OXFORD

Article

European institutional integration, trade unions and income inequality

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Abstract

What are the distributional implications of European institutional integration? This article argues that European institutional integration exerts a moderating effect on the relationship between trade union strength and income inequality—particularly inequality at the top—within countries of the European Union (EU). I contend that European institutional integration reduces the bargaining power of trade unions due to rising market competition and decreasing union control over the supply of labor. Thus, the effectiveness of trade unions in reducing inequality should decline with progressing European institutional integration. On the basis of a long-term within-country analysis of the EU15, I will show that the effect of trade unions on inequality varies strongly with European institutional integration. Consistent with the theoretical argument, the inequality-reducing effect of trade unions becomes substantially lower the more a country integrates in the EU.

Key words: Europe, economic integration, trade unions, inequality, political economy

JEL classification: F150 economic integration, F160 trade and labor market interactions, J5 labor–management relations, trade unions and collective bargaining

1. Distributional implications of negative integration

Described in such terms so many times that it has almost become an empty phrase, it is still worth reminding: The European Union (EU) is a unique historical experiment. On a continent battered by perennial hostility and destruction, the process of European institutional integration starting in the 1950s must be seen as a bold attempt of replacing war with cooperation. The EU's contribution to 'the advancement of peace and reconciliation, democracy and human rights' (Norwegian Nobel Committee, 2012) is a shining example far beyond its own borders:

The overall success of the European Union in regional integration, despite regular setbacks, has spurred regionalism worldwide as the EU demonstrates that regionalism can be instrumental in overcoming historical animosities, in embedding democracy and the rule of law, and in guaranteeing regional security which in turn fosters overall stability. This success challenges partners globally and inspires regional integration movements in all parts of the world (Reiterer, 2006, p. 224).

However, while the EU overall has received much praise, specific features of the European integration process have drawn significant criticism. A particularly prominent line of critique argues that European integration is biased in favor of economic interests and neglects the social policy dimension (Leibfried and Pierson, 1995; Pollack, 2005; Rhodes, 1996; Streeck, 1996, 1997). Put differently, the process of European institutional integration is criticized for giving much more weight to market liberalization than to social regulation. Scholars have described this as an asymmetry between negative integration, which means the removal of trade barriers and market rigidities, and positive integration, that is social regulations that correct market dysfunctions. Scharpf (1996, 1999) identifies different actors as the main cause of this development. On one hand, negative integration has mainly been driven by the European Commission (EC) and the European Court of Justice (ECJ), which both have been able to gradually expand their authority vis-à-vis EU member states. On the other hand, positive integration has largely remained a member states' issue and as such depends on high levels of agreement among governments. Yet due to economic, ideological and institutional differences, agreement is extremely hard to come by and so social policy remains by and large confined to national policy making. Many commentators fear that these diverging dynamics have enabled actors at the European level to promote an agenda of labor market deregulation and privatization (Kosonen, 1995; Offe, 2003). The few national options that remain are on the supply side and include flexibilization of employment conditions, increasing wage differentiation and welfare state retrenchment (Scharpf, 2002).

Against the backdrop of this important body of literature, it is surprising that empirical research has paid relatively little attention to the distributional implications of European institutional integration. The seminal studies by Jason Beckfield (2006, 2009) are to my knowledge the first to systematically test the relationship between European integration and income inequality. He finds that both economic (trade within the EU) and political (number of cases referred from national courts to the ECJ) integration exhibit a positive correlational link with income inequality within countries as measured by Gini coefficients between 1972/3 and 1997. Later studies (Bertola, 2010; Busemeyer and Tober, 2015; Ochsenfeld, 2018) have focused more on the distributional effects of the Economic and Monetary Union (EMU). They, too, find a positive association with income inequality.

Despite being significant contributions to our understanding of how European integration affects inequality, all of these studies have their shortcomings. While Beckfield (2006, 2009) provides an extensive list of mechanisms through which the process of Europeanization might affect the distribution of income, he tests none of these causal channels explicitly. The later studies do a better job in this regard by either providing evidence for EMU's depressing effect on social spending (Bertola, 2010; Busemeyer and Tober, 2015) or by showing how the euro distorted real interest and exchange rates and how these distortions eventually reverberated to the wage distribution (Ochsenfeld, 2018). Yet given their narrow focus on the EMU, these contributions are inevitably limited across time and thus

are not able to test empirically the longstanding socioeconomic criticism that has been leveled against European institutional integration.

This article attempts to address the shortcomings in existing research by spelling out and testing a major channel through which European institutional integration affects income inequality. The subsequent theoretical argument is based on two considerations. First, the fact that European institutional integration attaches much more importance to market liberalization than to social protection adversely affects trade unions because of the difficulties unions have in organizing effectively both on the national as well as European level. Second, empirical studies show that trade unions are a key factor in reducing income inequality. Especially the rise of top income shares seems to be related to the weakening of unions. Taken together, I derive a novel interactive hypothesis that claims that as European institutional integration increases, the dampening effect of trade unions on inequality declines. I test this interactive relationship using a time-series cross-section (TSCS) dataset, where the main model specification covers 15 EU members between 1955 and 2014. The analysis finds that there is an integration-varying impact of trade unions on income inequality. Consistent with the theoretical argument, the inequality-reducing effect of trade unions decreases in response to progressing European institutional integration. The conditioning influence of European institutional integration is substantial.

The rest of the article is organized as follows. Section 2 presents the theoretical argument and derives empirical implications on the effects of European institutional integration, trade unions and their interaction on income inequality. Section 3 develops the empirical strategy based on data description and model specifications. In turn, Section 4 discusses the empirical results. Finally, Section 5 concludes.

2. Trade unions in an integrated Europe

I argue that European institutional integration conditions the negative impact of trade unions on income inequality. Thus, this section starts by reviewing the literature on the nexus between unions and inequality—especially inequality at the top. In the next step, I elaborate on the conditioning role of European institutional integration.

2.1 The impact of trade unions on (top) income inequality

The literature provides much evidence that unions have an equalizing impact on the overall distribution of income through various channels (DiNardo *et al.*, 1996; Card, 1996b, 2001; Alderson and Nielsen, 2002; Rueda and Pontusson, 2000; Bradley *et al.*, 2003; Card *et al.*, 2004; Western and Rosenfeld, 2011; Ahlquist, 2017). Some argue in contrast that both the decline in unionization and the corresponding increase in inequality are actually the result of skill-biased technological change (Acemoglu *et al.*, 2001). However, empirical studies that examine the independent effect of technological change and declining union membership find that deunionization seems to be the more important driver behind the rise in inequality (Fernandez, 2001; Kristal and Cohen, 2017).

There are at least two channels by which trade unions may affect top income inequality. First, weak unions translate into reduced bargaining power of workers relative to capital owners, which in turn implies a reduction in the labor income share (Blanchard and Giavazzi, 2003; Kristal, 2013). It follows from the fact that capital incomes tend to be highly

concentrated that higher capital income shares should lead to increased top income inequality (Jaumotte and Osorio-Buitron, 2015). Second, trade unions serve as a confining factor for executive management (Huber *et al.*, 2019; Kristal and Cohen, 2017). A growing body of empirical research finds that union strength depresses executive compensation (Jensen and Murphy, 1990; DeAngelo and DeAngelo, 1991; DiNardo *et al.*, 1997; Gomez and Tzioumis, 2006; Banning and Chiles, 2007; Goldstein, 2012; Shin, 2014; Huang *et al.*, 2017). The studies explain this finding in various ways, including decreasing rents for managers and owners due to higher union rents, overall labor cost considerations (higher executive compensation might invite higher wage demands by unions), attempts to mitigate the chance of labor strikes, unions' shareholder activism (primarily through pension funds) and the efforts of unions to restrict stock options compensation. Furthermore, Goldstein (2012) shows that labor unions reduce the number of managerial employees overall.

In addition to these two explicit channels, the effect of trade unions on top income inequality has also been studied in a more general class-based framework (usually drawing on the power resource theory, for instance, Huber *et al.*, 2019). Here top incomes serve as an implicit proxy for the class of business actors, whereas the remaining bottom part of the income distribution serves as a proxy for workers. The argument—similar to the first channel from above—is that an increase in the strength of trade unions and left-wing parties empowers workers in their distributive struggle with employers and therefore should be associated with a decrease in top income inequality (Hager, 2018).

On the basis of these theoretical considerations, it comes as little surprise that extant empirical contributions on the impact of trade unions on top income inequality provide evidence for a moderating effect of the former (Scheve and Stasavage, 2009; Volscho and Kelly, 2012; Jaumotte and Osorio-Buitron, 2015; Huber *et al.*, 2019). In fact, Hager (2018, p. 15) concludes in her review article on top incomes that '. . . union strength provides what is perhaps the most robust predictor of top incomes across time and space'. Thus, I derive the following first hypothesis on the relationship between trade unions and income inequality:

> Hypothesis 1: The strength of trade unions decreases inequality, including at the top of the income distribution.

2.2 The conditioning role of European institutional integration

In February 2016, two weeks before David Cameron formally announced that a referendum would be held on the UK's membership of the EU, Paul Embery—a regional secretary of the Fire Brigades Union in London—called on fellow trade unionists to vote for leave with these words:

> Instead of promoting investment, full employment and strong public services, EU leaders have forced through cuts, privatisation and liberalisation—the worst possible response to the economic crisis, and the reason why so many European economies have struggled to escape from it. This strategy of austerity is rooted in the neoliberal ideology that has long lain at the core of the EU project and has been the driver for a set of laws inimical to the objectives of trade unions. (Embery, 2016)

Indeed, the process of European institutional integration has long been criticized for favoring market-making (negative integration) over market-correcting (positive integration) measures [see Crespy and Menz (2015) for a recent application of this critique]. This theme

also figures prominently in those studies on the distributional implications of European integration, which argue that integration decreases the bargaining power of organized workers (Beckfield, 2006, 2009; Busemeyer and Tober, 2015). How might European institutional integration affect the effectiveness of trade unions?

The main goal of European institutional integration has always been to strengthen economic ties between the participating countries. The institutional steps taken range from the early establishment of a customs union in the late 1950s to the adoption of the euro as common currency—the biggest step in European institutional integration so far (Martin and Ross, 2004). This process of economic deepening has opened up domestic markets to European trade and has facilitated the flow of capital between European countries beyond expectations. Both of these developments should negatively affect the bargaining power of trade unions, which critically depends on available surplus that can be captured by unions resulting in higher wages or better working conditions, and the ability to control the supply of labor (Booth *et al.*, 2000). First, increased trade is associated with increased product market competition. Badinger (2007) shows that competition in the Common Market has led to a significant reduction in firms' markups over marginal costs both in manufacturing and construction industries. Consequently, increasing competition weakens trade union power due to a decrease in capturable profits (cf. Card, 1996a; Guadalupe, 2007). In other words, the rise in product market competition implies that there are fewer rents to share and hence wages approach market-determined levels.

Second, a significant portion of intra-EU cross-border capital flows like foreign direct investment (FDI) takes place in the form of outsourcing and offshoring (Egger and Egger, 2003; Geishecker, 2006; Marin, 2006). In that sense, FDI is often motivated by labor market considerations. Having production units in different countries enhances the bargaining positions of firms, which can now—especially in the case of industrial dispute—credibly threaten with the relocation of production (Boeri *et al.*, 2001). In the presence of these risks, 'unions find themselves compelled to accept lower wages or less attractive employment conditions in order to save existing jobs' (Scharpf, 2002, p. 649).

In an influential article, Streeck and Schmitter (1991) explain why the increasing weakness of organized labor's bargaining position at the national arena has not been counterbalanced at the European level. To begin with, so these authors argue, trade unions as European actors face organizational difficulties that are usually not present at the national level and that affect business to a much lesser extent. These difficulties include problems posed by various national languages, ideological divisions between different political orientations and the wide differences in economic geography causing diverging interests between national union representatives (see also Visser and Ebbinghaus, 1992).[1]

On the other hand, European capital is relatively well organized and promotes the interests of firms and industries in a coherent manner. The overriding goal of profit maximization, shared by all firms and industries, provides capital with a natural sense of coherence

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1 The formation of the European Trade Union Confederation (ETUC) in 1973—despite being a significant improvement in labor's ability to organize at the EU level—has also not been sufficient to overcome these fundamental differences. In particular, the ETUC faces two trade-offs that seriously weaken its bargaining position (Bernaciak *et al.*, 2014): Broad representation versus goal-driven homogeneity and political independence versus financial dependence on European institutions.

and group identity. Additionally, since capital has a long history of international business practice, business is not only better equipped but also more experienced in organizing at the supranational level (Greenwood *et al.*, 1992). The ensuing imbalance between capital and labor allows business to prevent the Europeanization of regulatory capacity that would be required to make binding commitments at the supranational level. 'The result is growing interdependence between national economies due to progressing market integration without proportionate growth of regulatory institutions—with the consequence of integration and deregulation becoming one and the same' (Streeck and Schmitter, 1991, p. 142).

The deregulatory nature of the European integration process is further stimulated by the unanimity principle of decision making that generally favors those interest groups that want to prevent certain decisions. Along with the long tradition of supranational bodies like the EC or the ECJ to support negative over positive integration (Scharpf, 1996, 1999; Streeck, 1996), it is only logical that there is no European-centered collective bargaining between capital and labor. The fact that capital is more mobile than labor within the borders of the internal market, and the strategic product and labor market advantages that follow from this make future centralization highly unlikely. Recent research highlights the topicality of Streeck and Schmitter's analysis by showing that both employers and EU actors like the EC still stand firmly opposed to European-wide coordination of wage setting with trade unions (Pernicka and Glassner, 2014).

It is important to note that the distributional repercussions of decreasing union bargaining power because of increasing European integration are felt differently across different social groups. Wages of workers with low skill levels who are easier to replace than high-skilled workers or those with specific skill sets are particularly affected, as employers are more likely to base their hiring and firing decisions on cost considerations in these cases (Ridao-Cano and Bodewig, 2017). The relocation of production, too, has different wage effects across educational groups. Research on the wage implications of outsourcing and off-shoring shows that both business strategies decrease the wages of unskilled labor and, at the same time, raise skilled labor wages (Egger and Egger, 2003; Geishecker, 2006; Hummels *et al.*, 2014). On top of this, European integration has contributed to an increasing concentration of capital income and wealth at the top of the distribution [particularly in North and Continental Europe, see Ridao-Cano and Bodewig (2017)], which in turn has reverberated to the distribution of personal income as well (Schlenker and Schmid, 2015).

In short, European institutional integration weakens the bargaining power of trade unions by reducing the available surplus and by undermining union control over the supply of labor. At the same time, union weakness in the national political arena is not compensated at the European level as labor is mainly organized nationally and capital (backed by major EU actors) opposes successfully any kind of EU-centered collective bargaining. Consequently, the negative effect of trade union strength on income inequality decreases as European institutional integration increases. Combined with the specific distributional implications of European institutional integration, the result is increasing inequality. In summary, I derive the following second hypothesis on the conditioning role of European institutional integration:

> Hypothesis 2: The dampening effect of trade unions on income inequality—especially inequality at the top—declines with increasing European institutional integration.

3. Empirical strategy

I test the key implications of the theoretical argument using a country-level modeling strategy. Drawing on long-term TSCS data, the goal is to estimate how the effect of union strength on income inequality varies across different levels of European institutional integration. The theory predicts that the equality-enhancing effect of trade unions should decrease as European institutional integration increases.

3.1 Measurement

While information on trade union strength is relatively abundant both across space and time, a major challenge for the empirical analysis is to collect long-term cross-country data on income inequality and European institutional integration. Subsequently, I explain how these as well as additional control variables are measured. The main sample covers 15 European countries richly observed between 1955 and 2014.[2]

3.1.1 Income inequality

To measure income inequality, I draw on the World Inequality Database that was painstakingly put together using a combination of national accounts, survey and fiscal data (Alvaredo *et al.*, 2017). In particular, I use available estimates of the top decile (top 10% income share) and top percentile (top 1% income share) of the pre-tax national income distribution. The database is unique in that it covers a much longer period than other data sources. Furthermore, alternative inequality measures usually rely on household survey data, which suffer from top coding, small sample size and undercoverage of top incomes. This may explain why these alternative inequality statistics frequently report significantly slower increases in inequality than top income share statistics since the mid-1990s (Jaumotte and Osorio-Buitron, 2015). Nevertheless, in an effort to compare the initial results to other (likely underestimating) inequality measures, I will repeat the empirical analysis with pre-fisc Gini coefficients from the Standardized World Income Inequality Database (Solt, 2018). Moreover, I will use pre-fisc 90-10, 90-50 and 50-10 percentile earnings ratios from the OECD [previous research finds a statistically negative association of these ratios with union strength, see Rueda and Pontusson (2000), Rueda (2008), Vlandas (2018)].

3.1.2 European institutional integration

Most extant measures of European integration do not explicitly capture the degree of institutional integration at the member states level. While some measure integration only at the entire EU level (Leuffen *et al.*, 2013), others attempt to proxy for the institutional dimension (for example, in the form of nationally referred ECJ cases as in Beckfield, 2006, 2009) or focus merely on specific institutional steps like the EMU (König and Ohr, 2013). The measure used in this study—to my knowledge applied for the first time in the political economy literature—is an index of European institutional integration developed at the European Central Bank (ECB) (Dorrucci *et al.*, 2002). The numerical composite index meticulously accounts for institutional change from the beginnings of the EU until 2004 by attributing scores to

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2 The so-called EU15 that compromise the following 15 countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK.

each single event of European institutional integration. The scores are grouped within five stages: (a) free-trade area where internal tariffs and quotas among member countries are abolished; (b) customs union where common external tariffs and quotas are set up; (c) common market where restrictions on internal factor movements are abolished; (d) economic union where a significant degree of policy coordination and law harmonization is achieved; (e) total economic integration where economic policies are conducted at a supra-national level. The first two stages are combined and each of the resulting four stages has a maximum score of 25 so that the total index ranges from 0 (no integration) to 100 (full integration). Dorrucci *et al.* (2002, pp. 33–41) provide a detailed description of the measurement criteria, indicators and scores of the index.

While the original version of the index included only the six founding members, it was later updated to the nine countries that joined the EU between 1973 and 1995 (Mongelli *et al.*, 2005). Krieger-Boden and Soltwedel (2013) improved the index by expanding it to all EU15 countries, time-smoothing data over accession periods and taking into account pre-accession membership of the European Free Trade Association, as well as exemptions of some acceding countries like Denmark and the UK from Schengen and the EMU. In order to update the index for the most recent years, I rely on another novel index by the ECB, which measures the depth of integration for the EU as whole (Dorrucci *et al.*, 2015). The data appendix of this index lists all important institutional integration steps for the period 2005–2014. On the basis of this list, I update the country-level index by assessing which countries participated in these steps and which did not (Table A2 in the Online Appendix summarizes all integration steps, values assigned to each step and exempted countries). In the wake of the Lisbon treaty and the Eurozone crisis, the period in question saw a large number of institutional reforms. To give these steps appropriate weight, I discard the arbitrary limit of 100 such that higher numbers of the additive index indicate deeper integration without upper bound.

The resulting index (see Figure 1, where the light lines indicate average integration across all countries) closely tracks all pivotal events of European institutional integration (especially the custom union of 1968, the common market of 1993 and the monetary union of 1999). Mongelli *et al.* (2005) show that these institutional events causally preceded advances in market integration. This makes the index an appropriate measure for the theoretical argument, which in general terms claims that the market-making logic of European integration inhibits effective trade union action. Moreover, as the index captures exclusively institutional progress based upon events that are exclusively European, this measure is clearly distinct from the process of globalization.[3]

3.1.3 Trade union strength
To capture union strength, I employ the standard measure of trade union membership drawing on data from Visser (2016) from 1960 onward and Golden (2009) for the years between 1950 and 1959. Using membership data to measure union strength is sometimes contentious. France is a case in point where membership is low but unions are still strong due to

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3　Besides time (concrete institutional steps) and location, Europeanization differs from globalization in another important respect. As European integration reduces transaction costs between Member States, it discriminates against all non-EU countries by increasing relative transaction costs (Krieger-Boden and Soltwedel, 2013).
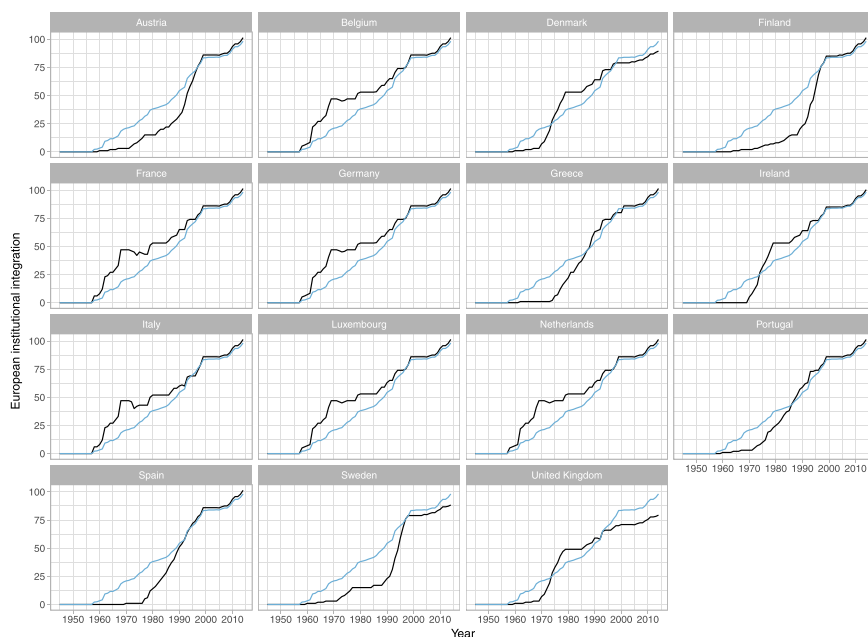
Figure 1. European institutional integration, 1945–2014.
Notes: The black lines indicate country-specific levels of European institutional integration. The light lines delineate the average levels of European institutional integration across all countries.

extensive statutory powers. However, on a more general note, the main source of union strength is the capacity to organize as many workers as possible. If trade union density is high, unions effectively control the supply of labor and thus can potentially inflict substantial damage on firms and employers by withdrawing their members.

3.1.4 Control variables

A series of standard controls enters the models (cf. Huber *et al.*, 2019; Jaumotte and Osorio-Buitron, 2017). Data on the bargaining level at which wages are determined are again taken from Visser (2016) and Golden (2009) for earlier years [the literature suggests that centralized bargaining reduces inequality, see Wallerstein (1990)]. To control for economic development, I use data on GDP per capita (in thousands) and the share of employed to total population. Moreover, previous work suggests that globalization affects both trade union strength and inequality (Dreher and Gaston, 2007, 2008). Thus, I include trade openness (sum of exports and imports as share of GDP) as a proxy for globalization. Since some argue that higher levels of formal education weaken trade unions (fewer incentives to organize in high-skilled jobs/sectors) and increase income differentials (Acemoglu *et al.*, 2001), the models control for average years of schooling. All these variables come from the Penn World Table (Feenstra *et al.*, 2015). A measure of the ideological composition of governments from the Party Government data set (Seki and Williams, 2014) accounts for the possibility that rising inequality is the result of certain policy preferences. Finally, I will test the sensitivity of the results to three relatively shorter time series (due to data availability across time and

space). First, an index for financial reforms from the IMF (Abiad *et al.*, 2008) controls for the potentially inequality-enhancing effect of financial liberalization. Second, I include top marginal tax rates (Genovese *et al.*, 2016) assuming a negative relationship with top income inequality. Third, female labor force participation (LFP) collected from different sources [for details, see Ortiz-Ospina and Tzvetkova (2017)] accounts for a relevant demographic feature, which may contribute to a decline in inequality. Section 1 of the Online Appendix gives detailed descriptive statistics for these controls and the main variables of interest.

3.2 Statistical specification

I now describe how I model inequality and how it is shaped by union strength and European institutional integration. To address the main research hypotheses, I test the following statistical specification:

$$\text{INE}^*_{ct} = \alpha_0 + \beta_1 \overline{\text{UNION}}_{ct-1,\ldots,t-5} + \beta_2 \text{EUII}_{ct} + \beta_3 (\overline{\text{UNION}}_{ct-1,\ldots,t-5} \cdot \text{EUII}_{ct})$$
$$+ x'_{ct}\gamma + \delta_1 t + \delta_2 t^2 + \nu_c + \epsilon_{ct}.$$

Let INE^*_{ct} represent inequality in country c $(c = 1,\ldots,n_t)$ at time point (year) t $(t = 1,\ldots,T)$. $\overline{\text{UNION}}_{ct-1,\ldots,t-5}$ is the country-specific trade union density. I average the variable over the preceding five years to account for the fact that changes in union strength should translate into changes in inequality with a delay (Volscho and Kelly, 2012). This strategy is agnostic about the pace with which union strength affects top income inequality and does not rely on an arbitrary time lag. Additionally, the procedure reduces the influence of unusual observations in the data (smoothing), which might arise because the data on trade union density for the years 1950–1959 were collected from a different source than later years (see Figure A1 in the Online Appendix). EUII_{ct} is the country-specific level of European institutional integration. The theoretical argument predicts that the interaction $(\overline{\text{UNION}}_{ct-1,\ldots,t-5} \cdot \text{EUII}_{ct})$ is positive, indicating that the effect of trade union membership on inequality declines as integration increases. A vector of controls is added by x'_{ct}. Applying Im-Pesaran-Shin panel-unit root tests to my main measure of inequality, top income shares, fails to reject the null hypothesis of all panels containing unit roots ($p_{\text{top10}\%} = 0.80$, $p_{\text{top1}\%} = 0.50$). However, the panel-unit root tests also demonstrate that the data turn into white noise once I include a linear time trend ($p_{\text{top10}\%} = 0.01$, $p_{\text{top1}\%} = 0.00$). This suggests that time has a simple, systematic effect on both measures of top income inequality. Moreover, the graphical representations of Figures A2 and A3 in the Online Appendix show that while top inequality decreased in most countries until the late 1970s, it gradually increased afterward. Hence, I include common linear t and quadratic t^2 time trends. I will check the robustness of this specification to the inclusion of year indicators, which control for year-specific shocks to all countries in the sample. Finally, to control for unobserved confounders,[4] country fixed effects (FE) ν_c are used.

Given the relatively long TSCS dataset ($T > N$) in use, more efficient estimation is feasible by additionally accounting for the likely autocorrelation in the error term ϵ_{ct}. To this end, I use an FE estimator with Driscoll and Kraay standard errors (Driscoll and Kraay, 1998),

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4   For instance, the historical strength of the left might jointly affect inequality, union membership and the *level* of institutional integration. The Hausman specification test also suggests the necessity of country fixed effects.

Table 1. Driscoll–Kraay FE estimation of the impact of union strength, European institutional integration and their interaction on top income inequality, 1950–2013

	Model 1 Top 10%	Model 2 Top 10%	Model 3 Top 10%	Model 4 Top 10%	Model 5 Top 1%	Model 6 Top 1%	Model 7 Top 1%	Model 8 Top 1%
Union strength	−0.242*	−0.265*	−0.188*	−0.257*	−0.097*	−0.128*	−0.072*	−0.122*
	(0.021)	(0.026)	(0.024)	(0.029)	(0.011)	(0.015)	(0.020)	(0.018)
Institutional integration	−0.049*	−0.085*	−0.079*	−0.087*	−0.034*	0.036*	−0.058*	−0.062*
	(0.020)	(0.022)	(0.010)	(0.017)	(0.013)	(0.010)	(0.006)	(0.016)
Interaction	0.001*	0.002*	0.001*	0.001*	0.001*	0.001*	0.001*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Long series	✓		✓		✓		✓	
Short series		✓		✓		✓		✓
Time trends	✓	✓			✓	✓		
Year indicators			✓	✓			✓	✓
Countries	15	12	15	12	15	12	15	12
Observations	516	285	516	285	516	285	516	285
Within R^2	0.551	0.718	0.710	0.783	0.469	0.703	0.618	0.754

*Zero outside the confidence interval. Driscoll–Kraay standard errors (in parentheses) robust to a generalized form of spatial and serial autocorrelation. Intercept term and coefficients of control variables not reported to save space.

which are allowed to be correlated serially between residuals from the same country in different time periods, spatially between countries within the same time period and cross-serially between different countries in different time periods. While this non-parametric technique of estimating standard errors is based on large T asymptotics, the cross-sectional dimension does not constrain feasibility. Comparing subsequent model results with an alternative standard error estimator—panel-corrected standard errors (Beck and Katz, 1995), the de facto standard in comparative political economy—shows that the Driscoll-Kraay estimator produces considerably larger standard errors and thus seems to be a more conservative, that is to say more demanding test of the theoretical argument.

4. Model results

In order to save space, I only present coefficient estimates for the main variables of interest (Table A3 in the Online Appendix contains full results for all control variables).[5] Table 1 shows parameter estimates and standard errors under various model specifications with top 10% (Models 1–4) and top 1% (Models 5–8) income shares as response variables. For each measure of top income share, the respective first model includes a set of richly observed controls. The second model adds three less frequently observed control series (index of financial reforms, female LFP and top marginal tax rates). The third and fourth models modify the two previous specifications by including year indicators instead of linear and squared time

5 A replication file for the main tables and figures is available at the Harvard Dataverse: doi:10.7910/DVN/GCPEXT.

Table 2. Marginal effect of union strength on top income inequality conditional on low and high institutional integration

	Marginal effect of union strength		
	Beta	SE	95% CI
(a) Top 10% income share			
Low	−0.228	0.021	−0.270 −0.186
High	−0.102	0.020	−0.142 −0.062
(b) Top 1% income share			
Low	−0.089	0.010	−0.109 −0.069
High	−0.017	0.012	−0.041 0.007
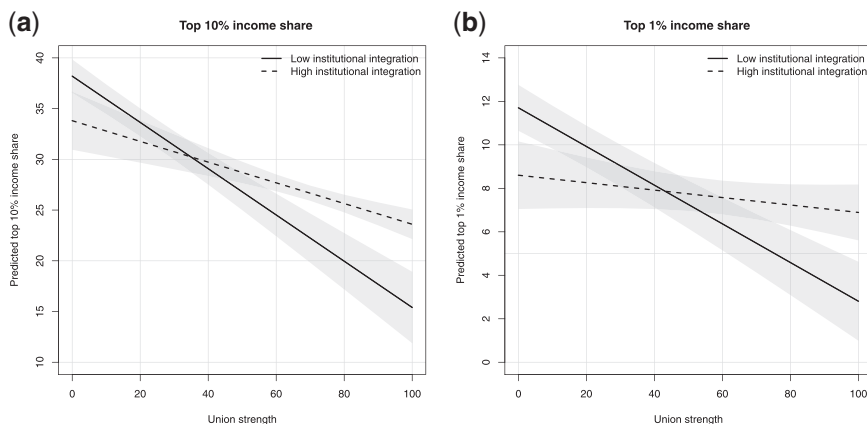
Figure 2. Predicted top income inequality by union strength and European institutional integration with 95% confidence intervals.

Notes: Panel (a) shows predicted levels of top 10% income shares across different levels of union strength under low (value of 10) and high (value of 100) European institutional integration (based on Model 1 of Table 1). Panel (b) repeats the analysis for top 1% income shares (based on Model 5 of Table 1).

trends. On the basis of the theoretical argument, I expect the interaction term between union strength and institutional integration to be statistically significant with a positive sign.

The parameter estimates for union strength, institutional integration and their interaction are statistically significant. Most importantly, I find that higher union strength is associated with lower top income shares (when there is zero institutional integration), and that this relationship decreases with a country's level of institutional integration. To gain a more intuitive understanding of the role of European institutional integration, I calculate quantities of interest: Predicted values of top income inequality for increasing union strength and marginal effects of union strength on top income inequality conditional on different levels of institutional integration.

Figure 2 compares predicted values of top 10% income shares in Panel (a) and predicted top 1% income shares in Panel (b) based on Models 1 and 5 of Table 1. With all control variables held constant, the only factors that change are union strength (in the x-axis) and the two levels of European institutional integration (in the solid and dashed lines). High institutional integration refers to a value of 100 (roughly the average level of integration at the end of the observation period), while low institutional integration refers to a value of 10 (roughly the average level of integration in the mid-1960s). The resulting graphs strongly correspond to the theoretical argument. At low levels of union strength, predicted levels of top income inequality are generally high and do not differ much across different levels of institutional integration. Yet, as union strength increases, the difference between low and high institutional integration becomes more pronounced. In line with my theoretical expectations, the inequality-reducing effect of union strength is lower at high levels of institutional integration compared to low levels.

Table 2 lends further support to the theoretical argument by calculating marginal effects of union strength with their respective standard errors and 95% confidence intervals conditional on low and high institutional integration (again based on Models 1 and 5 of Table 1). Both for top 10% and for top 1% income shares, a move from low to high institutional integration decreases the negative marginal effects of union strength substantially. In the case of top 10% income shares, the marginal effect decreases by 55 percentage points. As expected, the effect of union strength on top income inequality does not become statistically insignificant at high levels of institutional integration, but the size of the effect becomes significantly smaller. In the case of top 1% income shares, the marginal effect does not only decrease by 81 percentage points but also becomes statistically indistinguishable from zero.

The theory predicts that the conditioning effect of European institutional integration increases inequality, especially at the top. Thus, the previous analysis tested the argument by looking at top income shares. To see how other types of inequality are affected, Table 3 repeats the analysis with alternative distributional measures. The results show that the interaction term has the expected positive sign across all specifications. In case of the Gini index and the 50-10 ratios, the moderating influence of institutional integration is statistically detectable in the models with linear and squared time trends (Models 1 and 3) but not when the time trends are substituted by year indicators (Models 2 and 4). In the models that use 90-10 and 90-50 ratios, the interaction effect is always statistically significant, and the estimated coefficients are larger than in the 50-10 ratio models. This finding provides further evidence for the argument that the depressing effect of European institutional integration on the effectiveness of trade unions particularly promotes inequality at the top end of the income distribution. Figure 3 plots the marginal effect of union strength on 90-10 and 90-50 ratios conditional on European institutional integration (based on Models 6 and 8). Panel (a) of Figure 3 shows that trade union strength still reduces 90-10 ratios as institutional integration increases, but the size of the effect becomes much smaller (using the same definitions of low and high integration as in Figure 2 and Table 2, the effect reduces by roughly two-thirds). In the case of 90-50 ratios, Panel (b) of Figure 3 demonstrates that the marginal effect of union strength even turns statistically insignificant at higher levels of institutional integration (roughly around the average level of European institutional integration in 1990).

Table 3. Driscoll–Kraay FE estimation of the impact of union strength, European institutional integration and their interaction on alternative measures of inequality

	Model 1 Gini index	Model 2 Gini index	Model 3 50-10 ratio	Model 4 50-10 ratio	Model 5 90-10 ratio	Model 6 90-10 ratio	Model 7 90-50 ratio	Model 8 90-50 ratio
Union strength	−0.171*	−0.161	−0.805*	−1.083*	−3.271*	−3.904*	−1.008*	−1.089*
	(0.070)	(0.085)	(0.238)	(0.281)	(0.587)	(0.522)	(0.161)	(0.177)
Institutional integration	0.008	0.040	−0.632	0.183	−2.547*	−1.740*	−0.826*	−1.175*
	(0.046)	(0.058)	(0.340)	(0.276)	(0.614)	(0.600)	(0.168)	(0.374)
Interaction	0.001*	0.001	0.009*	0.003	0.032*	0.027*	0.010*	0.013*
	(0.001)	(0.001)	(0.004)	(0.003)	(0.007)	(0.008)	(0.002)	(0.003)
Long series	✓	✓						
Time trends	✓	✓	✓	✓	✓	✓	✓	✓
Year indicators								
Time period	'60–'14	'60–'14	'70–'14	'70–'14	'70–'14	'70–'14	'70–'14	'70–'14
Observations	615	615	242	242	242	242	242	242
Number of countries	15	15	15	15	15	15	15	15
Within R^2	0.712	0.698	0.296	0.548	0.396	0.504	0.428	0.520

*Zero outside the confidence interval. For specification details, see Table 1. Results in Models 1 and 2 are based on 100 multiply imputed datasets. Note that the R^2 computation for panel multiple imputation models is not supported by the standard mi estimate command in Stata. To obtain the R^2, I use the user-written mibeta command, which provides the R^2 for pooled OLS models only. The R^2 is obtained by running the pooled OLS model with added country dummies (least squares dummy variable model), which is analytically and empirically tantamount to the within (fixed effects) estimator.
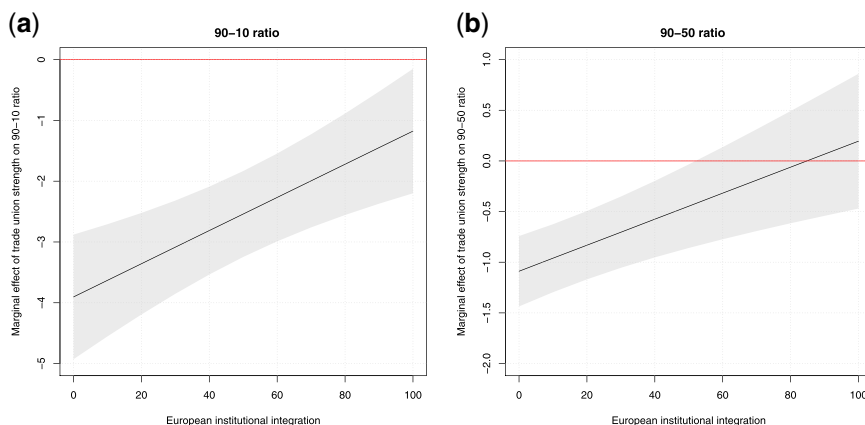
Figure 3. Marginal effect of union strength on 90-10 and 90-50 ratios conditional on European institutional integration with 95% confidence intervals.

Notes: Panel (a) shows the marginal effect of union strength on 90-10 ratios conditional on European institutional integration (based on Model 6 of Table 3). Panel (b) repeats the analysis for 90-50 ratios (based on Model 8 of Table 3).

4.1 Robustness and diagnostics

I conduct a series of robustness tests, which are summarized by Table A4 in the Online Appendix. First, Pontusson (2013) argues that union strength has generally become less closely associated with inequality since the early 1990s in OECD countries. Thus, to check whether the interaction effect is confounded by global trends, I expand the sample to five non-European countries (Australia, Canada, Japan, New Zealand and the USA) with zero level of institutional integration. The second test studies whether the results are sensitive to my updated index of European institutional integration by limiting the time period to the original timeframe (prior to 2005). The third robustness test captures union strength by non-overlapping, lagged five-year averages. Fourth, the economic dimension of the KOF Globalization Index (Dreher, 2006) replaces trade openness as a proxy for globalization. The main findings remain valid under all these specifications.

Finally, I address two recent methodological contributions on the correct application of interactions in (FE) regressions. First, Hainmueller *et al.* (2019) emphasize a crucial problem with multiplicative interaction models: A potential violation of the linear interaction effect (LIE) assumption. Applied to the present case, the LIE assumption implies that the effect of union strength on top income inequality can only linearly change with European institutional integration. Thus, as European institutional integration increases by one unit, the effect of union strength on top income inequality needs to change by β_3 (i.e. the slope of the interaction term), and this change needs to be constant across the whole range of institutional integration. To check whether this assumption holds, the authors recommend a series of diagnostic tools. Figures A5 and A6 in the Online Appendix apply two of these tools: Diagnostic plots based on generalized additive models and a kernel smoothing estimator. I describe the methodological rationale and results in detail in the Online Appendix. Suffice it to say here that I find no reason to suspect a violation of the LIE assumptions. Hence, the

use of the standard linear interaction model seems appropriate. In addition, these results further substantiate the main conclusions of this article.

Second, Giesselmann and Schmidt-Catran (2018) show that an interaction term in an FE regression model actually captures three terms. In the context of this article, these are the product of the between-variation in union strength and the within-variation in European institutional integration, the product of the between-variation in European institutional integration and the within-variation in European institutional integration and the product of the within-variation in European institutional integration and the within-variation in union strength (for a formal proof, see the Online Appendix). According to the authors, the FE estimator controls for effect heterogeneity across countries in the last term but not in the terms that include between-variation, and thus the results of the interaction might be biased if the random effects assumption is violated. To yield unbiased results, they propose to include only the within-part of the interaction in the FE regression model (Giesselmann and Schmidt-Catran call this the 'double-demeaned' estimator). I apply this specification in Table A5 in the Online Appendix. The results corroborate my initial findings.

5. Conclusion

This article has studied the linkage between European institutional integration, union strength and income inequality. I have argued that union strength has a dampening effect on income inequality, including inequality at the top. However, this inequality-reducing effect of trade unions varies with European institutional integration. I have distinguished two channels through which European institutional integration weakens the bargaining position of unions. First, as competitive pressures lead to a reduction in firms' markups over marginal costs, trade unions can capture less surplus. Second, FDI in the form of outsourcing and offshoring undermines union control over the supply of labor. Trade unions have also not been able to compensate their increasing weaknesses at the national level at the European level, since unions have a hard time organizing effectively at the EU level, and business and major EU actors are opposed to a European-wide collective bargaining process. The distributional implications of the conditioning effect of European institutional integration should particularly increase top income inequality.

In line with the theoretical model, I find that the marginal effect of union strength on inequality—especially at the top of the income distribution—varies substantially at different levels of European institutional integration. When union strength is low, the difference between high and low institutional integration is negligible. Yet, as union strength increases, the difference becomes more pronounced. In case of top 10% income shares, a one-unit increase in union strength still reduces inequality at high institutional integration, but the size of the reduction is substantially smaller than in the case of low institutional integration (less than half). In the case of top 1% income shares, the effect of union strength on inequality becomes even statistically insignificant. These findings are corroborated both by models that use alternative indicators of income inequality and various robustness tests. Moreover, using new diagnostic tools and a recently proposed FE estimation strategy, I cannot detect any alarming violations of the critical assumptions underlying the linear multiplicative interaction term in my model.

This research speaks to a couple of existing bodies of work. First, a longstanding theoretical critique of the European integration process has argued that European integration

favors market-making over market-correcting mechanisms (Scharpf, 1996), and this tendency may weaken the bargaining position of trade unions (Streeck and Schmitter, 1991). I have attempted to strengthen this argument by clearly spelling out how European institutional integration affects union bargaining power and which empirical implications the conditioning effect of European institutional integration has on the distribution of income. Second, extant empirical research that probes the relationship between European integration as a whole and income inequality has only looked at correlational evidence without explicitly testing the causal channels through which the former might affect the latter (Beckfield, 2006, 2009). While such an approach is essential for getting a first look at the world, this article goes beyond it by emphasizing a major mechanism that links European institutional integration to income inequality.

The core focus of this article has been European institutional integration and the way in which it affects the effectiveness of trade unions. At the same time, I have treated the negative impact of trade unions on inequality—in particular inequality at the top—as an established fact in the literature. Even though the empirical evidence on this relationship is compelling, the strong depressing effect of unions on top income inequality is *prima facie* surprising, given that trade unions do usually not bargain over top incomes. As reviewed earlier, extant research has detected multiple channels through which organized labor might still directly affect top income shares. Explicit empirical tests of these channels, however, have so far largely focused on the USA (Ahlquist, 2017; Hager, 2018). The results of this study suggest that the application of such tests to the European context should be a promising undertaking for future research.

Finally, let us remember Paul Embery, the union representative from London, who vigorously called for Brexit on the alleged behalf of unionized workers. The UK's departure from the EU—an unprecedented event in the history of European integration—might open up new avenues for future research to further substantiate my findings by establishing stricter causality. The causal story of this article would lead us to expect that Brexit could potentially lead to an improved bargaining position of trade unions. Whether such hopes materialize will, of course, not only depend on the concrete configurations of the UK's exit but equally (if not more) importantly on the domestic circumstances in which British trade unions will have to operate.

Supplementary material

Supplementary material is available at *Socio-Economic Review* online.

Acknowledgments

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