# The Impact of Trade Union Dynamics on Income Inequality Trends in European Union Countries

## Introduction

In the evolving landscape of the global economy, the nexus between labour practices and economic inequality has increasingly come under scrutiny (ILO, n.d.). Among the various mechanisms influencing the dynamics of labour markets, collective bargaining stands out as a critical lever in shaping equitable employment conditions and wage distribution (ILO, n.d.). This paper is intended to shed light on the intricate relationship between trade union coverage and inequality, offering a comprehensive exploration beyond mere statistical correlations to understand the underlying mechanisms, societal impacts, and policy implications.

Collective bargaining, a process of negotiation between employers and a group of employees aimed at agreements to regulate working salaries, working conditions, benefits, and other aspects of workers' compensation and rights, has been heralded as a potential equalizer in the labour market. By empowering workers to negotiate en masse, it is theorized that collective bargaining can lead to more equitable distributions of income, enhance job security, and improve working conditions, thereby addressing some of the root causes of economic inequality (Schmidt and Strauss 1976). However, the effectiveness and impact of collective bargaining are contingent upon various factors including the legal and regulatory framework, the strength and representativeness of labour unions, the economic context, and the adaptability of these institutions to changing labour market conditions. As such, this paper aims to unpack the complex relationship between collective bargaining coverage and its effectiveness in mitigating inequality. By examining empirical evidence, case studies, and theoretical frameworks, insight will be provided into the conditions under which collective bargaining most effectively reduces inequality and the challenges and opportunities it presents in the contemporary economic landscape. In doing so, a contribution is made to the academic discourse on labour economics and social justice, while also offering valuable insights for policymakers, labour organizations, and employers on fostering more inclusive economic growth through enhanced collective bargaining mechanisms. This project delves into the significant role Trade Unions and Collective Bargaining Coverage have played in addressing Income Inequality across various EU countries over the past two decades. Focusing on Austria, Belgium, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom, it aims to closely examine the relationship between two key variables: the Coverage and Density of labour unions. Collective Bargaining Coverage, as defined by the ILO, refers to the extent to which workers’ wages and employment conditions are governed by collective agreements. Meanwhile, Trade Union Density measures the proportion of employees affiliated with a union relative to the total workforce, with net density considering only those actively employed.

The backdrop to this study is the observed decline in union membership since the early 1990s across many EU member states, attributed largely to the rise of non-standard employment forms and a shifting labour market landscape (Hasell and Roser 2024). Despite these trends, the persistence of union density rates suggests a nuanced interplay with broader labour market dynamics. Crucially, empirical evidence and economic theory suggest that collective bargaining plays a pivotal role in reducing income disparities, with increased coverage rates linked to narrower wage gaps (Jelle Visser 2017). Countriepractisingng more centralized bargaining, particularly through multi-employer negotiations, tend to show fewer earnings inequality, highlighting the potential of collective bargaining mechanisms to foster more equitable economic outcomes.

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## Top of FormBottom of FormThe Importance of Trade Unions and Collective Bargaining

Trade unions have historically been cornerstones of the workforce, advocating for workers' rights and ensuring fair treatment in the workplace (Engeman 2021). At the heart of trade union efforts is collective bargaining, a process that not only brings numerous advantages to the table but also presents certain challenges. This chapter delves into the critical role of trade unions and the nuanced dynamics of collective bargaining, underscoring its profound impact on both the workforce and broader society.

Collective bargaining enhances compensation and support for union members significantly. Trade unions can achieve gains for workers that would be difficult, or even impossible, on an individual basis, often resulting in unionized workers enjoying wages that are substantially higher than their non-unionized counterparts. This is just the beginning, as collective agreements establish equitable workplace policies that promote justice and due process. Such frameworks benefit employees and employers alike, ensuring a fair and orderly work environment. A connection is frequently made in the literature between the process of unionization and the subsequent increase in job satisfaction and productivity, highlighting these as significant advantages. Union members often report greater satisfaction in their roles, attributed to enhanced pay, benefits, and workplace protections (Rafael Muñoz De Bustillo and Pablo De Pedraza, n.d.).Top of FormBottom of Form This sense of security translates into higher productivity, reduced absenteeism, and lower turnover rates. Furthermore, collective bargaining plays a crucial role in promoting social justice by ensuring a more equitable distribution of economic gains. It helps reduce the wage gap between top executives and average workers, serving as a vital tool in the fight against economic inequality (George W. Angell 1974). Moreover, union contracts often prioritize health and safety, leading to workplaces that are significantly safer for employees. This focus on safety results in lower rates of occupational injuries and fatalities. Empowerment of workers is another critical aspect, as trade unions give workers a collective voice, allowing them to influence decisions and policies that affect their working conditions. This empowerment fosters a more democratic and responsive workplace environment.

The benefits of collective bargaining extend beyond the union members, offering stability during economic downturns and setting standards that raise the bar for non-union employers (ILO 2015). This leads to improved wages and benefits across the board and encourages a more diverse workforce, including higher participation rates among women and older workers. By redistributing income from capital to labour, collective bargaining contributes to a reduction in economic disparities, supporting a fairer and more equitable society. Efficient dispute resolution mechanisms within union contracts minimize the need for arbitration or litigation, while the potential for innovation and adaptability arises from the collaboration between unions and management. Raising standards across industries compels non-union firms to elevate their practices to remain competitive, establishing a system of checks and balances that ensures corporate power is counterbalanced by a workforce with a voice in decisions impacting their livelihoods.

# Model building

This analysis is rooted in datasets procured from the Organisation for Economic Cooperation and Development (OECD) statistics and World Bank Data, targeting an array of variables pivotal to understanding the dynamics of labour markets and income distribution (Trapeznikova 2019). In the first place, before jumping to the model’s results comparison, it is fundamental to understand the variables' choices in building the models. To measure Income Inequality, economists have been using other metrics such as the Gini Index, Decile Ratios, Palma Ratio, and Theil Index (Trapeznikova 2019). All of them carry benefits and limitations. This case study will use the Gini Index as the dependent variable. The OECD defines it as the comparison of cumulative proportions of the population against cumulative proportions of income they receive, and it ranges between 0 in the case of perfect equality and 1 in the case of perfect inequality (“Inequality - Income Inequality - OECD Data,” n.d.). And in this case, income is defined as household disposable income for a specific year. It incorporates earnings, self-employment, capital income and public cash transfer. Therefore, the choice of adopting the Gini Coefficient also relies on the fact that it uses information from the entire income distribution and it is independent of the size of the country’s economy and population. Moreover, the Gini Index allows for easier interpretation of regression results. Now the focus moves to the two important independent variables: Trade Union Density and Collective Bargain Coverage. According to the European Industrial Relations Dictionary, Trade Union Density is defined as the ratio of salary and wage earners that are trade union members to the total number of wage and salary earners in the economy. it is a valuable metric to assess the power of trade unions across countries (EuroFound 2019). On the other side, Collective Bargaining Coverage is a wider indicator which shows that wor’s employment is influenced by isdsideion’s negotiations (EuroFound 2022). The spectrum in Europe is, according to the Eurofound, polarized with a group of countries which have almost complete coverage (Italy, Austria, Spain, Finland, France, and Sweden) and at the other side of the spectrum, another group with hardly any coverage (Estonia, Czechia, Lithuania, Poland, Slovakia, and Hungary) (EuroFound 2022). Since the 1980s, trade union membership in most EU countries has declined, partly due to employees increasingly opting out of joining unions and the rise of non-standard employment (Onaran and Guschanski 2018). Despite this, trade union density, which calculates the proportion of unionized workers in the workforce, shows more stability, reflecting labour market trends. This stability was particularly evident during the recent economic downturn when the economy in the unions declined due to significant employment losses. Union density varies widely across the EU, with Scandinavian countries maintaining high levels compared to the lower rates in Central and Eastern Europe, and a general declining trend observed across Continental and Mediterranean countries. Differences in union density are also pronounced between sectors within countries, with higher rates in the public sector due to better job security and working conditions. Factors influencing these differences include institutional arrangements like collective bargaining extension mechanisms, the services provided by unions, and their role in welfare systems, notably in unemployment benefits administration through the Ghent system.

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To account for the size of each country in the project, the Gross Domestic Product is analysed. Gross Domestic Product (GDP) and Foreign Direct Investments (FDIs), both inflow and outflow, can significantly affect labour unions and income inequality across different countries. A robust GDP growth can enhance labour market conditions, potentially strengthening the bargaining power of labour unions by increasing the demand for labour. This, in turn, can lead to improved wages and working conditions negotiated by unions. However, rapid economic growth without equitable distribution can also exacerbate income inequality if the gains are not uniformly shared across the workforce.

Foreign Direct Investment (FDI) inflows and outflows exhibit correlations with labour unions and income inequality measures, which are critical to the narrative. FDI inflows appear to be moderately correlated with certain variables related to labour suggesting that as a country becomes more attractive to foreign investors, it could potentially impact labour union activities and bargaining power. For example, significant FDI inflows may create more jobs, thereby offering unions a larger base from which to recruit members. However, this influx must be managed carefully, as it can also lead to a form of 'race to the bottom' if countries reduce labour standards to attract investment, potentially undermining unions and exacerbating income inequality. Conversely, FDI outflows show a different pattern of correlation, implying that when domestic companies invest abroad, this could strain domestic labour markets and unions if it results in job displacement or downward pressure on wages. This phenomenon can have a ripple effect on income distribution within the country, potentially increasing income inequality if high-wage jobs are outsourced and replaced with lower-wage domestic positions.

The negative correlation between inflation and wage growth suggests that when analyzing the effect of trade unions on wages, inflation can distort the picture. If not accounted for, inflation can mask the real value of wage increases negotiated by unions. As a confounder, inflation can lead to an underestimation of the positive impact of unions on wage growth, since nominal wage increases may not translate into actual purchasing power gains for workers without adjusting for inflation.

Given its positive correlation with GDP, wage growth can serve as a confounder when trying to understand the relationship between GDP and income inequality or union strength. If GDP is growing and wages are increasing simultaneously, it might be tempting to attribute rising wages solely to the influence of unions. However, wage growth could also be driven by overall economic expansion independent of union activity. Without controlling for wage growth, one could overstate the role of unions in driving up wages when in fact it could be the rising GDP that is raising incomes across the board.

Furthermore, the positive correlation between tax contribution and GDP suggests that as an economy grows and tax revenues increase, there might be more public investment in services and infrastructure, which could improve employment conditions and influence wage levels. If the goal is to assess the impact of unions on income equality, tax contributions could confound the results by introducing government policy effects that are independent of union actions. Strong public services funded by taxes can also affect income distribution, potentially alleviating inequality and thus confounding the relationship between union activities and the observed levels of income inequality.

In the context of labour unions and income inequality, women workers' employment rates and unemployment rates are essential variables that can act as confounders, especially when analyzing gender-specific labour dynamics.

Also, the proportion of women in the workforce may influence both union membership and income inequality. If unions have been successful in advocating for gender equality, an increase in the rate of female workers could be attributed to union influence. However, if not properly accounted for, the rise in female employment could be incorrectly linked to union efficacy, when in fact, it may reflect broader social changes, such as increased gender equality and changing norms.

Furthermore,the unemployment rate for women can confound the relationship between union density and income inequality. A high rate of female unemployment might mask the potential benefits that unionization could have on employed women, such as higher wages or better working conditions. Conversely, lower unemployment rates could reflect successful union negotiations or, independently, an economic environment that is favourable to female employment.

In the intricate web of factors that influence labour unions and their efficacy, the concept of Democratic Governance emerges as a pivotal variable (“Rule of Law Index, 1990 to 2022,” n.d.). This new construct, borne out of the interaction between Civic Participation and the Rule of Law Index, offers a lens through which to examine the political and legal environment that shapes labour union activities. Democratic Governance encapsulates the degree to which citizens can participate in civil society and the extent to which legal norms are respected and enforced, both of which are critical to the functioning and impact of labour unions (“Civil Society Participation Index, 2022,” n.d.).

Labour unions have long been at the forefront of pushing democratic frontiers forward, championing not just labour rights but also broader democratic reforms. Their engagement has historically extended beyond the workplace, touching on pivotal issues such as voting rights and social welfare. In this sense, labour unions do not operate in isolation; they are deeply embedded in the fabric of civil society and are responsive to the quality of Democratic Governance. The efficacy of unions, therefore, can be profoundly influenced by the strength of democratic institutions and practices within a country.

As such, when evaluating labour unions' contributions to economic conditions such as wage growth, income inequality, and the integration of women into the workforce, one cannot discount the context of Democratic Governance. It stands as both a foundation for and a product of vigorous labour movements. Hence, it is an essential variable to consider when analyzing the complex interplay between labour unions and socioeconomic outcomes.

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Since the dawn of industrial capitalism, labour unions have constantly fought for major democratic reform agendas, such as the eight-hour day, universal suffrage, and social provision of welfare. And labour unions are still the main agencies that advocate for the interests of the lower classes and the disadvantaged, those who are most vulnerable to increasingly fierce global market competitions and fluctuations. Given the critical roles of labour unions in civil society and their historical contribution to the development of stable democracies, their significant role in accounting for the performance of government should not be oA diagram of a social network

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## Model Selection

The fixed effects model emerges as the most accurate analytical tool for this study, considering the unique socio-economic heterogeneity across European countries. It excels in parsing out the precise effects of trade union shifts on income inequality by meticulously controlling for the unobservable, country-specific attributes that consistently influence labour dynamics. Such characteristics, ranging from entrenched legal systems and labour market regulations to deep-seated cultural norms, remain constant over time but vary across nations. By employing this method, our analysis can disentangle the intrinsic impact of trade union activities from the backdrop of these immutable national traits. The particular application of the fixed effects model in this study is deftly chosen to illuminate incremental yet significant shifts that occur within countries, shedding light on how labour unions can affect income distribution amidst the complex interplay of country-specific factors. This approach underscores a commitment to discerning nuanced patterns and extracting causal inferences that reflect the genuine power of trade union action across the multifaceted economic terrain of the European Union.

### Instrumental Variable

In the instrumental variables (IV) analysis, the variable “bargain” was initially identified as potentially endogenous concerning the Gini Index, suggesting the need for an instrumental variable approach to obtain unbiased and consistent estimates. **Demo** has been selected as an instrument, hypothesizing that it affects the Gini Index only through its impact on **bargain1**.

The initial phase involves regressing the potentially endogenous variable, Bargaining Power, on the instrumental variable, Democratic Governance, alongside other control variables including Collective Bargaining Coverage, Inflation, Wage Growth, Government Debt, Log of Labor Force, and Women's Unemployment Rate. This step aims to validate the instrument's relevance by ensuring it significantly predicts the endogenous variable.

The summary of this first-stage regression indicates significant coefficients, notably for Democratic Governance (with an estimated coefficient of 23.023832). This significant relationship confirms the instrumental variable's relevance in predicting Bargaining Power. The high F-statistic (198.8) and it is corresponding p-value (< 2.2e-16) further attest to the instrument's strength in explaining variance in Bargaining Power.

In the subsequent phase, the dependent variable, Gini Index, is regressed on the fitted values of Bargaining Power derived from the first stage, together with the original set of control variables. This procedure aims to obtain an unbiased estimate of the impact of Bargaining Power on the Gini Index, free from endogeneity concerns.

The summary for the second-stage regression shows the coefficient for Bargaining Power Fitted Values (-0.092719) to be marginally significant (at the 10% level), suggesting a nuanced impact of Bargaining Power on the Gini Index after accounting for endogeneity via the IV method. Control variables, particularly the Women's Unemployment Rate, exhibit significant influences on the Gini Index.

This IV analysis effectively demonstrates the validity and robustness of Democratic Governance as a strong instrument for Bargaining Power. Furthermore, it elucidates the complex relationship between Bargaining Power and the Gini Index, emphasizing the critical role of instrumental variable selection and validation in achieving accurate, unbiased econometric findings.

## Model Results

The fixed effects regression model with instrumental variables (IV) provides a more rigorous examination of the average treatment effect (ATE) on income inequality, as measured by the Gini Index. The IV model accounts for endogeneity and tries to isolate the causal impact of key labour market variables.

Using 'bargain1' as a proxy for collective bargaining strength, which is the interaction variable between Trade Union Density and Collective Bargaining Coverage, the IV model reveals a consistently negative coefficient across different model specifications, indicating a robust association between stronger collective bargaining and reduced income inequality. This suggests that labour unions serve as a critical channel for achieving a more equitable distribution of income. Furthermore, Trade Union Density also shows a negative ATE on the Gini Index, underscoring the role of union density in promoting income equality. Higher levels of unionization not only correlate with a decrease in income inequality, highlighting the power of collective action in the labour market.

The application of the IV model, particularly in the presence of the 'bargain1' variable, allows us to interpret these relationships as causal, rather than merely correlational. By addressing potential endogeneity through the IV approach, the results underscore the substantive role that collective bargaining and trade union density play in shaping income distribution. The introduction of Democratic Governance as an instrumental variable plays a pivotal role in addressing endogeneity in the model. It's important to note that these relationships are interpreted causally due to the use of instrumental variables, which helps to control for endogeneity. This implies that the observed relationships are less likely to be influenced by omitted variable bias or reverse causality. These findings contribute valuable insights into policy discussions aimed at reducing income inequality and improving labour market outcomes. Trade Union Density also shows a negative coefficient, suggesting that as union density increases, income inequality decreases. This is in line with traditional views on the role of unions in promoting fair wages and reducing income disparities. A higher union density means a larger proportion of the workforce is unionized, and this collective representation is effective in pushing for policies and wage negotiations that benefit a broader segment of employees, not just the top earners.

## Fixed Effect results

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## Fixed Effect with Instrumental Variable

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## Policy Implication

The empirical findings from the regression analysis have significant policy implications. The demonstrated negative relationship between collective bargaining, trade union density, and the Gini Index suggests that strengthening labour unions and collective bargaining processes could be an effective policy lever for reducing income inequality. Governments might, therefore, consider enacting and enforcing legislation that protects the right to organize and collectively bargain, as well as policies that encourage higher union membership. Moreover, supporting a fair minimum wage could serve as a complementary policy measure to narrow income disparities further. These strategies, alongside broader collective bargaining coverage, can not only promote a more equitable income distribution but also contribute to a stable and motivated workforce, which is beneficial for the overall economy. As such, policymakers should view the empowerment of trade unions and the facilitation of collective bargaining not only as a matter of labour rights but also as a central component of a comprehensive strategy to tackle economic inequality.

## Conclusions

In conclusion, the intricate investigation into the dynamics of labour unions and collective bargaining across EU countries has illuminated their profound influence on income inequality. The use of fixed effects regression models with instrumental variables provides a compelling narrative on the causal relationships inherent in the labour market. The findings explicitly demonstrate that collective bargaining and trade union density play instrumental roles in shaping equitable economic outcomes, as evidenced by their significant negative impact on the Gini Index. Collective bargaining strength, encapsulated in the 'bargain1' variable, emerged as a robust determinant in mitigating income inequality. Enhanced bargaining power, indicated by the ATE, is associated with a reduction in the Gini Index, suggesting that strong collective bargaining mechanisms are central to achieving income equity. The persistence of trade union density, despite the observed decline in membership, underscores the enduring importance of unions in the quest for social justice. The inclusion of Democratic Governance as an instrumental variable underscores the necessity of robust democratic institutions and practices in supporting effective labour representation. This factor alone has the potential to influence the very fabric of labour dynamics, as it encapsulates the degree to which citizens can engage in the socioeconomic decisions that affect their lives. From a policy perspective, these insights stress the importance of supporting and strengthening labour unions and collective bargaining frameworks. This support could take the form of favourable legislation, incentives for union membership, and initiatives that foster collective bargaining, especially in the face of a changing labour market landscape. Such measures not only address immediate economic disparities but also fortify the foundations for a resilient and inclusive economy. This study contributes to the ongoing discourse on labour economics and social equity by providing empirical evidence of the mechanisms through which collective bargaining and trade union density can influence income distribution. As we navigate the complexities of a globalized economy, it becomes increasingly clear that the pursuit of inclusive growth must consider the pivotal role of labour institutions in fostering equitable labour market outcomes.

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