital consumption is not usually asked for directly, but information from which it can be computed is often collected.

Table 2 shows the magnitudes of the figures involved. For comparison, total BEA personal consumption expenditure in 1980 was $1,668 billion. At issue, therefore, is the treatment of more than 10 percent of stated consumption expenditure.

The effect of treating owner-occupied housing in the household sector account on a strictly monetary basis, therefore, would be to reduce consumption expenditure by $58 billion (the difference between imputed space rent and the monetary expenditures actually made), and to reduce household income by $12 billion, the amount of imputed rental income. Gross household saving would rise by $46 billion, the amount of capital consumption of owner-occupied housing.

TABLE 2

PRODUCTION ACCOUNT FOR OWNER-OCCUPIED HOUSING, U.S., 1980
(BILLIONS OF DOLLARS)

	Outlays	Receipts
Imputed space rent		190.3
Maintenance and repairs	29.1	
Capital consumption	46.0	
Property taxes	27.3	
Interest	76.0	
Net imputed rental income	11.9	
Total	190.3	190.3

2. *Employer-financed pensions and insurance*

BEA and SNA both treat employers' contributions for life insurance and to private pension and welfare funds as a part of the current compensation received by employees, and therefore of personal income. Only that part of the contributions which is deemed to reflect the costs of operating the insurance companies and pension funds—called the service charge—is treated as personal consumption expenditure. The increase in the reserves of insurance companies and pension funds, therefore, is attributed to personal saving. Households are thus considered to own the reserves of the insurance companies and pension funds. Their net equity in these funds appears on their balance sheet, and interest earned on the reserves is attributed as income to households, although of course they do not receive it. As a corollary to this treatment, pension benefits and life insurance annuities actually paid to households do not appear as part of household income since that would involve counting the same income twice, once when the contribution is paid to the insurance company or pension fund and again when the benefit is paid to the household. Rather, receipts of such benefits are considered to represent only a change in the form of the assets held by the household, from net equity in life insurance and pension funds to cash.

Household survey data usually reverse this treatment. Pension and annuity income received by households is included in household income, and employers' contributions to pension funds and insurance are not. Interest on pension and

insurance reserves is not attributed to households, and their balance sheets do not include equity in employer-financed pension and insurance reserves. In the United Nations guidelines on income distribution statistics, it may be noted, this treatment rather than that of SNA is recommended [16]. Where the focus is on the distribution of income, it is clearly undesirable to treat pensioners as having zero income—that would not contribute much to an understanding of the position of the aged in the economy. Conversely, rights of younger persons to benefits that will become available only upon retirement or death are qualitatively different from cash income received in the present period, and employers' contributions for insurance and pensions are generally a poor and unstable measure even of the present value of those future rights.

Table 3 displays the magnitudes involved, for the U.S. in 1980. The amounts entering BEA personal income are $76 billion for employers' contributions and $45 billion for the interest on reserves, a total of $121 billion. In contrast, the amount that would be shown if benefits were included instead is $48 billion. The service charge for handling employer-financed pensions and insurance is estimated at about $6 billion. BEA treats this as part of consumer expenditures. Thus, the change in employer-financed pension and insurance reserves is $67 billion, and BEA personal saving is $67 billion larger than it would have been if the microdata treatment had been adopted. (Total BEA personal saving in that year was $110 billion.)

TABLE 3

PENSION AND INSURANCE CONTRIBUTIONS AND BENEFITS, U.S., 1980
(BILLIONS OF DOLLARS)

Employers' contributions for life insurance and pension funds	76.3
Interest on life insurance and pension fund reserves	44.5
Total employer life insurance and pension fund receipts	120.8
Employer pension and insurance benefits paid	47.7
Service charges on employer-financed pension and insurance funds	6.3
Change in employer-financed pension and insurance reserves	66.8
Total employer life insurance and pension fund outlays and change in reserves	120.8

3. *Financial services*

Neither BEA nor SNA considers interest to be a payment for a service, but rather they treat it as a transfer of factor income. BEA (but not SNA) subtracts interest received by enterprises from interest paid out by them, to derive the net interest which they pay out.

The exclusion of interest from the payments received by financial institutions for services rendered has an unfortunate impact upon their value added. Computed in the ordinary way as the difference between operating receipts and intermediate costs, value added of financial institutions would be very low or negative. Operating receipts would consist only of actual service charges imposed on depositors and other users of banking services and would not include receipts of interest, which are usually the major source of banking income. It is argued,

however, that service charges do not cover all of the services actually provided by these institutions, but that there is also an implicit exchange between the banks and their customers in which the banks provide services in return for the use of the customers' money to earn interest. The value attributed to the services provided is set equal to the difference between interest received and interest paid out, and this attributed amount is added to actual service charges to obtain total banking service charges. BEA distributes this total to banking customers in all sectors, including households, so a part of it appears in personal income and personal consumption expenditure. (In SNA, by convention, it is all attributed to enterprises, though this treatment is being reconsidered.)

Various alternatives to this treatment of banking services have been proposed. We will mention here only the proposal made by Preetom Sunga at the 1983 IARIW conference [13]. That proposal would, in effect, treat interest as an ordinary component of costs. This in turn would eliminate the problem of the value added of banking, and there would be no need to attribute anything.

This alternative treatment would have a further consequence. Since both BEA and SNA now treat interest paid by government and households as transfers, not as purchases of services, these interest payments are not included as part of GNP or GDP. If, instead, interest were treated as the purchase of a service, it would be included with other purchases of goods and services of government and with other consumption expenditures of households. This would increase both total consumption and total output (GNP/GDP).

Such a treatment of personal interest outlays would correspond more closely to the perception of individual households, where interest paid is certainly viewed as expenditure. Indeed, in the purchase of such items as automobiles and consumer durables the cost of installment credit is quite reasonably viewed by the purchaser as a part of the cost of the item itself, and only an economist would think differently.

Table 4 shows BEA imputed financial services in kind attributed to households, together with actual outlays for interest on consumer debt. The latter are greater than the former, so that showing actual interest paid rather than attributed financial services in the household account would increase household consumption expenditure by $12 billion. (Saving would not be affected; BEA does consider consumer debt interest to be an outlay, even if not consumption.)

TABLE 4

FINANCIAL SERVICES AND CONSUMER DEBT INTEREST, U.S., 1980
(BILLIONS OF DOLLARS)

Financial services in kind (attributed)	37.8
Interest on consumer debt	49.6
Difference	11.8

4. *Health care services*

The largest component of benefits in kind in BEA personal income is for health care services. In the U.S. institutional context, these are divided between

benefits provided by employers to their employees and families, primarily in the form of insurance, and benefits provided by government.

BEA's treatment of employer-financed health insurance resembles their treatment of employer-financed pensions and life insurance, except that no reserves are accumulated, and therefore there is no impact on personal saving. Premiums paid by employers are included in compensation of employees, in personal income, and in personal consumption expenditure. In personal consumption expenditure, expenditures on health care are broken down by type (drugs, doctors' fees, etc.). However, an item is included for medical insurance that is equal to the excess of premiums over benefits, so that in effect the control total on health care expenditures provided by employers is total premiums paid. This treatment differs from SNA only in classification and nomenclature; the end result is the same.

Government-provided health benefits in kind that enter BEA personal income, with very minor exceptions, have in the past been for Medicare. Medicare pays for drugs, doctors, and hospitals for the elderly, on a direct reimbursement basis: bills from medical care providers must be submitted, and the payment is related to the bill. The amounts of Medicare payments are entered into personal income as a government transfer payment, and into personal consumption expenditure broken down by type of service.

Medicare, however, accounts for only about a third of total government health care expenditures. Most of the rest is Medicaid (the program for the poor), with a small amount of veterans' services. These services are provided directly to households in the form of goods and services rather than as money transfers, and BEA has, until their most recent revision, considered them to be government expenditures on goods and services which do not enter the household account in any way. In effect, they have been treated exactly like government expenditures on education. In the most recent revision, this treatment was altered, and Medicaid, like Medicare, is now considered to be a government transfer and a part of consumer expenditure.

The difficulty of drawing the line between government expenditures that should be treated as transfers to households and those that should be treated as direct government expenditures on goods and services has led to a recent reconsideration of these issues, in which the work of Jean Pêtre has been in the forefront [9]. Pêtre pointed out that health care has several aspects, and information is needed in more than one form.

On the one hand, we want to know what the method of finance is—who pays for what. This monetary payment is what would enter into the core accounts. Pêtre has taken the view that when the government directly reimburses households for their medical care outlays, these outlays should be treated as having been made by the government, with the household acting only in an agent capacity. By analogy, the same applies to expenditures reimbursed by employer-financed insurance. Applying this principle to the U.S. figures, Medicare, Medicaid, and employer insurance contributions would all be removed from household income and household consumption expenditure, and would appear instead in the government and enterprise accounts. Payments made by employers to insurance companies, by insurance companies to health providers, or by government to health

providers would not be run through the household account, but would appear instead as expenditures in the government and enterprise accounts.

But on the other hand, we also want to know what health care services are actually provided to households and by which health care providers, without regard to who pays for them. This functional question calls for a different presentation, and its proper place is in a supplementary module. It is closely related to the issue of the measurement of total consumption of the population, a concept developed initially by Margaret Mod in the early 1960s and now widely used in the centrally planned economics [17], as well as in such programs as the UN's International Comparison Project [6]. It encompasses all consumption goods and services provided to households, however they are financed. Thus, in addition to what appears in household consumption expenditure it includes goods and services financed by government or enterprises. To show total consumption of health services in the U.S., it would be necessary to combine household expenditures for health care with both the services financed by employer contributions for health insurance and all of the health care expenditures paid for by government.

Many of these problems also arise in microdata files, and no consensus has been reached on their proper treatment. Such files normally do not include either imputations or attributions, though they would generally include at least some part of the reimbursed expenditures paid for by insurance or Medicare, as well as the amounts received as reimbursement. In additon, there are a number of proposals for adding non-cash benefits (a large part of which are for health care) to the data. If the full cost of medical care received were to be imputed to household income, as has sometimes been proposed, it would follow that no one who is sick enough to require costly medical treatment could be poor—even if his income over and above his medical care costs is well below the poverty line. This is surely not a desirable result. An alternative, where the cost is paid by insurance, would be to include the premiums paid rather than the benefits received, as is done for other types of casualty insurance like fire and theft. This would imply that what is being purchased is insurance, not health care, and that where extraordinary health care expenditures become necessary they partake of the nature of a capital loss, like a fire or theft. Where costs are paid by direct government expenditure, this alternative is not available, but it would still be possible to impute a value for health care as an entitlement. In any case, it seems especially important, where imputations for health care services are made in microdata files, to distinguish carefully between costs paid for by households out of their own income, costs paid by households for which they are reimbursed, and costs entirely met by others.

Table 5 presents the amounts involved in health care as shown by BEA, for the U.S. in 1980. The amounts paid for by others which now enter the BEA personal account are $50 billion of employers' contributions and $37 billion of government transfers. Households spent about $80 billion of their own funds on health care, making a total of $167 billion of health care expenditures in the personal account. In addition, however, households received direct health care services from government of a further $69 billion, which did not enter the BEA personal account but rather was shown as government expenditure. Thus the

TABLE 5

EXPENDITURES ON HEALTH CARE, U.S. 1980
(BILLIONS OF DOLLARS)

Employers' contributions for health insurance		49.7	
Government transfer payments		36.8	
Medicare	35.6		
Other	1.2		
Personal expenditures, not reimbursed		80.3	
Total BEA Personal Expenditure on Health Care			166.8
Government expenditures on health care		68.7	
Medicaid	56.0		
Veterans	6.2		
Other	6.5		
Total Health Care Expenditure			235.5

total amount of health care received by households—the amount that would appear in total consumption of the population—was $235 billion. If the Pêtre proposals were adopted, only $80 billion of this—the amount spent by households without reimbursement—would remain in the household core account.

5. *Other imputations and attributions*

The remaining imputations and attributions in the BEA personal account are quite small. They include food and clothing furnished to employees (in practice only the military and domestic servants), food and fuel produced and consumed on farms, margins on owner-built homes, and bad debts. The first three items are quite straightforward and require little comment. They would be excluded from the monetary core, but included in a supplementary module. The fourth item, bad debts, is shown by BEA as a transfer payment by business to households. It might more logically be shown as a reduction in personal consumption expenditures; what in effect is happening is that consumers have obtained a given quantity of goods for a smaller total expenditure.

Household surveys may sometimes collect quantity information from which farm consumption of own production could be computed. Bad debts would be more likely to show up, if at all, as a reduction in consumption expenditure, corresponding to the second alternative mentioned above.

Table 6 summarizes the information on other benefits in kind appearing in the BEA personal account, for the year 1980.

TABLE 6

OTHER IMPUTATIONS AND ATTRIBUTIONS, U.S., 1980
(BILLIONS OF DOLLARS)

Food and clothing furnished employees	5.8
Food and fuel consumed on farms	0.5
Margins on owner-built houses	1.3
Bad debts	8.9
Total	16.5

C. *Other Changes in the Recording of Transactions for Households*

One of the basic principles for constructing the core accounts is that, to the extent possible, they should record transactions in terms of the conceptions and perceptions of the transactors. Application of this principle requires some interpretation. It is not only difficult to implement in many instances, but if strictly followed would result in a lack of consistency at the macro level since different transactors may view the same transaction quite differently. As a consequence, the national accountant has been forced to adopt certain conventions as to what the most reasonable and useful way to record specific kinds of transactions.[3] In this context, the conventions relating to (a) withheld income and (b) the distinction between current and capital transactions need to be re-examined.

1. *The treatment of withheld income*

The SNA makes no distinction between income which households actually receive and that which is withheld by employers for the payment of taxes or other similar purposes. The employer, in the latter case, is considered to be acting as an agent for the employee, and the payment in question is recorded both as income received and as an outlay by the employee. BEA, however, does not follow the SNA procedure in recording social security contributions. Employers' contributions are routed directly from the employer to the government, and do not enter the personal income account at all. Employees' contributions are included in the wages and salaries paid to employees, but instead of treating these contributions as a household outlay, BEA deducts them on the income side of the personal income account. From the employee's point of view this treatment is quite reasonable, since although his stated wages have to cover his social security contribution, this is a part of his wages he never receives.

A good argument can be made for extending this same treatment to the income taxes that are withheld from wages. Withheld taxes would then be shown as a deduction from income rather than as an outlay by households. Tax refunds to individuals would be reported as income received, and tax settlements as tax outlays actually paid by individuals. Because of the large size and important seasonal variation of withholding, settlements, and refunds, analysts often wish to be able to take them explicitly into account, and this treatment would make that possible.

The data relating to these transactions are shown in Table 7 for the U.S. in 1980. The proposed treatment would reduce both household income and household outlay by a further $186 billion; the $89 billion of social security contributions is already excluded by BEA. Household gross saving would be unchanged.

2. *The distinction between capital and current outlays*

Both BEA and SNA treat consumer durable expenditures as part of current consumption, completely written off in the year of purchase. In contrast, the Federal Reserve Board's flow of funds accounts treat consumer durable expenditures as part of gross capital formation, and the stock of consumer durables

[3]This general problem is examined at some length by Postner elsewhere in this issue.

TABLE 7

HOUSEHOLD WITHHOLDING, REFUNDS AND TAX SETTLEMENTS, U.S., 1980
(BILLIONS OF DOLLARS)

Withheld social security contributions	88.7
Withheld income taxes	230.7
Less: Tax refunds to persons	44.4
Total Withheld Taxes (net)	275.0
Non-withheld Taxes Paid by Persons	150.1

as part of the assets held by households. The treatment of expenditures on consumer durables as current consumption is increasingly difficult to justify, especially for such large and relatively long-lived items as automobiles. Households clearly do treat their cars as assets; they pay for them over a period of years, and expect them to last even longer. To a lesser degree, this is true of most major durables, and it would be hard to explain the growth of consumer debt without taking the stock of consumer durables into account. The SNA guidelines on balance sheets recommend that the stock of consumer durables should be shown as a memorandum item, but do not suggest any corresponding adjustment to the flow accounts.

BEA has made estimates of the flows relating to the services of consumer durables, and these are shown in Table 8 [4]. For 1980, which was a recession year, consumer durable purchases amounted to $215 billion. For the same year,

TABLE 8

CONSUMER DURABLES, U.S., 1980
(BILLIONS OF DOLLARS)

Consumer durable expenditures		214.7
Gross income from durables		278.9
Capital consumption of durables		180.8
Imputed income from durables		98.1
Consumer debt interest paid	49.6	
Net return on equity	48.5	

BEA has estimated that capital consumption on the existing stock of consumer durables would have been $181 billion, and that imputed income from durables (estimated as an imputed return on their net value) was $98 billion. Consumer debt interest was $50 billion, so that households received an imputed net return on their equity in consumer durables of $48 billion. Gross income from durables was therefore $279 billion. Thus, for this recession year, expenditures on consumer durables were a rather poor proxy for the services of the total stock of consumer durable goods. In boom years, in contrast, expenditures on durables would be higher than gross income from durables. Since the stock of durables in much larger than the additions to it in any one year, gross income from durables pursues a much more even course than annual expenditures on them, which vary widely over the course of the cycle.

If consumer durable expenditures were treated as capital outlays, gross household saving would rise by $215 billion. Consumer debt interest would remain in the core account, but the imputations associated with this treatment—capital consumption and net return on equity—would appear in a supplementary module.

III. Construction of the Proposed Household Sector Accounts for the U.S.

Taking into account the changes discussed in the preceding section, it is possible to modify the present BEA personal income account to create (a) a core account which reflects the actual monetary transactions of households, (b) supplementary modules which provide data on imputations and attributions for the household sector, and (c) capital accounts which are integrated with the household current accounts.

A. *The Derivation of the Core Account for the Household Sector*

Table 9 shows the derivation of the household current core account from the BEA personal income account for the year 1980, for the major categories of income and outlays. The first column gives the figures published by BEA, and the second column shows the figures that would appear in the core account containing only the actual current monetary transactions of households. A dash (—) in either column signifies a conceptual difference between the BEA and the core definitions of a transaction category. The final column, headed "References", lists the sources of the data.

On the income side of account, the major differences are (1) the exclusion of income received by non-profit institutions ($17 billion), (2) the exclusion of imputations and attributions ($274 billion), (3) the addition of pension and insurance benefits received by households ($48 billion), and (4) the deduction of withheld taxes net of refunds ($186 billion). All of these changes have been explicitly discussed in the previous sections. The resulting household monetary income is estimated to be $429 billion lower than BEA personal income.

On the outlay and saving side of the account, the major differences are (1) the exclusion of consumer durables from consumption expenditures ($215 billion), (2) the removal of imputed expenditures, non-profit institution expenditures, and bad debt allowances ($395 billion), (3) the addition of owner-occupied housing expenditures ($132 billion), and (4) the recording of non-withheld tax payments instead of personal taxes (−$186 billion). As a consequence of these changes, the concept of "gross saving" ($305 billion) rather than "personal saving" ($110 billion) becomes the balancing residual in the current core account.

B. *Supplementary Modules of the Household Current Accounts*

A complete set of household income and outlay accounts containing both the core and supplementary modules is presented in Table 10 for the year 1980. The major flows of the current core account in this table (module A) are identical with those shown in Table 9, and show household current monetary transactions.

Module B contains the imputations now included in the BEA personal income account, together with imputations for consumer durable goods. Although the production boundary implicit in the BEA imputations is somewhat arbitrary and the valuations may be open to question in some cases, these imputations represent conventions which national accountants have learned not only to live with but to love. For both consistency and analytic usefulness, we suggest that it would be useful for national accountants to extend their love to consumer durables as well. In van Bochove/van Tuinen terms this module could then be considered mandatory, to be compiled as a part of the basic national accounts; together with the core account it would contain essentially the same information as the present BEA national accounts.

Module C shows the attributions of benefits in kind received by households, and is primarily designed to provide the additional information needed to achieve comparability over time and between countries in the measurement of the total consumption of the population. The growing need for such information has been discussed above in relation to the measurement of health care services. In the present example, module C is based on entries found in the existing BEA national accounts. However, in view of the treatment proposed here of interest and employers' pension and insurance contributions, attributions have not been made for either the services provided by financial intermediaries or the service charges in connection with employer-financed pension and insurance funds. This module, together with the core and module B, can yield a total for all household monetary, imputed, or attributed income and consumption, whatever the source, found in the existing national accounting estimates.

Finally, module D provides a place for additional imputations or attributions which users may feel are analytically desirable, beyond those encompassed by currently accepted national accounting constraints. Imputations for such non-market activity as household work, opportunity costs of students (as estimated by Kendrick [5]), the process benefits arising from time use (as proposed by Juster [3]), non-market activity of households (outlined by Chadeau and Roy [2]), and attributions such as the value of pension and insurance reserves or social security entitlements are all legitimate candidates for inclusion here, for use in analyses of household production and household well-being and its distribution.

C. *The Capital Accounts*

The core current account includes only current transactions. But households also engage in monetary capital transactions involving purchases and sales of tangible and financial assets or the acquisition and repayment of liabilities. In effect, these transactions result in changes in household balance sheets, and if the system of national accounts is to be complete, it will be necessary not only to record capital transactions, but to provide complete balance sheets as well.

It is possible to construct a set of capital accounts to show the relation between capital transaction accounts and balance sheets for the household sector. This set of capital accounts includes (1) balance sheets, which record the market value of assets and liabilities at the beginning and end of a period; (2) a capital

TABLE 9

DERIVATION OF THE HOUSEHOLD CURRENT CORE ACCOUNT FOR 1980 FROM THE BEA PERSONAL INCOME ACCOUNT

Income	BEA Personal Income Account	Household Current Core Account	References
1. Wages, Salaries and Other Labor Income	1,484.6	1,352.8	LINES(1A−1B+1C+1D+1E)
A. Total BEA wages and salaries	1,356.7	1,356.7	BEA6.6BL1
B. Less: Food and clothing furnished	—	−5.8	BEA8.8L(96+97)
C. Employer pension and insurance contributions	76.3	—	BEA6.15L(21+24+25+26)
D. Employer health contributions	49.7	—	BEA6.15L23
E. Other	1.9	1.9	BEA6.15L27
2. Proprietor and Rental Income	149.0	135.3	LINES(2A−2B−2C)
A. Total BEA proprietor and rental income	149.0	149.0	BEA2.1L(9+12)
B. Less: Imputed owner-occupied rental income	—	−11.9	BEA8.8L(79+86)
C. Less: Imputed gross farm product	—	−0.5	BEA8.8L95
D. Less: Imputed margins on owner-built homes	—	−1.3	BEA8.8L100
3. Interest Income	266.0	179.7	LINES(3A−3B−3C−3D)
A. Total BEA interest income	266.0	266.0	BEA2.1L14
B. Less: Non-profit interest income	—	−4.0	IEA1.10L41
C. Less: Interest on pension and insurance reserves	—	−44.5	BEA8.7L48−BEA8.8L91
D. Less: Imputed financial services provided	—	−37.8	BEA8.8L91
4. Dividend Income	56.8	54.1	LINES(4A−4B)
A. Total BEA dividend income	56.8	56.8	BEA2.1L13
B. Less: Non-profit dividend income	—	−2.7	IEA1.10L54
5. Transfers by Enterprises	11.7	47.7	LINES(5A+5B+5C)
A. Bad debt allowances	8.9	—	1EA1.10L63
B. Enterprise contributions to non-profits	2.8	—	BEA1.7L7−IEA1.10L63
C. Pensions and insurance benefits	—	47.7	BEA6.15L(28−30)
6. Transfers by Government	285.9	242.1	LINES(6A−6B−6C)
A. Transfers to persons and non-profits	285.9	285.9	BEA3.1L11
B. Less: Health benefits in-kind	—	−36.8	BEA3.16L(24+41+50)+BEA3.17L(14+20)
C. Less: Transfers to non-profits	—	−7.0	IEA1.10L67
7. Less: Withheld Taxes (net)	−88.7	−275.0	LINES(7C−7A−7B)
A. Less: Personal social insurance contributions	−88.7	−88.7	BEA2.1L23
B. Less: Withheld income taxes	—	−230.7	BEA3.4L4
C. Plus: Tax refunds	—	44.4	BEA3.4L6
8. A. BEA PERSONAL INCOME	2,165.3	—	LINES(1+2+3+4+5+6−7)
B. HOUSEHOLD MONETARY INCOME	—	1,736.7	LINES(1+2+3+4+5+6−7)

Outlays and Saving	BEA Personal Income Account	Household Current Core Account	References
9. Current Consumption Expenditures	1,668.0	1,240.8	LINES(9A+9B)
A. Durable goods	214.7	—	BEA1.1L3
B. Non-durable goods and services	1,453.3	1,247.1	LINES(9B1−9B2+9B3+9B4−9B5)
1. BEA Non-durable goods and services	1,453.3	1,453.3	BEA1.1L(4+5)
2. Less: Imputed expenditures	—	−385.8	LINES(SUM 9B2a thru 9B2g)
a. Owner-occupied space rent	—	−190.3	BEA8.8L(72+80)
b. Non-profit space rent	—	−9.7	BEA8.8L(87)
c. Employer health benefits	—	−49.7	LINE(1D)
d. Employer pension and insurance charges	—	−6.3	BEA2.4(L59/3)
e. Food and clothing furnished	—	−5.8	LINE(1B)
f. Non-profit expenditures	—	−48.8	IEA1.1L4
g. Government health benefits	—	−36.8	LINE(6B)
h. Financial services in kind	—	−37.8	LINE(3D)
i. Farm products consumed	—	−0.5	LINE(2C)
3. Plus: Owner occupied expenditures	—	132.4	LINES(9A3a+9A3b+9A3c)
a. Maintenance and repair	—	29.1	BEA8.8L(73+81)
b. Mortgage interest	—	76.0	BEA8.8L(78+85)
c. Property taxes	—	27.3	BEA8.8L(76−77+84)
4. Plus: Other consumer interest	—	49.6	BEA2.1L28
5. Less: Bad debt allowances	—	−8.9	LINE(5A)
10. Transfers Paid by Households	50.6	40.9	LINES(10A+10B+10C)
A. Interest paid by consumers	49.6	—	BEA2.1L28
B. Transfers paid to rest of world	1.0	1.0	BEA2.1L29
C. Transfers paid to non-profits	—	39.9	IEA1.10L66
11. Tax Payments	336.5	150.1	LINES(11A+11B)
A. BEA personal taxes	336.5	—	BEA2.1L24
B. Non-withheld taxes paid by persons	—	150.1	BEA3.4L(5+7+8+9)
13. A. BEA Personal Saving	110.2	—	BEA2.1L30
B. Household Gross Saving	—	304.9	LINES(13B−9−10−11)
14. A. PERSONAL OUTLAYS AND SAVING	2,165.3	—	BEA2.1L(26+30)
B. HOUSEHOLD MONETARY OUTLAYS AND GROSS SAVING	—	1,736.7	LINES(9+10+11+12)

References are listed as Source, Table Number and Line Numbers

Sources: BEA = Bureau of Economic Analysis, Department of Commerce, National Income and Product Tables published in *Survey of Current Business*
IEA = Integrated Economic Accounts, Richard and Nancy Ruggles, published in the *Survey of Current Business*, May 1982

TABLE 10

HOUSEHOLD CURRENT INCOME AND OUTLAY ACCOUNTS, U.S., 1980

A. Current Core Account	
Income	
1. Wages, salaries and other labor income	1,352.8
2. Proprietor and rental income	135.3
3. Interest income	179.7
4. Dividend income	54.1
5. Transfers by enterprises	47.7
6. Transfers by government	242.1
7. Less: Withheld taxes (net)	−275.0
8. Household Monetary Income	1,736.7
Outlays and Saving	
9. Current consumption expenditures	1,240.8
10. Transfers paid by households	40.9
11. Tax payments	150.1
12. Gross saving	304.9
13. Household Monetary Outlays and Gross Saving	1,736.7
B. Imputation Account	
Income	
1. Owner occupied housing gross imputed income	57.9
i. Capital consumption	46.0
ii. Net return on equity	11.9
2. Consumer durable gross imputed income	229.3
i. Capital consumption	180.8
ii. Net return on equity	48.5
3. Subsistence production imputed income	1.8
a. Farm products consumed on farms	0.5
b. Margins on owner-built homes	1.3
4. Total Gross Imputed Income	289.0
Outlays and Saving	
5. Consumption of imputed housing services	57.9
6. Consumption of imputed consumer durables	229.3
7. Consumption of imputed farm products	0.5
8. Saving from margins on owner-built homes	1.3
9. Total Imputed Consumption and Saving	289.0
C. Attribution Account	
Income	
1. Benefits in kind provided by employers	55.5
a. Health	49.7
b. Food and clothing	5.8
2. Benefits in kind provided by non-profits	58.5
a. Non profit institution expenditures	48.8
b. Non-profit institution space rent	9.7
3. Benefits in kind provided by government	288.7
a. Education	141.0
b. Health	105.5
c. Welfare	14.5
d. Housing and community service	12.9
e. Recreation and other	14.8
4. Total Income from Attributions	402.7
Outlays and Saving	
5. Consumption of in-kind education services	141.0
6. Consumption of in-kind health services	155.2
7. Consumption of in-kind housing services	12.9
8. Consumption of other in-kind services	94.6
9. Saving provided by in-kind services	(na)
10. Total Consumption and Saving Provided by Attributions	402.7

TABLE 10 (*cont.*)

D. Extended Account

Income	
1. Household non-monetary activity	1,264.9
a. Unpaid household work	980.7
b. Opportunity costs of students	284.2
c. Process benefits from time use	(na)
2. Entitlements	(na)
a. Net change in pension and insurance reserves	66.8
b. Social security entitlements	(na)
3. Total Extended Income	(na)
Outlays and Saving	
4. Extended consumption	(na)
5. Extended saving	(na)
6. Total Extended Consumption and Saving	(na)

transaction account, which records the changes in assets and liabilities resulting from monetary transactions occurring over the period; and (3) a revaluation account, which records the effect of changes in the prices of assets and liabilitues over the period.

BEA does not include balance sheets in its national accounts, but it has compiled separate estimates for stocks of tangible assets. The Federal Reserve Board has incorporated these data on tangibles with its own financial data to produce a complete balance sheet for the household sector [1]. The FRB's balance sheet already embodies some of the modifications which have been proposed here. Owner-occupied housing and consumer durables are both shown as assets of households, and mortgages on owner-occupied housing are shown as household liabilities. Making use of these data, it is possible to construct a set of capital accounts which are conceptually integrated with the household current accounts. These capital accounts are shown in Table 11. Statistically, however, there is still a problem. The net worth shown in the capital transactions account ($161.9 billion) plus the capital consumption of owner-occupied housing ($46.0 billion) and consumer durables ($180.8 billion), a total of $388.7 billion, should equal the gross saving of $304.9 billion shown in the household current core account. The discrepancy of $83.6 billion is the result of the different statistical sources and methods of estimation used by BEA and the FRB. This does not imply that the measurement of saving for the economy as a whole is in question. There is general agreement that the aggregate estimates of gross domestic investment, and thus of gross domestic saving for the economy as a whole, are quite accurate, so that the statistical discrepancy noted here arises from the allocation of income and/or assets and liabilities among sectors of the economy. Generally, U.S. macroeconomists have tended to accept the estimates of saving which are derived in the BEA accounts, rather than those derived from the FRB financial statistics, whereas financial analysts prefer the FRB figures.

Except for the estimate of capital consumption, the capital transactions account is a core monetary transactions account. The revaluation account is a

TABLE 11

HOUSEHOLD CAPITAL TRANSACTIONS, REVALUATIONS AND BALANCE SHEETS, U.S., 1980
(BILLIONS OF DOLLARS)

	Beginning Balance	Capital Transactions	Revaluations	End of Year Balance
1. Owner-occupied houses	1,771.0	39.2	156.3	1,966.5
A. Gross value	2,600.8	85.2	219.2	2,905.2
B. Less: Capital consumption	829.8	46.0	62.9	938.7
2. Consumer durables	874.4	33.9	89.7	998.0
A. Gross value	1,679.0	214.7	59.0	1,952.7
B. Less: Capital consumption	804.6	180.8	−30.7	954.7
3. Currency and deposits	1,451.6	174.9		1,626.5
A. Currency and checking accounts	250.3	15.3		265.6
B. Time deposits and money funds	1,201.3	159.6		1,360.9
4. Fixed claim assets	536.6	30.4		567.0
A. Government bonds	276.9	17.3		294.2
B. Corporate and foreign bonds	38.7	1.7		40.4
C. Mortgages	106.4	7.5		113.9
D. Other fixed claims	114.6	3.9		118.5
5. Equities held	3,159.5	−7.3	625.0	3,777.2
A. Corporate stock	745.9	−1.5	250.6	995.0
B. Non-corporate non-farm equity	1,367.0	−3.8	252.6	1,615.8
C. Farm equity	616.9	−14.4	68.8	671.3
D. Pensions and insurance	199.9	12.4	2.5	214.8
E. Estates and trusts	229.8		50.5	280.3
6. TOTAL ASSETS	7,793.1	271.1	871.0	8,935.3
7. Fixed claim liabilities	1,336.2	109.2		1,445.4
A. Mortgages	856.5	83.8		940.3
B. Consumer credit	382.7	2.3		385.0
C. Other	97.0	23.1		120.1
8. Net worth	6,456.9	161.9	871.0	7,485.1
A. Tangibles	2,645.4	73.1	246.0	2,959.8
B. Net financial assets	3,811.5	88.8	625.0	4,525.3
9. TOTAL LIABILITIES AND NET WORTH	7,793.1	271.1	871.0	8,935.2

mandatory supplementary module showing the effect of price changes on the stock of assets and liabilities held by households. Since the construction of balance sheets requires both, it in turn should be considered a supplementary module—but for preference also a mandatory one.

Additional supplementary modules for the capital accounts parallel to those drawn up for the current accounts can be conceived of. It may be desirable in some cases to impute a capital value to some assets owned by households which would have little or no actual market value—e.g., fully depreciated durables, or the family pet. Similarly, some of the assets or liabilities of government and/or enterprises might be attributed to households—politicians are always reminding us of the government debt our children will owe. Finally, extended balance sheets might reflect such things as the value of human capital, entitlements, and environmental assets. At present, however, such modules can only be speculative.

IV. The Effects of the Proposed Modifications in the National Accounts

Both producers and users of the national accounts argue against significant changes on the grounds that the present national accounts are functioning well. Any significant alteration of the accounts, it is feared, would destroy their usefulness for the analysis of macroeconomic policy. Therefore if revisions are to be made they should be handled through special supplementary tables or satellite accounts which would leave the main body of the accounts unchanged.

To counter these arguments against change, it is necessary to demonstrate that the proposals for modifying and extending the present national accounts will lead to new insights and understanding about the functioning of the economic system. To this end, the effects of the proposed modifications in the household accounts are examined here in three contexts. First, the traditional analysis of saving and investment is examined in light of both the BEA personal saving data and the proposed household gross saving and capital formation data to determine the effect of the proposed modifications on our understanding of what has taken place in the United States economy since 1947. Second, the new information on household capital formation and household balance sheet revaluations is examined to determine how this additional information affects our understanding of the process of household wealth accumulation. Finally, constant purchasing power estimates of household balance sheet revaluations are presented, to demonstrate the usefulness of the proposed extensions of the system for the analysis of inflation accounting.

A. *The Analysis of Household Saving and Capital Formation*

The analysis of saving and investment is central to macroeconomics. Households have traditionally been viewed as the ultimate income recipients in the economic system, and thus both as the final consumers and as the suppliers of saving. Explaining household saving behavior is therefore crucial, and many economists have sought to do so by analyzing the BEA estimates of personal saving. Early econometric models embodied personal saving as a function of personal disposable income, as a direct reflection of the Keynesian propensity to consume, and during the 1940s and 1950s empirical analysis of consumption functions was one of economists' favorite research topics. The national accounts still reflect this simple view, and it still dominates much public policy discussion.

Two theories of saving that have become accepted parts of the body of macroeconomics are the permanent income and life cycle hypotheses. The permanent income hypothesis of saving argues that individuals take their "permanent" level of income into account in determining their consumption, so that in response to short-run or temporary fluctuations in income the level of consumption expenditures remains relatively stable and saving fluctuates. The life-cycle hypothesis of saving suggests that individuals accumulate savings for their old age, saving during the productive phase of their lives and using up the saving during retirement. In an economy with a growing population, therefore, the excess of the saving of young over the dissaving of the old provides financing for economic growth.

Yet, despite all of the research effort which has been devoted to analyzing saving and the theorizing about how households can be expected to behave, the results have been disappointing. Even the most elaborate econometric models have not provided accurate predictions of saving. BEA personal saving does not behave in the manner predicted by the permanent income hypothesis; in periods of recession personal saving often increases as a percentage of disposable income. Evidence from household balance sheets does not support the life-cycle hypothesis of saving; retired households continue to save.

It is our contention not only that these hypotheses about saving are inappropriate, but also that the basic concept of personal saving in the BEA accounts is misleading. By recasting the household sector accounts as proposed, more meaningful concepts of saving emerge. Table 12 shows how personal saving in the BEA personal income account is related to gross saving in the household current core account, and how this in turn is related to the concept of net lending.

TABLE 12

PERSONAL SAVING, GROSS SAVING AND NET LENDING, U.S., 1980
(BILLIONS OF DOLLARS)

1. Personal Saving (BEA)		110.2
2. Less::		66.0
(a) Change in employers' pension and insurance reserves	66.8	
(b) Non-profit institution saving	−2.1	
(c) Margins on owner-built houses	1.3	
3. Plus:		260.7
(a) Imputed owner-occupied capital consumption	46.0	
(b) Expenditures on consumer durables	214.7	
4. Equals: Household Gross Saving		304.9
5. Less: Capital outlays by households		299.9
(a) Owner-occupied houses	85.2	
(b) Consumer durables	214.7	
6. Equals: Net Lending by Households to Other Sectors		5.0

BEA personal saving in 1980 was $110 billion. To derive household gross saving in the core account, two types of adjustment are required. First the attributions and imputations of saving resulting from employer-financed pension and insurance reserves, non-profit institution saving, and margins on owner-built houses must be subtracted from BEA personal saving. Second, the imputed outlays for owner-occupied housing and the expenditure on consumer durables which BEA includes in consumer expenditures need to be added back to household saving. Gross saving thus derived represents the monetary income which households had available to them after subtracting their *current* monetary outlays. If the *capital* outlays of households for owner-occupied housing and consumer durables are then subtracted from their gross saving, the result is the amount of income which households had left for *net lending* to other sectors.

The adjustments shown in Table 12 are those derived in Tables 10 and 11. These adjustments have been incorporated in a set of Integrated Economic

Accounts (IEA) going back to 1947 [12]. Table 13 compares the BEA estimates of personal saving, both in absolute magnitudes and as a percentage of disposable income, and the IEA estimates of gross saving, household capital formation, and net lending, for the whole period 1947-83.

It is apparent that the year to year changes in BEA personal disposable income and personal saving (columns 1 and 2 of Table 13) cannot be satisfactorily explained by the permanent income hypothesis. However, the year to year changes in household gross saving, household gross capital formation, and household net

TABLE 13

COMPARISON OF BEA AND IEA SAVING CONCEPTS, 1947-83
(BILLIONS OF DOLLARS)

	BEA NIPA Estimates			Integrated Economic Accounts Estimates			
	Personal Saving 1	Disposable Personal Income 2	Column 1 as Percent of Column 3	Household Gross Saving 4	Household Gross Capital Formation 5	Household Net Lending 6	Total Non Household Capital Formation 7
1947	5.2	168.0	3.1	26.4	30.2	−3.7	20.6
1948	11.1	188.0	5.9	34.4	35.3	−0.9	33.2
1949	7.5	188.9	4.0	32.7	36.5	−4.0	29.8
1950	11.9	206.6	5.8	43.3	47.1	−3.8	44.5
1951	16.1	226.0	7.1	46.3	44.8	1.5	68.4
1952	17.4	237.7	7.3	46.6	44.2	2.4	74.3
1953	18.5	252.2	7.3	50.9	47.9	3.0	78.3
1954	17.0	257.1	6.6	49.6	49.0	0.6	71.7
1955	16.4	275.0	6.0	54.5	59.0	−4.5	81.0
1956	21.3	292.0	7.3	58.6	56.8	1.8	84.0
1957	22.3	308.6	7.2	59.3	56.7	2.6	83.6
1958	23.6	319.0	7.4	64.0	54.4	9.6	79.3
1959	21.1	348.4	6.1	62.1	64.2	−2.1	88.0
1960	19.7	352.0	5.6	60.9	62.7	−1.8	86.0
1961	23.0	365.7	6.3	64.6	60.4	4.2	85.4
1962	23.3	386.8	6.0	67.7	66.9	0.8	102.2
1963	21.9	405.9	5.4	70.3	73.5	−3.2	106.8
1964	29.6	440.6	6.7	82.1	79.1	3.0	110.0
1965	33.7	475.8	7.1	93.1	86.2	6.9	126.9
1966	36.0	513.7	7.0	98.2	89.7	8.6	147.2
1967	44.3	547.9	8.1	115.0	92.1	22.9	153.5
1968	41.9	593.4	7.1	122.6	107.2	15.4	165.9
1969	40.6	638.9	6.4	119.4	114.1	5.3	175.4
1970	55.8	695.3	8.0	134.6	113.3	21.3	165.8
1971	60.7	751.8	8.1	154.5	137.1	17.4	177.0
1972	52.6	810.3	6.5	159.3	160.3	−1.0	193.5
1973	79.0	914.5	8.6	194.5	175.1	19.4	228.9
1974	85.1	998.3	8.5	190.0	167.7	22.3	246.7
1975	94.3	1096.1	8.6	222.4	177.5	44.9	233.6
1976	82.5	1194.4	6.9	228.4	217.3	11.1	265.8
1977	78.0	1314.0	5.9	243.3	259.4	−16.1	314.2
1978	89.4	1474.0	6.1	264.3	292.3	−28.0	365.9
1979	96.7	1650.2	5.9	279.4	309.2	−29.8	408.6
1980	110.2	1828.9	6.0	304.9	299.9	5.0	417.9
1981	137.4	2041.7	6.7	355.3	318.4	36.9	492.0
1982	136.0	2180.5	6.2	360.1	318.1	42.0	439.0
1983	118.1	2340.1	5.0	382.0	383.8	−1.8	473.0

lending (columns 4, 5 and 6 of Table 13) do lend themselves to a more straightforward explanation. In periods of prosperity the gross capital formation of households is likely to exceed their gross saving, so that they become net borrowers rather than suppliers of funds. In effect this means that the current and capital outlays which households actually make in prosperity periods tend to exceed the income they receive. Conversely, in periods of recession household gross capital formation declines faster than their gross saving so that in these periods they become net providers of funds. This is precisely the opposite of what the permanent income hypothesis predicts. The permanent income hypothesis overlooks two very important aspects of household behavior. First, a major portion of household saving is contractual and cannot be changed easily in the short run; the prime examples are repayment of home mortgages and consumer debt. Second, many consumer outlays can be reduced without commensurately disturbing the household's basic standard of living; this is especially true of outlays for houses and consumer durables. Therefore it is gross saving that tends to be relatively stable, and capital outlays that reflect income variations.

Although aggregate household savings data cannot be used to test the life cycle hypothesis of saving, the importance of houses and consumer durables as elements of household spending and accumulation suggests a quite different scenario from that which it posits. During the early years of the life cycle, households purchase houses and consumer durables and acquire mortgages and consumer debt. Gradually, with advancing age, mortgages and consumer debt are paid off, and at the time of retirement households have considerable equity in houses and durables. Although there is a life-cycle pattern, it is not the one which has been suggested; it is the acquisition of housing and durables rather than accumulation of saving for old age that drives the system, causing households to be net borrowers in their early years and accumulators of equity in their middle and later years. Thus, the effect of this life-cycle saving pattern on the supply of household saving available for non-household capital formation is the reverse of what the life-cycle hypothesis contemplates. A growing (and therefore young) population would not be a source of net lending, but rather would borrow from the other sectors in order to finance purchases of houses and durables. Conversely, a declining population would include a large segment of households in the phase of the life cycle in which they were paying off previously incurred debt, so that households as a group would be suppliers of funds to other sectors.

Furthermore, the relation of household net lending to total non-household capital formation (columns 6 and 7 in Table 13) show a very different role for households as suppliers of funds for non-household capital formation from that of conventional macro theory. What becomes apparent is that in periods of prosperity household gross capital formation frequently exceeds its gross saving, so that households on balance are borrowers of funds rather than suppliers. In no period do households contribute more than 19 percent of the financing for non-household gross capital formation, and it was only in deep recession (1975) that this figure was reached. For the whole period from 1947 through 1983 households contributed less than 3 percent of the funds used for non-household gross capital formation (i.e. gross capital formation by enterprises and government).

In light of this comparison of the BEA personal income account and the proposed household core accounts for the analysis of saving and investment, it is clear that the proposed modifications do provide new insights into the nature and function of household saving. Although of course owner-occupied housing and employer-financed entitlements are valued by households and affect their spending and saving behavior, it is nevertheless analytically useful to distinguish between the economist's valuations of these imputations and attributions and the actual market transactions engaged in by households, since it is only the latter that supply financing for the capital formation of other sectors.

B. *Household Wealth Accumulation*

National wealth and its change over time is a topic which has fascinated economists for many years, but has proved rather intractible in statistical terms. Information on the distribution of household wealth has been even more difficult to develop, since it requires microdata sources. There have been a few household wealth surveys, but in the United States in the main it has been necessary to use other sources, such as estate tax records and income tax files.

One of the more interesting questions with respect to household wealth concerns the relation of its change over time to household saving and the capital gains and losses which arise from revaluations. The 1968 SNA introduced capital finance and revaluation accounts to provide this linkage, but few countries have implemented these parts of the system and the United States is one of those that have not. BEA does not present either capital finance accounts or balance sheets, and given the concepts underlying its personal income and outlay account it is somewhat difficult to see how such accounts could be introduced. When the modifications proposed here are made, however, balance sheets and revaluation accounts do fit into the system. The Integrated Economic Accounts include estimates for the United States for the period 1947–80 which correspond to the capital accounts shown in Table 11. A summary of these estimates is given in Table 14.

The conclusions to be drawn from Table 14 are generally consistent with the analysis of household saving and capital formation in the preceding section. In the early part of the period, tangible assets accounted for almost all of net acquisitions of wealth. In more recent years, the large size of the statistical discrepancy between the FRB and BEA figures noted above obscures the picture.

Perhaps the most striking feature of Table 14 is the importance of capital gains in the accumulation of household wealth. Revaluations accounted for more than two-thirds of the increase in household wealth over the period as a whole. They exceeded half the gain in every period, and inflation raised the proportion to nearly four-fifths in the decade of the 1970s. Thus, revaluations play a central role in the accumulation of household wealth. If we are to understand both the change in household wealth over time and its distribution among different social and demographic groups, the national accounts should be extended to include balance sheets and revaluation accounts, and microdata sets should be developed which show the nature of the assets and liabilities of individual households. For the United States, this must involve an exploration of the causes of the statistical discrepancy between the FRB financial data and the BEA national accounts.

TABLE 14

SAVING AND REVALUATIONS IN RELATION TO CHANGES IN HOUSEHOLD NET WEALTH, U.S., 1947–1980
(BILLIONS OF DOLLARS)

	Net Acquisitions of Household Wealth				Net Revaluations				
	Tangibles 1	Equities 2	Net Fixed Claims 3	Total Net Saving 4	Tangibles 5	Equities 6	Total Net Revaluation 7	Net Change in Household Wealth 8	Revaluation as Percent of Net Change 9
1947–50	88.6	19.9	−18.7	89.6	40.7	78.5	119.4	209.0	57.1
1951–55	115.6	24.8	−1.3	139.0	34.4	174.6	208.9	347.9	60.0
1956–60	105.3	22.1	18.0	145.7	41.4	169.0	210.3	356.0	59.1
1961–65	141.8	21.5	31.3	194.7	18.8	313.7	332.6	527.3	63.1
1966–70	215.4	16.0	110.8	342.9	182.1	228.1	410.1	753.0	54.5
1971–75	338.2	−24.3	224.6	538.8	480.7	438.0	919.3	1,458.1	63.0
1976–80	535.6	−16.2	231.7	751.4	1,227.4	1,456.4	2,683.7	3,435.1	78.1
Total	1,540.5	63.8	596.4	2,202.1	2,025.5	2,858.3	4,884.3	7,086.4	68.9

C. *Constant Purchasing Power Revaluations*

The inflation of the 1970s made it apparent that the traditional national accounts were not adequate to explain what was taking place in the economy, and there have been a number of proposals for incorporating various aspects of "inflation accounting" in the system. In particular, there has been much interest in the impact of inflation on the distribution of wealth. The IEA sector balance sheets for years from 1947-80 throw considerable light on this question.

In Table 15, a general price deflator has been used to compute balance sheets revalued in terms of constant purchasing power, thus showing the distributional effect of differing price movements. By definition, both fixed claim assets and fixed claim liabilities are constantly revalued downward as prices rise. Durable goods also show a continued relative downward revaluation, reflecting the fact that consumer durable prices have risen more slowly than the general price level throughout the period covered. The housing picture is more mixed. From 1951 through 1965 housing prices rose more slowly than the general price level, but after 1965 they rose more rapidly—particularly in the period 1976-80. Corporate stock prices increased faster than the general price level from 1947-65, followed by a period of sharp decline over the next 10 years and then some relative increase after 1974. Other equities were the only asset holdings which showed a relative rise during every five year period (due largely to the price movements of non-farm unincorporated business and land).

Given these patterns of relative price behavior, it is possible to draw some conclusions about the effect of revaluations on real wealth holdings during the different periods. During the fifteen years from 1950 through 1965 price increases were relatively moderate, but nevertheless there were systematic changes in relative prices. Owners of homes, consumer durables, and fixed claim assets all suffered some erosion in the real value of their assets whereas owners of corporate stock and other equities enjoyed a rise. For individuals with fixed liabilities, their erosion added to the net increase in real wealth. These relative price changes resulted in some redistribution in real wealth. The portfolios of the lowest wealth holders are heavily concentrated in consumer durables and fixed financial claims, middle wealth holders tend in addition to own houses and have mortgage debt, and the highest wealth holders tend to hold a major share of their wealth in corporate stocks and other equities. As a consequence the assets of the lowest wealth holders eroded, those in the middle eroded somewhat less if they owed mortgage debt, but those at the top enjoyed substantial net gains in real terms.

In the decade from 1965 to 1975 the situation changed considerably. The lowest level of wealth holders suffered even more through the erosion in the real value of their consumer durables and fixed claim assets, but home owners benefited both from the relative increase in housing prices and the decline in the real value of their mortgages. Top wealth holders holding corporate stock suffered real losses, but those holding real estate or other non-corporate equities gained.

For the period since 1975, there is still another variant. The lowest wealth group still suffered from the erosion of their assets due to the high inflation, but the assets of both home owners and owners of corporate stock and other equities increased in value at the same time as the real value of their liabilities decreased.

TABLE 15

HOUSEHOLD BALANCE SHEET REVALUATIONS IN CURRENT PURCHASING POWER, U.S., 1947-1980
(BILLIONS OF 1972 DOLLARS)

	Revaluations of Household Assets							
	Houses	Durable Goods	Corporate Stock	Other Equities	Fixed Claim Assets	Total Assets	Revaluation of Household Liabilities	Net Revaluation Effect
	1	2	3	4	5	6	7	8
1947-50	17.6	−16.2	6.0	2.3	−78.0	−68.3	2.5	−70.8
1951-55	−6.4	−27.7	191.3	4.2	−49.6	111.8	−19.6	131.4
1956-60	−40.9	−21.7	80.0	76.7	−32.3	61.8	−30.5	92.3
1961-65	−31.5	−49.0	238.5	125.7	−47.3	236.4	−29.6	266.0
1966-70	17.8	−52.5	−35.0	14.0	−157.7	−213.4	−100.9	−112.5
1971-75	50.1	−83.2	−200.2	203.1	−291.1	−321.3	−118.4	−202.9
1976-80	155.0	−58.2	148.5	357.4	−380.9	221.8	−108.4	330.2
Total	161.7	−308.5	429.1	783.4	−1,036.9	28.8	−404.9	433.7

It is thus apparent that inflation has a significant and predictable effect on the real distribution of wealth. Because of the portfolio composition of different wealth groups, the lowest wealth group always loses from inflation, the middle wealth group's real gain or loss depends largely on what happens to relative housing prices, and the top wealth group enjoys positive gains except in those periods when the stock market suffers reversals.

In order to go beyond this crude conclusion, however, what is needed is information on the levels and composition of assets and liabilities held by individual households. Then, and only then, will it be possible to examine the changes in real wealth of households having different social and demographic characteristics.

V. Conclusions

It is the contention of this paper, based on the evidence presented, that present day national accounts are both seriously misleading in what they do present, and grossly inadequate in what they do not present.

The misrepresentation in the accounts arises from three sources:

1. By including imputations valued at shadow prices, arbitrary assumptions are introduced which obscure the actual transactions of the transactors.
2. By attributing to households as the residual claimants in the system transactions in which they do not actually engage, the accounts distort institutional realities.
3. By failing to recognize capital formation by households, the accounts impair our understanding of the saving and investment process.

As a consequence of these misrepresentations, the existing concepts of income, consumption, and saving are inappropriate for the kinds of analyses for which they are commonly used, and therefore they contribute to our failure to understand the processes involved.

The inadequacies of the accounts are twofold:

1. As currently conceived, the national accounts are not compatible with microdata, and they are unable to make effective use of the richness of the information to be found in microdata.
2. As currently implemented in the U.S., the national income and product accounts are not integrated with national or sectoral balance sheets. As a consequence it is difficult or impossible to bring the role of capital gains and losses and wealth holdings to bear upon the analysis of the current behavior of the system.

Almost 30 years have passed since the BEA national accounts were put in place, and 20 years since SNA reached its present form. The systems need to be reviewed in the light of the changes in information availability, data collection and processing technology, and policy interests since that time. A purely cosmetic review whose primary aim is the preservation of the continuity of series will not meet the need.

References

1. Board of Governors of the Federal Reserve System, Balance Sheets for the U.S. Economy 1945-1984, October 1985.

2. Chadeau, Ann and Caroline, Roy, Essai de mise en correspondance de la consommation finale des menages et de leurs activitiés: substituabilité ou complementarité entre production marchande et non marchande, paper presented at the 1985 IARIW conference.
3. Juster, F. Thomas, Changes in Work, Leisure, and Well-Being for Men and Women, paper presented at the 1985 IARIW conference.
4. Katz, A., Valuing the Services of Consumer Durables, *Review of Income and Wealth*, December 1983.
5. Kendrick, J., Expanding Imputed Values in the National Income and Product Accounts, *Review of Income and Wealth*, 1979.
6. Kravis, I. B., Z. Kenessey, A. Heston, and R. Summers, A System of International Comparisons of Gross Product and Purchasing Power: United Nations International Comparison Project, Phase One (1975).
7. Lutzel, H., Market Transactions in the National Accounts, *Review of Income and Wealth*, June 1986.
8. Orcutt, Guy, Steven Caldwell, and Richard Wertheimer II, Policy Exploration Through Micro-analytic Simulation, The Urban Institute, 1976.
9. Pêtre, J., The treatment in the national accounts of goods and services for individual consumption produced, contributed, or paid by government, paper presented at 17th IARIW General Conference, 1981.
10. Rudney, G. and M. Weitzman, Significance of Employment and Earnings in the Philanthropic Sector, 1972–1982, Working Paper No. 2077, ISPS, Yale University (1983).
11. Ruggles, N. D. and R. Ruggles, The Treatment of Pensions and Insurance in National Accounts, *Review of Income and Wealth*, December 1983.
12. Ruggles, R. and N. D. Ruggles, Integrated Economic Accounts for the United States, 1947–80, *Survey of Current Business, May* 1982.
13. Sunga, P. S., An Alternative to the Current Treatment of Interest as Transfer in the United Nations and Canadian Systems of National Accounts, *Review of Income and Wealth*, December 1984.
14. United Nations Statistical Office, Series F, No. 2, Rev. 3, A System of National Accounts (1968).
15. ———, Series M, No. 60, Provisional International Guidelines on the National and Sectoral Balance-Sheet and Reconciliation Accounts of the System of National Accounts (1977).
16. ———, Series M, No. 61, Provisional Guidelines on Statistics of the Distribution of Income, Consumption and Accumulation of Households (1977).
17. ———, Total Consumption of the Population: Technical Report, E/CN.3/512 (1978).
18. van Bochove, C. A. and H. K. van Tuinen, Flexibility in the Next SNA: the Case for an Institutional Core, *Review of Income and Wealth*, June 1986.
19. Vanoli, A., Sur la structure général du SCN à partir de l'expérience du systèm élargi de comptabilité national français, *Review of Income and Wealth*, June 1986.