INFLATION, HOLDING GAINS AND SAVING

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INTRODUCTION

Economic analysis, and especially the analysis of consumer behaviour, is complicated by the fact that in an inflationary environment measures of income and saving provided by national accounts take no account of the effects of price changes on the real value of assets. The consequences of increases in the general price level on monetary assets and liabilities are by now widely appreciated. It is likely that they influence economic behaviour in systematic ways which are difficult to capture using the concepts of income and saving in existing systems of accounts, including the internationally agreed *System of National* ***Accounts*** **(SNA),** used by the OECD, the United Nations and most national statistical offices. The problem is aggravated when there is a rapid acceleration in inflation, such as occurred in most OECD countries in the mid 1970s, or a significant deceleration of inflation, such as has occurred in many OECD countries in the early 1980s.

A major preoccupation of economic policymakers at the present time is to determine whether the recent slowing down in inflation will in itself stimulate a sustained increase in personal consumption, thereby raising rates of economic growth. Unfortunately, the information on income and saving provided by national accounts is not well suited to answering critical policy questions of this kind. Indeed, this information is incomplete and potentially misleading because no allowance is made for the real holding losses which households regularly incur on their monetary assets as a result of inflation. The problem is not confined to households: it affects the income and saving of other sectors of the economy, including general government, as shown in national accounts. Thus, it can be argued that existing measures of government saving, and thus of budget surpluses or deficits, may not be suitable for all purposes and could possibly give a misleading indication of the stance of fiscal policy in conditions of high inflation. For these reasons there is growing concern, and consensus, among economists and national accountants that existing measures of income and saving in national accounts need to be supplemented by additional information on the real holding gains and losses on the assets, especially financial assets, held by the different sectors of the economy, and that the provision of this information should be accorded high priority. The purpose of this paper, therefore, is to explain the limitations of national accounts measures of income and saving under inflationary conditions and to indicate the nature of the corrections which would be desirable from the point of view of economic analysis and policymaking based on it[1].

I. THE CONCEPT OF INCOME

There is substantial literature on the concept of "income" which predates recent concerns about the measurement of income and saving under inflationary conditions[2]. The most widely accepted definition to be put forward during these early debates was that advanced by Hicks (1946) who defined income as the maximum value which an individual can consume during a given period and still expect to be as well off at the end of the period as at the beginning[3]. This definition can be rendered more operational by defining income as the maximum amount which can be consumed within any given period while maintaining real net worth intact, which in turn can be translated into actual consumption plus the change in real net worth. This is the version used by Meade and Stone in their classic article on national accounting published in *The Economic Journal* in 1941[4].

Net worth is a balancing item, or accounting residual, which is equal to the total current value of all the assets held by an individual *less* total liabilities. It is a monetary figure which represents the individual's net command over goods and services at a particular point in time. Thus, the change in real net worth between two moments of time is affected not merely by the changes in the nominal values of the individual's assets and liabilities but also by the changes in prices of all the goods and services consumed by the individual. In order to obtain the change in *real* net worth, therefore, the monetary values of net worth at the beginning and end of the accounting period have to be expressed in units of constant purchasing power. As the change in real net worth also has to be commensurate with consumption in the same period, it needs to be measured with reference to the average consumer prices prevailing within the same accounting period, and this is the procedure adopted in this paper. Although described as the change in real net worth, it is nevertheless measured at the prices of the current period as distinct from the prices of some base period.

In practice, there is no single, comprehensive definition of income to be found in the **SNA** which corresponds to the Hicksian concept of consumption plus change in real net worth. Instead, three different types of income—namely, factor incomes, property incomes and unrequited current transfers—are distinguished, all of which are based on actual or imputed transactions. A measure such as total household income is built up from its various components and the aggregate itself is not separately defined. Precise definitions of the various income flows are given in Chapter 7 of the **SNA** and need not be elaborated here.

The distinction between current and capital transfers in the SNA is, perhaps inevitably, somewhat vague. Current transfers are stated to be transfers which are made out of current income and which are perceived by the recipient as being available for consumption. Capital transfers are lump sum transfers made irregularly and infrequently out of wealth. There are, however, no precise criteria for distinguishing current from capital transfers. Interest is treated as a transfer of income resulting from the use by one economic agent of the financial assets owned by another economic agent.

By deducting from total income as measured in national accounts various regular charges against income, in particular interest payments, taxes and social security contributions, and other current transfers paid, disposable income is obtained. By further deducting consumption, saving is obtained. Disposable income is the relevant measure for purposes of comparison with the Hicksian income concept. Evidently, the two concepts differ to the extent that the change in real net worth diverges from saving, as consumption is common to both. Although saving is obtained residually in national accounts, it reflects the net outcome of a large number of transactions and has to materialise in the form of net acquisitions of assets of one kind or another, including cash. Assets can also be acquired, or disposed of, by means of capital transfers, however; and it is necessary to exclude these in the present context[5]. Apart from capital transfers, it follows that the change in real net worth must diverge from saving, i.e. from the net acquisition of tangible and financial assets, by the amount of the real holding gains which accrue on the assets held.

II. CHANGES IN REAL NET WORTH

For purposes of exposition, it is sufficient to use a simplified balance sheet in which only four types of assets are distinguished, even though for purposes of actually calculating real holding gains and losses, further disaggregation would be needed. First of all, tangible assets need to be distinguished from financial assets. Secondly, financial assets need to be subdivided into equities, long-term bonds and monetary assets. Monetary assets are those whose value remains fixed in money terms, including bills, savings deposits and loans as well as money itself. In practice, the distinction between monetary assets and long-term bonds is somewhat arbitrary and, for convenience, the boundary used here corresponds to the distinction between short-term bills and bonds and long-term bonds as defined in Table 7.2 of the SNA. The significance of the distinction in the present context is that the market price of a long-term bond may change appreciably during the course of a year, but not that of a short-term bill or bond whose original maturity is always less than a year and whose market price does not deviate much from its nominal value. Because of the importance of monetary assets in the subsequent analysis, monetary assets and liabilities are shown separately.

Let A_t = the value of net tangible assets owned at time t
S_t = the value of shares and other equities held at time t
B_t = the value of long term bonds held at time t
M_t = the gross value of monetary assets held at time t
L_T = the value of monetary liabilities outstanding at time t

The subscript t refers to the end of the accounting period t.

The net worth W_t of an economic unit at the end of period t is given by:

$$W_t = A_t + S_t + B_t + M_t - L_t \tag{1}$$

Let ΔA_t, ΔS_t, etc., denote the *net* amounts of the various assets acquired or disposed of during period t by engaging in transactions with other economic units. ΔA_t also includes capital consumption at current cost.

Four separate price indices are now required: namely, for tangible assets, for shares, for bonds and for goods and services in general.

Let p_t^A = a specific price index for tangible assets

p_t^S = a specific price index for shares

p_t^B = a specific price index for bonds

and P_t = a general price index for all goods and services

The time base for each index is fixed at the middle of period t. The assets held at the beginning and end of period t can then be revalued at the prices prevailing in the middle of the period using the appropriate indices. The difference between the two resulting figures must reflect the net acquisitions of assets which have taken place within the period. That is,

$$A_t/p_t^A - A_{t-1}/P_{t-1}^A \approx \Delta A_t \tag{2}$$

where $t-1$ refers to the end of the previous period, i.e. the beginning of period t.

This is not a strict equality unless the average prices at which the transactions are conducted throughout the period coincide with the actual prices in the middle of the period. In practice, the approximation is likely to be fairly close for tangible assets whose prices tend to move smoothly and monotonically, but may not be so good for shares and bonds. For such financial assets, the approximation can always be improved, however, by choosing a shorter accounting period, such as a quarter instead of a year. If continuous time were used instead of period analysis, the discrepancy would disappear altogether. For this reason, (2) will hereafter be treated as an equality, even though it can hold only approximately in practice when actual accounting data are used for discrete periods of time.

Equation (2) can be rewritten as follows:

$$A_t = A_{t-1} + (p_t^A / p_{t-1}^A - 1)A_{t-1} + p_t^A \Delta A_t \tag{3}$$

which shows how the value of assets at the end of period t can be expressed in terms of their initial value at the start of the period plus nominal holding gains accruing during the period plus net acquisitions of assets, including nominal gains on the latter. Similar equations to (2) can be written for shares and long-term bonds: thus,

$$S_t/p_t^S - S_{t-1}/p_{t-1}^S = \Delta S_t \tag{4}$$

and

$$B_t/p_t^B - B_{t-1}/p_{t-1}^B = \Delta B_t \tag{5}$$

The corresponding equations for monetary assets and liabilities are simpler because there are no revaluations: thus,

$$M_t - M_{t-1} = \Delta M_t \tag{6}$$

$$L_t - L_{t-1} = \Delta L_t \tag{7}$$

The change in real net worth between the beginning and end of the period can be measured at the price level prevailing in the middle of the period as follows:

$$W_t/P_t - W_{t-1}/P_{t-1} = \Delta \bar{W}_t \tag{8}$$

where the bar over W indicates that the change refers to real, as distinct from nominal net worth. It is valued consistently with consumption expenditures within the same period.

Substituting equations (1) to (7) into (8) and rearranging, we obtain:

$$\begin{aligned}\Delta \bar{W}_t = \; & 1/P_t \big[(p_t^A/p_{t-1}^A - P_t/P_{t-1})A_{t-1} \\ & + (p_t^S/p_{t-1}^S - P_t/P_{t-1})S_{t-1} \\ & + (p_t^B/p_{t-1}^B - P_t/P_{t-1})B_{t-1} \\ & + (1 - P_t/P_{t-1})(M_{t-1} - L_{t-1}) \\ & + (p_t^A \Delta A_t + p_t^S \Delta S_t + p_t^B \Delta B_t + \Delta M_t - \Delta L_t)\big]\end{aligned} \tag{9}$$

Equation (9) decomposes the change in real net worth into five components:

i) real holding gains, or losses, in respect of tangible assets, as given by the first term involving A_{t-1};

ii) real holding gains, or losses, in respect of shares, as given by the second term involving S_{t-1};

iii) real holding gains, or losses, in respect of long-term bonds, as given by the third term involving B_{t-1};

iv) real holding gains, or losses, in respect of monetary assets and liabilities, as given by the fourth term involving M_{t-1} and L_{t-1};

v) net acquisitions of assets or liabilities resulting from transactions with other economic units.

In practice, the fifth component, consisting of net acquisitions, is identical to saving as defined in national accounts, as explained in the previous section (assets acquired by capital transfers being excluded from consideration, as noted earlier).

III. HOLDING GAINS AND INCOME

Equation (9) can be used to elucidate a number of points which are usually asserted without proper demonstration. First, it can be seen that if there is no inflation, i.e. if $P_t = P_{t-1}$, real holding gains and losses may occur in respect of

tangible assets, shares and bonds as a result of changes in the relative prices of the individual assets concerned. On the other hand, the fourth term involving monetary assets and liabilities must be zero if $P_t = P_{t-1}$.

Conversely, if, for purposes of argument, there is general inflation without any changes in relative prices, i.e.

$$\text{if } p_t^A / p_{t-1}^A = p_t^S / p_{t-1}^S = P_t / P_{t-1} > 1 \tag{10}$$

the first two-terms in (9) are zero, but the fourth term is positive or negative depending upon whether or not liabilities exceed monetary assets. The third term involving long term bonds is likely to be negative because, however the price of the bond may move over the life of the bond, it must eventually revert to its nominal value which remains fixed in money terms. Thus while the prices of long term bonds may change significantly during the course of any individual accounting period, over the long term they share the characteristics of monetary assets whose real value is continually eroded by inflation. Thus, the consequences of inflation *per se,* i.e. a uniform percentage increase in the prices of all goods and services, are confined to monetary assets and liabilities and bonds. When all prices increase by the same proportion these are the only assets which generate real holding gains or losses.

In practice, of course, all prices do not have to increase at a uniform rate for the above conclusions to remain valid. It is obvious from equation (9) that real holding gains or losses on monetary assets and liabilities vary in direct proportion to the rate of general inflation, whereas the real holding gains or losses on tangible assets and shares depend upon individual price movements as well. Thus when there is a significant acceleration (or deceleration) of inflation the real holding losses incurred on monetary assets are automatically increased (or reduced), whereas it is not possible to make any ***a** priori* predictions about the magnitude, or even the sign, of the real holding gains on tangible assets and shares as these depend essentially on changes in *relative* prices. It may happen that over a particular period of time the price of a specific kind of asset, such as housing, may surge ahead of the general rate of inflation thereby generating considerable real holding gains for house owners, but in other periods the opposite may happen with real losses being incurred.

It is now necessary to return to the central question of how appropriate it is in an inflationary environment to define disposable income as consumption plus the change in real net worth when the latter is bound to include substantial real holding gains or losses, at least on monetary assets and liabilities. First it is worth noting that this definition of income has never been applied mechanically in practice, even in periods of price stability, because capital transfers, especially large unexpected capital transfers, have never been treated as income. The decision to distinguish capital from current transfers and to exclude the former from income in national accounts, reflects an underlying assumption that consumers react differently to the two kinds of transfer. Capital transfers are, ***by** definition,* not likely to .be repeated and are not likely to be consumed in their entirety during the period in which they

are received. Thus, it does not follow that all real holding gains or losses must automatically be included in income, even if the objective is to approximate the Hicksian concept of income. Some holding gains or losses might be excluded on the same grounds that certain types of transfer, namely capital transfers, are excluded from current income. It has already been emphasised that real holding gains or losses on monetary assets or liabilities differ in certain fundamental respects from other kinds of holding gains or losses and it is worth exploring the economic implications of these differences somewhat further.

The most important consequence is that real holding gains or losses on monetary assets and liabilities may be predicted with much less uncertainty than other holding gains or losses because they do not depend on individual price movements. Expectations about the general rate of inflation are likely to be held much more firmly than expectations about the price changes of individual assets. After experiencing many years of high inflation it is likely that most ordinary consumers have fairly firm expectations about the rate of inflation in the near future, and these expectations translate immediately into expected gains or losses on their monetary assets or liabilities which in turn must influence behaviour. Moreover, these gains or losses can be quite large given that the net monetary assets of the household sector may exceed one year's disposable household income, as has been the case in recent years in Belgium, Germany, Italy and the United Kingdom, for example[6].

In contrast to real holding gains or losses on tangible assets or securities, real gains or losses on monetary assets or liabilities recur with predictable regularity year after year in an inflationary environment, even though their absolute magnitudes may vary from period to period (as, indeed, do most ordinary current receipts). In effect, real holding gains and losses on monetary assets or liabilities may be treated as permanent and irreversible and eventually are likely to be so regarded by most economic agents. Even if in the early stages of inflation economic agents are not very conscious of the gains and losses, they are bound to make a major impact on the perceptions of economic agents sooner or later because they are cumulative. Another important feature of the real holding gain or loss on a monetary asset or liability is that it involves a transfer of real wealth between identifiable economic units which can be observed and recorded. On the other hand, it is not possible to identify both parties to the transfer in the case of real holding gains or losses on tangible assets or securities. The owner of a tangible asset or security may receive a holding gain, but it is not at the expense of some other individual economic unit; conversely, if real losses are incurred by owners of assets, the corresponding beneficiaries cannot be identified.

These differences between real holding gains or losses on monetary assets and liabilities and on other assets have an impact on economic behaviour. Because the real holding gains and losses on monetary assets and liabilities can be predicted with some confidence, and because the losers and the winners can be identified, the losers are able to seek some compensation. Nominal interest rates vary with inflation precisely because there are firm expectations of a transfer of real wealth from creditor to debtor which the creditor is able to offset by charging higher rates of interest when contracting a new loan. For this reason, expected real

holding gains and losses on monetary assets and liabilities impinge directly on the size of actual transactions recorded in income and outlay accounts, namely interest payments, in a way that other kinds of holding gains or losses do not. Because the nominal interest payments actually recorded in national accounts are affected in this way, it can be argued that the information conveyed by existing income and outlay accounts is incomplete and misleading, as suggested at the beginning of this paper[7]. Somewhat paradoxically, the compensation paid for the expected real loss on an interest bearing monetary asset is treated as an income flow, but the actual loss itself is not treated as a charge against income. In national accounts terminology, the compensation paid for the expected real loss is treated as a current transfer, whereas the loss itself is treated as a capital item and relegated to the balance sheet reconciliation accounts.

One solution to this problem might appear to be to change the interest payments recorded in national accounts from nominal to real. There are, however, at least two serious objections to this proposal. The first is that real interest is essentially a forward-looking concept which depends on expected rates of inflation which are inevitably unobservable. The realised, or *ex post,* real rate of interest may not be the same. The second objection is that the real holding losses on monetary assets extend to non-interest bearing monetary assets as well as interest bearing assets. Economic agents presumably react in the same way to real losses on both kinds of monetary assets, so that it is not sufficient to make an adjustment affecting one type of asset alone.

The missing piece of information in the accounts is the real holding loss on both interest and non-interest bearing monetary assets—in other words, the depreciation of the real value of monetary assets resulting from general inflation. Such a statistic could, of course, be sub-divided into the real holding losses on interest bearing and non-interest bearing monetary assets, but deducting the former from nominal interest payments would still not yield a very satisfactory estimate of real interest payments, for reasons just given. Where ought this additional information to be shown in the accounts, assuming it is available? It could be entered as a charge against income in the income and outlay account but this would have drastic consequences for the system of accounts as a whole. In particular, saving, as the balancing item in the account, would be reduced by an amount equal to the real holding losses on monetary assets, so that the saving of a sector which is a net creditor, such as the household sector, would be substantially reduced whereas that of a net debtor, such as general government, could be substantially increased. This, in turn, would have repercussions for the capital accounts of the system.

If the real holding losses on monetary assets were incorporated into the income and outlay accounts in this way it follows that the existing measure of saving would disappear from the system. However, the existing measure of saving has its uses. As already stated, it determines the sector's net acquisition of tangible and financial assets which makes it an important statistic for flow-of-funds analysis. It must be noted that the compensation paid to a creditor for the expected real holding loss on this assets does constitute part of an actual transaction between debtor and creditor (the nominal interest payment), whereas the holding

loss itself is not a transaction. For this reason there must be serious doubts about the appropriateness of its inclusion in the income and outlay account.

A simple way out from the impasse would be to record the real holding gains and losses on monetary assets and liabilities "below the line" in the income and outlay accounts. It would then be possible to derive a second adjusted measure of saving which took account of real holding gains and losses on monetary assets. It would be the responsibility of the national accountant to provide the statistics on real holding gains and losses as a regular feature of the national accounts, but it would be left to the user of the statistics to decide which measure of saving is the more appropriate for his purposes. Thus, the operative question is not whether the existing measure of net saving is the "correct" one, but rather whether two measures—namely, before and after the deduction of the depreciation on the real value of monetary assets—should be made available for different purposes.

In the case of the government sector, for example, the existing measure of saving reflects the net outcome of the government's current transactions with the rest of the economy. In so far as its outlays exceed its income, it is obliged to borrow (or dispose of assets). Thus, government saving as defined at present may have important implications for inflation, because it affects the amount of new debt, including money, which must be issued. This is merely a specific example of the general property of the existing saving measure that it determines the extent to which the sector in question acquires or disposes of tangible or financial assets as a result of its current activities. On the other hand, for purposes of demand analysis an extended concept of income and saving may be more useful. The treatment of real holding gains or losses on monetary assets and liabilities as current items may, for reasons given earlier, improve the predictive power of functional relationships which seek to explain consumer behaviour, although this matter requires further econometric investigation. Furthermore, if households indeed tend to regard the real holding losses on their monetary assets, mainly government debt, as current charges against their other income, then the stance of fiscal policy in a period of high inflation may be much more restrictive than it appears from the existing income and outlay account of general government and the saving figure which emerges from it. Thus, two measures of government saving may be needed, one of which may be more relevant to flow-of-funds analysis and the other to aggregate demand management.

Finally, it is necessary to clarify the treatment of the real holding gains or losses on tangible assets and shares. It can be argued that to treat the real gains or losses on monetary assets as current items, while continuing to treat the real gains or losses on tangible assets and shares as capital items is logically inconsistent[8]. However, to draw a distinction between holding gains which are essentially current and others which are not is no more inconsistent than drawing a distinction between transfers which are current and others which are capital. In neither case is the distinction based on precise, objective criteria, but the differences between the two types of holding gain are sufficiently important to warrant different treatment. In brief, real holding gains on tangible assets and shares are uncertain, unpredictable and irregular whereas those on monetary assets are predictable, regular and cumulative, and this provides the rationale for the distinction.

IV. THE ANALYSIS OF CONSUMER BEHAVIOUR

In this section, the difficulty of correctly interpreting the existing measures of income and saving in an inflationary environment will be illustrated by an example which is highly relevant to the economic situation in which a number of countries now find themselves. There is considerable interest in the question to what extent a significant reduction in inflation will tend to stimulate real personal consumption. In order to highlight the issues raised in this paper it will be assumed that the growth of nominal personal incomes, except for interest receipts, declines to the same extent as inflation, leaving these incomes unchanged in real terms. It will be further assumed that the propensity to consume out of real income remains constant. Two special cases will now be examined. In the first case, real interest rates are unchanged, while in the second case nominal interest rates are assumed to be unchanged.

When real interest rates remain constant, it follows, under the conditions postulated, that real consumption is unchanged, because total personal real incomes are unchanged. However, in the national accounts an absolute fall in the nominal interest receipts of households will be observed accompanied by an equal reduction in recorded saving. It follows that the observed saving ratio will fall, perhaps significantly if there is a sharp reduction in inflation, as has happened in some countries. This apparent change in saving behaviour will not provide any stimulus to real household consumption however. The problem can be restated as follows. If real holding losses on monetary assets are treated by creditors as current charges against their income then, when nominal interest rates fall *pari passu* with inflation, both the income of creditors and the charges against their incomes are reduced by equal amounts, so that their disposable incomes, and hence consumption, will not be affected. However, this is not the way the national accounts portray the situation, because the real holding losses, being excluded from the existing income and outlay accounts, are not treated as current charges. Thus, the disposable income recorded in the accounts falls, but consumption remains unchanged, for reasons just stated. This in turn leads to an equal fall in the recorded saving ratio, but one which is not attributable to any increase in consumption.

At the other extreme, if nominal interest rates do not fall at all in response to the reduced inflation, real interest rates rise leading to an increase in real personal incomes and real consumption. In this case, the nominal interest receipts recorded in the national accounts remain constant, so that once again a decline in the saving ratio is observed. In contrast to the first case, however, the decline in saving is matched by a corresponding increase in consumption, because there has been a straightforward increase in the real disposable incomes of households resulting from increased real interest rates. Thus, although the observed propensity to save falls in both cases, the implications for consumption are quite different.

A situation intermediate between the two extremes has tended to occur in practice: nominal interest rates have fallen but real interest rates have risen. The situation thus becomes very confused in the national accounts. Significant reductions

in the propensity to save may be observed but without as much impact on real consumption as would normally be implied. There may appear to be some increase in the propensity to consume without this necessarily implying any underlying change in consumer behaviour. Concentration on the observed saving ratios may well lead to over-optimistic assessments of the growth of real personal consumption in the longer term resulting from a decline in inflation. In fact, it is not the decline in inflation, per se, which results in the increased real consumption, under the conditions assumed, but rather a rise in ex *post* real interest receipts.

The critical factor so far as consumption is concerned is evidently the extent to which the nominal interest rate adjusts to the rates of actual and expected inflation. If nominal rates tend to adjust only partially on average, then real interest rates will tend to fall when inflation accelerates and to rise when inflation decelerates. Under these circumstances, an acceleration of inflation may be expected to have a negative impact on the income and consumption of creditors, in particular households, whereas a slowing down of inflation may be expected to provide some stimulus to consumption. However, the national accounts are liable to give an exaggerated impression of the impact on consumption in both cases if attention is focused on the saving ratio. This is because changes in nominal interest rates associated with changes in the rate of inflation are liable to lead to equal changes in both income and saving as recorded in the accounts without necessarily affecting consumption. When inflation is high, some or all of the interest payments received by creditors are required to offset their real holding losses and these holding losses constitute current charges against income in much the same way as taxes or social contributions. To the extent that reductions in nominal interest rates match the fall in inflation as inflation subsequently moderates, there are equal reductions in both the nominal interest flows and the charges against these flows, so that the income available for consumption is not affected and consumption itself should be unchanged. However, the national accounts do not recognise the real holding losses as current charges against income. In the situation just described, they simply record the reduced interest receipts, i.e. a reduction in income, together with unchanged consumption, so that recorded saving falls. Of course, if real holding losses were to be treated as current charges against income, then no such fall in saving would be observed. Thus movements in the saving ratio may depend not *so* much on what has been happening to consumption as on the concept of income (or the distinction between current and capital items) which one chooses to employ in national accounts. For this reason, considerable caution is needed when interpreting recent reductions in personal saving ratios in certain countries as these need not imply any major change in consumer behaviour and may generate false optimism about the possibility of resurgence of personal consumption.

Finally, there may be other factors at work in the real world which influence consumer behaviour, such as a possible increase in consumer confidence following a fall in inflation, but the neglect of real holding gains and losses on monetary assets and liabilities in national accounts does not make it any easier to disentangle the various influences at work.

CONCLUSIONS

The response of consumers to variations in the rate of inflation is of direct concern to economic policy. One of the mechanisms by which a reduction in inflation may create conditions favourable to sustained economic growth is through a resurgence of personal consumption. The reductions in household saving ratios which have been observed to accompany falling inflation in several countries have therefore generated some optimism on this score. However, some concern has also been expressed in recent years by both economists and national accountants as to whether the concept of income used in national acccunts is appropriate in conditions of high and fluctuating rates of inflation. The measurement of saving depends critically on the concept of income employed, and to the extent that the latter may be inadequate, movements in observed saving ratios may give misleading signals about consumer behaviour.

The root of the problem is that income as measured in national accounts takes no account of the effects of inflation on monetary assets and liabilities, whereas in reality households, and other economic agents, may be systematically taking these effects into account when making their consumption decisions. Real holding losses on monetary assets occur with predictable regularity in an inflationary environment and consumers, who are net creditors, appear to be well aware of the fact. The existing concept of income used in national accounts is not based on firm, objective criteria and a good case can be made for including these holding gains or losses in income by appealing to traditional theoretic concepts of income. If the concept of income is extended in this way, then fluctuations in saving ratios which have been observed to accompany both rapid accelerations and decelerations in inflation are greatly reduced. Thus, there must be serious doubt as to the extent to which recent falls in saving ratios reflect real changes in consumer behaviour rather than inadequacies in the measures used. The question has far-reaching implications as the savings of other sectors besides households are also affected. Thus, existing measures of government saving, i.e. of budget surpluses and deficits, may not always be the most appropriate ones for the purposes for which they are used.

Until the rapid upsurge of inflation in the 1970s the question was of little practical significance, which explains the comparative neglect of this topic until the end of the 1970s. There is now, however, a growing consensus that information on real holding gains and losses, on all assets and not merely financial assets, needs to be provided in national accounts as a matter of some urgency. This need not imply major changes in the existing system of national accounts as the existing measures do, of course, have important uses of their own. However, additional information is needed in order to enable existing concepts of income to be extended for certain analytical purposes. Until this information is widely available it is difficult to subject several of the issues raised in this paper to empirical testing.

NOTES

1. A planned revision of the System *of* National Accounts is actually under consideration by the international organisations principally concerned, namely the UN, the OECD, the EEC and the IMF. These organisations are working in close collaboration with each other towards a planned revision at the end of the 1980s, and the present paper is intended as a contribution to the ongoing methodological debates on inflation.
2. For an excellent survey of the earlier literature on the concept of income, see the Introduction to Parker and Harcourt (1969).
3. Hicks, in fact, examined several alternative definitions of income as well and was very well aware of the difficulty, or even impossibility, of arriving at a definition of income which is both theoretically satisfactory and capable of practical implementation: see Hicks (1946), pp. 171-181.
4. Meade and Stone (1941), pp. 216-233.
5. A similar problem arises with the Hicksian concept of income whenever large unexpected capital transfers, i.e. ''windfalls'', occur as the discounted value of such receipts cannot have been included in net worth at the start of the period: thus, they must be excluded from any ex *post* measure of income. See Hicks (1946) for a discussion of this problem.
6. Cf. Cukierman and Mortensen (1983).
7. Various authors have addressed this problem in recent years: see, for example, Taylor and Threadgold (1979), Jump (1980) and Cukierrnan and Mortensen (1983).
8. Cf. Hibbert (1983).

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