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The labour share and financialisation: Evidence from publicly listed firms

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Abstract

This paper provides international evidence for the effect of financialisation on the labour share at the firm level. We test different hypotheses about the impact of financialisation on functional income distribution, while also controlling for the effect of technological change, market concentration, labour market institutions and globalisation. We use panel data for publicly listed non-financial companies globally and with a particular focus on the EU15 for the period of 1995-2016. We find a negative effect of financialisation on the labour share due to increased shareholder value orientation in all countries, while there is also evidence of a negative effect due to an increase in mark-ups in France and the UK. Additionally, our findings cast doubt on the hypotheses that the decline in the labour share in European publicly listed firms is due to technological change. Similarly, market concentration did not play an important role for the decline in the labour share. In contrast, we find that concentration has declined among publicly listed firms in Europe, and that concentration is not associated with declining labour shares.

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1. Introduction

There has been a significant decline in the share of labour income in GDP in both developed and developing countries since the 1980s. Previous research has highlighted the impact of technological change, increasing market concentration, globalisation, and changes in labour market institutions to explain this phenomenon (Autor, et al. 2017; Karabarbounis and Neiman, 2014; Bassanini and Manfredi, 2014; IMF, 2007; European Commission, 2007; Stockhammer, 2017). However, during the same period we also witnessed surges in dividend payouts and share buybacks and an increasing engagement of non-financial corporations in financial activities. These trends are part of a broader development that is referred to as financialisation, defined by Epstein (2005, p. 3) as the 'increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies'. Several authors suggested negative consequences for income distribution, but the theoretical arguments, and especially the empirical evidence, is underdeveloped.

This is the first paper to provide cross-country evidence on the effect of financialisation on the labour share (labour compensation as a ratio to net value added) at the firm level.

We test different hypotheses about the impact of financialisation on functional income distribution, while also controlling for the effect of technological change, market concentration, labour market institutions and globalisation using panel data for publicly listed non-financial companies (NFCs). Our focus lies on the EU15[1] and its largest member states (France, Germany, the UK and Sweden) for the period of 1995-2016, but we also conduct estimations for two country pools of advanced[2] and emerging/ developing economies[3]. Alvarez (2015) is the only publication that investigates the effect of financialisation on the labour share using firm-level data for France. We go beyond this contribution, first, by considering more detailed mechanisms via which financialisation can affect the labour share, second, by testing the impact of alternative factors that affect the labour share and controlling for potential biases arising from endogeneity, and third, by providing cross-country evidence.

The use of firm-level data has several advantages over country- and industry-level data, as used in the previous research. First, the financialisation argument implies a decline of the labour share within firms.[4] Country- or industry-level data cannot distinguish changes in the aggregate labour share that are due to a change of labour shares within firms and a reallocation of production towards firms with lower labour shares. This opens the door for a fallacy of composition. Indeed, if the wage share declined due to a between firm reallocation as claimed by Autor et al. (2017), the connection to financialisation seems questionable. The second point relates to data availability and measurement. Previous research cannot distinguish between

[1] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

[2] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

[3] Argentina, Bangladesh, Brazil, Chile, China, Colombia, Egypt, India, Republic of Korea, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Saudi Arabia, Singapore, Vietnam, South Africa, Sri Lanka, Thailand, Turkey.

[4] One exception is the argument by Hein (2015) that links financialisation to a change in the sectoral composition. However, this argument lacks empirical significance as the labour share declined mainly due to a change within industries, rather than due to changes in the industrial composition (Karabarbounis and Neiman, 2014).

publicly listed and non-listed firms, although theory mainly focuses on the former. Furthermore, previous macro-level studies could not convincingly control for the impact of technological change, because adequate measures are lacking at the macro level and because the effect is likely to be correlated with firm-specific characteristics. This can bias coefficients and render results unreliable. In contrast, panel estimations with firm-level data allow to account for unobserved heterogeneity between firms and more precise estimations. Lastly, data on financialisation at the country level is only available since the mid-1990s for a sufficient number of countries. Consequently, single country estimations using macro data are not reliable due to the short time dimension. Therefore, most studies revert to macro-panel estimations with little possibility to test the validity of the pooling assumption, i.e. without considering that the effect of financialisation might differ across countries. In contrast, we can obtain an exact measure of financial payments and financial income at the firm level, and test whether there is an effect based on single country estimations for the largest economies in our pool (France, Germany and the UK) before pooling all EU15 countries.

We find that the labour share in European publicly listed firms mainly declined due to a within-firm change, and that financialisation is a robust driver of this process. This confirms previous findings using country-level data and puts them on a more solid empirical footing (Stockhammer, 2017; Dünhaupt, 2016; Kohler, et al. 2018). Furthermore, we go beyond previous analyses, by testing three different channels via which financialisation can impact the labour share: 1) increased shareholder value orientation and consequent wage suppression, 2) increased financial overhead costs and consequent increases in the mark-up, 3) increased fall-back options for capital due to a decoupling of profit generation from the core business activities. Our results suggest a negative effect of financialisation on the labour share due to increased shareholder value orientation in all countries, while there is also evidence for a negative effect due to an increase in mark-ups in some individual countries (France and the UK). We find no evidence for a negative effect due to increased fall-back options of capital in advanced economies in general or Europe in particular. However, we are the first to find evidence for a negative impact of increasing fall-back options of capital on the labour share in emerging/ developing economies. Additionally, our findings cast doubt on the hypotheses that the decline in the labour share in publicly listed firms is due to technological change. Similarly, market concentration did not play an important role for the decline in the labour share. In contrast, for the EU15 we find that concentration has declined and that concentration is not associated with declining labour shares. We also find no evidence for the effect of globalisation once financialisation is controlled for, although results can only be seen as indicative due limited data availability at the firm-level.

In the next section we identify three key hypotheses in the theoretical literature on the determinants of the labour share: 1) The technological change hypothesis suggests that increasing substitution of capital for labour drives the decline in the labour share. 2) The bargaining power hypothesis sees the decline of the bargaining power of labour as the main explanatory factor. 3) The superstar firm hypothesis posits that the labour share declined because a small number of very productive firms grew faster than their competitors. We also review the existing evidence for these three hypotheses. Section 3 presents our data and descriptive statistics, with an in-depth analysis of the relevance of the superstar firm hypothesis for the EU15. Section 4 presents our estimation strategy and results, while Section 5 concludes.

2. Determinants of the labour share: different hypotheses

There are three main hypotheses explaining the decline in the labour share: the technological change hypothesis, the bargaining power hypothesis and the superstar firm hypothesis. This section outlines the main channels and the necessary assumptions underlying these hypotheses.

2.1 The technological change hypothesis

Main channel:
The technological change hypothesis posits that the labour share declined due to capital augmenting technological change and/or an increase in the capital-output ratio. Several studies argue that technological progress was capital augmenting since the 1980s (Bassanini and Manfredi 2014; European Commission 2007). This increases the amount of output that can be produced from a given unit of capital and can have a negative impact on the labour share. A related stream of literature posits that technological progress in the last four decades contributed to a decline in the price of capital relative to labour. If firms are optimising, this will lead to a substitution of capital for labour and an increase in the capital-output ratio, referred to as *capital intensity* (Karabarbounis and Neiman, 2014). The increase in capital intensity can also be driven by globalisation if firms in capital abundant countries offshore labour-intensive tasks to benefit from lower wages in labour abundant countries (IMF, 2017; Elsby, et al., 2013). These channels imply a change in labour share within firms.

Main assumption:
Indeed, under the assumption of fully competitive markets, optimising firms, and a differentiable production function the wage share can be expressed as a function of capital augmenting technological change and capital intensity alone (Bentolila and Saint-Paul, 2003). However, the effect of these two variables on the labour share depends on the elasticity of substitution between capital and labour. More precisely, the necessary assumption for a negative effect of both factors is that the elasticity of substitution between capital and labour is larger than one.

Evidence:
Empirical evidence for this hypothesis is inconclusive. Several empirical studies found a negative effect of technological change on the labour share (Bassanini and Manfredi, 2014; Bentolila and Saint-Paul, 2003; European Commission, 2007; Hutchinson and Persyn, 2012; IMF, 2007, 2017). Most prominently, Karabarbounis and Neiman (2014) provide evidence for an elasticity of substitution above one and increasing capital intensity worldwide. According to their estimations, about half of the global decline in the labour share can be explained by a change in the relative price of capital. However, out of 13 studies that estimate the labour share with sector- or country-level data, seven found an elasticity of substitution between capital and labour that is smaller or equal to one.

Table 1: Implied elasticity of substitution in selected papers

Paper	Implied elasticity
Bassanini & Manfredi (2014)	e>1
Bentolila and Saint-Paul (2003)	e>1
Doan and Wan (2017)	e<1
European Commission (2007)	e<1 (K/L); e>1 (ICT)
Elsby, et al. (2012)	e=1
Harrison (2002)	e<1
Hutchinson and Persyn (2012)	e>1
ILO (2011)	e<1
IMF (2007)	e<=1 (K/L); Non-linear for ICT
IMF (2017)	e>=1 (relative price of capital); e>1 (TFP)
Karabarbounis & Neiman 2014	e>1
Stockhammer 2009	e=1
Stockhammer 2016	e<=1

Notes: If conflicting results are found the variables are indicated in in brackets. (K/L) = capital-output ratio; TFP = total factor productivity; ICT = ICT capital intensity; RI = relative price of capital. Results for IMF (2007) are based on estimations for the aggregate labour share using instrumental variables. They find evidence for an elasticity above one when they conduct estimations for high- and low-skilled sectors separately.

More importantly, studies whose primary focus lies on the estimation of the elasticity of substitution between capital and labour consistently find values below one and closer to 0.4 (Chirinko, 2008; Chirinko and Mallick, 2014).[5]

2.2 The bargaining power hypothesis

Main channel:

The bargaining power hypothesis attributes the decline in the labour share to a decline in the bargaining power of labour. In models of bargaining power, capital and labour bargain for wages and potentially employment. Both parties have an interest in concluding the negotiations and the split of the value added depends on their fall-back options. However, the effect of an

[5] Additionally, Barkai (2016) provides evidence that the decline in the labour share was accompanied by a decline in the capital share, measured as the capital stock to value added ratio evaluated at the competitive rate of return of capital. Income can be split into the labour share, the capital share and the profit share. Under the assumption of perfectly competitive markets economic profits are zero. Consequently, income is distributed among the factors exhaustively, i.e. a decline in the labour share implies an increase in the capital share. Barkai's (2016) argument is the following: Since any change in the labour share that is induced by factor substitution implies a proportionate increase in the capital share, the only way to reconcile a simultaneous decline in both factor shares is a change in the profit share. Since we are not able to calculate a competitive rate of return for capital due to data availability, we are not able to distinguish between profit shares and capital shares in our empirical analysis.

increase in the bargaining power of labour on the labour share depends on the specific bargaining model. In models where unions bargain for wages and firms set employment unilaterally (e.g. 'right-to-manage' bargaining), an increase in wages will lead to a substitution of capital for labour. Consequently, increased bargaining power of labour only improves the labour share if the elasticity of substitution between capital and labour is smaller than one (Bentolila and Saint-Paul, 2003). Furthermore, such an effect will be reflected in changes in the capital intensity. If labour can bargain for wages as well as employment (e.g. models of efficiency bargaining), an increase in bargaining power will increase the labour share unambiguously (Blanchard and Giavazzi, 2003). A third category are Kaleckian models of mark-up pricing (Kalecki, 1954, p. 18). In these models, workers can set the nominal wage while firms set prices, i.e. product markets as well as labour markets are not perfectly competitive. If unions manage to increase wages, firms respond by increasing prices, resulting in so-called conflict inflation (Rowthorn, 1977). However, since firms cannot increase prices indefinitely without losing their market share, an increase in labour's bargaining power increases the labour share.[6] Summing up, changes in bargaining power can impact factor distribution either by increasing the real wages (without reducing employment) or by changing the mark-up firms charge on production costs. All these channels imply a change in the labour share within firms.

Main assumption:
As soon as markets are not fully competitive, i.e. there is market power in the labour market and potentially the goods market, bargaining power between capital and labour becomes an additional variable that determines factor distribution.

Specific channels and empirical evidence:
Four main determinants of bargaining power have been highlighted in the literature: globalisation, labour market institutions, concentration and financialisation.

Globalisation:
Deregulation of trade barriers increases the mobility of capital by reducing relocation and offshoring costs (capital's fall-back options) and thereby increases the credibility of the firing threat (Rodrik, 1998; Harrison, 2002). There is strong empirical evidence for a negative effect of globalisation on the labour share as captured by different measures of trade intensity, offshoring and foreign direct investment (FDI) (Elsby, et al., 2013; European Commission, 2007; IMF 2007, 2017; Bassanini and Manfredi, 2014; Harrison, 2002; Hutchinson and Persyn, 2012; Onaran, 2011, 2012; Stockhammer, 2017; Lin and Tomaskovic-Devey, 2013; Jayadev, 2007).

Labour market institutions:
However, the traditional focus of bargaining power models are labour market institutions (Blanchard and Giavazzi, 2003). For example, an increase in unemployment benefits would

[6] Note that Kaleckian models of mark-up pricing usually assume a zero or low elasticity of substitution. Therefore, firms respond to changes in wages by increasing prices rather than by factor substitution.

improve the fall-back options and thereby the bargaining power of workers. Studies estimating the effect of labour market institutions on labour share abound, but evidence is mixed. The European Commission (2007) finds a negative effect of unemployment benefits and employment protection legislation, while the International Monetary Fund (IMF, 2007) reports a negative effect of unemployment benefits, and justifies this by a high elasticity of substitution. Stockhammer (2017), on the other hand, does not find statistically significant effects of labour market institutions. Conversely, evidence suggests more robust positive effects of direct measures of bargaining power such as union density (Stockhammer, 2009, 2017; ILO, 2011; Guschanski and Onaran, 2017), strike activity (Kristal, 2010; Argitis and Pitelis, 2001; Bentolila and Saint-Paul, 2003) and minimum wages (ILO, 2011; European Commission, 2007).

Concentration:

Most studies using country-level data find no impact of product market regulation, which is used as a proxy for the degree of competition, on the labour share (European Commission, 2007; IMF, 2007). Recent studies use firm-level data to account for the effect of concentration on the mark-up and subsequently on the labour share. Hutchinson and Persyn (2012) document an increase in concentration in 13 European countries between 1991 and 2001. Subsequently, they estimate the effect of concentration on the labour share at the industry level. In their theoretical model an increase in concentration increases the mark-up which has an adverse effect on the labour share. However, in their regression analysis concentration is only included together with an estimate of the Lerner-index. Concentration is insignificant, which is not surprising if the Lerner index appropriately captures the mark-up and thus constitutes an intervening variable. However, the Lerner index is not robust in the longer sample and has a very small effect on the labour share in comparison to other variables. The authors do not, however, control for potential endogeneity between the labour share and their explanatory variables. Barkai (2016) documents an increase in concentration in the U.S. In this framework, concentration is treated as a result of decline in the degree of competition, and changes in market regulation are named as one plausible driver. Barkai (2016) then proceeds by providing empirical evidence for a negative correlation between increases in concentration and the wage at the industry level for the U.S., which is particularly prominent in non-tradable sectors. In combination with his analysis of changes in the capital share, his findings imply that the decline in the labour share in the U.S. is a result of an increase in the mark-up.[7]

Lastly, an increase in concentration could also have a negative impact on the bargaining power of labour by reducing labour's fall-back options. This is a labour demand argument: a reduction in the number of firms in a particular sector increases the monopsony power of large employers. This can be conceived as a reduction in workers' fall-back options with adverse effects for the

[7] Barkai (2016) does not conclusively identify the reason for the increase in concentration. Consequently, in contrast to other contributions discussed in this section, he is agnostic about whether the decline in the labour share is due to changes in the mark-up among the majority of firms or due to a reallocation of output towards firms with larger mark-ups. Barkai cites unpublished work by Peltzman (2014), who finds that industries in the US that experienced the strongest increases in concentration also experienced the strongest increase in prices, which indeed suggest an increase of mark-ups in the majority of firms and a decrease in the within-firm labour share.

labour share. Evidence for this hypothesis is scarce, but Azar, et al. (2017) show that labour market concentration (i.e. a reduction in the number of employers per geographic region) is negatively associated with posted wages in the U.S.

Financialisation:
This paper addresses financialisation as an important determinant of bargaining power which gained momentum since the 1980s and received only limited attention in the literature on functional income distribution. Focusing on the definition by Epstein (2005, p. 3, see Section 1), we outline three sub-channels via which financialisation can impact the wage share: 1) the increasing role of financial motives for the management of non-financial corporations leads to wage suppression; 2) financial actors exert pressure on non-financial corporations, which leads to increasing overhead costs and increasing mark-ups; 3) financial markets offer an alternative source of profits and thereby increase the fall-back options of capital.[8]

1) Financial Motives – the shareholder value channel: The first channel focuses on the corporate governance of publicly listed firms and is based on the emergence of shareholder value maximisation (SVM). The term derives from the corporate governance literature of the 1980s which asserted that corporate managers (the agents) need to be controlled by shareholders (the principals), lest the former engage in activities that do not maximise value for the latter. More precisely, managers would focus on increasing the market share and size of their corporation as well as investing in the skill-base of their workforce, rather than maximise income for shareholders. The two major methods to align objectives of shareholders and managers are the 'market for corporate control' and linking managers' remuneration to stock price performance (Jensen and Fama, 1983; Jensen et al. 1990). The former method relies on the stock price being a signal for the implications of internal decisions on current and future cash flows. Decisions that are not supported by shareholders will reduce the share price, thereby exposing the firm to the risk of a hostile takeover. However, while hostile takeovers were common up until the mid-1990s, the majority of takeovers now are of a 'friendly' nature (Admati, 2017:133). More precisely, firms found other means to protect themselves from the threat of hostile takeovers. Since then, shareholders have relied on the second channel, i.e. the creation of incentive structures that link managers' remuneration to share price performance in the form of stock options or bonuses.
How is shareholder value orientation linked to the labour share? Palia and Lichtenberg (1999) show that linking managers' remuneration to share prices (via a higher ownership stake of managers) is associated with increases in total factor productivity. Bryan, et al. (2009) argue

[8] Koehler, Guschanski and Stockhammer (2018) identify another mechanism by which financialisation can affect the labour share. Increasing financialisation of households, in particular the rise of household debt, may have increased the financial vulnerability of working class households (Langley, 2007). This may have weakened labour vis-à-vis capital. Testing this hypothesis at the firm level would require data on the indebtedness of employees which is not available. Wood (2017) finds a negative effect of mortgage debt in Great Britain and the USA, but no effect in Sweden and Denmark for the period 1979-2012. Guschanski and Onaran (2016) find a negative effect of household debt (measured at the country level) on sectoral wage shares in Austria, Great Britain, and the USA for the period 1970-2010. However, they do not find evidence in estimations with a pool of all countries, suggesting that the effect is country dependent. Kohler, et al. (2018) find no significant effect of household debt in a panel of 14 OECD countries.

that this increased productivity might be a result of increased work intensity. There is also a general argument that shareholder value maximisation led to a change in the management culture that unsettled a balance between stakeholders and shareholders that had been more favourable to workers. With the emergence of shareholder value maximisation the focus of managers shifted to the pursue of short-term gains and stock prices performance, by means of increased dividend payouts and share buybacks – referred to as the 'downsize and distribute' approach (Lazonick and O'Sullivan, 2000).[9] Lazonick (2014) explicitly argues that excess profits from productivity gains in the last decades were used for share buybacks rather than wage increases, resulting in the divergence of real wages and productivity that underlies the decrease in the labour share. However, the argument is incomplete as it requires an explanation of why workers let it happen. Factors that explain the decline in workers' bargaining power abide and range from declining union density to welfare state retrenchment and globalisations as outlined above. In this sense a decline in bargaining power is a necessary condition for a negative effect of shareholder value maximisation on the wage share, however, without shareholder value maximisation the wage share would have declined less. Put differently, shareholder value maximisation reduces prospects for labour to agree on a beneficial compromise but requires a decline in the bargaining power of labour to be fully effective. Kohler et al. (2018) are the only study to explicitly investigate this mechanism in a macro-panel estimation of 14 OECD countries. They find a negative, but not robust effect of shareholder value orientation and specifically short-termism on the labour share, as captured by the stock market turnover ratio.

2) Financial actors – the mark-up channel: The second channel analyses the effect of shareholder value maximisation on the labour share via the product market. The argument is usually framed in the tradition of Kaleckian (1969) mark-up pricing models. In these models, firms do not possess full knowledge of their production function and therefore base their pricing decision on average unit costs rather than marginal costs, i.e. they take overhead costs into account. As average unit costs decline with the level of output, the pricing decision will be based on some 'normal' output level. This is referred to as normal cost pricing (Lavoie, 2014, chapter 3).[10] Hein (2015), referring to Kalecki (1969, pp. 17-18), maintains that increased financial payments (i.e. interest and dividend payments) will increase the mark-up firms charge on their products, as such payments are considered overhead costs from the perspective of firms. Financialisation has led to an increase in financial payments due to shareholder value orientation. A rise in the mark-up due to increased financial overhead costs will increase prices, reduce real wages and thereby increase the profit share. Notably, this mechanism relies on two assumptions: First, firms must possess the power to raise the mark-up in response to an increase in overhead costs. Second, interest payments must rise for reasons linked to financialisation,

[9] Interestingly, this process is not necessarily to the benefit of the shareholders. Indeed, due to similar information asymmetries that provided the ground for the principal-agent problem that led to the emergence of shareholder value maximisation, managers can now engage in activities that increase share prices but harm the long-term prospects of the corporations (Admati, 2017).

[10] This clearly deviates from models of marginalist pricing. As another important difference, in this literature the mark-up is determined by the degree of monopoly, which is function of market concentration, product substitutability and the bargaining power between capital and labour (Hein, 2014), rather than the price elasticity of demand alone as in the basic neoclassical models of imperfect competition.

such as an increase in the interest rate due to increased power of rentiers or because firms take on debt to finance share buybacks (the latter is suggested by Lazonick and O'Sullivan, 2000). However, interest payments are only partly under the control of the firm. Furthermore, if firms take on debt to finance productive investment, interest payments could be associated with an expansion of production and have a positive impact on the labour share.
This argument has motivated four econometric studies. Hein and Schoder (2011) estimate an autoregressive distributed lag model for the USA and Germany between 1963 and 2007 and report a weakly significant (at the 10% level) positive impact of net interest payments on the profit share. Dünhaupt (2016) regresses the wage share on net dividend and interest payments of non-financial corporations using a panel of 13 OECD countries over the period 1986-2007. She finds a strong and statistically significant negative impact of dividend payments, whereas the coefficient on interest payments is negative but statistically insignificant. Kohler, et al. (2018) find a negative impact of net financial payments in a panel of 14 OECD countries over the 1992-2014 period. Alvarez (2015) is the only study that investigates the effect of financialisation on the labour share using firm-level data for France. He finds a negative impact of interest payments; however, his empirical model has several identification issues. First, by including employment, profits, sales and value added simultaneously as explanatory variables, his estimations should be interpreted as an analysis of wages rather than the labour share. Second, his dependent variable is labour compensation as a ratio to total assets rather than value added. His explanatory variables turn insignificant once he changes his denominator to value added, which potentially is the related to the use of profits and employment as explanatory variables. Third, he does not control for endogeneity of his explanatory variables, so that his results might be driven by a simultaneity bias.

3) Financial markets – the financial profits channel: The majority of previous studies focused on the negative effects of shareholder value maximisation on the accumulation of fixed assets due to the attractiveness of short-term financial gains at the expense of long-term investment (Tori and Onaran, 2017; 2018). The growth in the share of profits of financial subsidiaries of non-financial corporations, such as General Motors, Ford, General Electric, and Sears is well documented for the US (Lin and Tomascovic-Devey, 2013; Lazonick, 2014). This provides the basis for the third channel of the effect of financialisation on functional income distribution. A decoupling of profits from core business activities constitutes an improvement in the fall-back options of capital relative to labour, with potentially negative effects for the labour share (Lin and Tomascovic-Devey, 2013). Rather than agreeing to wage demands of the workforce, the manager can decide to outsource or close the relevant part of the production process and engage in financial activities. Similarly, it decreases the leverage of labour: For example, if a strike is organised in the main business sector, the company continues making profits in the financial division. Conversely, a relaxation of the budget constraint due to financial profits can make bargaining outcomes that are more favourable to labour more likely. Simply put, if there is more income, capital could be more willing to make concessions to labour. Consequently, *a-priori* the effect of financial income on the labour share is not clear cut. Lin and Tomaskovic-Devey (2013) and Alvarez (2015) investigate this hypothesis using US sector-level and French firm-level data respectively. Both find a negative effect of financial income on the wage share,

while controlling for variables measuring technological change and globalisation. In contrast, Kohler, et al. (2018) find no effect of financial income in a panel of 14 OECD countries.[11]

2.3 The superstar firm hypothesis

Main channel:
The superstar firm hypothesis links the declining labour share to an increase in market concentration. However, in contrast to contributions focusing on bargaining power, the transmission channel does not rely on changes in the mark-up. Rather, concentration arises because a small number of very productive (superstar) firms grow much fast than their competitors. These firms are characterised by lower labour shares, either because of scale effects or because their productivity grows much faster than wages.

Main assumption:
All previously discussed channels assume a decline of the labour share within firms. The superstar firm hypothesis implies that the main reason for the decline in the aggregate labour share is a reallocation of production towards firms with low labour shares. This is referred to as the 'between effect' and will be discussed in more detail in Section 3.

Specific channels and empirical evidence:
Contributions to this literature differ mainly by the mechanism that is leading to an increase in concentration. In the model by Autor et al. (2017) a positive shock to the price elasticity of demand leads to an increased share of output being produced by highly productive firms.[12] Since the labour share consists of fixed overhead labour costs and variable costs, it is decreasing in firm size. Consequently, the labour share is increasing in the majority of firms (due to an increase in the competitive pressure and a decline in the mark-up), while it is decreasing in high productive (superstar) firms due to decreasing overhead labour as a ratio to output. Interestingly, in contrast to approaches highlighting changes in bargaining power, this model posits that increasing concentration is a result of an *increase* in competitive pressure (captured by the price elasticity of demand) rather than a *decrease* in competition as in Barkai (2016). The empirical analysis relies mainly on U.S. Economic Census data and contains three main insights. First, concentration increased in the U.S. Second, the labour share declined due to reallocation towards low-labour share firms rather than a decline of the labour share within

[11] A related stream of literature argues that financial liberalisation during the 1980s and 1990s and thus higher international capital mobility increases the exit options of capital. While the financial income argument implies a shift from the core business of the firm towards financial services, the deregulation of capital flows enabled firms to relocate production abroad and is thus similar to the effect of offshoring. Several studies investigate this hypothesis using country level data and find a negative effect of financial globalisation on the labour share (see Kohler, et al., 2018, for a review of this literature). In a different argument, IMF (2017) has linked financial globalisation to changes in the relative prices price of capital with subsequent impact on the labour share in line with the technological change hypothesis. Diwan (1999) finds that the labour share is negatively affected by banking and exchange rate crises, indicating that labour is forced to bear the bulk of the costs. In so far as financial crises became more frequent and more widespread with the increase in financial openness and international financial flows, this channel provides another link between financial globalisation and the labour share.
[12] However, the authors also discuss alternative reasons for such a reallocation of production, including barriers to entry and network effects.

firms. Third, there is a negative bi-variate correlation between the increase in concentration and the between-firm decline of the labour share. This correlation is observed at the sector level, calculated by aggregating the firm-level data to a narrow industry classification. However, the empirical evidence is not conclusive. Author et al. (2017) obtain less economically significant and less robust correlations between concentration and the labour share for manufacturing sectors in comparison to service sectors, although the former suffer less from measurement errors. Further, like the other contributions in this literature stream, they do not control for other variables but rather only look at correlations between their two variables of interest.

Autor, et al. (2017) is the only paper that provides international evidence for the superstar firm hypothesis. Using the CompNet database (Lopez-Garcia, et al., 2015) they show a correlation between 5- and 10-year changes in the sales ratio of the 10 largest firm in a 2-digit NACE sector and the labour share. Furthermore, they provide a shift-share analysis of the aggregate wage share decline based on the Orbis database – a firm-level dataset that contains non-listed as well as publicly listed firms. A shift-share analysis allows to decompose changes in the aggregate labour share into changes of the labour shares within firms (within component) and changes due to a reallocation of output towards firms with lower labour shares (between component). According to this decomposition, the between component dominates the decline in the aggregate labour share in the UK (2003-2008), Germany, Italy and Portugal (2003-2010) while it has the same magnitude as the effect from exiting firms in France (2003-2008). The within component dominates the decline in Sweden. However, this finding might be driven by the short time period considered which also includes the first year of the Great Recession, during which labour shares increased across the board *within* firms, thereby seemingly reducing the contribution of the within component.

The relevance of the between component for the decline in the labour share in the US is also confirmed by other studies. Hartman, et al. (2016) analyse the labour share of publicly listed firms in the US using the Compustat database. In their model the increase in concentration is a result of increasing firm-level revenue volatility, which leads to the emergence of some very productive firms while the others stay behind.[13] Kehring and Vincent (2017) provide an empirical analysis that stays agnostic about the reason for the increase in concentration. Like Autor, et al. (2017) they use census data for U.S. manufacturing firms. Interestingly, their findings highlight the relevance of the decline in the labour share within superstar firms. More precisely, they document that ⅓ of the decline in the aggregate labour share is due to the reallocation of sales between firms, ⅙ is due to the exit of plants with a higher-than-average labour share, while ½ of the decline is explained by plants that grow and decrease their labour share simultaneously. Furthermore, they show that labour shares in superstar firms declined

[13] The intuition behind this mechanism is that increased revenue volatility lowers the threshold of a minimum level of productivity that is required for a firm to continue production. If revenues are highly volatile, even a firm with previously low revenues can suddenly become highly profitable, which in turn reduces the exit rate of firms. This reduction in the rate of exiting firms allows for the emergence of a few very productive firms, while the lower tail of highly unproductive (low revenue) firms grows as well. Wages are determined ex ante, i.e. before productivity is known. Consequently, the wage share declines in highly productive firms, whereas it increases in those 'unlucky' firms that never achieve a high level of productivity. They show that under certain conditions the aggregate wage share will always decline due to this process and that the decline will take place via a change in the size distribution of firms.

because of an increase in value added while employment remained constant, suggesting a key role for productivity to explain the decline of superstar firms' labour share, in line with Autor, et al. (2017) and Hartman, et al. (2016).
Other contributions cast doubt on the link between productivity and concentration. For example, Gutierrez and Philippon (2017) provide evidence that concentration is negatively linked to productivity in the U.S. since the beginning of the 1990s and most likely a result of decreased competition. Lastly, size effects are not the only potential reason for a decline in the labour share in superstar firms. First, as also mentioned by Autor, et al. (2017), firms with a larger market share might be able to impose higher mark-ups. Second, as discussed in Section 2.2 concentration can lead to a decline in labour's fall-back options. However, such aspects of bargaining power are usually ignored in the 'superstar firm' literature.

2.4 Summary

Summing up, we have identified three key hypotheses that offer an explanation for the decline in the labour share. First, the technological change hypothesis implies that changes in relative prices induced substitution of capital for labour which led to an increase in the capital-output ratio. This process was supported by capital-augmenting technological change and the offshoring of labour intensive tasks abroad. This hypothesis relies on the assumption of an elasticity of substitution between capital and labour that is larger than one. Second, the bargaining power hypothesis focuses on a change in industrial relations. Fall back options of labour declined as labour markets became more flexible and bargaining institutions like trade unions eroded. While organisational power of labour dwindled, managers, motivated by shareholder value maximisation, adopted a corporate governance strategy that is more hostile towards wage increases and prioritises dividend payouts and share buybacks. An alternative channel highlights increasing financial payments due to financialisation. Rather than accepting profit cuts, managers shifted the burden of increased financial payments on consumers by increasing the mark-up on production costs. Another channel highlights that fall-back options of capital increased due to the possibility to invest in financial assets rather than productive activities. Both the technological change and the bargaining power hypothesis imply a decline in the labour share within firms. Third, the superstar firm hypothesis posits that the decline of the aggregate labour share results from a reallocation of production towards extremely productive firms with low labour shares. This process is argued to be linked to increasing competition and increasing cash flow volatility at the firm-level.

3. Data, descriptive statistics and a test of the superstar firm hypothesis

Our sample consists of active publicly listed companies in 50 advanced and emerging/ developing economies, supplied by Thomson Reuters' Worldscope database.[14] It provides annual information on standard accounting items such as employment, compensation, and

[14] Our focus on active firms is based on data reliability concern. Firm level data are characterised by large outliers for firms shortly before their bankruptcy or merger, which are events not related to the effects we want to test. Furthermore, data for active firms is more reliable as it is more frequently controlled by the data analysts at Thomson Reuters.

capital stock, as well as financial income and payments. While the database is widely used in the literature on investment (Bond, et al. 2003; Love and Zicchino, 2006; Tori and Onaran 2017; 2018), this is the first paper to the best of our knowledge to employ it to analyse functional income distribution. Its main advantage lies in international comparability, which is assured by adjusting accounting variables for differences in presentation and disclosure.[15] Nevertheless, national accounting systems differ in important ways, which cannot be factored out, such as the calculation of depreciation and the utilisation of accruals and provisions. Therefore, we prefer analyses at the national level, if this is feasible given the number of available companies per country. As the second-best option, we present detailed analysis at the EU15 level, which is the economic area for which we have the largest number of observations and there is more regulatory convergence.[16]

Our sample differs from datasets used in the firm-level analysis in the literature on the USA in two important ways: first, in contrast to Autor et al. (2017), Barkai (2016), and Vincent and Kehring (2016), we do not have information on non-listed companies. Since our focus lies on the hypotheses outlined by the financialisation literature, which apply to non-financial publicly listed companies, this is not a major concern. For the same reason we exclude financial and real estate companies from the sample.[17] Another distinguishing characteristic of this database is that it reports consolidated balance sheets. Given that a large share of firms, especially publicly listed companies, operate in different countries, this allows us to obtain a more comprehensive picture of the within-firm distribution of their value added in global markets. More specifically, consolidated accounts capture all activities within the multinational corporation, including the relocation of production. For example, if a firm relocates tasks to an affiliate in order to benefit from lower wages abroad, this will be reflected in an overall decline in the firm-level labour share in our data, as long as the relocated activity is conducted within a subsidiary of the firm. Such processes cannot be captured with data from national accounts which is limited to domestic production only. However, the use of consolidated balance sheets and the limitation to publicly listed NFCs implies that we capture only a limited part of a countries' value added[18], and our dataset does not necessarily reflect the development of the aggregate labour share in a particular country. Nevertheless, as illustrated in Table 2, the firms

[15] More precisely, Thomson Reuters reconstructs the balance sheets of companies based on a common definition of variables –e.g. the item 'net sales' is always reported net of excise taxes (Thomson Reuters, 2013).

[16] The low number of firms available for the USA is due to accounting rules by the U.S. Securities and Exchange Commission (SEC), which does not oblige firms to disclose staff costs as separate item in operating expenses (Tracy, 2008). Consequently, the labour share can only be constructed for ca. 13% of publicly traded firms (Hartman, et al., 2016). Of those firms, an even smaller share reports staff costs for five consecutive years, rendering an econometric analysis of the US individually impossible.

[17] Furthermore, we exclude firms operating in agriculture and mining industries, as value added for these companies will fluctuate significantly with changes in commodity prices, as well as firms that are part of the public administration sector, as labour share dynamics in these firms will not be driven by the channels under consideration. This is a typical procedure in industry-level studies (e.g. Guschanski and Onaran, 2017).

[18] Furthermore, we cannot capture firms that enter or exit the market in a reliable way. Given that our dataset excludes delisted or bankrupt firms, our panel is characterised by a large share of entrants, i.e. firms that were listed between 1996 and 2016 and a smaller share of exiters, i.e. firms for which data is not available for more recent sample years. Theoretically, there should be no exiters in our sample since it is constrained to active companies. However, financial accounts data is not always immediately updated, so that the number of missing observations increases in more recent years. For a similar argument that applies to the Orbis firm database, see Autor et al. (2017: 43)

in our sample employ a large workforce in relation to the country of their headquarters, and consequently the analysis of their income distribution is relevant in itself.[19]

Table 2: Employment share of our sample

	Min	Max	Mean	Number of firms
United Kingdom	0.15	0.31	0.23	1065
France	0.16	0.38	0.28	574
Germany	0.10	0.18	0.15	598
Sweden	0.17	0.37	0.28	404

Notes: Columns 2-4 show the number of employees in our sample as a ratio to aggregate employment by country over the period 1995-2014. Data reports the maximum, minimum and average value over the 1995-2014 period. The denominator is based on industry level data from EU KLEMS (Jäger, 2016), which ends in 2014. Aggregate values in the denominator exclude the following sectors that are also excluded from the firm-level database: Agriculture, Hunting, Forestry and Fishing; Mining and Quarrying; Finance, Insurance and Real Estate; and Public Administration and Defence.

Worldscope provides data from 1980 onwards, but coverage for earlier years is very limited, especially for financial variables; therefore we start our sample in 1995. For the wage bill at the firm level we use data on staff costs, which includes wages as well as all employee benefits such as health insurance and contributions to pension plans. Unfortunately, we are not able to adjust the wage bill for the income of self-employed workers. For example, services performed by consultants and contractors, who can be hired for several years but legally operate as self-employed, are not part of the staff costs measure. However, this practice is mainly observed in the financial sector, which is excluded from our sample. We take the ratio of staff costs to the sum of staff costs and operating income, which is net sales minus operating expenses. Operating expenses include, among other costs, depreciation and amortisation. This accounts for two arguments raised in previous research. The first argument states that the decline of the labour share is less pronounced if depreciation is accounted for. The second argument is that depreciation has to be subtracted from value added if the labour share is to be interpreted as a measure of income distribution (Rognlie, 2015; Bridgman, 2017).[20]

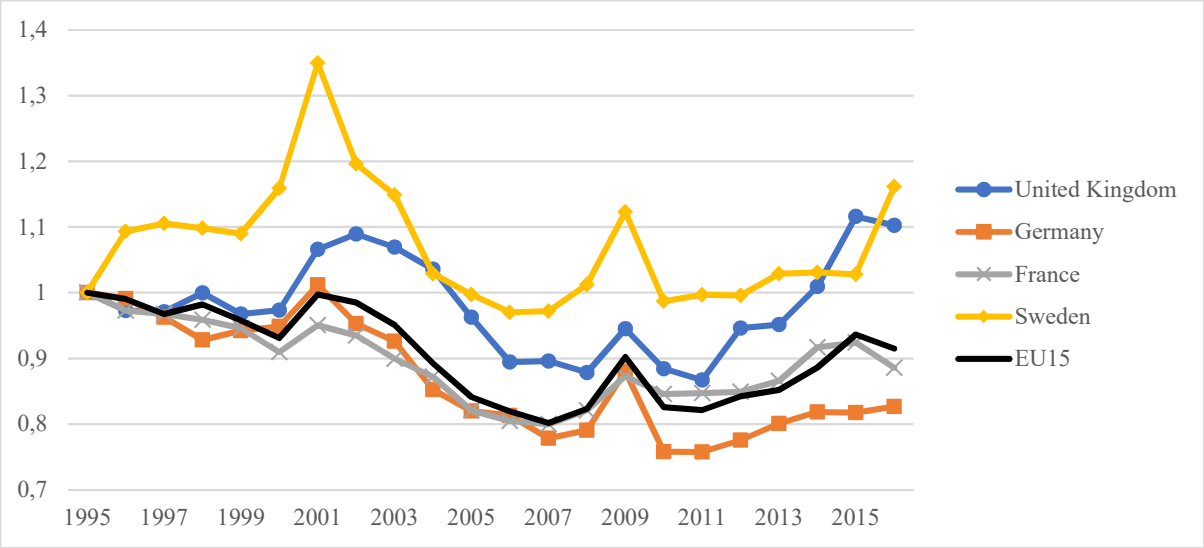
Figure 1 plots the aggregate labour share for the UK, France, Germany, Sweden, the EU15 pool, the advanced economies pool and the emerging/ developing economies pool. The series is normalised to be equal to one in 1995 for better comparability and because level differences are difficult to interpret as they could stem from differences in the availability of firms from different sectors. We observe a decline in all samples between 1995 and 2007, albeit some upward movement in between, most remarkably in Sweden. In all countries the labour share increases sharply between 2008 and 2009 due to the Great Recession before it starts falling again in 2010. Since 2011 it shows an increasing trend in all groups except the advanced economies pool where it continues to decline. Notably, as of 2016 the wage share is lower than in 1995 in France, Germany, the EU15 and the advanced economies pool, but higher in the UK, Sweden and the emerging/ developing economies pool. For the UK the increase of the

[19] Note since our variables are consolidated, employment in our sample includes employment outside the country of residence. Consequently, Table 2 aims at highlighting the relevance of our sample in terms of employment, rather than a measure of the country share of employment in publicly listed firms.

[20] Other contributions, however, opposed this view based on the argument that depreciation patterns are rather driven by the business cycle than long-term structural changes (Schwellnus, et al., 2017).

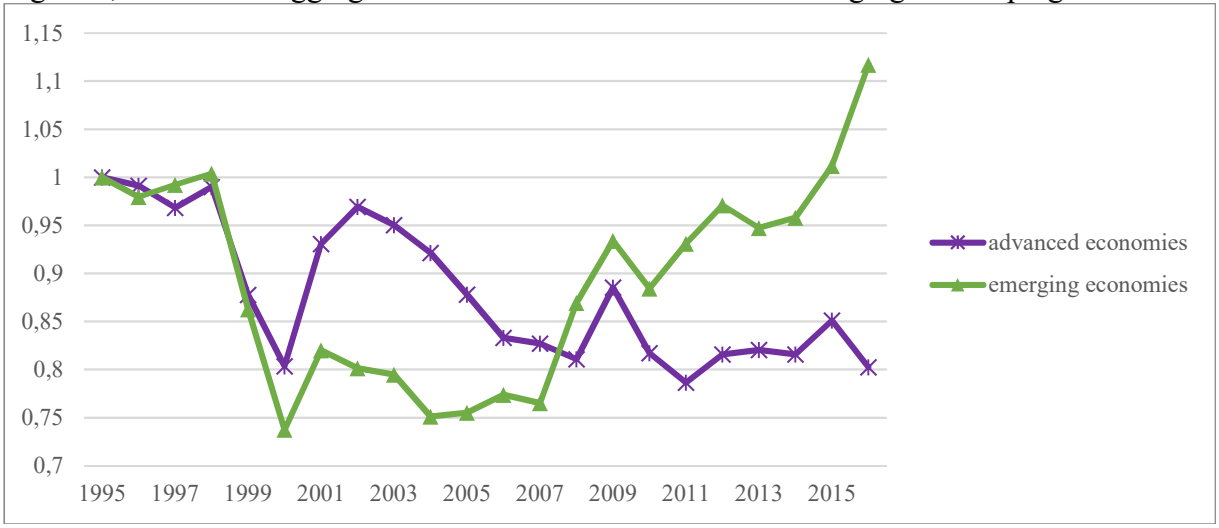
labour share since 2009 is in line with the observation that productivity has been particularly stagnant in the aftermath of the Great Recession. However, since data is lacking for many companies for the last 2 years of our sample, such aggregate measure can only be seen as indicative for recent years.

Figure 1: Aggregate labour share in the EU15



Source: Own calculations based on Worldscope database. Labour share in 1995 is set to 1.

Figure 1, continued: Aggregate labour share in advanced and emerging/ developing economies



Source: Own calculations based on Worldscope database. Labour share in 1995 is set to 1.

Next, we look at descriptive evidence for the main hypotheses under consideration. We mainly focus on the superstar firm hypothesis as it is increasingly gaining prominence in the literature. Furthermore, we cannot capture this hypothesis satisfactorily in our regression analysis in Section 4.2: according to the superstar firm hypothesis, an increase in concentration implies declining labour shares in superstar firms, while labour shares would increase or stay constant in other firms. Therefore, it is not clear whether we would expect a positive or a negative effect of this variable on the labour share. Consequently, we must rely on a more descriptive analysis

to assess the validity of this hypothesis.[21] However, by including a measure of industry-level market concentration in our regression analysis, we can account for the hypothesis that an increase in concentration led to an increase in the labour share within firms across all firms, as suggested by mark-up pricing models. After an analysis of market concentration, we continue by looking at the bargaining power and technological change hypothesis.

The superstar firm literature implies three testable hypotheses: 1) concentration has increased, 2) the decline in the labour share is due to between-firm reallocation, 3) there is a negative correlation between the increase in concentration and the decline in the labour share. Previous research has examined them mainly for the U.S., and our contribution is to provide evidence for Europe. Our measure of concentration differs in two important ways from the previous contributions. First, using consolidated balance sheets allows to calculate concentration measures that take international sales into account. Given that many firms, and especially large publicly listed companies, compete on the global scale, concentration measures limited to the domestic market might be a misleading representation of the actual degree of market power. However, for some firms (especially in service industries) the domestic market might be a more relevant reference. Unfortunately, we cannot exclude international sales from our concentration measure due to limited data coverage. Second, we can only measure changes in concentration among publicly listed firms, i.e. we are unable to capture an increase in concentration between non-listed and listed companies. While this is a caveat, Grullon, Larkin and Michaely (2016) argue that the increase in concentration was driven by a small share of publicly listed firms, which suggest that we should be able to find evidence of this process using our data. To further account for this, we consider data from the CompNet database supplied by the European Central Bank (Lopez-Garcia, et al., 2015). The database collects information on non-financial companies, including listed- and non-listed firms, and aggregates them into sectors in order to ensure anonymity. For measures of concentration it covers 57,824 firms in France and 25,978 in Germany on average across all sectors in a given year. The UK and Sweden are not part of the database.[22] Table 3 reports the number of sectors that experienced a decline in concentration as a ratio to total number of sectors.

[21] Another option would be to aggregate our firm-level data and conduct estimations at the industry level. However, the loss of information implied by this aggregation seems unjustified because the main focus of this analysis is financialisation, which we are particularly interested in examining at the firm level, as explained in Section 1.

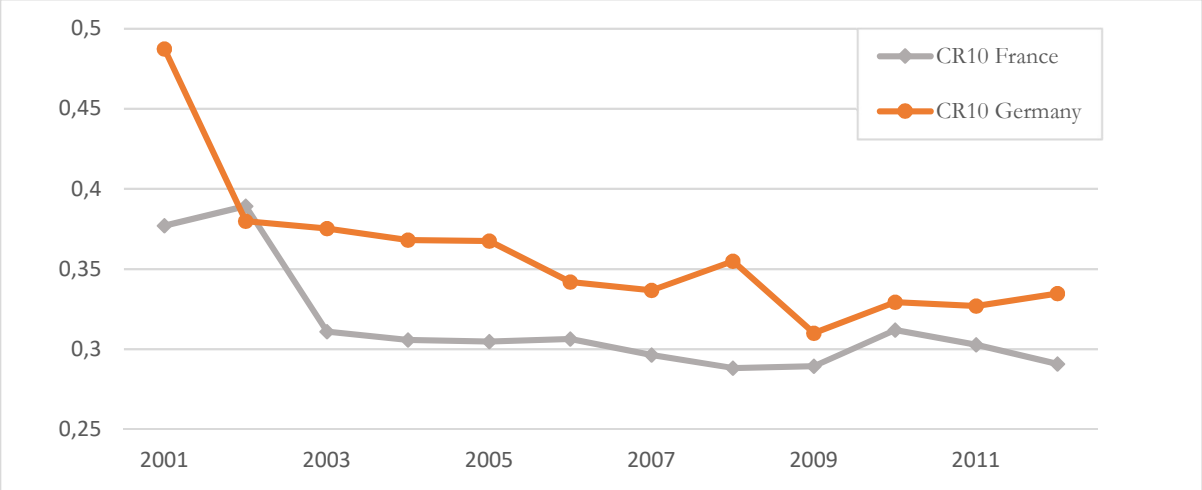
[22] We regard this database as complementary to our sample of exclusively publicly listed firms, although it comes with its own drawbacks. Specifically, for France only firms with more than 750,000 euros of sales are included in the sample, whereas in Germany there is a bias towards large manufacturing firms. As recommended by the providers we rely on the E20 database whenever possible, which is an adapted version covering only firms with 20 or more employees. Additionally, the E20 version uses re-weighting techniques to increase its representativeness with respect to the total population (CompNet, 2016, p. 12).

Table 3: Shares of sector with a decline in concentration

Measure	Top4-sales share	Herfindahl-Index	Top10-sales share	
Database	Worldscope		CompNet	
Country	EU15	EU15	Germany	France
2000-2007			31/44	27/53
2000-2012			23/44	21/53
1995-2007	29/35	31/35		
1995-2015	28/35	30/35		

Using the Worldscope database of publicly listed firms, we observe that concentration increased only in a small share of sectors in the sample of all EU15 countries, as can be seen in Table 3. This trend is mirrored at the individual country level in all EU15 member states.[23] Turning to the CompNet database, we find no significant increase in concentration for Germany and France. For the period of 2001-2007 concentration declined in 70% of all sectors in Germany, while it declined in 51% of all sectors in France. For the 2001-2012 period the figures are 40% in France and 52% in Germany. Given that sectors differ by size, Figure 2 provides data on the sales of the 10 largest firms in each sector weighted by the sector's contribution to total sales. This aggregate series confirms a decreasing trend of concentration measures in Germany and France. Our finding of declining concentration in Europe is in line with the evidence provided by Gutierrez and Philippon (2017), which contrasts with findings by Hutchinson and Persyn (2012) who look at a different time period (1991-2005) and include listed and non-listed firms.

Figure 2: Top10 firms' sales share (CR10)



Notes: Graphs show sales of the largest 10 firms in each sector as a ratio to total sales. Data is based on the CompNet database (Lopez-Garcia, et al., 2015).

[23] Results are available upon request.

Next, we compute correlations between the sector level concentration and the labour share. We use long-term differences for two sub-periods, 2001-2007 and 2001-2012, in order to account for structural changes after the Great Recession. We rely on data from Thomson Reuters for the EU15 and data from CompNet for France and Germany. Table 4 reports the results.

Table 4: Correlation between labour share and concentration (long-differences)

EU15				
	measure	correlation	95% limits	
1995-2007	HHI	0.339	-0.136	0.687
1995-2007	CR4	0.379	-0.091	0.711
1995-2015	HHI	0.150	-0.326	0.566
1995-2015	CR4	0.361	-0.112	0.700
Germany				
	measure	correlation	95% limits	
2001-2007	HHI	0.005	-0.303	0.312
2001-2007	CR10	0.047	-0.265	0.349
2001-2012	HHI	-0.138	-0.427	0.177
2001-2012	CR10	-0.031	-0.335	0.279
France				
	measure	correlation	95% limits	
2001-2007	HHI	-0.584	-0.742	-0.365
2001-2007	HHI (excluding water transport)	-0.088	-0.36	0.198
2001-2012	CR10	-0.263	-0.504	0.017
2001-2012	HHI	-0.44	-0.64	-0.184
2001-2007	CR10	-0.205	-0.457	0.078

Notes: Data for the EU15 is based on the Worldscope database. Data for France and Germany is based on CompNet. HHI stands for the Hirschman-Herfindahl index. CR4 and CR10 stands for the sales ratio of the largest 4 and 10 firms respectively. The table reports correlations between long-difference of the variables for the periods in column 1.

Correlation coefficients for the EU15 and Germany are never significantly different from zero, while we do find a negative correlation between the change in the Herfindahl index and the labour share for France during 2001-2007. However, this result appears to be entirely driven by 1 sector (water transport), which is relatively small in terms of its value added to the total economy. If this sector is excluded the correlation is statistically insignificant. If the whole period (2001-2012) is considered, there is evidence for a negative correlation between the Herfindahl-Hirschman index and the labour share in France. However, this is not confirmed for the CR10 measure, which is the more accurate measure of the rise of 'superstar firms'. Furthermore, it appears to be driven entirely by the period after the Great Recession, which suggests that the increase in concentration might be a result of exiting firms rather than growing industry leaders.

Lastly, the superstar firm hypothesis implies that the decline in the labour share is mainly driven by the between component, i.e. a reallocation of output towards firms with lower labour shares. In Table 5 we report a shift-share decomposition (Baily, et al., 1992) for our data in order to distinguish between- and within-firm changes in the aggregate labour share. We focus on surviving firms, i.e. firms that report data in the first and last year of the period under

consideration since data on exit and entry is not reliable.[24] We constrain the sample until 2015 in order to mitigate dynamics that are mainly due to missing data in the last year.

Table 5: Shift-share decomposition of the decline in the aggregate labour share

		ΔLabour share	Within effect	Between effect	Covariance
The UK	1995-2007	-0.037	-0.005	-0.030	-0.001
	1995-2015	0.090	0.188	0.004	-0.102
France	1995-2007	-0.179	-0.173	-0.029	0.023
	1995-2015	-0.073	-0.087	-0.014	0.027
Germany	1995-2007	-0.214	-0.199	0.009	-0.024
	1995-2015	-0.143	-0.261	0.002	0.115
EU15	1995-2007	-0.149	-0.124	-0.021	-0.004
	1995-2015	-0.039	-0.040	0.004	-0.003

Notes: Data based on Worldscope database

In Germany, France and the EU15 almost all the decline in the labour share is explained by within firm variation for the period 1995-2007, while the between component and the covariance term are of similar magnitude. The contrary holds for the UK, where the between component explains the largest part of the labour share decline. Interestingly, the picture changes when the whole sample period (1995-2015) is considered. While the within component gains significance in all countries, the between component loses significance in the UK and the EU15, while it stays almost constant in France and Germany. Similarly, the covariance term indicates changes in the opposite direction of actual changes in the wage share in all countries except the EU15 sample, although the effect is quite large in some countries for the full period.[25]

Overall, descriptive analysis suggests a limited increase in concentration, and a low correlation between changes in concentration and the labour share in European publicly listed firms.

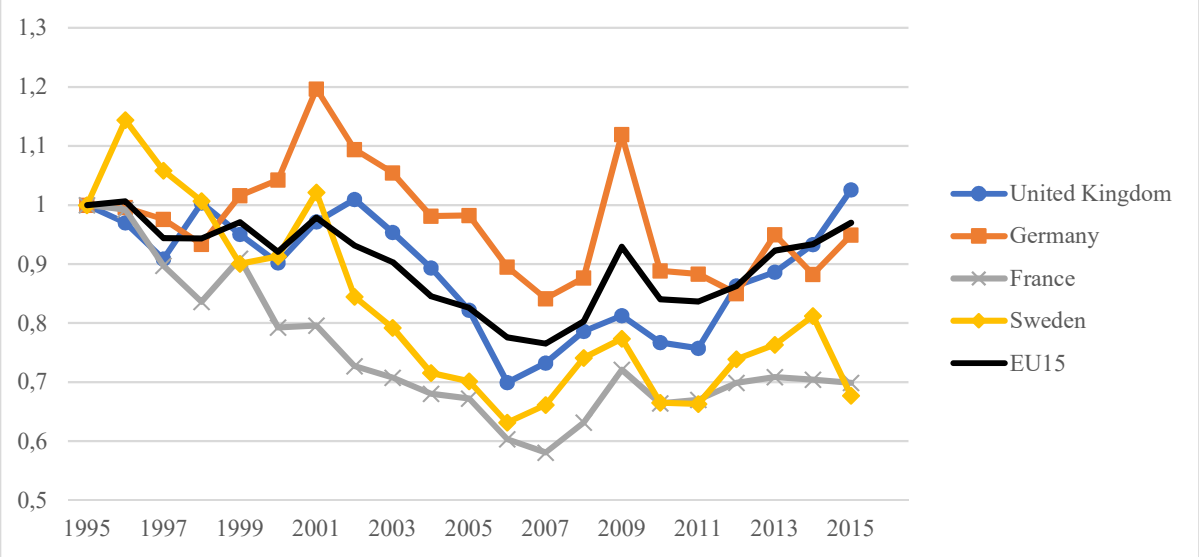
[24] Otherwise a large share of the change in the aggregate labour share would be explained by entering firms in the early years of the sample and exiting firms in later years. See Autor et al. (2017) for a similar argument for the Orbis database. Sweden is excluded from the analysis because of the small sample size. Constraining data to 'surviving' firms results in a sample of 47 firms for the 1995-2007 period and 32 firms for the 1995-2015 period, which cannot be considered representative. However, for this small sample the within-firm component dominates the between component.

[25] The covariance term reflects a joint effect of the within and between components. This can be interpreted as follows: for the EU15, 7% (or 0.3 %-points) of the decline in the aggregate labour share between 1995-2015 is explained by a relocation of output towards low labour share firms that also decreased their labour share in the same period. However, this is only one possible interpretation. A more thorough analysis involving different decomposition techniques would be necessary to pin down the exact changes. Given that the covariance term has a modest impact for the pre-2007 period, which we consider as more representative of the long-run trend than the whole sample including the Great Recession, this is beyond the scope of this research.

Furthermore, changes in the labour share are mainly driven by a decline within firms. This cast doubt on the validity of the superstar firm hypothesis for the EU15 and suggests a potential role for those hypotheses that rely on a decline of the within-firm labour share, namely the technological change and the bargaining power hypothesis.

However, a look at total fixed capital stock as a ratio to value added indicates a declining or U-shaped pattern in the majority of countries in our sample (Figure 3). It would be desirable to analyse the evolution of information and communication technology (ICT) capital or intangible assets, as different types of capital can potentially have different elasticities of substitution with respect to labour. Unfortunately, this is not feasible due to lack of data. Analysis at the industry level indeed suggest an increasing trend for ICT capital (Guschanski and Onaran, 2017) and intangible assets (Corrado, et al. 2012), which are more appropriate measures for the recent pattern of technological change in the post-1980s. However, the share of ICT in value added and intangibles as a ratio to total capital stock is still very small (Crouzet and Eberly, 2017; Guschanski and Onaran, 2017)[26] and evidence for the US suggests it is growing too slowly to affect the general trend (Barkai, 2016).

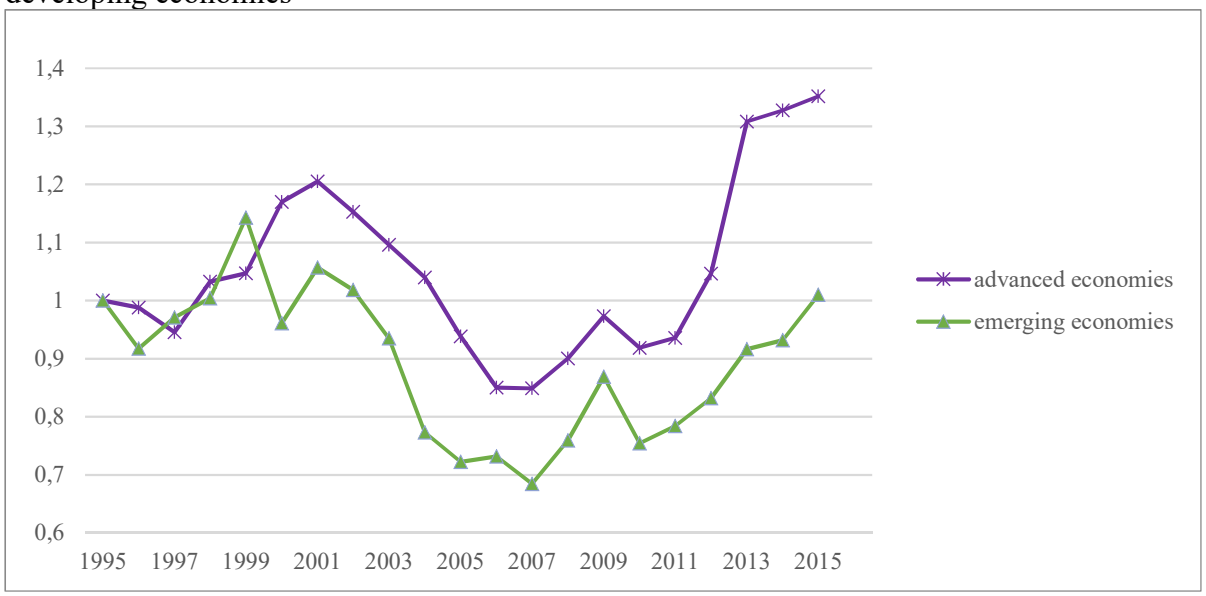
Figure 3: Net fixed capital stock as a ratio to value added in the EU15



Source: Own calculations based on Worldscope database. Capital intensity in 1995 is set to 1.

[26] In the sample of 14 OECD countries used in Guschanski and Onaran (2017) which is based on the EU KLEMS database (Jäger, 2016), the ICT capital stock as a ratio to total capital stock rarely exceeds 10%.

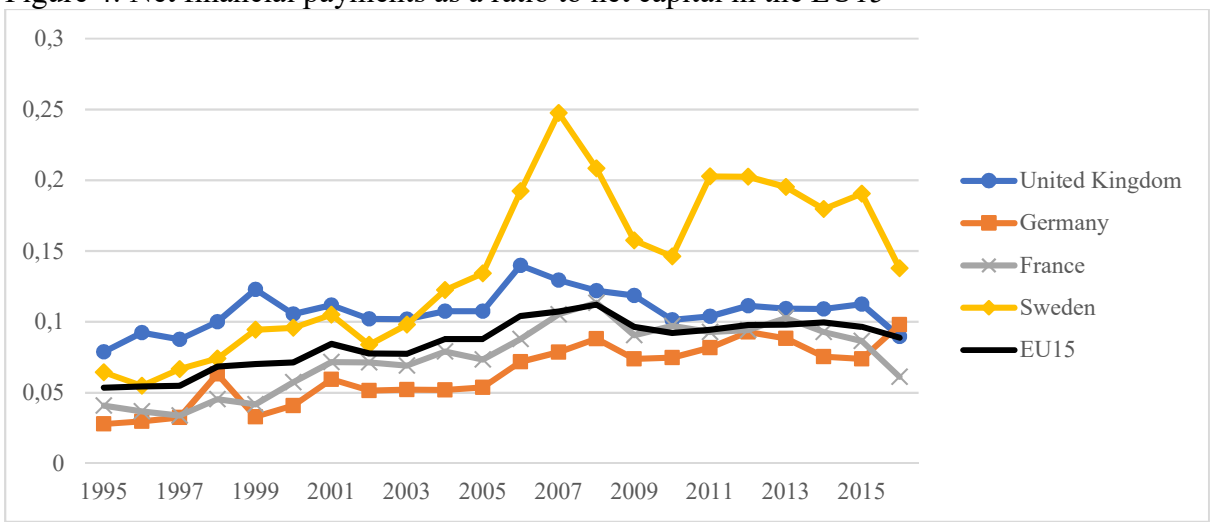
Figure 3, continued: Net fixed capital stock as a ratio to value added in advanced and emerging/ developing economies



Source: Own calculations based on Worldscope database. Capital intensity in 1995 is set to 1.

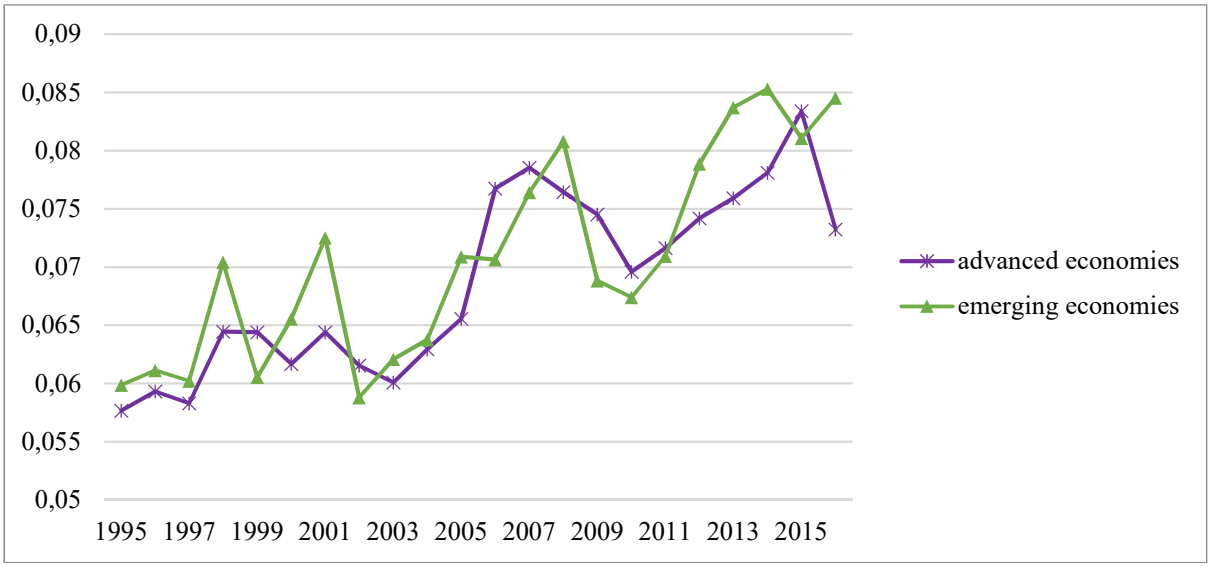
Lastly, Figure 4 presents the evolution of net financial payments, i.e. dividend and interest payment minus dividend and interest income, as a ratio to the capital stock.

Figure 4: Net financial payments as a ratio to net capital in the EU15



Source: Own calculations based on Worldscope database.

Figure 4, continued: Net financial payments as a ratio to net capital in advanced and emerging/ developing economies



Source: Own calculations based on Worldscope database.

All countries show an increasing trend of net financial payments as a ratio to the net capital stock. The trend of this variable is mainly driven by increasing dividend payments. Indeed, interest payments decline in most countries, due to declining interest rates during the period under consideration.

Summing up, the increase in dividend payments is in line with the financialisation channels outlined in Section 2, while declining capital intensity and concentration provides weak evidence for the superstar firm hypothesis for the EU15 and technological change hypothesis for all countries. Given that the aggregate labour share of publicly listed firms declined mainly due to a decline within firms, the next section tests in more detail the hypotheses that offer an explanation of within-firm changes in the labour share, namely the technological change and the bargaining power, with a particular focus on financialisation.

4. Econometric Analysis

4.1 Model and estimation method

In order to test the different channels outlined in Section 2 we estimate the following equation:

$$LS_{i,t} = \alpha_1 LS_{i,t-1} + \alpha_2 GROWTH_{i,t} + \alpha_3 CAPITAL\ INTENSITY_{i,t} + \alpha_4 FINANCIALISATION_{i,t} + \varepsilon_{i,t}$$

where *LS* is the labour share in firm *i*, measured as staff costs as a ratio to value added. We include *GROWTH,* measured as the logarithmic change in real value added, to account for the counter-cyclicality of the wage share, which is due to the fact that profits decline in recessions, while wage incomes are more stable due to fixed-term wage contracts and overhead labour costs (Kalecki, 1954). It can also be justified as capturing adjustment costs in the process of

hiring and firing of workers (Bentolila & Saint-Paul, 2003). *CAPITAL INTENSITY,* our main measure of technological change, is captured by the net capital stock as a ratio to value added.[27] We include three measures of *FINANCIALISATION* – financial income, calculated as the sum of interest and dividend income received, and separate variables for interest payments and dividend payments. Financial income accounts for increases in fall-back options of capital and there is no theoretical reason to distinguish between the two sources of income. Similarly, financial payments can lead to an increase in the mark-up independent of whether they result from an increase in dividend or interest payments. However, changes in the corporate governance due to shareholder value maximisation are best captured by dividend rather than interest payments. The amount of dividend payouts are purely a decision of the firm and are therefore most closely related to changes in corporate governance. Furthermore, they are strongly correlated with share price rises and therefore directly linked to shareholder value maximisation. Interest payments, on the other hand, are only partly under the control of the firm and are not necessarily related to shareholder value maximisation.[28] Lazonick (2014) argues that US firms increasingly distribute income to shareholder via share buybacks rather than dividend payouts. Furthermore, previous literature attributed the increasing relevance of shareholder value maximisation to changes in the remuneration structure of managers. It would be desirable to augment our estimations by a measure of share buybacks and a dummy for the link of CEO compensation and share prices. However, this data is not available.

In a set of robustness tests, we also control for the impact of globalisation and concentration on the labour share. Note that globalisation has a dual character: First, via its impact on the structure of production it can alter the degree of capital intensity (Section 2.1). Second, it increases the relative bargaining power of capital (Section 2.2). Consequently, if globalisation has an impact on the wage share *for a given* capital-output ratio, this effect works via a change in relative bargaining power of capital vis-à-vis labour. We capture globalisation by including international operating income, measured as operating income generated from operations in foreign countries (before adjustments and eliminations), as a ratio to total operating income. It excludes exports and is closely related to a measure of foreign direct investment (FDI). However, it cannot capture intra-firm trade and offshore-outsourcing, which constitutes a very important dimension of globalisation.[29] We capture concentration as either the Hirschman-Herfindahl index or as the sales share of the four largest companies in the ISIC4 industry. However, the inclusion of market concentration into our empirical model does not allow us to

[27] It would be desirable to include a measure of intangible assets or ICT capital. Thomson Reuters provides data on computer equipment. However, data availability is limited to few firms and its inclusion in our empirical analysis reduces the sample to less than 100 firms for the EU15 sample, which cannot be considered reliable.

[28] Kohler et al. (2018) measure the shareholder value channel by the stock market turnover ratio, defined as the total value of shares traded per year as a ratio to the average market capitalization. This measure is not available at the firm level. Furthermore, whether an increased turnover ratio actually has an impact on the behavior of managers is arguably better captured by variables that lie under the direct control of the firm, such as dividend payments. Lazonick and O'Sullivan (2000) suggest that firms took on debt in order to engage in share buybacks and make their balance sheets less attractive for takeovers, implying that increasing interest payments could also serve as a proxy for increasing shareholder value orientation. However, takeovers are rarely hostile, as firms found other means to protect themselves (Admati, 2017). Furthermore, since we lack data on share buybacks, interest payments seem a far-fetched proxy. For these reasons we consider dividend payments a much more direct measure of this channel.

[29] Intra-firm exports make up one third of global exports in 2015 (Lakatos and Ohnsorge, 2017).

test directly for the superstar firm hypothesis. According to the superstar firm hypothesis, the increase in concentration led to a decline in the labour share within superstar firms, while the labour share of other firms stagnated, or oven increased. Therefore, it is not clear whether we would expect a positive or negative impact of market concentration in our estimation. However, according to other contribution in line with the bargaining power hypothesis (Azar, et al., 2017; Hutchinson and Persyn, 2012; Kalecki, 1954), an increase in concentration would lead to an increase in the mark-up and consequently (and unambiguously) decrease the labour share within firms. It is the effect on the mark-up that we are controlling for by including concentration into our model.

$\varepsilon_{i,t}$ constitutes a composite error term with time-period and firm-specific components. The former is accounted for by the inclusion of year dummies, while the latter cancels out due to first-differencing.

Technological change, as captured by capital intensity, is likely to be a function of past or current values of the labour share (Acemoglu, 2003; Cassetti, 2003; Bhaduri, 2006; Hein, 2014). Similarly, a lower labour share, i.e. higher profit share, is likely to result in higher dividend payments. Accounting for simultaneity and reverse causality requires the use of instrumental variables. We use the General Method of Moments (GMM) estimator introduced by Arellano and Bond (1991) and developed further by Blundell and Bond (1998) because it provides readily available 'internal' instruments based on lagged values of the explanatory variables. This also solves the problem of correlation between the lagged dependent variable and the error term in dynamic panel models (referred to as Nickell-bias; Nickell, 1981) and eliminates firm-specific but time constant unobservables by differencing the data in difference-GMM and using lagged differenced variables as instruments in system-GMM.

To arrive at our baseline specification we adopt an estimation strategy that starts with the most general specification and the most robust estimator (difference GMM) and work our way towards the most parsimonious model with the most efficient estimator (two-step system GMM with standard errors adjusted for heteroscedasticity and Windmeijer, 2005, small sample error correction), following Kiviet, et al. (2015). We start with the estimation of a fairly unrestricted Autoregressive Distributed Lag (ARDL) model including the contemporaneous and lagged value of all explanatory variables and a lagged dependent variable. This automatically restricts our sample to observations with at least three consecutive values of all variables. To assure that our test statistics are calculated for each firm, we further restrict our sample to firms with at least five consecutive years, as is common in the micro-econometric literature (e.g. Bond et al., 2003).[30] All estimations include year dummies to account for unobservable common shocks and mitigate cross-sectional dependence. We use all available lags as instruments in order to exclude the possibility that our results are driven by a particular choice of instrument lag length. Furthermore, we restrict our instrument set to one instrument column per variable (so-called collapsed instrument set) to limit the overall instrument count and mitigate the danger of instrument proliferation (Roodman, 2009). We start by treating all variables as endogenous. Subsequently, we perform a 'testing down' procedure by dropping variable lags with the lowest

[30] The Arellano-Bond test for autocorrelation in the residuals of second order requires three estimated values per cross-section. Hence, the constraint to five consecutive years is a necessary evil, even though it leads to loss of data. Otherwise, not all cross-sections feed into the tests and the validity of the instruments cannot be assured.

absolute t-statistic, until we are left with at least one measure per variable. Thereafter, we test whether some of the variables can be treated as predetermined or exogenous by including one-by-one more recent lags of the variable as an additional instrument and testing for its validity by applying the incremental Sargan-Hansen test (also referred to as difference-in-Hansen test).[31] This procedure indicates that dividend payments can be treated as predetermined in the case of the United Kingdom, while the other variables are treated as endogenous. For other countries we treat all variables as endogenous. Only then do we move to the system-GMM estimator, which includes additional moment conditions that can be applied to the model estimated in level additional to estimations in differences. More precisely, while the difference-GMM uses lagged level values as instruments for the estimation equation in differences, system-GMM additionally estimates the model in levels, using differenced lags of the variables as instruments. This improves efficiency, especially for estimations with variables that change slowly over time. However, the validity of the instruments used in the level equation relies on the assumption that the correlation between the explanatory variables and the firm-specific constant does not change over time. This is also referred to as the stationarity condition. The incremental Sargan-Hansen tests allows to test for this assumption by testing the validity of the instruments used in the level equation.[32] Only if the incremental Sargan-Hansen test for the level equation is passed, we can rely on the results using the more efficient system-GMM, otherwise we resort to the difference-GMM estimator. Lastly, we provide estimations using the within-estimator for our baseline specification for comparison and as a robustness test.

For our econometric analysis we exclude outliers from our database following usual procedures in the microeconometric literature, and especially previous papers using the Worldscope database.[33]

4.2 Econometric results

We start our econometric analysis with country-specific estimations for the largest EU15 member states (France, Germany, the UK and Sweden) as well as a pool of all EU15 members[34]. Ideally, we would conduct estimations for all member states individually. However, this is not possible due to data availability. The EU15 pool is our preferred alternative for several reasons. First, accounting standards are similar in the EU15 and therefore errors

[31] The GMM estimator relies on the absence of autocorrelation in the residual (except of first order due to over-differencing), as this would render lagged values of the explanatory variables invalid instruments. For this reason, it is important to account for a lagged dependent variable as well as to start the estimations based on a fairly general model that allows for lags of the explanatory variables. Additionally, it is particularly important to test for autocorrelation in the residuals.

[32] Most studies that apply the system-GMM estimator do not report the value of the incremental Sargan-Hansen test for the level equation, claiming the validity of their instruments based on the value of the overall Hansen test. This seems unfortunate, given the strong assumption underlying the validity for the level equation.

[33] More specifically we exclude observations with negative sales and negative or zero capital stock (e.g. also in Autor, et al. 2017; Hartman, et al., 2016). We exclude observations with negative value added as this would create negative labour shares which is not meaningful (this is also suggested by Vincent and Kehring, 2016). We also exclude observations where real sales or capital stock increased by over 200% as these are likely to constitute mergers (e.g. Bond, et al. 2003; Guariglia and Carpenter, 2008). As is common in the literature, we winsorize all variables at the 1st and 99th percentile (e.g. Bond, et al. 2003). Lastly, we only include firms with five consecutive years for all variables for econometric reasons as outlined in Section 4.1.

[34] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.

based on different measurement of items in the financial account are minimised. Second, it is a relatively homogenous group in terms of institutional settings, and therefore the pooling assumption is more likely to be justified. This is particularly important because our data comes from consolidated balance sheets. For example, institutional changes or global shocks that are captured by our time dummies are more likely to have the same effect across firms that operate in the same area. This helps our model to be better specified and can achieve instrument validity by reducing autocorrelation in the error term. Third, the EU15 is the economic zone that dominates our sample and is therefore likely to drive results for larger country pools. After a detailed analysis of the EU15 pool and individual member states we also present estimation results for a pool of advanced and emerging/ developing economies to test our hypotheses for a larger set of countries with different institutional settings.

4.2.1 Estimations for the EU15

Table 6 reports our baseline results for the UK, France, Germany, Sweden and the EU15 pool. The lag-structure is a result of the testing down procedure that is applied to each sample separately. We report estimation results using both system-GMM (the more efficient estimator) and difference-GMM (the more robust estimator).

Table 6: Baseline estimation results EU15

	(1) France	(2) UK	(3) Germany	(4) Sweden	(5) EU15
estimator type	system-GMM				
period	1995-2016				
growth	-0.393**	-0.103	-0.267**	-0.623**	-0.247***
	(0.013)	(0.196)	(0.029)	(0.011)	(0.000)
capital intensity	0.221***	0.014	0.046	0.117	0.081***
	(0.009)	(0.716)	(0.215)	(0.157)	(0.000)
capital intensity(-1)	-0.184***				-0.020**
	(0.001)				(0.019)
financial income		-0.052		-0.024	
		(0.351)		(0.625)	
financial income(-1)	0.153*		0.028		0.005
	(0.086)		(0.792)		(0.878)
dividend payments	0.006	-0.034**		-0.014**	-0.006**
	(0.914)	(0.015)		(0.027)	(0.014)
dividend payments(-1)			-0.027**		
			(0.035)		
interest payments				0.106*	
				(0.074)	
interest payments(-1)	-0.057	-0.030*	0.009		0.020**
	(0.249)	(0.078)	(0.846)		(0.032)
wage share(-1)	0.509***	0.289***	0.182***	0.141***	0.225***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
constant	0.399***	0.503***	0.722***	0.547***	0.550***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
Hansen test (pval)	0.148	0.165	0.307	0.184	0.199
diffHansen (pval)	0.033	0.022	0.422	0.632	0.184
AR1 test (pval)	0.000	0.001	0.000	0.037	0.000
AR2 test (pval)	0.149	0.350	0.670	0.995	0.583
instruments	146	149	146	148	146
number of firms	361	558	381	198	2272
F-test	9.240	8.672	6.242	4.866	15.228
Observations	4596	7771	4720	2135	29024
F-test year dummies	0.774	0.000	0.008	0.866	0.155

Table 6, continued: Baseline estimation results EU15

	(6) France	(7) UK	(8) Germany	(9) Sweden	(10) EU15
estimator type	difference-GMM				
period	1995-2016				
growth	-0.359***	-0.240***	-0.148	-0.652**	-0.251***
	(0.006)	(0.008)	(0.153)	(0.012)	(0.000)
capital intensity	0.403***	0.070**	0.107***	0.123	0.078***
	(0.000)	(0.035)	(0.000)	(0.103)	(0.003)
capital intensity(-1)	-0.129*				-0.015
	(0.050)				(0.106)
financial income		-0.089		-0.003	
		(0.352)		(0.946)	
financial income(-1)	0.120		0.032		0.011
	(0.303)		(0.758)		(0.669)
dividend payments	-0.103*	-0.049***		-0.013	-0.004
	(0.067)	(0.006)		(0.225)	(0.116)
dividend payments(-1)			-0.012		
			(0.592)		
interest payments				0.041	
				(0.515)	
interest payments(-1)	-0.181**	-0.035*	0.050		0.010
	(0.042)	(0.064)	(0.442)		(0.322)
wage share(-1)	0.245***	0.251***	0.157***	0.101***	0.202***
	(0.004)	(0.000)	(0.002)	(0.004)	(0.000)
wage share(-2)	-0.058				
	(0.138)				
year dummies	Yes	Yes	Yes	Yes	Yes
Hansen test (pval)	0.318	0.220	0.386	0.232	0.338
AR1 test (pval)	0.000	0.001	0.000	0.038	0.001
AR2 test (pval)	0.489	0.333	0.835	0.861	0.750
instruments	138	142	139	141	139
number of firms	361	558	381	198	2272
F-test	7.130	7.808	5.785	3.060	17.414
Observations	3845	7162	4274	1913	26455
F-test year dummies	0.180	0.078	0.851	0.995	0.757

Notes: Dependent variable is the firm-level labour share. All estimations conducted for 1995-2016 period. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

We find a negative impact of dividend payments in all countries. The variable is significant at the 5%-level, except for France, where it is significant at the 10%-level only (specification 6). *Dividend payments* increased between 16-5%-points in the countries in our sample. An increase in the dividend payments to capital stock ratio by 10%-points leads to a decrease in the labour share by 1%-point in France and 0.5%-points in the UK. We find a negative impact of interest payments in France and the UK, whereas the effect is insignificant in Germany and positive in Sweden and the EU15 pool. We interpret these findings as evidence for a negative effect of shareholder value orientation on the labour share that works via changes in corporate governance. The joint significance of interest and dividend payments in France and the UK can also be interpreted as evidence for the mark-up channel, whereas findings for the other countries cast doubt on the international validity of this mechanism. Financial income has no statistically significant negative effect in any of our specifications. This suggests that the increase in fall-back options as captured by financial profits did not contribute to a decline in the labour share.

With respect to our control variables, we consistently find a negative impact of *growth*, which confirms the counter-cyclical dynamics of the labour share. *Capital intensity* has a positive sign in Germany, Sweden and the UK, albeit being statistically significant only for the latter country. For France and the EU15 pool it shows alternating signs for the contemporaneous value and the first lag, with an overall positive long-run coefficient. This can be interpreted as evidence for an elasticity of substitution smaller than or equal to one in all countries. Considering our evidence from Figure 3 this suggests that labour share decreased not because of an increase, but rather a decrease in capital intensity.

Besides the estimation results, the table reports a set of statistics that allow to evaluate our model. Tests for autocorrelation of first and second order (AR1 and AR2 test) suggest that our model is dynamically complete, with autocorrelation of first order (due to over-differencing) and no autocorrelation of second order. This is a precondition for using the lagged values of our explanatory variables as instruments. The results of the overall Hansen tests do not reject the hypothesis of instrument validity, and the relatively low values provide evidence that the test is not driven by instrument proliferation. The same qualitative results are obtained for the incremental Sargan-Hansen (*diffHansen*) test on the instruments for the estimation equation in levels for Germany, Sweden and the EU15 pool. The incremental Sargan-Hansen test on the instruments used in the level equation are not passed in the case of France and the UK, which is why the interpretation of estimation results are based on the difference-GMM estimator for these two countries. While the results are very robust across system- and difference-GMM in the case of the UK, dividend payments become insignificant for France when the system-GMM estimator is used.

We present several robustness tests. Estimations in Table 6 might suffer from an omitted variable bias given that we lack direct measures of bargaining power such as union density or strike intensity at the firm level. As a first step, we include union density at the industry level as an additional control variable. Data for union density is based on Visser (2015) and only available at an aggregated industry level and not available for each year. Therefore, we linearly interpolate the series between available years and extrapolate using the growth rate of data available for the next higher level of aggregation. For example, we extrapolate data for individual manufacturing sectors using the growth rate of the total manufacturing union density

or country-level union density when the former series was not available.[35] Nevertheless, sector-level measures of these variables can only serve as proxies, since our firms conduct a large share of their production process outside their country of residence. The variable will be relevant only if the multinational corporations transfer the home country industrial relations culture to their foreign subsidiaries. A second robustness test is conducted by including an industry specific trend into our model. This captures, on the one hand, changes in bargaining power at the sectoral level, as well changes in other sector-level variables such as concentration. It can also capture measures of capital that are not available in our dataset, such as intangible or ICT capital. We chose an industry classification that is equivalent to a 2-digit ISIC4 classification for manufacturing and a 1-digit ISIC4 classification for services, resulting in up to 21 sectors per country. Arguably, this generic trend has advantages over concentration as captured by our data, as the latter excludes non-listed firms and therefore cannot account for changes in concentration between listed and non-listed companies. Table 7 reports the results.

[35] One exception is Germany where industry specific union density data ends in 1997. Therefore, we use union density measured at the national rather than industry level for Germany.

Table 7: Robustness tests – union density and sector-specific trends

	(1) France	(2) France	(3) UK	(4) UK	(5) Germany	(6) Germany
estimator type	system-GMM					
period	1995-2016					
growth	-0.354***	-0.410**	-0.068	-0.132*	-0.318**	-0.289**
	(0.003)	(0.011)	(0.341)	(0.075)	(0.012)	(0.020)
capital intensity	0.107	0.177**	0.002	0.008	0.061*	0.050
	(0.236)	(0.022)	(0.948)	(0.790)	(0.097)	(0.104)
capital intensity(-1)	-0.115*	-0.159***				
	(0.061)	(0.002)				
financial income			-0.044	-0.049		
			(0.490)	(0.396)		
financial income(-1)	0.118*	0.172*			0.084	0.063
	(0.077)	(0.066)			(0.411)	(0.536)
dividend payments	-0.011	-0.037	-0.031**	-0.045***		
	(0.788)	(0.459)	(0.024)	(0.000)		
dividend payments(-1)					-0.039***	-0.032**
					(0.008)	(0.015)
interest payments(-1)	-0.027	-0.068	-0.038**	-0.040***	-0.006	-0.002
	(0.509)	(0.154)	(0.019)	(0.009)	(0.883)	(0.973)
union density(-1)	-0.002		-0.003**		0.005**	
	(0.656)		(0.042)		(0.049)	
wage share(-1)	0.434***	0.456***	0.316***	0.304***	0.184***	0.186***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
constant	0.499***	0.463***	0.569***	0.503***	0.565***	0.724***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes
sector-specific trend	No	Yes	No	Yes	No	Yes
Hansen test (pval)	0.344	0.026	0.416	0.151	0.178	0.392
diffHansen (pval)	0.460	0.003	0.222	0.171	0.242	0.597
AR1 test (pval)	0.000	0.000	0.001	0.001	0.000	0.000
AR2 test (pval)	0.152	0.162	0.330	0.362	0.985	0.773
instruments	132	165	136.000	167.000	132	165
number of firms	354	354	539	539	372	372
F-test	8.191	123.228	9.272	2408.052	6.316	26.323
Observations	4288	4562	7197	7680	4418	4682
F-test year dummies	0.714	0.698	0.161	0.221	0.607	0.035
F-test trend		0.000		0.000		0.000

Table 7, continued: Robustness tests – union density and sector-specific trends

	(7) Sweden	(8) Sweden	(9) EU15	(10) EU15
estimator type	system-GMM			
period	1995-2016			
growth	-0.835***	-0.752***	-0.285***	-0.238***
	(0.000)	(0.002)	(0.000)	(0.000)
capital intensity	0.137**	0.063	0.094***	0.085***
	(0.049)	(0.299)	(0.000)	(0.001)
capital intensity(-1)			-0.026**	-0.026***
			(0.029)	(0.007)
financial income	0.006	-0.016		
	(0.885)	(0.713)		
financial income(-1)			0.012	0.014
			(0.689)	(0.620)
dividend payments	-0.016**	-0.020***	-0.008**	-0.007***
	(0.043)	(0.003)	(0.016)	(0.010)
interest payments	0.059	0.070		
	(0.266)	(0.207)		
interest payments(-1)			0.023**	0.024**
			(0.049)	(0.013)
union density(-1)	-0.004**		-0.000*	
	(0.049)		(0.088)	
wage share(-1)	0.114***	0.138***	0.232***	0.236***
	(0.008)	(0.002)	(0.000)	(0.000)
constant	0.925***	0.616***	0.553***	0.546***
	(0.000)	(0.000)	(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes
sector-specific trend	No	Yes	No	Yes
Hansen test (pval)	0.536	0.554	0.161	0.045
diffHansen (pval)	0.855	0.890	0.102	0.090
AR1 test (pval)	0.051	0.040	0.001	0.001
AR2 test (pval)	0.461	0.320	0.369	0.336
instruments	128	166	132	165
number of firms	185	185	2211	2211
F-test	6.095	75.840	16.735	14.510
Observations	1851	2068	26907	28727
F-test year dummies	0.983	0.601	0.223	0.267
F-test trend		0.000		0.000

Notes: Dependent variable is the firm-level labour share. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is the F-test on all variables and the Wald test on the joint significance of all year dummies.

The effect of dividend payments is robust across all specifications with the exception of France where it turns insignificant. This confirms the negative impact of shareholder value orientation on the labour share for the majority of countries. Interest payments have a robust impact on the labour share in the UK (negative) and the EU15 (positive), whereas the coefficient turns insignificant in France and Sweden. Financial income remains insignificant in the majority of estimations, with the exception of France where it is positive at the 10%-level. This casts further doubt on the hypothesis that an increase in fall-back options due to financial profits had a negative impact on the labour share.

Turning to our control variables, we continue finding a robust negative impact of *growth*, while *capital intensity* is less robust and becomes statistically insignificant in several specifications. The (long-run) coefficient for *capital intensity* remains positive in all countries, suggesting an elasticity of substitution less than one.

Union density is positive and statistically significant in Germany, while it has a negative impact in the UK, Sweden and the EU15 sample.[36] The finding of a negative effect of union density is surprising, even though it is statistically significant at the 10%-level only. A potential reason for the negative effect of union density is that unions managed wage moderation or refrained from aggressive bargaining during the Great Recession in order to save jobs. Indeed, restricting the sample to the years prior to the Great Recession (2008) turns the coefficient for union density statistically insignificant and using the system-GMM estimator leads to positive effects in some cases as we will discuss below in more detail.[37] It would require further country specific estimations to determine which countries drive the negative effect of union density for the whole sample. However, since we have no firm specific measure for bargaining power this is beyond the scope of this research.

A battery of additional robustness tests for each sample is reported in Tables 8 to 11. First, we report estimations including union density and a sector specific trend using the difference-GMM estimator (specifications 1-2 in Tables 8-11). This is particularly relevant for France, where the incremental Sargan-Hansen test is not passed for the specification including sector specific trends only (specification 2, Table 7). The difference-GMM version of specification (2) shows a statistically significant negative effect of interest payments, while the other results are robust. The remaining specifications in Table 7 pass the incremental Sargan-Hansen test on the instruments in level, so that we rely on the results obtained using the more efficient system-GMM estimator as reported in Table 7. However, while results for financialisation variables are largely robust, results for union density show large variation across the two estimators. Specifically, the negative and significant coefficient for union density in the UK and the EU15 pool turns positive, and for the UK statistically significant when the difference-GMM estimator is used. This puts further doubt on the reliability of this variable in a sample of consolidated firm-level data.

[36] The negative effect in Sweden can also be related to the fact that it is part of the Ghent-system, a social security framework which sets union membership as a requirement for the access to unemployment benefits. This is one reason for the relatively high and stable union density in Sweden and may weaken the connection of this measure to bargaining power. Stockhammer (2009) obtains a negative effect of union density for Ghent countries in a macro panel estimation.

[37] Results available upon request.

Table 8: France – robustness tests

	(1) UD	(2) TREND	(3) BASE	(4) BASE	(5) FE	(6) GLOB	(7) GLOB
Period	1995-2016		1995-2007		1995-2016		
growth	-0.189**	-0.255**	-0.315***	-0.446***	-0.271***	-0.358**	-0.226**
	(0.044)	(0.046)	(0.001)	(0.000)	(0.000)	(0.010)	(0.025)
capital intensity	0.282***	0.305***	0.086	0.038	0.206***	0.228***	0.239***
	(0.002)	(0.003)	(0.246)	(0.464)	(0.000)	(0.007)	(0.007)
capital intensity(-1)	-0.112**	-0.142**			-0.136***	-0.089	-0.158*
	(0.036)	(0.013)			(0.000)	(0.127)	(0.068)
financial income(-1)	0.109	0.168*	0.106	0.098	0.030	-0.175	0.057
	(0.169)	(0.071)	(0.341)	(0.286)	(0.577)	(0.418)	(0.583)
dividend payments	-0.058	-0.075	0.042	0.048	-0.056***	-0.108	-0.050
	(0.531)	(0.188)	(0.573)	(0.491)	(0.000)	(0.210)	(0.382)
interest payments(-1)	-0.090	-0.146*	-0.107	-0.074	-0.055	0.011	-0.060
	(0.246)	(0.060)	(0.316)	(0.379)	(0.117)	(0.953)	(0.574)
union density(-1)	0.046						
	(0.129)						
international OPI						-0.017	-0.033*
						(0.146)	(0.052)
wage share(-1)	0.312***	0.328***	0.309***	0.467***	0.351***	0.347**	0.584***
	(0.000)	(0.000)	(0.004)	(0.000)	(0.000)	(0.025)	(0.002)
wage share(-2)					-0.073**		
					(0.039)		
constant				0.461***	0.626***		0.201
				(0.000)	(0.000)		(0.182)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM			sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.556	0.162	0.383	0.196		1.000	1.000
diffHansen (pval)				0.207			0.988
AR1 test (pval)	0.000	0.000	0.007	0.002		0.066	0.050
AR2 test (pval)	0.059	0.066	0.236	0.421		0.067	0.115
instruments	125	158	76	83		156	164
number of firms	354	354	259	259	361	101	101
F-test	7.210	443.200	5.167	7.089	15.601	6.251	8.987
Observations	3876	4147	1903	2181	4260	821	961
F-test year dummies	0.976	0.952	0.010	0.035		0.497	0.426
F-test trend		0.000					

Table 8: France – robustness tests, continued

	(8) HERFIN	(9) HERFIN	(10) CR(4)	(11) CR(4)	(12) LOGS
Period	1995-2016				
growth	-0.283**	-0.389***	-0.256***	-0.359***	-0.284**
	(0.011)	(0.008)	(0.010)	(0.009)	(0.014)
capital intensity	0.325***	0.187***	0.336***	0.169***	0.369***
	(0.000)	(0.002)	(0.000)	(0.004)	(0.000)
capital intensity(-1)	-0.125**	-0.172***	-0.152***	-0.169***	-0.398***
	(0.012)	(0.000)	(0.004)	(0.001)	(0.000)
financial income(-1)	0.151*	0.153*	0.146*	0.156*	0.066
	(0.073)	(0.091)	(0.069)	(0.072)	(0.283)
dividend payments	-0.080	0.000	-0.055	-0.007	-0.080
	(0.198)	(0.997)	(0.379)	(0.866)	(0.102)
interest payments(-1)	-0.138*	-0.063	-0.134*	-0.061	-0.082*
	(0.078)	(0.178)	(0.089)	(0.198)	(0.073)
herfindahl index	0.605*	-0.033			
	(0.065)	(0.830)			
CR(4)			0.578	-0.234*	
			(0.206)	(0.082)	
wage share(-1)	0.318***	0.484***	0.349***	0.479***	0.764***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
wage share(-2)					
constant		0.458***		0.662***	-0.022
		(0.000)		(0.000)	(0.290)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.330	0.119	0.452	0.091	0.152
diffHansen (pval)		0.059		0.024	0.827
AR1 test (pval)	0.000	0.000	0.000	0.000	0.001
AR2 test (pval)	0.045	0.150	0.054	0.153	0.443
instruments	159	167	159	167	146
number of firms	361	361	361	361	361
F-test	7.325	8.899	7.771	8.926	19.366
Observations	4172	4596	4172	4596	4596
F-test year dummies	0.675	0.961	0.815	0.981	0.562

Notes: Dependent variable is the firm-level labour share. Estimation period in second row. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Table 9: The United Kingdom – robustness tests

	(1) UD	(2) TREND	(3) BASE	(4) BASE	(5) FE	(6) GLOB	(7) GLOB
Period	1995-2016		1995-2007		1995-2016		
growth	-0.212**	-0.255***	0.035	0.046	-0.239***	-0.245**	-0.068
	(0.026)	(0.007)	(0.656)	(0.460)	(0.000)	(0.032)	(0.536)
capital intensity	0.050	0.088**	-0.030	-0.047	0.060***	0.017	-0.023
	(0.101)	(0.015)	(0.437)	(0.224)	(0.007)	(0.485)	(0.480)
financial income	-0.026	-0.078	0.192	0.002	0.003	-0.016	-0.034
	(0.762)	(0.381)	(0.266)	(0.961)	(0.899)	(0.829)	(0.680)
dividend payments	-0.045**	-0.050***	-0.040	-0.055**	-0.019**	-0.021	-0.042***
	(0.013)	(0.002)	(0.260)	(0.013)	(0.027)	(0.405)	(0.002)
interest payments(-1)	-0.039**	-0.042**	-0.068*	-0.059	-0.031**	-0.042	-0.018
	(0.013)	(0.015)	(0.094)	(0.141)	(0.021)	(0.174)	(0.361)
union density(-1)	0.004**						
	(0.034)						
international OPI						0.003	-0.012
						(0.633)	(0.219)
wage share(-1)	0.270***	0.233***	0.266***	0.264***	0.270***	0.243***	0.243***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant				0.588***	0.500***		0.565***
				(0.000)	(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM			sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.349	0.397	0.112	0.245		0.242	0.610
diffHansen (pval)				0.509			0.124
AR1 test (pval)	0.002	0.001	0.016	0.017		0.000	0.000
AR2 test (pval)	0.312	0.301	0.335	0.340		0.109	0.062
instruments	129	160	79	86		162	170
number of firms	539	539	402	402	558	369	369
F-test	7.396	17.104	8.050	9.017	11.725	4.771	6.262
Observations	6614	7093	3445	3858	7771	3622	4189
F-test year dummies	0.034	0.758	0.795	0.129		0.314	0.000
F-test trend		0.000					

Table 9: The United Kingdom – robustness tests, continued

	(8) HERFIN	(9) HERFIN	(10) CR(4)	(11) CR(4)	(12) LOGS
Period	1995-2016				
growth	-0.244***	-0.118*	-0.229**	-0.102	-0.235***
	(0.005)	(0.078)	(0.014)	(0.196)	(0.000)
capital intensity	0.073**	0.011	0.082**	0.012	-0.010
	(0.034)	(0.737)	(0.020)	(0.701)	(0.586)
financial income	-0.093	-0.063	-0.086	-0.058	-0.081*
	(0.332)	(0.326)	(0.338)	(0.369)	(0.095)
dividend payments	-0.051***	-0.033**	-0.050***	-0.033**	-0.048***
	(0.004)	(0.023)	(0.004)	(0.018)	(0.007)
interest payments(-1)	-0.031*	-0.025	-0.033*	-0.026	-0.011
	(0.081)	(0.112)	(0.060)	(0.109)	(0.445)
herfindahl index	0.069	0.197			
	(0.821)	(0.518)			
CR(4)			0.174	0.036	
			(0.594)	(0.739)	
wage share(-1)	0.254***	0.314***	0.254***	0.320***	0.488***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.451***		0.459***	-0.182***
		(0.000)		(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.218	0.168	0.250	0.206	0.442
diffHansen (pval)		0.004		0.004	0.317
AR1 test (pval)	0.001	0.001	0.001	0.001	0.000
AR2 test (pval)	0.341	0.380	0.353	0.388	0.550
instruments	162	170	162	170	149
number of firms	558	558	558	558	558
F-test	7.084	8.852	7.254	8.547	18.470
Observations	7162	7771	7162	7771	7771
F-test year dummies	0.210	0.007	0.133	0.019	0.160

Notes: Dependent variable is the firm-level labour share. Estimation period in second row. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Table 10: Germany – robustness tests

	(1) UD	(2) TREND	(3) BASE	(4) BASE	(5) FE	(6) GLOB	(7) GLOB
period	1995-2016		1995-2007		1995-2016		
growth	-0.256*	-0.166	-0.110	-0.107	-0.304***	-0.079	-0.053
	(0.062)	(0.131)	(0.411)	(0.452)	(0.000)	(0.498)	(0.745)
capital intensity	0.094***	0.104***	0.109***	0.048	0.134***	0.045	0.029
	(0.000)	(0.000)	(0.007)	(0.291)	(0.000)	(0.192)	(0.275)
financial income(-1)	0.240**	0.046	0.534	0.233	0.100	0.125	-0.034
	(0.025)	(0.696)	(0.118)	(0.344)	(0.134)	(0.389)	(0.668)
dividend payments(-1)	-0.035	-0.013	-0.042	-0.080**	-0.009	0.038	-0.070*
	(0.108)	(0.584)	(0.308)	(0.039)	(0.180)	(0.548)	(0.064)
interest payments(-1)	0.069	0.065	0.050	0.254	-0.045	0.197*	0.161
	(0.475)	(0.328)	(0.814)	(0.269)	(0.256)	(0.091)	(0.490)
union density(-1)	0.003						
	(0.482)						
international OPI(-1)						0.007***	0.007***
						(0.001)	(0.001)
wage share(-1)	0.162***	0.176***	0.163**	0.189**	0.198***	0.233***	0.336***
	(0.001)	(0.000)	(0.025)	(0.025)	(0.000)	(0.000)	(0.000)
constant				0.695***	0.644***		0.492***
				(0.000)	(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM			sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.105	0.496	0.151	0.165		1.000	1.000
diffHansen (pval)				0.369			0.988
AR1 test (pval)	0.000	0.000	0.004	0.004		0.021	0.019
AR2 test (pval)	0.920	0.991	0.756	0.991		0.730	0.673
instruments	125	158	76	83		153	161
number of firms	372	372	270	270	381	93	93
F-test	6.564	4.835	7.935	7.447	15.364	5.891	7.834
Observations	3987	4246	1925	2213	4720	711	849
F-test year dummies	0.610	0.156	0.000	0.001		0.379	0.227
F-test trend		0.654					

Table 10: Germany – robustness tests, continued

	(8) HERFIN	(9) HERFIN	(10) CR(4)	(11) CR(4)	(12) LOGS
period	1995-2016				
growth	-0.142	-0.274**	-0.134	-0.276***	-0.466***
	(0.181)	(0.018)	(0.204)	(0.009)	(0.000)
capital intensity	0.099***	0.038	0.104***	0.036	-0.018
	(0.000)	(0.274)	(0.000)	(0.288)	(0.571)
financial income(-1)	0.076	0.057	0.049	0.030	-0.003
	(0.479)	(0.628)	(0.693)	(0.799)	(0.957)
dividend payments(-1)	-0.010	-0.025**	-0.016	-0.026**	-0.017
	(0.630)	(0.044)	(0.422)	(0.038)	(0.259)
interest payments(-1)	0.050	-0.003	0.043	0.004	-0.050
	(0.412)	(0.929)	(0.519)	(0.932)	(0.213)
herfindahl index	-0.288	0.008			
	(0.338)	(0.982)			
CR(4)			0.082	0.110	
			(0.761)	(0.520)	
wage share(-1)	0.156***	0.207***	0.155***	0.226***	0.592***
	(0.002)	(0.000)	(0.003)	(0.000)	(0.000)
constant		0.710***		0.611***	-0.019
		(0.000)		(0.000)	(0.317)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.401	0.380	0.590	0.452	0.673
diffHansen (pval)		0.309		0.314	0.786
AR1 test (pval)	0.000	0.000	0.000	0.000	0.000
AR2 test (pval)	0.826	0.754	0.809	0.826	0.777
instruments	159	167	159	167	146
number of firms	381	381	381	381	381
F-test	5.838	6.323	5.046	7.023	15.376
Observations	4274	4720	4274	4720	4720
F-test year dummies	0.405	0.391	0.989	0.002	0.007

Notes: Dependent variable is the firm-level labour share. Estimation period in second row. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Table 11: EU15 – robustness tests

	(1) UD	(2) TREND	(3) BASE	(4) BASE	(5) FE	(6) GLOB	(7) GLOB
Period	1995-2016		1995-2007		1995-2016		
growth	-0.268***	-0.264***	0.105	-0.008	-0.321***	-0.319***	-0.328***
	(0.000)	(0.000)	(0.270)	(0.914)	(0.000)	(0.001)	(0.005)
capital intensity	0.084***	0.070***	0.116***	0.076**	0.102***	0.058**	0.047**
	(0.005)	(0.006)	(0.001)	(0.023)	(0.000)	(0.011)	(0.040)
capital intensity(-1)	-0.019	-0.013	-0.054***	-0.037**	-0.033***	-0.006	-0.003
	(0.119)	(0.135)	(0.003)	(0.043)	(0.000)	(0.574)	(0.794)
financial income(-1)	0.012	0.012	0.272**	0.044	0.012	0.035	-0.002
	(0.650)	(0.663)	(0.016)	(0.478)	(0.566)	(0.216)	(0.926)
dividend payments	-0.005*	-0.004*	-0.000	-0.003	-0.002	-0.005	-0.013
	(0.083)	(0.099)	(0.975)	(0.204)	(0.354)	(0.700)	(0.350)
interest payments(-1)	0.008	0.009	0.001	0.009	-0.008	-0.051	-0.020
	(0.463)	(0.344)	(0.880)	(0.396)	(0.398)	(0.224)	(0.162)
union density(-1)	0.002						
	(0.299)						
international OPI						-0.011	-0.015
						(0.283)	(0.177)
wage share(-1)	0.196***	0.204***	0.272***	0.292***	0.217***	0.101	0.096
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.298)	(0.272)
constant				0.503***	0.581***		0.619***
				(0.000)	(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM			sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.376	0.232	0.740	0.046		0.605	0.255
diffHansen (pval)				0.001			0.043
AR1 test (pval)	0.001	0.001	0.000	0.000		0.008	0.011
AR2 test (pval)	0.613	0.509	0.792	0.874		0.166	0.178
instruments	125	158	76	83		159	167
number of firms	2211	2211	1552	1552	2272	776	776
F-test	18.564	12.062	16.218	18.079	28.687	4.877	5.891
Observations	24430	26228	12042	13672	29024	6801	7943
F-test year dummies	0.343	0.436	0.973	0.597		0.844	0.044
F-test trend		0.004					

Table 11: EU15 – robustness tests, continued

	(8) HERFIN	(9) HERFIN	(10) CR(4)	(11) CR(4)	(12) LOGS
Period	1995-2016				
growth	-0.213***	-0.194***	-0.256***	-0.232***	-0.262***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
capital intensity	0.081***	0.080***	0.081***	0.096***	0.234***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
capital intensity(-1)	-0.016*	-0.021**	-0.014	-0.025**	-0.208***
	(0.076)	(0.032)	(0.121)	(0.017)	(0.000)
financial income(-1)	0.006	-0.001	0.007	-0.000	-0.048
	(0.808)	(0.962)	(0.801)	(0.991)	(0.134)
dividend payments	-0.004	-0.006**	-0.004	-0.007**	-0.007*
	(0.119)	(0.013)	(0.144)	(0.019)	(0.064)
interest payments(-1)	0.009	0.019**	0.009	0.022**	0.001
	(0.333)	(0.032)	(0.396)	(0.036)	(0.930)
herfindahl index	-0.027	0.077			
	(0.880)	(0.734)			
CR(4)			0.102	0.783***	
			(0.640)	(0.000)	
wage share(-1)	0.195***	0.225***	0.192***	0.227***	0.585***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.548***		0.163	-0.092***
		(0.000)		(0.102)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.339	0.027	0.151	0.015	0.012
diffHansen (pval)		0.001		0.003	0.001
AR1 test (pval)	0.001	0.001	0.001	0.000	0.000
AR2 test (pval)	0.804	0.562	0.851	0.555	0.009
instruments	159	167	159	167	146
number of firms	2272	2272	2272	2272	2272
F-test	17.645	15.095	17.737	17.721	53.323
Observations	26455	29024	26455	29024	29024
F-test year dummies	0.430	0.153	0.878	0.548	0.244

Notes: Dependent variable is the firm-level labour share. Estimation period in second row. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Next, we restrict our sample to the years prior to the Great Recession (specifications 3-4 in Tables 8-11). We pass the incremental Sargan-Hansen test for all countries except the EU15 pool, where we have to rely on the difference-GMM specification. The coefficient for dividend payments remains negative in all countries except France, although it turns insignificant in the EU15 sample. In France, it switches the sign while being, however, statistically insignificant.

Our next robustness test estimates our baseline specifications (Table 6) using the within-estimator (specification 5, Tables 8-11). Our baseline results are generally confirmed, with negative coefficients for dividend payments, which are, however, statistically significant only for France and Germany. Yet, we consider the within-estimator unreliable due to simultaneity bias for our explanatory variables, and the dynamic panel bias (Nickell bias) due to the inclusion of a lagged dependent variable.

The next robustness tests consider different model specifications. First, we control for measures of globalisation by including international operating income as a ratio to total operating income into the regression. This variable is closely related to a measure of FDI (specifications 6-7 in Tables 8-11). However, data availability is limited, reducing our total number of firms by up to two thirds of the initial sample, and making comparison to our baseline specification difficult. Results indicate a negative impact of international operating income in France and insignificant coefficients in the UK and the EU15, while the effect is positive in Germany. Dividend payments turn insignificant in France and the EU15, while remaining negative in the UK and Germany. While this casts further doubt on the robustness of the effect of financialisation in France, the other results seem robust: the coefficient for international operating income is insignificant for the UK and the EU15, which suggest that it can be excluded from the model, thereby bringing us back to the baseline estimation in Table 6. The effect of international operating income is statistically significant only in Germany, and the effect of dividend payments remains negative and statistically significant. Note that the Hansen tests are inflated in these specifications due to the large number of instruments in comparison with the cross sections, which results in p-values close to one.

Next, we control for sales concentration (specifications 8-11 in Tables 8-11). We consider two measures, the Herfindahl-Hirschman index which captures overall concentration and the sales share of the largest four firms (CR4), both measured at the ISIC 2-digit level and calculated based on Worldscope data. As outlined in Section 3, this variable captures international market concentration among publicly listed firms. Our results confirm the intuition from our descriptive statistics, suggesting that concentration is not a main driver of the decline in the labour share in Europe. Both variables are rarely significant. The only exceptions are estimations for the EU15 sample using the CR4 measure. However, it has a positive coefficient, and renders the Hansen tests insignificant –potentially a sign of misspecification, which casts doubt on the reliability of the results. The negative effect of dividend payments remains robust to the inclusion of concentration in all countries.

The last robustness test (specification 12 in Tables 8-11) controls for a different functional form. The log-linearization of a constant elasticities of substitution production function would suggest a relation between log *capital intensity* and the log labour share rather than their levels. Consequently, we re-estimate our baseline specification, taking the natural logarithm of the labour share and *capital intensity*. The other variables are left in levels, as they constitute shift factors between the labour share and the capital-output ratio (Bentolila and Saint-Paul 2003;

Bassanini and Manfredi, 2014). Results show neither changes in the sign nor the statistical significance of *capital intensity* in all countries, and thereby confirm our finding of an elasticity of substitution smaller than or equal to one. Dividend payments remain statistically significant for the UK and the EU15 in this specification, while interest payments but not dividend payments remain significant in France. Dividend payments turn borderline insignificant for Germany and Sweden, while remaining negative. However, we prefer the baseline specification where all our variables are taken in ratios, as taking logs suggest misspecification for the EU15 pool.

Summary of results for EU 15

Summing up, our results indicate a negative impact of dividend payments on the labour share in all samples. The effect is particularly robust in the UK, Germany and the EU15 pool, while there is much weaker evidence for France. We also find some evidence for Sweden, although the results can only be seen as indicative due to the relatively small sample size. This finding is in line with the shareholder value channel that posits that increased shareholder value orientation of managers had negative consequences for labour, potentially due to wage suppression. This confirms previous findings from macro-panel analyses that found a negative impact of net financial payments (Kohler, et al., 2018) and net dividend payments (Dünhaupt, 2016). This paper is the first study to confirm this effect at the firm level and demonstrate that it holds across countries with different institutional settings.

There is evidence for a negative impact of interest payments in France and the UK, while the effect is insignificant or positive in other countries and the EU15 pool. The negative finding for France confirms previous findings by Alvarez (2015). However, the overall lack of robustness casts some doubt on the mark-up channel which argues that increasing financial overhead costs resulted in higher mark-ups and a decline in the labour share. Several macro-panel studies also found a positive impact of interest payments on the wage share, although this has generally not been interpreted as evidence against the mark-up channel (Jayadev, 2007; Stockhammer, 2009; Dünhaupt, 2016). If interest payments are a result of borrowing for investment in fixed capital rather than financial assets or share buybacks, they could be associated with an expansion of production, and have a positive impact on the labour share. It would be desirable to complement estimations with a measure of share buybacks to control for this effect. However, data availability does not permit to do so. In any case, the finding that the effect differs considerably across countries suggest caution when interpreting results based on country pools, like our EU15 pool or as has been done in previous studies.

We cannot confirm the 'fall-back options' hypothesis that posits a negative relation between financial income and the labour share. Our measure of financial income is largely insignificant and sometimes shows a positive, albeit not robust and significant, sign for France. This contradicts previous findings at the firm level for France (Alvarez, 2015) and at the sector-level for the US (Lin and Tomaskovic-Devey, 2013). Furthermore, it is surprising given that international measures of financial fall-back options of capital, such as the sum of international assets and liabilities or an institutional index of financial openness, have been found to be strong predictors of the labour share in macro panel studies (IMF, 2017; Stockhammer, 2009, 2017). One possible explanation is that *de-jure* financial deregulation is more important than

de-facto financial income at the firm level. This would be in line with political economy theories that argue that the threat of relocation of production, which gains credibility through deregulation of capital mobility, has a stronger distributional impact than the relocation itself (Burke and Epstein, 2002). The major institutional changes setting the path for financial globalisation are concluded by the mid-1990s, which could be a reason for the lack of significance in our sample period. Furthermore, the effect might be driven by non-listed rather than listed companies that were already integrated in financial markets much earlier than non-listed firms. This implies that the increase in fall-back options of firms loses its impact in the medium-run. Indeed, Kohler, et al. (2018) estimate an error-correction model for a sample of 14 OECD countries with data going back to 1990 and find that an institutional index for financial openness, which they use as a proxy for increasing fall-back options of capital, exhibits short-run but no long-run effects on the labour share. Overall, taking our results by face value suggests that the ability to generate profits through financial activities does not impact on the labour share. Furthermore, we find a positive, but not robust effect of financial income in France. This would be in line with the argument that increased income of the firm increases the likelihood of employers becoming more likely to accommodate bargaining outcomes that are more favourable for labour, independent of the source of income.

In terms of our control variables, we find a robust negative impact of effective demand as captured by *growth*. This is in line with the evidence from macro data that profits decline faster during economic downturns than wages. More economically interesting is the positive or insignificant impact of *capital intensity*. These findings suggest an elasticity of substitution smaller than or equal to one for all countries. Interestingly, in combination with the declining *capital intensity* observed in the majority of countries in our sample, this implies that a lack, rather than a surge in capital deepening contributed to a decline in the labour share. In general, it casts doubt on the hypothesis of capital augmenting technological change as an explanation for the decline in the labour share. While data availability does not allow to account for ICT capital or intangible assets, our results are robust to the inclusion of sector specific trends that can partly account for changes in capital composition or technological progress. We were not able to confirm a negative impact of globalisation or concentration on the labour share. However, arguably, our test of these hypotheses was affected by a lack of data. Measures of globalisation were only available for a small share of our sample and cannot capture intra-company trade or offshoring. Our variables is closest to a measure of FDI, which produced mixed results in previous studies, and for which the effect depends strongly on whether it has a market- or cost-seeking character (Onaran, 2012). Therefore, our finding of a largely insignificant effect of globalisation must be interpreted with caution. Similar considerations apply to our test of the effect of concentration. Our measure captures concentration among publicly listed firms in international rather than domestic markets. Using this measure, we find no significant effect of changes in concentration on the labour share, while variables accounting for financialisation remain robust. This suggest that changes in market concentration were not behind the increase in the mark-up and changes in the labour share. Similarly, the general trend of declining concentration in Europe and the lack of correlation between the labour share and different concentration measures at the industry level suggest no empirical evidence for the superstar firm hypothesis in the EU15, as outlined in Section 3.

4.2.2 Estimations for the pool of advanced economies

Our finding of a negative impact of shareholder value orientation in Europe suggest that we should test whether the effect holds for a wider set of institutionally more divers countries. Country-specific estimations would be the preferred option, which is, however, not feasible due to insufficient data for individual countries. Consequently, we continue by estimating our model with data for a pool of advanced economies.[38] Table 12 reports the results. The lag-structure is a result of the testing down procedure described in Section 4.1 and we report estimation results using both system-GMM (the more efficient estimator) and difference-GMM (the more robust estimator).

[38] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

Table 12: Estimation results for all advanced economies

	(1)	(2)	(3)	(4)	(5)	(6)
Period	1995-2016					
growth	-0.204***	-0.258***	-0.219***	-0.249***	-0.206***	-0.222***
	(0.010)	(0.001)	(0.003)	(0.000)	(0.009)	(0.002)
capital intensity	0.096***	0.097***	0.078**	0.103***	0.093***	0.096***
	(0.001)	(0.000)	(0.015)	(0.000)	(0.002)	(0.000)
capital intensity(-1)	-0.021**	-0.027***	-0.017	-0.026**	-0.020**	-0.030***
	(0.027)	(0.004)	(0.104)	(0.015)	(0.033)	(0.001)
financial income(-1)	0.025	0.021	0.028	0.029	0.026	0.026
	(0.377)	(0.487)	(0.364)	(0.354)	(0.364)	(0.357)
dividend payments	-0.008	-0.008**	-0.008	-0.009**	-0.007*	-0.007**
	(0.108)	(0.022)	(0.128)	(0.025)	(0.098)	(0.025)
interest payments(-1)	0.025	0.025*	0.020	0.029*	0.025	0.029**
	(0.192)	(0.060)	(0.259)	(0.052)	(0.177)	(0.039)
union density(-1)			0.001	-0.000*		
			(0.424)	(0.063)		
wage share(-1)	0.200***	0.218***	0.187***	0.217***	0.197***	0.224***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.534***		0.542***		0.540***
		(0.000)		(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes
sector-specific trend	No	No	No	No	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	diff-GMM	sys-GMM
Hansen test (pval)	0.094	0.037	0.088	0.064	0.064	0.010
diffHansen (pval)		0.183		0.063		0.043
AR1 test (pval)	0.000	0.000	0.000	0.000	0.000	0.000
AR2 test (pval)	0.485	0.384	0.676	0.412	0.421	0.280
instruments	139	146	125	132	158	165
number of firms	2855	2855	2653	2653	2653	2653
F-test	20.241	18.279	19.368	18.794	14.438	15.496
Observations	31442	34652	28278	31233	30709	33700
F-test year dummies	0.740	0.744	0.315	0.379	0.227	0.170
F-test trend					0.007	0.000

Notes: Dependent variable is the firm-level labour share. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Dividend payments have a negative impact on the labour share in all specifications. The variable is statistically significant in four out of six specifications, and borderline insignificant (with p-values 0.11 and 0.13) in the other two. Interest payments, however, have a positive effect which is statistically significant in three specifications. The effect of financial income is never statistically different from zero. Turning to our control variables, we find a negative impact of *growth*, which confirms the counter-cyclical dynamics of the labour share. *Capital intensity* shows alternating signs for the contemporaneous value and the first lag, with an overall positive long-run coefficient in all countries. However, test statistics suggest our model might be misspecified. Specifically, the Hansen test of overidentifying restrictions rejects the null-hypothesis of instrument validity in three specifications and shows value just marginally under 0.1 in the others. In other words, results in Table 12 are not reliable because they might suffer from an endogeneity bias.

Additional robustness tests: advanced economies

Several robustness tests are reported in Table A1 in the appendix. Specifications (1) and (2) report baseline results for a sub-sample ending in 2007. The Great Recession is characterised by large drops in output and productivity and only a slow recovery, which could constitute an outlier with respect to the long-run relations of the variables of interest. Therefore, it is important to control for the time consistency of our parameters of interest before and after 2007. We find that dividend payments continue having a negative impact on the labour share, although the coefficient turns insignificant. The coefficient for interest payments is still insignificant, while financial income has a positive impact in specification (1) using difference-GMM (the (incremental) Hansen test for the system-GMM specification 2 is not passed rendering these results unreliable). Next, in specification (3), we estimate our model using the within-estimator, i.e. not controlling for endogeneity. Results are similar to the baseline estimation using difference-GMM, with mainly capital intensity and growth being significant. Specifications (4-9) control additionally for globalisation and concentration in our model. Globalisation shows the expected negative sign, while being statistically insignificant. Our two measures of concentration, the Herfindahl and CR(4) index are both statistically insignificant when the difference-GMM estimator is used, and results for the Hansen test suggest that estimations using the system-GMM estimator are unreliable.[39] Lastly, we check the robustness of our estimations to differences in the functional form by estimating our baseline specification, taking the natural logarithm of the labour share and *capital intensity*. Results show a negative effect of dividend payments, while the coefficient for interest payments and financial income turns negative but remains statistically insignificant. However, the value of the overall Hansen test suggests that results are unreliable.

Summing up, while we find some evidence for a negative impact of financialisation on the labour share, our results suffer from a lack of robustness across specifications, and test statistics indicate concern about potential misspecification and instrument validity. One potential

[39] Arguably, concentration measures for such a diverse sample are very imprecise since they rely on the assumption that firm that are in the same sector also compete in the same market. While this is quite likely for a relatively closed trading area like the EU15, it is a much stronger assumption in a sample that includes the U.S., Canada and Japan.

explanation is that we pool countries with very different institutional settings. Country or sector specific trends within a country that are not accounted for by our variables can induce autocorrelation in the residuals and render our instruments invalid. For this reason, we prefer estimation results based on the EU15 sample as well as country-specific estimations for its largest member states individually.

4.2.3 Estimations for the emerging/ developing economies pool

Finally, we conduct estimations for a pool of emerging and developing economies.[40] Again, country-specific estimations are not feasible due to insufficient data for individual countries. Results are reported in Table 13.

[40] Argentina, Bangladesh, Brazil, Chile, China, Colombia, Egypt, India, Republic of Korea, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Saudi Arabia, Singapore, Vietnam, South Africa, Sri Lanka, Thailand, Turkey.

Table 13: Estimation results for emerging/ developing economies

	(1)	(2)	(3)	(4)	(5)	(6)
Period	1995-2016					
growth	-0.130	-0.473***	-0.091	-0.314***	-0.120	-0.375***
	(0.176)	(0.000)	(0.387)	(0.002)	(0.220)	(0.000)
capital intensity	0.064***	0.036***	0.068***	0.056***	0.077***	0.054***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
capital intensity(-1)	-0.021***	-0.013***	-0.022***	-0.020***	-0.022***	-0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
financial income(-1)	-0.065***	-0.063**	0.023	0.013	-0.028	-0.021
	(0.007)	(0.038)	(0.644)	(0.744)	(0.454)	(0.522)
dividend payments	-0.025**	-0.009*	0.024	-0.005	-0.014*	-0.004
	(0.013)	(0.054)	(0.667)	(0.711)	(0.094)	(0.434)
interest payments(-1)	0.008	0.012	-0.012	-0.012	-0.007	0.005
	(0.406)	(0.184)	(0.847)	(0.769)	(0.666)	(0.673)
union density(-1)			0.000	-0.002***		
			(0.733)	(0.000)		
wage share(-1)	0.271***	0.293***	0.262***	0.283***	0.246***	0.293***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.258***		0.337***		0.194***
		(0.000)		(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes	Yes
sector-specific trend	No	No	No	No	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	diff-GMM	sys-GMM
Hansen test (pval)	0.726	0.019	0.261	0.032	0.855	0.185
diffHansen (pval)		0.000		0.045		0.000
AR1 test (pval)	0.000	0.000	0.000	0.000	0.000	0.000
AR2 test (pval)	0.635	0.102	0.995	0.547	0.566	0.083
instruments	139	146	125	132	158	165
number of firms	4911	4911	3053	3053	3053	3053
F-test	28.355	24.391	16.510	22.683	14.590	22.087
Observations	34721	40061	19455	22679	24528	27848
F-test year dummies	0.000	0.000	0.562	0.344	0.158	0.094
F-test trend					0.171	0.000

Notes: Dependent variable is the firm-level labour share. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Results for Table 13 confirm a negative impact of shareholder value orientation, captured by dividend payments for emerging/ developing economies. Dividend payments show the expected negative sign in all specifications except specification (3) where the coefficient is positive but insignificant. The variable is statistically significant in all specification using the difference-GMM estimator, which is our preferred estimator for this sample since the incremental Sargan-Hansen test on the instruments in the level equation is never passed, which suggests that estimations using system-GMM are not reliable. Furthermore, in specification (3) union density[41] is insignificant, suggesting that it should be excluded, which would bring us back to the baselines specification (1) where dividend payments have a statistically significant negative impact. Overall, this confirms the relevance of shareholder value maximisation in explaining the decline in the labour share globally. While institutions differ significantly across countries, our results can be interpreted as evidence for changes in corporate governance that favour shareholders at the expense of workers globally. Interest payments are never statistically significant, and results show alternating signs across specifications. This casts further doubt on the mark-up channel. Interestingly, financial income has a negative impact on the labour share in emerging/ developing economies in most specifications. This is in contrast to estimations for advanced economies and suggests that increasing fall-back options for capital changed relative bargaining power and contributed to a decline in the labour share. One potential reason why this variable is significant for the emerging/ developing economies pool only, is that a large share of these countries only recently deregulated capital flows. It is plausible that the bargaining power effect of increased financial fall-back options is most effective shortly after deregulation and wears off in the long-run.
Turning to our control variables, we confirm an overall positive long-run coefficient for *capital intensity*, suggesting that production is characterised by an elasticity of substitution smaller than one. This is in-line with our findings for advanced economies. The effect of demand, captured by *growth* is negative confirming our previous findings.

Additional robustness test: emerging and developing economies
Table A2 reports our robustness test for the pool of emerging/ developing economies. Specification (1) and (2) are based on a reduced sample ending in 2007. Interestingly, this changes our results substantially, with dividend payments turning statistically insignificant, while interest payments have a statistically significant negative impact on the labour share. Results for our control variables are robust and qualitatively in line with our baseline specification (Table 13).
Specification (3) in Table A2 applies the within estimator. It confirms our previous results with respect to a negative impact of dividend payments, while interest payments have a statistically

[41] Union density at the sector level is not available for emerging/ developing economies; hence we use union density at the country level.

significant positive impact which is surprising and not confirmed by other specifications, casting doubt on the reliability of this result.
Specifications (4-9) include our measures of globalisation and concentration. Results from our baseline specification are largely confirmed for dividend payment and financial income as both variable show a negative, albeit largely statistically insignificant effect. However, measures of globalisation and concentration are also statistically insignificant, suggesting that nothing is gained by including them into the model and bringing us back the baseline specification in Table 13.
Lastly, specification 10 in Table A2 re-estimates our baseline specification using the logarithm of the labour share and capital intensity. Results confirm a negative impact of financial income on the labour share, although the low value of the Hansen tests cast doubt on the reliability of the results and confirms that our baseline estimation without logs is preferable.

Summing up, we found evidence for a negative impact of dividend payments in emerging/ developing economies. Interestingly, our results in Table 13 also suggest a negative impact of financial income on the labour share. This implies that financialisation is a global phenomenon which impacts different country groups differently. Specifically, while there is evidence for a negative impact of increased shareholder value orientation worldwide, the effect of increasing fall-back options of capital as captured by non-operating financial profits is particularly relevant in emerging/ developing economies. One potential reason is that emerging economies only recently became integrated in financial markets. This would imply that the impact of increasing fall-back options on the labour share is only effective shortly after countries open up to capital flows. It would also explain why we don't find a significant effect for advanced economies. Furthermore, it is consistent with the finding of a short-run effect of financial fall-back options in Kohler, et al. (2018), who use data for OECD countries that goes back to 1990, i.e. including several years when the deregulation of capital flows was taking place. Nevertheless, in general results for emerging/ developing economies are less robust than for the EU15 countries as indicated by the robustness tests in Table A2. Overall, there is indication that results strongly depend on the institutional setting. Therefore, results based on country pools with very different institutions can only produce indicative results and require a more detailed analysis based on smaller sub-pools. Unfortunately, country-specific analysis for emerging/ developing economies is not possible due to the relatively small number of publicly listed firms available for each country.

5. Conclusion

The decline in the labour share coincided with the permeation of economic processes by financial motives and activities. While there is a recent surge in the literature focusing on the

decline in the labour share, financialisation has not played a role in most studies. We contribute to the existing literature by analysing the effect of financialisation on the labour share of publicly listed firms in advanced and emerging economies and with a specific focus on the EU15, while also controlling for the effect of technological change and concentration. We investigate the effect of financialisation on the labour share via three channels: 1) increased shareholder value orientation and consequent wage suppression, 2) increased financial overhead costs and consequent increases in the mark-up, 3) increased fall-back options for capital due to a decoupling of profit generation from the core business. Previous studies based on country-level data used net financial payments to argue that financialisation had a negative impact on the labour share due to increasing financial overhead costs and subsequent increases in the mark-up (Alvarez, 2015; Dünhaupt, 2016). In contrast, we argue that dividend payments, interest payments and financial income capture different channels and thereby might have different effects. Our findings confirm this hypothesis: We find evidence of a negative effect of shareholder value orientation (captured by dividend payments) on the labour share in all countries, while the effect of increasing financial overhead costs (relying on a joint significance of dividend and interest payments) is mainly relevant for France and the UK. This suggests that changes in the balance of power and bargaining relations within firms rather than changes in the mark-up lie at the heart of the decline in the labour share. Furthermore, we find evidence for a negative impact of increased fall-back options of capital, as captured by financial income from dividends and interests. However, this effect is only statistically significant in emerging/ developing economies and insignificant in advanced countries. This contradicts previous findings at the firm level for France (Alvarez, 2015), at the sector-level for the U.S. (Lin and Tomaskovic-Devey, 2013), and research using country-level data for advanced countries (Stockhammer, 2009, 2017). One potential reason for this finding is that increased fall-back options have a negative impact only shortly after a country opens up to capital flows. Since the majority of publicly listed firms in advance economies were already integrated in global financial markets by 1995, this channel is only effective for emerging and developing economies, where firms only relatively recently started speculating on global financial markets. Previous research (Bentolila and Saint-Paul, 2003; Bassanini and Manfredi, 2014; Karabarbounis and Neiman, 2014) highlighted the role of technological change for the decline in the labour share. This argument assumes an elasticity of substitution between capital and labour that is larger than one. In contrast, we consistently find evidence for an elasticity of substitution smaller than one, casting doubt on this hypothesis. This is in line with previous research that specifically estimates this elasticity (Chirinko and Mallick, 2014). The majority of studies using firm-level data to investigate the determinants of the labour share focus on the superstar firm hypothesis (Autor, et al., 2017). The gist of the argument is that wages did not stay behind productivity in the majority of firms, but only in a small share of very productive companies. In contrast, our results suggest that wages stayed behind productivity in very financialised firms, as revenues are increasingly channelled to shareholders rather than shared

with the workforce in line with their productivity. This is substantiated by our finding that concentration declined among publicly listed European firms, which casts doubt on the superstar firm hypothesis.

Our findings have important policy implications. Appropriately designed taxation and corporate regulation can create incentives to decrease financial payments. This would not only encourage firms to invest in productive capacity rather than maximising shareholder value, but also improve income distribution. This could be achieved through higher taxation of dividend payments and capital gains, and by prohibiting share buybacks. Decoupling executives' remuneration from share prices and including representatives of employees and the wider public on company boards would further support this process (Lazonick 2014).

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Appendix

Table A1: Advanced economies – robustness tests

	(1) BASE	(2) BASE	(3) FE	(4) GLOB	(5) GLOB
Period	1995-2007	1995-2007	1995-2016	1995-2016	1995-2016
growth	0.085	-0.017	-0.309***	-0.297***	-0.291**
	(0.334)	(0.810)	(0.000)	(0.001)	(0.018)
capital intensity	0.091***	0.071***	0.098***	0.074***	0.072***
	(0.004)	(0.000)	(0.000)	(0.001)	(0.000)
capital intensity(-1)	-0.043***	-0.035***	-0.032***	-0.009	-0.008
	(0.006)	(0.001)	(0.000)	(0.285)	(0.396)
financial income(-1)	0.271***	0.068	0.032	0.022	0.021
	(0.009)	(0.270)	(0.228)	(0.827)	(0.791)
dividend payments	-0.000	-0.003	-0.001	-0.007	-0.025
	(0.874)	(0.228)	(0.640)	(0.661)	(0.247)
interest payments(-1)	0.002	0.008	-0.014	0.023	-0.007
	(0.794)	(0.422)	(0.236)	(0.780)	(0.674)
international OPI				-0.004	-0.010
				(0.567)	(0.402)
wage share(-1)	0.270***	0.296***	0.217***	0.095	0.091
	(0.000)	(0.000)	(0.000)	(0.290)	(0.255)
constant		0.502***	0.567***		0.591***
		(0.000)	(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.619	0.034		0.458	0.302
diffHansen (pval)		0.001			0.127
AR1 test (pval)	0.000	0.000		0.004	0.007
AR2 test (pval)	0.818	0.893		0.182	0.199
instruments	76	83		159	167
number of firms	1790	1790	2855	1043	1043
F-test	20.442	23.326	34.785	4.995	5.870
Observations	13709	15583	34652	8643	10114
F-test year dummies	0.873	0.270		0.372	0.858

Tables A1, continued: Advanced economies – robustness tests

	(6) HERFIN	(7) HERFIN	(8) CR(4)	(9) CR(4)	(10) LOGS
Period	1995-2016	1995-2016	1995-2016	1995-2016	1995-2016
growth	-0.221***	-0.259***	-0.209***	-0.252***	-0.276***
	(0.003)	(0.000)	(0.004)	(0.000)	(0.000)
capital intensity	0.106***	0.104***	0.105***	0.095***	0.230***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
capital intensity(-1)	-0.022**	-0.028***	-0.022**	-0.028***	-0.205***
	(0.011)	(0.001)	(0.015)	(0.003)	(0.000)
financial income(-1)	0.024	0.025	0.025	0.026	-0.025
	(0.363)	(0.369)	(0.341)	(0.325)	(0.346)
dividend payments	-0.007	-0.008**	-0.007	-0.007**	-0.006*
	(0.102)	(0.025)	(0.101)	(0.034)	(0.077)
interest payments(-1)	0.026	0.030**	0.025	0.030**	-0.000
	(0.179)	(0.038)	(0.177)	(0.039)	(0.987)
herfindahl index	0.193	0.702**			
	(0.578)	(0.044)			
CR(4)			0.052	0.536***	
			(0.719)	(0.000)	
wage share(-1)	0.190***	0.221***	0.193***	0.231***	0.605***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.490***		0.345***	-0.088***
		(0.000)		(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.134	0.023	0.143	0.003	0.004
diffHansen (pval)		0.037		0.000	0.346
AR1 test (pval)	0.000	0.000	0.000	0.000	0.000
AR2 test (pval)	0.465	0.289	0.441	0.250	0.017
instruments	159	167	159	167	146
number of firms	2653	2653	2653	2653	2855
F-test	20.257	17.505	20.541	18.090	56.151
Observations	30709	33700	30709	33700	34652
F-test year dummies	0.780	0.630	0.724	0.129	0.336

Notes: Dependent variable is the firm-level labour share. ***, **, * denote statistical significant at the 1%, 5% and 10% level, respectively. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. Period denotes estimation period. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and of the Wald test on the joint significance of all year dummies.

Table A2: Emerging/ developing economies – robustness tests

Firm-level Wage Share	(1) BASE	(2) BASE	(3) FE	(4) GLOB	(5) GLOB
Period	1995-2007	1995-2007	1995-2016	1995-2016	1995-2016
growth	-0.285**	-0.333***	-0.191***	-0.091	-0.167*
	(0.027)	(0.006)	(0.000)	(0.203)	(0.053)
capital intensity	0.046***	0.028**	0.054***	0.052***	0.040***
	(0.000)	(0.012)	(0.000)	(0.000)	(0.000)
capital intensity(-1)	-0.019***	-0.014***	-0.017***	-0.014***	-0.015***
	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)
financial income(-1)	0.041	0.023	0.006	-0.053***	-0.047
	(0.541)	(0.742)	(0.596)	(0.008)	(0.158)
dividend payments	0.034	-0.065	-0.004*	-0.004	-0.010***
	(0.668)	(0.353)	(0.059)	(0.810)	(0.005)
interest payments(-1)	-0.218**	-0.023	0.013***	0.004	0.016
	(0.040)	(0.740)	(0.009)	(0.548)	(0.233)
international OPI				-0.010	-0.004
				(0.524)	(0.551)
wage share(-1)	0.397***	0.417***	0.244***	0.265***	0.311***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.226***	0.219***		0.191***
		(0.000)	(0.000)		(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	within	diff-GMM	sys-GMM
Hansen test (pval)	0.423	0.276		0.545	0.365
diffHansen (pval)		0.006			0.018
AR1 test (pval)	0.000	0.000		0.000	0.000
AR2 test (pval)	0.657	0.471		0.407	0.132
instruments	76	83		159	167
number of firms	1275	1275	4911	2007	2007
F-test	9.786	15.390	60.203	17.534	15.395
Observations	6874	8192	40061	13038	15497
F-test year dummies	0.047	0.000		0.002	0.001

Table A2, continued: Emerging/ developing economies – robustness tests

Firm-level Wage Share	(6) HERFIN	(7) HERFIN	(8) CR(4)	(9) CR(4)	(10) LOGS
Period	1995-2016	1995-2016	1995-2016	1995-2016	1995-2016
growth	-0.099	-0.298***	-0.073	-0.271***	-0.616***
	(0.269)	(0.000)	(0.395)	(0.001)	(0.000)
capital intensity	0.074***	0.054***	0.075***	0.052***	0.332***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
capital intensity(-1)	-0.022***	-0.019***	-0.022***	-0.019***	-0.264***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
financial income(-1)	-0.029	-0.022	-0.024	-0.013	-0.126***
	(0.410)	(0.475)	(0.507)	(0.633)	(0.007)
dividend payments	-0.012	-0.007	-0.011	-0.006	0.001
	(0.276)	(0.148)	(0.331)	(0.200)	(0.948)
interest payments(-1)	-0.006	0.002	-0.007	-0.003	0.019
	(0.712)	(0.875)	(0.643)	(0.765)	(0.364)
herfindahl index	0.122	-0.052			
	(0.308)	(0.640)			
CR(4)			0.030	-0.035	
			(0.702)	(0.657)	
wage share(-1)	0.249***	0.294***	0.249***	0.299***	0.630***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
constant		0.196***		0.213***	-0.384***
		(0.000)		(0.000)	(0.000)
year dummies	Yes	Yes	Yes	Yes	Yes
estimator type	diff-GMM	sys-GMM	diff-GMM	sys-GMM	sys-GMM
Hansen test (pval)	0.759	0.101	0.717	0.016	0.002
diffHansen (pval)		0.000		0.000	0.001
AR1 test (pval)	0.000	0.000	0.000	0.000	0.000
AR2 test (pval)	0.466	0.067	0.490	0.063	0.400
instruments	159	167	159	167	146
number of firms	3053	3053	3053	3053	4911
F-test	21.121	21.594	20.402	21.120	83.719
Observations	24528	27848	24528	27848	40061
F-test year dummies	0.000	0.000	0.000	0.001	0.000

Notes: Dependent variable is the firm-level labour share. ***, **, * denote statistical significant at the 1%, 5% and 10% level. Period denotes estimation period. Hansen test (pval) stands for the p-value of the Hansen test of overidentifying restrictions for all instruments. diffHansen (pval) reports the p-values of the incremental Hansen test for the instruments used in the level equation. AR1 and AR2 is the p-value of the Arellano-Bond test for autocorrelation of first and second order in the residuals. Instruments denote the number of instruments used. F-test and F-test year dummies is p-value of the F-test on all variables and on the joint significance of all year dummies.

Summary statistics[42]

The United Kingdom					
Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	10237	0.661211	0.819014	-6.88333	7.329377
growth	11430	0.08969	0.524099	-7.27733	7.994821
capital intensity	10946	0.957166	2.67793	-28.0393	22.9107
financial income	10940	0.249775	2.96587	-0.03522	219.0833
dividend payments	12380	0.191549	0.447423	0	4.519702
interest payments	12313	0.195386	0.648776	0	10.05263

France					
Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	6467	0.805261	0.554023	-4.18587	4.737561
growth	7962	0.07934	0.422759	-5.90807	9.870331
capital intensity	6898	0.754885	1.237341	-4.30612	10.00899
financial income	5813	0.118855	0.715449	-0.00364	20.98113
dividend payments	7111	0.141212	0.32493	0	3.577778
interest payments	7496	0.176575	0.362073	-0.07623	5.04

Germany					
Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	6405	0.846096	0.77235	-5.06792	7.372857
growth	7768	0.076312	0.527517	-9.85027	7.370213
capital intensity	6732	1.043547	1.707805	-4.92821	16.30825
financial income	6997	0.253737	4.418862	-0.01012	288.7746
dividend payments	7257	0.146197	0.501264	0	8.624967
interest payments	7934	0.201226	0.642234	0	12

EU15					
Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	39632	0.756474	0.800039	-12.8412	20.14474
growth	48021	0.069986	0.47581	-9.85027	9.870331
capital intensity	41981	1.335747	3.928346	-174.347	105.1799
financial income	42149	0.183939	2.476464	-0.95232	288.7746
dividend payments	47039	0.24615	2.258407	-0.02564	141.4
interest payments	49516	0.200527	0.843428	-0.07623	54.73214

[42] Note that several of our variables are characterised by large outlier, which is typical for firm-level literature (Autor, et al. 2017). The outliers constitute only a minor part of the sample. For example, for the EU15 sample, labour shares above 3 make up only 1 percent of the sample. Furthermore, it is important to keep in mind that comparison of our labour share data with data based on National Accounts is problematic because 1) value added is net of depreciation, 2) we exclude a number of industries and 3) because we don't not have information for non-listed firms.

advanced economies

Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	49214	0.721528	0.810939	-14.231	20.14474
growth	99316	0.063662	0.441928	-9.85027	10.07194
capital intensity	52274	1.278733	4.805752	-174.347	105.1799
financial income	89057	0.178326	9.373008	-0.95232	2094.433
dividend payments	100752	0.152035	1.555126	-0.02564	141.4
interest payments	102804	0.186512	1.479506	-0.07623	94.64286

emerging economies

Variable	Observations	Mean	Std. Dev.	Min	Max
labour share	77034	0.46853	0.714579	-8.22456	11.48526
growth	123525	0.060114	0.450607	-9.85467	14.96615
capital intensity	81128	3.088817	8.522262	-350.465	215.0951
financial income	98392	0.14415	3.70636	-10.0468	572.8461
dividend payments	112349	0.124878	3.740539	-0.65283	1169.048
interest payments	129835	0.129565	0.845666	-4.71915	58.42093