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Has the Labour Share Declined? It Depends

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ABSTRACT

We revisit the issue of how to best measure the labour and capital shares in OECD economies, distinguishing between production- and income-based perspectives. The former adopts a producer perspective with gross income as a reference: it uses a production function in a market setting. The latter adopts a consumer perspective with net income as a reference, taking account of depreciation and including taxes and subsidies as perceived by final consumers. We confirm a statistically significant but small decline in the labour share across OECD countries over the past two decades under a production perspective. But this appears to result mainly from a rise in the gross capital share caused by rising depreciation rates, themselves reflecting a shift towards short-lived, high-obsolescence capital goods such as information and communication technology products and cyclical effects. Accordingly, we find little or no decline in the labour share under an income perspective, where income is measured net and after depreciation.

Keywords: Labour share, functional distribution

JEL classification: D33

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1. Introduction

Along with the debate on the increasing dispersion of income and consumption among households (OECD, 2015b; Atkinson, 2015), the distribution of income between labour and capital has also attracted rising interest[1] in light of evidence of a declining labour share, in particular in the United States. International evidence such as Karabarbounis and Neiman (2014) have corroborated the idea that the declining labour share can be considered a stylised fact in many countries even more so as convincing explanations have been put forward to account for the decline, including technical change that led to rapid declines in relative prices of investment goods, coupled with a large elasticity of substitution between labour and capital, technical change that is biased against unskilled labour, international trade and investment that put pressure on wages through rising competition and declining bargaining power of workers. The declining labour share has also played a central part in the macro-economic discussions around inequality (Stiglitz, 2015) and in the discussions around the role that specific industries play in the evolution of the aggregate labour share (Elsby, Hobijn and Sahin, 2013). One reason for the strong interest in the functional income distribution is the impact from 'upstream' that it may exert on the inter-household distribution of income and consumption. As labour income tends to play a larger role as a source of income among lower-income households than among higher income households, a decline in the labour share can translate into a widening overall income distribution[2]. In short, there continues to be strong interest in the evolution of aggregate and industry-level labour shares and, by implication, capital shares.

It is hardly news that gauging the labour and capital shares is fraught with measurement issues to which theory provides little guidance. These include the allocation of the income of the self-employed between labour and capital; the right scope of income; the valuation of income and whether it should be measured

[1] See Bentolila and Saint-Paul (2003), Ellis and Smith (2007, 2010), EU (2007), IMF (2007), Atkinson (2009), Stockhammer, Onaran and Ederer (2009), ILO (2011, 2013), Guerriero (2012), OECD (2012), Karabarbounis and Neiman (2014).

[2] Other work points to the increasing inequality among those receiving labour income with compensation of top income earners increasing and the position of bottom earners worsening (e.g. Saez and Veall, 2005; Atkinson et al., 2011).

gross or net of depreciation. Work on some of these issues dates back to Johnson (1954) and Kravis (1959). We revisit the measurement question and make some headway by drawing a distinction between *production-based* and *income-based* measures of the labour share. This distinction reflects different purposes in measuring the labour share. The production-based approach depicts the roles of labour and capital in a production framework; the income-based approach depicts how labour and capital shares influence inter-household income distribution. We carefully decide on various measurement questions with these references in mind and put in place labour and capital measures based on high-quality national accounts data from official sources in OECD countries. This leads to new and differentiated messages about the evolution of the labour share in OECD countries over the past 20 years or so.

To foreshadow results, the basic observation of a statistically significant decline in the labour share holds up, for the past two decades, for the *production-based* measure of labour and capital income, albeit with significant variations across countries. Also, while the measured average, cross-country decline of the labour share is statistically significant, it tends to be modest in size. On the other hand, evidence for a decline in the *income-based* labour share is much weaker or non-existent. This is somewhat surprising given the greater proximity of the income measures underlying the income-based labour shares to overall net income which in turn affects net income that is disposable to households and whose distribution has become more unequal in many countries. We devise a method to de-compose the difference between the production- and income-based labour shares and find that the single most important explanatory is depreciation. There is no deduction for depreciation of capital in gross income, and its share is rising. And as gross income is the basis of the production-based approach, the capital share is also rising under this approach, implying a corresponding fall in the production-based labour share. This is not true for the income-based labour and capital shares, where income is measured net. This corroborates the conclusions reached by Bridgman (2014), Zheng et al. (2015) who compare gross and net labour shares and find no evidence for a decline of the net labour share in the United States and several other advanced countries. We conclude that the functional income distribution, in particular when measured from an income rather than a

production perspective is a weak predictor of the development of the inter-household income distribution whose driving forces must be sought elsewhere.

2. Measurement of labour shares

Production and income perspective

The labour share is the share of factor income or production costs that accrues to labour. A central analytical use of the labour share arises from its role in production analysis and neoclassical economic models. Under assumptions of cost-minimising behaviour of producers the labour share in production costs approximates the otherwise unobserved cost elasticity of labour. Measurement of the cost elasticity is in turn central for estimating multi-factor productivity (MFP) and for purposes of growth accounting[3]. The cost elasticity is also instrumental in that it permits establishing a direct link between changes in the labour share and the elasticity of substitution between labour and capital (Hicks, 1932), a relationship that has been used in the analysis of changing labour shares, for instance by Elsby, Hobijn and Sahin (2013), Karabarbounis and Neiman (2014), and Stiglitz (2015). We refer to this analytical use of the labour share as the ***production perspective***.

Another use of the labour share is to respond to the question about the distribution of income between factors of production, labour and capital[4] from a political economy angle or from an ***income perspective***. Atkinson (2009) is an excellent example of this perspective. He judges the study of labour shares important because it allows "(i) to make a link between incomes at the macroeconomic level (national accounts) and incomes at the level of the household; (ii) to help understand inequality in the personal distribution of income; (iii) to address the concern of social justice with the fairness of different sources of income" (p.5). In the debate, a decline of the labour share is often associated with a loss of collective bargaining powers

[3] Under perfect competition, the cost share of labour will also measure the production elasticity of labour, required for primal estimates of MFP. Basic references to productivity measurement include Solow (1957), Jorgenson and Griliches (1967), Balk (1998), OECD (2001), Diewert and Nakamura (2007).

[4] Krueger (1999) reports that 'the empirical determination of factor shares was the proximate cause for the founding of the National Bureau of Economic Research' (p. 1).

of workers, itself a consequence of declining unionisation, unemployment or increased competition through globalisation of markets. Along the same lines, the labour share is often seen as the link between the functional distribution of factor income and the inter-personal distribution of income and wealth. As Atkinson (2009) explains, differentiating between labour and capital income is important from a policy perspective because different types of incomes raise different policy issues, and "In building bridges between the national accounts and household experience, the factor shares provide, therefore, a valuable starting point." (p.8).

None of these income and distribution-related issues requires setting the labour share discussion in a production model. While in a simple world without taxes and subsidies (on products), and in the absence of any residual profits, losses and mark-ups (typically assumed away via fully competitive markets) the production perspective and the income perspective coincide except for the effects of depreciation, this is not in general the case. From a very practical angle, the distinction will be useful in decisions about measurement of the labour and the capital share, of which there are many including the treatment of taxes, the scope of income and the treatment of depreciation. As we shall see, the two perspectives also give rise to somewhat different conclusions about the development of the labour share over time.

Valuation of income

A first measurement question relates to the valuation of income in terms of taxes and subsidies. From a production perspective, value-added (output) is appropriately measured at *basic prices*, a valuation that includes taxes minus subsidies on production and so reflects the value actually received by the producer. Value added at basic prices has to be distinguished from value-added at *market prices*[5], the headline GDP figure in many countries including the United States. Valuation at market prices reflects *all* taxes minus subsidies on products and production and consequently represents a demand or consumer perspective

[5] EU (2007), IMF (2007), ILO (2011, 2013) and Stockhammer, Onaran and Ederer (2009) use GDP at market prices as the denominator for their labour share calculations; Bentolila and Saint-Paul (2003) and Ellis and Smith (2007, 2010) use GVA at basic prices.

rather than a producer perspective. We conclude that a computation of labour shares for purposes of production analysis is best based on gross value-added at basic prices whereas a computation of labour shares for purposes of distribution analysis should use gross value-added at market prices. In terms of accounting identities, we relate the gross value-added at basic prices GVA_B and at market prices GVA_M to the compensation of employees CE, gross operating surplus GOS (a measure of profits), gross mixed income GV_{MIX} of the self-employed (of which more below), taxes minus subsidies on products T_{PR}, and other taxes minus subsidies on production T_{PRN}[6]:

(1.1) Gross value-added at basic prices: $GVA_B=CE+GOS+GV_{MIX}+T_{PRN}$;

(1.2) Gross value-added at market prices (GDP): $GVA_M=CE+GOS+GV_{MIX}+T_{PRN}+T_{PR}$.

Scope of income and production

A further practical question concerns the scope of income or production. Should all resident producers and all domestic income be considered or should certain economic activities or sectors be excluded? One activity that is regularly considered for exclusion is income from owner-occupied housing (see, for instance OECD, 2012; Pionnier and Guidetti, 2015). This income is an imputed item that corresponds to the value of housing services for persons living in their own house. These services are exclusively recorded as operating surplus or capital services in the households sector[7] along with a corresponding value of consumption, but no imputation is made for the labour input associated with providing housing services, thus producing a potential upwards bias to profit shares and an asymmetric treatment of labour and capital inputs. Excluding these housing services appears plausible from a production perspective but not necessarily from an income perspective – housing services on which owner-occupiers draw are true consumption items even if there is no monetary transaction, they matter for peoples' well-being and have

[6] Both taxes minus subsidies on products T_{PR}, and other taxes minus subsidies on production T_{PRN} comprise taxes on production and imports.

[7] In some countries' national accounts, Non-profit institutions serving households (NPISHs) are combined with households. As NPISHs only generate negligible gross operating surplus, any gross operating surplus of the combined sector would still be mostly attributable to owner-occupied housing.

played a significant role in shaping the distribution of consumption and wealth between households (Atkinson, 2015). Therefore, our set of labour shares for purposes of production analysis will exclude imputed housing services, but the contribution of housing services to capital income will be taken into account when calculating labour shares for purposes of analysis of functional income distribution

A related reasoning applies to non-market producers, such as general administration, health and education where government often provides services for free or below market prices. The value of these services is measured via their costs but, by convention, capital costs only comprise depreciation whereas capital costs of market providers also reflect a net return to capital. The consequence is a systematic downward bias in the remuneration of government-owned capital[8]. Pionnier and Guidetti (2015) therefore also recommend exclusion of the public sector (or of industries that are dominated by non-market producers). We agree in principle with this reasoning for purposes of production analysis but encounter the practical difficulty that in general industry data with the appropriate break-down of value-added components and matching employment series is less timely and patchier than aggregate data which would limit the scope of cross country comparisons. We thus do not exclude Public Administration for the dataset at hand. However, we carry out a sensitivity test for case of Korea for which a full data set is available to find that the exclusion of public administration, defense, health and education from the list of activities can affect the level of the labour shares but hardly matters for their evolution over time.

A similar robustness check was applied to test for the effects of excluding the financial services industry, another activity that Pionnier and Guidetti (2015) purge from their computation of production-based labour shares. Again, at least for the Korean case, this exclusion matters little for the trend in labour shares.

We do exclude, however, owner-occupied housing for our labour share computations for purposes of production analysis. Accounting identity (1.1) is then modified as in (2) to reflect the exclusion of owner-

[8] Jorgenson and Schreyer (2013) argue for a measure of the cost of government-owned capital that includes a net return to capital, OECD (2009) discusses practical ways of its measurement.

occupied housing (as value-added consists exclusively of gross operating surplus, one has $GVA_{B\_OOH}=GOS_{OOH}$):

(2) $GVA_B' \equiv GVA_B - GVA_{B\_OOH} = CE + GOS - GOS_{OOH} + GV_{MIX} + T_{PRN}$

Mixed income

Mixed income is the income of unincorporated enterprises owned by households (the self-employed) and lumps together compensation for labour services and a gross return to capital. A tricky issue lies in splitting the income of the self-employed into a labour and a capital component. Some authors, for instance Karabarbounis and Neiman (2014) and Rognlie (2015) have restricted labour share measurement to the corporate sector, thereby aiming to avoid splitting mixed income altogether as, in principle, corporations do not produce mixed income. However, Pionnier and Guidetti (2015) find that the practice of allocation of units to the corporate and to the household sector varies significantly between countries. For instance in Germany and Italy, a large part of self-employed workers, and consequently the mixed income that they receive, are allocated to the corporate sector[9]. Thus, limiting the scope of labour share measurement to the corporate sector, only avoids the issue of dealing with "mixed income" in some countries[10]. Absent a consistent allocation of mixed income in countries' national accounts, the issue of splitting mixed income into a labour and a capital component needs to be tackled[11] both for international comparisons and for studying the evolution of the labour share over time[12]. Further, from an income perspective, restricting the

[9] The System of National Accounts distinguishes between unincorporated enterprises that are part of the household sector and unincorporated enterprises that resemble corporations in key aspects (e.g. complete set of accounts). These are called *quasi-corporations* and allocated to the corporate sector. In some countries, self-employed businesses with mixed income (and without explicit labour compensation) are treated as quasi corporations and are thus part of corporate sector.

[10] Note that we here use the term "mixed income" for the corporate sector although the SNA reserves it for the households' sector. Nevertheless, when self-employed workers are attached to the corporate sector, what the SNA calls "gross operating surplus" is actually similar to mixed income in the households' sector because it mixes labour and capital income.

[11] Preferably, this should be done at the industry level.

[12] For instance, when self-employed workers in the agricultural sector are replaced by salaried workers in manufacturing in the course of economic development, the labour share would automatically increase if mixed income is ignored.

object of research to corporations is questionable in particular for developing countries where self-employment accounts for significant part of economic activity.

Various authors (Johnson, 1954; Jorgenson, 1991; Young, 1995; Gollin, 1998, 2002; Krueger, 1999; Bernanke and Gurkaynak, 2001; Freeman, 2011; Guerriero, 2012; Cho, Kim and Schreyer, 2015; Pionnier and Guidetti, 2015) have employed different approaches towards splitting mixed income. The theoretically most compelling approach is a procedure based on matching micro-data records at national level. As this is not a feasible approach for the task at hand, we shall consider a whole sequence of options for breaking down mixed income as laid out below. The allocation of mixed income to labour and capital is required whether a production or an income perspective prevails.

Gross and net labour shares

A key aspect in moving from a production to an income perspective is that income should be measured net of depreciation[13] rather than gross. Income provides the bridge to consumption expenditures in constant prices (Jorgenson and Slesnick, 1987, 2014). Net saving in constant prices corresponds to increments in the current period to future flows of consumption (Weitzman, 1976; Sefton and Weale, 2006; Hulten and Schreyer, 2010). Thus, net concepts are a natural choice when labour and capital shares are interpreted from an income and, ultimately, welfare perspective. Gross concepts, on the other hand, are the appropriate set-up for production-related analyses with labour shares[14]. We conclude that gross and net labour shares are complementary rather than competing concepts.

In terms of identity (1.2), depreciation D is deducted from gross operating surplus and gross mixed income to yield a measure of net domestic product NDP_M:

[13] See for instance Stiglitz, Sen and Fitoussi (2009).

[14] Rognlie (2015) makes a similar point: 'Whether a gross or net measure is more appropriate depends on the question being asked: the allocation of gross value added between labor and gross capital more directly reflects the structure of production, while the allocation of net value added between labor and net capital reflects the ultimate command over resources that accrues to labor versus capital. […]" (p. 5). Along the same lines, Bridgman (2014) notes that 'the literature has been motivated by welfare related questions such as inequality, so the net measure is the correct one' (p.13).

(3) $NDP_M = GVA_M\text{-}D=CE+GOS+GV_{MIX}\text{-}D+T_{PRN}+T_{PR}$.

Equation (3) will form the basic identity for the measurement of labour shares from an income perspective, and (2) from a production perspective.

Allocation of income items to labour and capital

Taxes

The next task is the allocation of the various income items in (2) and (3) to labour and capital. We start from a *production perspective* and define labour compensation $w_{Pj}L_j$ as

(4) $w_{Pj}L_j = (CE+\alpha_j V_{MIX})(1+\tau_P)$,

where w_{Pj} is the unit value of labour compensation in the economy, L_j is the corresponding quantity of labour input, α_j is the share of net mixed income V_{MIX} attributed to labour. Labour compensation variables are indexed with j=1,2,…5 to reflect the fact that different values of α_j (j=1,2,…5) will be selected during computations. We start by noting that gross mixed income GV_{MIX} contains a depreciation part that is clearly not part of labour compensation. Thus, the measurement of the labour part of mixed income uses net mixed income V_{MIX} as a starting point[15]. $\tau_P \equiv T_{PRN} /[GVA_B\text{'}-T_{PRN}]$ is the rate that proportionally allocates other net taxes on production[16] to labour and capital. There are no strong theoretical reasons for this proportionate allocation of T_{PRN} but it seems like a neutral way of dealing with taxes on production from a production perspective. Also, the proportionate allocation leads to the same labour share as would be observed under a valuation of income at factor costs, i.e., ignoring net taxes on production T_{PRN}[17]. We compute the labour share from a production perspective LS_{Pj} as:

[15] If only gross mixed income GV_{MIX} is available (this is the case in many countries), net mixed income is computed as $V_{MIX} = GV_{MIX} - D * GV_{MIX} / (GOS + GV_{MIX})$; i.e. by applying the share of overall depreciation in profits and mixed income. As GV_{MIX} contains a labour component, the overall depreciation share is likely to be understated. However, we prefer a possible downward bias for capital as the focus of the paper is on the declining labour share.

[16] Note that in conjunction with taxes, 'net' refers to taxes minus subsidies. In conjunction with income, 'net' refers to gross measures minus depreciation.

[17] A factor cost valuation has also been suggested by Atkinson (2009) and Pionnier and Guidetti (2015).

(5) $LS_{Pj} = w_{Pj}L_j/GVA_B'$; j=1,2,…5.

Labour compensation for purposes of *income analysis* is:

(6) $w_{Dj}L_j = CE + \alpha_j V_{MIX}$

where w_{Dj} is the unit value of labour and L_j is again the quantity of labour input. For purposes of income analysis, we allocate all taxes to the non-labour (capital) component of value-added on the grounds that these taxes must be covered out of operating surplus. One notes that net domestic income at market prices NDI_M which is the same, in nominal terms, as net domestic product at market prices NDP_M also includes taxes on products T_{PR} (such as sales taxes) for which there is no basis for allocation to labour or capital. We then compute the labour shares from an income perspective LS_{Dj} as:

(7) $LS_{Dj} = w_{Dj}L_j/NDI_M$; j=1,2,…5.

Mixed income

We shall now present alternative measures of α, the share of mixed income allocated to labour. Table 1 below presents various combinations. Some of the computations of α require information on the volume of labour and the following holds: total employment L equals employees (L_W), employers (L_{NW_empr}), and own-account workers and contributing family workers (L_{NW_wkr}). Hours worked are preferred to numbers employed but not widely available so for the computations at hand we use data on numbers employed.

(8) $L = L_W + L_{NW\_empr} + L_{NW\_wkr}$.

Of the five computations presented, LS4 – assuming the same unit compensation for the self-employed as for the employees - is a widely-used approach towards dealing with mixed income (OECD, 2001). This does not necessarily mean it is correct. Where more in-depth analysis has been carried out, the hypothesis of equal average compensation is not normally confirmed. For instance, Freeman (2011), following the

methodology[18]by Jorgenson (1991) finds a downward bias implied by the LS4 method for the United States. Other empirical work (Cho, Kim and Schreyer 2015) uses a different method and finds the unit compensation for the self-employed to be significantly below the unit compensation of employees[19]. Also, OECD (2001) reports that small business owners often have a lower average compensation. A second best solution, only based on national accounts data is to make an imputation at the industry level. This allows controlling for industry composition effects (for instance, self-employed workers in the agriculture sector are probably less well paid than self-employed workers in the services sector). Data constraints for our cross-country panel data set prevent us from testing this method for all countries. However, the method was put in place for the Korean case. As it turns out, the resulting economy-wide allocation of mixed income to labour is quite close to the allocation that is obtained by applying an economy-wide adjustment factor $\alpha = 0.5(CE/L_w)(L_{NW}/V_{MIX})$ or $\alpha = 2/3$, in line with LSP5 or LSP2[20].

[18] Essentially, micro-data on employees are classified by wage-relevant characteristics and regression analysis is used to evaluate the wage premium for each characteristic (education, industry, age etc.). As the same characteristics are known for the self-employed, an imputation can be made that yields the relevant compensation.

[19] This was at least the case for Korea. When the relative wage rate of self-employed is estimated relative to per capita compensation of employee by a user cost approach, the value of 0.5 is a good approximation that empirically matches Korean income and wealth data (Cho et al. 2015b). Here the user cost approach implies searching for the value of α_j in equation (4) and (6) which minimizes the gap between capital income derived from the national income account with a certain α_j and the value of capital services derived from capital stock and a rate of return, etc., during 1970 to 2013. The computation entails the assumption of a constant real rate of return during the whole period. Land, as estimated in Cho et al. (2015a), is included in the asset boundary.

[20] In Korea, the case of j=4 is regarded as overstating Korean labour income share as observed in Hong (2014), Joo and Jeon (2014), Lee (2015), Cho (2016). Pyo (2015) provides estimates of the Korean labour share for the years 1918 to 1935. In addition, Kim (2016) analyses which factors drive movements in the Korean labour share. This seems to be in support of the case j=5 although the authors recognize that the 50% figure is may not have been constant over time as assumed in the computations.

Table 1 Allocation of mixed income

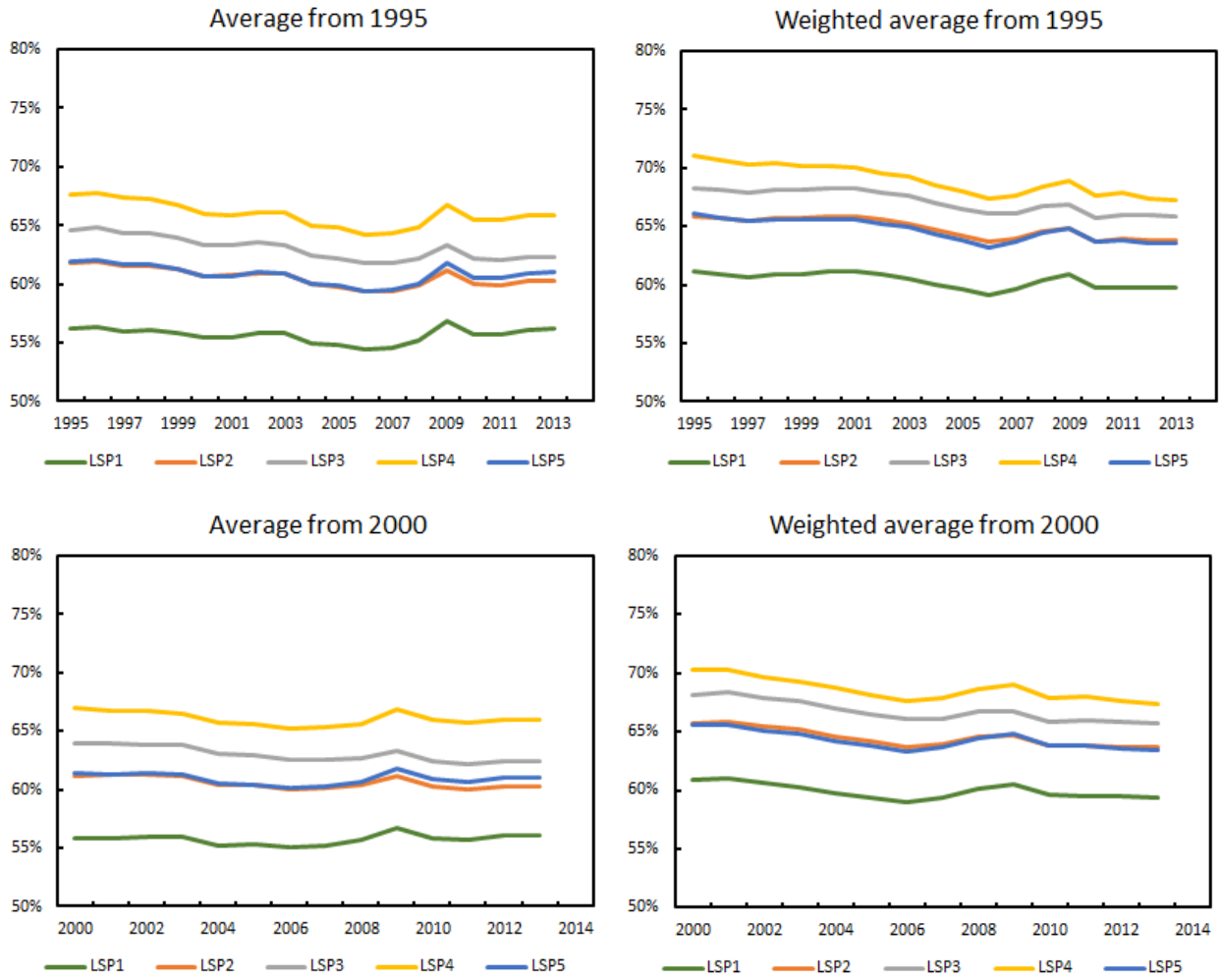
Variant	α_j	Comment
j=1	0	Unadjusted labour share
j=2	2/3	Johnson's (1954) version with 2/3rds of mixed income allocated to labour
j=3	1	Gollin's (2002) 1st adjustment with all mixed income allocated to labour
j=4	$(CE/L_w)(L_{NW}/V_{MIX})$	Average compensation of non-salaried workers equals the average compensation of salaried workers (CE/L_w).
j=5	$0.5(CE/L_w)(L_{NW}/V_{MIX})$	The average compensation of non-salaried workers is set to equal half the average compensation of salaried workers. α_5 is also a simple average of α_1 and α_4

3. Results

Labour shares

We estimate labour shares from a production and from an income perspective, each for different values of α_j (j=1,2,…5). As we only rely on officially available national accounts data collected by the OECD, country coverage varies over the period. Our core analysis relates to 22 OECD countries and the period 1995-2014 (when only the period 2000-2014 is considered, the set grows to 28 countries). We start with a visual inspection of results for production-based average labour shares in Figure 1. Two types of averages are presented – an unweighted average across countries and a GDP-weighted measure. A first observation is that the levels of labour shares vary significantly with the choices of allocation of mixed income. Also, in general, the various measures evolve at a different pace, indicating that the allocation of mixed income is indeed a crucial element in the computation and interpretation of labour shares. The exception is labour shares 2 and 5 yield that yield nearly identical results.

Figure 1 Average labour shares (production perspective)



Note: Data starting in 1995 comprise 22 countries of Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Japan, Korea, Netherlands, Norway, Portugal, Slovak Republic, Sweden, Switzerland, United States; data starting in 2000 also include 6 countries of Iceland, Ireland, Poland, Slovenia, Spain, United Kingdom.

Sources: Authors' calculation based on OECD Annual National Accounts.

To check the presence of a common time trend, we set up the following regression models[21] for the production-based labour share:

(9a) $LS_{Pi,t} = \mu_i + \alpha * x_{i,t} + \beta * t + \varepsilon_{i,t}$; $\varepsilon_{i,t} \sim N(0, \sum_{\varepsilon})$;

(9b) $LS_{Pi,t} = \mu_i + \alpha * x_{i,t} + \beta * t + \varepsilon_{i,t}$; $\varepsilon_{i,t} = \varphi\, \varepsilon_{i,t-1} + v_{i,t}$; $v_{i,t} \sim N(0, \sum_{v})$.

[21] The model has been upgraded to include a cyclical factor from its original (Cho, Hwang and Schreyer, 2017) to accommodate comments from OECD researchers. Authors express gratitude for their valuable opinions.

(9a) is a fixed effects model where $LS_{Pi,t}$ is the production-based labour share in country i=1,...22 and year t=1,…20, μ_i are the corresponding country dummies, α captures a business cyclical factor effect based on countries' output gap ($x_{i,t}$)[22], β captures a positive or negative common trend among countries' labour shares and a normally-distributed error term $\varepsilon_{i,t}$ allows for random deviations. In (9b) we test for a common trend in a set of a random effects model with an autocorrelated error term[23]. Both regression models are run for each of the five versions of α_j with results in Table 2. Overall, there is a statistically significant *downward trend for production-based labour shares*, independent of the way mixed income has been allocated, except for LS_{P1} under both specifications and LS_{P5} under the random effects specification. The unit of the β coefficient is percentage points per year, so the estimated average decline in the labour share over the period ranges from -0.129*(2014-1995)=-2.45 percentage points for LS_{P3} (fixed effects model) to -0.057*(2014-1995)=-1.08 percentage points for LS_{P1} (random effects model) when only statistically significant models are considered. While these values are most statistically highly significant, the magnitude of declines remains after all, contained. Time trends under the random effects model are also significant with the exception of LS_{P1} and LS_{P5} but even smaller in magnitude. Also, averages hide significant cross-country variation, as is apparent from Figure 2. It compares estimates of LS_{P5} between the beginning and the end of the period for individual countries. Of the 23 countries, 14 show a declining labour share and 9 countries show a rising share. Overall, however, our results confirm earlier examinations of production-based labour shares across countries, for instance OECD (2012) and OECD-ILO (2015) and forthcoming work by Schwellnus et al.

[22] Output gap data is sourced from the OECD.Stat Database. While, in principle, the business cyclical effect could enter in a country-specific way (α_i rather than α in equation (9a) and (9b)), this would lead to multicollinearity problems as countries' business cycles tend to be correlated. Hence a common cyclical factor was selected.

[23] We introduce both specifications because a Hausman test indicates that the null hypothesis cannot be rejected that the random effect model is superior to the fixed effect model. Also we could not reject serial correlation in error terms. As a consequence we consider that the random effect model with AR1 error terms is the preferred specification. Test results and full presentation of the regressions can be found in Appendix D.

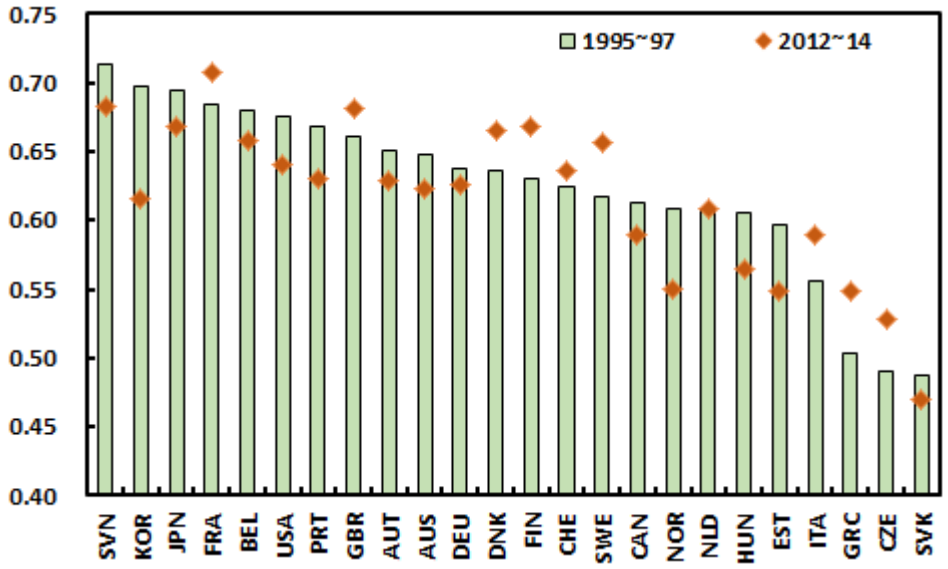
Table 2 Time trends in production-based labour shares, 1995 - 2014

Time variable(β_t)	LS_{P1}	LS_{P2}	LS_{P3}	LS_{P4}	LS_{P5}
Fixed effects model (9a)	0.0006	-0.086***	-0.129***	-0.116***	-0.057***
	(0.015)	(0.013)	(0.013)	(0.019)	(0.016)
Random effects model	0.004	-0.078**	-0.118***	-0.113*	-0.055
with AR1 error term (9b)	(0.051)	(0.033)	(0.037)	(0.060)	(0.042)

Note: Standard errors between brackets. One, two, and three asterisks indicate parameter significance at the 10, 5, and 1% level. Estimates based on 22 countries (see Figure 1 for list).

Source: Authors' calculations.

Figure 2 Changes in production-based labour shares (LS_{P5})



Note: End-years and starting years were averaged to allow for country differences in observations. Depending on data availability, adjacent three-year averages are used for a few countries.

Source: Authors' calculations.

Turning to labour shares LS_{Dj} computed from an income perspective[24], we find a different picture. Figure 3 immediately conveys a visual message of broad constancy of the labour shares on average, whether weighted or not. A more systematic statistical analysis in the form of a panel regression along the lines of equation (9) demonstrates indeed that the common time trend has become weaker overall. If coefficients

[24] A word of caution is in place here: as assumptions about depreciation patterns tend to vary between countries, labour shares based on net income measures are less comparable across countries than labour shares based on gross income measures.

were already moderate in size for the production-based labour share (Table 2), they are even smaller for the income-based variables (Table 3). The maximum cumulative decline of the income based labour share (LS_{D3}) over the past 20 years is hardly noticeable with -0.090*(2014-1995)=-1.71 percentage points. What is more, in four of the five cases under the random effects estimate, statistical significance disappears altogether[25]. Thus, on average, and in terms of a common trend across countries, there is no evidence of a pervasive decline of labour shares under an income-based measure. Similar to production-based labour shares, the allocation of mixed income matters for the levels of income-based labour shares except for LSD_2 and LSD_5 that are virtually identical. This result of a missing downward trend in income-based labour shares weakens the link that has been put forward between declining labour shares and rising inter-household income inequality as described in OECD (2012) or OECD-ILO (2015) [26].

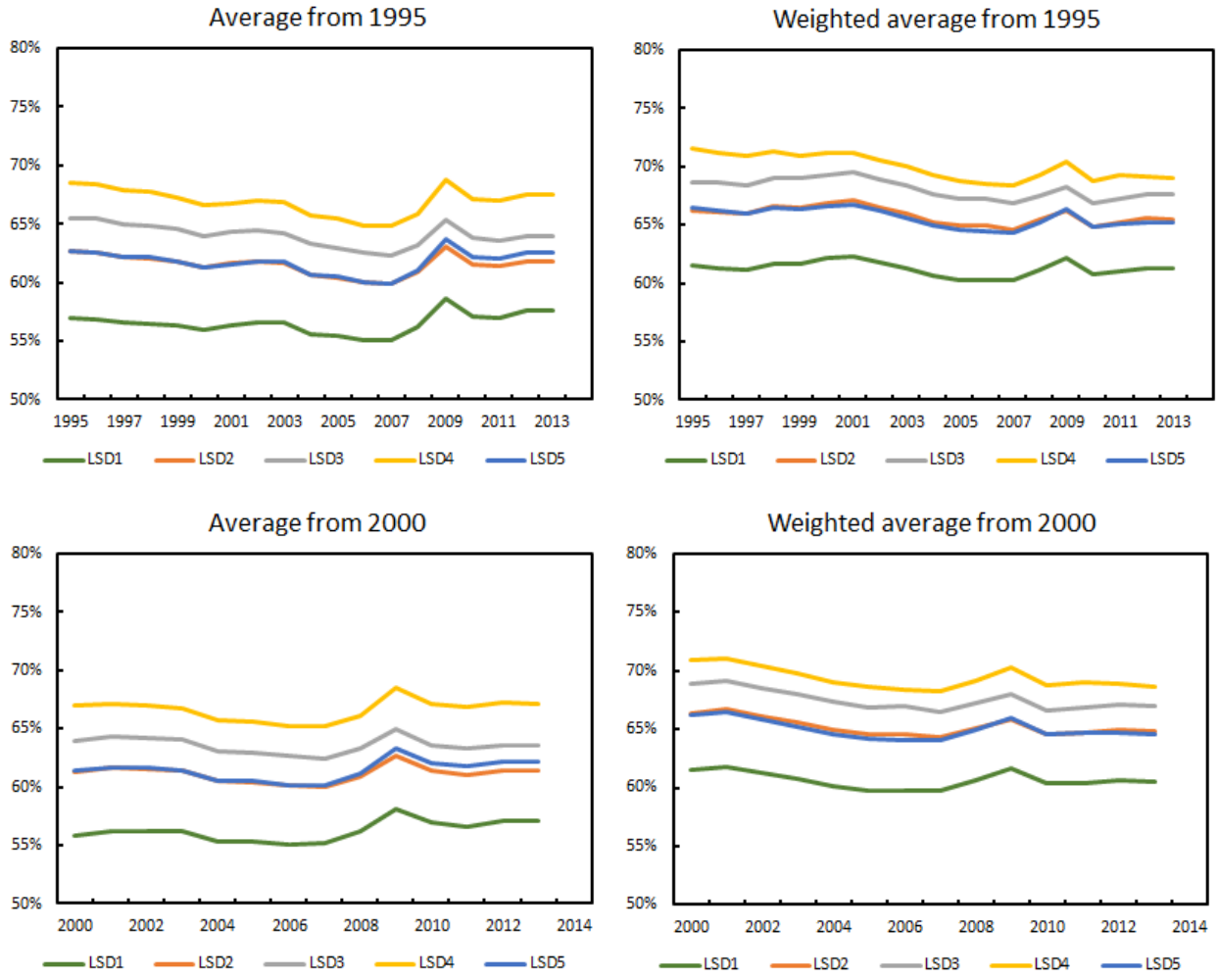
Two caveats are in place here: one of the reasons why we find only a small or no contraction in the labour share may be the period under study. Labour shares may be counter-cyclical (IMF, 2012) and until the onset of the crisis there was a downward trend in labour shares as shown in Figure 3. The trend was reversed afterwards. Now, many countries for which the upward trend in both income-based and production-based labour shares is most evident are countries that are still under a protracted period of crisis (e.g. Italy, Greece, France but also Finland and Denmark) and it is possible that, as growth resumes in these countries, the labour share will go down again. Ideally, longer term computations should thus be based on peak-to-peak comparisons to control for cyclical effects. Another caveat is that the picture may turn out differently if only the business sector is considered, in particular in conjunction with production-based labour shares. As mentioned earlier, the capital income of government producers is measured as

[25] If 28 countries are analysed for data starting in 2000, statistical significance disappears in all five cases under random effects models and only LS_{P3} under fixed effects models with significance at 5% shows a rising labour share trend, as presented in Appendix D.

[26] Of course, a labour share in net income that is approximately constant is in no way inconsistent with rising income inequality. For instance, wage income has become more unequally distributed even if the average growth of labour income has equalled capital income growth. The effects on total income inequality can be compounded when capital income grows faster than the wages of *low-income* workers, and even more so as the distribution of wealth is highly skewed. Thus, constant capital and labour shares may well be associated with growing income inequality.

depreciation. For the income-based measures of labour shares where income is measured net of depreciation it follows that government entities enter with a labour share equal to one. If their share in total net income increases this may be one of the reasons why no decline in the income based labour share is visible. There is indeed some evidence (OECD, 2012) that the negative trend is on average stronger when looking only at the business sector.

Figure 3 Average labour shares (income perspective)



Note: Data starting in 1995 comprise 22 countries of Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Japan, Korea, Netherlands, Norway, Portugal, Slovak Republic, Sweden, Switzerland, United States; data starting in 2000 also include 6 countries of Iceland, Ireland, Poland, Slovenia, Spain, United Kingdom.

Sources: Authors' calculation based on OECD Annual National Accounts.

Table 3 Time trends in income-based labour shares, 1995 - 2014

Time variable(β_t)	LS_{D1}	LS_{D2}	LS_{D3}	LS_{D4}	LS_{D5}
Fixed effects model	0.052***	-0.031**	-0.073***	-0.052***	0.0002
	(0.016)	(0.014)	(0.014)	(0.019)	(0.017)
Random effects model	0.027	-0.050	-0.090**	-0.085	-0.026
with AR1 error term	(0.055)	(0.037)	(0.040)	(0.064)	(0.045)

Note: Standard errors between brackets. One, two, and three asterisks indicate parameter significance at the 10, 5, and 1% level. Estimates based on 22 countries (see Figure 1 for list).

Source: Authors' calculations.

What drives the differences between production-based and income-based labour shares? We consider the following decomposition of the changes of LSP and LSD (leaving out subscripts that refer to different allocations of mixed income for ease of notation):

$$(10) \quad LS_D = [w_D L_D / w_P L_P] \cdot [w_P L_P / VA_B'] \cdot [VA_B' / VA_B] \cdot [VA_B / VA_M] \cdot [VA_M / NDI_M]$$

$$= LS_P \cdot [w_D L_D / w_P L_P] \cdot [VA_B' / VA_B] \cdot [VA_B / VA_M] \cdot [VA_M / NDI_M]$$

$$= LS_P \cdot \gamma_1 \cdot \gamma_2 \cdot \gamma_3 \cdot \gamma_4$$

where $\gamma_1 \equiv [w_D L_D / w_P L_P]$: proportional attribution of net taxes on production T_{PRN} to labour;

$\gamma_2 \equiv [VA_B' / VA_B]$: exclusion of owner-occupied housing;

$\gamma_3 \equiv [VA_B / VA_M]$: valuation at basic prices rather than market prices;

$\gamma_4 \equiv [VA_M / NDI_M]$: gross rather than net measure (depreciation effect).

The components on the right hand side of (10) indicate the various adjustments that are required to move from the labour share measures LS_D (income perspective) to labour shares LS_P (production perspective). Table 4 presents the results of the decomposition for the case of LS_{P5} and LS_{D5}. It breaks down the percentage point change of the labour share LS^{2014}_{P5}-LS^{1995}_{P5} into its additive components. This is achieved

by transforming the percentage point difference into a logarithmic difference by applying a logarithmic mean[27]:

(11) $LS_D^{2014} - LS_D^{1995} \equiv \Delta LS_D = m(LS_D^{2014}, LS_D^{1995})\Delta \ln LS_D$

with $\Delta \ln LS_D = \Delta \ln LS_P + \Delta \ln \gamma_1 + \Delta \ln \gamma_2 + \Delta \ln \gamma_3 + \Delta \ln \gamma_4$.

Table 4 Explaining the gap in changes between LSP5 and LSD5 by country

Percentage points, cumulative over the period 1995-2014

Country	Time period	Changes in production-based LS	+ Effect of allocation of net taxes	+ Effect of exclusion of owner-occupied housing	+ Effect of valuation	+ Effect of depreciation	Changes in income-based LS
		$m*\Delta \ln LS_{P5}$	$m*\gamma 1$	$m*\gamma 2$	$m*\gamma 3$	$m*\gamma 4$	$=\Delta LS_{D5}$
Australia	1995~2014	-1.62	-0.55	-0.82	**0.97**	0.20	-1.82
Austria	1996~2014	-2.27	-0.31	-1.05	-0.77	**1.45**	-2.95
Belgium	1996~2014	-2.28	1.16	0.86	-0.53	**3.27**	2.47
Canada	1995~2014	-4.10	0.97	0.00	1.17	**1.55**	-0.41
Czech Republic	1996~2014	3.94	0.51	**-0.62**	-0.40	0.24	3.67
Denmark	1996~2014	3.20	**-0.60**	0.03	0.01	0.50	3.14
Estonia	1996~2014	-6.03	0.54	-0.29	**-0.74**	0.31	-6.22
Finland	1996~2014	3.97	-0.44	**-1.51**	-1.20	0.82	1.63
France	1995~2014	3.13	0.01	-0.55	-0.34	**1.88**	4.14
Germany	1996~2014	-1.63	-0.72	-0.21	-0.45	**1.22**	-1.78
Hungary	1996~2014	-6.21	-0.15	0.43	-0.27	**-1.37**	-7.58
Italy	1996~2014	3.52	-2.06	-1.70	-0.33	**2.39**	1.83
Japan	1995~2013	-3.40	-0.69	**-1.48**	0.16	1.14	-4.27
Korea	1995~2014	-6.30	-0.02	0.11	0.35	**5.62**	-0.24
Netherlands	1996~2014	-0.18	-0.24	**1.09**	-0.43	0.36	0.60
Norway	1996~2014	-5.65	-0.28	**3.52**	1.69	-0.77	-1.50
Portugal	1996~2014	-3.98	-0.41	**-2.66**	-0.52	1.38	-6.20
Slovak Republic	1996~2014	0.75	-0.39	-0.09	0.45	**-0.83**	-0.10
Slovenia	1997~2014	-5.55	-0.41	1.43	0.20	**1.70**	-2.64
Sweden	1996~2014	5.13	**-2.11**	1.00	0.69	2.05	6.75
Switzerland	1996~2013	2.08	**-0.93**	0.00	-0.05	0.64	1.75
United Kingdom	1998~2014	2.62	0.16	**-1.91**	-0.38	-0.51	-0.03
United States	1998~2014	-2.97	-0.08	-0.47	1.03	**1.15**	-1.33
Average		-1.04	-0.31	-0.21	0.01	**1.06**	-0.48
Average of absolute effects			0.60	**0.95**	0.57	**1.36**	

Note: Shaded cells indicate the largest absolute component.

Source: Authors' calculations.

[27] For any two real numbers a, b>0, the logarithmic mean is defined as m(a,b)=(a-b)/ln(a/b) – for a discussion see Balk (2008) who attributes the origins of the logarithmic mean to unpublished work by Törnqvist in 1935 (Balk 2008, p. 134).

It emerges from Table 4 that the most important element in this decomposition is the passage from a gross to a net measure of income and thus the role of depreciation (or consumption of fixed capital as it is labelled in the national accounts)[28]. On average, and in many individual countries, the share of depreciation in gross income has indeed seen a steady upward trend (Figure 4), driving a wedge between the growth of gross value added and net domestic income[29]. Rising average depreciation can be caused by more rapid wear and tear as well as obsolescence of certain capital goods or by a shifting composition of the capital stock towards a higher share of quickly depreciating assets. For instance, since the introduction of the 2008 SNA, intellectual property products (such as stocks of R&D) form part of measured capital. These assets depreciate quickly and their share in total assets has risen over time. Larger or more frequent replacement investments are required to keep the productive capacity of capital intact. Put differently, one reason for a rising capital share (falling labour share) from a production perspective may simply be the fact that more income is needed for potential replacement investment than in the past. Another important factor is cyclical effects – indeed, the strong uptake around 2007-08 is no coincidence: rather stable flows of depreciation met contracting output and so generated a fast rise in depreciation rates[30]. That said, the inclusion of a cyclical variable (output gap) in our regression analysis had no effect on the quality of the results. Whatever the precise reason for rising rates of depreciation, an increasing *net* return on capital has not been the source of rising capital shares. The *gross* return, on the other hand, may be rising to cover rising wear, tear and obsolescence of capital.

[28] Bridgman (2014) and Zheng et al. (2015) arrive at a similar conclusion for United States.

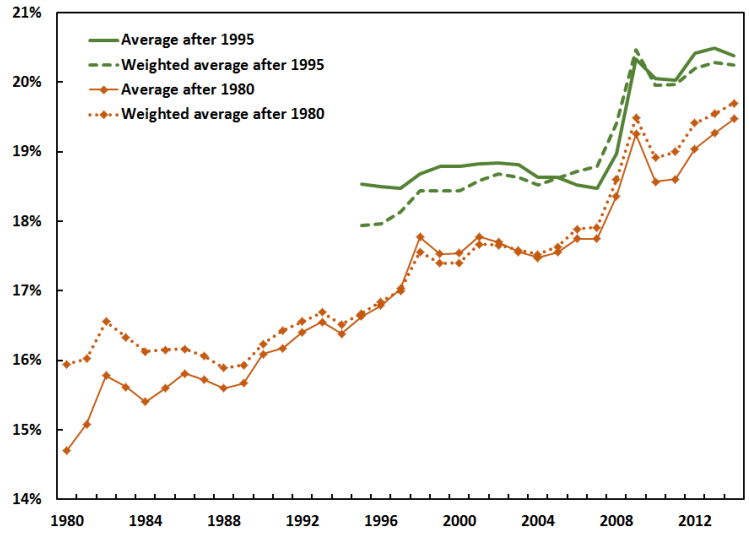
[29] Thus, in many countries, the increase in nominal net income is likely to have been even feebler than the increase in gross income (GDP) that has been a concern since the onset of the crisis.

[30] Some caution is also called for regarding the quality of countries' depreciation measures. While some countries can point to recent surveys to determine age profiles of assets and rates of depreciation, this is not the case for many other countries and assumed service lives may not be up to date (OECD, 2009).

Table 4 also points to the importance of owner-occupied housing as an element that drives a wedge between production-based and income-based labour shares[31]. There is no clear pattern, however. In many countries, and on average, owner-occupied housing enters the de-composition with a negative sign, thus contributing to a decline (or reducing a rise) in LS_P. This suggests that the imputed capital income associated with owner-occupied housing has increased less quickly than capital income in other parts of the economy. For about one third of countries, the effect is positive, contributing to a rise or reducing a decline in labour shares. Either way, the imputations are likely to reflect the influence of land prices in the following sense. While revaluations of assets such as land are not *as such* part of income, they affect rental prices and rents for dwellings: a widely-used method to value owner-occupied housing services is by imputing observed market rents for comparable dwellings. As market rents tend to move in tandem with land prices, changes in the latter will translate into values of owner-occupied rents. An alternative estimation technique is the user cost method. As user costs are computed as a proportion of asset values, there is again a direct link from land revaluation to the value of owner-occupied housing. Rising/falling land prices will thus raise/dampen the income from owner-occupied housing and this appears to be at least a partial explanation for movements in the production-based labour and capital shares.

[31] This supports Rognlie's (2015) finding for the United States "Overall, the net capital share has increased since 1948, but when disaggregated this increase comes entirely from the housing sector: the contribution to net capital income from all other sectors has been zero or slightly negative, as the fall and rise have offset each other."

Figure 4 Depreciation/Gross Value-Added



Note: data for Australia, Canada, France and Korea: 1981-2014; data for all 21 countries: 1995-2014.

Source: Authors' calculation based on OECD Annual National Accounts.

Conclusions

We revisit the recurring question of how best to measure the labour share in OECD economies by drawing a distinction between production-based and income-based perspectives. The former examines labour and capital in a reference framework of a production function in a market setting, the latter looks at labour and capital income measures that have macro-economic net income measures as a reference, thus including income generated by non-market production, taking account of depreciation and recognising taxes and subsidies as perceived by final consumers. The distinction is helpful in deciding on various measurement decisions and results in different observations on the development of the labour share. We find in particular:

- Confirmation of a statistically significant decline in the labour share when adopting a production perspective. While the decline is significant, it is rather small on average but with large variations between countries.

- A much lower or entirely insignificant decline in the labour share when adopting an income perspective. Given this evidence, it is hard to argue that changes in the functional income distribution – labour against capital – have been a driving force behind a rather pervasive trend towards more income inequality in OECD countries (OECD 2015). Rather, our analysis shows that there has been a change in the distribution *within* capital income components. To the extent that

the gross income share of capital has risen (our production-related measure), this appears to have been a consequence of rising depreciation rates. A weakened link between the functional and the inter-household distribution of income is compatible with a rising inequality among wage earners, i.e., within the labour share. It may also be consistent with rising inequality within the capital share when rents on non-produced assets account for an increasing part of capital income as opposed to returns to produced capital (Stiglitz 2015). If the wealth distribution effect from appreciating land assets is persistent, and if the ultimate ownership structure between households of non-produced assets is different from the ultimate ownership structure of produced assets, this will translate into income distribution effects through a different distribution of property income associated with the different assets.

- Mixed income cannot be ignored in labour and capital share calculations. Given statistical practices, restricting the scope of observations to the corporate sector does not resolve the issue and comes at the price of ignoring about 1/3 of economy-wide income. How mixed income is allocated to labour and capital strongly affects results.

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Appendix A. Description of variables and computation of labour income shares

The analysis is based on data downloaded on August 3, 2016 from the Annual National Accounts part of the OECD.stat Database (http://stats.oecd.org/). Korean income data has been divided into operating surplus and mixed income by authors' estimation.

1) Item code used in computing labour income shares

Item code	Variable	Description
■ Based on Detailed Non-Financial Sector Accounts, in OECD Annual National Accounts		
D1P	CE	Compensation of employees
D2P-D3R		Taxes(D2P) less subsidies(D3R) on production and imports
D21P-D31R	T_{PR}	Taxes(D21P) less subsidies(D31R) on products
D29P-D39R	T_{PRN}	Other taxes(D29P) less subsidies(D39R) on production
B2GR	GOS	Operating surplus, gross
B3GR	GV_{MIX}	Mixed income, gross
K1MP	D	Consumption of fixed capital
B1GR	GDP, GVA_M	GDP or Gross Value Added at market prices
■ Sectoral code		
S1	S1	Total Economy
S14+S15	S14+S15	Households and Non-profit institutions serving households (NPISHs)
■ Based on Summary tables in Annual Labour Force Statistics		
	L	Civil employment rather than total employment due to data availability
	L_W	o Wage and salaried workers excluding soldiers
	L_{NW}	o Self-employment (=L-L_W) o It includes employers, own-account workers, contributing family workers, workers not classifiable by status according to ILO Labour Statistics

2) Variables derived from the above information

Variables	Description
GOS_{OOH}	o Gross operating surplus derived from owner-occupied housing o GOS(S14+S15). GOS_{OOH} is considered as the same as gross operating surplus earned by households and NPISHs under the condition that gross operating surplus is separately compiled from gross mixed income in the S14+S15 sector.
V_{MIX}	o V_{MIX}, if mixed income is compiled in net terms as well as in gross terms. o GV_{MIX}–D*GV_{MIX}/(GOS+GV_{MIX}), if V_{MIX} is not identified separately.
GVA_M	o CE+GOS+GV_{MIX}+T_{PRN}+T_{PR}=GDP
GVA_B	o CE+GOS+GV_{MIX}+T_{PRN}
GVA_B'	o CE+GOS+GV_{MIX}+T_{PRN}−GOS_{OOH}
NDI_M	o GVA_M−D=GDP−D=CE+GOS+GV_{MIX}+T_{PRn}+T_{PR}−D

3) Types of labour income shares

Type	Computation of labour income share with variables
LS_{P1}	o $CE/(CE+GOS+GV_{MIX}-GOS_{OOH})$
LS_{P2}	o $(CE+2/3*V_{MIX})/(CE+GOS+GV_{MIX}-GOS_{OOH})$
LS_{P3}	o $(CE+1*V_{MIX})/(CE+GOS+GV_{MIX}-GOS_{OOH})$
LS_{P4}	o $CE/L_W*(L_W+1*L_{NW})/(CE+GOS+GV_{MIX}-GOS_{OOH})$
LS_{P5}	o $CE/L_W*(L_W+0.5*L_{NW})/(CE+GOS+GV_{MIX}-GOS_{OOH})$
LS_{D1}	o CE/NDI_M
LS_{D2}	o $(CE+2/3*V_{MIX})/NDI_M$
LS_{D3}	o $(CE+1*V_{MIX})/NDI_M$
LS_{D4}	o $CE/L_W*(L_W+1*L_{NW})/NDI_M$
LS_{D5}	o $CE/L_W*(L_W+0.5*L_{NW})/NDI_M$

Appendix B. Data availability by country

(For production-based labour shares)

	LSP1	LSP2	LSP3	LSP4	LSP5	Compensation of Employees	Operating surplus + Mixed income, gross	GOSOOH	Mixed income, net	Wage and salaried workers excluding soldiers	Self employment
						D1P(S1)	B2GR+B3GR(S1)	B2GR(S14+S15)	VMIX	LW	LNW
Australia	1959~2014	1959~2014	1959~2014	1964~2014	1964~2014	1959~2014	1959~2014	1959~2014	1959~2014	1964~2014	1964~2014
Austria	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1968~2014	1968~2014
Belgium	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Canada	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1956~2014	1956~2014
Chile	N/A	N/A	N/A	N/A	N/A	2003~2014	2003~2014	N/A	N/A	1996~2014	1996~2014
Czech Republic	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1992~2014	1992~2014
Denmark	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1960~2014	1960~2014
Estonia	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1989~2014	1989~2014
Finland	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1959~2014	1959~2014
France	1950~2014	1978~2014	1978~2014	1978~2014	1978~2014	1950~2014	1950~2014	1950~2014	1978~2014	1956~2014	1956~2014
Germany	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1957~2014	1957~2014
Greece	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1960~2014	1960~2014
Hungary	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1992~2014	1992~2014
Iceland	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	1964~2014	1964~2014
Ireland	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1956~2014	1956~2014
Israel	N/A	N/A	N/A	N/A	N/A	2000~2014	2000~2014	N/A	N/A	1995~2014	1995~2014
Italy	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Japan	1994~2014	1994~2014	1994~2014	1994~2013	1994~2013	1994~2014	1994~2014	1994~2014	1994~2014	1956~2013	1956~2013
Korea	1970~2014	1975~2014	1975~2014	1975~2014	1975~2014	1970~2014	1970~2014	1970~2014	1975~2014	1963~2014	1963~2014
Luxembourg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1960~2014	1960~2014
Mexico	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	1970~2014	1970~2014
Netherlands	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
New Zealand	N/A	N/A	N/A	N/A	N/A	1971~2014	1971~2014	N/A	N/A	1956~2014	1956~2014
Norway	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Poland	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	1956~2014	1956~2014
Portugal	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Slovak Republic	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1994~2014	1994~2014
Slovenia	1995~2014	1995~2014	1995~2014	1996~2014	1996~2014	1995~2014	1995~2014	1995~2014	1995~2014	1996~2014	1996~2014
Spain	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1960~2014	1960~2014
Sweden	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1963~2014	1963~2014
Switzerland	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1991~2014	1991~2014
Turkey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1960~2014	1960~2014
United Kingdom	1995~2014	1997~2014	1997~2014	1997~2014	1997~2014	1995~2014	1995~2014	1995~2014	1997~2014	1956~2014	1956~2014
United States	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1956~2014	1956~2014

(For income-based labour shares)

	LSD1	LSD2	LSD3	LSD4	LSD5	Compensation of Employees	NDIM	Mixed income, net	Wage and salaried workers excluding soldiers	Self employment
						D1P(S1)	NDIM	VMIX	LW	LNW
Australia	1959~2014	1959~2014	1959~2014	1964~2014	1964~2014	1959~2014	1959~2014	1959~2014	1964~2014	1964~2014
Austria	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1968~2014	1968~2014
Belgium	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Canada	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1981~2014	1956~2014	1956~2014
Chile	N/A	N/A	N/A	N/A	N/A	2003~2014	N/A	N/A	1996~2014	1996~2014
Czech Republic	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1992~2014	1992~2014
Denmark	1995~2014	1995~2014	1995~2014	1995~2013	1995~2013	1995~2014	1995~2014	1995~2014	1960~2014	1960~2013
Estonia	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1989~2014	1989~2014
Finland	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1959~2014	1959~2014
France	1978~2014	1978~2014	1978~2014	1978~2014	1978~2014	1950~2014	1978~2014	1978~2014	1956~2014	1956~2014
Germany	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1957~2014	1957~2014
Greece	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1960~2014	1960~2014
Hungary	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1992~2014	1992~2014
Iceland	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	2000~2013	1964~2014	1964~2014
Ireland	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1956~2014	1956~2014
Israel	2000~2014	N/A	N/A	2000~2014	2000~2014	2000~2014	2000~2014	N/A	1995~2014	1995~2014
Italy	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Japan	1994~2014	1994~2014	1994~2014	1994~2013	1994~2013	1994~2014	1994~2014	1994~2014	1956~2013	1956~2013
Korea	1970~2014	1975~2014	1975~2014	1970~2014	1970~2014	1970~2014	1970~2014	1975~2014	1963~2014	1963~2014
Luxembourg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1960~2014	1960~2014
Mexico	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	2003~2013	1970~2014	1970~2014
Netherlands	1995~2014	1995~2014	1995~2014	1995~2013	1995~2013	1995~2014	1995~2014	1995~2014	1956~2014	1956~2013
New Zealand	1971~2012	N/A	N/A	1986~2012	1986~2012	1971~2014	1971~2012	N/A	1956~2014	1956~2014
Norway	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1978~2014	1995~2014	1956~2014	1956~2014
Poland	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	2000~2014	1956~2014	1956~2014
Portugal	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1956~2014	1956~2014
Slovak Republic	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1994~2014	1994~2014
Slovenia	1995~2014	1995~2014	1995~2014	1996~2014	1996~2014	1995~2014	1995~2014	1995~2014	1996~2014	1996~2014
Spain	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1999~2014	1960~2014	1960~2014
Sweden	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1995~2014	1963~2014	1963~2014
Switzerland	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1995~2013	1991~2014	1991~2014
Turkey	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1960~2014	1960~2014
United Kingdom	1997~2014	1997~2014	1997~2014	1997~2014	1997~2014	1995~2014	1997~2014	1997~2014	1956~2014	1956~2014
United States	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1970~2014	1956~2014	1956~2014

Appendix C. Descriptive statistics for labour shares

1) LS_{P1}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.615	0.609	0.598	0.584	0.582	0.528	0.589	0.650	(1982)	0.517	(1959)
France	1950~2014	0.636	0.654	0.638	0.647	0.665	0.506	0.669	0.677	(1982)	0.495	(1950)
Korea	1970~2014	0.387	0.464	0.522	0.512	0.512	0.379	0.518	0.551	(1996)	0.357	(1974)
United States	1970~2014	0.662	0.653	0.655	0.646	0.623	0.673	0.618	0.679	(1970)	0.617	(2013)
Austria	1995~2014	..	..	0.597	0.567	0.579	0.601	0.585	0.607	(1995)	0.548	(2007)
Belgium	1995~2014	..	..	0.610	0.604	0.602	0.610	0.606	0.621	(2002)	0.588	(2007)
Canada	1981~2014	..	0.589	0.595	0.562	0.560	0.598	0.562	0.626	(1992)	0.551	(2008)
Czech Republic	1995~2014	..	..	0.452	0.455	0.473	0.459	0.475	0.481	(2013)	0.440	(2001)
Denmark	1995~2014	..	..	0.613	0.627	0.637	0.605	0.634	0.667	(2009)	0.603	(1995)
Estonia	1995~2014	..	..	0.556	0.521	0.524	0.574	0.522	0.597	(1995)	0.499	(2005)
Finland	1995~2014	..	..	0.575	0.569	0.613	0.578	0.620	0.621	(2012)	0.555	(2007)
Germany	1995~2014	..	..	0.598	0.581	0.583	0.601	0.588	0.607	(2000)	0.552	(2007)
Greece	1995~2014	..	..	0.360	0.405	0.437	0.354	0.427	0.454	(2010)	0.350	(1996)
Hungary	1995~2014	..	..	0.538	0.542	0.531	0.546	0.530	0.558	(1995)	0.524	(1999)
Iceland	2000~2013	..	..	..	0.661	0.616	0.640	0.626	0.725	(2007)	0.566	(2009)
Ireland	1999~2014	..	..	0.467	0.468	0.455	0.458	0.446	0.522	(2008)	0.434	(2002)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.461	0.472	0.504	0.461	0.505	0.507	(2012)	0.455	(2001)
Japan	1994~2014	..	..	0.626	0.609	0.616	0.624	0.618	0.633	(1998)	0.591	(2007)
Mexico	2003~2013	..	..	..	0.331	0.314	0.341	0.312	0.356	(2003)	0.309	(2012)
Netherlands	1995~2014	..	..	0.568	0.561	0.552	0.567	0.554	0.575	(2000)	0.543	(2006)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.593	0.520	0.527	0.580	0.529	0.622	(1998)	0.482	(2006)
Poland	2000~2014	..	..	..	0.458	0.436	0.491	0.434	0.501	(2001)	0.432	(2006)
Portugal	1995~2014	..	..	0.560	0.568	0.560	0.558	0.554	0.575	(2005)	0.553	(2014)
Slovak Republic	1995~2014	..	..	0.476	0.438	0.429	0.472	0.430	0.491	(1998)	0.408	(2008)
Slovenia	1995~2014	..	..	0.644	0.620	0.624	0.659	0.618	0.678	(1995)	0.598	(2007)
Spain	1999~2014	..	..	0.562	0.567	0.576	0.561	0.569	0.589	(2010)	0.557	(2002)
Sweden	1995~2014	..	..	0.582	0.598	0.611	0.581	0.621	0.624	(2013)	0.563	(1995)
Switzerland	1995~2013	..	..	0.578	0.587	0.597	0.579	0.602	0.607	(2013)	0.569	(2007)
United Kingdom	1995~2014	..	..	0.602	0.640	0.632	0.588	0.625	0.657	(2001)	0.579	(1996)

Note: 1970s means an average over 1970 to 1979.

2) LS_{P2}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.676	0.657	0.640	0.626	0.623	0.633	0.628	0.703	(1974)	0.605	(2008)
France	1978~2014	0.716	0.694	0.674	0.678	0.688	0.716	0.692	0.718	(1981)	0.657	(1989)
Korea	1975~2014	0.649	0.624	0.626	0.576	0.551	0.651	0.556	0.653	(1975)	0.544	(2010)
United States	1970~2014	0.709	0.695	0.699	0.693	0.670	0.719	0.667	0.724	(1970)	0.665	(2013)
Austria	1995~2014	..	..	0.638	0.603	0.614	0.642	0.619	0.649	(1995)	0.584	(2007)
Belgium	1995~2014	..	..	0.649	0.636	0.628	0.649	0.631	0.655	(2001)	0.618	(2007)
Canada	1981~2014	..	0.643	0.651	0.614	0.610	0.650	0.610	0.681	(1992)	0.601	(2008)
Czech Republic	1995~2014	..	..	0.520	0.516	0.523	0.528	0.524	0.531	(1997)	0.505	(2001)
Denmark	1995~2014	..	..	0.646	0.648	0.654	0.642	0.651	0.681	(2009)	0.631	(2000)
Estonia	1995~2014	..	..	0.616	0.570	0.558	0.630	0.556	0.639	(1995)	0.547	(2005)
Finland	1995~2014	..	..	0.600	0.594	0.635	0.605	0.641	0.642	(2012)	0.582	(2007)
Germany	1995~2014	..	..	0.645	0.620	0.620	0.649	0.625	0.654	(1995)	0.592	(2007)
Greece	1995~2014	..	..	0.549	0.566	0.559	0.547	0.548	0.583	(2010)	0.540	(2013)
Hungary	1995~2014	..	..	0.603	0.595	0.572	0.614	0.570	0.628	(1995)	0.564	(2014)
Iceland	2000~2013	..	..	..	0.674	0.624	0.660	0.634	0.734	(2007)	0.574	(2009)
Ireland	1999~2014	..	..	0.523	0.513	0.489	0.513	0.479	0.563	(2008)	0.477	(2014)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.566	0.569	0.587	0.566	0.588	0.590	(2009)	0.557	(2001)
Japan	1994~2014	..	..	0.650	0.627	0.629	0.649	0.631	0.655	(1998)	0.608	(2007)
Mexico	2003~2013	..	..	..	0.456	0.443	0.468	0.439	0.485	(2003)	0.434	(2012)
Netherlands	1995~2014	..	..	0.615	0.601	0.588	0.614	0.590	0.620	(2000)	0.584	(2010)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.600	0.525	0.531	0.587	0.534	0.628	(1998)	0.486	(2006)
Poland	2000~2014	..	..	..	0.589	0.565	0.620	0.563	0.631	(2001)	0.559	(2014)
Portugal	1995~2014	..	..	0.636	0.633	0.615	0.634	0.610	0.639	(2005)	0.609	(2012)
Slovak Republic	1995~2014	..	..	0.537	0.525	0.523	0.532	0.523	0.553	(1998)	0.510	(2004)
Slovenia	1995~2014	..	..	0.688	0.661	0.656	0.701	0.650	0.718	(1995)	0.640	(2014)
Spain	1999~2014	..	..	0.644	0.637	0.619	0.642	0.612	0.644	(1999)	0.610	(2014)
Sweden	1995~2014	..	..	0.599	0.613	0.624	0.599	0.633	0.635	(2013)	0.583	(1995)
Switzerland	1995~2013	..	..	0.626	0.629	0.635	0.628	0.638	0.648	(2002)	0.612	(2007)
United Kingdom	1997~2014	..	..	0.644	0.671	0.666	0.644	0.659	0.687	(2001)	0.624	(1997)

Note: 1970s means an average over 1970 to 1979.

3) LS_{P3}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.707	0.681	0.661	0.646	0.643	0.685	0.647	0.729	(1974)	0.626	(2008)
France	1978~2014	0.740	0.714	0.691	0.694	0.700	0.740	0.704	0.740	(1978)	0.678	(1989)
Korea	1975~2014	0.774	0.704	0.679	0.609	0.571	0.786	0.575	0.798	(1975)	0.565	(2010)
United States	1970~2014	0.732	0.716	0.721	0.717	0.693	0.742	0.691	0.747	(1970)	0.690	(2013)
Austria	1995~2014	..	..	0.658	0.622	0.631	0.662	0.636	0.671	(1995)	0.602	(2007)
Belgium	1995~2014	..	..	0.669	0.652	0.640	0.669	0.644	0.673	(2001)	0.634	(2007)
Canada	1981~2014	..	0.671	0.679	0.640	0.634	0.676	0.635	0.708	(1992)	0.626	(2008)
Czech Republic	1995~2014	..	..	0.554	0.546	0.548	0.562	0.548	0.565	(1996)	0.538	(2001)
Denmark	1995~2014	..	..	0.663	0.659	0.662	0.660	0.660	0.689	(2009)	0.644	(2000)
Estonia	1995~2014	..	..	0.646	0.594	0.575	0.658	0.573	0.662	(1996)	0.566	(2011)
Finland	1995~2014	..	..	0.613	0.607	0.646	0.618	0.652	0.653	(2012)	0.595	(2007)
Germany	1995~2014	..	..	0.668	0.640	0.638	0.673	0.643	0.678	(1995)	0.613	(2007)
Greece	1995~2014	..	..	0.644	0.647	0.621	0.644	0.608	0.657	(2003)	0.601	(2013)
Hungary	1995~2014	..	..	0.636	0.622	0.592	0.648	0.590	0.663	(1995)	0.584	(2014)
Iceland	2000~2013	..	..	..	0.681	0.628	0.670	0.638	0.739	(2007)	0.578	(2009)
Ireland	1999~2014	..	..	0.550	0.535	0.505	0.540	0.496	0.583	(2008)	0.494	(2014)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.618	0.617	0.629	0.619	0.629	0.633	(2009)	0.608	(2001)
Japan	1994~2014	..	..	0.662	0.636	0.636	0.662	0.638	0.666	(1998)	0.616	(2007)
Mexico	2003~2013	..	..	..	0.519	0.508	0.532	0.503	0.549	(2003)	0.494	(2008)
Netherlands	1995~2014	..	..	0.638	0.622	0.606	0.637	0.608	0.642	(2000)	0.602	(2010)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.603	0.528	0.534	0.591	0.536	0.631	(1998)	0.489	(2006)
Poland	2000~2014	..	..	..	0.654	0.630	0.685	0.627	0.696	(2001)	0.622	(2014)
Portugal	1995~2014	..	..	0.673	0.666	0.643	0.672	0.638	0.676	(1996)	0.637	(2012)
Slovak Republic	1995~2014	..	..	0.568	0.568	0.570	0.562	0.569	0.584	(2009)	0.542	(1995)
Slovenia	1995~2014	..	..	0.710	0.682	0.673	0.722	0.666	0.738	(1995)	0.657	(2014)
Spain	1999~2014	..	..	0.685	0.672	0.640	0.683	0.633	0.685	(1999)	0.631	(2014)
Sweden	1995~2014	..	..	0.608	0.621	0.630	0.608	0.639	0.641	(2013)	0.593	(1995)
Switzerland	1995~2013	..	..	0.650	0.651	0.653	0.652	0.657	0.669	(2002)	0.633	(2007)
United Kingdom	1997~2014	..	..	0.660	0.687	0.683	0.660	0.677	0.702	(2001)	0.641	(1997)

Note: 1970s means an average over 1970 to 1979.

4) LS_{P4}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1964~2014	0.721	0.720	0.699	0.668	0.652	0.653	0.656	0.772	(1982)	0.636	(2008)
France	1978~2014	0.800	0.770	0.719	0.711	0.739	0.801	0.746	0.807	(1981)	0.704	(2007)
Korea	1975~2014	0.905	0.889	0.836	0.774	0.710	0.899	0.714	0.966	(1982)	0.703	(2011)
United States	1970~2014	0.733	0.719	0.716	0.697	0.668	0.748	0.662	0.756	(1970)	0.661	(2013)
Austria	1995~2014	..	..	0.694	0.653	0.668	0.700	0.674	0.710	(1995)	0.635	(2007)
Belgium	1995~2014	..	..	0.746	0.711	0.704	0.750	0.711	0.753	(1996)	0.690	(2007)
Canada	1981~2014	..	0.653	0.666	0.622	0.616	0.661	0.616	0.697	(1992)	0.607	(2008)
Czech Republic	1995~2014	..	..	0.520	0.544	0.577	0.523	0.581	0.589	(2012)	0.511	(1995)
Denmark	1995~2014	..	..	0.677	0.689	0.700	0.668	0.696	0.735	(2009)	0.665	(2000)
Estonia	1995~2014	..	..	0.604	0.569	0.575	0.620	0.574	0.641	(1995)	0.542	(2005)
Finland	1995~2014	..	..	0.675	0.655	0.709	0.682	0.718	0.719	(2012)	0.636	(2007)
Germany	1995~2014	..	..	0.671	0.658	0.658	0.674	0.663	0.681	(2000)	0.628	(2007)
Greece	1995~2014	..	..	0.649	0.645	0.683	0.652	0.671	0.701	(2011)	0.624	(2004)
Hungary	1995~2014	..	..	0.649	0.628	0.602	0.665	0.598	0.680	(1995)	0.588	(2014)
Iceland	2000~2013	..	..	..	0.774	0.706	0.773	0.717	0.843	(2006)	0.643	(2009)
Ireland	1999~2014	..	..	0.580	0.568	0.548	0.564	0.538	0.630	(2008)	0.529	(2002)
Israel	N/A	..	..	..	..	..	..	..	..	(1950)	..	(1950)
Italy	1995~2014	..	..	0.651	0.648	0.673	0.651	0.674	0.677	(2012)	0.633	(2001)
Japan	1994~2013	..	..	0.764	0.718	0.712	0.765	0.717	0.771	(1995)	0.688	(2007)
Mexico	2003~2013	..	..	..	0.509	0.474	0.535	0.469	0.562	(2003)	0.466	(2012)
Netherlands	1995~2014	..	..	0.646	0.639	0.659	0.648	0.664	0.667	(2014)	0.622	(2006)
New Zealand	N/A	..	..	..	..	..	..	..	..	(1950)	..	(1950)
Norway	1995~2014	..	..	0.649	0.564	0.568	0.636	0.571	0.678	(1998)	0.527	(2006)
Poland	2000~2014	..	..	..	0.617	0.562	0.680	0.555	0.695	(2001)	0.552	(2014)
Portugal	1995~2014	..	..	0.784	0.769	0.717	0.780	0.705	0.795	(1998)	0.690	(2014)
Slovak Republic	1995~2014	..	..	0.511	0.495	0.508	0.504	0.509	0.528	(1998)	0.475	(2008)
Slovenia	1996~2014	..	..	0.778	0.735	0.753	0.785	0.747	0.798	(1996)	0.704	(2008)
Spain	1999~2014	..	..	0.714	0.695	0.697	0.706	0.692	0.714	(1999)	0.686	(2003)
Sweden	1995~2014	..	..	0.652	0.665	0.683	0.653	0.693	0.697	(2013)	0.634	(1995)
Switzerland	1995~2013	..	..	0.669	0.667	0.667	0.669	0.672	0.694	(2002)	0.646	(2007)
United Kingdom	1997~2014	..	..	0.710	0.738	0.743	0.710	0.738	0.758	(2010)	0.691	(1997)

Note: 1970s means an average over 1970 to 1979.

5) LS_{P5}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1964~2014	0.668	0.664	0.648	0.626	0.617	0.601	0.622	0.711	(1982)	0.592	(1964)
France	1978~2014	0.733	0.712	0.679	0.679	0.702	0.735	0.708	0.742	(1981)	0.666	(1989)
Korea	1975~2014	0.653	0.676	0.679	0.643	0.611	0.639	0.616	0.713	(1982)	0.603	(2010)
United States	1970~2014	0.698	0.686	0.686	0.672	0.645	0.711	0.640	0.717	(1970)	0.639	(2013)
Austria	1995~2014	..	..	0.646	0.610	0.624	0.650	0.629	0.659	(1995)	0.591	(2007)
Belgium	1995~2014	..	..	0.678	0.658	0.653	0.680	0.658	0.682	(1996)	0.639	(2007)
Canada	1981~2014	..	0.621	0.630	0.592	0.588	0.630	0.589	0.661	(1992)	0.579	(2008)
Czech Republic	1995~2014	..	..	0.486	0.500	0.525	0.491	0.528	0.535	(2012)	0.478	(1998)
Denmark	1995~2014	..	..	0.645	0.658	0.669	0.636	0.665	0.701	(2009)	0.635	(2000)
Estonia	1995~2014	..	..	0.580	0.545	0.549	0.597	0.548	0.619	(1995)	0.521	(2005)
Finland	1995~2014	..	..	0.625	0.612	0.661	0.630	0.669	0.670	(2012)	0.596	(2007)
Germany	1995~2014	..	..	0.635	0.619	0.621	0.637	0.626	0.644	(2000)	0.590	(2007)
Greece	1995~2014	..	..	0.504	0.525	0.560	0.503	0.549	0.576	(2010)	0.498	(1996)
Hungary	1995~2014	..	..	0.594	0.585	0.566	0.605	0.564	0.619	(1995)	0.556	(2014)
Iceland	2000~2013	..	..	..	0.717	0.661	0.707	0.672	0.783	(2007)	0.604	(2009)
Ireland	1999~2014	..	..	0.524	0.518	0.502	0.511	0.492	0.576	(2008)	0.481	(2002)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.556	0.560	0.588	0.556	0.590	0.592	(2012)	0.544	(2001)
Japan	1994~2013	..	..	0.695	0.663	0.663	0.694	0.668	0.701	(1998)	0.640	(2007)
Mexico	2003~2013	..	..	..	0.420	0.394	0.438	0.390	0.459	(2003)	0.387	(2012)
Netherlands	1995~2014	..	..	0.607	0.600	0.605	0.608	0.609	0.613	(1995)	0.583	(2006)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.621	0.542	0.548	0.608	0.550	0.650	(1998)	0.504	(2006)
Poland	2000~2014	..	..	..	0.538	0.499	0.585	0.494	0.598	(2001)	0.493	(2014)
Portugal	1995~2014	..	..	0.672	0.669	0.638	0.669	0.630	0.680	(2003)	0.622	(2014)
Slovak Republic	1995~2014	..	..	0.493	0.467	0.468	0.488	0.469	0.510	(1998)	0.442	(2008)
Slovenia	1996~2014	..	..	0.707	0.677	0.688	0.713	0.682	0.731	(1996)	0.654	(2007)
Spain	1999~2014	..	..	0.638	0.631	0.636	0.633	0.630	0.648	(2010)	0.622	(2002)
Sweden	1995~2014	..	..	0.617	0.631	0.647	0.617	0.657	0.661	(2013)	0.599	(1995)
Switzerland	1995~2013	..	..	0.623	0.627	0.632	0.624	0.637	0.650	(2002)	0.608	(2007)
United Kingdom	1997~2014	..	..	0.661	0.689	0.688	0.661	0.681	0.705	(2001)	0.641	(1997)

Note: 1970s means an average over 1970 to 1979.

6) LS_{D1}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.643	0.613	0.590	0.572	0.573	0.579	0.579	0.683	(1974)	0.558	(2008)
France	1978~2014	0.635	0.628	0.599	0.609	0.637	0.639	0.640	0.654	(1982)	0.587	(1989)
Korea	1970~2014	0.366	0.448	0.514	0.518	0.538	0.358	0.547	0.554	(2014)	0.342	(1974)
United States	1970~2014	0.655	0.656	0.650	0.653	0.633	0.658	0.632	0.674	(1982)	0.631	(2013)
Austria	1995~2014	..	..	0.592	0.564	0.576	0.596	0.581	0.607	(1995)	0.543	(2007)
Belgium	1995~2014	..	..	0.598	0.609	0.633	0.597	0.638	0.641	(2013)	0.595	(1997)
Canada	1981~2014	..	0.613	0.609	0.588	0.605	0.629	0.609	0.643	(1982)	0.573	(2005)
Czech Republic	1995~2014	..	..	0.505	0.502	0.519	0.509	0.522	0.528	(2013)	0.493	(2007)
Denmark	1995~2014	..	..	0.605	0.622	0.635	0.599	0.630	0.675	(2009)	0.596	(2000)
Estonia	1995~2014	..	..	0.560	0.525	0.540	0.577	0.536	0.613	(1995)	0.502	(2006)
Finland	1995~2014	..	..	0.576	0.573	0.612	0.584	0.616	0.624	(2009)	0.560	(2007)
Germany	1995~2014	..	..	0.628	0.608	0.611	0.632	0.616	0.636	(1995)	0.573	(2007)
Greece	1995~2014	..	..	0.342	0.390	0.421	0.337	0.412	0.437	(2010)	0.333	(1996)
Hungary	1995~2014	..	..	0.535	0.530	0.515	0.542	0.512	0.549	(1995)	0.503	(2014)
Iceland	2000~2013	..	..	..	0.623	0.612	0.611	0.621	0.665	(2007)	0.573	(2009)
Ireland	1999~2014	..	..	0.446	0.454	0.460	0.437	0.452	0.513	(2009)	0.416	(2002)
Israel	2000~2014	..	..	..	0.549	0.519	0.564	0.517	0.576	(2001)	0.515	(2013)
Italy	1995~2014	..	..	0.449	0.452	0.486	0.455	0.487	0.488	(2012)	0.433	(2000)
Japan	1994~2014	..	..	0.666	0.645	0.655	0.664	0.656	0.673	(1998)	0.626	(2004)
Mexico	2003~2013	..	..	..	0.319	0.308	0.326	0.307	0.337	(2003)	0.304	(2011)
Netherlands	1995~2014	..	..	0.594	0.588	0.596	0.596	0.597	0.607	(2009)	0.563	(2007)
New Zealand	1971~2012	0.598	0.567	0.489	0.493	0.508	0.549	0.508	0.648	(1975)	0.469	(2001)
Norway	1995~2014	..	..	0.559	0.505	0.531	0.545	0.535	0.586	(1998)	0.464	(2006)
Poland	2000~2014	..	..	..	0.445	0.421	0.480	0.421	0.491	(2001)	0.416	(2011)
Portugal	1995~2014	..	..	0.559	0.566	0.551	0.558	0.541	0.575	(2009)	0.533	(2014)
Slovak Republic	1995~2014	..	..	0.524	0.471	0.467	0.522	0.470	0.539	(1997)	0.432	(2007)
Slovenia	1995~2014	..	..	0.631	0.616	0.641	0.646	0.636	0.662	(1995)	0.594	(2007)
Spain	1999~2014	..	..	0.560	0.569	0.586	0.560	0.577	0.609	(2009)	0.558	(2004)
Sweden	1995~2014	..	..	0.519	0.542	0.566	0.524	0.576	0.578	(2013)	0.508	(1998)
Switzerland	1995~2013	..	..	0.707	0.720	0.730	0.712	0.736	0.751	(2002)	0.691	(2007)
United Kingdom	1997~2014	..	..	0.584	0.612	0.587	0.584	0.578	0.625	(2001)	0.564	(2014)

Note: 1970s means an average over 1970 to 1979.

7) LS_{D2}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.708	0.661	0.632	0.613	0.612	0.693	0.617	0.738	(1974)	0.600	(2008)
France	1978~2014	0.682	0.666	0.632	0.638	0.659	0.685	0.662	0.694	(1981)	0.622	(1998)
Korea	1975~2014	0.613	0.602	0.617	0.584	0.579	0.616	0.587	0.632	(1996)	0.563	(2010)
United States	1970~2014	0.701	0.699	0.693	0.700	0.680	0.704	0.682	0.721	(2001)	0.677	(2010)
Austria	1995~2014	..	..	0.632	0.600	0.611	0.637	0.615	0.650	(1995)	0.579	(2007)
Belgium	1995~2014	..	..	0.636	0.642	0.660	0.636	0.665	0.668	(2013)	0.627	(2005)
Canada	1981~2014	..	0.670	0.667	0.643	0.658	0.683	0.661	0.696	(1982)	0.628	(2005)
Czech Republic	1995~2014	..	..	0.582	0.569	0.574	0.586	0.575	0.597	(1997)	0.554	(2007)
Denmark	1995~2014	..	..	0.638	0.644	0.652	0.635	0.647	0.690	(2009)	0.622	(2000)
Estonia	1995~2014	..	..	0.621	0.575	0.575	0.634	0.571	0.657	(1995)	0.547	(2006)
Finland	1995~2014	..	..	0.602	0.598	0.634	0.611	0.637	0.647	(2009)	0.586	(2007)
Germany	1995~2014	..	..	0.677	0.649	0.649	0.682	0.654	0.687	(1995)	0.614	(2007)
Greece	1995~2014	..	..	0.523	0.545	0.539	0.521	0.528	0.562	(2009)	0.518	(1996)
Hungary	1995~2014	..	..	0.600	0.581	0.554	0.610	0.551	0.618	(1995)	0.542	(2014)
Iceland	2000~2013	..	..	..	0.635	0.620	0.629	0.629	0.673	(2007)	0.581	(2009)
Ireland	1999~2014	..	..	0.499	0.497	0.494	0.489	0.485	0.550	(2009)	0.458	(2002)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.551	0.545	0.566	0.560	0.566	0.572	(2009)	0.532	(2000)
Japan	1994~2014	..	..	0.691	0.664	0.669	0.691	0.670	0.696	(1998)	0.644	(2007)
Mexico	2003~2013	..	..	..	0.440	0.435	0.447	0.432	0.458	(2003)	0.427	(2007)
Netherlands	1995~2014	..	..	0.643	0.631	0.634	0.645	0.636	0.652	(1995)	0.604	(2007)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.565	0.510	0.535	0.552	0.540	0.592	(1998)	0.469	(2006)
Poland	2000~2014	..	..	..	0.573	0.545	0.607	0.546	0.619	(2001)	0.540	(2011)
Portugal	1995~2014	..	..	0.634	0.631	0.605	0.635	0.595	0.641	(2001)	0.588	(2014)
Slovak Republic	1995~2014	..	..	0.591	0.565	0.569	0.588	0.572	0.606	(1997)	0.536	(2007)
Slovenia	1995~2014	..	..	0.674	0.657	0.674	0.687	0.669	0.701	(1995)	0.639	(2007)
Spain	1999~2014	..	..	0.642	0.639	0.630	0.642	0.620	0.655	(2009)	0.616	(2014)
Sweden	1995~2014	..	..	0.534	0.555	0.578	0.540	0.587	0.589	(2013)	0.523	(1998)
Switzerland	1995~2013	..	..	0.766	0.771	0.776	0.771	0.781	0.802	(2002)	0.742	(2007)
United Kingdom	1997~2014	..	..	0.615	0.642	0.618	0.615	0.610	0.654	(2001)	0.597	(2014)

Note: 1970s means an average over 1970 to 1979.

8) LS_{D3}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1959~2014	0.740	0.686	0.653	0.633	0.632	0.751	0.637	0.766	(1974)	0.620	(2008)
France	1978~2014	0.706	0.686	0.649	0.653	0.671	0.708	0.673	0.713	(1981)	0.637	(1998)
Korea	1975~2014	0.731	0.679	0.668	0.616	0.600	0.744	0.608	0.760	(1975)	0.584	(2010)
United States	1970~2014	0.724	0.720	0.715	0.724	0.704	0.726	0.706	0.746	(2001)	0.699	(2010)
Austria	1995~2014	..	..	0.652	0.618	0.628	0.658	0.632	0.671	(1995)	0.597	(2007)
Belgium	1995~2014	..	..	0.655	0.658	0.673	0.655	0.678	0.681	(2009)	0.643	(2005)
Canada	1981~2014	..	0.698	0.695	0.670	0.685	0.711	0.687	0.722	(1982)	0.656	(2005)
Czech Republic	1995~2014	..	..	0.620	0.603	0.602	0.624	0.602	0.634	(1997)	0.585	(2007)
Denmark	1995~2014	..	..	0.654	0.654	0.660	0.654	0.656	0.697	(2009)	0.634	(2000)
Estonia	1995~2014	..	..	0.651	0.599	0.593	0.662	0.588	0.679	(1995)	0.569	(2006)
Finland	1995~2014	..	..	0.615	0.611	0.645	0.624	0.648	0.658	(2009)	0.599	(1998)
Germany	1995~2014	..	..	0.702	0.670	0.669	0.707	0.673	0.712	(1995)	0.635	(2007)
Greece	1995~2014	..	..	0.613	0.623	0.598	0.613	0.586	0.635	(2003)	0.581	(2014)
Hungary	1995~2014	..	..	0.632	0.607	0.574	0.643	0.570	0.652	(1995)	0.561	(2014)
Iceland	2000~2013	..	..	..	0.642	0.624	0.639	0.633	0.678	(2007)	0.585	(2009)
Ireland	1999~2014	..	..	0.525	0.519	0.511	0.516	0.501	0.568	(2009)	0.480	(2002)
Israel	N/A	..	..	..	..	..	..	..	..		..	
Italy	1995~2014	..	..	0.601	0.591	0.606	0.612	0.606	0.615	(2009)	0.581	(2000)
Japan	1994~2014	..	..	0.704	0.673	0.676	0.704	0.677	0.710	(1994)	0.652	(2007)
Mexico	2003~2013	..	..	..	0.501	0.498	0.507	0.494	0.522	(2009)	0.486	(2007)
Netherlands	1995~2014	..	..	0.667	0.652	0.654	0.669	0.656	0.676	(1995)	0.625	(2007)
New Zealand	N/A	..	..	..	..	..	..	..	..		..	
Norway	1995~2014	..	..	0.568	0.512	0.538	0.555	0.542	0.595	(1998)	0.471	(2006)
Poland	2000~2014	..	..	..	0.636	0.608	0.670	0.608	0.683	(2001)	0.603	(2011)
Portugal	1995~2014	..	..	0.672	0.663	0.633	0.673	0.623	0.677	(1996)	0.615	(2014)
Slovak Republic	1995~2014	..	..	0.625	0.611	0.620	0.621	0.622	0.639	(1997)	0.588	(2007)
Slovenia	1995~2014	..	..	0.695	0.677	0.691	0.708	0.686	0.721	(1995)	0.661	(2007)
Spain	1999~2014	..	..	0.683	0.674	0.651	0.682	0.641	0.683	(2002)	0.637	(2014)
Sweden	1995~2014	..	..	0.542	0.562	0.584	0.548	0.593	0.594	(2013)	0.530	(1998)
Switzerland	1995~2013	..	..	0.795	0.797	0.799	0.801	0.803	0.828	(2002)	0.768	(2007)
United Kingdom	1997~2014	..	..	0.630	0.657	0.634	0.630	0.626	0.668	(2009)	0.614	(2014)

Note: 1970s means an average over 1970 to 1979.

9) LS_{D4}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1964~2014	0.754	0.724	0.690	0.654	0.641	0.709	0.645	0.800	(1974)	0.631	(2008)
France	1978~2014	0.763	0.740	0.675	0.669	0.708	0.766	0.713	0.779	(1981)	0.654	(1998)
Korea	1970~2014	0.886	0.856	0.823	0.783	0.745	0.919	0.754	0.950	(1973)	0.729	(2010)
United States	1970~2014	0.725	0.723	0.710	0.705	0.679	0.732	0.677	0.746	(1982)	0.675	(2013)
Austria	1995~2014	..	..	0.688	0.650	0.665	0.695	0.669	0.711	(1995)	0.629	(2007)
Belgium	1995~2014	..	..	0.731	0.717	0.740	0.735	0.748	0.755	(2013)	0.701	(2007)
Canada	1981~2014	..	0.679	0.682	0.651	0.665	0.695	0.667	0.711	(1982)	0.633	(2005)
Czech Republic	1995~2014	..	..	0.581	0.600	0.633	0.580	0.638	0.645	(2012)	0.565	(1995)
Denmark	1995~2013	..	..	0.668	0.684	0.698	0.661	0.696	0.744	(2009)	0.656	(2000)
Estonia	1995~2014	..	..	0.608	0.574	0.592	0.624	0.589	0.663	(2009)	0.546	(2005)
Finland	1995~2014	..	..	0.677	0.658	0.708	0.689	0.713	0.723	(2009)	0.641	(2007)
Germany	1995~2014	..	..	0.705	0.689	0.690	0.708	0.695	0.714	(2000)	0.651	(2007)
Greece	1995~2014	..	..	0.618	0.621	0.658	0.621	0.647	0.676	(2012)	0.598	(2001)
Hungary	1995~2014	..	..	0.645	0.613	0.583	0.660	0.578	0.670	(1995)	0.565	(2014)
Iceland	2000~2013	..	..	..	0.730	0.702	0.737	0.711	0.774	(2006)	0.651	(2009)
Ireland	1999~2014	..	..	0.553	0.550	0.555	0.538	0.545	0.622	(2009)	0.507	(2002)
Israel	2000~2014	..	..	..	0.633	0.594	0.654	0.591	0.666	(2001)	0.589	(2013)
Italy	1995~2014	..	..	0.633	0.620	0.649	0.644	0.649	0.652	(2012)	0.606	(2000)
Japan	1994~2013	..	..	0.812	0.760	0.757	0.814	0.763	0.821	(1994)	0.729	(2007)
Mexico	2003~2013	..	..	..	0.491	0.465	0.511	0.461	0.531	(2003)	0.458	(2011)
Netherlands	1995~2013	..	..	0.676	0.671	0.710	0.680	0.714	0.718	(2013)	0.645	(2006)
New Zealand	1986~2012	0.698	0.688	0.617	0.605	0.610	0.661	0.610	0.784	(1980)	0.585	(2001)
Norway	1995~2014	..	..	0.611	0.548	0.573	0.598	0.577	0.639	(1998)	0.508	(2006)
Poland	2000~2014	..	..	..	0.601	0.542	0.665	0.538	0.682	(2001)	0.537	(2014)
Portugal	1995~2014	..	..	0.782	0.767	0.705	0.781	0.688	0.790	(1998)	0.666	(2014)
Slovak Republic	1995~2014	..	..	0.562	0.533	0.553	0.558	0.556	0.576	(1997)	0.498	(2007)
Slovenia	1996~2014	..	..	0.762	0.730	0.774	0.771	0.768	0.791	(2010)	0.706	(2008)
Spain	1999~2014	..	..	0.713	0.697	0.709	0.705	0.701	0.733	(2009)	0.681	(2004)
Sweden	1995~2014	..	..	0.582	0.602	0.632	0.588	0.643	0.646	(2013)	0.568	(1998)
Switzerland	1995~2013	..	..	0.819	0.818	0.816	0.823	0.822	0.860	(2002)	0.785	(2007)
United Kingdom	1997~2014	..	..	0.678	0.706	0.690	0.678	0.683	0.722	(2009)	0.666	(1997)

Note: 1970s means an average over 1970 to 1979.

10) LS_{D5}

Country	Data availability	Labour share averages							Max.(year)		Min.(year)	
		1970s	1980s	1990s	2000s	2010s	Initial 3 yrs	Last 3 yrs				
Australia	1964~2014	0.699	0.669	0.640	0.613	0.607	0.653	0.612	0.742	(1974)	0.595	(2008)
France	1978~2014	0.699	0.684	0.637	0.639	0.672	0.703	0.676	0.717	(1981)	0.622	(1998)
Korea	1970~2014	0.626	0.652	0.669	0.651	0.641	0.639	0.650	0.697	(1996)	0.599	(1975)
United States	1970~2014	0.690	0.690	0.680	0.679	0.656	0.695	0.655	0.710	(1982)	0.653	(2013)
Austria	1995~2014	..	..	0.640	0.607	0.620	0.646	0.625	0.659	(1995)	0.586	(2007)
Belgium	1995~2014	..	..	0.665	0.663	0.687	0.666	0.693	0.698	(2013)	0.649	(2005)
Canada	1981~2014	..	0.646	0.646	0.620	0.635	0.662	0.638	0.677	(1982)	0.603	(2005)
Czech Republic	1995~2014	..	..	0.543	0.551	0.576	0.545	0.580	0.586	(2013)	0.532	(1995)
Denmark	1995~2013	..	..	0.636	0.653	0.666	0.630	0.664	0.709	(2009)	0.626	(2000)
Estonia	1995~2014	..	..	0.584	0.550	0.566	0.601	0.563	0.636	(1995)	0.524	(2005)
Finland	1995~2014	..	..	0.626	0.616	0.660	0.637	0.665	0.674	(2009)	0.600	(2007)
Germany	1995~2014	..	..	0.666	0.649	0.650	0.670	0.656	0.675	(2000)	0.612	(2007)
Greece	1995~2014	..	..	0.480	0.505	0.539	0.479	0.530	0.555	(2010)	0.473	(1996)
Hungary	1995~2014	..	..	0.590	0.572	0.549	0.601	0.545	0.609	(1995)	0.534	(2014)
Iceland	2000~2013	..	..	..	0.676	0.657	0.674	0.666	0.718	(2007)	0.612	(2009)
Ireland	1999~2014	..	..	0.500	0.502	0.507	0.488	0.498	0.567	(2009)	0.461	(2002)
Israel	2000~2014	..	..	..	0.591	0.556	0.609	0.554	0.621	(2001)	0.552	(2013)
Italy	1995~2014	..	..	0.541	0.536	0.568	0.550	0.568	0.570	(2012)	0.520	(2000)
Japan	1994~2013	..	..	0.739	0.703	0.706	0.739	0.710	0.744	(1998)	0.678	(2007)
Mexico	2003~2013	..	..	..	0.405	0.386	0.418	0.384	0.434	(2003)	0.381	(2011)
Netherlands	1995~2013	..	..	0.635	0.629	0.653	0.638	0.655	0.659	(2012)	0.604	(2006)
New Zealand	1986~2012	0.646	0.627	0.553	0.549	0.559	0.599	0.559	0.713	(1980)	0.527	(2001)
Norway	1995~2014	..	..	0.585	0.526	0.552	0.571	0.556	0.613	(1998)	0.486	(2006)
Poland	2000~2014	..	..	..	0.523	0.481	0.572	0.480	0.587	(2001)	0.477	(2011)
Portugal	1995~2014	..	..	0.671	0.666	0.628	0.669	0.615	0.679	(2003)	0.599	(2014)
Slovak Republic	1995~2014	..	..	0.543	0.502	0.510	0.540	0.513	0.557	(1997)	0.465	(2007)
Slovenia	1996~2014	..	..	0.692	0.673	0.707	0.700	0.702	0.723	(2010)	0.650	(2007)
Spain	1999~2014	..	..	0.636	0.633	0.648	0.633	0.639	0.671	(2009)	0.620	(2004)
Sweden	1995~2014	..	..	0.550	0.572	0.599	0.556	0.610	0.612	(2013)	0.538	(1998)
Switzerland	1995~2013	..	..	0.763	0.769	0.773	0.767	0.779	0.805	(2002)	0.738	(2007)
United Kingdom	1997~2014	..	..	0.631	0.659	0.638	0.631	0.630	0.672	(2009)	0.617	(2014)

Note: 1970s means an average over 1970 to 1979.

Appendix D. Econometric analysis – full set of results

1) Based on 22 countries (1995 – 2014)

Fixed Effect Model (FEM)											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0529	0.0013	***	0.0163	-0.1592	0.0000	***	0.0317	0.937	NA	1796.138
LSD2	-0.0312	0.0319	**	0.0145	-0.1221	0.0000	***	0.0282	0.919	NA	1694.765
LSD3	-0.0732	0.0000	***	0.0146	-0.1036	0.0003	***	0.0284	0.912	NA	1701.535
LSD4	-0.0525	0.0087	***	0.0199	-0.2248	0.0000	***	0.0387	0.905	NA	1962.034
LSD5	0.0002	0.9918		0.0172	-0.1920	0.0000	***	0.0334	0.914	NA	1836.261
LSP1	0.0006	0.9698		0.0151	-0.1117	0.0002	***	0.0294	0.932	NA	1730.685
LSP2	-0.0864	0.0000	***	0.0132	-0.0687	0.0080	***	0.0258	0.893	NA	1617.301
LSP3	-0.1299	0.0000	***	0.0135	-0.0471	0.0728	*	0.0262	0.874	NA	1631.728
LSP4	-0.1160	0.0000	***	0.0193	-0.1707	0.0000	***	0.0375	0.894	NA	1934.306
LSP5	-0.0579	0.0004	***	0.0162	-0.1414	0.0000	***	0.0315	0.902	NA	1786.262
Random Effect Model (REM)											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0528	0.0013	***	0.0163	-0.1589	0.0000	***	0.0318	0.006	0.936	1902.275
LSD2	-0.0314	0.0314	**	0.0145	-0.1219	0.0000	***	0.0283	0.004	0.919	1795.169
LSD3	-0.0734	0.0000	***	0.0146	-0.1036	0.0003	***	0.0285	0.007	0.911	1799.703
LSD4	-0.0531	0.0087	***	0.0201	-0.2245	0.0000	***	0.0391	0.009	0.905	2058.527
LSD5	-0.0002	0.9919		0.0174	-0.1916	0.0000	***	0.0337	0.007	0.915	1935.407
LSP1	0.0004	0.9767		0.0152	-0.1111	0.0002	***	0.0295	0.002	0.932	1835.189
LSP2	-0.0866	0.0000	***	0.0133	-0.0681	0.0089	***	0.0259	0.012	0.892	1710.689
LSP3	-0.1302	0.0000	***	0.0135	-0.0468	0.0763	*	0.0263	0.028	0.872	1720.339
LSP4	-0.1166	0.0000	***	0.0195	-0.1700	0.0000	***	0.0379	0.013	0.895	2028.231
LSP5	-0.0583	0.0004	***	0.0165	-0.1405	0.0000	***	0.0319	0.007	0.902	1882.116
Random Effect Model with AR(1) errors											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0270	0.6271		0.0556	-0.2897	0.0000	***	0.0261	0.013	0.013	1451.454
LSD2	-0.0500	0.1884		0.0379	-0.2693	0.0000	***	0.0253	0.018	0.825	1401.234
LSD3	-0.0908	0.0249	**	0.0403	-0.2634	0.0000	***	0.0253	0.023	0.766	1399.606
LSD4	-0.0855	0.1863		0.0646	-0.3836	0.0000	***	0.0312	0.025	0.025	1588.598
LSD5	-0.0262	0.5638		0.0454	-0.3329	0.0000	***	0.0283	0.020	0.801	1499.467
LSP1	0.0042	0.9349		0.0518	-0.1942	0.0000	***	0.0245	0.007	0.007	1394.260
LSP2	-0.0786	0.0208	**	0.0338	-0.1669	0.0000	***	0.0235	0.018	0.776	1326.171
LSP3	-0.1185	0.0015	***	0.0371	-0.1568	0.0000	***	0.0233	0.032	0.643	1318.100
LSP4	-0.1137	0.0627	*	0.0609	-0.2673	0.0000	***	0.0296	0.019	0.020	1542.029
LSP5	-0.0557	0.1934		0.0427	-0.2286	0.0000	***	0.0268	0.014	0.767	1445.988

Notes 1) One, two, and three asterisks indicate parameter significance at the 10, 5, and 1% level.

2) Marginal R-squared = Var(Fixed effect) / Var(Total)

3) Conditional R-squared = (Var(Fixed effect)+Var(Random effect)) / Var(Total)

4) The smaller AIC, the better model

2) Based on 28 countries (2000 – 2014)

Fixed Effect Model (FEM)											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0905	0.0001	***	0.0221	-0.2031	0.0000	***	0.0305	0.952	NA	1287.235
LSD2	0.0113	0.5883		0.0209	-0.1408	0.0000	***	0.0288	0.933	NA	1249.608
LSD3	-0.0283	0.1850		0.0213	-0.1097	0.0002	***	0.0294	0.925	NA	1263.368
LSD4	0.0345	0.2345		0.0289	-0.2269	0.0000	***	0.0397	0.916	NA	1456.687
LSD5	0.0622	0.0118	**	0.0245	-0.2152	0.0000	***	0.0337	0.929	NA	1348.386
LSP1	0.0313	0.1030		0.0191	-0.1570	0.0000	***	0.0264	0.954	NA	1191.941
LSP2	-0.0509	0.0043	***	0.0177	-0.0891	0.0003	***	0.0244	0.925	NA	1140.384
LSP3	-0.0920	0.0000	***	0.0182	-0.0552	0.0288	**	0.0251	0.909	NA	1160.653
LSP4	-0.0375	0.1566		0.0264	-0.1782	0.0000	***	0.0362	0.917	NA	1396.186
LSP5	-0.0037	0.8640		0.0216	-0.1681	0.0000	***	0.0297	0.929	NA	1266.087
Random Effect Model (REM)											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0906	0.0001	***	0.0223	-0.2024	0.0000	***	0.0308	0.013	0.951	1393.804
LSD2	0.0113	0.5965		0.0212	-0.1403	0.0000	***	0.0293	0.006	0.932	1348.629
LSD3	-0.0285	0.1915		0.0217	-0.1095	0.0003	***	0.0300	0.003	0.924	1359.798
LSD4	0.0344	0.2467		0.0296	-0.2260	0.0000	***	0.0406	0.011	0.915	1550.279
LSD5	0.0621	0.0151	**	0.0254	-0.2140	0.0000	***	0.0349	0.014	0.929	1446.128
LSP1	0.0314	0.1028		0.0192	-0.1563	0.0000	***	0.0265	0.007	0.954	1299.721
LSP2	-0.0508	0.0044	***	0.0177	-0.0885	0.0003	***	0.0244	0.004	0.923	1236.425
LSP3	-0.0919	0.0000	***	0.0182	-0.0548	0.0300	**	0.0251	0.007	0.907	1252.009
LSP4	-0.0373	0.1598		0.0265	-0.1773	0.0000	***	0.0364	0.007	0.914	1489.579
LSP5	-0.0035	0.8714		0.0219	-0.1670	0.0000	***	0.0300	0.008	0.927	1363.412
Random Effect Model with AR(1) errors											
	t				Output gap				Marginal R-squared[2)]	Conditional R-squared[3)]	AIC[4)]
	Coef	P value[1)]		Std.Error	Coef	P value[1)]		Std.Error			
LSD1	0.0430	0.4176		0.0530	-0.3344	0.0000	***	0.0268	0.021	0.835	1094.237
LSD2	-0.0327	0.5750		0.0582	-0.3065	0.0000	***	0.0256	0.022	0.023	1058.768
LSD3	-0.0700	0.2281		0.0579	-0.2921	0.0000	***	0.0256	0.022	0.023	1056.017
LSD4	-0.0504	0.4950		0.0738	-0.4159	0.0000	***	0.0326	0.028	0.029	1211.213
LSD5	-0.0043	0.9486		0.0661	-0.3757	0.0000	***	0.0290	0.027	0.028	1137.994
LSP1	0.0117	0.8328		0.0554	-0.2396	0.0000	***	0.0240	0.012	0.012	1025.373
LSP2	-0.0631	0.2177		0.0511	-0.2019	0.0000	***	0.0227	0.016	0.016	975.074
LSP3	-0.1017	0.0169	**	0.0423	-0.1815	0.0000	***	0.0228	0.018	0.734	966.079
LSP4	-0.0864	0.2034		0.0678	-0.3041	0.0000	***	0.0300	0.019	0.020	1155.270
LSP5	-0.0362	0.4677		0.0498	-0.2693	0.0000	***	0.0266	0.018	0.800	1070.972

Notes 1) One, two, and three asterisks indicate parameter significance at the 10, 5, and 1% level.

2) Marginal R-squared = Var(Fixed effect) / Var(Total)

3) Conditional R-squared = (Var(Fixed effect)+Var(Random effect)) / Var(Total)

4) The smaller AIC, the better model

3) Hausman test to discriminate between Random and Fixed Effects Models

H_0 : Random effects model to be preferred to Fixed Effects Model

Model	Time range	Chi-sq	df	p-value[1)]
LSD1	1995~	0.0474	2	0.9766
LSD2	1995~	0.0376	2	0.9814
LSD3	1995~	0.0360	2	0.9822
LSD4	1995~	0.0397	2	0.9803
LSD5	1995~	0.0384	2	0.9810
LSP1	1995~	0.0582	2	0.9713
LSP2	1995~	0.0667	2	0.9672
LSP3	1995~	0.0632	2	0.9689
LSP4	1995~	0.0518	2	0.9744
LSP5	1995~	0.0590	2	0.9709
LSD1	2000~	0.0239	2	0.9881
LSD2	2000~	0.0084	2	0.9958
LSD3	2000~	0.0024	2	0.9988
LSD4	2000~	0.0140	2	0.9930
LSD5	2000~	0.0208	2	0.9897
LSP1	2000~	0.0876	2	0.9571
LSP2	2000~	0.1813	2	0.9133
LSP3	2000~	0.9818	2	0.6121
LSP4	2000~	0.0864	2	0.9577
LSP5	2000~	0.0703	2	0.9655

Note: 1) If p-value is less than 0.05, which is the confidence level for the test, then we can reject the null hypothesis.

4) Breusch-Godfrey/Wooldridge test for serial correlation

H_0 : No serial correlation in idiosyncratic errors

Model	Time range	Chi-sq	df	p-value[1)]
LSD1	1995~	247.25	15	0.0000
LSD2	1995~	221.18	15	0.0000
LSD3	1995~	217.55	15	0.0000
LSD4	1995~	245.11	15	0.0000
LSD5	1995~	237.39	15	0.0000
LSP1	1995~	251.17	15	0.0000
LSP2	1995~	231.84	15	0.0000
LSP3	1995~	234.91	15	0.0000
LSP4	1995~	265.32	15	0.0000
LSP5	1995~	251.06	15	0.0000
LSD1	2000~	155.48	14	0.0000
LSD2	2000~	158.38	14	0.0000
LSD3	2000~	163.72	14	0.0000
LSD4	2000~	171.27	14	0.0000
LSD5	2000~	161.88	14	0.0000
LSP1	2000~	152.96	14	0.0000
LSP2	2000~	152.63	14	0.0000
LSP3	2000~	159.40	14	0.0000
LSP4	2000~	176.04	14	0.0000
LSP5	2000~	160.72	14	0.0000

Note: 1) If p-value is less than 0.05, whch is the confidence level for the test, the null hypothesis is rejected.