

# Factor shares: the principal problem of political economy?

A. B. Atkinson\*

**Abstract** This paper identifies three reasons for studying factor shares: to make a link between incomes at the macroeconomic level (national accounts) and incomes at the level of the household; to help understand inequality in the personal distribution of income; and to address the concern of social justice with the fairness of different sources of income. In each case, I explore the implications and point to ways in which the analysis could be taken forward in a twenty-first-century treatment of the classical problem of political economy.

**Key words:** factor shares, wages, profits, distribution

**JEL classification:** E25

## I. Introduction

In his last paper, a chapter in the *Oxford Handbook of Economic Inequality*, Andrew Glyn (Glyn, 2009) returned to the subject that had been central to his 1972 book with Bob Sutcliffe, *British Capitalism, Workers and the Profits Squeeze*: the determination of the division of national income by factor shares. In reviewing the literature on the functional distribution of income, he began by asking why we should be interested in how national income is divided between wages, profits, and rent, quoting Mark Blaug: ‘the great mystery of the modern theory of distribution is why anyone regards the *share* of wages and profits as an interesting problem’ (Blaug, 1996, p. 467). It is with this question that the present paper is concerned. I do not attempt to summarize the evidence about changes in factor shares, nor do I explore the different ways (neoclassical or otherwise) in which they might be explained. I am simply asking whether the functional distribution should be on today’s economic agenda. To what questions are studies of factor shares the answer? Should factor shares be on a twenty-first century research agenda or are they a dead subject?

\*Nuffield College, Oxford, e-mail: [tony.atkinson@nuffield.ox.ac.uk](mailto:tony.atkinson@nuffield.ox.ac.uk)

Helpful comments on earlier versions were provided by Wiemer Salverda, the referees, and participants in the September 2008 Workshop on Inequality, Politics and Unemployment that formed part of the Celebration of Andrew Glyn’s Life and Work.

doi: 10.1093/oxrep/grp007

© The Author 2009. Published by Oxford University Press.

For permissions please e-mail: [journals.permissions@oxfordjournals.org](mailto:journals.permissions@oxfordjournals.org)

Factor shares certainly have been of interest to economists in the past. My title harks back to the famous statement by Ricardo that:

the produce of the earth—all that is derived from its surface by the united application of labour, machinery and capital, is divided among three classes of the community, namely, the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the labourers by whose industry it is cultivated. . . . To determine the laws which regulate this distribution is the principal problem in Political Economy. (Ricardo, 1911 [1817], p. 1 in 1911 edition)

And this interest continued in the twentieth century. The constancy of factor shares featured among Kaldor's stylized facts of economic growth (Kaldor, 1961). Economics textbooks of the 1960s gave prominence to factor shares, and the same was true in academic research. As Andrew notes in his *Handbook* chapter, the International Economic Association conference on income distribution in the mid-1960s focused heavily on factor shares, which were the subject of six of the seven theoretical chapters and five of the six empirical chapters (Marchal and Ducros, 1968).

Since the 1960s, factors shares have been downplayed. The textbooks no longer give them much space. The books assigned for courses in macroeconomics seem happy to comment on the relative constancy of factor shares and to draw the conclusion that they can be explained by factors of production being paid their marginal products with a Cobb–Douglas aggregate production function. To quote one widely used text,

Paul Douglas [noticed that] the division of national income between capital and labour had been roughly constant over a long period. . . . More recent US data are also consistent with the Cobb–Douglas production function. . . . Despite the many changes in the economy over the past four decades [the] division of income is easily explained by a Cobb–Douglas production function. (Mankiw, 2007, pp. 55–8)

Equally, those concerned with the personal distribution have emphasized that there is no direct link with factor shares:

Adam Smith, Ricardo, and Malthus took it for granted that landlords were rich, labourers were poor, and capitalists were somewhere in the middle. . . . Much of the discussion of the problem of distribution is still carried on in these terms, despite the fact that it is well known that many landowners are poor, many employees earn more than some capitalists, many property-owners work and many workers own property. (Lydall, 1968, p. 2)

Factor shares are, however, making a comeback. There has been a flurry of recent papers, with titles such as 'Explaining movements in the labour share' (Bentolila and Saint Paul, 2003), 'Getting income shares right' (Gollin, 2002), 'Falling wage shares in Europe and the United States' (Serres *et al.*, 2001), and 'Did wages reflect growth in productivity' (Feldstein, 2008). Factor shares have attracted the attention of international organizations: IMF (2007); the European Commission (2007); and the Bank for International Settlements (Ellis and Smith, 2007). The answer to the question posed above appears therefore to be 'yes'. Factor shares are on today's research agenda. But why is this? How should this research agenda be taken forward?

In this paper, I identify three reasons for studying factor shares, all three drawing on Andrew's *Handbook* chapter:

- to make a link between incomes at the macroeconomic level (national accounts) and incomes at the level of the household;
- to help understand inequality in the personal distribution of income;
- to address the concern of social justice with the fairness of different sources of income.

In each case, I explore some of the implications and point to ways in which the analysis could be taken forward in a twenty-first-century treatment of the classical problem of political economy. It should be emphasized that the paper is intended only to be *exploratory*; it suggests avenues for future possible research but does not set off down them. It should also be stressed that the three reasons listed above are not the only ones why we may be interested in factor shares. For example, it could well be argued that the shares of profits and of rents provide an indicator of the relative power of different groups. Indeed, the share of capital income is a key variable in the explanation given by Acemoglu and Robinson (2006) for the economic origins of dictatorship and democracy.

To put the issue bluntly, does it matter if the share of labour falls, as has been found to be the case in the majority of recent country studies? Or would we feel differently if the ‘labor compensation share has been remarkably stable since the 1970s’, as Feldstein (2008) argues is the case for the United States? How would we react if we learned that the upward trend in profit shares was largely a statistical artefact associated with the growth of financial services?

## II. From national accounts to household incomes

The first reason for exploring factor shares is that there is at present an evident disjuncture between the macroeconomic measures of economic performance and the perceptions by citizens as to what is happening to their incomes. It may seem strange to make such an assertion in 2009, when both GDP and household incomes are plummeting, so that the connection appears all too obvious. But over the longer-run, the two have often been separated. Governments make statements about the aggregate economy that seem to have little relation to the circumstances of individual households. Improvement in the macroeconomic numbers is simply assumed to imply a commensurate improvement in personal incomes.

It was on these grounds that international institutions were becoming concerned. Globalization was being attacked because the benefits in terms of growth did not seem to have been translated into individuals feeling better off. Even before the economic crisis that started in 2008, European politicians were becoming worried that success in securing economic growth had not been recognized by the population or, more crucially, by the electorate. According to the Eurostat estimates of the growth rate of real GDP per head, the EU15 economies grew by 20.8 per cent over the period 1998–2007. This increase of a fifth in aggregate income did not appear to have been converted into a perceived improvement in household incomes. The same was true of the United States—whose growth performance was often held up as a model—where ordinary people seemed to be no better off than 10 or 20 years ago.

In part, these perceptions stem from the fruits of growth being unequally distributed, to which I turn in section III. As described by Dew-Becker and Gordon (2005) in their article ‘Where did the productivity growth go?’, the gains from US growth have gone largely to the upper part of the income distribution. But, in part, the perceptions that aggregate growth has not benefited the average citizen stem from the failure to make the link between national

accounts, on the one hand, and the receipt of income by individual households, on the other hand.

### (i) Understanding the links between aggregate and household variables

It is this link between national accounts and household incomes that I address in this section. Suppose that one takes the UK national accounts *Blue Book*, and seeks to explain to non-economist neighbours the link between the income they record in their tax returns and the aggregates recorded in the national accounts. To make such a link is quite a challenge. Opening the *Blue Book* is like entering a maze. One sets off with a few apparently recognizable landmarks in the early tables, but on turning the pages one soon becomes unable either to locate the centre or return to the place from which one set out.

In seeking to negotiate this maze, factor shares do, I believe, provide one way of finding one's bearings. It is not surprising that, in seeking to understand the impact of globalization, the IMF (2007) should talk about the global labour supply and the recent trends in labour shares. The source of income—wages, profits, or rent—does have high-street recognition. In passing a supermarket, one can understand that the owners pay wages to their staff, rent to the landlord, and that the residual, when they have paid for the goods, goes to them or their shareholders. Of course, there is no longer any simple correspondence between classes of people and sources of income. Lydall was right in saying that we can no longer identify 'workers' with the receipt of wages and 'capitalists' with the receipt of profits; and pure 'rentiers' may have virtually disappeared. The same person may work for the supermarket, may own some shares in the company, and have part of their pension in a fund that owns the building. They may, therefore, receive parts of all three categories of income. Nonetheless, the sources provide a recognizable starting point. They correspond to different lines in the individual tax return, and we might hope to find counterparts in the lines of the national accounts.

In making the link between national income and the income of the household sector, the breakdown by sources is, indeed, necessary since the different sources raise different issues. Let us start with the compensation of employees, which includes a number of elements that do not enter the pay-packets of workers, such as employer contributions for social security, and employer payments for private pensions, health care, and other benefits. This is of more than footnote importance. In the United States in recent years there has been a marked rise in such payments as a percentage of total compensation. Burtless (2007) shows that, whereas the real average compensation of a full-time worker increased by 5.6 per cent between 2000 and 2005, of this increase 10 per cent went on increased social insurance contributions, 24 per cent on increased employer pension contributions, and 35 per cent on health insurance, leaving less than a third for increased cash wages (Burtless, 2007, Chart 3). Taking a longer-term perspective, Feldstein (2008) estimated that wage and salary payments declined from 89.4 per cent of total compensation in 1970 to 80.9 per cent in 2006 (for the entire economy).

It could be argued that households are being myopic if they completely ignore the advantages they obtain from these employer contributions and benefits. Certainly these items would be included in the Haig–Simons definition of income that has been widely accepted in the public finance literature: 'the sum of (1) the market value of rights exercised in consumption

and (2) the change in the value of the store of property rights between the beginning and end of the period' (Simons, 1938, p. 50). There are, however, two aspects that need to be clarified.

- (a) The first concerns the valuation of benefits where there is no market transaction; this is, of course, a general problem that affects other items, such as the government provision of individual consumption (discussed below). It cannot be assumed that the value to the employee equals the cost to the employer: workers may reasonably apply a discount to income received in kind or in the form of benefits; £1 of income in these forms is not equivalent to £1 in the pay-packet. (There may be a number of reasons why the employer provides the benefit in this apparently inefficient form, including the tax treatment.)
- (b) The second aspect concerns part (2) of the Haig–Simons definition: the distinction between accrual and realization bases for calculating changes in value. On an accrual basis, the change in value is recorded when it occurs; on a realization basis, the change is recorded when a transaction takes place. Where the benefits are deferred, then the two bases may lead to different conclusions regarding *when* the benefit is recorded. This is important in the case of pension funds, to which I return below.

The shares of profit and rent are often treated as a unit, and this is the procedure adopted here, where I consider income from capital assets, although from a number of macroeconomic respects, including issues of sustainability, the distinction is a serious one. When we consider the link between national accounts and household income from capital, the complexities multiply. A simple but important example is provided by the imputed rent on owner-occupied houses. A substantial part of the wealth of households takes the form of housing, often with a counterpart mortgage. Households are almost certainly aware of the interest they pay on their mortgages, regarding this as a deduction from their income, but may not recognize the value of the services provided by their houses (or indeed by consumer durables). Yet an income is imputed in the national accounts, and this imputed rent has formed an increasing proportion of national income. In the UK, the proportion rose by a half between 1990 and 2005.

Accounting for the difference between national and household income becomes more complicated when we take account of the important intervening institutions, including the state, the company sector, and pension funds. To begin with, an important element of household income from savings has no counterpart in the national accounts: the interest paid on the national debt. We may owe it to ourselves, but the household with national savings certificates regards the interest as part of their income. They are also well aware of the taxes that have to be subtracted to finance debt interest and government spending more generally. The latter introduces a new category of household income: the social transfers received and benefits from the government provision of goods and services. Transfers are straightforward from an accounting point of view, but in-kind benefits pose major problems of valuation. As Deaton has noted in his analysis of the divergence between national accounts and household survey data in India (Deaton, 2005), part of the difference lies in the attribution to households of an imputed value of government services. Where households do not share the view that the quantity and quality of public services has improved commensurately with the growth of inputs, this is a further reason for diverging views of economic performance. Again, we need to consider the appropriate concept to enter the definition of household income.

Profits accrue to companies, such as the high-street supermarket envisaged above, but only a part is then paid out to UK households as income in the form of interest and dividends. A substantial part is retained for investment by the company sector. Where these investments pay off in the future, shareholders will benefit in the form of future dividends, and this may be capitalized immediately in the form of increased share prices. Such capital gains, or holding

gains, are not included in national income, but they would be recognized by an income concept that takes account of changes in asset prices (as with the Haig–Simons definition described above). The same applies to assets owned directly by households, notably their houses. With all these assets and liabilities, the difference between accrual and realization is crucial. The reader can immediately see how marking to market would generate a great deal of volatility in measured household income. The hypothetical neighbours to whom the national accounts were being explained might well agree that the national accountants are sensible to ignore capital gains and losses.<sup>1</sup>

A sizeable part of profit and rent income goes to pension funds. The flows in and out of pension funds raise the issue of deferred payments already discussed. On an accrual basis, one would count the dividend and rental income received, together with current employer and employee contributions, as adding to the ‘pension pot’, to which one would add the income received with respect to the assets held. This would point to consolidating the pension and household sectors. Such a treatment would mean that private pensions in payment would not be counted as part of income. On an accrual basis, this would be correct: the pension paid would be exactly offset by an accrued reduction in the value of the pension pot. This accrual basis may, however, be queried on the grounds that households fail to ‘see through the veil’: the receipt of dividends and interest by pension funds may not mean anything to households concerned with their actual cash income. For households, the meaningful income concept may be the receipts of payments from the pension funds in the form of occupational pensions. This points to a realization basis, or to the application of a discount to income that has accrued, but not been realized.

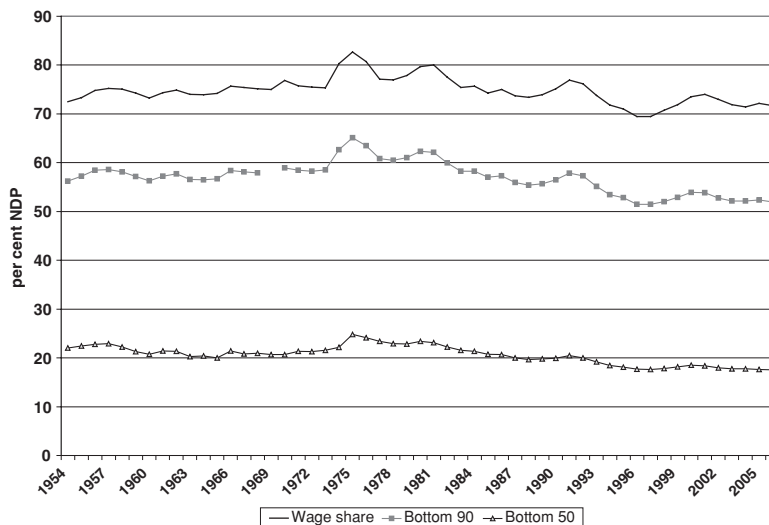
## (ii) Summary

In building bridges between the national accounts and household experience, the factor shares provide, therefore, a valuable starting point. Wage and capital incomes raise different issues. These issues need to be taken into consideration when writing the narrative that links aggregate economic performance to household living standards. But factor shares are only one element in the story. The links need to be interpreted in the light of the intervening institutions and different concepts of income. We cannot draw any direct conclusions regarding the implications of an upward trend in the profit share.

## III. Factor shares and the personal distribution

The link between factor shares and the personal distribution is more complex than in the days of classical economists for two important reasons: people have multiple sources of income (as discussed in section II) and there is considerable inequality within categories of income. Within the labour force of the high-street supermarket envisaged in section II, there are low-paid and well-paid workers, and if we bring in the headquarters and the company directors, the gaps will be larger still. For the economy as a whole, a great deal has been written in recent years on the increased wage dispersion in many OECD countries.

<sup>1</sup> Although they would be less impressed to read that the methods adopted to measure value added in the financial services sector may have meant that half of the reported value added could have been illusory (Weale, 2009, p. 7).

**Figure 1:** Share of wages in UK and share of different groups of workers

*Sources:* The sources for the wage share for 1992–2006 are Blue Book 2007, Tables 1.2 and 1.1 (for capital consumption), and corresponding tables for 1991 (Blue Book 2006), 1990 (Blue Book 2005), 1985 to 1989 (Blue Book 2003), 1984 (Blue Book 2002), 1983 (Blue Book 2001), 1982 (Blue Book 2000), 1981 (Blue Book 1999), 1980 (Blue Book 1998), 1975–9 (Blue Book 1997), 1974 (Blue Book 1996), 1973 (Blue Book 1995), 1971–2 (Blue Book 1993), 1970 (Blue Book 1992), 1969 (Blue Book 1991), 1968 (Blue Book 1990), 1967 (Blue Book 1989), 1966 (Blue Book 1988), 1965 (Blue Book 1987), 1964 (Blue Book 1986), 1963 (Blue Book 1985), 1962 (Blue Book 1984), 1961 (Blue Book 1983), 1960 (Blue Book 1982), 1959 (Blue Book 1981), 1958 (Blue Book 1980), 1957 (Blue Book 1979), 1956 (Blue Book 1967–77), 1955 (Blue Book 1966–76), and 1954 (Blue Book 1965–75). The distributional data are derived from the New Earnings Survey (NES)/Annual Survey of Hours and Earnings and relate to Great Britain. The data cover all workers: men and women, youths and girls, full-time and part-time. The sample used includes only those whose pay was unaffected by absence during the survey period. The NES data are linked to an earlier series based on annual principal source Schedule E income published in the Inland Revenue Annual Reports from 1954–5 (see Atkinson and Voitchovsky, 2008).

The effect of such increased wage dispersion was demonstrated in Glyn (2009) by an ingenious calculation of the wage share of the bottom 99 per cent of workers, using the estimates for the USA by Piketty and Saez (2007) of the share of the top 1 per cent. In Figure 1, I show the effect of making a similar calculation for the UK from 1954 to 2006 (based on Atkinson and Voitchovsky, 2008). The starting point is the wage share, calculated as total employee compensation as a proportion of employee compensation + mixed income + operating surplus – capital consumption. This is the upper solid line in Figure 1. The division of the wage share is then based on data for individual earnings drawn from the Annual Survey of Hours and Earnings (previously the New Earnings Survey). These data are not ideal, since they relate to wages and salaries, not total compensation. I am, in effect, assuming that the ratio of wages to total compensation has remained the same across the distribution. But they

provide an indication as to what happened over the period to the shares in total Net Domestic Product earned by the bottom 90 per cent and the bottom 50 per cent of workers. (In contrast to the Piketty–Saez calculations, which relate to tax units, our estimates are for individual workers.)

The impact of distributional change is evident when one considers, not the whole wage share, but that of the bottom 50 per cent of workers. In the Golden Age of the 1950s, when the overall wage share was rising (slightly), the bottom half suffered a reduction in their share: between 1954 and 1964, the wage share rose by 1½ percentage points, but the share of the bottom half of workers fell by 2 percentage points. More recently, the share of the bottom half has been falling since 1975. In 2006, the overall wage share is virtually the same as it was in 1954, but the share of the bottom 50 per cent was lower by 4 percentage points. Given that the share of the bottom 50 per cent in national income is only around 20 per cent, a fall of 4 percentage points is a fall of a fifth. The sources of this fall require further investigation. For example, it may in part reflect the growth of part-time employment. My main point here is that we need, following Andrew’s lead, to combine factor shares with distributional data.

### (i) Introducing capital income

The increase in wage dispersion is an important part of the story, and one that has been much discussed. But to examine overall income inequality, we have to look also at capital income. (Again I combine profit and rent income.) The possible effect of a change in factor shares on the personal distribution may be seen if we consider a simple decomposition of the squared coefficient of variation of income,  $V^2$ , where there are two types of income: wage income (subscript  $w$ ) and capital income (subscript  $k$ ). Denoting the share of capital income by  $\pi$ , we can write the overall inequality as a function of the share, of the inequality of wage income ( $V_w$ ) and capital income ( $V_k$ ), and of the correlation  $\rho$  between wage income and capital income (see Atkinson and Bourguignon, 2000, p. 9):

$$V^2 = (1 - \pi)^2 V_w^2 + \pi^2 V_k^2 + 2\pi(1 - \pi)\rho V_k V_w. \quad (1)$$

If there is an upward trend in the share of capital income, then this does not necessarily lead to a rise in overall income inequality. It may be calculated that for the right-hand side of (1) to increase with the share of capital income, we require that

$$\pi > [1 - \lambda\rho]/[1 + \lambda^2 - 2\lambda\rho]. \quad (2)$$

I have defined here  $\lambda$  as the ratio of the coefficient of variation of capital income to that of wages (i.e.  $\lambda = V_k/V_w$ ). In the case of a pure class system (workers with wages and capitalists with profit income), where the correlation is  $-1$ , the right-hand side is equal to  $1/(1 + \lambda)$ . As noted in Glyn (2009),  $V_k$  is likely to exceed  $V_w$ : ‘despite the spread of “popular capitalism” wealth and especially high-yielding wealth is still extremely unevenly distributed’. So that the critical value of the capital income share where inequality starts to increase is less than half, but it is still positive. In the class model, it is possible in theory, if not likely in practice, that the capital share can fall to a level where a further fall would *increase* inequality. Put differently, the personal distribution of income depends on the income per person, and the implications of a given profit share depend on the number of people among whom it is shared.

In today’s world, where people have both earnings and capital income, the effect on inequality of a rise in the capital share depends on the degree of correlation. Where they



are uncorrelated, a rise in the capital share increases inequality where it exceeds  $1/(1 + \lambda^2)$ , a less tight condition than in the class model. (It is assumed throughout that  $\lambda$  is greater than 1.) Where the correlation is positive, the critical value is reduced still further, and if  $\rho$  is greater than  $1/\lambda$ , an increase in the capital share always increases inequality.

## (ii) A three-factor approach

In order to understand the changes in the distribution of income, it is therefore necessary to look both at capital incomes and at wage dispersion. Suppose that we combine the much discussed model of skilled and unskilled workers with capital in a three-factor model. With capital earning a return  $r$ , units of skilled and unskilled labour earning  $w_s$  and  $w_u$ , respectively, and constant returns to scale in producing output  $Y$ , we may write the cost function as  $c(r, w_s, w_u)Y$ . If we follow what Andrew called, with a tinge of regret, ‘the dominant neo-classical theory’, then the factor prices (and  $Y$ ) are determined by the full employment conditions and a normalization so that the unit cost equals 1 (which means that the wages are in real terms):

$$c_r Y = K \quad (3a)$$

$$c_s Y = AL_s = H \quad (3b)$$

$$c_u Y = L_u \quad (3c)$$

$$c(r, w_s, w_u) = 1. \quad (3d)$$

In these expressions,  $c_i$  denotes the derivative with respect to the  $i$ -th factor price, and  $K$ ,  $L_s$ , and  $L_u$  are the fixed stocks of factors. The variable  $A$  is introduced to represent skill-biased technical change (SBTC) which is the most widely espoused explanation of rising wage dispersion. It should be noted that  $w_s$  denotes the return per unit of  $H$ , so that a skilled worker earns  $w_s A$ , since each skilled worker supplies  $A$  units. A rise in  $A$  increases the effective supply of skilled labour (increases  $AL_s = H$ ) and reduces the return per unit of  $H$ . The wage of skilled workers rises providing that the fall in the return is less than the gain from the rise in  $A$ . If there were no capital, this would require that the elasticity of substitution between skilled and unskilled labour be greater than 1. (If the elasticity is equal to one, the skill-bias cannot be detected.)

This is the standard result, but it is derived for the case where there are only two factors. When we introduce capital, as a third factor, we have to ask what happens to the return to capital as a result of SBTC (the rise in  $A$ ). Has ICT benefited not only skilled workers but also the recipients of capital income? The usual answer is that it depends on the substitutability between capital and the two types of labour, with a general presumption that capital and skilled labour are complementary. Krusell *et al.* (2000), in an article entitled ‘Capital–skill complementarity and inequality’, argue that a key feature of aggregate technology is that the elasticity of substitution between capital equipment and unskilled labour is higher than that between capital equipment and skilled labour. (They distinguish between capital equipment and capital structures.) For this purpose, they make use of a specific production function, assumed to be Cobb–Douglas with respect to capital structures and a nested constant elasticity of substitution (CES) function of the other three inputs (unskilled labour and a CES function of skilled labour and capital equipment). This form is chosen on account of its properties with regard to substitution between factors.

In general, however, we have to examine the patterns of substitutability and complementarity between factors. This, in turn, means that we have to specify how these are measured. Approaching this question via the cost function (and assuming throughout constant returns to scale), it is natural to make use of the Allen definition, where the elasticity of substitution between factors  $i$  and  $j$  is defined by  $c_{ij}c/c_i c_j$ , which is referred to here as  $\delta_{ij}$ . This expression has the merit of being symmetric, but is described by Blackorby and Russell as ‘correct but uninteresting’ (1989, p. 884), since it provides no information about the comparative statics of income shares—which is what interests us here. They argue instead for the Morishima definition  $M_{ij}$ . If we define  $\theta_i$  as the share of factor  $i$  in total cost, then

$$M_{ij} = \theta_i(\delta_{ij} - \delta_{ii}) \quad \text{and} \quad M_{ji} = \theta_j(\delta_{ij} - \delta_{jj}). \quad (4)$$

The effect on the relative shares of factors  $i$  and  $j$  of a rise in the price of factor  $i$  is given by  $1 - M_{ij}$ . This mirrors the two-factor case, but we should note that the definition is not symmetric. If we were to change the price of factor  $j$ , the effect on the relative shares of factors  $i$  and  $j$  is given by  $1 - M_{ji}$ . In general this is different. We cannot in general talk about two factors being complementary without specifying the direction of price change envisaged. Applied to the case of SBTC, we can examine the effect of a rise in  $A$ . If, as in the two-factor case, the rise in  $H = AL_s$  is accommodated by both a rise in  $Y$  and a fall in the return per unit of  $H$ , then either  $w_u$  or  $r$  has to rise according to the unit-cost condition (3d). If the fall in the price of  $H$  has little effect on the demand for capital ( $M_{rs}$  is small), then to bring back equilibrium in the capital market (condition (3a)), given the rise in  $Y$ , it looks as though  $r$  must rise. However, we cannot look only at  $M_{rs}$ . We have also to look at the effects of the use of capital of the change in  $w_u$  induced by the SBTC. This may appear complicated, but complexity seems inevitable once we leave the case of two factors.

Once we combine the capital/labour distinction with heterogeneous labour, there is a much richer set of possible distributional outcomes. Moreover, the SBTC story is essentially dynamic, which suggests that we need to embed the aggregate analysis within a fully dynamic model of capital accumulation and the acquisition of skill. The rate of capital accumulation may be a function of the factor prices. The relative rates of growth of the number of skilled and unskilled workers may be a function of the skill premium (as examined in Atkinson, 2008).

### (iii) Summary

To conclude, the chapters in economics textbooks dealing with factor prices are rarely linked to those—typically much shorter—chapters dealing with the personal distribution. It is, however, possible to make such links, as we have seen with the wage share of the bottom 50 per cent and with the aggregate production function with heterogeneous workers. The challenge is to take this further.

## IV. Income source enters social judgments

Factor shares link income to productive activity, and this is relevant not just to understanding the distribution of income but also to the way in which we evaluate the fairness or

otherwise of the distribution. There are good reasons why people refer to wages, salaries, and self-employment income as ‘earned income’, and to profits and rent as ‘unearned income’. In this case, the combining of profits and rent into ‘capital income’ makes sense.

The issue of social justice is evoked in Glyn (2009), where he cites the German Finance Minister as calling on European companies to give workers a ‘fairer’ share of profits or risk causing a ‘crisis of legitimacy’. Glyn goes on to say that:

employees’ sense of fairness is clearly offended when their employer’s profits rise much faster than their wages. The classical notion that employers’ profits derive ultimately from their workers’ efforts chimes at least in part with workers’ own experience. This leads to the demand for ‘fair shares’... and there is no reason to believe that this sentiment evaporates as more workers own financial assets. (Glyn, 2009)

Factor shares influence collective bargaining, where a crucial issue may be the extent to which increased labour productivity is reflected in increased wages, this being regarded as a fair division.

Why do we regard the source of income as relevant to concepts of justice or fairness? A response is important when we consider the variety of sources. We may be clear that a person working all day for a wage has earned income and a person living off his rent roll has unearned income. But what about social transfers received in the place of wages? What about pensions? Here I consider three of the possible grounds on which we may distinguish between earned and unearned income. The first is, prosaically, the costs of working. These include not just travel, childcare costs, and other outgoings, but also the psychic costs of working. In the standard model of work/leisure choice, the level of achieved income,  $Y$ , is not a measure of the opportunities open to the person, since  $Y$  depends on the level of effort chosen. This has led to proposals to replace  $Y$  by a measure that takes account of the cost of effort expended. As shown in Atkinson and Bourguignon (1990, p. 20), with a constant elasticity labour supply function, and no income effects, the implied indirect utility function (in its least concave form) expresses individual welfare in terms of net income minus the cost of effort, where the latter is a proportion  $\beta/(1+\beta)$  of earnings, where  $\beta$  is the elasticity. This means that an elasticity of  $1/4$  implies a deduction of one-fifth. On this basis, pensions would not be treated as earned income, since no effort is required and there are no costs of working. Transfers such as unemployment benefit are in an intermediate position, since they are typically associated with job-search requirements that involve effort.

A second, economic, argument is that wages are precarious, in that the person may lose the job, whereas property rights ensure that rents and other capital income have greater security. On this basis, too, pensions, or at least state guaranteed pensions, are closer to unearned income. Unemployment insurance has a particular position, in that its existence serves to reduce the income risk associated with employment. At the same time, unemployment benefits contain their own elements of uncertainty, being subject to a variety of conditions, and their duration is limited.

The third, rather different, line of argument concerns the notion of *participation*. Under a principle of ‘fair reciprocity’ (for example, White, 2003) we may expect citizens to make a productive contribution to society, and the remuneration for this contribution may be regarded as ‘earned’ income. As in my discussion of a ‘participation income’ (Atkinson, 1995), qualifying activities can extend beyond paid employment (including unpaid carers,

for example) and recognize past contributions. On this basis, pensions may indeed qualify as earned income.

### (i) Reintroducing earned income relief

The distinction between ‘earned’ and ‘unearned’ income is not confined to debates about fairness. In the past, it played an important role in the UK tax system. Differentiation between earned and unearned income was first introduced in 1907, and came later to take the form of an *earned income relief*. At the end of the 1960s, when the basic rate of tax was 41.25 per cent, there was earned income relief at a rate of 2/9 up to (approximately) a professorial salary, and a relief of 1/9 on the next tranche up to (approximately) twice a professorial salary. This meant that, up to the first threshold, one paid tax on 7/9ths of earnings, which increased the starting point for taxation and reduced the basic rate of tax to 32.1 per cent. It may be noted that this relief had the effect of applying a ‘discount’ to earned income, but that there was a tapered ceiling to the discount. There was a maximum to the relief that could be claimed. High salaries were taxed at the margin at the same rate as unearned income. Earned income relief was abolished in 1972, when it was replaced by an investment income surcharge, but this did not survive the arrival of the Thatcher government in 1979. Earned income and investment income are now taxed at the same rate, with three important qualifications. The first is that investment income is taxed on the money return, with no allowance for the fact that part of the return is a compensation for inflation. Working in the opposite direction is the lower tax rate applied to capital gains and losses, and the fact that earned income is subject to National Insurance contributions.

If there are concerns about the legitimacy of the present UK distribution, and the declining wage share, at least of the bottom half of workers, then this could be addressed by reintroducing earned income relief. For example, the basic rate of 20 per cent and higher rate of 40 per cent (in 2008–9) could be raised to 25 and 50 per cent, respectively, accompanied by earned income relief of one-fifth up to a ceiling. This proposal may encounter the objection that it would raise the apparent rate of income tax. The ‘headline’ rate would increase from 20 to 25 per cent. Not only does such an objection insult the intelligence of the UK taxpayer, but it would surely be possible to counter any such negative publicity. There would be undoubted attractions to be able to say that, with the proposed earned income allowance, the person would have one day in the week’s earnings free of tax. The UK would not be alone. The tax system of Singapore operates a relief, stating that ‘earned income relief is a relief to provide recognition for individuals who receive income from work, trade, business, profession or vocation’ (website of Inland Revenue Authority of Singapore). Closer to the UK, the States of Jersey allow a deduction of a quarter of earned income, up to a (quite low) limit. It is the nature of this deduction, and of the earned income relief proposed here, that the relief is restricted to the first tranche of earnings. There is a contrast here with a scheme, operated for example in France, that exempts from tax earnings beyond a certain level (in the French case, those working additional hours).

The introduction of earned income relief would require a definition of ‘earned income’. Would retirement pensions be counted as earned? How would disability or unemployment benefits be treated? As we have seen, the responses depend on the rationale for the distinction. This is a good example why we need to revive welfare economics as an integral part of economics. It is not for economists to answer such questions, but it is their responsibility to clarify the relation between ethical premises and the design of policy.

## V. Conclusions

Developing the ideas in Glyn (2009), I have suggested three ways in which the study of factor shares is relevant today and pointed to some of the promising avenues for future research. The ground covered has been diverse—from national accounts to cost functions to fairness—but this has been intentional. In my view, economics has become too splintered into sub-disciplines. It has become over-specialized. There is a great need, particularly at this juncture, to unify the different branches of economics. The link between macro and micro is essential, and economics has suffered from allowing these to go their separate ways. Empirically, the national accounts need to be brought closer to micro-data on households. Theoretically, the aggregate analysis of distribution needs to look at both profits and the wages of heterogeneous workers. Growth theory, macroeconomics, and labour economics are all part of the mix.

## References

- Acemoglu, D., and Robinson, J. A. (2006), *Economic Origins of Dictatorship and Democracy*, Cambridge, Cambridge University Press.
- Atkinson, A. B. (1995), 'Beveridge, the National Minimum and its Future in a European Context', in *Incomes and the Welfare State*, Cambridge, Cambridge University Press.
- (2008), *The Changing Distribution of Earnings in OECD Countries*, Oxford, Oxford University Press.
- Bourguignon, F. (1990), 'The Design of Direct Taxation and Family Benefits', *Journal of Public Economics*, **41**, 3–29.
- — (2000), 'Introduction: Income Distribution and Economics', in A. B. Atkinson and F. Bourguignon (eds), *Handbook of Income Distribution*, Geneva, Elsevier Science.
- Voitchovsky, S. (2008), 'The Distribution of Top Earnings in the UK since the Second World War', University of Oxford Discussion Paper.
- Bentolila, S., and Saint Paul, G. (2003), 'Explaining Movements in the Labor Share', *Contributions to Macroeconomics*, **3**, article 9.
- Blackorby, C., and Russell, R. R. (1989), 'Will the Real Elasticity of Substitution Please Stand Up? (A Comparison of the Allen/Uzawa and Morishima elasticities)', *American Economic Review*, **79**, 882–8.
- Blaug, M. (1996), *Economic Theory in Retrospect*, 3rd edn, Cambridge, Cambridge University Press.
- Burtless, G. (2007), 'Income Progress Across the American Income Distribution 2000–2005', Testimony for the Committee on Finance, US Senate, 10 May.
- Deaton, A. S. (2005), 'Measuring Poverty in a Growing World (or Measuring Growth in a Poor World)', *Review of Economics and Statistics*, **87**, 1–19.
- Dew-Becker, I., and Gordon, R. J. (2005), 'Where did the Productivity Growth Go? Inflation Dynamics and the Distribution of Income', *Brookings Papers on Economic Activity*, **2**.
- Ellis, L., and Smith, K. (2007), 'The Global Upward Trend in the Profit Share', BIS Working Paper 231.
- European Commission (2007), 'The Labour Income Share in the European Union', *Employment in Europe 2007*, Brussels, European Commission.
- Feldstein, M. S. (2008), 'Did Wages Reflect the Growth in Productivity?', NBER Working Paper 13953.
- Glyn, A. (2009), 'Functional Distribution and Inequality', in W. Salverda, B. Nolan, and T. M. Smeeding (eds), *Oxford Handbook of Economic Inequality*, Oxford, Oxford University Press.
- Sutcliffe, R. B. (1972), *British Capitalism, Workers and the Profits Squeeze*, Harmondsworth, Penguin.
- Gollin, D. (2002), 'Getting Income Shares Right', *Journal of Political Economy*, **110**, 458–74.
- IMF (2007), 'The Globalization of Labor', ch. 5 in *World Economic Outlook*, April.
- Kaldor, N. (1961), 'Capital Accumulation and Economic Growth', in F. A. Lutz (ed.), *The Theory of Capital*, London, Macmillan.

- Krusell, P., Ohanian, L. E., Rios-Rull, J.-V., and Violante, G. L. (2000), 'Capital–Skill Complementarity and Inequality: A Macroeconomic Analysis', *Econometrica*, **68**, 1029–53.
- Lydall, H. F. (1968), *The Structure of Earnings*, Oxford, Clarendon Press.
- Mankiw, N. G. (2007), *Macroeconomics*, 6th edn, New York, Worth.
- Marchal, J., and Ducros, B. (eds) (1968), *The Distribution of National Income*, London, Macmillan.
- Piketty, T., and Saez, E. (2007), 'Income and Wage Inequality in the USA', in A. B. Atkinson and T. Piketty. (eds), *Top Incomes over the Twentieth Century*, Oxford, Oxford University Press.
- Ricardo, D. (1911), *Principles of Political Economy*, first published 1817, London, Dent.
- Serres, A. de, Scarpetta, S., and Maisonneuve, C. de la (2001), 'Falling Wage Shares in Europe and the United States: How Important is Aggregation Bias', *Empirica*, **28**, 375–400.
- Simons, H. C. (1938), *Personal Income Taxation*, Chicago, IL, University of Chicago Press.
- Weale, M. (2009), 'Growth Prospects and Financial Services', *National Institute Economic Review*, **207**, 4–9.
- White, S. (2003), *The Civic Minimum: On the Rights and Obligations of Economic Citizenship*, Oxford, Oxford University Press.