

## labour's share of income

Economists have long studied labour's share of national income as a crude indicator of income distribution. More recently, labour's share has also been seen as offering insights into the shape of the aggregate production function. This has made labour's share a parameter of interest for macroeconomics, growth economics, and international economics, among other fields. Recent studies support the long-standing observation that labour's share of national income is relatively constant over time and across countries. Measurement of labour income, however, can be difficult in economies where many people are self-employed or work in family enterprises.

At least since the time of Adam Smith, economists have been interested in the shares of production accruing to the owners of different factors. In the era before formalized national income and product accounts, factor shares were observed primarily at the firm or industry level. But Smith himself recognized that national product could similarly be divided into the income received by owners of land, labour and capital (the last of which he termed 'stock'). Early in Book I of *The Wealth of Nations*, Smith (1776, p. 155) notes that

the exchangeable value ... of all the commodities which compose the whole annual produce of the labour of every country, taken complexly, must resolve itself into ... three parts and be parcelled out among different inhabitants of the country, either as the wages of their labour, the profits of their stock, or the rent of their land ... Wages, profit, and rent, are the three original sources of all revenue as well as of all exchangeable value.

Smith and other early economists viewed the distribution of income among factors of production as intimately related to the level of wages and the degree of income inequality within a country. This was probably a reasonable assumption, given that, outside of agriculture and certain types of self-employment, most individuals probably subsisted entirely on wage income.

Factor shares were, in fact, one of the few available sources of data on the size distribution of income – a subject that was viewed as crucial for policymaking, but about which little was known. As late as 1912, a prominent US labour economist wrote (Streightoff, 1912, p. 155), 'Knowledge of the distribution of incomes is vital to sane legislative direction of progress. In a form definite enough for practical use, this knowledge does not exist. No time should be wasted in obtaining this knowledge.'

Labour's share of national income was seen as a particularly sensitive issue – intimately related to the supposed struggle of labour against capital. Simon Kuznets (1933, p. 30) referred to '[t]he significant political and social conflicts that center about the relative share of these productive factors'. Because of the importance of the topic, and because factor shares could be estimated reasonably well from micro data, a considerable literature emerged to document cross-section and time series observations on factor shares. In fact, the literature on factor shares eventually served as one of the foundations for the emergence of national income and product accounts.

From the beginning, the measurement of factor shares has been complicated by the difficulty of disentangling individual incomes into their functional components. Certain categories of income are easily assigned to land, labour, or capital. For example, wages and salaries are generally classifiable

as labour income – although for some high-skill workers (such as hedge fund managers, star athletes), they may also embody some rents. Dividends and interest must be forms of capital income. Land rents are easily classified. But Kuznets (1933) pointed out that entrepreneurial income – which was about one fourth of national income in the 1920s – represented a mix of wages, salaries, interest, rent, and profits.

As national income accounting evolved over the succeeding decades, there were few improvements to the categorization of income according to factors of production. Irving Kravis (1962, p. 122) noted that ‘the theory of distribution remains in a parlous state’, largely because ‘the components of income for which we have data has not been determined by the requirements of the economists but by the legal and institutional arrangements of our society’.

Nevertheless, by the 1950s a striking empirical regularity had begun to emerge. Labour's share of national income in the United States appeared to have remained roughly constant over a long period of time. Modest increases in the share of wages and salaries in national income appeared to have come at the expense of declines in entrepreneurial income – consistent with a structural shift away from self-employment and towards wage work. The regularity was sufficiently pronounced that Charles Cobb and Paul Douglas, writing in 1928, suggested that a simple constant-returns production function in the now familiar form  $Y = AK^{\frac{1}{3}}L^{\frac{2}{3}}$  would provide an accurate representation of the US time series for aggregate output as a function of aggregate capital stock and labour. They considered a value for labour's share as low as two-thirds to be plausible.

As national income accounting became more systematic, evidence on factor shares accumulated over succeeding decades. John Maynard Keynes, writing in 1939 (p. 48), referred to the ‘stability of the proportion of the national dividend accruing to labour, irrespective apparently of the level of output as a whole and of the phase of the trade cycle’. He went on to refer to this (p. 48) as ‘one of the most surprising, yet best-established facts in the whole range of economic statistics, both for Great Britain and for the United States’.

D. Gale Johnson (1954) constructed and analysed data for the US economy going back over a century, to 1850, and concluded (p. 175) that there had been no ‘significant secular change’ in labour's share of income over that period. Robert Solow's paper (1957) on the sources of growth in the US economy noted that the data for the US economy seemed consistent with a Cobb–Douglas representation for the aggregate production function, with a capital share of 0.35 (and thus, implicitly, a labour share of 0.65). (However, Solow, 1958, professed scepticism over the proposition that factor shares were actually constant, suggesting instead that variation within sectors was balanced out at the aggregate level.) Nicholas Kaldor (1961) characterized the phenomenon as one of the stylized facts of modern economic growth.

This apparent consensus soon began to unravel, however. A major challenge to the hypothesis of constant factor shares appeared in comparisons of factor shares across countries. Kuznets, in an influential 1959 paper, further argued that the cross-country evidence did not support the view that factor shares were constant across countries or over time. Kuznets argued that data for other countries – and in particular for poor countries – revealed very different levels for labour's share in other countries. In particular, Kuznets suggested that labour's share of income was systematically lower in poor countries than in rich countries, while the share of unincorporated enterprises in national income was higher in poor countries than in rich countries. Kuznets concluded that the concept of a labour share lacked useful meaning

– particularly as a proxy for discussions of the size distribution of income. His scepticism over constant factor shares was echoed by Solow (1958) and by Kravis (1962), among others.

To a large degree, scholarly interest in the labour share waned in succeeding years, although quantitative studies in both international trade and growth continued to rely on Cobb–Douglas aggregate production functions. In the trade literature, it was commonplace to assume that rich countries had a relatively high labour share, while poor countries had lower shares. Macro and growth studies of advanced economies typically assumed a Cobb–Douglas production function with a labour share of about two-thirds, often based on the employee compensation share of GNP for the United States, but this parametrization was seen as problematic for models that were intended to characterize both poor countries and rich ones.

This apparent discrepancy between cross-country and time series observations on labour's share was largely unaddressed in the literature until Gollin (2002) revisited the question. Drawing on the earlier work of Kuznets and others, he noted the potential significance of self-employment in skewing 'naive' calculations of factor shares. Gollin argued that poor countries typically have far higher levels of self-employment than do rich countries; as a result, cross-country comparisons of the employee compensation share (or wage share) will tend to yield large differences between rich and poor countries. Gollin showed that, after adjusting labour's share to account for differences in self-employment rates, no systematic patterns remained in the cross-country data between a country's income and its imputed labour share. Gollin reported labour shares in most countries, adjusted for self-employment, between 0.6 and 0.8. Similar results were obtained by Ben Bernanke and Refet Gürkaynak (2002), who used a different approach to adjust for the fraction of output produced by unincorporated enterprises.

Recent and preliminary work by Rodrigo García-Verdú (2005) for Mexico found that labour's share falls into this range when estimated from household survey data, rather than from national income accounts might suggest. However, Daniel Ortega and Francisco Rodríguez (2006) present evidence from industrial census data that labour shares are lower in poor countries than in rich countries. And Samuel Bentolila and Gilles Saint-Paul (2003) show that labour's share within OECD countries is not constant, but rather moves in parallel with changes in the capital–output ratio.

Econometric studies of aggregate production functions, such as those by John Duffy and Chris Papageorgiou (2000) and Pol Antràs (2004), often reject the Cobb–Douglas specification of the aggregate production function. This suggests that, if factor shares are indeed (approximately) constant, there must be a different underlying mechanism. At the simplest level, any constant returns production function with labour-augmenting technical progress can give rise to constant factor shares if the rate of return on capital is constant over time – as, for example, on a balanced growth path. To see this, consider a simple Solow model with the constant returns aggregate production function  $Y = F(K, AL)$ . The productivity parameter  $A$  grows at a constant rate  $g$ , and there is an exogenous savings rate,  $s$ . This economy will converge to a balanced growth path; assuming no population growth, the condition for balanced growth is given by

$$k^* = \frac{sf(k^*)}{\delta + g}$$

where  $\delta$  is the depreciation rate and

$$k \equiv \frac{K}{AL}$$

But the balanced growth path implies that the capital share is

$$\frac{rk^*}{f(k^*)} = \frac{sr}{\delta + g}$$

which will necessarily be constant because the rate of return is constant along the balanced growth path.

An alternative way to generate constant factor shares is through aggregation. Charles I. Jones (2005) reproduces and generalizes a result of Houthakker (1955) in which an aggregate Cobb–Douglas technology can be derived from firm-level or industry-level Leontief techniques. Jones shows that the same intuition can be applied more generally to a world in which the underlying production technologies have almost any form, and the ‘aggregation’ can simply occur across ideas or techniques within a firm. Jones’s result is consistent with factor shares that are constant, but it also allows for movement in the factor shares and for differences across countries. In general, it appears to offer a useful theoretical framework for reconciling the different features of the data.

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### See also

<xref = xyyyyyy > Cobb–Douglas functions;  
 <xref = G000209 > economic growth;  
 <xref = xyyyyyy > economic growth, empirical regularities in;  
 <xref = F000298 > factor prices in general equilibrium;  
 <xref = xyyyyyy > growth accounting;  
 <xref = xyyyyyy > level accounting;  
 <xref = P000204 > production functions.

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## Index terms

aggregation  
balanced growth  
Cobb–Douglas functions  
constant-returns production function  
entrepreneurial income  
factor shares  
labour's share of income  
national income accounting