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How the Great Recession changed class inequality: Evidence from 23 European countries

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ARTICLE INFO	ABSTRACT
	The question of whether economic recessions increase or decrease the earnings gap between the working and upper-middle class is debated. We study this issue and examine the Great Recession period using two different analytical strategies: three-level multilevel models and multivariate analysis over time. Based on EU Statistics on Income and Living Conditions (EU-SILC) data in 23 countries from 2004 to 2017, our results under both analytical strategies provide robust evidence that, by and large, the Great Recession widened the earnings gap between the working and upper-middle class. The effect magnitude is sizable; an increase of 5 percentage points in the unemployment rate is associated with an increase in the class earnings gap of approximately 0.10 log points.

1. Introduction

Following the Great Recession, many workers struggled economically across European countries. The crisis led to a media focus on widening class divisions, with the rich growing richer and the poor poorer. Recent scholarship suggests that the current rise in nationalism and populism is linked to the 2008 financial crisis (Caiani and Graziano, 2019). While the recession probably affected various societal outcomes, we are interested in its effect on class inequalities.

Several sociological studies have shown how social classes fared differently during the Great Recession (Albertini, 2013; Whelan and Maître, 2014; Wodtke, 2016; Albertini et al., 2020). It remains unclear, however, whether these differences were homogenous across European countries and how macroeconomic factors such as unemployment rate and GDP gap affected earnings inequality between social classes. This article adds to this line of research by gauging whether a major cyclical slump widens or compresses the earnings gap between different social classes. Put differently, we analyze whether the effect of the 2008 financial crisis was heterogeneous across social classes. Addressing this empirical gap sheds important light on the theory of cumulative (dis)advantages in the context of economic recessions. Substantively, this question is important for two reasons. First, if the working class suffers more than the upper-middle class, this can lead to a costly societal and political divide, which in turn can affect the viability of our societies (Atkinson and Morelli, 2011). Second, if we thoroughly understand the repercussions of the 2008 economic crisis, we might be able to better address future economic recessions.

The study of class inequalities in the labor market is well established in sociology. The working class earns less and experiences more unemployment spells than the upper-middle class (Goldthorpe, 2010). Previous studies have found that economic crises can widen the class gap due to two major elements. First, while the bargaining power of all workers decreases during an economic crisis as companies react to financial losses, the working class is particularly vulnerable, as its skills are more easily replaceable than those of

the upper-middle class (Goldthorpe and McKnight, 2006). Second, as companies stop hiring during and following a financial crisis, a form of crowding-out occurs as the supply of workers applying for less skilled occupations increases (Reder, 1955; Devereux, 2002). Such an increase in the supply of workers in certain occupations is likely to put downward pressure on wages.

However, an opposite scenario is also possible– an event that reshuffles the cards in favor of the working class. For example, income inequality decreased between the working and upper class following the Great Depression (Piketty, 2014). This is because deep recessions can decrease higher wages more than lower wages, as the former are largely tied to the performance of the financial markets (Atkinson and Morelli, 2011). Economic recessions may also lead to policies that increase the progressivity of taxes and the regulation of labor markets (Piketty, 2014; Roine and Waldenström, 2015; Scheidel, 2017).

We analyze earnings inequality between social classes for 23 European countries over the period of 2004–2017 using the European Union Statistics on Income and Living Conditions (EU-SILC). We perceive the Great Recession similarly to a natural experiment whereby people and countries are exposed to an event without selecting themselves to it. As countries were hit differently by the financial crisis, our design can compare earnings gaps across social classes between strongly affected countries (e.g., Spain, Ireland) and countries less affected by the economic downturn (e.g., Poland, Germany). We deploy two analytical strategies: (1) three-level multilevel models for time-series cross-sectional data and (2) multivariate analyses over time.

The results from both analytical strategies show that, by and large, the earnings gap between the working and upper-middle class widens under negative macroeconomic conditions. These findings are robust across several macro indicators and other sensitivity analyses. We next investigate whether the intensity of the 2008 financial crisis influenced the direction of the effect. For instance, countries that experienced a severe economic recession might have a contracting class gap[1] scenario similar to what occurred during the Great Depression. To answer this question, we rely on our findings from the multivariate analyses over time, which facilitate comparison across countries. The results reveal that the intensity of the financial crisis does not seem to lead to a contraction in the class earnings gap.

2. Background

2.1. Class and income inequality

While economists and sociologists are both interested in earnings differences, they tend to estimate them differently. Economists often measure the extent to which income is distributed unevenly across people in a country using different indicators, such as the Gini coefficient, the Theil index, and the variance of log income (Allison 1978; Schwartz and Winship 1980). These indicators have some shortcomings since they respond differently to various shifts in the income distribution (Zhou and Wodtke, 2019). There is recent research in economics that extends beyond these indicators and examines the level of income composition inequality (Ranaldi, 2022; Ranaldi and Milanović, 2022). Specifically, these studies examine whether capital and labor income are distributed randomly across people or whether they are concentrated more toward the top rather than the bottom of the income distribution. A high concentration of capital income at the top suggests a classical capitalist country compared with a classless society where capital income is more equally distributed across the income distribution (Ranaldi, 2022). This line of research suggests that countries that have a low level of capital income inequality seem to also have a low level of labor income inequality, with the exception of China (Ranaldi, and Milanović, 2022).

Sociologists consider individuals to be part of subgroups (e.g., social classes) that are essential in explaining inequalities between people. They believe that inequalities are not randomly assigned across individuals but rather that these differences are part of a hierarchal grouping (Wright, 2005). Even though social classes do not need to be strictly hierarchal, they tend to display some forms of economic distinctions from the top to the bottom of the social hierarchy (Goldthorpe, 2007). This is because social class reflects the extent of advantage that individuals possess in the labor market (Wright, 1997; Goldthorpe and McKnight, 2006). Two major resources that separate occupations hierarchically are the amount of authority and expertise (Wright, 1997). A high amount of authority and expertise required by a certain occupation provides its incumbents with a high leverage as they are more difficult to replace. This translates into a higher bargaining power that is reflected in their more advantageous contracts and wages (Le Grand and Tåhlin, 2013). While our article acknowledges that there are several plausible methods for disentangling earnings inequalities, it contends that a class-based approach offers important insights, as shown in previous research (Wodtke, 2016; Albertini et al., 2020).

Another rationale for analyzing earnings differences between social classes is that the degree of class stratification strongly influences the social and political sphere (Zhou and Wodtke, 2019). For instance, the Great Recession may have had either homogeneous or heterogeneous effects across social classes. If the working and lower-middle class suffered more than the upper-middle class, this could generate a costly societal and political divide. However, if the repercussions of the 2008 financial crisis were more evenly distributed between different social classes, then the social and political consequences should not be the same.

In the following, we elaborate a possible scenario whereby the earnings differences between social classes could widens. We then discuss the opposite scenario, that is, an economic recession that disproportionately affects the upper-middle class in comparison with the working class.

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[1] As this article is interested in analyzing the change in the earnings gap between the working and upper-middle class, the terms 'social-class gap' and 'class gap' are used to refer to this phenomenon.

2.2. Cumulative (dis)advantage

A simple Matthew effect occurs when the rich grow richer and the poor grow poorer, as the effect of an advantage or disadvantage can grow in magnitude over time (Merton, 1968). This concept has been extended in different works in the stratification literature on cumulative (dis)advantages, for example, in careers, education and social class (DiPrete and Eirich, 2006). Redbird and Grusky (2016) claim that the Great Recession generated a cumulative (dis)advantage among poorly educated workers. Consequently, one would expect larger losses among the working class than among the upper-middle class, and scholars have proposed a number of mechanisms to explain this effect.

During economic recessions, companies face two options: either laying off their employees or keeping them until the storm passes. Companies tend to keep their skilled employees, as they have usually invested heavily in them. Firing them can lead to a comparative loss, as it is costly and time intensive to replace skilled labor once market demand picks up again. Therefore, many workers remain valuable even during an economic crisis (Biddle, 2014). However, this may not be the case across all social classes, as routine occupations might be easier to fill than managerial positions.

An additional factor that could also disproportionately affect the working class and the lower-middle class during economic recessions can be explained by labor substitution. During economic hardships, firms accelerate efforts to lower labor costs by increasing automation. A technological change can increase the wage differential through two pathways. First, it leads firms to hire more skilled workers and rely less on unskilled workers. Second, it may weaken the bargaining power of unions (Acemoglu, 2002). Moreover, an increase in automation during an economic recession not only leads to mass unemployment but also renders the skills of many workers obsolete as firms raise their requirements. Recent evidence that used data from electronic posting between 2007 and 2015 suggests two notable findings in areas that were more affected by the Great Recession compared with other less affected areas in the United States. First, there was a higher increase in skill requirements in routine cognitive occupations, which remained even when the economy recovered. Second, there was a large job loss in routine-manual occupations (Hershbein and Kahn, 2018). This decline in routine occupations seems to be more severe with the Great Recession compared to previous economic recessions (Jaimovich and Siu, 2020). Such developments are class-graded, and the upper-middle class is expected to be more protected from them compared with their peers of lower social classes.

The working class may also fall prey to a crowding-out mechanism following an economic recession. Lower-middle and upper-middle class workers who struggle to find a job may apply for positions below their initial ordinary reservation wage during periods of crisis (Devereux, 2002). This likely leads to a greater asymmetry in bargaining power between workers and employers in working-class occupations. Previous research supports this notion and indicates that economic conditions affect workers' bargaining power: the higher the unemployment rate is, the weaker their bargaining power (Western and Healy, 1999). Companies are likely to take advantage of this situation by cutting wages and raising hiring standards in the face of the increasing influx of workers (Reder, 1955). The consequent crowding-out mechanism places more wage pressure on working-class occupations, as they experience more layoffs than the upper-middle class. According to this theory, we should observe a wider difference in earnings between the working class and the upper-middle class during economic recessions (Hypothesis 1 [H_1]).

Empirical evidence shows that income differences grew by approximately 13% between occupational classes in the United States between 1980 and 2010 (Wodtke, 2016). It also suggests that the increase in income differences across occupational classes seems to have started following the early 1990s. One may wonder whether the Great Recession accelerated, halted or reversed this trend in class inequality. Recent empirical evidence supports the acceleration argument and shows a widening of the earnings gap between the self-employed and the working class, on the one hand, and the upper class, on the other, between 2005 and 2014 in some European countries (Albertini et al., 2020). Nevertheless, there are some variations within countries: while income differences have strengthened in Germany, Spain, Italy, the Netherlands and Poland, this widening in the earnings gap was less salient in Sweden and the United Kingdom.

2.3. Socioeconomic reshuffling

Piketty (2014) argues that inequality moves procyclically. It increases during economic expansions and decreases during economic recessions. This is because when national income increases during an economic expansion, people at the top are more likely to have a higher increase in their wages than people at the bottom. On the other hand, following an economic recession, high earners may take a large hit, as their labor income is largely tied to the performance of financial markets (Atkinson and Morelli, 2011). At the same time, political factors influence wage progression and likely compress income inequality (Piketty, 2014). In addition, new public policies such as progressive taxation, increases in the minimum wage and rent control can be introduced to level off the repercussions of an economic recession. As a result, these measures can enhance equality (Piketty, 2014; Roine and Waldenström, 2015; Scheidel, 2017).

Evidence on early economic recessions suggests that the Great Depression contracted the differences in earnings between top and low earners. This compressive effect even persisted following the New Deal era, long after the 1929 crisis (Piketty, 2014). Findings on more recent recessions in the United States suggest that the top one percent lost 30% and 36% in real income growth during the dotcom bubble and the Great Recession, respectively. In contrast, average real income growth decreased by 11% and 17% during the same period (Saez, 2013). While this compressive effect may be attributed to large losses in capital income and wealth, there is evidence that the procyclical case also extends to labor income. Empirical evidence supports this notion and shows that the wages of top earners are more cyclical than the wages of lower earners. Parker and Vissing-Jorgensen (2010) scrutinized the cyclicality of labor income in the United States and Canada between 1982 and 2005. The study suggests that cyclicality is asymmetrically U-shaped; it is higher at both ends of the income distribution than in the middle, yet the cyclicality is stronger at the top than at the bottom. Put differently, the

earnings of people at the top of the income distribution are more volatile during economic recessions than those of people at the bottom. Another study that investigated the cyclicality of labor income also supports this finding (Guvenen et al., 2014). If economic recessions affect class inequality in this way, we can expect earnings differences to contract between the upper-middle class and the working class (Hypothesis 2 [H_2]).

However, these findings that economic shocks decrease inequality between top and low earners are not fully supported by a study that looked over the effect of macroeconomic shocks on inequality in 25 countries over the period of 1911–2010 (Atkinson and Morelli, 2011). In the wake of the 29 crises studied, inequality decreased in eight cases, remained stable in another eight cases and increased in 13 cases. This evidence suggests that any generalization of the effect of financial crises on earnings inequality should be taken with caution. Notably, earnings inequality dropped drastically following the Great Depression (Atkinson and Morelli, 2011). On the other hand, earnings inequality increased in other financial crises that were less severe. If the severity of the financial crisis influences the direction of earnings inequality, we may expect earnings differences to contract between the upper-middle class and the working class in countries that experienced severe economic recession, such as Greece and Iceland. Conversely, we can expect widening earnings inequality in countries experiencing a moderate economic recession (Hypothesis 3 [H_3]).

3. Data, measures and analytical strategy

3.1. Data

Our analysis of earnings differences between social classes covers 23 European countries[2] and is based on 14 cross-sectional survey rounds from the EU-SILC between 2004 and 2017 (Eurostat, 2020). The EU-SILC is a survey that employs probability sampling methods and aims at providing harmonized data. Countries may differ in questionnaire design, sample design and mode of data collection (survey data vs. register data) (Trindade et al., 2020). However, this dataset is among the highest-quality comparative surveys undertaken, specifically if income is the outcome variable. We select 23 European countries to widen the perspective and provide an up-to-date account of class and earnings inequality.[3]

3.2. Measures

Our outcome variable is labor income (corrected for inflation[4] and expressed in euros) in a given year. It captures income generated from employment, which includes wages and salaries, remuneration for a certain time not worked, overtime compensation, commissions, profit sharing and bonuses. Our outcome excludes capital gains such as profits collected from renting or selling an asset. We include the working population, that is, all the employed individuals in our sample. A portion of the working population reported zero or negative earnings. As we aim to use the logarithm of earnings, we bottom code[5] our income variable as it includes the zero and negative earnings. That is, any value below 15% of the median wage in a certain country module is set to 15% of the median wage. This threshold is recommended by the data producers when bottom coding (Neri et al., 2009). We limit the age range between 25 and 64, leaving aside younger people, who are often still in education, and older people, who generally leave the workforce or are in transition toward retirement.

We follow the dominant tradition in stratification research and argue that occupations are the cornerstones of contemporary labor markets and the resulting class system (Treiman, 1977). Thus, we use occupations as the building blocks of social class as our main predictor. We transform the original occupational variable ISCO-08 (2 digit) according to a version developed by Oesch (2006) into three different classes: (1) the upper-middle class of managers and professionals (ISCO 1 and 2); (2) the lower-middle class of associate managers, semiprofessionals, technicians and skilled clerks (ISCO 3 and 4); and (3) the working class of craft, production, sales and service workers (ISCO 5 to 9). These three categories mirror the scheme made by Erikson and Goldthorpe (1992) in terms of employment relationships. We show in Table S1 a detailed listing of the two digit occupations that comprise our class variable.

Our second key independent variable represents macroeconomic shocks, which we measure in two different ways. First, we use the standardized unemployment rate among prime-age workers as our aggregate measure of adversity in the labor market. Second, we employ the output gap in GDP, which refers to the difference between actual and potential GDP. This measure indicates whether a country experienced a macroeconomic demand shortage. Both macro variables are extracted from the OECD, 2021. We further control for respondents' age, gender and country of birth. The descriptive statistics of all the variables are shown in Table S2 in the supplementary material.

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[2] These countries are Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Ireland, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

[3] We aimed to include all countries represented in the EU-SILC; however, we had to exclude some. First, we excluded Bulgaria, Cyprus, Croatia, Lithuania, Latvia, Malta, Romania and Serbia because no information on their output gap in GDP is available. Second, we excluded Slovenia because its country of birth variable is missing one category (EU citizen).

[4] We extract the consumer price indices from the OECD: https://stats.oecd.org/.

[5] Sensitivity analysis on non-logged income including zeros and negatives values shows similar findings to our original models (see Table S4).

3.3. Analytical strategy

Our analysis deploys two analytical strategies. First, we run a three-level multilevel regression analysis within 23 countries, 290 country-year units, and 2,234,878 individuals. This strategy analyses the association between social class and earnings across the different measures of macroeconomic shocks (unemployment rate and GDP gap). This approach is important because it takes into consideration the intensity of the crisis in different years across countries. For example, the increase in the unemployment rate in Poland was negligible compared to that in Spain during the same period.

Second, we use the survey year as a measure of economic crisis and compare the earnings gap in 2007 with that in the years that followed. This strategy is used because the unemployment rate and GDP gap cannot fully capture the effect of the 2008 financial crisis. For example, the debt and banking crisis – which affected the intensity of the financial crisis in certain areas – are not accounted for by these indicators. Therefore, we use the survey year as a proxy. This analytical strategy estimates a separate multivariate linear regression for each country for the years between 2004 and 2017 and is modeled in Equation (2). We explain the details of both analytical strategies next.
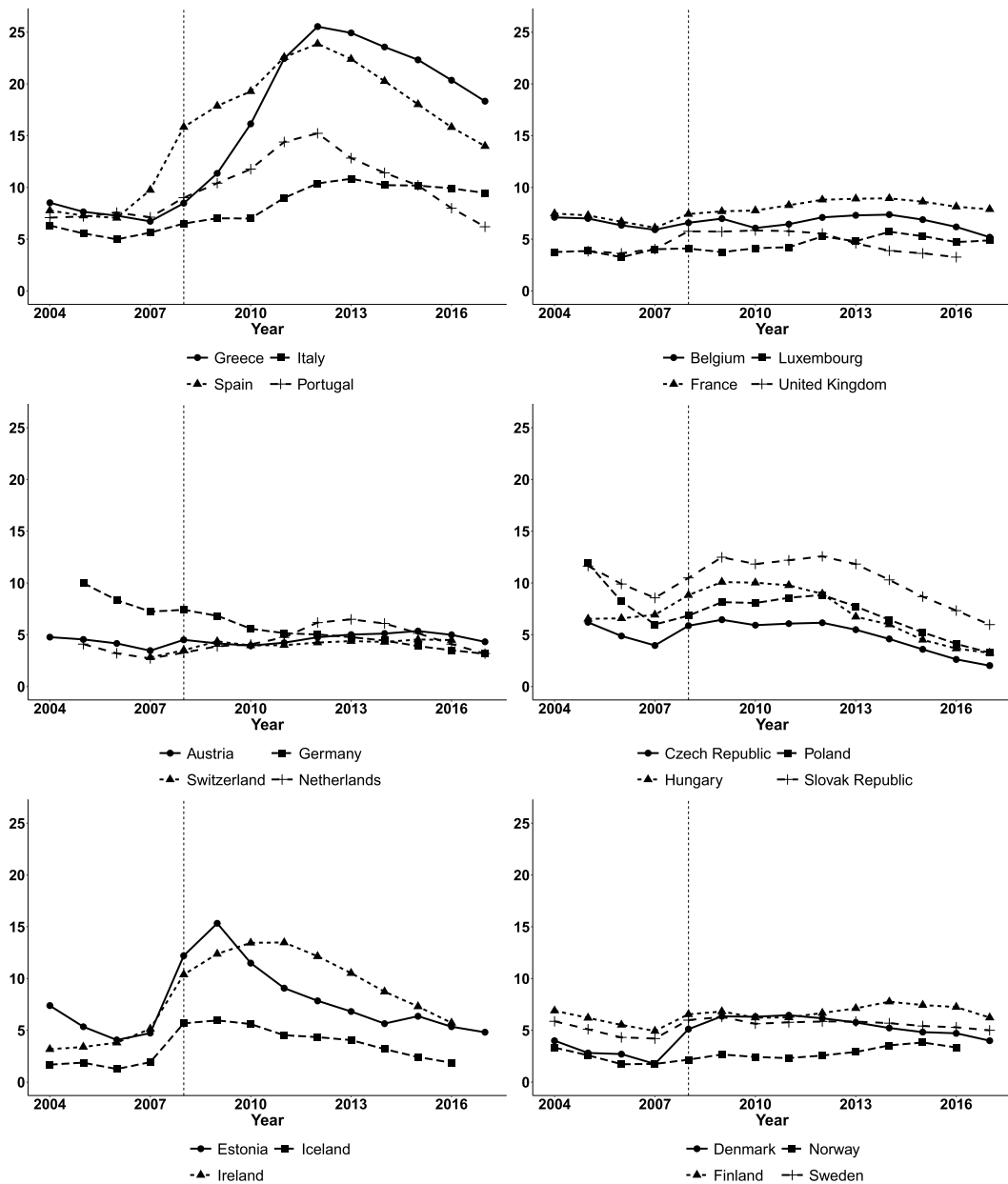

Fig. 1. Unemployment rate between 2004 and 2017 (in %). Source: OECD Labour Market Statistics, extracted 2021.

To design our first analytical strategy, we follow the recommendations of Schmidt-Catran and Fairbrother (2016), which are specific to comparative cross-sectional data over time. That is, Equation (1) treats country-years as nested within countries and respondents as nested in country-years. This approach is advantageous for several reasons. First, it assumes that individuals embedded in one country are more similar than those in other countries. Second, it recognizes that individuals observed in the same country and the same year are more similar than individuals from the same country but different years (Schmidt-Catran and Fairbrother, 2016). The number of higher-level units in our sample (290 country-years) exceeds the minimum number of units (30) required for unbiased estimates (Bryan and Jenkins, 2016).

$$y_{ijl} = \beta_0 + \beta_p Class_{ijl} + \beta_q Unemployment\_rate_{jl} + \beta_{pq} Class_{ijl} * Unemployment\_rate_{jl} + \beta_t Year\_dummies_{jl} + \beta_c Controls_{ijl} + u_{jl} + u_l + \varepsilon_{ijl} \qquad (1)$$

The subscript i represents respondents, jl represents country-years, and l represents countries. β_p indicates the individual-level variables such as social class, age, gender and country of birth. β_q represents country-year level variables such as the unemployment rate and output gap in GDP. β_{pq} indicates the cross-level interactions, that is, the interaction between social class and both country-year-level variables (the unemployment rate and output gap in GDP), where each interaction resides in a separate model. β_{pq} is our coefficient of interest, and a negative and significant slope suggests that the earnings gap between the working class and the upper-middle class widened following the Great Recession. β_t represents the period fixed effects (a set of year dummies) and accounts for general trends over time. The random part consists of the error terms u_{jl} (country-years), u_l (countries), and ε_{ijl} (individuals). We follow recent recommendations to include a random slope at the country level for our main predictor (social class) involved in a cross-level interaction (Heisig and Schaeffer, 2019). Our first estimation strategy is important because it controls for any possible statistical dependence and takes into account the variation in the timing and severity of the financial crisis across countries. Models are estimated using the MixedModels (Bates et al., 2022) and the Effects (Alday et al., 2022) packages in Julia.

The second equation below estimates a separate linear regression for each country for the years between 2004 and 2017:

$$Y_i = \beta_0 + \beta_p \ Class_{it} + \beta_q \ Year_t + \beta_{pq} \ class_{it} * year_t + \beta_c \ controls_{it} + \varepsilon_{it} \qquad (2)$$

The subscript i represents respondents, and t represents the time period. where Y is the logarithm of annual wages for individual i. Our two main predictors are individuals' social class $class_i$ and the survey year $year_t$. The coefficient β_{pq} is an interaction between social class and year, which estimates the differences in the earnings gap among different social classes between 2004 and 2017. A negative and significant slope would suggest that the social-class gap in terms of earnings widened following the Great Recession. Put differently, such a finding would support the hypothesis that the working class was more negatively affected by the Great Recession than the upper-middle class. β_c includes a vector of control variables such as country of birth, gender and age, and ε_{it} represents the error term. For replicating all analyses, we provide our scripts online (Moawad, 2022b).

4. Results

4.1. Evolution of the financial crisis in Europe

Fig. 1 shows the unemployment rate in 23 European countries from 2004 to 2017. The increase in the unemployment rate following the 2008 financial crisis varied widely in Europe. For example, Finland, Sweden, Norway, Poland, the Czech Republic, Austria, Switzerland, France, the Netherlands, Belgium, Luxembourg and the United Kingdom experienced a modest increase in unemployment that ranged from 1 percentage point (pp.) to 3 pp. Other countries, such as Denmark, Iceland, Hungary, Slovakia and Italy, were hit harder by the economic crisis, seeing increases in unemployment rates of 4 pp. to 6 pp. The economic crisis was strongest in Estonia, Ireland, Portugal, Spain, and Greece, where the unemployment rate surged to a range of 9 pp. to 16 pp. On the other hand, in Germany, the unemployment rate decreased by 2 pp. following the 2008 financial crisis. In sum, Fig. 1 shows that European countries experienced the intensity of the Great Recession differently. To evaluate whether these differences across countries hold using a different crisis indicator, we show the output gap in GDP in Figure S1 and find that the trend mostly mirrors that of the unemployment rate (see the online supplementary material).

4.2. The effect of macroeconomic shocks on earnings

We turn to our central question, that is, whether the Great Recession had a heterogeneous effect on the working and upper-middle class. To explore this, we add cross-level interactions between social class and key macrolevel variables (the unemployment rate and GDP gap). This interaction is shown in equation (1) as β_{pq}. We present the empirical results for these cross-level interactions graphically as the gap in predicted values between the working class and upper-middle class in Fig. 2, and we also document the corresponding coefficients in Table 1. We include the detailed findings in Table S3 and Figure S2.

Model 1 represents the interaction β_{pq} in equation (1) between the unemployment rate and social class and supports hypothesis (H₁). This suggests that the earnings gap rose between the working and upper-middle class as the estimate of $\beta_{pq} = $ - 0.02. An increase in the unemployment rate of approximately 5 percentage points implies a jump of approximately 0.10 log points in the earnings gap between the working and upper-middle class. The left panel in Fig. 2 shows this association and makes clear that the difference in earnings between the working class and the upper-middle class widens with every unit increase in unemployment rate. If we analyze the difference at both extremes, we see that an increase of 15 percentage points in the unemployment rate is associated with an increase in the gap between the working and upper-middle class by approximately 0.30 log points (i.e., 0.791–0.495 = 0.296).
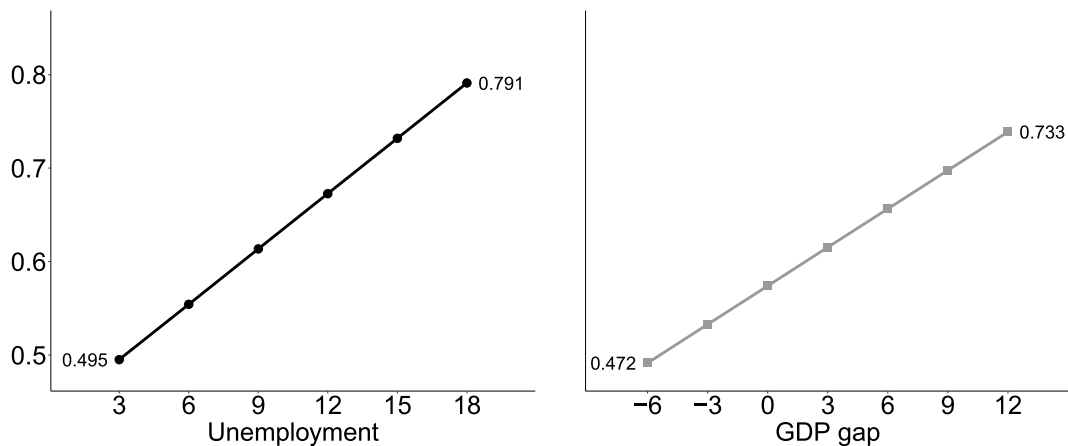
Fig. 2. The class gap in predicted values of labor income by macroeconomic shocks. Note: Difference in predicted values of working class relative to upper-middle class; multilevel linear models. Left panel corresponds to Model 1 and right panel corresponds to Model 2 in Table 1. Y-axis models log income. The models control for (1) age, gender, country of birth and social class; (2) macrolevel: unemployment rate (Model 1), GDP gap (Model 2). Full graph can be found in the supplementary material in Figure S2. Source: EU-SILC, 2004–2017.

Table 1
Interaction effects of social class and macroeconomic shocks on labor income.

Predictors	Model 1	Model 2
Lower-middle class * unemployment	−0.013*** (0.001)	
Working class * unemployment	−0.020*** (0.001)	
Lower-middle class * GDP gap		−0.011*** (0.000)
Working class * GDP gap		−0.014*** (0.000)
Random slope - country level	Yes	Yes
Year dummies	Yes	Yes
N (individuals)	2,234,878	2,234,878
N (country-years)	290	290
N (countries)	23	23
†<p 0.1 *<p 0.05 **p < 0.01 ***p < 0.001		

Note: Coefficients from multilevel linear models. Standard errors are in brackets. Dependent variable: log income. Models control for (1) age, gender, country of birth and social class; (2) macrolevel: unemployment rate (Model 1), GDP gap (Model 2). Full table can be found in the supplementary material in Table S3.

To check that our findings hold across different financial crisis measures, we use the output gap in GDP as a robust indicator of the business cycle. It captures the macroeconomic demand shortages of European countries by comparing actual GDP (output) and potential GDP (maximum-efficiency output). Model 2 presents the corresponding coefficients of the cross-level interaction β_{pq} in equation (1) between the GDP output gap and social class (see Table 1). In brief, we find results similar to those of our original analysis; that is, an economic recession is associated with an increase in the earnings gap between the working class and upper-middle class. The right panel in Fig. 2 exhibits this association by showing an increase in the earnings gap between the working class and the upper-middle class with every unit increase in the GDP gap. More specifically, it shows that an increase of 15 percentage points in the GDP output gap is associated with an increase in the earnings gap between the working class and the upper-middle class by approximately 0.26 log points (i.e., 0.733–0.472 = 0.261).

While this effect size is slightly smaller than that identified for the unemployment rate, it indicates that our findings are robust. In sum, our results support hypothesis (H1) that the Great Recession widened earnings inequality between the working and upper-middle class. The earnings gap between the lower-middle and upper-middle class seems to have widened, as Model 1 and Model 2 suggest in Table 1. This finding suggests that the working class was not the only loser during the Great Recession, but the lower-middle class seems to have suffered as well.

4.3. The association between individual earnings and social class over time

Our previous analysis sheds some light on the effect of macroeconomic shocks on earnings across different social classes. While this multilevel design is suitable for answering our research question, one can argue that analyzing the association between individual earnings and social class over time for each country separately could add value to our analyses. To investigate this, we add an interaction between social class and survey year. This interaction is shown in equation (2) as β_{pq}. We present the empirical results for this interaction in Fig. 3.
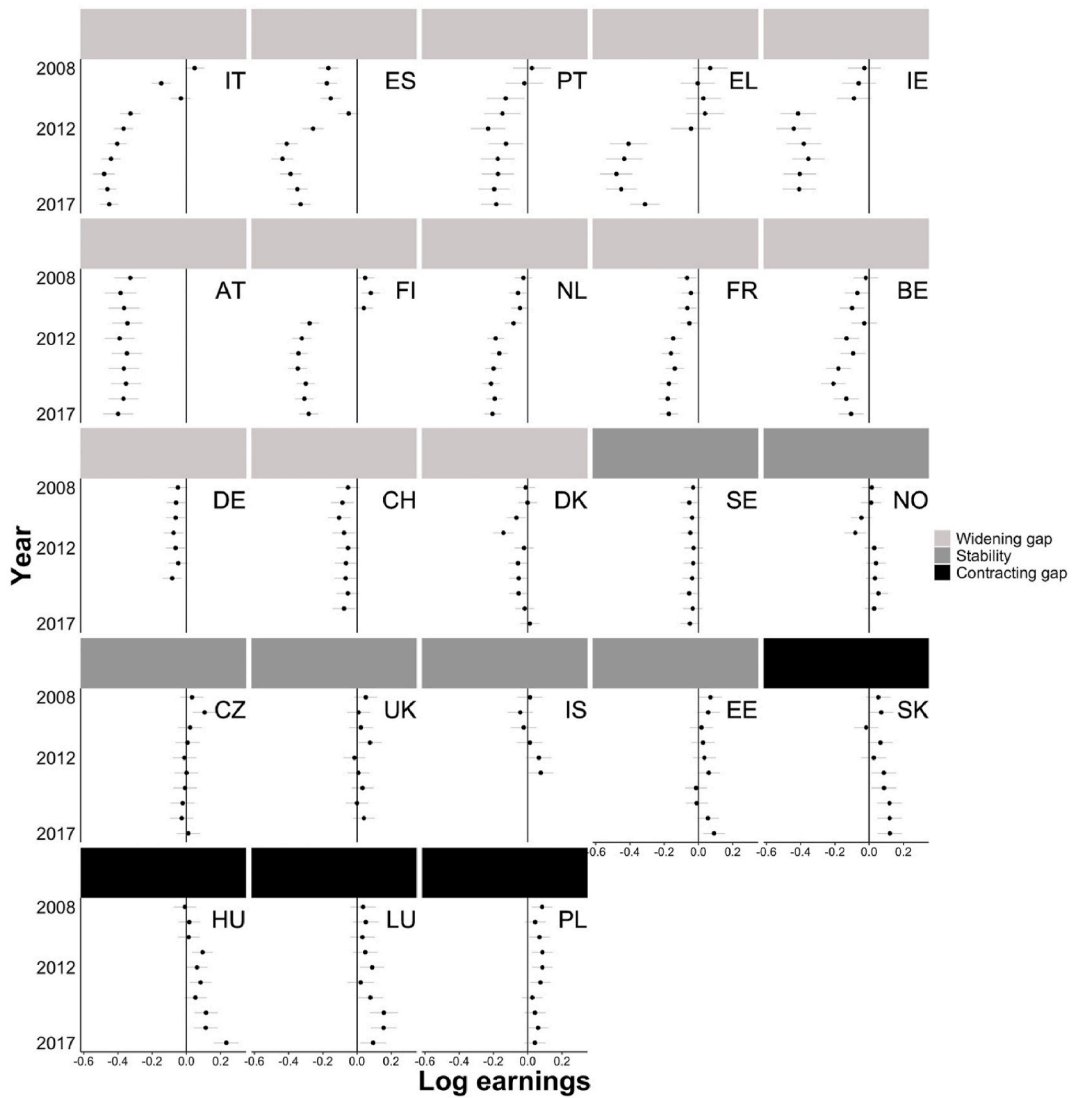
Fig. 3. Change in labor income 2004–2017 of working class adults relative to upper-middle class adults. Note: Coefficients from linear models. Confidence intervals 95%. Dependent variable: log income. Models control for age, gender, country of birth, social class and year of interview. Reference category of y-axis is year 2007*working class. Countries displayed are IT: Italy, ES: Spain, PT: Portugal, EL: Greece, IE: Ireland, AT: Austria, FI: Finland, NL: Netherlands, FR: France, BE: Belgium, DE: Germany, CH: Switzerland, DK: Denmark, SE: Sweden, NO: Norway, CZ: Czech Republic, UK: United Kingdom, IS: Iceland, EE: Estonia, SK: Slovak Republic, HU: Hungary, LU: Luxembourg, PL: Poland. Source: EU-SILC, 2004–2017.

Fig. 3 analyses how the earnings gap between the working and upper-middle class evolved between 2004 and 2017. We omit from the plot the period that preceded 2008 for brevity. We fix our reference category for the survey year of the working class as 2007, the year that preceded the Great Recession. This allows us to compare whether the earnings gap widened in each subsequent year. Fig. 3 shows that 13 out of the 23 countries experienced an increase in the earnings gap between the working class and the upper-middle class following the 2008 economic recession.[6] These countries are Italy, Spain, Portugal, Greece, Ireland, Austria, Finland, the Netherlands, France, Belgium, Germany, Switzerland, and Denmark.

These countries generally saw an increase in the earnings gap relative to that in the reference year of 2007 in at least two modules that followed. The effect size is substantively large in several countries that were strongly hit by the Great Recession, such as Italy, Spain, Portugal, Greece and Ireland. It may seem that the earnings gap could be diminishing over time in some modules in Spain (following 2014), Portugal (following 2012) or Greece (following 2015); however, this shift is unfounded, as the confidence intervals

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[6] The earnings gap between the lower-middle class and the upper-middle widened in twelve countries, remained stable in six countries and contracted in five countries (see Figure S3).

overlap between modules within these countries. This hints that the widening gap in earnings between the working class and upper-middle class seems to be stable over the period observed in Ireland and the Southern European countries.

The class gap in earnings also widens in some Nordic countries, such as Denmark and Sweden, but the effect size is small. Moreover, this widening in the class gap is only statistically significant at the 0.05 level in 2009 in Sweden. The widening in the class gap is not different than zero relative to 2007 in several modules in Denmark following 2013. This could be driven by the fact that these countries experienced a relatively mild economic recession. Finland stands out as an exception among the Nordic countries, as the earnings gap among the working class and upper-middle class widened in several modules. While Finland experienced a modest increase in the unemployment rate, its GDP gap contracted the most compared with the rest of the Nordic countries, except for Iceland. This could influence the widening gap observed in Finland.

Fig. 3 shows that four out of the 23 countries experienced a decrease in the earnings gap between the working class and the upper-middle class following the Great Recession. Among countries with this scenario, we find Poland and Luxembourg. Both countries were little affected by the Great Recession. In fact, Poland experienced economic growth according to its GDP gap trajectory. This could benefit the working class, as previous studies show that an economic boom can be particularly helpful for the earnings of the disadvantaged (Hines et al., 2001; Moawad, 2022a).

The class gap in earnings also contracted in countries that were hit by the Great Recession, such as the Slovak Republic and Hungary. This beget the question of why countries that faced an economic recession such as some Eastern European countries experienced a different trajectory than Ireland and the Southern European countries? In short, there is no clear pattern, and this remains a puzzle for future studies to explore further. We explore whether groups with divergent trajectories implemented different social policies in response to the Great Recession and find no systematic differences among them (Helgason, 2019). Then, we compare whether employment rates systematically differed across both groups and find no notable divergence in their trajectories (OECD, 2021).

4.4. Additional sensitivity tests

In additional analyses available in the online supplementary material, we included country fixed effects to examine the robustness of our findings to country-level fixed unobserved heterogeneity (see Table S5). Second, we reran our models separately excluding each of the eight countries with the largest population in our data: Germany, France, the United Kingdom, Italy, Spain, Poland, the Netherlands and Belgium (see Table S6 and Table S7). Without exception, all the replicated results show that our findings are robust. The findings reveal that the earnings gap between the working and upper-middle class increases in deteriorating macroeconomic conditions.

We also ran sensitivity tests on our multivariate analysis over time. Originally, we fix our reference category to 2007, the last year that preceded the Great Recession. However, if this year is an outlier from a general trend, our models might be biased. Consequently, we pool the four years (2004–07) that preceded the Great Recession and fix them as a reference category. The replicated analysis mirrors similar findings to our original models (see Figure S4). Only two countries out of 23 reveal a different trend. The earnings gap between the working and upper-middle class contracts instead of stabilizing in Iceland and Estonia. Finally, we ran a robustness check and include all unemployed individuals in our sample to account for any differential selection into unemployment across social classes. We find similar findings to our original analyses (see Table S8 and Figure S5).

5. Discussion

Against the background of considerable academic concerns about a possible cumulative disadvantage scenario for disadvantaged subgroups resulting from the Great Recession (Redbird and Grusky, 2016), our article examined the extent to which such concerns are warranted. To do so, we analyzed whether the earnings gap between the working and upper-middle class increased between 2004 and 2017 in 23 European countries. We address our question using two different analytical strategies. First, we conduct a three-level multilevel approach that takes into account macro indicators, notably the unemployment rate and GDP gap. Second, we run a multivariate regression model over time for each country separately.

The study presents a number of original and relevant findings. First, our article provides supportive evidence that the Great Recession increased the earnings gap between the working and upper-middle class. This is evident under both of our analytical strategies. Thus, our findings support (H_1). With a few exceptions, the weight of the evidence from our analysis casts considerable doubt on the notion that the effects of the Great Recession align with the predictions of countercyclicality theory (H_2). That is, the earnings of top earners are more volatile than their peers at the bottom of the income distribution (Parker and Vissing-Jorgensen, 2010; Guvenen et al., 2014). Overall, our findings are in line with previous studies that examined Italy (Albertini, 2013) and the United States (Wodtke, 2016).

Second, we test whether the intensity of the financial crisis positively or negatively influences the earnings gap between the working and upper-middle class – that is, whether severe economic recessions such as the Great Depression are more likely to contract the class gap in earnings than less severe economic recessions (H_3). We find that the class gap in earnings widened in Southern European countries and Ireland, all of which faced a severe economic recession. These findings reject H_3 and hint that what drives earnings inequality upward or downward is not strictly related to the severity of the financial crisis but may be influenced by other factors.

Beyond our findings, some caveats must be taken into consideration. First, earnings data are not collected using the same method across countries . This probably leads to some measurement errors; nonetheless, the EU-SILC is considered among the best cross-

country comparative datasets in terms of earnings measures. Second, as our data are cross-sectional, we could not examine whether the losses experienced by the respondents persisted over time. Future research using longitudinal data may investigate this possibility, especially in countries that face a large increase in the earnings gap between the working and upper-middle class, such as Spain and Italy.

New concerns regarding inequalities in OECD countries have been raised in public discourse (Keeley, 2015). We contribute innovative evidence with respect to this topic, as we investigate whether a macroeconomic shock – the Great Recession – affected earnings inequalities between social classes. Our contribution may be relevant to the recent economic crisis that unfolded following the COVID-19 pandemic and the eruption of the war in Ukraine. If we thoroughly understand the repercussions of the 2008 financial crisis, we might be able to better address the aftermath of the current economic crisis. To the extent that the earnings gap between the working and upper-middle class generally widened following the Great Recession, one might speculate that there could be some reasons for concern over how the recent economic crisis might expand this gap even further.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssresearch.2022.102829.

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