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Determinants of the Wage Share: A Panel Analysis of Advanced and Developing Economies

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Abstract

Wage shares have declined substantially in all OECD countries and most developing economies since 1980. This study uses a new ILO/IILS dataset on adjusted wage shares for a panel of up to 43 developing and 28 advanced economies (1970–2007) to explain changes in wage shares and assess the relative contributions of technological change, financialization, globalization and welfare state retrenchment. We find strong negative effects of financialization as well as negative effects of welfare state retrenchment. Globalization has (in production) robust negative effects in advanced as well as in developing economies, which is at odds with the Stolper–Samuelson theorem. We find small, and for developing countries positive effects of technological change. Our results support a Political Economy approach to explaining income distribution.

1. Introduction

The past 30 years have seen dramatic changes in income distribution, with top incomes, in particular in the USA, rising to levels unseen in two generations (Piketty and Saez 2003) and wage shares falling substantially since about 1980 across all OECD countries. This has led to a renewed interest in the determinants of the distribution of income. Changes in personal income distribution have had more prominence (Atkinson *et al.* 2011; Autor *et al.* 1999; OECD 2011), but there is also an increasing interest in the determinants of functional income distribution. The literature here falls into four relatively independent groups. First, mainstream (modern neoclassical) economics contributions argue that technological change (EC 2007; IMF 2007a) is the main driver of income distribution. Secondly, the Political Economy of globalization approach has highlighted the effects of globalization on

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the bargaining power of labour and capital. It differs from the neoclassical approach in highlighting the effects of globalization on bargaining power (Rodrik 1997). Thirdly, similar in spirit, but with a different focus, a literature coming from the social sciences regards changes in income distribution as the result of distributional struggle and emphasizes the role of welfare state retrenchment and the decline of the unions (Bengtsson 2014; Hancke 2012; Kristal 2010). Forth, there is a growing literature on financialization, which also highlights its distributional impact, but few studies have examined the influence of financialization on the functional income distribution so far (Dünhaupt 2013; Stockhammer 2009). The empirical analysis has almost exclusively focused on advanced economies. Only the second stream has made attempts to cover developing countries.

This study investigates the determinants of functional income distribution and seeks to identify the contributions of technological change, globalization, financialization and welfare state retrenchment. This is done with an (unbalanced) panel analysis covering up to 71 countries (28 advanced and 43 developing and emerging economies) from 1970 to 2007. The contribution of the paper is that it integrates insights from all four debates and uses a broad sample of countries that include advanced as well as developing economies. This has the advantage of more variation in the countries and it allows for richer analysis of the effects of globalization, however it comes at the price of limitations in data availability. We use the private, self-employment adjusted wage share as the dependent variable and offer a rich set of robustness checks.

The paper is structured as follows. Section 2 will discuss changes in functional income distribution and contextualizes these within broader changes in income distribution. Section 3 presents the key determinants of functional income distribution identified by different theories and offers a review of the recent empirical literature that uses panel data analysis. Section 4 discusses the estimation methodology and data sources. Section 5 presents the econometrics results and section 6 concludes.

2. Changes in income distribution

In the last quarter century dramatic changes in the personal distribution as well as to the functional distribution of income have taken place. In the advanced economies[1] the adjusted wage share has, on average, fallen from 73.4 per cent in 1980 to 64.0 per cent in 2007 (Figure 1). Changes in income distribution have taken somewhat different forms in different countries. In the Anglo-Saxon countries a sharp polarization of personal income distribution has occurred, combined with a moderate decline in the wage share. In the United States the top 1 per cent of the income distribution increased their share of national income by more than 10 percentage points (Atkinson *et al.* 2011; OECD 2008; Piketty and Saez 2003) and the wage share has declined from 70.0 per cent to 64.9 per cent (2007). In continental European countries functional rather than personal income distribution has shifted dramatically,

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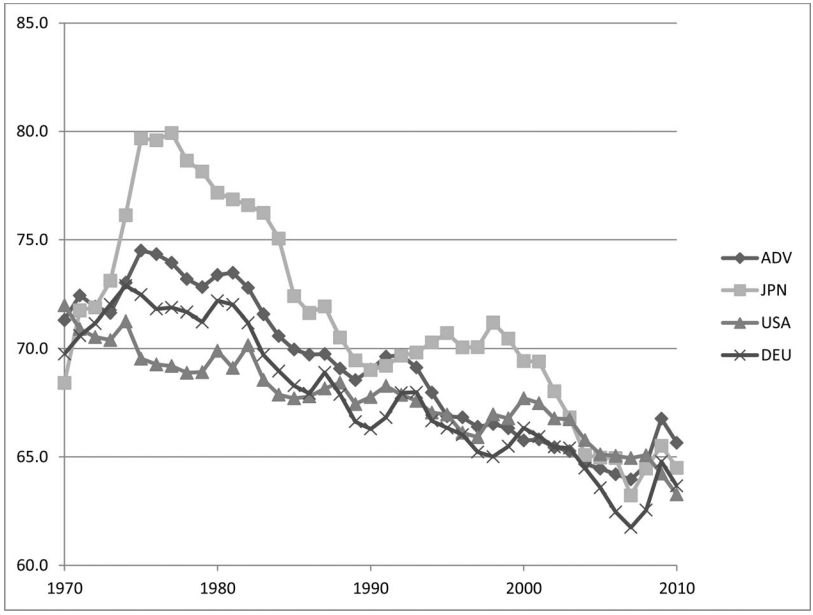
FIGURE 1
Adjusted Wage Shares in Advanced Countries, Germany, the USA and Japan, 1970–2010.



Note: ADV stands for unweighted average of high income OECD countries.[7]
Source: AMECO.

with comparatively moderate changes in personal distribution (OECD 2008, 2011). In Germany the adjusted wage share has declined from 72.2 per cent to 61.8 per cent.

Data on the functional income distribution is not readily available for developing economies[2] and often less reliable. Figure 2 gives summary measures of the adjusted wage share for the groups of developing countries where comparatively long series are available. DVP3 summarizes the data for three countries where data are available since 1970; DVP5 for five countries where data are available from 1979; and DVP16 for a group of 16 developing countries, where data are available from 1993. They all show a pronounced decline in (adjusted) wage shares since 1990. Among developing countries with at least 10 years of adjusted wage share data there are 14 countries (Argentina, Botswana, Brazil, Bulgaria, China, Cote d'Ivoire, Mexico, Namibia, Oman, Panama, South Africa, South Korea, Thailand and Turkey) with declining wage share, three (Mauritius, Russia and Sri Lanka) with broadly stable wage shares and seven (Belarus, Chile, Colombia, Costa Rica, Hong Kong, Kenya and Peru) with increasing wage shares. While there is more variation in terms of the development of the wage share in developing economies than in advanced economies, it is clear that on average there has been a pronounced decline in the wage share in developing and emerging economies, at least since 1990.

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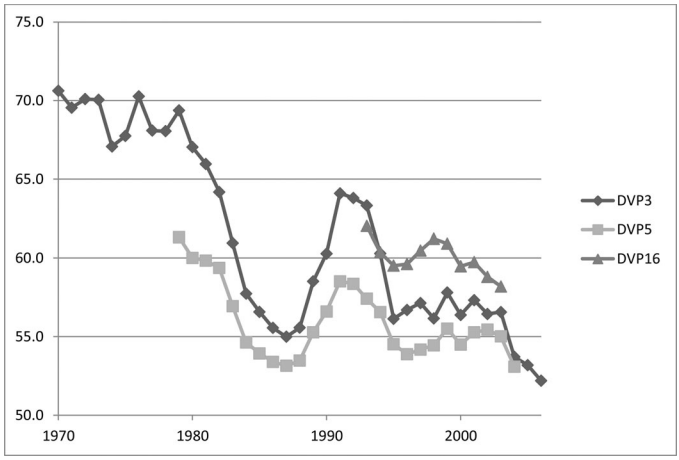
FIGURE 2
Adjusted Wage Share in Developing Countries.



Note: DVP3: unweighted average of Mexico, South Korea and Turkey; DVP5: unweighted average of China, Kenya, Mexico, South Korea and Turkey; DVP16: unweighted average of Argentina, Brazil, Chile, China, Costa Rica, Kenya, Mexico, Namibia, Oman, Panama, Peru, Russia, South Africa, South Korea, Thailand and Turkey.
Source: see text.

For developing countries as well, the decline in the wage share is part of a broader trend in income distribution where social inequalities have increased. Goldberg and Pavcnik (2007) conclude a comprehensive survey of personal distribution in developing countries: "the evolution of various measures of inequality suggests that most of the developing countries experienced an increase in inequality during the past two decades" (Goldberg and Pavcnik 2007: 54; similar OECD 2011: ch. 2).

A discussion of the link between personal and functional income distribution is beyond the scope of this paper (see Daudey and Garcia-Penalosa 2007; Wolff and Zacharias 2007). While developments appear rather different in Anglo-Saxon countries and continental Europe at first sight, they share the common trend that the share of non-managerial wage earners in national income has decreased sharply. The remuneration of top managers is counted as labour compensation in the National Accounts.[3] If they were counted as part of profits, trends in the United States and in continental Europe would look rather similar.

3. Determinants of functional income distribution: key arguments in the recent debate

The larger part of the literature on rising inequality has been concerned with changes in *personal* income distribution. *Functional* income distribution has received comparably less attention, but, recently several high profile studies

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have appeared, for example IMF (2007a) in the *World Economic Outlook,* and in ILO's (2011) *World of Work Report*. This section will provide the theoretical background for the empirical analysis by summarizing the key arguments in the debate on income distribution, highlighting technological change, globalization, financialization and welfare state retrenchment. It will also survey the studies that are closely related to our own research design, that is that explain changes in the wage share over time and across countries in a panel analysis.

4. Neoclassical approaches and technological change

The core of neoclassical theory of income distribution is that technological change is the main determinant of changes in distribution. The basic argument is set in a world of complete markets, perfect competition, full employment and well behaved aggregate production functions and modern neoclassical theory allows for deviations from this. The modern version of this argument is that since the early 1980s technological change has been skill biased. In particular, information and communication technology (ICT) is viewed as complementary to skilled labour and a substitute for unskilled labour. Thus, there has been a shift in income distribution towards skilled labour. This hypothesis has motivated a substantial number of empirical studies, in particular for the USA, where it was used to explain the sharp increase in personal income inequality (Autor *et al.* 1999; Card and Di Nardo 2002).

Technological change is also used to explain changes in functional income distribution. Technological change, according to this story, has become capital augmenting rather than labour augmenting. Consequently, wage shares have fallen (EC 2007; IMF 2007a). This does not follow from skill-biased technological change, but is consistent with it. As the use of ICT capital increased, the demand for high-skilled labour increased and that of low-skilled labour decreased, which came with rising wages for high-skilled workers and falling wages for low-skilled workers. Only with specific assumptions about the labour demand elasticities of skilled and unskilled labour, will it result in a declining wage share (EC 2007).

IMF (2007a) is probably the most prominent mainstream analysis of changes in functional income distribution. It uses a panel of 18 OECD countries with annual data for the period 1983–2002 to analyse the effects of globalization, changes in technology and labour market institutions. The study is careful in discussing the effects of globalization, with indicators for offshoring, relative import and export prices and immigration. The ICT capital stock and the capital-labour ratio are used as technology variables. It includes union density and the tax wedge as labour market institutions. IMF (2007a) concludes that "globalization is one of several factors that have acted to reduce the share of income accruing to labour in advanced economies, although rapid technological change has had a bigger impact" (IMF 2007a, 161). EC (2007) is based on a panel of annual data for 13 OECD countries

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from 1983 to 2002. It is similar in spirit to IMF (2007a), but its focus is on the effects on different skill levels. EC (2007) finds that the capital-labour ratio has a positive effect. ICT services (per employee) has *no* statistically significant effect. Openness has a negative effect and significant effects for some labour market institutions variables.

The preferred variable for skill-biased technological change is the use of ICT capital or ICT services. In the context of developing economies GDP per capita is usually used as a proxy. In addition, variables measuring structural change such as the agricultural share have been used.

5. Globalization, classical trade theory and the political economy approach

Globalization features prominently in political debates as well as in economic analysis, but there are important theoretical differences. *Classical trade theory* as expressed in the Stolper and Samuelson (1941) theorem states that the *abundant* factor will gain from international trade. Globalization is thus supposed to benefit capital in the advanced and labour in the developing economies. The Stolper–Samuelson theorem assumes full employment and that neither capital nor labour is mobile. However, the recent period of globalization has been marked by an increase in capital mobility. But "if capital can travel across borders, the implications of the theorem weaken substantially" (EC 2007: 45). Despite these limitations the Stolper–Samuelson theorem has a firm place in the mainstream economics canon and it is often used to argue that globalization will hurt workers in the advanced economies and benefit workers in developing economies.[4] However, the evidence supports only half of the Stolper–Samuelson argument: While workers in advanced economies have indeed lost out, those in developing countries seem to have lost as well (see Section 2).

The *Political Economy of globalization approach* argues that the main effect of trade on income distribution is not via relative prices, but through affecting the bargaining position of labour and capital (Onaran 2011; Rodrik 1997). Globalization increases the strategic options of capital by allowing it to relocate production; Rodrik (1997) thus argues that trade liberalization benefits the more *mobile* factor, which will typically be capital. Unlike in the Stolper–Samuelson theorem, the change in distribution takes place because of a redistribution of rents, not because of the equalization of factor costs. In contrast to classical trade theory this approach predicts, first, that labour will lose in advanced as well as in developing economies and, second, that trade or FDI flows among similar countries will affect income distribution.

Harrison (2002), Jayadev (2007) and ILO (2011) analyse the determinants of functional income distribution in advanced as well as developing countries. Harrison (2002) investigates the effects of globalization in an analysis covering more than 100 countries 1960–1997. Openness, capital controls, the terms of trade and exchange rate crises are used as variables for globalization.

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The estimations also control for the capital-labour ratio, relative per capita GDP and the government share in GDP. Harrison finds that the capital-labour ratio has a strong (positive) impact and globalization has had negative effects on distribution. Capital controls have a positive effect. Openness, exchange rate crises and FDI-inflows have negative effects on the wage share. Jayadev (2007) analyses the effect of financial openness and trade openness on the wage share covering up to 80 countries for the period 1970–2001. The openness variables are legal measures on openness. Control variables include (in various specifications) per capita GDP, interest rates, a crisis dummy, the government share and the budget deficit. Capital account openness and trade openness are found to have negative effects on the wage share. ILO (2011) reports estimates for developing countries by regional group, but no full panel. Explanatory variables include trade openness, financial globalization, capital account openness, unemployment benefits, employment protection legislation, minimum wages, GDP per capital, real interest rates and a crisis dummy. The discussion highlights that financialization and trade openness has reduced the bargaining power of labour.

In empirical research trade openness, that is imports plus exports relative to GDP, is the most commonly used indicator for globalization (used e.g. by EC 2007; Harrison 2002; Rodrik 1997). IMF (2007a) offers several measures of globalization including the terms of trade and measures of offshoring and immigration. Harrison (2002) and Rodrik (1998) also use measures of capital account liberalization.

6. Welfare state retrenchment and the bargaining power of labour

The analysis of welfare states has long held a prominent place in political science. The extent and nature of welfare state retrenchment has been subject to debate (Korpi and Palme 2003; Pierson 1994). While aggregate social expenditures may still be high by historical standards, there has been a reduction in welfare state generosity and a shift towards private provision of social services. The power resources theory was developed in the analysis of welfare states (O'Connor and Olsen 1998), but it has recently also been used to explain changes in income distribution (Bengtsson 2014; Kristal 2010). It regards income distribution as determined by the relative power positions of labour and capital.[5] Kristal (2010) distinguishes between the organizational, political and structural dimensions of power. In the empirical analysis union density and unemployment benefits play key roles, but she also includes strikes activity, left governments and broader measures of social expenditures and finds positive effects.

Similar issues do surface in the mainstream economic approach, but with a different twist. First, higher bargaining power of workers will lead to an increase in wages, but it will only increase the wage share, if labour demand is inelastic. Secondly, in empirical research economists tend to identify the welfare state with labour market institutions (LMI), the measures of which are

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designed to measure labour market *inflexibility* rather than genuine bargaining power.

There are three relevant studies from the political and social sciences. Kristal (2010) estimates a wage share equation for 16 OECD countries 1960–2005 by means of panel ECM and uses union density and strike activity as variables for organizational power, government civilian spending and left governments for political power and southern imports and FDI for structural power. She finds that the variables have the expected signs, but some have short-term effects and others long-term ones. Hancké (2012) focuses on the interaction of the monetary policy regime and the collective bargaining structure. He estimates a panel of 14 OECD countries 1973–1999 by means of a difference estimator and finds that collective bargaining coordination in interaction with conservative central banks has a negative effect on the wage share, with insignificant effects of union density and left governments. Bengtsson (2014) takes a power resources approach, focussing on the role of labour unions. He uses a panel ECM model (with fixed effects) for a panel of 16 OECD countries (1960–2007). He controls for productivity growth, unemployment benefits, social expenditures, openness, growth and agricultural employment and finds robust effects for union density. All three studies deal with advanced economies and none of them controls for financialization.

For developing economies little comparative work on the welfare state exists. The studies that also cover developing economies have used the government share in GDP (Harrison 2002; Jayadev 2007). However, this measure is problematic for econometric reasons. Government consumption consists of the wages of government employees and is thus by definition related to the wage share, leading to endogeneity problems.

7. Financialization

An increased role of financial activity and rising prominence of financial institutions is a hallmark of the transformations of economy and society since the mid 1970s. These changes are often referred to as financialization which are based on the deregulation of financial markets and international capital flows and have resulted at the macroeconomic level in more volatile exchange rates and asset prices and higher leverage ratio, but it has also affected how non-financial firms conduct their business (Ertürk *et al.* 2008; Stockhammer 2013). Köhler *et al.* (2015) distinguish four channels by which financialization may affect income distribution First, firms have gained more exit options: they can invest in financial assets as well as in real assets. Stockhammer (2004) and Krippner (2005) document that non-financial businesses are increasingly active on financial markets and in many countries receive half their operating surplus from financial transactions. Thompson (2003) argues that this makes them less likely to strike a deal with labour at the shopfloor level. Secondly, it has empowered shareholders and rentiers to extract a bigger share of

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corporate profits in the form of interest and dividend payments. To the extent that financial overheads increase firms are likely to put pressure on wages. Thirdly, financialization may have increased competitive pressures on capital markets and established a market for corporate control. This has encouraged firms to pursue shareholder value as their primary goal, which has shifted firms priorities from growth to profitability (Stockhammer 2004) or involves share buybacks to increase asset prices. Lazonick and O'Sullivan (2000) argue that has led firms to adopt a 'downsize and distribute' strategy. Firms that do not comply will be subject to takeovers and leveraged buyouts. Appelbaum *et al.* (2013) present case studies of private equity buyouts and their effects on labour relations. Fourthly, the financialization of households may have undermined working class identities and thereby weakened the strength of organized labour.

However, most panel studies on changes in functional income distribution in OECD countries have not included financialization variables. Stockhammer (2009) and Dünhaupt (2013) are the exceptions, but cover only advanced economies. Stockhammer uses financial globalization and interest rates as variables for financialization and controls for ICT services, the capital labour ratio, various LMI, union density and openness in a panel for 15 OECD economies, 1982–2003. He, first, estimates a specification similar to those of IMF (2007a) and EC (2007) and finds that their findings regarding the role of technology are not robust. Secondly, the estimated wage share equation is extended to allow for distributional effects of financial globalization and for different effects of union density according to social security system. Results from the extended model suggest economically significant effects of financial globalization and of union density. Dünhaupt (2013) uses interest and dividend payments as proxies for financialization, controlling for union density, strikes, government expenditures, openness, FDI and import prices (with no technology controls) in a panel of 13 OECD countries 1986–2007. She finds statistically significant effects for financialization and globalization. Rodrik (1998) and Harrison (2002) have included measures of capital controls and capital mobility.

8. Comments on the literature

There is a sizeable, but uneven empirical literature on the determinants of changes in functional income distribution, which can usefully be grouped into those inspired by modern neoclassical theory and Political Economy approaches on globalization, welfare state retrenchment and financialization. While the literature on the Political Economy approaches has originated from different disciplines and highlighted different causes, it shares a common ground in regarding income distribution as determined by power relations. This contrasts to the neoclassical approach that regards distribution as ultimately determined by market forces of price equilibration.

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IMF (2007a) and EC (2007) are the most prominent representations of the neoclassical view. They both identify technological change as the single most important factor and acknowledge that globalization has had a negative impact on the wage share. The prominence given to technological change seems to be driven by theoretical priors. IMF (2007b) notes that the effects of technology are *not* robust to the inclusion of time effects. EC (2007) finds that ICT services, the preferred variable of technological change in IMF (2007a), has *no* statistically significant effect.

Next to all studies find substantial effects of globalization on functional income distribution. Nonetheless, there is a potential confusion around the Stolper–Samuelson theorem. The Stolper–Samuelson theorem is part of the conventional wisdom of mainstream economics, even though it is widely acknowledged that its assumptions are simplistic. The finding, that for advanced economies there is a negative effect of globalization on the wage share, is then easily read as support for the Stolper–Samuelson theorem. Challenging the neoclassical view, the findings of Harrison (2002), Rodrik (1998) and Jayadev (2007) show that increased trade has a negative effect on the wage share in developing as well as in advanced economies which contradicts the predictions of the Stolper–Samuelson theorem.

While most studies try to control for some measure of globalization and technology, only few studies allow for an effect of financialization on functional income distribution. In the case of mainstream economics this is perhaps surprising as IMF (2007bb) has found to that it has an effect on *personal* income distribution. Stockhammer (2009) and Dünhaupt (2013) do find effects for advanced economies and Jayadev (2007) includes a measure of capital account openness.

Most studies cover only advanced economies. Only those studies discussed under the heading Political Economy of globalization also report results for developing economies. The studies for advanced economies all use the *adjusted* wage share as dependent variable, while the studies covering advanced as well as developing economies use un-adjusted wage shares. This is presumably because of data availability issues. However, the adjustment is more important for developing countries than for advanced countries as the informal sector tends to be larger.

Among the studies cited, only Bengtsson (2014) has been published in an Industrial Relations/Human Resources Management journal. Research in these journals typically focuses on the micro or meso level and considers specific sectors, firm characteristics, union strategies and institutional determinants such as minimum wages. Compared to that our approach highlights more macro-economic factors that impact on management strategies and workers' bargaining position. However, all of the themes that are important for our argument have, from a different angle, also featured in the industrial relations literature. In particular the role and organizational strength of trade unions has received a lot of attention, however, it is typically used to explain the differences in wages between unionized versus non-unionized workers, for example Freeman and Medoff (1984). More recently,

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Leslie and Pu (1996) use union density to explain changes in personal income inequality in Britain over time and Pontussen (2013) to explain changes in inequality across countries. The effects of globalization on wages have featured prominently in international economics (e.g. Geishecker and Gorg 2008), where it has been used to explain differences in wages on between skilled and unskilled workers. In industrial relations there have been various sector-specific studies on the effects on wages, employment (Gomez *et al.* 2013 on Canadian business services) and worker morale (e.g. McCann 2014 on UK banking and insurance), but there is little research on the overall distribution of income in the economy. Boulhol *et al.* (2011) provide evidence for UK manufacturing that imports from developing countries reduces mark ups as well as workers' bargaining power. Technological change and computer use in particular have long been used to explain individual earnings (e.g. Dolton and Pelkonen 2008 for the UK) and the size of the union wage premium (Betcherman 1991 for Canadian blue collar workers). Financialization, a key factor in our study, is recently meeting growing interest in industrial relations research. Thompson (2003) argues that financial constraints have kept firms from establishing high-road employment relationships. Gospel and Pendleton (2003) systematically analyse the impact of financial systems on corporate governance and labour relations based on a varieties of capitalism framework. Appelbaum *et al.* (2013) present four case studies of private equity-led restructuring of firms. Palpacuer *et al.* (2011) argue that even in a coordinated market economy like France HRM for skilled employees has been affected by financialization.

9. Estimation equation, data sources and econometric methodology

We estimate the private sector adjusted wage share (*WSAP*) as a function of variables measuring growth, technological change (*tech*), globalization (*glob*), financialization (*fin*) and welfare state retrenchment (*wfst*):

$$WSAP = f(growth, tech, glob, fin, wfst). \quad (1)$$

This is a synthetic equation that incorporates the key arguments of the debate. It is based on a Political Economy approach, but our analysis encompasses the neoclassical approach (such as EC 2007; IMF 2007a). Welfare state retrenchment as well as globalization and financialization affect the bargaining power of capital and labour. Our approach is consistent with what we have labelled the Political Economy of globalization and the Power Resources theory, which regards income distribution as the outcome of bargaining processes rather than a market clearing process, but we have a stronger emphasis on the effects of financialization. We do control for growth as a business cycle variable as the wage share tends to have counter-cyclical pattern.

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Filling these categories with empirical data raises conceptual as well as practical issues. Conceptually, there may be no clear cut distinction between the different determinants. For example without the development of modern communication technologies international production networks would not be feasible. Thus technological change and globalization may depend on one another. An important practical issue is that including additional variables typically implies losing observations due to missing data. We have to tread a fine balance between using the best variables available and keeping sample size as large as possible.

In the baseline specification, technological change will be proxied by GDP per worker, and, additionally by the agricultural share and the industrial employment share; for the welfare state we use the government consumption; for globalization we use trade openness; for financialization financial globalization. The baseline specification, however, is ultimately arbitrary as there are several candidates for variables that could have been included. It is the result of pre-testing and includes variables that have proven robust. We will report various specifications to check the robustness of the results.

Our dependent variable is the private, adjusted wage share (*WSAP*). The wage share is the share of wages in national income. Two adjustments are made to the wage share. First, there is an adjustment that imputes wage payments for self-employed workers. This is particularly important for developing countries where a large part of the population is self-employed. The adjusted wage share imputes wage payments for the self-employed to avoid counting all their income as profit income (Gollin 2002; Krueger 1999). This adjustment is standard in the literature and we directly use adjusted data from ILO/IILS and other sources.

The second adjustment transforms the wage share for the total economy into the private wage share. This is because our measure for the welfare state will be the size of government consumption. However, the wage share in government consumption is a hundred percent as the public sector does not generate profits. Government consumption is thus by definition related to the wage share and would lead to endogeneity problems in the regression analysis. The wage share of the total economy is the sum of the private wage share (WS^P) and the government wage share (WS^G) weighted by their respective sizes. We use government consumption (*CG*) as percent of GDP as measure for the size of the government sector:

$$WS = (1 - CG)^* WS^P + CG^* WS^G.$$

As the wage share in the government sector is equal to 1, we can reconstruct the private wage share as $WS^P = (WS - CG)/(1 - CG)$.

We employ several sources for the adjusted wage share (WSA). Our primary source is the ILO/IILS database (compiled by Matthieu Charpe). As the AMECO database, the OECD and some national statistics provide longer series for certain countries we complement the ILO/IILS series with data from

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these alternative sources. For the EU15 member states and Australia, Canada, Japan and the United States we use series from the AMECO database. For Mexico, South Korea and Turkey we employ data from the OECD. For China we use a national series.

The following variables are used in the baseline specification for developing and advanced economies: Growth (*GROWTH*) is real GDP growth (in national currency) taken from the World Bank WDI. Financial globalization (*FINGLOB*) is the logarithm of external assets plus external liabilities divided by GDP, taken from Lane and Milesi-Ferretti (2007). This is a broad measure of financialization that counts foreign financial assets and liabilities of all sectors and is often used to measure the degree of integration of a country into (or the exposure to) the international financial system. Trade openness (*OPEN*) is measured as exports plus imports divided by GDP, taken from the World Bank WDI. Government consumption as percentage of GDP (*CG*) is taken from the PENN World Tables 7.0. The logarithm of the PPP converted GDP per worker at constant prices (*GDPPW*), taken from the Penn World Tables, is used as a measure of technological change. Structural change in developing countries is operationalized with the variables for agricultural share (*AG*), that is the value added by forestry, hunting, fishing, the cultivation of crops and livestock production as a percentage of GDP and industry share (*IND*), which stands for value added in mining, manufacturing, construction, electricity, water and gas as a percentage of GDP. *AG* and *IND* are taken from the World Bank WDI dataset.

For the baseline variables we get an unbalanced panel that includes up to 71 countries for a maximum period of 1970 to 2007. However, for most developing countries the series are much shorter than that. The common sample covers up to 2191 observations of which 864 advanced and 599 developing countries. Descriptive statistics and correlations are summarized in Tables 1 and 2.

In extensions of the baseline variables, the following variables will be included. These additional variables will, at times substantially, reduce the sample. *TOT* stands for terms of trade and has been put together from the AMECO database (for advanced countries) and for developing countries according to availability the IMF IFS (export unit values/import unit values) or the World Bank WDI (net barter terms of trade index). These series are not strictly comparable across countries and *TOT* is therefore not included in the set of baseline variables. *UNEMPL* is the number of unemployed people as a share of the labour force. For the member states of the EU(15), Australia, Canada, Japan, Mexico, South Korea, Turkey and the United States data from the AMECO database is used. For other countries unemployment data from the ILO database on labour statistics, the IMF or the World Bank WDI dataset is employed, depending on which dataset has the longest time series. *ICT_CB* is the logarithm of ICT assets divided by GDP taken from the Conference Board Total Economy Database. Furthermore, the impact of severe economic crises is tested using dummy variables for crisis years (defined as a real GDP growth of less than –3 per cent) and for exchange rate crisis

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TABLE 1
Descriptive Statistics for Baseline Variables

	Full sample		*OECD countries*		*Developing countries*	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
WSAP	58.314	16.007	63.204	7.495	48.792	20.677
GROWTH	0.035	0.032	0.030	0.023	0.041	0.042
LOG(FINGLOB)	0.204	0.986	0.383	1.070	–0.030	0.781
OPEN	0.726	0.457	0.705	0.424	0.741	0.505
LOG(GDPPW)	10.188	0.948	10.799	0.318	9.263	0.826
CG	9.289	3.255	9.835	2.455	8.642	4.217
AG	9.280	9.369	4.982	3.821	15.756	11.335
IND	31.480	7.146	31.761	5.485	31.175	9.282
Observations	1463		864		599	

Note: AG, agricultural employment share; CG, government consumption as share of GDP; developing countries: low and medium income countries; FINGLOB, financial globalization; GDPPW, GDP per worker; GROWTH, growth of real GDP; IND, industrial employment share; OECD countries: high-income OECD countries; OPEN, openness; WSAP, adjusted private-sector wage share.

TABLE 2
Correlation of Baseline Variables

Correlations	*WSAP*	*GROWTH*	*LOG (FINGLOB)*	*OPEN*	*LOG (GDPPW)*	*CG*	*AG*	*IND*
WSAP	1.000	–0.067	–0.018	–0.058	0.416	0.021	–0.353	0.128
GROWTH	–0.067	1.000	–0.076	0.082	–0.190	–0.040	0.153	0.165
LOG(FINGLOB)	–0.018	–0.076	1.000	0.681	0.360	–0.026	–0.376	–0.347
OPEN	–0.058	0.082	0.681	1.000	0.103	0.083	–0.182	–0.205
LOG(GDPPW)	0.416	–0.190	0.360	0.103	1.000	0.037	–0.855	0.118
CG	0.021	–0.040	–0.026	0.083	0.037	1.000	–0.062	0.120
AG	–0.353	0.153	–0.376	–0.182	–0.855	–0.062	1.000	–0.245
IND	0.128	0.165	–0.347	–0.205	0.118	0.120	–0.245	1.000

Note: AG, agricultural employment share; CG, government consumption as share of GDP; FINGLOB, financial globalization; GDPPW, GDP per worker; GROWTH, growth of real GDP; IND, industrial employment share; OPEN, openness; WSAP, adjusted private-sector wage share.

(defined as a nominal devaluation of more than 20 per cent vis-a-vis the dollar). The impact of financial reforms is investigated with a dataset from Abiad *et al.* (2008) which reports the financial reform index (*FINREF_XN*) is a summary index for financial reforms.

In a variation for advanced economies technological change is measured by the capital-labour ratio (*KL_KLEMS*), which is the logarithm of capital services divided by the number of persons engaged, and ICT services (*ICT_KLEMS*), which is the logarithm of ICT capital services divided by gross value added. Both variables are from the EU KLEMS dataset. Union density (*UNION*) is from Bassanini and Duval (2006) and Baker *et al.* (2005).

The impact of labour market institutions on the wage share is measured with variables from Aleksynska and Schindler (2011) which account for the ratio of minimum wage to mean wage (*MW_MNW*), the gross replacement

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rate (*UB_GRR1*), the unemployment benefits coverage (*UB_COVERAGE*), the advance notice period after four years (*EPL_AN4Y*) and the severance pay after four years (*EPL_SP4Y*). As labour supply variables we use the logarithm of the number of economically active people (*LF*), taken from the World Bank WDI dataset, and the logarithm of the population (*POP*), retrieved from the Penn World Tables 7.0

Panel analysis requires the assumption that a change in a variable has the same marginal effect in different countries. This is a strong assumption. However, the number of variables that we wish to investigate and the fact that for many developing economies we have short samples, prohibit analysis of each country individually. Certainly our data do not allow to investigate for each country individually the dynamic adjustments that play a prominent role in time series econometrics. Therefore panel analysis is used. The coefficient estimates of the panel analysis, however, have to be interpreted with caution as the pooling restriction (i.e. the assumption of identical coefficients across countries) is likely to hold only as an approximation in our sample. The coefficient estimates have to be interpreted as average effects across a group of possibly heterogeneous countries.

Our preferred specification is a standard fixed effects (FE) estimator most frequently used in the literature (e.g. EC 2007; IMF 2007a; Jayadev 2007). We use cross section fixed effects, an autocorrelation correction and heteroscedasticity-consistent standard errors. This is also called the Parks estimator (Beck and Katz 1995; Wooldridge 2002). Unless otherwise noted, results will refer to this specification. Panel unit root tests reject the hypothesis of a common unit root of *WSAP* at the 1 per cent level. The tests that allow for individual unit roots reject the null of a unit root at the 10 per cent level.

10. Econometric results

The baseline specification is:

$$WSAP_{t,j} = \beta_1 GROWTH_{t,j} + \beta_2 FINGLOB_{t,j} + \beta_3 OPEN_{t,j} + \beta_4 CG_{t,j} + \beta_5 GDPPW_{t,j} + \beta_6 AG_{t,j} + \beta_7 IND_{t,j} + \beta_8 \alpha_{j+} \varepsilon_{t,j}$$

where *WSAP* is the adjusted private wage share, growth the real GDP growth, *FINGLOB* (the logarithm of) financial globalization, *OPEN* trade openness, *CG* government consumption, *GDPPW* (the logarithm of) GDP per worker, *AG* the agricultural share, *IND* the industrial share.

Table 3 presents our baseline specification and some extensions. Specification 1 is the baseline specification. For our baseline variables the results are very similar in the different specifications. *FINGLOB* consistently has a statistically significant negative effect (at the 1 per cent level) in all specifications (except specification 9). *OPEN* has a statistically significant negative effect in all specifications (at the 1 per cent or the 5 per cent level). *CG* has a positive effect (at the 5 per cent level) in all specifications except for

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TABLE 3
Results for the Baseline Specification and Variations

	1	2	3	4	5	6	7	8	9
GROWTH	–11.936	–11.97	–12.32	–11.193	–11.603	–16.086	–9.913	–13.976	–12.137
t-value	*–4.167***	*–4.172***	*–4.254***	*–3.774***	*–3.872***	*–3.007***	*–3.310***	*–4.803***	*–4.083***
LOG(FINGLOB)	–3.659	–3.677	–4.384	–3.046	–3.556	–2.551	–3.729	–3.251	–3.42
t-value	*–6.997***	*–6.932***	*–5.258***	*–5.141***	*–7.017***	*–2.554***	*–7.049***	*–5.623***	*–6.125***
OPEN	–3.811	–4.02	–3.821	–6.225	–3.561	–5.775	–3.898	–3.913	–5.027
t-value	*–3.211***	*–2.540***	*–3.191***	*–4.436***	*–2.869***	*–2.595***	*–3.306***	*–3.141***	*–3.675***
LOG(GDPPW)	–0.658	–0.667	–1.155	–2.364	–4.098	–2.834	–0.62	–0.829	–2.512
t-value	*–0.321*	*–0.325*	*–0.568*	*–1.138*	*–1.786**	*–0.616*	*–0.307*	*–0.396*	*–1.217*
CG	0.801	0.801	0.804	0.392	0.954	–0.049	0.824	0.731	0.67
t-value	*3.975****	*3.972****	*3.995****	*2.052***	*4.210****	*–0.169*	*4.154****	*3.490****	*3.415****
AG	–0.235	–0.236	–0.228	–0.139	–0.342	–0.421	–0.237	–0.235	–0.277
t-value	*–2.719****	*–2.721****	*–2.621****	*–1.338*	*–3.700****	*–2.195***	*–2.744****	*–2.683****	*–2.672****
IND	–0.159	–0.158	–0.146	–0.261	–0.183	–0.339	–0.162	–0.152	–0.174
t-value	*–2.457***	*–2.457***	*–2.208***	*–3.697****	*–2.731****	*–2.861****	*–2.524***	*–2.324***	*–2.360***
OPEN*D_OECD		0.513							
t-value		*0.248*							
LOG(FINGLOB)*D_OECD			1.238						
t-value			*1.228*						

(*Continued*)

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TABLE 3
Continued

	1	2	3	4	5	6	7	8	9
TOT				–4.22					
t-value				*–3.253***					
UNEMPL					–0.315				
t-value					*–4.743***				
LOG(ICT_CB)						0.26			
t-value						*0.159*			
D_CRISIS							0.878		
t-value							*1.034*		
D_EXCRIS								–1.415	
t-value								*–2.590***	
FINREF_XN									–3.096
t-value									*–1.971***
obs	1450	1450	1450	1310	1302	664	1450	1427	1177
adj r^2	0.981	0.981	0.981	0.982	0.975	0.977	0.981	0.981	0.979
dw	1.719	1.719	1.715	1.675	1.741	1.701	1.71	1.69	1.653

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All specifications use a fixed effects estimator and heteroscadisticity-consistent standard errors.
AG, agricultural employment share; CG, government consumption as share of GDP; D_CRISIS, dummy for crisis years; D_EXCRIS, dummy variable for exchange rate crisis; D_OECD, dummy variable for high-income OECD countries; FINGLOB, financial globalization; FINREF_XN, financial reform index; GDPPW, GDP per worker; GROWTH, growth of real GDP; ICT, information and communication technology assets as share of GDP; IND, industrial employment share; OPEN, openness; TOT, terms of trade; UNEMPL, unemployment rate; WSAP, adjusted private-sector wage share.

specifications 6 and 7. *GDPPW* only has a statistically significant negative effect (at the 10 per cent level) in specification 5. *AG* has a statistically significant negative effect (at the 1 per cent level) in all specifications except specification 4. *IND* has a statistically significant negative effect (at the 1 per cent or 5 per cent level) in all specifications. This is probably due to the fact that manufacturing sectors have a high capital intensity and thus require higher profit shares to maintain their capital stock.

GROWTH has a statistically significant negative effect in all specifications in Table 1. This is the case in practically all specifications to be presented later. Presumably, this reflects the fact that, in the short run, prices are more flexible than wages. *GROWTH* is included in all specifications as a short-run variable. As the study is interested in medium term developments and for our time period growth performance has been rather stable, we will not discuss this variable further.

Specification 2 interacts *OPEN* with a dummy variable for high income countries. This is to test whether globalization has a different effect in advanced and in developing economies as the Stolper–Samuelson theorem suggests. We find no statistically significant effect. Specification 3 interacts *FINGLOB* with the high income dummy. Again we find no statistically significant effect. This suggests that the effects of globalization as well as the financialization do not differ systematically between advanced and developing countries. Specification 4 includes *TOT*, which is statistically significant at the 1 per cent level. Specification 5 includes a variable for unemployment. This has a statistically significant negative effect. Specification 6 includes a variable measuring the ICT services. This reduces the sample substantially as the variable is only available from 1990. We find no statistically significant effect, which is at odds with skill-biased technological change being the key driver of income distribution. Specifications 7 and 8 include dummy variables for crisis years (defined as a negative real GDP growth rate) and for exchange rate crisis (defined as a nominal devaluation of more than 20 per cent vis-a-vis the dollar). We find no statistically significant effect of the crisis dummy and we do find a statistically significant effect of exchange rate crises. Specification 9 reports results for specifications including summary index of financial reform from Abiad *et al.* (2008). This variable is found to have statistically significant negative effect, which confirms the effect of financialization. The effect of *FINGLOB* is robust to the inclusion of *FINREF_XN*, We conclude that the effects of our baseline variables are robust.

Table 4 reports the results by income groups. The sample sizes of the different income groups differ substantially, with upper middle income and high income groups being much larger (and therefore more reliable). For low-income countries (with only 50 observations!) we find a positive effect (at the 10 per cent level) of *OPEN* and negative ones of *CG* and of *AG* (both at the 10 per cent level). For the other country groups we find consistent results: negative effects of *FINGLOB* (statistically significant at the 1 per cent level in upper middle and high income countries), negative effects of *OPEN* (at the 10 per cent level for low middle income countries and at the 1 per cent

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TABLE 4
Results by Income Group

	1 lowin	2 lowmidin	3 upmidin	5 OECD	OECD	6
GROWTH	–20.47	–26.616	–13.337	–9.557	GROWTH	–16.434
t-value	*–1.365*	*–2.011***	*–3.322****	*–3.495****	*t*-value	*–5.212****
LOG(FINGLOB)	–2.4	–5.045	–2.456	–1.765	LOG(FINGLOB)	–2.418
t-value	*–0.695*	*–1.435*	*–2.367***	*–3.328****	*t*-value	*–3.370****
OPEN	12.834	–11.455	–7.558	–2.538	OPEN	–5.888
t-value	*1.742**	*–1.770**	*–3.259****	*–2.229***	*t*-value	*–3.206****
					TOT	–4.546
					t-value	*–2.570***
CG	–0.988	0.847	0.69	0.801	CG	0.929
t-value	*–1.778**	*2.464***	*2.535***	*4.472****	*t*-value	*3.836****
					UNION	0.099
					t-value	*1.782**
LOG(GDPPW)	–7.457	23.666	8.278	–3.694	LOG(KL_KLEMS)	–7.034
t-value	*–0.596*	*2.508***	*2.469***	*–1.436*	*t*-value	*–1.821**
AG	–0.548	–0.07	–0.329	–0.319	LOG(ICT_KLEMS)	1.436
t-value	*–1.945**	*–0.388*	*–2.581***	*–2.746****	*t*-value	*1.635*
IND	–0.124	0.621	–0.211	–0.412		
t-value	*–0.414*	*2.981****	*–2.730****	*–6.677****		
obs	50	101	426	836	Obs	470
adj r^2	0.991	0.988	0.967	0.954	adj r^2	0.94
dw	1.857	2.04	1.721	1.576	dw	1.814

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All specifications use a fixed effects estimator and heteroscadisticity-consistent standard errors.
AG, agricultural employment share; CG, government consumption as share of GDP; FINGLOB, financial globalization; GDPPW, GDP per worker; GROWTH, growth of real GDP; ICT_KLEMS, ICT services; IND, industrial employment share; KL_KLEMS, capital-labour ratio; LOWIN, low income countries; LOWMIDIN, lower middle income countries; OPEN, openness; OECD, high income OECD countries; UNION, organizational strength of unions (% of labour force); UPMIDIN, upper middle income countries; WSAP, adjusted private-sector wage share.

TABLE 5
Results by Estimation Method

	1 FE	2 diff	3 5yr	4 GMM
lag.dep.var.				0.766
t-value				*41.65***
GROWTH	–11.936	–12.147	–32.411	–7.882
t-value	*–4.167***	*–4.146***	*–2.636***	*–3.996* ***
LOG(FINGLOB)	–3.659	–2.65	–2.975	–1.368
t-value	*–6.997***	*–4.140***	*–2.705***	*–6.542***
OPEN	–3.811	–4.449	–5.802	–0.340
t-value	*–3.211***	*–3.200***	*–1.970**	*–0.413*
LOG(GDPPW)	–0.658	4.954	–2.527	0.813
t-value	*–0.321*	*2.048***	*–0.761*	*0.763*
CG	0.801	0.74	–0.043	–0.010
t-value	*3.975***	*3.573***	*–0.129*	*–0.065*
AG	–0.235	–0.28	0.013	0.029
t-value	*–2.719***	*–2.971***	*0.041*	*0.579*
IND	–0.159	–0.196	–0.038	–0.093
t-value	*–2.457***	*–2.910***	*–0.335*	*–6.272***
Obs	1450	1450	281	1392
adj r^2	0.981	0.173	0.969	NA
dw	1.719	1.744	2.327	NA

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All specifications use a fixed effects estimator and heteroscadisticity-consistent standard errors.
AG, agricultural employment share; CG, government consumption as share of GDP; DIFF, difference estimator; FE, fixed effects estimator; FINGLOB, financial globalization; GDPPW, GDP per worker; GROWTH, growth of real GDP; GMM, GMM estimator; IND, industrial employment share; OPEN, openness; WSAP, adjusted private-sector wage share; 5YR, non-overlapping five year averages.

level for upper middle and high income countries); a positive effect of *CG* (at the 5 per cent level or better); for *GDPPW* positive effects in low and middle income countries; negative effects of *AG* (at the 5 per cent level for upper middle income and high income countries); negative effects of *IND* (at the 1 per cent level at upper middle and high income countries), but statistically significant positive effects for low middle income countries. Our results thus seem to be driven by the upper middle and high income countries that make up most of our sample. The results are qualitatively very similar for lower middle income countries, but weaker in terms of statistical significance. However, it is not clear whether our baseline results also hold for low income countries, but this may simply be due to the small sample size for these countries.

To compare our results with those of IMF (2007a) and EC (2007) specification (6) reports a specification for advanced economies that includes *ICT_KLEMS*, *KL_KLEMS*, *UNION* and *TOT* which are not available for developing countries. This reduces the sample to 480 observations. We find that the effects for *FINGLOB*, *OPEN*, *CG* are robust. *KL_KLEMS*, *UNION* and *TOT* do have statistically significant effects, where *ICT_KLEMS* does not.

Table 5 present the results for the baseline specification with four different estimation methods to check the robustness of results. The second specification will be a first-difference estimator. This estimator should

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theoretically yield similar results to the fixed effects estimator and is preferable if the regression suffers from a high degree of autocorrelation in the residuals (Wooldridge 2002: 284). We report panel corrected standard errors that are consistent to heteroscedasticity. It turns out that the FE estimator and the difference estimator mostly yield very similar results. Thirdly we present medium-run results based on non-overlapping five-year average data. This is often regarded as appropriate when institutional variables are involved that do not change on a year-to-year basis. However, this approach comes at the cost of losing some information. Fourthly, we estimate a GMM estimator based on Arellano and Bond (1991). This is a dynamic panel estimator that instruments the lagged dependent variable. While presently fashionable in the literature, the Arellano and Bond (1991) estimator and the Blundell and Bond (1998) estimator have been developed for panels that have much larger cross sections than ours. Instrumental variable estimators do not have good small sample properties. The GMM estimator therefore cannot be presumed to be superior in our context.

Specification 1 reports the estimation results of the fixed effects estimator in levels. Specification 2 reports the results in first differences, specification 3 the results with non-overlapping five-year averages, and specification 4 the GMM results. For the most part, the results are rather similar. *FINGLOB* has a statistically significant effect (at the 1 per cent level) in all specifications. *OPEN* has statistically significant, negative effect in specifications 1 and 2 (and at the 10 per cent level in specification 3), but no statistically significant effect in specification 4. *CG* has a statistically significant positive effect in specifications 1 and 2, no statistically significant effect in specification 3 and no statistically significant effect in specification 4. Among the technology variables *GDPPW* has a statistically significant, positive effect in specification 2; *AG* has a statistically significant negative effect in specifications 1 and 2 (but none in specifications 3 and 4); *IND* has a statistically significant negative effect in specifications 1, 2 and 4.[6]

Table 6 reports results for specifications including labour market institution data from Aleksynska and Schindler (2011). Specification 2 includes the ratio of minimum to mean wages, specification 3 the unemployment benefit gross replacement rate (at one year of unemployment), specification 4 the unemployment benefit coverage ratio, specification 5 the employment protection legislation/advance notice (after four years of work) and specification 6 the employment protection legislation/severance pay (after four years of work). Specifications 7 and 8 include the labour force and population as labour supply measures. Surprisingly, none of these variables has a statistically significant effect. The sample sizes get reduced due to the inclusion of these variables, but are still quite large. We have also experimented with specifications including the unemployment rate, estimations for all countries and for developing economies separately and with different estimation methods. The conclusion is the same: we are unable to find reliable effects of the labour market institutions on the wage share. This is consistent with

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TABLE 6
Results with Labour Market Institutions Variables

	1	2	3	4	5	6	7	8
GROWTH	–11.936	–13.275	–12.297	–12.551	–12.343	–12.297	–12.785	–11.878
t-value	*–4.167***	*–3.428***	*–3.663***	*–3.686***	*–3.708***	*–3.705***	*–3.964***	*–4.139***
LOG(FINGLOB)	–3.659	–3.135	–2.746	–2.819	–2.689	–2.709	–3.152	–3.422
t-value	*–6.997***	*–4.874***	*–4.806***	*–4.946***	*–4.698***	*–4.855***	*–5.802***	*–6.627***
OPEN	–3.811	–3.16	–4.675	–3.844	–4.782	–4.802	–3.678	–3.777
t-value	*–3.211***	*–2.112***	*–3.378***	*–2.651***	*–3.451***	*–3.479***	*–3.015***	*–3.193***
LOG(GDPPW)	–0.658	–2.556	–1.519	–2.086	–2.019	–1.991	1.201	–0.246
t-value	*–0.321*	*–1.117*	*–0.667*	*–0.895*	*–0.927*	*–0.922*	*0.551*	*–0.119*
CG	0.801	0.62	0.623	0.432	0.563	0.573	0.773	0.795
t-value	*3.975****	*2.460***	*3.039****	*1.965***	*2.748****	*2.792****	*3.627****	*3.949****
AG	–0.235	–0.349	–0.293	–0.325	–0.287	–0.28	–0.245	–0.258
t-value	*–2.719****	*–2.911****	*–2.611****	*–2.665****	*–2.590****	*–2.513***	*–2.572***	*–2.937****
IND	–0.159	–0.101	–0.219	–0.177	–0.219	–0.219	–0.194	–0.166
t-value	*–2.457***	*–1.2*	*–2.787****	*–2.145***	*–2.765****	*–2.766****	*–2.816****	*–2.557***
MW_MNW		–0.478						
t-value		*–0.288*						

(*Continued*)

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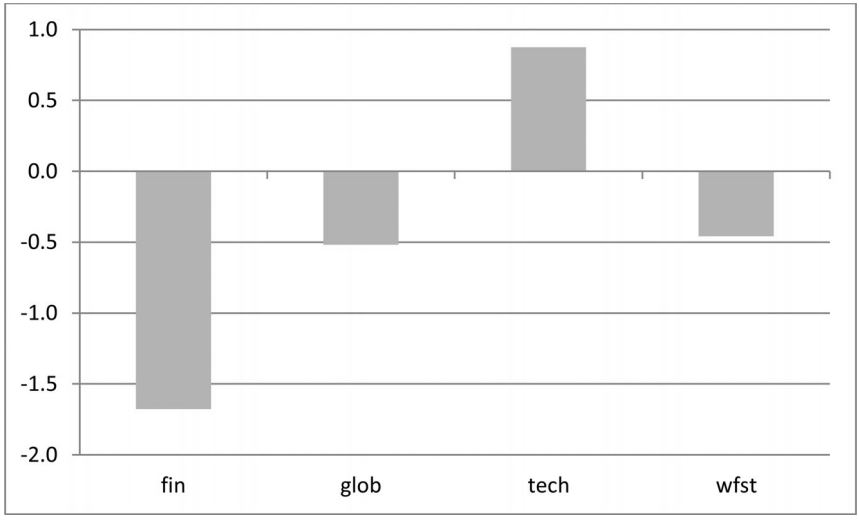
TABLE 6
Continued

	1	2	3	4	5	6	7	8
UB_GRR1			–2.512					
t-value			*–1.314*					
UB_COVERAGE				0.513				
t-value				*0.62*				
EPL_AN4Y					–1.222			
t-value					*–1.624*			
EPL_SP4Y						0.082		
t-value						*0.225*		
LOG(LF)							4.996	
t-value							*1.347*	
LOG(POP)								–9.749
t-value								*–1.543*
obs	1450	718	1007	878	1026	1026	1242	1450
adj r^2	0.981	0.974	0.981	0.98	0.981	0.981	0.982	0.981
dw	1.719	1.663	1.718	1.69	1.696	1.714	1.738	1.715

Note: *, ** and *** denote statistical significance at the 10%, 5% and 1% level, respectively. All specifications use a fixed effects estimator and heteroscadisticity-consistent standard errors.
AG, agricultural employment share; CG, government consumption as share of GDP; EPL_AN4Y, employment protection legislation index; EPL_SP4Y, severance pay regulation index; FINGLOB, financial globalization; GDPPW, GDP per worker; GROWTH, growth of real GDP; IND, industrial employment share; LF, labour force; MW_MNW, minimum wage relative to mean wage; OPEN, openness; POP, population; UB_COVERAGE, unemployment benefit coverage ratio; UB_GRR1, unemployment benefit replacement ratio; WSAP, adjusted private-sector wage share.

FIGURE 3
Contributions to the Change in the Wage Share for All Countries, 1990/1994 to 2000/2004.



Note: fin: financialization; glob: globalization; tech: technological change; wfst: welfare state retrenchment. Contributions are calculated as estimated coefficients (specification 1 of Table 3) times the actual change of the explanatory variables from 1990–1994 to 2000–2004.

two interpretations: either bargaining power of labour was not a driver of changes in income distribution or the LMI variables are poor indicators of the bargaining position of labour.

To illustrate the relative size of effects implied in our estimation results, Figure 3 presents the contributions of financialization, globalization, welfare state retrenchment and technological change to changes in wage shares from 1990/1994 to 2000/2004. The impact of financialization is proxied by *FINGLOB*, globalization by *OPEN*, welfare state by *CG* and technological and structural change by *GDPPW*, *AG* and *IND*. The contribution of *GROWTH*, which was included as short-term variable, is approximately zero and is therefore omitted in the presentation. The contributions of different factors are calculated as the coefficient estimate multiplied with the change in the respective underlying variable. These calculations are carried out for a hypothetical average country, that is they are based on the mean of the respective variables across countries. Figure 3 shows that in this decade financialization has had the largest impact on the adjusted, private wage share, explaining about 1.5 percentage points. Globalization and welfare state retrenchment have each contributed about a half percentage point reduction in the wage share. Technological change, broadly defined to include structural change, has had a positive contribution to the wage share of about three quarters of a percentage point.

The picture looks very similar when looking at developing countries only (Figure 4): financialization has had the largest negative impact, explaining

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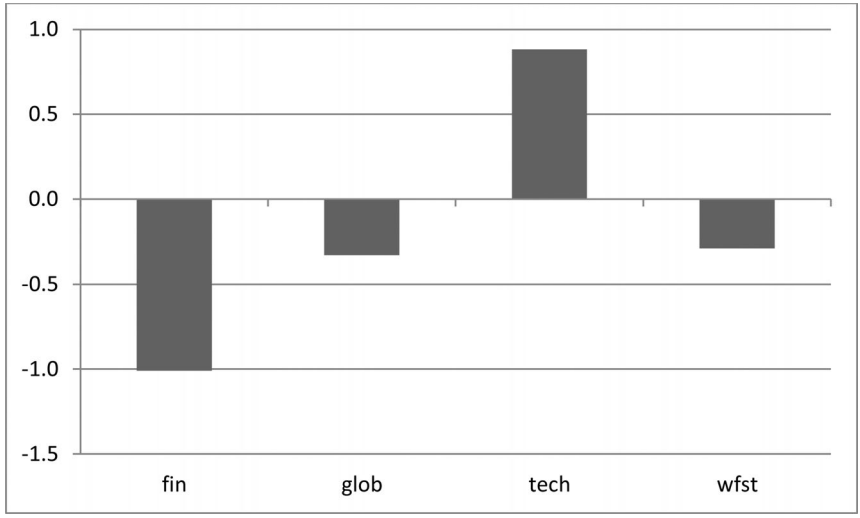
FIGURE 4
Contribution to Change in the Wage Share for Developing Countries, 1990/1994 to 2000/2004.



Note: fin: financialization; glob: globalization; tech: technological change; wfst: welfare state retrenchment. Contributions are calculated as estimated coefficients (specification 1 of Table 3) times the actual change of the explanatory variables from 1990–1994 to 2000–2004.

more than half of the total change of the wage share. Globalization and welfare state retrenchment have had more modest negative effects. Technological and structural change has had a positive effect on the wage share in developing economies from the early 1990s to the early 2000s. The positive effects stems from the structural component, that is agricultural and industrial share, whereas GDP per worker has had minor negative impact on the wage share.

11. Conclusion

Functional income distribution has changed substantially in the course of the last three decades. Wage shares have declined in all OECD countries and most developing economies. This is part of a broader trend towards greater social inequality. This paper has investigated the relative impact of financialization, globalization, welfare state retrenchment and technological change on functional income distribution based on a dataset covering up to 71 countries (28 advanced and 43 developing and emerging economies) from 1970 to 2007.

Our results refute two widely held views about income distribution. First, the view that changes in income distribution have mainly been driven by technological change is not supported by our findings. While we find non-trivial effects of technological change, they are comparatively small. Secondly, the Stolper–Samuelson prediction that globalization would benefit workers

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in developing and emerging economies does not hold empirically in the past 30 years. We fail to find statistically significant differences of the effects in advanced and developing economies and we find an overall negative contribution of globalization on wage shares in developing economies.

We find that financialization has had the largest contribution to the decline of the wage share. Globalization has also had substantial effects (in advanced as well as in developing economies). Welfare state retrenchment has also contributed to the changes in distribution, but has had a smaller effect. Overall our results support a Political Economy approach to explaining changes in income distribution. Factors affecting the bargaining position of labour and capital play a larger role than technological change. Compared to the literature inspired by the power resources theory, our findings highlight that trade policies and financial regulation may have a bigger effect on income distribution than labour relations.

Our main finding is that the existing literature on changes in income distribution may have overlooked a very important factor: financialization. Our financialization variable, however, is a rather crude one. Future research should take into account financial factors and it should develop a more detailed analysis of the mechanisms by which it affects income distribution. This will require microeconomic and case study work as well as macroeconomic analysis.

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Notes

1. We use 'advanced' economies to include all high income OECD countries except South Korea.
2. We use the term 'developing countries' as short hand for developing and emerging countries and include all countries that are not classified as high income countries by the World Bank. We include South Korea in this group as it has been a developing country for much of the sample period.
3. Mohun (2006) calculates adjusted profit shares based on the distinction between supervisory and non-supervisory workers for the United States. This shows a much sharper increase in profit shares than the raw data.

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4. An important area of research has been the introduction of heterogeneous labour into trade models. These models use labour with different skill-levels and allow for intermediate goods (Feenstra and Hanson 1997, 1999). These types of models are designed to analyse the effect of outsourcing on different groups of labour, but the effect on the total wage share is less clear.
5. The literature focuses on the bargaining power of labour. The bargaining power or, more narrowly, the market power of firms is an under researched topic. Globalisation ought to have decreased the market power of firms by means of the entrance of new competitors. At the same time it has increased the bargaining power of firms vis-a-vis labour (as discussed above). Azmat *et al.* (2007) and Hutchinson and Persyn (2009) are among the exceptions that analyse the bargaining power of firms in sectoral studies.
6. The GMM results turn out to be very sensitive to the lag length in the instruments. The results reported do thus not impose a restriction on the lag length.
7. Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom and the United States.

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