Trade, Labor Market Institutions and the Decline of Labor Shares

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Abstract

The fall of labor's share of GDP in many advanced economies has been a key driver of rising economic inequality and macroeconomic imbalances. Yet we know little about why labor shares have fallen much more strongly in some countries than in others. Combining insights from New New Trade Theory and comparative political economy, I argue that the interaction between globalization pressures and domestic labor-market institutions plays an important role. The more coordinated wage-bargaining institutions are, the larger the incentives and capacities of employees to respond to mounting price pressure by curbing their wage demands. As a result, trade liberalization leads to a more rapid decline of labor shares in coordinated market economies than in liberal market economies. I find robust evidence in line with this argument using panel data on about 8691 publicly listed firms in the European Union and exploiting exogenous variation in trade liberalization. These findings have important implications for our understanding of the political economy of falling labor shares as well as the way in which domestic institutions mitigate globalization pressures.

1   Introduction

For David Ricardo, determining the laws that regulate the distribution of income between "the proprietor of the land, the owner of the stock or capital necessary for its cultivation, and the labourers by whose industry it is cultivated [was] *the* principal problem in Political Economy" (Ricardo, 1821, p.1). For a long time, scholars that followed in his footsteps were less fascinated by the functional distribution of income, mainly because factor shares - that is the slice of national income that goes to capital (capital share) or is paid out in wages and other forms of labor compensation (wage share) - seemed to change little over time. In fact, their stability became one of the fundamental features of most macroeconomic models (Kaldor, 1957; Mankiw, 2007). However, in recent years, interest in the distribution of income between capital and labor, for several reasons, has made a striking comeback into research and international headlines.

First, after decades of stability, labor's share in national income has fallen substantially in the last 30 years (Chen, Karabarbounis and Neiman, 2017; Autor et al., 2017; Stockhammer, 2015). A decreasing share of the total income in advanced economies is, thus, paid out in wages and other forms of labor compensation and a growing slice goes to the owners of capital.[1] Compared to the 1980s, average national wage shares in OECD countries have dropped by almost 10 percentage points, reaching their lowest level just prior to the global financial crisis and not recovering materially ever since (see Figure 1). Second, this trend is not only at odds with conventional economic wisdom, it is also linked to a range of important political and economic issues. For one, declining wage shares imply rising income inequality (Dao et al., 2017). As most capital is owned by individuals at the top of the income distribution, an increase in the share of national income that goes to capital automatically widens the gap between high income earners and poorer workers (Atkinson, 2009; Adams and Neiman, 2014; Piketty, 2014). Moreover, research shows that within the work force, the brunt of the declining wage shares was borne by low- and medium-skilled workers (Dao et al., 2017; Autor, Levy and Murnane, 2003; Dauth et al., 2017). According to some pundits,

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[1]The aggregate labor share equals total compensation of labor across all three sectors divided by GDP. Since this paper is mostly interested in trends in the private sector, I follow Chen, Karabarbounis and Neiman (2017) and use the labor share in the corporate sector to describe trends at the macro level. This corporate sector wage share equals the sum of compensation paid to labor, divided by the gross value added (GVA) in the corporate sector.

these two factors turn declining wage shares into the single most important driver of rising economic inequality in countries like the US (Mishel, 2012).

Besides adding to income inequality, falling wage shares have also been associated with macroeconomic instability. On the one hand, rising functional income inequality can impede growth. As wage growth remains a key driver of domestic demand, the fact that an increasingly large share of revenues go to profits has been associated with much broader debates about low growth and secular stagnation (Gonzalez and Mathy, 2018; Storm and Storm, 2018; Summers, 2015). On the other hand, falling wage shares also are a key factor in the emergence of global current-account imbalances. While being a worldwide trend, the fall of labor shares has been especially pronounced in export-oriented countries such as Germany, Japan or the Netherlands (Behringer and Treeck, 2018; Belabed, Theobald and Treeck, 2018). Since rising profits have not been mirrored by corresponding increases in private investment, declining wage shares directly fueled excess savings and capital exports from these countries (Treeck, 2015; Redeker, 2019) and thus contributed to current-account instabilities.
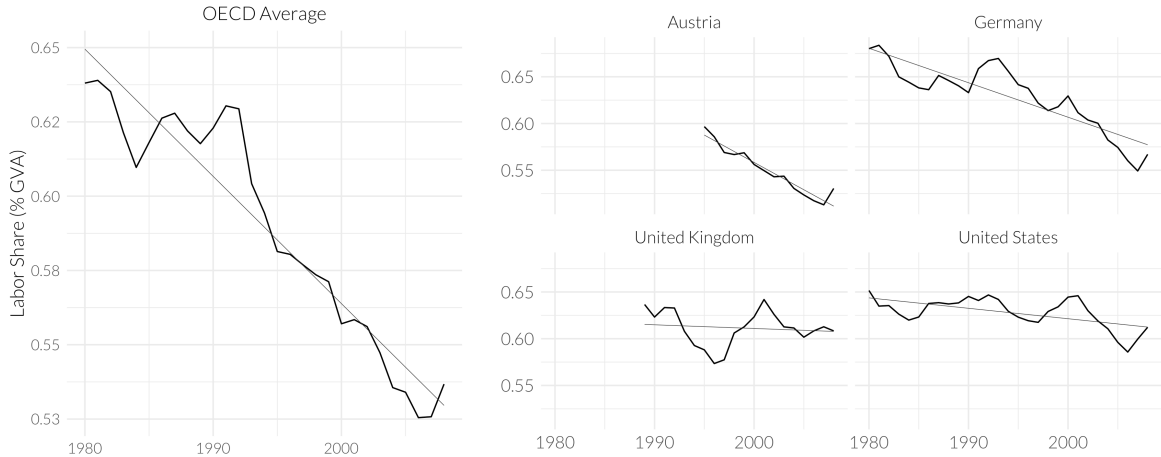

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FIGURE 1: The development of labor shares in OECD countries. Labor shares are measured as the share of total labor compensation in gross value added in the corporate sector. Data is based on national accounts (Chen, Neiman and Karabarbounis, 2016).

Existing research proposes three explanations for the global decline of wage shares. A first strand focuses on the demise of labor power. From this perspective, factor shares are the result of distributional conflicts between capital and labor with each side bargaining to maximize their slice of national income (Kristal, 2013). The more the bargaining power of

workers and employees relative to capital decreases, the more wage shares fall (Ahlquist, 2017). In recent years, labor shares, thus, decreased as multiple factors, ranging from structural economic change and globalization(Kristal, 2013; Elsby, Hobijn and Sahin, 2013) to the political deregulation of labor markets (Blanchard and Giavazzi, 2003; Bental and Demougin, 2010; Thelen, 2014) and the demise of trade unions (Kristal, 2010; Dünhaupt, 2013), all weakened workers' bargaining position.

A second line of research emphasizes the role of technological change. Karabarbounis and Neiman (2012), argue that starting from the 1980s, technological advances began to significantly decrease the costs of investment goods relative to labor. Given these changing input prices, firms across the world increased their capital to labor ratios, which according to their estimates accounts for about half of the decline in the labor's share of global income. Other studies have confirmed that labor-displacing technological change explains a substantial fraction of declining wage shares (Autor and Salomons, 2018).

Finally, market concentration has become an influential explanation for declining wage shares. Focusing on the US, Autor et al. (2017) develop a model in which rising price competition due to globalization or technological advantages benefits only the most productive firms in each sector. As a consequence, product market concentration rises and industries become increasingly dominated by very productive firms with high profits and low labor shares (see also Loecker, Eeckhout and Unger, 2018)

While the existing literature has greatly advanced our understanding of the drivers of globally falling wage shares, they fail to explain an important pattern across countries. In recent years, the fall of wages in national income was most pronounced in export-oriented coordinated market economies (Behringer and Treeck, 2018; Belabed, Theobald and Treeck, 2018). Figure 1 compares the development of private sector wage shares between the US and the UK as two classical examples of liberal economies that have witnessed rising levels of economic inequality with the trajectories of labor shares in the economically more coordinated Germany and Austria, which are often associated with more egalitarian economic outcomes (Thelen, 2012). Labor shares fell by about 5 and 2.5 percentage points in the US and the UK since the beginning of the 1990s. While this constitutes a substantial decline, the trend is far flatter than in Germany or Austria, where wage shares fell by almost twice as much. This difference is especially surprising as it does not seem to square with existing theories. Both Germany and Austria still have relatively strongly organized trade unions

and comparably regulated labor markets (Thelen, 2012; Hall, 2012). At the same time, technological change and globalization should lead to similar increases in price competition across advanced economies (Autor et al., 2017) and Baccini et al. (2018) show that trade shocks have affected product market concentration in coordinated market economies such as Germany or Austria much less than in the US or the UK. So how can we make sense of the cross-country pattern in declining wage shares?

To understand these differences, I argue, we need a better understanding of how global economic trends interact with domestic labor market institutions. Rising competitive pressure confronts workers with a trade-off between wage growth and job security. Building on insights from the classical comparative capitalisms literature (Calmfors and Driffill, 1988; Hall and Soskice, 2001; Manger and Sattler, 2015; Baccaro and Pontusson, 2016) and recent research on the roots of economic divergence in the Eurozone (Hancké, 2013; Hall, 2012; Höpner and Lutter, 2014; Streeck, 2015), I argue that domestic wage setting institutions have a large influence on how employees resolve this trade-off. If wage bargaining is decentralized, workers have little incentives and capacities to choose employment security over wage growth. As a result wages are downward sticky and aggregate labor shares fall only due to a reallocation of economic activity from less to more capital intensive firms. However, the more coordinated domestic wage bargaining systems are, the more employees will be willing to and capable of responding to heightened globalization pressure by curbing their wage demands. As a result, wage bargaining coordination allows less productive firms to remain in the market and reduces the "winner-takes-most" dynamics of rising competitive pressure (Baccini et al., 2018). However, this strategy comes at the expense of a significant redistribution of income from labor to capital.

I test this argument in two steps. First, I use panel data from publicly listed firms in all member countries of the European Union to analyze how much firm-level labor shares have declined across different countries. More importantly, I analyze to what degree labor share trends were dominated by changes *between* (as much of the existing literature suggests) or *within* firms. Using classical decomposition tools, I show that labor shares not only have fallen more strongly in more coordinated wage bargaining systems but that these changes are also driven by dynamics *within* rather than *between* firms. In a second step, I combine the firm level data with information on European level trade exposure to analyze how labor shares react to trade liberalization. Using measures of de jure tariff cuts and instrumented

import growth based on European preferential trade agreements (PTA), I show that trade competition significantly decreases labor shares within firms in countries with more coordinated wage bargaining institutions and that this decline is driven by decreasing wage growth rather than a reduction in the number of employees.

My findings add to existing research in a number of ways. First, they contribute to our understanding of the political economic processes that underlie falling wage shares across different institutional contexts. On the one hand, showing that the decline of labor shares in countries with more coordinated wage bargaining systems is the result of wage restraint rather than market concentration adds important nuances to the debate about the potential causes of falling labor shares. It also shows that it is often problematic to generalize from studies that focus predominantly on the US. On the other hand, getting this diagnosis right is important to address the problem of falling wage shares correctly in different contexts. In other words, what helps to tackle functional income inequality in the US might fail to work in Germany. Second, this study contributes to a rich literature on how national labor market institutions change in response to the pressures of globalization (e.g. Hall and Soskice, 2001; Thelen, 2009, 2012; Hassel, 2014; Malesky and Mosley, 2018). Much of this literature has centered on the question whether national differences in labor market institutions converge (Streeck, 2010; Glyn, 2007; Howell, 2003; Baccaro and Howell, 2011) or remain resilient (Iversen and Soskice, 2009; Martin and Swank, 2012; Martin and Thelen, 2007) when faced with increasingly mobile capital. In contrast, this paper shows that institutions of economic coordination, which are often associated with more egalitarian economic outcomes (Rueda and Pontusson, 2000; Ahlquist, 2017; Hope and Martelli, 2019) can contribute to functional income inequality when put under the strains of trade liberalization. Finally, this paper adds to a growing literature within international political economy, which looks at the domestic sources of macroeconomic imbalances (Manger and Sattler, 2015; Sattler and Haas, 2018; Baccini et al., 2018; Baccaro and Pontusson, 2016; Frieden and Walter, 2018). By showing that labor shares in coordinated market economies drop as a response to trade liberalization, this study helps to explain an important driver of sluggish growth, financial fragilities and global imbalances.

2   Labor Market Institutions and Wage Shares

My theoretical framework centers on the idea that labor market institutions play a key role in mitigating the macroeconomic effect of increased competition on the labor share. I develop this argument in three steps. First, I briefly recap the most prominent existing theories on the decline of labor shares. Whereas these theories provide us with strong arguments on how increased competitive pressure leads to a reallocation of market shares from more labor to more capital intensive firms, they are largely silent on the role of workers. However, taking both the preferences of workers and their capacity to pursue them into account has important implications for the predictions about labor share developments. In a second step, I therefore, introduce the preferences and strategic capacities of workers in struggling firms. I argue that rising competitive pressure confronts employees with a trade-off between wages and employment and that domestic labor market institutions crucially shape how they resolve this trade-off. In a third step, I build on these arguments to deduce hypotheses about the trajectories of aggregate and firm-level wage shares across different labor market institutions.

2.1   Existing Theories: Competition, Reallocation and the Labor Share

Much of the existing literature suggests that labor shares in advanced economies fall as a consequence of a structural reallocation of economic activity and market shares from more to less labor intensive firms and sectors. One of the most prominent example of an explanation along these lines is the so-called "super star" firm model introduced by Autor et al. (2017). The model rests on two important assumptions. First, following recent advances in new new trade theory (Melitz, 2003; Helpman, Melitz and Yeaple, 2004)[2], their theory assumes that firms that consider entering a market are ex ante uncertain about their own productivity and only learn about it after paying a sunk cost of market entry (Kim and Osgood, 2019; Bernard et al., 2012). This implies that firms which compete in the same sector can differ widely with respect to their productivity.

A second key assumption which Autor et al. (2017) share with many other theories on the development of labor shares is that wages are set in a decentralized manner and simply reflect market forces (see also Karabarbounis and Neiman, 2012; Dauth et al., 2017; Dao

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[2]See also Kim and Osgood (2019) for a detailed review of this literature

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et al., 2017). This combination of firm heterogeneity and given wage costs has important implications for the development of wage shares. If labor costs are fixed, more productive firms, by definition, employ less labor to produce the same amount of output and will hence have a lower labor share (Bartelsman, Haltiwanger and Scarpetta, 2013). At the same time, more productive firms are also better equipped to weather rising competitive pressures. If consumers or corporate buyers - for some external reasons ranging from increased import competition to technological change - become more price sensitive, less productive companies will struggle and have to reduce their output. At the same time, more productive firms will be able to adapt to increased competition and capture a larger share of the market. As a result of this "winner takes most" dynamic, the reallocation of market shares causes more output to be produced by firms with lower wage shares. On aggregate, this leads to a fall in labor's overall share of national income (Kehrig and Vincent, 2017; Autor et al., 2017).

While the super star firm model constitutes a prime explanation for the fall of labor shares, it is not the only approach that expects the labor share to fall as a result of the reallocation of economic activity. For example, theories building on sectoral trade models, stipulate that globalization reallocates economic activity from more import-competing to more export-oriented industries (Hiscox, 2001; Walter, 2017). As import-competing industries usually have higher wages shares, their decline also implies that labor's share in national income falls (Elsby, Hobijn and Sahin, 2013). Similarly, a range of models have predicted that technological change may also induce a reallocation of output shares from less to more capital intensive firms or sectors (Autor and Salomons, 2018; Decker et al., 2017).

So while scholars may disagree on the specific mechanisms that link competitive pressure to lower labor shares, they share the predictions that wage shares fall predominantly due to a reallocation of economic activity between heterogeneous firms and sectors and that labor market institutions only play a limited role in this process. As wage costs are assumed to be fixed and given by market forces, the preferences and strategies that employees face when their firms are confronted with rising competitive pressures, are of little concern. However, taking these preferences into account, has important implications for the ways in which of rising competition affects labor shares.

2.2   Introducing Workers: Trade-Offs, Institutions and the Labor Share

From the perspective of employees, rising competitive pressures stipulate a trade-off between wages and employment. Workers in firms that struggle with, for example, rising import competition can opt for two alternative strategies. If they prefer wages and relative income growth over job security, they may use their bargaining power to maximize their relative income. By doing so, they may be able to defend their current share of the over all income of the firm. However, they also risk that their employer is unable to keep up with the new competitive environment, has to reduce output, loses income and eventually, will lay off workers. If employees value job security over wage growth they, therefore, may also refrain from trying to maximize their own income share and instead attempt to maximize the market share of their firm as an alternative strategy. In that case, employees in firms that are confronted with mounting competitive pressure would try to strengthen their firm's competitiveness by reducing their wage claims and, thus, increase their job security at the expense of decreasing their relative income. Domestic labor market institutions determine have an important influence on how employees resolve this general trade-off.

A central insight of the literature on the political economy of labor markets is that the domestic institutional environment has a large influence on whether economic actors "coordinate their activities primarily via hierarchies and competitive market arrangements" or "depend more heavily on non-market relationships to coordinate their endeavors" (Hall and Soskice, 2001, p.8). Whereas this question relates to various different aspects of institutional complementaries (e.g. Culpepper, 2011; Martin and Swank, 2012; Busemeyer and Trampusch, 2011), domestic wage setting institutions are likely to be the most decisive for the preferences and strategies of workers in struggling firms. Numerous studies have analyzed how the degree to which wages are set by market forces or the outcome of coordinated bargaining processes spanning across employees, firms and sectors influences the distribution of income (Rueda and Pontusson, 2000; Pontusson, Rueda and Way, 2002; Ahlquist, 2017), often equating more coordinated wage bargaining systems with more egalitarian economic outcomes (Thelen, 2012). However, when it comes to the wage response of employees in struggling firms, more coordinated wage bargaining systems may fuel the fall of labor shares for two reasons: They should make employees more likely to prefer job security over wage growth and they should increase their strategic capacities to pursue this preference.

First, wage setting institutions influence workers' preferences. When confronted with the trade-off between wages and employment, higher levels of wage bargaining coordination will increase workers *incentives* for wage restraint. Countries with low levels of wage bargaining coordination are often characterized by relatively flexible labor markets and education and training systems that put a strong emphasis on acquiring general skills (Hall and Soskice, 2001; Iversen, Soskice and Hope, 2016). In times of economic downturns, firms in these economies can relatively easily dismiss parts of their workforce, which makes it less attractive for employees to acquire very firm or sector specific skills (Rueda and Pontusson, 2000). If their companies are hit by a competitive shock, employees in these context are likely to insist on their current income share and simply change firms or sector if high wage costs result in a reduction of the workforce. These preferences change in more coordinated wage bargaining systems. As such systems often go hand in hand with more long-term employer-employee relations, stricter labor market regulations and an encompassing vocational training system, employees in these contexts have higher incentives to invest in firm-specific skills. Often such skills are difficult to transfer to other sectors or even firms within in the same industry (Streeck and Thelen, 2005), which renders it complicated for employees to abandon their employer in times of rising competitive pressure and try their luck in other firms or industries. Given their vested interest in the survival of the firm, employees of struggling firms in more coordinated contexts, thus, have stronger incentives to curb their wage claims if they are confronted with the trade off between job security and income share.[3]

Second, wage setting institutions do not only influence the preferences that workers hold with regards to wage restraint. They also determine their capacity to actually implement this strategy. Wage restraint only makes sense as a collective endeavor. If a single worker comes to the conclusion that lowering her wage demands would serve the survival of her firm, actually doing so is only rational as long as her colleagues do the same. If not, cutting her own salary will have little effects on the competitiveness of her firm and she might end up with less money and having lost her job anyway. Wage restraint, thus, needs to be organized. This is difficult to achieve in countries with largely decentralized wage bargaining systems but becomes increasingly effective the more coordinated domestic wage bargaining

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[3]In addition to skill-specificity, the presence of institutions like shop-floor representation and co-determination that are often associated with coordinated wage bargaining might also provide employees with a more long-term perspective inside the firm and could therefore encourage strategic cooperation and wage restraint (Höpner and Lutter, 2014).

institutions are. At the firm-level, trade unions and employer associations in more coordinated systems, on average, simply have better institutional capacities for wage moderation. Institutions such as long-lasting job floor ties and established works councils enable employers and employees to negotiate plant level deals to curb wage growth in exchange for a commitment to maintain employment levels (Thelen, 2012). Importantly, while plant level labor representation is much more prevalent in countries with coordinated wage setting institutions, it is not exclusive to them. Even in decentralized system there might single firms or industries in which trade unions are strong enough to strike firm-level employment deals. However, these deals are likely to be less potent in decentralized systems as wage restraint becomes more effective, the broader it reaches (Driffill, 2006; Hall and Soskice, 2001). If wage moderation only occurs in a single firm, the most productive workers will always have incentives to leave the company. Centralized bargaining at the sector or industry level, therefore, needs to make sure that more productive firms, for which competitive pressure is less of a problem, have less room to undermine moderation by poaching employees away from their competitors (Campbell and Kamlani, 1997; Baccini et al., 2018). This becomes even more effective if institutions such as pattern bargaining also allow for the extension of wage restraint to non-exposed sectors and, thus, make it less attractive for employees to abandon struggling firms, for example, to seek higher wages in the public sector (Höpner and Lutter, 2014).

Existing qualitative evidence points to the fact that cooperation between capital and labor in countries with more coordinated wage bargaining institutions intensifies in times of heightened competitive pressure (Thelen, 2012). For example, German trade unions and employer associations have increasingly pushed for the establishment of so-called "Pacts for Employment and Competitiveness" (*Bündnisse zur Beschäftigungs- und Wettbewerbssicherung*) since the 1990s. These pacts involve trade-offs in which managers commit to job security and workers in exchange provide flexibility with regards to working times and wage growth (Hassel, 2014; Thelen, 2009). Another famous example of coordinated wage restraint in recent years is the fact the powerful German union for metalworkers (*IG Metall*) declined to set forth any wage demands at all in the years following the financial crisis of 2008 and instead focused entirely on job security and training (Thelen, 2012; Höpner and Lutter, 2014). Similar trends have been described in the context of other coordinated market economies

such as the Netherlands as well as Austria (Visser and Hemerijck, 1997; Raess and Burgoon, 2006).

2.3   Empirical Implications: Competition, Wage Bargaining and the Labor Share

Summing up, I argue that rising competitive pressures confront employees in struggling firms with a trade-off between wages and employment security. How workers resolve this trade-off, depends on the level of coordination in domestic wage setting institutions. The more coordinated wage bargaining is, the more likely workers will be to favor job security over wage growth and the more capable they are to follow these preferences by organizing collective wage restraint. While this strategy increases the competitiveness of less productive firms and tames the "winner takes most" dynamics in times of rising pressure (Baccini et al., 2018), it comes at the expense of a significant redistribution of income from labor to capital. This argument has a number of empirical implications.

A first empirical implication concerns the descriptive pattern of aggregate labor-share changes at the national level. The currently most prominent explanations for rising functional income inequality expect labor shares to fall due to a reallocation of economic activity (e.g. Autor et al., 2017; Elsby, Hobijn and Sahin, 2013). As wage costs are given by market forces, labor share developments are dominated by between firm effects. Less productive firms have to reduce their output and aggregate labor shares fall as an increasingly large share of total income is produced by firms with relatively low labor shares. While I agree with diagnosis, my argument suggests that it is specific to institutional contexts in which wage outcomes are predominantly shaped by market forces. The more coordinated wage bargaining systems are, the more important organized wage restraint within existing firms should become for the trajectories of wage shares. On the one hand, this implies that labor shares fall more strongly in more coordinated countries. On the other hand, it means that aggregate labor share developments are dominated by changes within existing firms rather than the reallocation of market shares between companies.

- *H1: The more coordinated wage bargaining systems are, the stronger aggregated labor shares fall and the more they are dominated by within firm developments.*

In addition to these broad macro-level trajectories, the argument outlined above also has implications at the firm level. Most specifically, we should be able to causally link decreasing

firm-level labor shares to rising competitive pressure. Similar to existing research, I see rising competitive pressure as a key driver of declining wage shares. However, whereas for example the super star firm model assumes that such pressure leaves firm-level wage shares unchanged and simply pushes less productive firms out of the market, my argument suggests that coordinated wage bargaining increases employees incentives and strategic capacities to respond to heightened competition by curbing their wage claims. As a consequence, rising pressure should have a more negative effect on firm-level labor shares, the more coordinated wage bargaining systems are.[4] I thus test the following hypothesis:

- *H2: The more coordinated wage bargaining systems are, the more increased competitive pressure results in a drop of firm-level labor shares.*

Finally, my argument implies that wage restraint is the key driver of declining firm-level wage shares in contexts with more coordinated wage bargaining systems. In theory, labor shares within existing firms could drop for a number of reasons including, for example, a dismissal of large parts of the workforce and a switch to more capital-intensive forms of production (Karabarbounis and Neiman, 2012; Dauth et al., 2017). However, if wage bargaining coordination makes employees more likely to favor job security over wage growth and fosters their capacities to organize this strategy, wage moderation should be at the heart of the drop of firm-level labor shares. It is, therefore, crucial to study the specific mechanism that links rising competitive pressure to declining wage shares and I, finally, also test the following hypothesis.

- *H3: The more coordinated wage bargaining systems are, the more competitive pressure should turn firm-level wage restraint into the main driver of falling labor shares.*

In the rest of the paper, I will test these hypotheses in two steps. In the next section, I will start with decomposing labor share dynamics between and within firms across advanced economies. I then turn to a more systematic analysis of the effect of import competition on labor shares and its interaction with domestic labor market institutions.

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[4]An important question in the literature on the macroeconomic effects of wage bargaining centralization pertains to whether these effects are monotonic or hump-shaped (Driffill, 2006). In the latter case, very decentralized and very centralized forms of wage bargaining would, for example, produce different unemployment outcomes than intermediate cases. While the empirical jury on this question is still out in debate (e.g. Nickell, Nunziata and Ochel, 2005; Elmeskov, Martin and Scargetta, 1998; Blanchard et al., 2006), the discussion above suggests that both incentives and capacities for wage moderation should strictly increase with higher levels of coordination.

3 Decomposing Changes Labor Share Changes

I start the analysis with a descriptive investigation of the patterns of labor share changes across countries with different levels of wage bargaining coordination. My first hypothesis is that aggregate labor shares in countries with more coordinated forms of wage formation should fall more strongly and have a more pronounced within-firm component than in contexts in which wage setting is dominated by market forces. I investigate this implication decomposing the aggregate change of labor shares in publicly listed firms in the European Union (EU).

3.1 Data on Firm-Level Labor Shares

The main data for all my analyses below come from the Compustat database provided by Standard & Poor's. For each firm-year observation, Compustat lists a full set of balance-sheets items, including for example, each firm's total payroll, total employment, total sales etc. together with its geographic location and different industry identifiers. I extract all publicly listed firms in the European Union (EU) during the period 1995 and 2015. Whereas data quality does not allow me to extent the analysis to years before 1995, I focus on countries within the EU for two main reasons.

First, as accounting standards differ across countries, firms in many states outside the European Union are often not legally required to publish the data needed to construct firm-level labor shares. For example, information on annual payroll is available for less than 15% of all US firm observations in Compustat. Second, my analysis on the effects of import competition on labor shares crucially hinges on exploiting trade liberalization at the EU level, which obviously only affects firms within European countries. I thus focus on EU member states for which sufficient data is available for the entire period under consideration. This results in a dataset with 8691 unique firms in 18 European countries and a total number of about 87363 firm-year observations. Importantly, the focus in the EU also allows me to study the trajectories of labor shares across different levels of wage bargaining coordination. Whereas some canonical cases of liberal market economies with very decentralized modes of wage formation such as the US and Australia are not included in the analysis, the dataset covers cases without any coordination in wage setting such as the UK, Estonia or Hungary all the way to some countries with the most centralized wage bargaining system in the world

such as Finland and Belgium. For the decomposition analysis, I follow existing research convention and measure firm-level labor shares as the ratio of total labor costs over sales (Siegenthaler and Stucki, 2015; Autor et al., 2017).[5]

As Compustat only provides data on publicly listed firms, this data is not necessarily representative of the complete universe of companies in a given country. Nonetheless, it provides the best available data source to test the hypotheses outlined above for a number of reasons. First, using Compustat data allows me to compare firm-level developments across a large number of countries. Publicly listed firms are legally required to publish their annual balance-sheet data. This allows me to construct panel information and track long-term trajectories *within* firms.[6] Second, Compustat provides information for long time periods with good data quality ranging back to the mid 1990s. Given that a lot of meaningful trade liberalization took place at the end of the last millennial, this will be especially relevant for the analysis of the effect of rising competitive pressures. Finally, while publicly listed firms tend to be larger and more productive than other companies, they are also responsible for the biggest share of national output and income. Analyzing what happens in these firms, is therefore, on the one hand, in itself economically meaningful. On the other hand, as discussed above, wage restraint becomes more likely the less competitive firms are. If I am able to corroborate my hypotheses studying data from large and productive firms, this should allow us to infer similar or even more pronounced effects in non-listed companies.

3.2 Empirical Strategy and Findings

To explore whether changes in labor shares are driven by within or by between firm effects, I implement a standard decomposition analysis (Baily, Hulten and Campbell, 1992; Melitz and Polanec, 2012). These tools were originally constructed for productivity decompositions, but can also be applied to study labor shares (Autor et al., 2017). The main intuition behind the analysis is to decompose what share of the aggregate change in wage shares is the result of changes within existing firms and what fraction stems either from changes in existing firms' contribution to total output or from the fact that firms with different levels of labor shares

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[5]Ideally, I would be able to measure labor shares as the ratio of total labor costs over value-added. However, data on value-added is not readily available in Compustat and must be constructed from another of other balance-sheet items. As this information is missing for a lot of firms, doing so would, however, result in substantial data loss.

[6]Alternative data sources such as Bureau Van Dyke's ORBIS and AMADEUS only allow for the analysis of repeated cross-sections. In addition, data quality on items such as wages is much weaker (Kalemli-ozcan et al., 2015).

enter and leave the market. More formally, we can write the aggregate changes of labor share between the base year $(t = 1)$ and the current period $(t = 2)$[7] in a given country as:

$$(1) \qquad \Delta Y_j = \sum_{i \in S} s_{i1}(\gamma_{i2} - \gamma_{i1}) + \sum_{i \in S} (s_{i2} - s_{i1})\gamma_{i2} + \sum_{i \in E} s_{i2}\gamma_{i2} - \sum_{i \in X} s_{i1}\gamma_{i1},$$

where S, E and X denote the sets of surviving, entering and exiting firms in the market of country j respectively. γ_{it} denotes firm i's labor share at point t and s_{it} denotes it's weight in the economy, measured as firm i's share of sales over total sales in the economy. The first term is the within-firm sub-component. It keeps each firm's contribution to total output constant and just captures how much of the aggregate shift in labor shares is driven by changing wage shares *within* existing firms. The following three terms provide information on shifts that result from composition or *between* firm changes. The second term keeps each firm's labor share fixed at the level it had at t_1 and instead computes how much of the aggregate change is driven by changing weights of existing firms (i.e. what share of total labor share changes is driven by the fact that more or less capital intensive grow or shrink), the following two terms capture the effect of firms with different labor shares entering or leaving the market between the two time periods.

Figure 2 plots the result of this shift-share decomposition calculated for adjacent five-year periods for firm-level labor shares and then cumulated over the period from 1995-2015. It calculates *within* effects (first term in (1)) and composition effects (terms 2-4 in (1)) for each country separately and then takes averages of these outcomes across different levels of wage bargaining coordination. I measure coordination using the wage bargaining coordination index provided by Visser (2015). This variable ranges from 1 to 5 and measures "the degree of intentional harmonization observed in the wage-setting process". It will be described in more detail in the following section.[8] Separate results for each country can be found in B.3 in the supplementary materials (SM).

A couple of main results stand out. First, Figure 2 shows that changes in the aggregate labor share of publicly listed firms in countries with largely decentralized forms of wage bargaining are dominated by between firm changes. This in line with previous findings by

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[7]Note that 5 year changes in the firm-level data forms the basis for the decomposition analysis

[8] The index takes the following values for the countries in the dataset. 1 (United Kingdom, Estonia, Hungary, Poland); 2 (France, Czech Republic, Greece, Portugal); 3 (Spain, Italy, Luxembourg); 4 (Austria, Germany, Denmark, Netherlands, Sweden); 5 (Belgium, Finland)
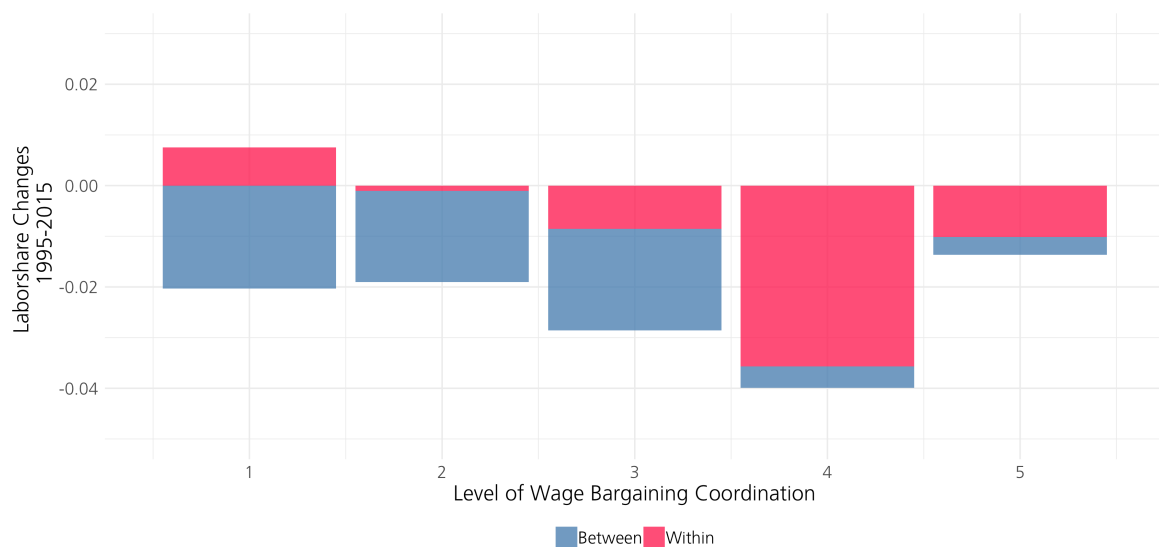
FIGURE 2: Each bar represents the average cumulated sum of a shift-share decomposition of labor-share dynamics in publicly listed firms over adjacent five-year intervals between 1995-2015 for countries across different levels of wage bargaining coordination.

Autor et al. (2017) and confirms the idea that in contexts in which wages are mainly set by market forces, the fact that companies with lower labor shares increasingly capture larger market shares is an important driver of falling wage shares.[9] However, this pattern looks differently in more centralized countries. The more coordinated wage bargaining systems get, the more important within firm developments become for the trajectory of labor shares. In countries with highly coordinated bargaining institutions, the within firm component clearly outweighs changes that result from a reallocation of market shares. This is broadly in line with the argument, that wage restraint plays an important role in contexts in which wage setting is shaped by more intentionally harmonized processes. Finally, Figure 2 also provides some suggestive evidence in favor of the hypothesis that more coordinated wage bargaining systems result in a stronger decline of labor shares. Whereas the aggregate wage share in publicly listed firms fell only by about 1 percentage point between 1995 and 2015 in highly decentralized countries, it decreased on average by almost four times as much in countries with the second highest score on the coordination index. However, the descriptive picture also shows coordination alone cannot explain total changes. Belgium and Finland

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[9]Figure 2 also suggests that labor shares within existing firms in countries without wage bargaining co-ordination have even increased. However, this result is driven by UK where large spikes in the salaries of financial sector professionals have contributed positively to overall wage share developments (Denk, 2015).

are the only two countries in the sample that have a coordination index of 5. However, their average wage shares fell less than in other countries with more decentralized wage setting institutions. Against this background, the next section delves further into the question how wage bargaining coordination interacts with changes in the level of competitive pressures in pushing down firm-level labor shares.

4 Import Competition and Wage Shares

The previous section has established descriptively that aggregated firm-level labor shares in countries with more coordinated wage bargaining systems, on average, fell faster and were to a larger extent driven by within firm changes than in countries with more decentralized modes of wage formation. I now turn to analyzing to which degree these changes were a response to increased competitive pressures.

4.1 Research Design & Empirical Strategy

To study the effect of increased competition on firm-level labor shares, I am interested in estimating the following model:

$$(2) \qquad Y_{it} = \beta_0 + \beta_1 \Delta IMP_{ict} + \beta_2 Coord_{ct} + \beta_3 \Delta IMP_{it} \times Coord_{ct} + \beta_4 X + \delta_i + \delta_t + \epsilon_{ict},$$

in which Y_{it} the labor share in firm i at point t, changes in competitive pressures is measured in import competition and denoted as ΔIMP_{ict}, $Coord_{ct}$ represents different indicators of wage bargaining coordination in country c and X depicts a number of covariates at the firm and the country level. Finally, δ_i nets out time invariant firm specific effects and δ_t are year fixed effects that control for overall trends in firm-level labor shares. My key variable of interest is β_3 which measures how much the effect of increased competition on firm-level labor shares changes over different levels of wage coordination and which I expect to be negative. Below, I describe variable measurement and identification in more detail.

Labor Shares and Import Competition: Measurement and Identification

My main variable of interest is the labor share per firm per year. As before, I use Compustat data and measure labor share as the ratio of wage costs over sales. A potential problem with

this approach is that Compustat does not distinguish between different firm branches and only provides consolidated information at the headquarter level. This could be problematic if changes in the total labor share of a firm a driven by establishments that are not located in the same country as the headquarter and are thus subject to different wage bargaining structures. I warrant against this issue by merging Compustat with Thomas Reuters information on foreign subsidiaries and making sure that my findings are robust to dropping firms with foreign establishments. More details on the distribution of this variable can be found in Figure B.2 of the supplementary materials (SM).

My first main explanatory variable are changes in the level of competitive pressures that firms are exposed to. Whereas in theory, competitive pressures could originate from a range of sources including, for example, technological change or product market deregulation, in the empirical analysis I focus on the effects of trade for mainly two reasons. First, globalization and rising import competition is often discussed as a key driver of rising inequality and falling labor shares (Elsby, Hobijn and Sahin, 2013; Dao et al., 2017), it also has turned into one of the politically most contested sources of structural economic change in recent years (Baccini et al., 2018; Frieden, 2018). Analyzing how the effect of trade liberalization differs across different institutional set ups is, thus, substantially interesting in itself. Moreover, as I will discuss in more detail below, the fact that trade liberalization is a much more guided and, thus, potentially exongenous process than, for example, technological innovations, render it a more useful set up to parse out the effect heightening competition on labor shares.

ΔIMP_{ict}, therefore, denotes the change of import competition a firm is exposed to in a given year. The most straightforward way to measure this would be to simply look at how imports into the main sector a firm is active in increase. However, this could cause a number of issues. Industries experiencing an increase in import penetration might differ from industries facing no such rise. This could pose a threat to identification if, for example, industries that become more capital intensive also import more intermediary inputs or if foreign exporters strategically target markets with rising wage costs. In any case, rising import competition is unlikely to be completely exogenous to labor share trajectories.

I circumvent this problem in two ways. First, I exploit *de jure* changes in import competition. For this, I rely on the fact that in the EU all trade policy with non-member countries is conducted by the European Commission. Given the bureaucratic nature of these negotiations and the fact that the Commission negotiates on behalf of all 28 member states at

the same time, it is unlikely that tariff concessions made towards third countries are shaped by the labor share developments of specific industries in specific countries. Moreover, trade liberalizations are usually the result of long, drawn-out processes, in which packages deals for up to 5000 product lines are negotiated at the same time and usually take up to X years. Even if member states are able to shift negotiation outcomes with regards to wage developments in specific industries, this makes it very unlikely that they are able to determine the exact *timing* at which trade liberalization takes place. Tariff cuts thus provide us with a plausible source of exogenous variation in import competition.

I take data on EU level tariff cuts with third countries form Baccini, Pinto and Weymouth (2017). The dataset contains preferential tariff concessions made by the EU in all Preferential Trade Agreements signed between 1995 and 2015.[10] It provides information on tariff schedules at a very disaggregated product level of the Harmonized Commodity Description and Coding System (HS6) listing average tariffs before the entry into force of a PTA as well as all subsequent cuts until the end of the implementation period (Baccini, Pinto and Weymouth, 2017). From this, I add up all import tariff cuts made by the EU in a given year and use conventional correspondence tables to aggregate them to the industry level (SIC 4 Digit). Details on the exact construction of the variable are in the SM.

In a first step I, thus, analyze how de jure increases in import competition caused by EU import tariff cuts affect the labor share of a given firm in a given industry. However, while tariff cuts provides us information on potential increases in import competition, they do not say much about actual trade flows.[11] In a second step, I therefore use tariff cuts to instrument real trade flows. More formally, I implement an IV regression in which ΔIMP_{ict} is substituted by $\Delta I\hat{M}P_{ict}$, denoting the fitted values of a first stage regression of ΔIMP_{ict} on a sector level tariff cuts. This approach should get us closer to the actual effect of increased import while circumventing the potential endogeneity problem of rising import competition in a standard OLS. I measure import growth as the log difference in sector-level imports into the EU for each year. Data is provided on a quarterly basis for detailed product codes (HS6) by COMTEXT (EU, 2019). I aggregate imports by year and across all trading partners and use standard correspondence tables to match them to the industry SIC codes used in Compustat.

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[10]As trade liberalization stemming from PTAs only affects EU member states, I include observations from countries that joined the EU after 2004 and 2007 only after their accession.

[11]In a potential outcomes framework, tariff cuts would correspond to the intention to treat (ITT) effect.

Measurement of Wage Bargaining and Controls

My second main independent variable are labor market institutions. More specifically, I am interested in the extent to which wage setting systems are coordinated. The more coordinated the wage setting process is, the more employees should be willing and able to respond to increased import competition by strategically curbing their wage demands. For my main analyses, I measure economic coordination as wage bargaining coordination using a variable from the ICTWSS database, which provides yearly values of an index of wage bargaining coordination developed by Kenworthy (2001). This proxy measures "the degree of intentional harmonization observed in the wage-setting process" (Kenworthy 2001, 76), that is, the extent to which economic actors (especially trade unions and employer associations) align their wage negotiation behavior. The variable is ordinal, ranging from one ("Fragmented wage bargaining, confined largely to individual firms or plants") to five ("Maximum or minimum wage rates/increases based on centralized bargaining"), and it captures the level to which wages and salaries are determined by market forces or the outcome of coordinated negotiations. In countries scoring one (e.g., the UK), negotiations about wages take mainly place between individual workers (or plant-level trade unions) and their employers. The more a country has a wage-setting dynamic that limits (formally or informally) this tendency, the more I expect employees to be able to engage in strategic and coordinated wage restraint.

While I believe that this measure comes closest to capturing the most relevant dimension of economic coordination for my argument, I also make sure that my findings are robust across other measures of labor market coordination, including wage bargaining centralization, the share of wage earners that is covered by wage bargaining and the strictness of labor market regulation. Whereas the former two provide alternative measures of the institutional *capacities* for strategic wage restraint, stricter labor market regulation should make it more likely for workers to build long-term relations with their workplace and invest in firm specific skill and thus positively influence employees *incentives* to forfeit wage growth when confronted with rising import competition. Details on the construction of these variables can be found in the SM (p. 10).

Finally, I also include a number of controls. At the firm level, I control for the size of the company measured as the log of total sales as firm size and productivity have been found to be crucial determinants of firm-level labor shares (Siegenthaler and Stucki, 2004;

Autor and Salomons, 2018; Dao et al., 2017). I also control for the capital intensity of a firm by measuring the total value of its property, plant and equipment. The more firms rely on capital relative to labor input, the smaller labor shares should be (Autor et al., 2017). Additionally I control for a range of time varying country level factors that might influence labor share trajectories. Most importantly, these measures include real GDP growth, the rate of unemployment, trade union density and the cost of capital, measured as real interest rates. Variable sources and summary statistics can be found in the SM (Table B.1).

4.2 Analysis

The analysis proceeds in two steps. First, I look at the effect of de jure tariff cuts on firm level labor shares. Second, I implement the IV regression, estimating the instrumented effect of import growth on labor shares across different levels of coordination. Finally, I analyze what drives these changes in labor shares. More specifically, I explore whether declining labor shares actually correspond to wage restraint.

Main Results

Table 1 presents the main findings for the analysis of de jure tariff cuts on changes of firm-level labor shares. Model (1) shows the simple correlation between tariff cuts, levels of wage bargaining coordination and within firm changes in labor shares, model (2) adds year fixed effects and the relevant controls and model (3) introduces the interaction term between trade liberalization and coordination as the main variable of interest.

Three results are especially relevant. First, in line with idea that trade liberalization only affects within-firm changes in countries with coordinated wage bargaining systems, tariff cuts have no significant effect on the development of firm-level labor shares if we take into account firms in all European countries. Second, disregarding exposure to increased price competition, firm-level labor shares in countries with more coordinated modes of wage-bargaining have developed slightly more positively. Given that without heightened price competition, wage coordination should increase employees bargaining power vis-a-vis their employers, this is again what we would expect. Third and most importantly, Table 1 shows that the interaction term between wage bargaining coordination and tariff cuts is negative. The more coordinated the wage bargaining system in which firms operate is, the more trade liberalization leads to a decline in firm-level labor shares.

TABLE 1: The Effect of De Jure Tariff Cuts on Firm-Level Labor Shares

	Dependent variable:		
	Firm Level Labor Share		
	(1)	(2)	(3)
Tariff Cut	−0.072	−0.040	0.019
	(0.039)	(0.034)	(0.018)
Coordination	0.444***	0.273*	0.284*
	(0.101)	(0.117)	(0.117)
Tariff Cut x Coordination			−0.051**
			(0.016)
Controls	×	✓	✓
Year Fixed Effects	×	✓	✓
Firm Fixed Effects	✓	✓	✓
Observations	76,535	65,565	65,565
R^2	0.774	0.783	0.783

Note: *p<0.05; **p<0.01; ***p<0.001

Coordination measures the level of wage bargaining coordination. Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level. Full models are in Table C.2 in the SM.
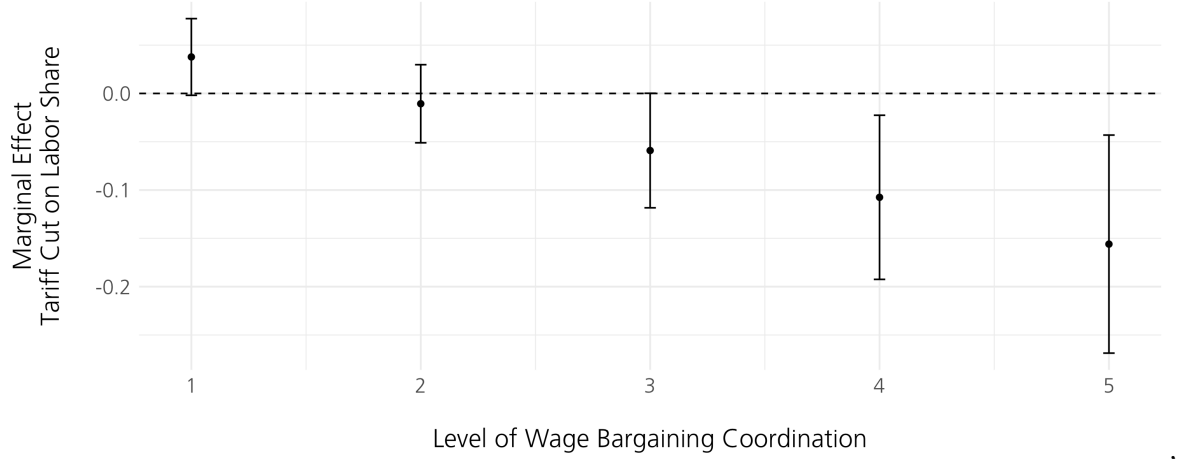
FIGURE 3: Marginal Effects of De Jure Tariff Cuts on Labor Shares Across Different Levels of Wage Bargaining Coordination. Estimates correspond to Model (3) in Table 1.

To facilitate the interpretation of this interaction term and to make sure that these differences are actually statistically significant (Brambor et al., 2006), Figure 3 plots the marginal effect of tariff cuts on firm-level labor shares at different levels of wage bargaining coordination. The results are in line with the argument suggested above. As expected, at

low levels of coordination, the effect of trade liberalization on labor shares is close to zero and statistically insignificant. This corresponds to the argument that if wages are the result of decentralized market forces, increased competitive pressure leaves firm-level labor shares unchanged. However, in line with the expectation that incentives and capacities for wage restraint increase with higher levels of wage bargaining coordination, the effect of import competition on labor shares turns increasingly negative and becomes statistically significant for values of 3 or higher on the coordination index. In highly coordinated systems, a 10 percentage point tariff cut, leads the labor shares of firms in affected industries to drop by about 1.5 percentage points.[12]

Next, I turn to analyzing the effect of de facto trade flows instead of de jure tariff cuts. A legitimate concern with looking at PTA tariff cuts only would be that preferential tariff cuts are on average small, most EU country partners are small and less developed and tariff cuts might therefore not actually to a relevant increase in import competition. Furthermore, based on de jure measures of trade liberalization it is hard to disentangle whether labor shares drop as a result of actual import competition or simply due to anticipated price pressure.

Table 2 therefore introduces logged import growth into the EU as an alternative measure of trade-induced import competition. Columns 1-3 show results for simple OLS estimates. Estimates remain similar to the results of de jure tariff cut with the exception of the interaction term between trade liberalization and wage bargaining coordination not gaining standard levels of statistical significance. However, given that sector-level import growth is unlikely to be exogenous to labor-share trajectories, column 4 applies the IV strategy instrumenting import growth with de jure tariff cuts to account for potential endongeneity. The first stage diagnostics show that the instrument is relevant: The IV's coefficient in the first stage ($\alpha = 0.038$) is highly significant ($t = 4.264$, $p < 0.001$) and the Kleibergen-Paap (K-P) statistics pass standard tests of instrument relevance.[13] In the IV regression, the co-

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[12]The results show average effects for all firms active in a specific sector in a specific country. As discussed above, wage restraint should most likely to occur in less productive firms, which would find it more difficult to survive without their employees reducing their wage claims. Ideally, I would therefore be able to test a triple interaction between import competition, wage bargaining coordination and a measure of firm-level productivity. However, since total factor productivity for firms is measured as the residuals of a production function calculated for each sector-year separately, including this measure in my analysis results in too many missings to draw meaningful inference. However, as very productive firms are usually in a minority, the fact that I find a negative average effect is in line with the rationale suggested in the argument.

[13]The Kleibergen-Paap weak identification F-statistics show that the IV surpasses the relevant thresholds calculated by Stock and Yogo (2005), i.e., 16.38 for the regressions with one endogenous regressor and 7.03 for the regressions with two endogenous regressors. Surpassing these critical values ensures that the 2SLS size distortion potentially resulting from weak identification is smaller than 10%.

TABLE 2: The Effect of Import Growth on Firm-Level Labor Shares

	Dependent variable:			
	Firm Level Labor Share			
	OLS	OLS	OLS	IV
Log Import Growth	0.17	−0.10	0.20	0.55
	(0.18)	(0.16)	(0.22)	(1.40)
Coordination	0.41***	0.27*	0.34**	0.60**
	(0.10)	(0.12)	(0.12)	(0.22)
Log Import Growth x Coordination			−0.12	−2.06*
			(0.10)	(0.91)
Controls	×	✓	✓	✓
Year Fixed Effects	×	✓	✓	✓
Firm Fixed Effects	✓	✓	✓	✓
K-P weak identification test (F)				18.22
Observations	76,535	65,565	65,565	65,565
R^2	0.73	0.78	0.76	0.78

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Coordination measures the level of wage bargaining coordination. Logged import growth gives total import growth into the EU measured at the SIC 4 digit level. Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level.

efficient of the main interaction term of interest becomes much larger and again statistically significant. As before, Figure 4 plots the marginal effect of instrumented import growth on firm-level labor shares across different levels of wage bargaining coordination. Similar to the results for de jure tariff cuts, trade liberalization has no effect on labor shares in liberal market economies, but significantly decreases wage shares in firms operating in systems with higher degrees of wage bargaining coordination. In highly coordinated countries, an increase of logged import growth by one standard deviation (0.766) reduces firm-level labor shares by about 5.75 percentage points.

Robustness and Alternative Measures of Coordination

I employ a range of robustness tests. First, labor shares in industries implementing trade liberalization might be on different trends than industries without tariff cuts. I therefore include industry-specific time trends to find support for the parallel trend assumption that is implicit in my de jure analysis. Column 1 in Table C.4 in the SM shows that this does not change the results substantially. Results are furthermore robust to the inclusion of a lagged dependent variable on the right-hand side of the model as well as to the introduction of an alternative measure of trade liberalization, which weighs tariff cuts by the value of sector-
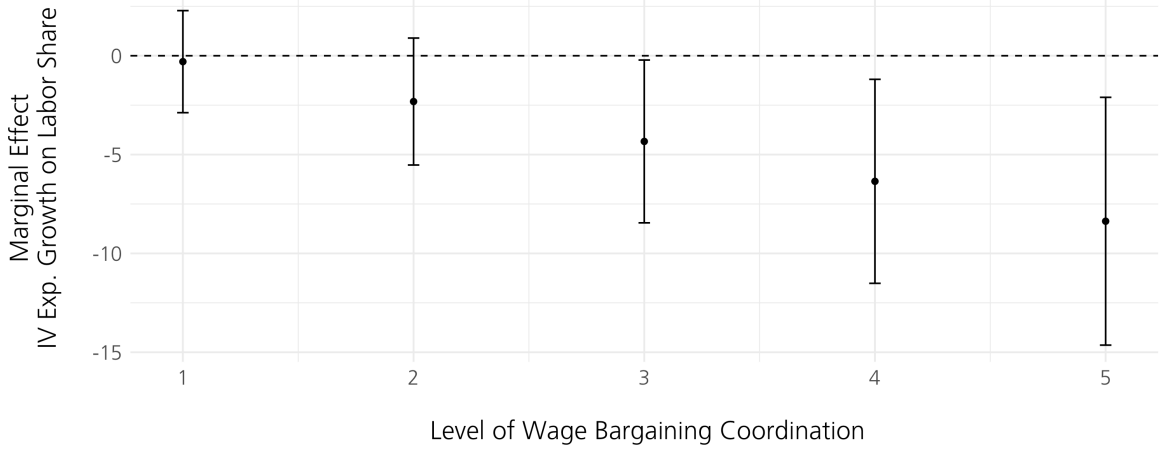
FIGURE 4: Marginal Effects of Instrumented Import Growth on Labor Shares Across Different Levels of Wage Bargaining Coordination. Estimates correspond to column (4) in Table 2.

specific product imports from the PTA partner countries[14] (columns 2 & 3 in Table C.4). Furthermore, PTAs are often negotiated based on package deals, in which both the EU and its trading partners agree to reduce tariffs at the same time. As a placebo test, I therefore repeat the analysis using export instead of import tariff cuts. As column 4 in Table C.4 shows, increased export opportunities leave firm-level labor shares unchanged, which further supports the argument that dropping wage shares in more coordinated market economies actually stem from increased import competition.

Another possible concern with regards to the findings presented is that measures of co-ordination could pick up a range of other country characteristics that are often associated with more coordinated market economies and have an independent effect on the trajectories of labor shares. To warrant against this problem, I show that my findings regarding market coordination are robust to the inclusion of additional interaction terms between trade liberalization and other country characteristics including trade union density, measures of left-party cabinet power and different aspects of welfare state generosity. Details on possible direction and measurements of these confounders are presented in section C.2 in the SM. Table C.5 shows that including additional interaction terms does not change the substance of my findings and even increases the magnitude of the negative interaction coefficient between trade liberalization and market coordination in some specifications.

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[14]For the details of this alternative measure, see p.1 in the SM and Baccini et al. (2018)

Finally, Tables D.6 and D.7 in the SM show that both my de facto as well as my IV estimations are robust to the usage of alternative measures of market coordination. As discussed above, I use wage bargaining centralization and the share of the workforce that is covered by wage agreements as alternative measures for institutional capacities for organized wage restraint. Moreover, I use the strictness of labor market regulation as a measure for the incentives employees have to curb wage demands in the context of heightened import competition. The intuition behind this proxy is that stricter labor laws should lead employees to acquire more firm-specific skills and thus become more dependent on their current employer. Results remain similar to before. Independent of the specific measure of labor market institutions, higher degrees of coordination lead to a more negative effect of trade liberalization on labor shares.

Mechanisms and Further Implications

So far, this paper has presented evidence that rising import competition causes firm-level labor shares in countries with more coordinated wage bargaining systems to fall. I now turn to testing my final hypothesis (H3), namely that the fall in labor shares is actually driven by wage restraint on the part of employees. In theory, firm level labor shares can drop for a number of other reasons including, for example, a turn towards more capital intensive forms of production or a layoff by large parts of the workforce (Karabarbounis and Neiman, 2012; Dauth et al., 2017). To further investigate the implications of my argument, Table 3 therefore provides evidence in line with the idea, that labor market coordination actually leads employees to curb their wage demands when facing globalization pressures.

First, it's hard to tell whether employees in more coordinated contexts engage in wage restraint by looking exclusively at the trajectories of firm-level wage shares. This ratio could fall if wage growth stays the same or even increases as long firm-level profits rise faster than firm-level wages. To test whether employees actually curb their wage claims as response to rising competitive pressure, models (1) and (2), therefore, analyze the effect of trade liberalization on firm-level wage growth, measured as the annual change in total staff expenses using both de jure tariff cuts and instrumented import penetration. In line with the argument that wage restraint needs to be organized, increased import exposure has no effect on firm-level wage growth in countries with largely decentralized systems. However,

TABLE 3: Mechanism

	Wage Growth		Employee Changes		Profits	
	De Jure	IV	De Jure	IV	De Jure	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Import	0.009	0.402	0.005	0.253	−0.021**	-1.488*
	(0.006)	(0.003)	(0.005)	(0.003)	(0.008)	(0.614)
Coordination	0.085***	0.128**	0.046***	0.065**	−0.230***	-0.205**
	(0.031)	(0.051)	(0.015)	(0.030)	(0.041)	(0.064)
Δ Import x Coordination	−0.009***	−0.385**	−0.005	−0.197	0.015**	0.540**
	(0.003)	(0.176)	(0.003)	(0.145)	(0.005)	(0.250)
Controls	✓	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓	✓
Firm Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	65,564	65,672	47,488	47,577	49,922	49,922
R^2	0.197	0.185	0.227	0.214	0.891	0.888

Note: *p<0.05; **p<0.01; ***p<0.001

Coordination measures the level of wage bargaining coordination. For de jure analyses, Δ import gives import tariff cuts. For the IV regressions, it measures instrumented logged import growth. Wage growth is measured as logged annual changes in total staff expenditures, employee changes as logged annual changes in numbers of employees and profits as logged gross profits. Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level.

the more coordinated wage bargaining institutions are, the more import competition leads to a significant reduction of total annual staff expenses.

Second, an alternative explanation for decreasing wage shares in more coordinated wage bargaining systems would be that employers in these contexts are more inclined to substitute labor with capital input if they confront mounting competitive pressure, which is the argument mechanism behind much of the literature on the effect of technological change on labor shares (Karabarbounis and Neiman, 2012; Dauth et al., 2017). In this case, labor shares as well as wage growth would not fall as a result of wage moderation on the part workers but simply because firms reduce their workforce and invest in machinery instead. To exclude this potential alternative explanation and to provide further evidence in line with the mechanisms at the heart of my argument, models (3) and (4) show that the decline in wage growth is not driven by a reduction of employees. Instead, trade exposure leaves the number of firm-level workers unchanged both in more decentralized and in more coordinated wage bargaining systems.

Finally, the argument that wage restraint drives declining labor shares in countries with more coordinated wage bargaining systems is also supported by the development of profits. As discussed above, the main rational for employees to engage in wage moderation should be to safeguard their jobs by reducing the negative impact of increased import competition on their firm's revenues. If this were the case, we should be able to see that larger levels of wage bargaining coordination actually cushion the effect of import competition on firm-level profits. Models (5) and (6) in Table 3 provide evidence in line with this rational. Increased import exposure significantly reduces the firms' profits in countries with highly decentralized modes of wage formation. However, the more coordinated wage bargaining systems are, the more this negative effect decreases. In fully coordinated systems, it even turns positive, though it remains statistically insignificant.

Summing up, the findings presented in this section suggest that domestic labor market institutions play an important role in explaining the global patterns of falling wages shares. The more coordinated domestic labor markets are, the more firm-level labor shares drop as a respond to trade liberalization. Furthermore, this effect seems be driven by wage restraint instead of an adjustment of the labor force and mitigates the negative repercussions of import competition on firm-level profits.

5   Conclusion

The global decline of labor shares is not only at odds with conventional economic wisdoms. The fact that an increasingly growing slice of the national income ends up in the hands of capital owners also fuels economic inequality and contributes to sluggish growth and macroeconomic imbalances.

Much of the existing literature has ascribed this trend to broad, structural factors, an increase in market concentration and the reallocation of economic activity towards more capital intensive firms, sectors and forms of production. While I agree with this general diagnosis, this paper has argued that existing theories overlook the role that the preferences and strategic capacities of workers play in this process. Rising competitive pressure confronts employees in less productive firms with a trade-off between wages and employment. The more coordinated domestic wage bargaining systems are, the more likely workers should be to prefer job security over wages and the more capable they should be to follow this preference.

As a result, import competition leads to more wage restraint and a larger reduction of firm-level labor shares, the more coordinated national wage bargaining systems are. I test this claim using a panel of balance-sheet data from publicly listed firms in 18 European countries. I exploit plausibly exogenous variation in import competition stemming from tariff cuts negotiated in PTAs at the EU level. I find evidence for my argument at the aggregate level, by using both de jure tariff cuts and instrumented import growth and across a broad range of robustness tests.

For theory, the finding that labor shares in more coordinated market economies fall not only more strongly but also for different reasons than in decentralized wage bargaining systems contribute to a more nuanced understanding of wage share dynamics. This has important implications for the analysis of global wage share trajectories (e.g. Karabarbounis and Neiman, 2012), our understanding of the potency of national labor market institutions in times of globalization (Glyn, 2007; Thelen, 2014) and theories about the domestic sources of global imbalances (Sattler and Haas, 2018; Manger and Sattler, 2015). It also re-emphasizes that economic effects of globalization differ across institutional contexts and that it is problematic to generalize from solely from the case of the US. My findings are, thus, in line with recent work by Baccini et al. (2018), who show that wage bargaining coordination tames the "winner-takes-all" effects of trade liberalization and distributes the fruits of globalization more evenly across firms. However, my findings also suggest that this comes at the expense of a significant redistribution of income from labor to capital. For policy, this suggests that different countries will have to develop different strategies to address trends towards rising functional income inequality.

A number of shortcomings of this study should be addressed in future research. First, my argument suggests that employees' response to rising competitive pressure depends on their relative preference and strategic capacity for wage restraint. Whereas both should on average be more prevalent in countries with coordinated wage bargaining systems, similar arguments could also be made about variation at the subnational level. Even in highly decentralized countries, there might be single industries or sectors were skill specificity and bargaining coordination developed enough, that wage restraint becomes a likely outcome. Future research should, therefore, further explore the role of firm and sector level variation in workers' preferences and capacities for wage restraint.

Second, my empirical analysis is exclusively based on publicly listed firms. While these firms constitute a substantial share of output and employment in most countries, they are by no means representative of the entire universe of firms. To make sure that the mechanisms proposed also applies to firms which are smaller or remain unlisted for different, we therefore need more encompassing firm-level panel data across different countries. Third, my design studies the effects of trade liberalization between Europe and partner countries that are often smaller and much less developed. Future iterations of this work should dig deeper into the effects of liberalization between trading partners that are more on par with each other. Finally, much of the recent literature on the effects of trade emphasize firm-level heterogeneity in productivity (Kim and Osgood, 2019). While data limitations keep me from analyzing how labor share dynamics differ across firm-level productivity, it is obvious that competitiveness crucially influences the incentives for wage restraint. Future research should thus study the relation between productivity, wage restraint and liberalization in more detail.

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** Supplementary Materials **

A   Construction of Trade Liberalization Variable

In constructing the measure of European tariff cuts, I largely follow Baccini, Pinto and Weymouth (2017). For the purpose of transparency, I briefly recap the main steps of constructing this variable here. Note that the procedure is to a large extent similar to the steps explained in Baccini and Dür (2018).

1. Baccini, Pinto and Weymouth (2017) have collected data for each preferential trade agreement (PTA) signed by the European Union (EU) since 1995. For each of these agreements, the authors list provide information on tariffs for all products included at the HS 6 digit level. These information include the preferential tariffs (PRF) at t_0, i.e. the year of ratification, and and in all subsequent years until the tariffs reaches zero (up to 22 years). The data thus lists the entire phase-out tariff period for each product in each EU PTA. In addition, the dataset also contains the Most-Favored Nation tariff for each product before the implementation of the PTA, which I use as the baseline for the tariff cut.

2. Based on this data, I create a tariff cut variable for each product in each PTA. In the year of the ratification of the PTA, the tariff cut is the difference between the PRF and the MFN. In all subsequent years, it is the difference between the lagged and the current PRF, i.e. $PRF_{t_{-1}} - PRF_t$.

3. For the robustness tests, I also create a weighted tariff cut by dividing the tariff cuts for each product by the value of product exports from the partner country into the EU.

4. I then sum all the tariff cuts (weighted and non-weighted) across all EU PTAs for a given product in a given year. This gives me the measure of product-level trade liberalization.

5. To merge with the COMPUSTAT firm data, I use existing crosswalk tables to sort all products into their corresponding 4-digit industry codes of the Standard Industrial Classification (SIC).

6. Finally, I take the average value of all my measures of tariff cuts (weighted and not weighted) in each year to move from HS 6-digit to SIC 4-digit. Importantly, I do not

sum all tariff cuts in this case because there are different numbers of 6-digit products in 4-digit industries. For each industry, where there is no corresponding product mentioned in any of the PTAs, I set the tariff cut in the respective year to 0.

To give an overview of this liberalization measure, Figure A.1 plots yearly average tariff cuts between 1995 and 2015 across industries. Note that while for the analysis, I use average tariff cuts at the much more fine grained SIC 4 digit level, for the purpose of readability, Figure A.1 presents averages at the SIC 2 digit level.
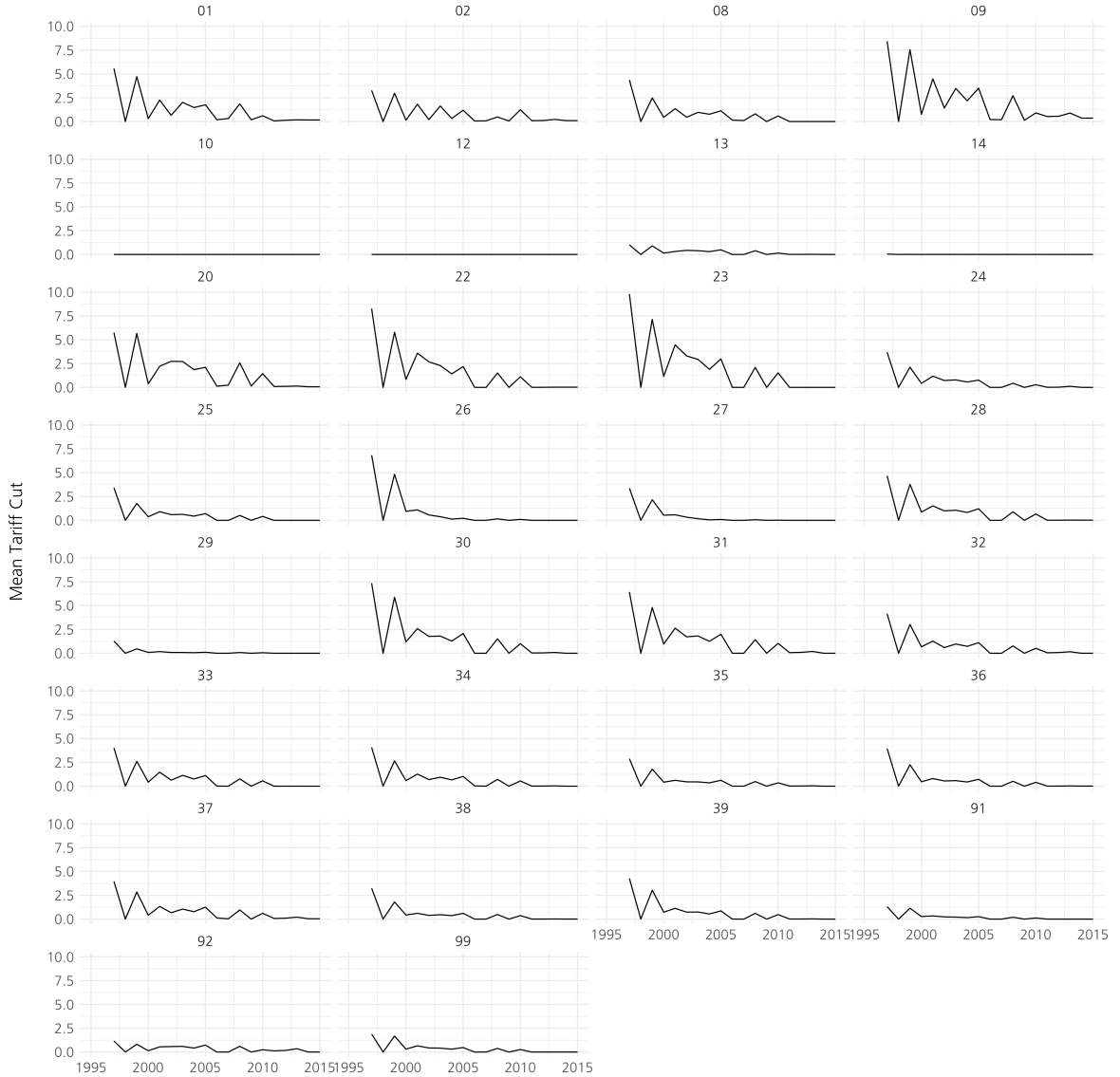
FIGURE A.1: Yearly average tariff cuts between 1995 and 2015 at the SIC 2 Digit Industry Level.

B Descriptives & Summary Statistics

TABLE B.1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Firm Level Labor Share	93,220	79.821	15.034	0.001	100.000
Tariff Cut	93,220	0.215	1.141	0	75
Log. Import Growth	93,220	0.158	0.767	−4.432	5.515
Coordination	81,822	2.717	1.319	1.000	5.000
Log. Sales	93,220	5.489	2.663	0.001	18.422
Log. Net PPE	93,176	4.014	2.836	0.000	18.148
Unemployment Rate	71,140	7.538	3.076	2.245	27.500
Real GDP Growth	71,140	1.678	2.283	−9.179	7.070
Trade Union Density	70,014	31.292	19.840	7.548	86.621
Weighted Tariff Cut	93,220	0.063	0.484	0	40
Wage Bargaining Centralization	73,950	0.326	0.180	0.083	0.925
Wage Bargaining Coverage	51,105	59.068	23.489	0.000	98.000
Left Government Cabinet Seats	71,140	49.185	42.305	0.000	100.000
Social Expendture (Per. GDP)	71,140	15.025	2.608	9.178	21.300
Public Expenditures (Perc. GDP)	71,140	46.943	5.990	30.937	63.528

First part of the table lists variables that are used in the main analysis, the second part those that are only employed in various robustness checks.

FIGURE B.2: Distribution of Firm-Level Labor Shares and Number of publicly listed Firm-Year Observations across different Levels of Wage Bargaining Coordination.

C Full Models & Robustness

C.1 Full Models

TABLE C.2: The Effect of De Jure Trade Libearlization on Firm-Level Labor Shares - Full Model

	Dependent variable:			
	Firm Level Labor Share			
	(1)	(2)	(3)	(4)
Tariff Cut	0.131	0.082	−0.040	0.019
	(0.090)	(0.060)	(0.034)	(0.018)
Coordination	−0.506**	−0.514**	0.273*	0.284*
	(0.174)	(0.177)	(0.117)	(0.117)
Log. Sales	3.941***	3.941***	5.745***	5.747***
	(0.522)	(0.522)	(0.498)	(0.498)
Net. PPE Value	−1.470***	−1.470***	−4.285***	−4.285***
	(0.405)	(0.405)	(0.387)	(0.387)
Unemployment Rate	−0.092*	−0.092*	−0.179***	−0.178***
	(0.041)	(0.041)	(0.040)	(0.040)
Real GDP Growth	−0.249**	−0.248**	−0.084*	−0.083*
	(0.078)	(0.077)	(0.032)	(0.032)
Union Density	−0.056***	−0.056***	0.219***	0.221***
	(0.009)	(0.009)	(0.059)	(0.059)
Real Interest	0.403***	0.405***	0.164*	0.162*
	(0.083)	(0.083)	(0.070)	(0.070)
Tariff Cut x Coordination		0.043		−0.051**
		(0.048)		(0.016)
Year Fixed Effets	✓	✓	✓	✓
Firm Fixed Effects	×	×	✓	✓
Observations	65,565	65,565	65,565	65,565
R^2	0.245	0.245	0.783	0.783

Note: *p<0.05; **p<0.01; ***p<0.001

Models correspond to models (1) to (4) in Table 1 of the main analysis. All standard errors are clustered at the industry level (level of treatment assignment).
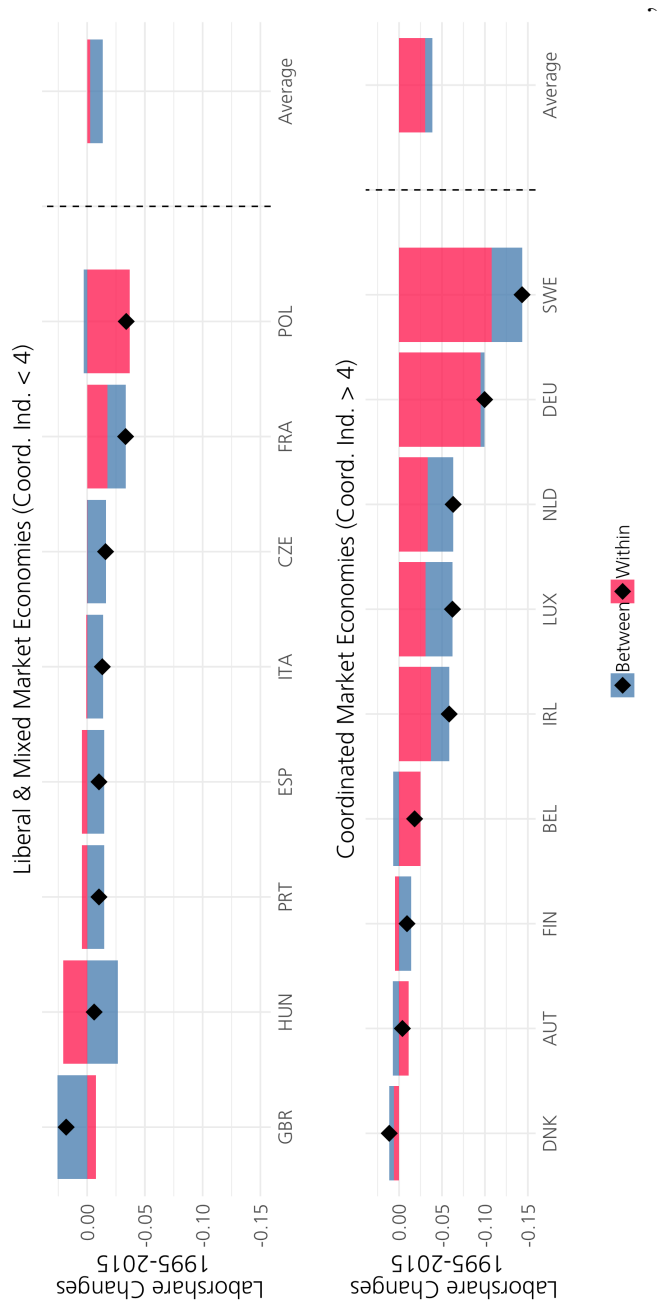
FIGURE B.3: Each bar represents the cumulated sum of a shift-share decomposition of labor share dynamics in publicly listed firms over adjacent five-year intervals between 1995-2015.

TABLE C.3: The Effect of Import Growth on Firm-Level Labor Shares - Full Model

	Dependent variable:			
	Firm Level Labor Share			
	OLS 1	OLS 2	OLS 3	IV
Log Exp. Growth	0.22	0.33	−0.05	0.55
	(0.49)	(0.51)	(0.21)	(1.40)
Coordination	−0.50**	−0.48**	0.28*	0.60**
	(0.17)	(0.17)	(0.12)	(0.22)
Log. Sales	3.96***	3.96***	5.74***	5.75***
	(0.52)	(0.52)	(0.50)	(0.50)
Net. PPE Value	−1.49***	−1.49***	−4.28***	−4.27***
	(0.40)	(0.40)	(0.39)	(0.39)
Real Interest	0.41***	0.41***	0.16*	0.16*
	(0.08)	(0.09)	(0.07)	(0.07)
Unemployment Rate	−0.09*	−0.09*	−0.18***	−0.17***
	(0.04)	(0.04)	(0.04)	(0.04)
Real GDP Growth	−0.25**	−0.25**	−0.08**	−0.08*
	(0.08)	(0.08)	(0.03)	(0.03)
Union Density	−0.06***	−0.06***	0.22***	0.20***
	(0.01)	(0.01)	(0.06)	(0.06)
Log Exp. Growth x Coordination		−0.07	−0.02	−2.02**
		(0.09)	(0.10)	(0.74)
Year Fixed Effets	✓	✓	✓	✓
Firm Fixed Effects	×	×	✓	✓
Observations	65,565	65,565	65,565	65,565
R^2	0.24	0.24	0.78	0.78
K-P weak identification test (F)				31.43

***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Models correspond to models (1) to (4) in Table 2 of the main analysis. Coordination measures the level of wage bargaining coordination. All standard errors are clustered at the industry level (level of treatment assignment).

C.2 Robustness

TABLE C.4: De Jure Trade Libearlization on Firm-Level Labor Shares - Robustness Tests

	Dependent variable:			
	Firm Level Labor Share			
	(1)	(2)	(3)	(4)
Tariff Cut	0.006	0.002		
	(0.028)	(0.027)		
Weighted Tariff Cut			0.019	
			(0.045)	
Export Tariff Cut				0.002
				(0.001)
Coordination	0.807***	0.792***	0.799***	0.792***
	(0.124)	(0.121)	(0.124)	(0.124)
Lagged Labor Share		0.141***		
		(0.010)		
Tariff Cut x Coordination	−0.058**	−0.051**		
	(0.019)	(0.018)		
Weighted Tariff Cut x Coordination			−0.143**	
			(0.053)	
Export Tariff Cut x Coordination				−0.0004
				(0.002)
Controls	✓	✓	✓	✓
Year Fixed Effects	×	✓	✓	✓
Linear Time Trend	✓	×	×	×
Firm Fixed Effects	✓	✓	✓	✓
Observations	64,097	64,096	64,097	64,097
R^2	0.754	0.763	0.754	0.754

Note: *p<0.05; **p<0.01; ***p<0.001

Coordination measures the level of wage bargaining coordination. Weighted Tariff Cut introduces an alternative measure of trade liberalization by weighting tariff cuts by the value of product-level imports from the PTA partner into the EU. Export Tariff Cuts measures the reductions of tariff that EU exporters in partner markets and serves as a placebo test. All standard errors are clustered at the industry level (level of treatment assignment).

Additional Interaction Terms

A legitimate concern regarding the interpretation of the main findings in the paper would be that the measures of market coordination could pick up the effects of other country characteristics that are often associated with coordinated market economies and which are actually driving the differences in the way in which trade liberalization affects firm level labor shares. To mitigate this concern, I include interaction terms between Tariff Cuts and and a number of alternative country-level characteristics, which might be associated with labor shares, into the main analysis I test for the following potential confounders.

- **Trade Union Density** A number of studies have found that larger and more powerful trade unions positively influence labor shares (e.g. Kristal, 2013; Bental and Demougin, 2010). I thus include trade union density as a classical measure of trade union power into the analysis. The variable measures net union membership as a proportion wage and salary earners in employment (Armingeon et al., 2017).

- **Left Government** Government policies can affect wage shares through numerous channels (e.g. Blanchard and Giavazzi, 2003; Kristal, 2010; Dünhaupt, 2013). I there for control for an interaction term between tariff cuts and the percentage of cabinet posts of social democratic and other left parties in percentage of total cabinet posts, weighted by the number of days in office in a given year (Armingeon et al., 2017).

- **Unemployment Support and Active Labor Market Programmes** Employees willingness to engage in wage restraint might also depend on the material costs of unemployment and potential support for relocation into other industries or sectors. To cover the former, I include a variable that measures social security transfers as a percentage of GDP (OECD, 2016). For the latter, I include a measure of public and mandatory private expenditure on active labor market programmes as a percentage of GDP (OECD, 2016)..

As table C.5 shows, interacting these possible confounders with trade liberalization does not yield any significant results and does not affect the main interaction term of interest. The magnitude of the main effect does not shrink and even increase in some model specification.

TABLE C.5: Additional Interactions between Country Characteristics and Tariff Cuts

	Dependent variable:			
	Firm Level Labor Share			
	(1)	(2)	(3)	(4)
Tariff Cut	0.016	−0.007	−0.004	0.032
	(0.068)	(0.052)	(0.118)	(0.033)
Trade Union Density	0.174***			
	(0.063)			
Left Government		−0.005***		
		(0.002)		
Social Expenditure (% GDP)			0.358**	
			(0.140)	
Active Labor Market Programmes (% GDP)				1.411**
				(0.614)
Coordination	0.331***	0.303**	0.284**	0.440***
	(0.119)	(0.120)	(0.113)	(0.114)
Tariff Cut x TU Density	0.0003			
	(0.002)			
Tariff Cut x Left Government		0.001		
		(0.001)		
Tariff Cut x Soc. Expenditure			0.004	
			(0.009)	
Tariff Cut x ALM Programmes				0.045
				(0.073)
Tariff Cut x Coordination	−0.050***	−0.049**	−0.062***	−0.063***
	(0.018)	(0.020)	(0.021)	(0.023)
Year Fixed Effects	✓	✓	✓	✓
Firm Fixed Effects	✓	✓	✓	✓
Observations	64,097	64,205	64,205	57,160
R^2	0.764	0.764	0.764	0.765

Note: *p<0.1; **p<0.05; ***p<0.01

Coordination measures the level of wage bargaining coordination. Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level.

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D   Additional Measures of Market Coordination

- **Labor market regulation** is constructed as an additive index of two variables. The first measures the strictness of the regulation of individual dismissal of employees on regular/indefinite contracts. The second measures the strictness of similar regulations for fixed-term and temporary work agency contracts. Both indicators are based on measures of legislation as well as enforcement processes and range on a scale from 0 to 6 with higher values indicating stricter employment protection (Armingeon et al., 2017).

- **Wage bargaining centralization** index combines a measure of the level of bargaining (centralized, intermediate, and decentralized) with a measure of union concentration. The index also takes into account the degree of enforceability of wage agreements (i.e., the ability of lower-level bargainers to elude the agreement). The index ranges from 0 to 1, where 1 corresponds to full centralization. (Visser, 2015).

- **Bargaining coverage** measures the number of employees covered by wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargain. The measure is, thus, constructed as percentages and is adjusted for the possibility that some sectors or occupations are excluded from the right to bargain (Visser, 2015).

TABLE D.6: Alternative Measures of Market Coordination - De Jure Tariff Cuts

	Dependent variable:		
	Firm Level Labor Share		
	(1)	(2)	(3)
Tariff Cut	0.055	0.048	0.220*
	(0.029)	(0.027)	(0.094)
Labor Market Regulation	−3.079***		
	(0.358)		
Bargaining Centralization		−0.179***	
		(0.027)	
Bargaining Coverage			−0.032
			(0.018)
Tariff Cut x LM Regulation	−0.022*		
	(0.011)		
Tariff Cut x Centralization		−0.003**	
		(0.001)	
Tariff Cut x Coverage			−0.004*
			(0.002)
Controls	✓	✓	✓
Year Fixed Effects	✓	✓	✓
Firm Fixed Effects	✓	✓	✓
Observations	65,565	62,637	44,327
R^2	0.766	0.763	0.776

Note: *p<0.05; **p<0.01; ***p<0.001

Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level.

TABLE D.7: Alternative Measures of Market Coordination - Import Growth

	Dependent variable:					
	Firm Level Labor Share					
	OLS	IV	OLS	IV	OLS	IV
Log Import Growth	0.31	2.52	0.01	2.81	0.94	10.20*
	(0.38)	(1.29)	(0.36)	(1.89)	(0.68)	(4.71)
Labor Market Regulation	−3.08***	−2.77***				
	(0.35)	(0.48)				
Log Import Growth x LM Regulation	−0.08	−0.96*				
	(0.08)	(0.49)				
Bargaining Centralization			−17.99***	−14.56***		
			(2.69)	(3.16)		
Log Import Growth x Centralization			−0.05	−15.16*		
			0.98	(7.32)		
Bargaining Coverage					−0.03	−0.01
					(0.02)	(0.02)
Log Import Growth x Coverage					−0.02	−0.14*
					(0.01)	(0.06)
Controls	✓	✓	✓	✓	✓	✓
Firm Fixed Effects	✓	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓	✓
Num. obs.	65565	65673	62637	62637	44327	44327
R^2	0.77	0.76	0.76	0.76	0.78	0.77
K-P weak identification test (F)		23.99		19.87		42.64

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Firm-level controls include the logged value of total sales and the capital stock (measured as the overall value of all property, plant and equipment). Country-level controls include real GDP growth, unemployment rate and real interest rates. All standard errors are clustered at the industry level.