

Saving and the National Economy

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Summary

1. Aggregate saving determines the balance between current and future consumption opportunities available to the economy and for this reason the consumption/saving choice can, along with the work/leisure choice be seen as one of the two key macro-economic choices. Aggregate saving includes saving by the household, corporate and government sectors, since all sectors ultimately serve households today and in the future.
2. National accountants define saving using a definition of income which excludes capital gains, in contrast to another popular definition of income which includes capital gains after inflation adjustment.
3. A third popular definition of income is sustainable consumption. This is equal to the national accountants' definition of income only in very restrictive circumstances.
4. More generally the definition of saving which follows from the national accountant's definition of income can be related to movements in future welfare.
5. From this perspective the case for excluding capital gains from income and saving is strong.
6. There is a case for further adjustments to measures of saving to reflect use of exhaustible resources on the one hand, and accumulation of intangible capital on the other hand.
7. This point is illustrated further with specific examples. These show that, once consumption plans are shown in balance sheets as liabilities, the increases in net worth which might result from capital gains in conventional balance sheets often do not translate into increased consumption opportunities.
8. The effect depends very much on the time horizon over which the consumption plan is considered and the benefits of capital gains for consumption are more obvious when the planning period is short than when it is long.
9. The United Kingdom is shown to have the lowest mean saving rate, as a proportion of GDP, of all the OECD countries for which data exist for the period 1987-2007. The savings rate of the United States is only very slightly higher.
10. The saving rate in the UK has been lower since 1980 than in the years after the Second World War. The ratio of wealth to income, as measured by cumulated saving, fell to a low of 2 during the War. It had recovered to its pre-War level by the mid 1970s, but has since fallen back to a level last seen during the recovery

period of the 1950s.

11. Looking at the sectoral components of saving, it is shown that the corporate sector contributes the most to national saving. Household saving is negatively correlated with national saving.
12. Measures of saving calculated including capital gains are much more variable than those resulting from the national accounts measures and are poorly correlated with them. The main source of the difference has been fluctuations to house prices driven the movements in the price of land.
13. A simple measure of savings adequacy can be calculated as the savings rate needed to hold the ratio of wealth to income constant. On this measure the UK savings rate is too low.
14. An alternative with a stronger economic basis is to look at the saving needed if each cohort is to fund its own consumption without any reliance on transfers from other generations. The results depend on the assumed rates of interest and rates of growth but point to consumption patterns being unaffordable both for the current adult population and more specifically for people now starting their adult life.

Introduction

Economics focuses on choices that people make and the factors that influence them. Most of these choices are micro-economic in character- decisions to purchase one good rather than another good. But there are two choices which have clear and direct implications for the whole economy. The first is the choice between work and leisure and the second is the choice between consumption and saving.

The choice between work and leisure is a proximate determinant of the level of economic activity. In a small open economy, such as the UK, the amount of capital employed per worker is determined internationally by rates of return in capital markets; thus, for any given level of overall productivity it is fair to say that the work/leisure choices normally determines output.

By contrast the consumption/saving choice has little influence on output in the short term, if the economy is not suffering from recessionary unemployment. But in the longer term it determines how much of the domestic capital stock is owned by domestic residents rather than by foreigners. If the capital stock is owned by foreigners property income has to be paid to them out of domestic output, so that national income is lower than domestic output. Conversely if domestic saving runs ahead of the need to finance the domestic capital stock the country will be a net recipient of income from abroad and income will exceed output. In either case it is fair to say that, while saving has no impact on output it does determine future national income and thus consumption opportunities.

Over the last twenty-five years policy-makers' attention has been focused on policies designed to alter the balance between work and leisure; indeed the government has an explicit aim of delivering high labour force participation from people of working age. By contrast it has no explicit policy with reference to overall saving in the economy although policy has referred to some specific forms of saving by households (such as pension saving) and the government's macro-economic framework established clear target rules for government saving, i.e. the surplus or deficit on the government's current account.

For the government to adopt overall saving as a formal policy goal would mean that it would have to settle on an appropriate definition of saving. As this paper shows, there are several possible definitions of saving. However, for a government taking a long-term view of the nation's affairs, this report argues that of some of the possible definitions are unsuitable, facilitating the choices which might be made for a policy goal.

This report begins by discussing different measures of saving and, in particular the way in which they treat capital gains. The UK's saving record is then put in an international context and more detailed sectoral and historical data are discussed. The concept of savings adequacy is then explored. Finally conclusions are drawn.

Motives for Saving

Economists identify two distinct motives for saving. The first is the precautionary motive; future income is uncertain and if people are risk averse it then makes sense to abstain from consuming income completely immediately so that a reserve is available to maintain consumption should income be lower than expected. The second motive is the life-cycle motive. People typically plan to retire; in order to finance their spending in retirement they need to save up out of their earnings while they work.

In a static economy with a stable population precautionary saving in aggregate would be positive in normal years and negative in abnormal years. But one might expect it would be zero on average. Similarly the saving of young people to provide for their retirement would be balanced by the withdrawals of people who had already retired, so that there would be no net life-cycle saving.

But in a growing economy positive saving would normally be expected. Young people aspire to living standards in retirement higher than those enjoyed by current old people, so their saving has to exceed to the decumulation of wealth carried out by old people; the faster the rate of growth the higher the required rate of saving. Similarly it is quite likely that, as people's incomes increase their desire to be protected from now larger income shocks will also increase. Thus the balance of wealth held for precautionary reasons will tend to increase over time and positive saving will also be required to deliver this.

Income and Saving Defined

Economists have faced difficulties in producing generally acceptable definitions of both income and saving as comments from two distinguished economists of the last century make clear John Hicks remarked that "income was a bad tool which breaks in our hands" while Dennis Robertson observed that "the gaols and workhouses of the world are full of people who gave up as a bad job the admittedly difficult task of distinguishing capital from income". Without a clear definition of income no definition of saving, which is equal to income less consumption, is possible. This section summarises some of the attempts to define income and saving.

The National Accounts

In the national accounts the income accruing to households, corporations and government can be defined as the sum of factor incomes (wages, profits including rent on land and the mixed incomes of the self-employed), property incomes (dividends and interest income) and transfer incomes (tax revenues, social security benefits). Many people and certainly households, corporations and government in aggregate both receive and pay property and transfer income; such payments have to be deducted to arrive at disposable income.

Saving is then that part of disposable income which is not consumed. National saving is made up of the saving of households, corporations and government.

It should be noted that the definition above makes no reference to depreciation. The outcome obviously depends on whether profits and mixed incomes are measured gross or net of depreciation. From an economist's perspective it is clear that the measurement should be net of depreciation since, depreciation allowances are intended to make up for capital used up in the production process and are not therefore additional resources which can be consumed later on. However, in the UK depreciation figures are calculated only annually with the consequence that any focus on quarterly saving has to be on gross figures. The household savings ratio, perhaps the most widely discussed savings indicator is calculated from saving gross of depreciation, By contrast the analogous figure in the United States is calculated from saving net of depreciation.

The national accountant's definition also does not include any capital gains or losses. This contrasts with the next definition of income which we consider.

Hicksian Income and Saving

Despite his uneasiness with the concept indicated above, Hicks produced a definition of income (Hicks, 1938, Chapter XIV) which is widely quoted. He stated

“a person's income is what he can consume during the week and still expect to be as well off at the end of the week as he was at the beginning” .

Given the standard definition of consumption it follows that the definition of saving is determined by the definition of income. Hicks regarded “as well off” as meaning holding the same amount of wealth at the end of the period as at its start, after adjusting for changes in the cost of living. While there were questions how this definition of income could be measured *ex ante*, Hicks thought it could be measured *ex post*. Since, for a closed economy, financial gains and losses would net out.

“Total savings *ex post* therefore reduce to nothing else but the increment in the value of physical capital”

with the value of physical capital presumably measured in terms of consumption goods.

The key difference¹ from the national accounts is that real capital gains are included in

¹ Hicks also raised a reasonable but relatively minor concern with the national accountants' definition of consumption. For reasons of statistical convenience, durable goods with the exception of houses are defined as being consumed at the time of their purchase. It is generally recognized that one might ideally measure the services provided by durables instead of their purchases, but this is not in practice attempted and the problems created by existing practice are not thought to be large. This is discussed further

Hicks' definition of income and therefore saving. There have, from time to time been attempts to bring the national accounts in line with this definition. For example Eisner (1988) set out an alternative system of national accounting, the Total Income System of Accounts, in which capital gains are included. However it is fair to say that this approach has not found international favour. Some of the problems with his treatment of capital gains are indicated below.

Income and Sustainable Consumption

Hicks' definition of income gave rise to an alternative but related idea that income should be defined to be equal to sustainable consumption where the latter is that level of consumption which, if constant could be sustained indefinitely. The connection with Hicks' definition is that, if someone is exactly as well off at the end of the week as at the beginning, that might seem to imply that the amount they consumed during that week could be sustained indefinitely, at least if their income does not change.

This notion was given more formal exposition by Weitzman (1976). He showed that, in a closed economy with income defined by net domestic product, income was indeed equal to the interest rate multiplied by the present discounted value of current and future consumption. In that sense income was equal to sustainable consumption. Two points need to be noted. First of all, Weitzman assumed that there was no productivity growth. With rising productivity sustainable consumption is higher than income. Secondly, Weitzman's work in fact pointed to a concept of real income different from real net domestic product. He required net domestic product to be deflated by the price index of consumption rather than the price index of output.

But these issues aside, Weitzman assumed in his analysis that the rate of return on capital was constant. He considered a closed economy, such as the global economy. In a closed economy the rate of interest can be expected to be constant only if the capital stock per worker is constant, i.e. there is no capital accumulation. But if there is no capital accumulation then all of current income is being consumed and there is no reason why either income or consumption should change. Thus the concept of sustainability becomes tautological instead of useful.

Sefton and Weale (2006) generalized Weitzman's approach to a situation in which capital accumulation and decumulation could take place. They showed that it was no longer possible to equate income to sustainable consumption. Nevertheless net income, as measured in national accounting terms could be related to current and future consumption possibilities. Saving defined, on the same basis, was equal to the increase in the

below.

discounted sum of future welfare multiplied by the marginal utility of money.

This definition, of course, explains what saving delivers but does not clarify how to measure it. However, a key point of Sefton and Weale's work was that it shed light on the question of capital gains, at least in the circumstances that they considered. In an economy which is accumulating capital, capital goods become less and less scarce and the price of such goods measured in terms of consumption declines. Should these capital losses be deducted from flow income in order to arrive at a more relevant measure of income? The answer turns out to be no. The capital losses are capitalization of the future decline in the marginal product of capital. But since this is in any case reflected in future income earned by each unit of capital, it would be double-counting to offset it against current income as well. The same point applies to gains as well as losses and can be seen in a much simpler context by means of a number of examples.

Capital Gains and Saving: A Balance Sheet Analysis

Both financial and real assets are valuable because they entitle their owners to a stream of future income. The value of an asset is usually regarded as equal to the discounted value of the stream of future payments that the owner receives. But its value then depends on the discount rate used; a reduction in the discount rate used increases the present value of future income and thus raises the current value of any asset. For many assets the income stream associated with them is uncertain. Changes in expected future income streams will similarly be discounted to affect the current asset price. Thus the two main causes of capital gains and losses are i) changes to discount rates and ii) changes to expected future income streams. We present in Appendix 1 some examples to show how capital gains may not necessarily lead to increased consumption opportunities. These examples introduce the situation described here where a reduction to the interest rate leads to capital gains for an owner of land but where the consumption opportunities enjoyed by the land-owner are in fact reduced rather than increased.

Suppose that the interest/discount rate is 5% p.a., and that an individual expects to earn £200 p.a. for the next ten years. He owns land currently worth £400. With a consumption plan of £125 p.a., shown as a liability in the balance sheet, we initially find an excess of comprehensive assets over comprehensive liabilities of £4. Annual consumption could be increased to £125.24 and still be affordable.

Table 1 A Balance Sheet with Land and Human Capital as Assets and a Discount Rate of 5% p.a.

	Assets		Liabilities
Land	400		
Human Capital (10 years at £200 p.a.)	1621.564		
		Consumption Stream (£125 p.a. for 30 years)	2017.634
Net Worth			4
Total	2021.564		2021.564

Suppose now the interest/discount rate falls to 2 ½ % p.a. This leads to a doubling of the price of land and also increases the capitalised value of wages, shown as human capital, and of the consumption stream. Evaluating the present discounted values of these flows, the comprehensive balance sheet is now as shown in Table 2.

Table 2 The Effect of a Discount Rate of 2 ½% p.a. when Land and Human Capital are Included

	Assets		Liabilities
Land	800		
Human Capital (10 years at £200 p.a.)	1794		
		Consumption Stream (£125 p.a. for 30 years)	2682
Net Worth			-88
Total	2594		2594

Despite the fact that land prices have doubled, there is a shortfall of £88 shown in the balance sheet. Consumption has to be reduced to £120.92 in order to make ends meet. A conventional balance sheet would show a substantial improvement in the balance sheet position whereas in fact the interest rate change has made the individual whose affairs are represented in the balance sheet worse off rather than better off.

The explanation of this paradox is quite straightforward. The reduction to the interest rate raises the amount which has to be saved out of labour income to finance any given level of consumption beyond the ten-year labour income horizon. Thus, this effect reduces the magnitude of affordable consumption. The increase in the land price has, as we have seen above, the effect of raising the amount of consumption that can be afforded

over a finite period. But with the numbers shown above the impact working through labour income is larger than that working through land and the overall effect is that consumption has to be cut back.

These different results demonstrate that there is no clear meaning to the phrase "as well off". The person shown in Table 1 is as well off if he spends some of his capital gain in the period in which he receives it. The person who wants to protect his descendents from the effects of rising land prices by leaving the plot as a legacy, or the nation which has an infinite horizon have no increase in consumption possibilities and therefore whether the capitalised value of these should be shown as income which can be consumed or saved is neither here nor there because there is nothing extra to spend.

Changes to Expected income Streams

An alternative situation which gives rise capital gains is one in profits increase. If a rentier enjoys an income stream from profit on capital and that income stream rises by a quarter then, the asset which represents that capitalised income stream will also rise in prices by a quarter. The rentier can choose whether to enjoy a consumption splurge, spending all of the capital gain in one go or whether to enjoy a permanent income increase in consumption of one quarter. But it is clear that in this case available resources have increased. The situation is quite different from that which arose when the discount rate on land fell.

Such a situation might arise if capital became inherently more productive, but that there were no change to either the rate of return on capital or to the wage rate (possibly because the economy is only a small component of an open international economy). This is then exactly analogous to an increase in the capital stock resulting from saving. It is coherent to regard this capital gain as income which is saved and which makes higher future consumption possible from the perspective of both an individual with a finite horizon and a nation with an infinite horizon. The present discounted value of the increase to consumption is the same in both cases and the concept of "as well off" is perfectly clear.

But suppose that the increase in profits has been at the expense of wages. Consider a situation where profits, net of depreciation, amount to 20% of net domestic product, with the remaining 80% being taken up by wages. If the share of profit rises to 25% and the share of wages falls to 75% but there is no change to the discount rate, then the value of the capital stock should be expected to rise by one quarter. Capital has simply become more productive and labour less productive. Fairly obviously, a conventional balance sheet which shows the increased value of capital goods, but not the reduced value of human capital will lead to the conclusion that there have been consumption-enhancing capital gains. However, in a comprehensive balance sheet which shows the discounted sum of wage income and discounted consumption gives a different story. The effect on

any individual depends on their personal ratio of produced capital to human capital. Typically an old person will experience increased consumption opportunities while a young person will find that their main asset, human capital, is worth less than previously. Once again this can be offset by means of legacies from old people to young people. If, however, we look at the comprehensive national balance sheet, then there can be no increase in overall consumption possibilities simply because what had been labour income is now profit. These various examples show what lies behind Sefton and Weale's result that capital gains which result from changing asset prices and changing discount rates driven by capital accumulation or decumulation should not be counted as income.

Regular computation of balance sheets showing as assets human capital as well as physical assets and with discounted consumption shown as a liability is not popular with national accounts. The problem is that, while the market values of assets are observed data, the other entries have to be based on forecasts for consumption and labour income. A moment's thought suggests that such an approach is not very different from the earlier practice of entering zero in tables when numbers are unknown. Comprehensive balance sheets are inevitably going to be based on forecasts which turn out to be wrong with hindsight. But a failure to produce them can result in the important message that they convey being ignored.

Summary

These results inevitably suggest that it is not sensible to produce a general principle that capital gains should, or should not be counted as income. In some cases, as we have seen, consumption possibilities are increased and in other cases they are not. Which one of these happens depends not only on the source of the gain but also on the horizon over which consumption possibilities are considered. Even if one takes the view that the nation should adopt an infinite horizon, the conclusion still depends on the source of the gain. But if one wants a general rule, it is probably safer to leave capital gains out of income than to include them.

Omissions

Natural Resource Depletion

It is generally recognised that measures of saving should take account, in some form or other, of depletion of the stock of natural resources. The heuristic argument that resource decumulation is like other forms of asset decumulation was given a more formal structure by Hartwick (1978). He showed that a resource-using economy will, on the optimal path of resource use, save an amount equal to the value of the resource depleted. If it does this it is putting in place produced capital to replace the naturally provided capital. Plainly for policy purposes it makes little difference to deduct resource decumulation from saving

and examine the net figure, or to use the gross figure but take account of the effects of resource decumulation for savings needs. Seen from Hicks' perspective, the value of unexploited natural resources should be included as a component of physical wealth; it follows that any depletion of such resources should be treated as an amount to be made good before the "as well off" calculation can be performed. Alternatively, Sefton and Weale's framework can be used to show that their definition of income and saving can be adapted to the handling of exhaustible natural resources provided that the value of resources extracted is deducted from conventional net domestic product before income is calculated.

However, Hartwick's general principle gave rise to the so-called Kuwait problem. Kuwait's entire economic activity is, in practice, oil extraction. If it were required to save the whole of its oil produced it would not be able to enjoy any of the benefit of the oil that it extracted, at least until it started to derive income from whatever its savings had been invested in. Sefton and Weale (1996) showed that, while Hartwick's argument is correct for a closed economy, in an international environment, some, and possibly most of the required saving falls on the resource consumers rather than the resource producers. As oil becomes increasingly scarce its price is expected to rise, resulting in a worsening of the terms of trade for importers and an improvement to the terms of trade for exporters. If importers did not save in anticipation of this, they would experience a worsening of their real incomes as a consequence of the rising cost of oil. If nothing else, this demonstrates the complexity in applying the concepts of income and "as well off" when income is expected to change. How far does the idea of "as well off" need to take account of foreseeable changes to income?

Intangibles

The definition of income in the national accounts relies on a clear distinction between the use of inputs and investment. The costs of the former are deducted before arriving at the concept of profit while the latter is paid for out of income. Nevertheless the distinction is not always as clear as it might be. Marrano, Haskel and Wallis (2007) argued that a part of what is conventionally treated as expenditure on inputs is in fact investment in intangible assets such as economic competencies (human capital, reputation and organisational capital), innovative property (R&D and design) and computerised information (mainly software). If this is true then both income and saving are higher than is shown in the national accounts. Taking this position they found that gross investment in these had risen from about 6% of GDP in 1970 to 15% in 2004. However the depreciation rates associated with such assets are presumably high and therefore the impact on net saving is appreciably lower than the impact on gross saving.

Durable Consumption Goods

As already noted, the treatment of purchases of durable consumption goods as though they are current consumption is logically incorrect. Jalava and Kavonius (2009) present estimates of the effects of treating purchases of consumer durables as gross saving on net saving by households in Euro Area countries. They found that, averaged over the period 1999-2003 net saving was increased by an amount which ranged from 0.64 percentage points in Germany to 1.91 percentage points in the Netherlands. Since net household income is below GDP the impact on net saving as a proportion of GDP is lower than this.

Other omissions

For the sake of completeness it is worth mentioning that a number of other changes to the definition of income have been proposed. Perhaps the most significant is that leisure time should be valued on the basis of an appropriate wage rate and shown as income which is then consumed. Another suggestion is that expenditure involved in offsetting the consequences of economic activity, such as the cost of cleaning to remove the effects of industrial dirt, should be treated as inputs rather than as consumption out of income. Such changes, however, typically change income and consumption by equal amounts and have no implications for the measurement of saving.

International Comparisons

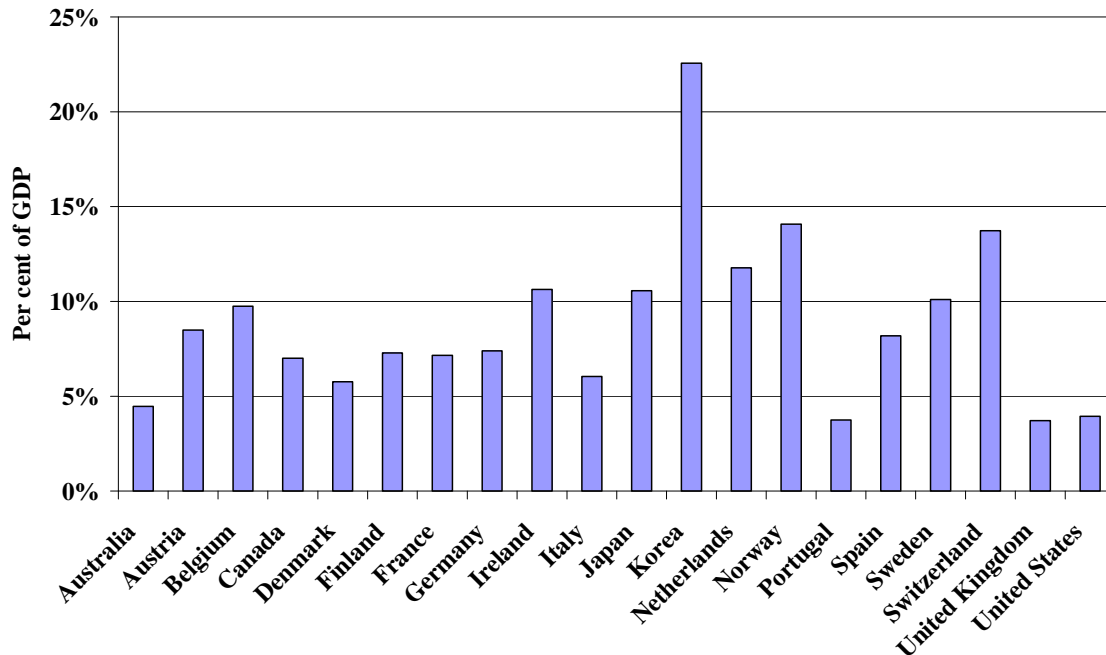
By international standards the UK is a low-saving economy. Figure 1 shows average national savings rates for a range of advanced countries over the period 1987-2007. All of the other countries saved more than the UK, although Portugal and the United States saved very little more. These data are drawn directly from the OECD data base and are generally assumed to be comparable.

Audenis, Hild and Louvot (2002) and Harvey (2004) identify a number of other definitional factors, over and above durables and capital gains, discussed above, which affect measured savings rates. However, most of these, such as the question whether national insurance contributions are treated as taxes or as a form of saving, affect computed household saving but have no impact on computed net national saving. Indeed an inference to be drawn from these studies is that, at least for comparisons across countries, attention needs to focus on net national saving as well as conventional measures of household saving. There is a minor effect that the ratio depends on whether saving is measured gross of net indirect taxes (income at market prices) or net of indirect taxes (at factor cost), i.e. on whether taxes on investment goods are regarded as saving. But there is no reason to believe that this is a major source of the differences in saving rates reported by different countries. The data below are shown net of indirect taxes.

There is no reason to believe that all countries have similar savings needs; these depend

on factors like the age profile of labour income, on which retirement practices are an important influence but so too are others such as how wages rise with seniority. They also depend on the extent to which societies want to support high levels of consumption in old age. And they depend on population structures such as the timing of the post-war baby boom which was by nom means uniform across countries. Nevertheless, the UK's position in the ranking ought to be a source for some concern.

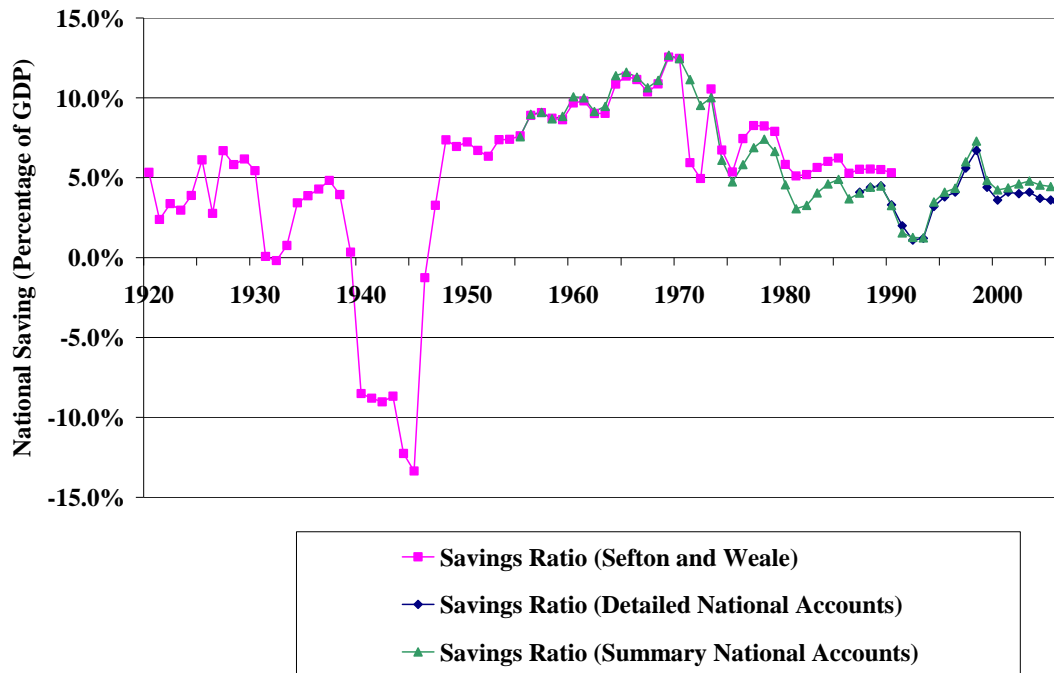
Figure 1 Net Saving Rates in OECD Countries: 1987-2007 averages



National Saving: 1920-2007

Precise data on national saving are available only back to 1987. However the Office for National Statistics provides usable aggregate data back to 1955 and from these it is possible to calculate estimates of national saving. Sefton and Weale (1995) provide data for the period 1920-1990 although on the basis of the 1968 System of National Accounts rather than on the basis of the principles of the European System of Accounts (1995). In examining these data it must be remembered that saving is the difference between two large numbers, net national income and consumption, so that relatively small errors in these two may lead to larger proportionate errors in savings estimates. We show, in Figure 2 the estimates from all three sources.

Figure 2 The National Savings Rate: 1920-2007



It is clear that the three different measures of saving are telling the same story although Sefton and Weale's estimates differ substantially from those derived from the ONS data in 1971 and 1972². Saving was low during the 1930-32 depression (but not during the earlier depression of 1921). The Second World War was financed by substantial dis-saving, but years after the war saw high net national savings rates. These fell somewhat during the recessions of 1974-1976 and also 1979-81. But perhaps the most striking feature of the data is that the savings rate has been markedly lower in the period since 1987 than in the twenty-five years after the Second World War.

Of course the high level of saving after the war may have been a consequence of the cost of the war, which appears as very negative savings rates in Figure 2. We can examine this further by looking at cumulated saving to provide a measure of produced wealth. We discuss other factors behind the movement of savings in the period after 1950 when we discuss the sectoral composition of saving.

In 1920 total produced wealth was comprised as shown in Table 3

² Sefton and Weale's series were fully reconciled in that all the discrepancies in the national accounts were allocated across the variables in proportion to their perceived reliability. Since their work ONS has adopted alternative means of allocating the major discrepancies and it is not possible to identify the key differences.

Table 3 Produced Wealth in 1920

Asset value at end of 1920	£bn
Stocks and Work in Progress	3.00
Net Fixed Capital Stock	13.44
Net Foreign Assets	4.41
Total National Wealth	20.85
GDP at Market Prices	5.923
Wealth to GDP ratio	3.52

Source: Feinstein(1972)

If we take this wealth as our starting point we can then cumulate net saving in each year to provide a measure of wealth at the end of each year, on the assumption that there are no capital gains or losses; in other words this assumes that the price of the assets in which the nation's wealth is invested move in line with the GDP deflator. This results in a synthetic series for wealth as a multiple of GDP shown in Figure 3. The terminal figure for wealth as a multiple of GDP calculated in this way is 2.39 in 2007.

Actual wealth for 2007 is as shown in Table 4

Table 4 Produced Wealth in 2007

Asset value at end of 2007	£bn
Stocks and Work in Progress	229
Net Fixed Capital Stock	2926
Net Foreign Assets	-382
Total National Wealth	2773
GDP at Market Prices	1401
Wealth to GDP ratio	1.97

Source: Blue Book(2008)

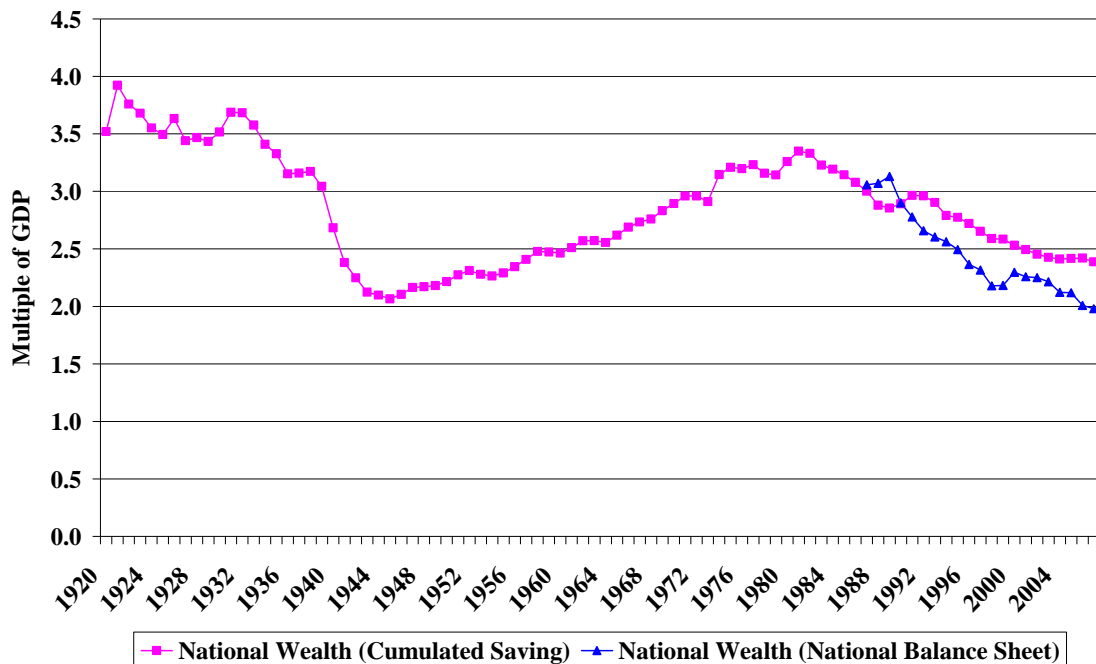
The result is not exactly the same as that calculated by cumulating saving, but it is sufficiently close to regard the pattern shown by the wealth to GDP line in figure 1 as informative and the conclusions are striking. The shorter series which is calculated from annual national balance sheet data has fallen slightly faster than the line constructed by cumulating saving. Much of the relative decline occurred between 1990 and 1992 when there was a sharp fall in the price of buildings relative to other prices. This fall is reflected in the national accounts data but not in the series calculated by cumulating saving.

First of all we note that national wealth, relative to income, has not regained the levels observed between the end of the Great War and the depression of the 1930s. This is in

itself noteworthy because one might expect that Great War, like the Second World War would have been a period of low saving. The recovery of the mid 1930s was a period when saving, although higher than during the depression, was not high enough to maintain the ratio of wealth to income; the “lost saving” of the depression was not made up.

When normal economic activity was restored after the Second World War and the crisis of 1948 the savings rate was quite high and indeed rose until the first oil crisis/recession of 1974. In essence the economy was making up for the lost time of the Second World War. The 1938 ratio of wealth to income was reached in 1975 and maintained or exceeded until 1984. But the ratio of national savings to GDP declined after this and as a consequence the ratio of wealth to GDP has been falling. On the measure shown here it is at its lowest since 1956.

Figure 3 Cumulated Saving as an Indicator of National Wealth: 1920-2007



Thus a reasonable conclusion is that Britain’s savings behaviour since the mid 1980s has taken the ratio of national wealth to GDP to a level last seen as a consequence of the cost of fighting the Second World War.

The Sectoral Composition of Saving

As our earlier discussion made clear, national saving can be broken down into component parts- saving by households, by financial and non-financial companies and by the government. On the current national accounting basis, data are available which show this

back to 1987 while Sefton and Weale (1995) make data available on the pre-1997 sector composition from 1948. We present five-year averages from 1950-1989 on the old basis in Table 5 and ammu; data from 1987 onwards on the new basis in Table 6.. In both cases the data are shown as percentages of GDP at market prices.

Table 5 Sectoral Contributions to Overall Saving: 1950-1989 (% of GDP)

	Personal Sector	Company Sector	Public Corporations	General Government	Total Net Saving
1950-54	1.91%	6.40%	-0.76%	1.69%	9.24%
1955-59	4.15%	5.23%	-0.28%	1.15%	10.25%
1960-64	4.52%	4.07%	-0.21%	3.83%	12.22%
1965-69	4.81%	6.29%	-0.71%	3.13%	13.52%
1970-74	6.21%	7.32%	-0.53%	-1.26%	11.74%
1975-79	5.46%	4.24%	-0.34%	-1.91%	7.44%
1980-84	2.01%	4.89%	-0.12%	-0.15%	6.64%
1985-89	3.32%	2.03%	-0.32%	1.44%	6.47%

Source: Sefton and Weale (1995)

The most striking feature of the 1950-1989 period is the movement in personal sector net saving, from a low at the start of the 1950s as people adjusted to the end of rationing, to a high in the early 70s and then a sharp decline in the 1980s. One factor behind this may have been the ending of credit controls in the 1980s. However, company saving was also generally lower after 1975 than it had been earlier and the contribution from the government was generally lower in the 1980s and 1980s than it had been in the 1960s. It was only in the late 1980s that high levels of government revenue led to positive saving once more.

Table 6 Sectoral Composition of Saving: 1987-2007

	Non-financial Cos	Financial Cos	House- holds	All Private	Govern- ment	National Saving	Gross National Saving
1987	4.2%	0.5%	0.6%	5.2%	-1.0%	4.1%	17.3%
1988	3.9%	0.4%	-0.6%	3.7%	0.7%	4.4%	17.3%
1989	1.8%	0.4%	0.8%	3.0%	1.5%	4.5%	17.3%
1990	0.3%	-0.1%	2.5%	2.6%	0.7%	3.3%	16.4%
1991	-0.5%	-0.5%	4.2%	3.2%	-1.2%	2.0%	15.4%
1992	-0.4%	0.4%	5.7%	5.7%	-4.6%	1.1%	14.3%
1993	1.6%	0.5%	5.1%	7.2%	-6.1%	1.2%	14.0%
1994	3.3%	1.1%	3.8%	8.3%	-5.1%	3.2%	15.7%
1995	2.9%	0.4%	4.6%	7.9%	-4.1%	3.8%	15.9%
1996	3.3%	0.2%	3.9%	7.3%	-3.2%	4.1%	16.1%
1997	3.5%	-0.2%	3.9%	7.2%	-1.6%	5.6%	17.1%
1998	4.2%	-0.3%	2.3%	6.2%	0.6%	6.7%	18.0%
1999	3.4%	-1.2%	0.6%	2.8%	1.5%	4.4%	15.7%
2000	3.7%	-2.0%	0.1%	1.8%	1.9%	3.6%	15.0%
2001	3.4%	-1.8%	1.0%	2.6%	1.5%	4.1%	15.4%
2002	4.4%	0.7%	0.0%	5.1%	-1.1%	4.0%	15.3%
2003	4.9%	1.2%	0.3%	6.3%	-2.2%	4.1%	15.1%
2004	5.2%	1.5%	-0.8%	5.9%	-2.2%	3.7%	15.0%
2005	5.2%	0.4%	0.0%	5.6%	-2.1%	3.6%	14.6%
2006	5.0%	0.0%	-0.9%	4.1%	-1.1%	3.0%	14.2%
Correlation with net national saving	0.549	-0.130	-0.380	0.012	0.541	1.000	

In the more detailed data from 1987 we can see that non-financial companies are the most important source of saving while household saving (broadly comparable to personal saving in the earlier table) falls to around zero both in the late 1980s and from 1999 onwards. Compared with the high saving period of the 1960s, we have, in the period from 1999 onwards low saving by both the government and the personal sector. Corporate savings levels are also somewhat lower.

At the foot of the table we show the correlation between the saving of each sector and overall saving in the economy. Here it is striking that household saving is negatively correlated with overall saving. Thus household saving over the last twenty years has been a perverse indicator of the extent to which the economy as a whole is making provision for the future. This does not, of course, mean that any policy intended to encourage household saving will reduce overall national saving; it merely summarises the

relationships between the data over the last twenty years; with a changed focus to policy these relationships should be expected to change. In any case the correlation measures the relationship between short-term movements. If average household saving were increased, through policy measures, by say 2 per cent of GDP, but nothing else changed, national saving would increase by a similar amount. But in the twenty years following the increase, there would still be a negative correlation between household and national saving. Comparing average household saving for the countries shown in Figure 1 with the rates of national saving shown there, we find a positive correlation of 0.4.

Corporate saving does, of course, consist of retained profits which might be used to finance investment, repay debt or simply to build up cash reserve and which might otherwise be distributed to households. Such saving could be regarded as taking place on behalf of the households that invest in the companies, but even with this very reasonable view of corporate saving, it remains the case that in recent years most saving has been done on behalf of households rather than by households.

One might expect that profit retention by corporations, which is what saving amounts to, would be reflected in share prices. This might lead to the suggestion that household savings figures could be “corrected” by the inclusion of capital gains on shares as a way of identifying the impact of retained profits. But share prices move for all sorts of reasons, of which profit retention is only one, and, as we have seen earlier, we would probably not want to include other such changes with saving. Rather than attempt to correct household saving for profit retention, it is a better idea to aggregate household and corporate saving to give total private sector saving.

One might see household survey data, as collected in the Expenditure and Food Survey and formerly in the Family Expenditure Survey as an alternative source of information of information on income and expenditure and estimates of saving. However, as the Appendix explains, the coverage of this is rather different from the national accounts, and the ratio of consumption as measured in the EFS/FES to consumption as reported in the national accounts has declined sharply in recent years. As a corollary it follows that savings patterns have been very buoyant. But in the absence of a full reconciliation between the EFS and the national accounts measures of consumption it is not safe to conclude that this offers a more accurate view of the recent savings habits of the British economy.

Hicksian Saving

As the definition of saving provided by Hicks suggests, an alternative way of looking at saving is to measure it simply *ex post* as the increase in the real value of wealth. This can be computed from the national and sectoral estimates of net worth and is shown in Table 7. The measure of saving is defined as

Closing net worth \times Opening price level/closing price level – Opening net worth.

The balance sheets provide figures for end of year net worth. We measure the price level using the final consumption deflator. This is computed from public and household consumption taken together. The official data are annual averages; we compute end-year figures as the average of the figures for the two adjacent years.

Table 7: Hicksian Saving by Sector: 1987-2007

	Non- financial Cos	Financial Cos	House- holds	All Private	Govern- ment	National Saving
1988	76.2%	2.3%	57.9%	136.4%	10.0%	146.4%
1989	-17.1%	-0.7%	20.2%	2.4%	4.4%	6.7%
1990	-9.4%	-4.8%	-27.2%	-41.3%	-5.2%	-46.5%
1991	-12.7%	1.8%	-7.3%	-18.2%	-5.8%	-24.0%
1992	-6.1%	-1.6%	-9.1%	-16.8%	-13.6%	-30.3%
1993	-7.0%	-5.8%	37.2%	24.4%	-9.5%	15.0%
1994	15.7%	1.1%	-21.4%	-4.7%	-0.9%	-5.6%
1995	-13.7%	-9.6%	17.2%	-6.1%	-5.0%	-11.1%
1996	-6.2%	-3.9%	20.3%	10.2%	-2.4%	7.7%
1997	-16.3%	-15.2%	48.9%	17.4%	-2.5%	14.9%
1998	-11.0%	-9.4%	33.1%	12.8%	-1.0%	11.8%
1999	-28.1%	-6.2%	60.3%	26.0%	3.3%	29.3%
2000	16.5%	2.2%	13.3%	32.0%	6.0%	38.0%
2001	19.6%	-1.0%	-16.1%	2.5%	6.6%	9.1%
2002	32.7%	9.2%	3.8%	45.7%	-0.8%	44.9%
2003	-8.0%	3.5%	30.7%	26.2%	1.4%	27.6%
2004	-4.3%	0.0%	27.6%	23.3%	0.8%	24.1%
2005	-21.4%	-4.5%	25.5%	-0.4%	1.3%	0.9%
2006	-9.4%	1.3%	29.2%	21.1%	1.0%	22.1%
2007	-1.3%	-1.8%	30.9%	27.8%	0.5%	28.3%
Correlation with National Accounts Measure	0.15	0.15	-0.23	0.09	0.70	0.38

It is clear that the numbers are very different from those of Table 6. It is hard to believe that the increase in net worth between the end of 1987 and the end of 1988 is correctly measured. But looking beyond this, the figures are much less stable than those produced from the flow data. This reflects the fact that they are largely driven by capital gains and losses. With the exception of the government sector the correlations with the flow measures are low. The negative correlation for households could be a consequence of households regarding capital gains as a substitute for saving.

But it is not possible to say whether these figures are better or worse than the figures from the flow data without giving some thought to the purpose of measuring saving. The more appropriate figure is that which is more suited to the required purpose.

Savings Needs

A Simple Framework for Savings Adequacy

A simple framework for savings adequacy can be constructed by examining what level of saving is necessary to keep the ratio of wealth to GDP constant. This can be set out using simple algebra. If g is the growth rate and w is the wealth to GDP ratio, then the savings rate needed for the growth rate of wealth to be the same as the growth rate of income is

$$s = gw$$

Thus with the wealth to GDP ratio of 2 at the end of 1997, and a trend growth rate of 2½% p.a. the required savings rate is 5% of GDP. Alternatively, with the average savings rate of 3.7% in the UK over the period 2002-2006, the ratio of wealth to income will eventually fall to 1.5 times

This simple approach is, of course, open to criticism. Since it does not say what saving is for it is not possible to conclude whether capital gains should be included or not. If, as above, the calculations are performed only with produced wealth excluding land, then the only capital gains included would be those arising from movements in the production costs of capital goods relative to consumption goods.

The most one can say using this framework is that the aim of holding the ratio of wealth to GDP constant over time, is probably desirable in an economy believed to be in a steady state. But much of the current concern over saving arises from the fact that the economy is not in a steady state; instead it has to address the problem of an ageing population. Unless there are good reasons for thinking that the existing stock of wealth is “too high”, or we expect the duration of working lives to increase at a faster rate than adult life expectancy, this means we should expect to see the ratio rising rather than falling.

Intergenerational Equity and Savings Adequacy

An alternative view of saving needs can be based on the premise that each cohort should expect to pay its own way, albeit with possibly considerable redistribution between different individuals in each cohort. Such a proposition has a clear ethical appeal, although it should also be mentioned that there is a powerful argument against it; this is that technical progress makes it likely that future generations will enjoy higher living standards than those currently alive and that it therefore makes sense to set up a structure

whereby future cohorts are required to transfer resources to their predecessors. But even if transfers between cohorts are to be implemented, it makes considerable sense to identify, as a base-line, the amount of saving which would be required if there were no net transfers between cohorts. Thus, in any series analysis of savings adequacy, an analysis structured round the assumption of no intergenerational transfers is required as a reference point, whether it is implemented or not.

Such an analysis is inevitably based on forecasts. Saving is about provision for the future and the necessary provision depends on both forecast future income and forecast future spending plans.

A key point of the analysis is that allocates consumption to individuals whether that consumption is paid for by them, provided on an individual basis by the state (as with health services) or is carried out collectively, for example as with policing and defence. Consumption is measured net of taxes on consumption goods since the latter serve to finance public spending but do not themselves represent a use of the nation's resources³

Income is allocated similarly, with employment income attributed to the people who are employed whether they received it or it is collected in taxes or retained as employers' pension contributions. The property income earned on the wealth accrued if these individuals' incomes are higher than their consumption is similarly attributed to them, whether it accrues on their own savings, to pension funds from which they expect to benefit or to firms in which they own shares.

In any study of this type there is a question how mortality is handled. The simplest assumption is that wealth is annuitized, i.e. that the assets of those who die accrue to the survivors in the same cohort. This does not, of course, rule out legacies or prevent people leaving assets to their descendents. But it is plain that if each cohort wishes to pay its own way and leave resources to its descendents then, for any given level of income, saving will have to be higher than if it did not plan to leave such legacies.

The treatment of land needs careful treatment in this analysis. Seen from the perspective of intergenerational equity, it is plain that the notional first cohort must have acquired land for nothing. Thus intergenerational equity requires that land should be bequeathed to future cohorts rather than sold to them. Predominantly for this reason, calculations of savings adequacy made in this framework can give results very different from those which look at whether particular households can afford given levels of consumption in retirement. This is not to say, however, that current cohorts derive no benefit from land. The rent on land is income which they can use to finance consumption and the figures

³ For example, if consumption taxes are used to pay for health spending, then the tax component of consumption is as health consumption. It would be double-counting also to include it as consumption paid for directly by individuals.

produced subsequently were calculated on the assumption that the rent on land was spread equally across the adult population.

Forecasts of both consumption and income as functions of age have to be derived from current and historic observations. Deaton (1997) pointed out that, provided these are observed in several years (at least three) it is possible to produce age profiles which are separated from cohort effects and age effects. But his approach requires the age and cohort effects to be stable over time, a proposition rejected in analysis of the Family Expenditure Survey/Expenditure and Food Survey over the period 1971-2007. An average of the three most recent annual cross-sections tends to offer better predictions than does Deaton's approach, at least in producing forecasts of consumption as a function of age. Nevertheless, these average cross-section profiles have to be tilted to allow for continuing economic growth, i.e. that a current twenty-year old when fifty expects to consume more than does a current fifty-year old. FES/EFS data might in principle enable us to identify the relevant trend rate of growth. However, as the appendix shows, consumption estimated from these surveys has declined relative to consumption as indicated in the national accounts. Until the reasons for this are established it is probably more satisfactory simply to explore the implications of different growth rates for savings requirements.

This approach does not make it possible to say how much the country needs to save at the moment without further assumptions. The amount of saving needed to finance the future consumption of the current adult population depends on how much they have saved in the past. As noted earlier, if that amount of wealth is inadequate to sustain the current consumption profile, i) labour income must be increased by working longer ii) some transfer must be made from future generations or iii) future consumption of those currently alive must be reduced below the levels implied by observed consumption profiles. . If neither of the first two solutions is adopted, the choice is between lower consumption in the immediate future and lower consumption further in the future and the implications for current saving depend on the choice which is made.

One possible choice is to reduce all future consumption by the same percentage. If inter-temporal balance is calculated in this way it is, of course, possible to calculate how much saving needs to be; the absolute rise in saving is simply the absolute reduction to consumption. This provides the most obvious basis for a calculation of required saving given past wealth accumulation.

This calculation is, in principle, age-specific. It is perfectly possible that, some adult cohorts have accumulated the wealth that they need to finance their consumption plans while others have not. We are not really in a position to observe the amount of wealth held by each individual cohort; by contrast the national balance sheet tells us about the overall stock of produced wealth owned by the country. Thus, while we cannot identify

how much each individual cohort needs to change its consumption pattern, we can identify how much all adult cohorts taken together need to change their consumption in response to a shortfall of overall wealth.

We can, furthermore, assume that the youngest cohort owns no wealth, and needs to finance all of its consumption out of labour income if it is not to burden future generations. Thus, for this cohort, we can work out how much the observed consumption profile, adjusted for trend growth, needs to be scaled up or down to ensure that the youngest cohort just meets its inter-temporal budget constraint. Separately from the required average savings rate we can therefore identify the savings rate of young people consistent with this.

Table 8 presents the results of these calculations using data for 2005 for different assumptions about the real rate of return and the underlying *per capita* growth rate of the economy. The results show the sensitivity of the calculations to the underlying assumptions about growth rates and the real interest rate. At the same time they point to a substantial need to reduce consumption unless the real interest rate is high and the rate of productivity growth is low. In interpreting these figures it may be helpful to note that UK GDP per hour worked grew by 2.5% p.a. over the period 1973-1995 and 2.2% p.a. over the period 1995-2004 (Crafts, 2007). Khoman and Weale (2008) estimated the real rate of interest in the UK to be 4.4% p.a. averaged over the period 1989-2006.

Table 8 Affordable Consumption as a Proportion of Actual Consumption in 2005

	Per capita Growth Rate			
Real interest rate	0.5% p.a.	1% p.a.	1.5% p.a.	2% p.a.
Affordable Consumption of Twenty-year olds as Proportion of Actual Consumption				
4% p.a.	0.948	0.922	0.893	0.860
5% p.a.	0.996	0.976	0.953	0.927
Affordable Consumption of Current Adult Population as Proportion of Actual Consumption				
4% p.a.	0.977	0.934	0.888	0.839
5% p.a.	1.069	1.029	0.988	0.943

If the current adult population makes the proportionate adjustment to its consumption as shown in Table 8 then net saving as a proportion of GDP would take the values shown in Table 9

Table 9 Net Saving as a Percentage of GDP associated with Affordable Consumption (2005 data)

	Labour Income Growth Rate			
Real interest rate	0.5% p.a.	1% p.a.	1.5% p.a.	2% p.a.
4% p.a.	6.3%	9.5%	12.9%	16.5%
5% p.a.	-0.6%	2.4%	5.4%	8.8%

These results indicate that, unless the rate of return is high and growth expectations are low, the savings rate needs to be substantially above the value of 4.5% of GDP it took in 2005.

The focus of this analysis on the idea that each cohort should finance its own consumption means that account should be taken of capital gains only insofar as they do not arise at the expense of future cohorts. This obviously excluded capital gains on land and those other gains which arise from movements to rates of return.

Conclusions

Overall saving by all sectors of the economy has not, hitherto, been a focus of UK policy. Over the last twenty years the UK has saved the lowest share of its income of any advanced economy. Since saving is one of the determinants of future income, the likely implication of this very low saving is that future income and thus future consumption will be adversely affected.

In recent years saving in the UK has also be low by comparison with earlier peace-time periods and saving has been too low for wealth to grow in line with GDP. Thus, while the ratio of produced wealth to national income had recovered from the effects of the Second World War by the mid 1970s, it has declined steadily since the mid-1980s.

The consequences of low levels of saving are reflected in calculations of the extent to which current patterns of consumption are affordable if current generations aren't to rely on transfers from future generations. With a real interest rate of 4% p.a. and a growth rate of 1 ½ % p.a., current overall savings rates suggest that today's twenty-year olds can afford only 89.3% of their current consumption while the UKs adult population as a whole can afford only 88.8% of its actual consumption. This problem can be resolved only by raising labour income (through increased employment rates or longer working lives) or by relying on transfers from younger generations.

These figures are based on 2005 data. Given that it is generally accepted that sustainable output has fallen as a result of the events associated with the financial crisis by around 5% of GDP (HM Treasury 2009, Kirby, Barrell and Pillonca, 2009, Weale, 2009), the adjustment likely to be needed is probably rather larger than these figures suggest.

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Appendix 1: Capital Gains and Discount Rate

We present here a number of examples to put in an appropriate context the effects of capital gains arising from changes to discount rates, identifying the impact on consumption opportunities.

The first example assumes that an investor holds a plot of land which pays a rent of £100 p.a. At a discount rate of 5% p.a. the capital value of the land is £2000. If the discount rate falls to 2 ½ % p.a. , then the value of the land rises to £4000. Using a conventional balance sheet structure this appears as increased net worth

Table 10 A Simple Balance Sheet with Land Discounted at 5% p.a.

	Assets		Liabilities
Land	2000		
		Net Worth	2000
Total	2000		2000

Table 11 The Impact of a Reduction in the Discount Rate to 2 ½ % p.a.

	Assets		Liabilities
Land	4000		
		Net Worth	4000
Total	4000		4000

But the balance sheet as conventionally presented is incomplete. In a comprehensive balance sheet all sources of capitalised income and expenditure are shown and, with discounted consumption as the residual, total assets equal total liabilities. This is shown in a balance sheet which treats future consumption as a liability. If the discount rate used to compute capitalised income falls, so too should the discount rate used to capitalise expenditure. Net worth is now zero.

Table 12 The Balance Sheet with Discounted Consumption as a Liability

	Assets		Liabilities
Land	2000		
		Consumption Stream (£100 p.a.)	2000
		Net Worth	0
Total	2000		2000

The effect of the change to the discount rate can now be seen. Assets and liabilities rise in line, so there is no gain in net worth. The comprehensive balance sheet position has not improved since net worth remains zero as is shown below.

Table 13 The Impact of the Discount Rate Falling to 2 ½% p.a. with Consumption as a Liability

	Assets		Liabilities
Land	4000		
		Consumption Stream (£100 p.a.)	4000
		Net Worth	0
Total	4000		4000

This is, however, a feature of the fact that the infinite income stream arising from land is matched against an infinite consumption stream. Suppose, instead an individual had a horizon of thirty years⁴. The value of the land can be spent gradually over this period making consumption of £123.91 p.a. possible

Table 14 A 30-year Consumption Stream as a Liability and a Discount Rate of 5% p.a.

	Assets		Liabilities
Land	2000		
		Consumption Stream (£123.91 p.a.)	2000
		Net Worth	0
Total	2000		2000

The affordable level of consumption (giving zero net worth) is now £123.91 p.a.

If the discount rate falls to 2 ½ % p.a. the value of the land is doubled as before, The discounted value of consumption also increases, but by less, to £2658, so that some net worth now appears. Alternatively consumption could be set at a higher constant rate. If the aim were to deplete the initial stock of wealth over thirty years as well as spending the rent, consumption of £186.48 p.a. could be afforded.

⁴ E.g. a man aged 55 in 2009 according to the Government Actuary cohort life tables.
http://www.gad.gov.uk/Demography_Data/Life_Tables/Eoltable06.asp

Table 15 A 30-year Consumption stream as a Liability with a Discount Rate of 2 ½% p.a.

	Assets		Liabilities
Land	4000		
		Consumption Stream (£123.91 p.a.)	2658
		Net Worth	1342
Total	4000		4000

In this context capital gains have resulted in increased affordable consumption because the time horizon of the consumer is shorter than the horizon over which land delivers and income. The gain is in effect made at the expense of the future generations to whom the land must be sold as the current owner draws down wealth. Thus, while an individual might regard it as a gain, a government which is concerned about future generations would be less likely to.

Appendix: Saving in the National Accounts and the Expenditure and Food Survey

In principle one might expect there to be a close relationship between the estimates of household (but not national) saving produced in the national accounts and information on income and expenditure contained in the Expenditure and Food Survey or its precursor, the Family Expenditure Survey. There are, however, a number of important differences.

On the income side:-

1. Imputed rent on owner-occupied housing is included as income in the national accounts but not in the EFS. It used to included in income reported in the FES until 1992.
2. The concept of disposable income in the national accounts is net of interest and Council Tax paid by households. The EFS figure is gross of these (to be confirmed by DWP).
3. The increase in equity of pension funds⁵ is treated as a category of resources different from household disposable income but which is added to income before consumption is deducted to give saving in the national accounts

On the expenditure side⁶:-

1. Non- life insurance - EFS asks for details of premiums paid, whereas the national accounts are only interested in the "management charge" (premiums less claims)
2. Life assurance - Again all that HE covers is the management charge whereas EFS includes the whole payment.
3. Financial services - The treatment of these are different. Expenditure on Financial intermediation services indirectly measured (FISIM) is not part of the EFS.
4. Games of chance - HE expenditure is defined as the amount staked less the amount returned in winnings - the EFS only records stakes/
5. Purchases of second-hand vehicles. HE is only interested in the margin between the buying and selling of vehicle if the sale is between households (since they cancel each other out). The EFS would record the total amount spent on such a vehicle.
6. Cars in kind. Households do receive goods and services as income-in-kind in lieu of cash. Use of company cars for private purposes is a good example of this. Again not covered by the EFS.
7. Package holidays - EFS records the total amount spent on package holidays whereas the HE only records expenditure made in the UK eg air fares. Expenditure on accommodation abroad is treated as household expenditure abroad.

⁵ Employers' contributions are treated as a component of household income before deductions, but are taken off in order to arrive at gross disposable income.

⁶ This information was kindly provided by Ann Harris of the Office for National Statistics.

8. Household expenditure like all GDP components may be required to take on adjustments as part of the GDP balancing process. EFS would not be subject to such adjustments.

Separately it must be remembered that the FES and EFS are designed to represent the circumstances of the population. The skewed nature of income and, even more, of saving, means that relatively few households are likely to be responsible for much overall saving. As a consequence estimates of saving from the FES/EFS are likely to be particularly inaccurate. Or, to put the point a different way, saving is the difference between two large numbers, income and consumption which are approximately equal. Small errors in these translate to large relative errors in the measurement of saving.

Nevertheless it can be instructive to compare the various elements from the FES/EFS with the superficially corresponding figures in the national accounts. The FES/EFS was run on a financial year basis from 1993/4 until 2005/6. The FES provides grossing factors allowing users to produce estimates of the variables for the household sector as a whole only from 1997/8 and our comparison therefore starts then. We compare the data for these years with those from the national accounts on the same financial year basis. For 2006 and 2007 we make comparisons on a calendar year basis.

The variables of interest to us from the two sources are presented in Table 16. It is not very surprising, given the points made above, that the ratios are some way from one. It is also not very surprising that for Council Tax/other taxes the discrepancy is both stable and not very large. A survey would be likely to collect information on council tax payments fairly reliably. The relationship between the two estimates of interest paid is fairly stable until 2007 and the same is true of the two measures of disposable income.

However there is a substantial divergence with consumption figures which increases over the period shown. If one gives any degree of credence to the EFS the implication is that the national accounts have substantially overstated the growth of consumption during the period.

If this were true it would have the following implications

1. Either investment by households and small businesses would have been much larger than the national accounts show or the financial deficit of the household sector would have been much smaller- or replaced by a surplus.
2. If the latter is true the implication is that there would have to be a much larger deficit incurred by some other sector, implying that its income was lower or its spending was higher than the national accounts show.
3. Alternatively there would be a large discrepancy in the national accounts; total income would be very different from total expenditure.

There is limited support for the third point. In 1997 identified income of households shown in the national accounts fell short of identified expenditure (including investment and net acquisition of financial assets) by £2546mn; this figure fluctuated. In some years identified income exceeded identified expenditure, e.g. by £9557mn in 2003. But in

2007 expenditure exceeded income by £9730mn or 11% of consumption. Thus there are obviously substantial errors in the components of the household component of the national accounts.

The general view is, however, that these discrepancies arise mainly in that it is not easy for national accountants to identify fully financial transactions rather than because flows of income or goods and services are badly mismeasured. If the problem lay in the measurement of incomes and expenditures rather than financial flows then there would be a substantial discrepancy between GDP measured in terms of the components of income and the categories of expenditure. This overall discrepancy was only £695mn in 2007. Thus, for consumption to be much lower than the national accounts show, to would be necessary either that some other category of expenditure was much higher or that some category of income, wages, profits or the revenue from net indirect taxes was much lower than the national accounts show, and the error would have to be appreciably larger than the limited information on the reliability of the national accounts suggests (Sefton and Weale, 1995, p.176).

Further light would be shed on the factors behind the discrepancy by means of a reconciliation between the FES/EFS data and the figures produced in the national accounts, but that can be provided only by the Office for National Statistics.

Table 16 Comparison of Income and Consumption from the Expenditure and Food Survey/National Expenditure Survey and the National Accounts

Data from Family Expenditure Survey/Expenditure and Food Survey

	Code	1997-8	1998-9	1999-00	2000-1	2001-2	2002-3	2003-4	2004-5	2005-6	2006	2007
Mortgage interest/principle - interest paid	B150	7813	10708	11395	14746	17578	19384	22173	28106	30288	n/a	37343
Mortgage interest only - last payment	B130	17590	19473	16859	17612	14768	11645	8815	8571	8706	8834	9638
Council tax -gross weekly amount payable	B028p	14826	16314	18812	18696	19975	20982	23560	25042	27021	27813	28271
Total expenditure - (national accounts)	P560tp	394564	414630	438156	449968	441311	443191	456555	467839	479216	489750	498977
Normal weekly disposable household income-anonymised	P389p	446562	475480	515105	532562	578162	574052	595289	621361	645137	635480	669032
Savings Ratio		11.6%	12.8%	14.9%	15.5%	23.7%	22.8%	23.3%	24.7%	25.7%	22.9%	25.4%

Data from National Accounts

	Code	1997-8	1998-9	1999-00	2000-1	2001-2	2002-3	2003-4	2004-5	2005-6	2006	2007
Interest paid	ABRE	29905	32736	30753	37591	31220	31679	33141	45886	46329	49046	66157
Other taxes	NVCO	16223	17688	18916	19696	21569	23194	25795	27422	28808	29831	31610
Consumption	ABRE	541196	577332	614960	646441	681641	714456	751587	783633	819602	846868	894839
Disposable income	QWND	578713	601553	633698	667172	707327	732438	765708	786881	828859	852443	874164
Savings Ratio		6.5%	4.0%	3.0%	3.1%	3.6%	2.5%	1.8%	0.4%	1.1%	0.7%	-2.4%

Ratio National Accounts/FES

Mortgage Interest		1.18	1.08	1.09	1.16	0.97	1.02	1.07	1.25	1.19		1.41
Council Tax		1.09	1.08	1.01	1.05	1.08	1.11	1.09	1.10	1.07	1.07	1.12
Consumption		1.37	1.39	1.40	1.44	1.54	1.61	1.65	1.68	1.71	1.73	1.79
Disposable Income		1.42	1.40	1.35	1.39	1.35	1.40	1.42	1.41	1.43	1.42	1.47

Note:

1. The FES data are grossed up and then multiplied by 52 to give annual estimates.
2. The figure for interest paid in the national accounts covers all interest and not just mortgage interest paid.
3. "Other taxes" covers all current taxes paid by households apart from income tax and not just council tax.
4. The comparison of disposable income is achieved by comparing normal weekly household disposable income from the FES/EFS less both identified types of interest and council tax with the national accounts data.

