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Wealth and Income Stratification by Social Class in Five European Countries

Carlos J. Gil-Hernández[1] · **Pedro Salas-Rojo**[2] · **Guillem Vidal**[3,4] · **Davide Villani**[3]

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Abstract
Wealth is a central determinant of life chances and intergenerational status persistence in modern societies. Despite increasing attention, sociologists traditionally overlooked its role in class-based economic disparities, while most economists focused on the elites' accumulation. This article combines sociological and economic perspectives to test whether big occupational classes, the most standardised and operationalisable approach, depict the wealth distribution. Drawing from the Luxembourg Wealth Study (2002–2018) in five European countries, we explore (1) how wealth is distributed and stratified by big occupational classes over time and cross-nationally and (2) to what extent classes account for aggregate wealth inequality trends compared with income. Unlike bold claims on class 'death' or 'decomposition', inequality of outcomes in wealth accumulation is firmly rooted across big occupational classes in contemporary capitalism, potentially harming social mobility in future generations. Still, occupational classes better capture between-group income inequality and stratification than wealth, emphasising the importance of economic resources beyond labour market attachment. Against the backdrop of previous research and our findings, we discuss the role of wealth in contemporary class analysis.

Keywords Social class · Income inequality · Wealth inequality · Social stratification · Occupations · Luxembourg Wealth Study

✉ Carlos J. Gil-Hernández
carlos.gil@unifi.it

[1] Department of Statistics, Computer Science, Applications, University of Florence, Florence, Italy

[2] London School of Economics and Political Science, International Inequalities Institute, London, UK

[3] Joint Research Centre, European Commission, Seville, Spain

[4] Social Rights and Inclusion Department, Generalitat de Catalunya, Barcelona, Spain

1 Introduction

Over the past few decades, many Western economies have witnessed a notable surge in income and wealth inequality (Piketty, 2014a), fostering discussion on the links between economic inequality and class measurement (Milanovic, 2023; Toft & Hansen, 2022). Income has recently gained relevance over occupational class as the preferred indicator of socioeconomic position for social stratification scholars (Barone et al., 2022), paralleling bold claims on *big* occupational class *death* (Pakulski, 2005) or *decomposition* (Weeden & Grusky, 2012). Nevertheless, ample evidence shows that big class schemes based on occupations still explain a substantial portion of income inequality cross-nationally and over time (Albertini et al., 2020; Goedemé et al., 2022; Zhou & Wodtke, 2019).

While class-based income distribution and trajectories got more attention (Kim et al., 2018), recent research focuses on wealth (Duvoux & Papuchon, 2022). Wealth is more unequally distributed than income, with different drivers, such as saving, investment decisions and tax policy, explaining their levels and trends (Pfeffer & Waitkus, 2021). Thus, a classical occupational-class approach (Goldthorpe, 2007; Oesch, 2023; Wright, 2005) might overlook economic resources not originating from labour market attachment (Sørensen, 2000; e.g., rent-generating assets) but advantaging wealth accumulation and transmission (Toft & Hansen, 2022).

Wealth is one of the "Big Four" social stratification dimensions (Pfeffer & Killewald, 2018) beyond the classic socioeconomic status (SES) triad of education, occupational class, and income (Hälsten & Thaning, 2021). Wealth begets wealth accumulation through capital investments, protects against economic shocks, conveys social status and political power (Beckert, 2023), and contributes to intergenerational SES persistence through non-meritocratic channels beyond education or labour markets, such as inheritances (Albertini & Radl, 2012), and social closure strategies (Waitkus et al., 2024). Recent studies documenting sizeable and persistent class wealth gaps (Duvoux & Papuchon, 2022; Hansen & Toft, 2021) illustrate its central role in contemporary capitalism. However, despite rising interest and contributions from sociology and economics (Beckert, 2023; Killewald et al., 2017; Morgan & Cha, 2007), the class-wealth inequality link and its temporal evolution remain underexplored (Waitkus et al., 2024).

First, sociologists have not paid enough attention to economic inequality in general (Albertini, 2013) and wealth inequality in particular (Savage, 2014) due to its traditional focus on stratification by ascribed characteristics—ethnicity, gender—and occupations (DiPrete, 2007; Sakamoto & Wang, 2020). Based on labour markets, mainstream occupational class schemes miss the theoretical and empirical links with wealth accumulation and composition (Waitkus et al., 2024; Duvoux & Papuchon, 2022; Lersch & Luijkx, 2014). Second, inequality and stratification are distinct analytical concepts with different implications for class analysis that sociologists have not accurately disentangled (Zhou & Wodtke, 2019). While inequality denotes the extent to which average (economic) resources are distributed across social classes, stratification indicates how individuals can be ranked over an economic hierarchy into non-overlapping groups (Zhou, 2012). Third, some economists reduced the class structure to the capitalists-labourers divide (Giangregorio & Villani, 2024), while others applied an attributional view to the overall income distribution or the wealth accumulation dynamics of the elites (Piketty, 2014a). Yet, wealth matters for understanding not just the accumulation of resources, status, and power by a small elite (Wright, 2015) but also for depicting

unequal life chances across the entire class structure (Duvoux & Papuchon, 2022: 324; Wolff & Zacharias, 2013), which is better understood in relational than attributional terms (Goldthorpe, 2012).

A relevant overarching question is whether big occupational class schemes, the most used and operationalisable measure in standard surveys for stratification scholars (Barone et al., 2022), depict the wealth inequality hierarchy beyond the top 1% (Duvoux & Papuchon, 2022). We ask two descriptive research questions on wealth inequality and stratification dynamics by social classes: (1) *How is wealth—and its composition—distributed and stratified by occupational classes over time and cross-nationally compared with income?* (2) *To what extent do big occupational classes account for aggregate wealth inequality trends compared with income?*

We employ data from the *Luxembourg Wealth Study* (LWS), studying wealth and income class inequality trends in five European countries (Finland, Germany, Greece, Spain, and Slovakia) over a long period (2002–2018) characterised by slight-to-moderate economic inequality growth. While our analysis emphasises the commonalities of stratification systems (le Grand & Tåhlin, 2013; Treiman, 1977), these countries differ significantly in their institutional contexts of welfare capitalism (Pfeffer & Waitkus, 2021), potentially explaining cross-national heterogeneity. Subject to data availability, we apply a neo-Weberian occupational scheme (Moawad & Oesch, 2024), differentiating 5 big classes with an upper class mostly made of managers and employers, the chief capital accumulators leaving aside the wealthiest 1% (Fana & Villani, 2024; Giangregorio & Villani, 2024).

We combine economic and sociological approaches to class and inequality to address Piketty's *challenge to sociology* (Piketty, 2014b)—social classes and privilege as accumulation and inheritance (Savage, 2014: 592)—and contribute to the literature on three main fronts. First, we explore to what extent occupational classes account for levels and trends of wealth inequality and stratification compared with income. We assess disparities in household market income and net wealth by social classes with multiple indicators: median values, relative shares, the wealth-to-income ratio (WIR), the Gini index, the mean log deviation (MLD)—and between/within classes decompositions, and the stratification index (Zhou, 2012). Second, we dig into asset composition inequalities (Beckert, 2023), as classes with diversified and profitable portfolios might get more returns and economic security. Third, we provide novel evidence for a set of European countries where wealth distribution studies are less established than in the US. In sum, we shed new light on the relationship between occupational classes and economic inequality in income and wealth in the twenty-first century.

The article is organised as follows. Section 2 reviews the main theoretical and empirical approaches to class analysis from economics and sociology to frame our empirical expectations. Section 3 describes the data, variables, and methods to answer our research questions. Section 4 presents the empirical findings. Finally, Sect. 5 concludes by discussing the implications of our findings for class measurement and the increasingly important role of wealth in class inequality against the backdrop of previous research.

2 Theoretical Background and Empirical Expectations

2.1 Social Classes in Economics

Social classes were central analytical categories to classical political economists (Milanovic, 2023) until the late 19th-century marginalist revolution shifted the analysis unit to individuals. Still, social classes have not entirely disappeared from the research map and have recently been conceptualised and applied in two main strands.

The first approach employs percentile thresholds and ratios to identify social class boundaries. Central to this method is the emphasis on income and wealth accumulation by affluent elites (e.g., top 0.1–1 percentiles; Piketty & Saez, 2006) and the disparities between the super-rich and the broader population. Piketty (2014b) generally considers social class multidimensional (Savage et al., 2013) but draws data-driven comparable class frontiers over historical periods. Other studies develop the "middle class" concept as a designated population segment—such as the central 60% (Estache & Leipziger, 2009; Oesch, 2023)— or define relative income brackets (Ravallion, 2010). Despite its usefulness, the boundary definition is somewhat arbitrary (Atkinson & Brandolini, 2011).

The second approach addresses these shortcomings grounded in classical political economy (e.g., Smith, Ricardo and Marx; Milanovic, 2023). The class structure splits into two main categories based on primary income sources: labourers earning wages (labour income) and capitalists receiving income from profits and rents (capital income). Although this analysis waned during the late twentieth century, it resurged (Atkinson, 2009) with researchers delving into factors affecting the income labour share (e.g. Dao et al., 2019). This classical approach enables a clear demarcation between social classes. Still, recent changes in the labour market make it less clear-cut today since individuals often receive multiple sources of income (Milanovic, 2017).

Other studies consider the role of wealth (Rehm et al., 2016; Wolff & Zacharias, 2009), managers (Krueger, 1999; Mohun, 2006), and self-employment (Gollin, 2002) in shaping the labourers/capitalists divide. Managers are a blurred category with a contradictory class location (Wright, 2005), particularly in large firms at the top of the income distribution. Wages primarily represent their income, but their roles and interests align more with traditional capitalists, setting a significant share of their incomes from capital returns. Similarly, the categorisation of income for the self-employed, a diverse group combining wages and profits, is a subject of contention (Gollin, 2002).

2.2 Social Classes in Sociology

Economic class approaches do not differentiate classes within the workforce by skills or occupations. Together with the (post)industrialisation and modernisation process, these dimensions are more relevant in sociology. Beyond some economists' attributional view of class as an individual feature, sociological class approaches view market inequalities resulting from social and power relations (Goldthorpe, 2012). Based on the neo-Weberian pillars of market situations and life chances, mainstream social class schemes rely on the socio-technical division of labour—productive assets (skills) and occupations—and the means of production ownership (Oesch, 2023). In the most widespread schemes (the *European Socioeconomic Classification*, ESeC), occupations aggregate into broad

social classes based on employment relations (Rose & Harrison, 2010)—e.g., *monitoring difficulty* and *human asset specificity*.

Big occupational classes still hold appeal among stratification scholars (Smallenbroek et al., 2022) due to their general satisfactory validity in accounting for theorised foundational mechanisms and predicting unequal life chances over careers, like unemployment and poverty risk (Gioachin et al., 2023; Requena, 2023), lifetime income (Shahbazian & Bihagen, 2022), and financial prospects (e.g., savings, credit, homeownership, inheritance; Duvoux & Papuchon, 2022). Yet some critics argue against employing occupational social classes as good proxies for permanent income (Brady et al., 2018; Kim et al., 2018).

This standard big-class approach based on work situations overlooks other income sources, such as capital incomes (rental and financial; Sørensen, 2000), that do not originate from labour market attachment but can increasingly convey advantaged life chances. Still, one can expect that employers earning incomes from profits and employees with advantaged employment relations, such as managers and professionals, might also have more chances to accumulate wealth over the life course (Duvoux & Papuchon, 2022) than classes with a labour contract (Goldthorpe, 2007) due to their more diffuse reward types (company stocks and bonuses boosting financial wealth) and longer time horizons (job stability and rising wage prospects enhancing savings, credit and homeownership).

Neo-Marxist class theorists were the main competing model to the neo-Weberian approach (Wright, 2005). They incorporate capital as an axis structuring the class hierarchy regarding owners/non-owners of rent-generating assets (e.g., financial and housing rents) (Sørensen, 2000), or exploitative relations between antagonist capital owners and wage labourers (Roemer, 1982). The latter approach got the most attention with Wright's revised class scheme (2005), further considering employee surplus asymmetries regarding horizontal (skills) and vertical assets (management), leading to power, authority, and control inequalities in the production process. Still, few studies applied neo-Marxist schemes—given cumbersome operationalisation (Barone et al., 2022; Wright, 2000) and broad working-class conceptualisation (Oesch, 2006), and even less analysed wealth inequality (Morgan & Cha, 2007).

Recently, meso-level class approaches argue that large employers, managers and professionals are pooled together in big class schemes despite their marked horizontal differences in life chances (Smallenbroek et al., 2022), *work logics* (Oesch, 2023) or resources (Hansen & Toft, 2021). Drawing from Bourdieu's (1986) multidimensional social space, detailed class schemes emphasise the salient role of economic assets and income sources to depict the social hierarchy (Hansen & Toft, 2021; Savage et al., 2005, 2013) and its reproduction (Hansen & Wiborg, 2019). Unfortunately, data constraints in most surveys, including this article, limit its application.

In practical terms, there is a significant conceptual and empirical overlap between neo-Weberian and neo-Marxist class approaches (Hertel et al., 2023; Lambert & Bihagen, 2014), as both draw from social/power relations (Wright, 2005), skills and broad occupational titles (le Grand & Tahlin, 2013). Furthermore, while these occupational-based schemes did not explicitly include different wealth assets as class-generating mechanisms or outcomes for validity testing, both operationalise big employers, top managers, and higher-grade professionals—the main capital accumulators and top wage earners beyond the super-rich (Giangregorio & Villani, 2024)—within the upper classes. Therefore, a pertinent sociological question is whether big occupational class schemes, the most commonly used by stratification scholars and operationalisable in standard surveys (Barone et al., 2022), can effectively represent the wealth distribution—considerably more concentrated

than income—across countries and stratification systems among the 99% (le Grand & Tåhlin, 2013; Treiman, 1977).

Expectation 1 We expect (median) wealth to be as rank-ordered by big occupational classes as income but more steeply, reflecting class-based accumulation dynamics and higher wealth than income inequality. In turn, we expect relative inequality in class wealth shares to be bigger than income, keeping stable or increasing over time during the slight-to-moderate economic inequality rise period analysed (2002–2018).

2.3 Wealth Composition by Social Classes

From the late 1970s, wealth inequality returned to the rise after a long post-WWII decline (Piketty & Saez, 2013), together with income inequality growth and economic financialisation, two processes with critical implications for class inequality in wealth accumulation and composition.

Wealth accumulation may stem from rising income inequalities (Berman et al., 2016). Since consumption is a concave function of income, higher income levels lead to higher saving rates. Social classes with advantaged employment relations earn and save more, thus accumulating more financial assets than relatively poorer classes. Accordingly, wealth disparities across social classes should be higher than those found for income. This process is further affected by several other factors: interest rate fluctuations, exogenous changes in asset prices, heterogeneity in investment skills, debt accumulation, or risk aversion towards specific investments (De Nardi & Fella, 2017; Lusardi et al., 2017).

The process of financialisation (van der Zwan 2013) expanded the financial products available to firms and households. These changes catalysed the rise of shareholder values, where firms prioritised strategies to boost stock prices and shareholder profits (Godechot et al., 2023; Lazonick & O'Sullivan, 2000). The phenomenon expanded to other realms, like housing, education investment, and retirement planning, paralleling the diminishing state's role as a redistributive agent (Hacker & Pierson, 2010). The financialisation of the economy highlights the relevance of decomposing wealth into its two main components, financial and non-financial, and their implications for class inequality (Morgan & Cha, 2007).

Financial wealth is highly unequally distributed, comprising deposits, stocks, bonds, or other marketable securities that yield more volatile but higher returns than non-financial wealth. Besides, financial assets are liquid, offering leverage against economic shocks, as their owners can quickly reshuffle their portfolios during downturns (Beckert, 2023). Since these assets are not physically attached, they can be easily traded across countries with minimal regulation. Still, investment skills or the resources to hire financial advice are often needed to maintain regular returns from these assets.

Conversely, non-financial wealth, such as real estate, is much more equally distributed across households, mainly due to the prevalence of homeownership (Boertien & López-Gay, 2023) and its intergenerational transmission (Lersch & Luijkx, 2014). Regardless of their social position, many families also own real estate beyond their primary residence, for instance, via inheritances. Due to their physical attachment, these assets are hardly liquid and tradable across countries, so they are often used for long-term savings, bequest vehicles, and private use. Non-financial wealth also comprises business assets owned mainly by the self-employed. Although less liquid than most financial assets, business assets can be used as collateral to support or expand entrepreneurial activity.

Differences in asset composition within a household's portfolio are noteworthy for class analyses (Beckert, 2023). Classes with diversified and profitable portfolios, such as financial and business assets, may get increasing returns from their wealth, be less vulnerable to income shocks and thus maintain and reproduce their status. By contrast, classes with a higher portfolio share tied to primary residences might be constrained by less liquidity during economic downturns.

Expectation 2 We expect class-based inequalities in wealth composition: upper (managers and employers), upper-middle (professionals) and middle classes (self-employed) own a higher proportion of financial and business assets, while the working classes mostly own real estate assets (primary residences).

2.4 Wealth-to-Income Ratios by Social Classes

Class-based inequalities in wealth composition also lead to WIR disparities. The WIR captures how much capital returns outpace the mean growth rate of the economy, consolidating a rentier dynastic elite (Piketty & Zucman, 2014). Since wealth is a cumulative stock at the household level, a high WIR proxies the weight of the past—savings from labour and capital incomes and inheritances—over the present annual income (Duvoux & Papuchon, 2022). Thus, class-based WIR inequality is expected if the upper and middle classes accumulate wealth from high incomes and savings or are less dependent on wages—self-employed, owning business assets, or rentiers. By contrast, the working classes mainly rely on (low) wage incomes and primary residence assets, pointing to less savings and greater exposure to economic downturns.

Expectation 3 The upper and middle classes (self-employed) have higher WIRs than the working classes, with relative class-based WIR inequalities remaining constant or increasing over time during the slight-to-moderate economic inequality rise period analysed (2002–2018). WIR absolute levels might be heterogeneous across countries, given different homeownership and self-employment rates. Still, the WIR class rank order should be relatively homogeneous cross-nationally (Duvoux & Papuchon, 2022).

2.5 Between-Class Inequality and Stratification

To test whether big occupational classes account for economic inequality trends over time and cross-nationally, it is crucial to stress that between-group inequality and stratification are related but distinct conceptual and analytical categories that sociologists have not measured accordingly (Zhou, 2012). Between-group inequality is the dispersion of outcome (income, wealth) averages across population groups defined by labour market characteristics (i.e., social class). In turn, stratification refers to the hierarchical segmentation of social groups according to their relative rank in the outcome distribution. That implies that low levels of between-group inequality can coexist with high stratification if their averages are close, but their distributions hardly overlap and cluster into layers. Hence, we study between-class inequality and stratification as complementary instruments.

In contrast to the 'death' (Pakulski, 2005) and 'decomposition' (Weeden & Grusky, 2012) of class hypotheses, predicting a declining explanatory power of big occupational class, previous findings show these schemes explain a substantial portion of income inequality (between-class inequality) and stratification (Marqués-Perales et al., 2024) both

cross-nationally and over time (Goedemé et al., 2021; Albertini et al., 2020), even to a similar or greater extent than detailed occupations or micro classes (Zhou & Wodtke, 2019).

Expectation 4 Unlike class 'death' and 'decomposition' hypotheses, we predict that big occupational classes' capacity to account for wealth inequality and stratification over time remains constant or increases across countries during the slight-to-moderate economic inequality rise period analysed (2002–2018). Yet, between-class wealth inequality and stratification should stand below income, indicating that occupational classes are better suited to capture labour market dynamics.

3 Data, Variables and Methods

3.1 Data

The data comes from the *Luxembourg Wealth Study* (Luxembourg Wealth Study (LWS) Database), a cross-national homogenised database. We focus on five European countries (see Appendix Table A5 for samples by country-wave.): Finland (2013, 2016), Germany (2002, 2007, 2012, 2017), Greece (2009, 2014, 2018), Spain (2002, 2005, 2008, 2011, 2014, 2017) and Slovakia (2010, 2014, 2017). This period and country selection respond to data availability and comparability on the necessary variables to build social class.

We do not formulate country-specific comparative hypotheses since we are interested in the commonalities of stratification systems and the capacity of occupational classes to account for wealth disparities in different settings (le Grand & Tåhlin, 2013). Still, we cannot disregard that our selected countries represent a diverse macro setting that should be borne in mind when interpreting our results (Pfeffer & Waitkus, 2021). Finland is typically characterized as a low-inequality country that benefits from progressive welfare policies promoting social mobility and equity. Germany's stable economic growth has been primarily driven by manufacturing and technological advancements, which have ultimately contributed to rising wage and regional disparities particularly due to a dual labour market structure. In contrast, Greece's growth during the early 2000s was undermined by fiscal instability, with high public spending and a large informal economy culminating in a sovereign debt crisis. Austerity measures imposed from 2010 onwards did not improve the economic performance and especially harmed vulnerable population groups, deepening income and wealth inequality. Spain experienced rapid economic expansion driven by a booming construction sector and high consumption levels until 2008. Its reliance on temporary contracts and an overheated housing market left the country vulnerable to a severe downturn during the Great Recession, exacerbating inequality in wages and financial assets. This contrasts with widespread homeownership across social strata, making Spain relatively less unequal in terms of real estate wealth. Finally, Slovakia, completing its transition to a market economy during the period covered by our data, faced rising inequality due to the privatisation of large enterprises, but also implemented reforms in the welfare system that palliated these disparities.

The data available in the LWS, as in most wealth surveys, takes the household as the unit of analysis for the outcome variables on income and wealth. For the primary independent variable, occupational social class, we selected household heads aged 25–75—to better capture wealth inequality and occupational maturity—with available information on occupation, education and employment status among those active in paid employment.

These variables might reflect the family's sociodemographic composition, with household heads being, on average, married (71%) men (62%) aged 49 living in households with 3.2 members. Still, families are the primary unit of stratification and consumption, pooling resources across household members. Thus, the household economic situation, even though it might mask intra-household gender inequalities (Kapelle & Lersch, 2020; Waitkus & Minkus, 2021), is an encompassing indicator of individual life chances.

3.2 Variables

Occupational Class. Given data and cross-country comparability availability, we build a neo-Weberian 5-class occupational classification (Moawad & Oesch, 2024) using the unemployed as a separate category to avoid selection and compositional issues (Requena, 2023). This scheme builds upon three harmonised variables on the household head: (1) employment status (1 = employer; 2 = self-employed; 3 = employee); (2) 1-digit ISCO-88 (or ISCO-08); and (3) educational attainment (1 = low: no post-compulsory or < upper secondary education [ISCED-2011: 0–2]; 2 = medium: upper secondary or post-secondary non-tertiary [3–4]; 3 = high: tertiary [5–8]). Since access to numerous occupations depends on specific educational degrees (Moawad & Oesch, 2024), we use educational attainment to (re)classify broad occupations with similar skill-level requirements following the skill hierarchy set by the ILO's *International Classification of Occupations* (Elias, 1997). Table 1 illustrates the three-fold criteria defining each class. This scheme closely matches the ESeC (*Rho* = 0.86–0.91 with the 9–3-category ESeC), the most widespread and standardised scheme. In our scheme, the upper- and upper-middle classes broadly correspond to the ESeC salariat (Classes 1–2), the middle class to the ESeC intermediate class (Classes 3–6), and the skilled- and low-skilled working classes to the ESeC working class (Classes 7–9).[1] A detailed explanation and its comparison with the ESeC are in Technical Appendix 1 and Moawad and Oesch (2024). The Appendix shows the analytical sample sizes and information on the share of classes, unemployed and retired households (Table A5), as well as robustness checks excluding the unemployed (Figures A7–A11) and simultaneously including the retired and unemployed (A6–A10).

Income and Wealth. Households receive labour and/or capital incomes. Aggregating both sources yields total household factor income, denoted here as "income". Households accumulate financial and non-financial assets. After deducting debts, we obtain measures of net financial and non-financial wealth, with their summation yielding net wealth. All income and wealth measures are equivalised with the squared root of the household size and presented in thousands of PPP-adjusted 2017 US dollars. To facilitate cross-country comparisons and overcome data limitations, we concentrate on factor income, disregarding other public transfers. Likewise, financial assets do not include pensions. The Appendix provides robustness checks run with alternative income (total household income; disposable income) and wealth measures (gross assets). Also, it repeats the main analyses separating income and wealth components. Appendix Table A1 defines the dependent variables, and Table A2 shows the main descriptive statistics.

[1] We run additional analyses (available upon request) that include those self-employed in non-managerial occupations as a single class, and the main findings hold. Yet, its small sample size in some countries lead us to merge the self-employed in the middle class.

Table 1 The social class scheme by occupational, employment status, and educational criteria

Social Class	Occupation (1-digit ISCO)	Employment Status	Educational Attainment
Upper	Managers (ISCO 1)	—	≥ Upper-secondary
Upper-Middle	Professionals (ISCO 2)	—	Tertiary
Middle	Managers (ISCO 1)	—	< Upper-secondary
	Professionals (ISCO 2)	—	< Tertiary
	Technicians and associate professionals (ISCO 3)	—	—
	Clerical support workers (ISCO 4)	—	Tertiary
	ISCO 4-9	Employer or self-employed	—
Skilled Working	Clerical support workers (ISCO 4)	Employee	Upper-secondary
	Service and sales workers (ISCO 5)		≥ Upper-secondary
	Skilled agricultural, forestry and fishery workers (ISCO 6)		
	Craft and related trades workers (ISCO 7)		
	Plant and machine operators, and assemblers (ISCO 8)		
Low-Skilled Working	ISCO 4-8	Employee	< Upper-secondary
	Elementary Occupations (ISCO 9)		—

No criteria applied: all categories included. Blank squares correspond to the educational or employment status category above

3.3 Methods

3.3.1 Economic Inequality and Between-Class Decomposition

Economic inequality analyses rely on the Gini index that, when applied to non-negative values, is defined between 0 (perfect equality) and 1 (total inequality). However, for variables encompassing negative values, like net wealth, the standard Gini coefficient may exceed 1. This boundary asymmetry hampers a direct comparison of Gini estimates for incomes and wealth, so we employ the normalization of the Gini index proposed by Raffinetti et al. (2014), facilitating the direct comparison of variables spanning both positive and negative values:

$$Gini(y) = \frac{1}{2N^2 \mu_{RSV}} \sum_{i=1}^{N} \sum_{j=1}^{N} \left| y_i - y_j \right| w_i w_j \tag{1}$$

$$\mu_{RSV} = \frac{(N-1)(T^+ + T^-)}{N^2} \tag{2}$$

where N is the total sample size, y is the outcome of interest, w represents the weights associated with observations i and j, and T^+ and T^- are, respectively, the total positive and total negative outcomes.

The Gini index has an intrinsic property, as it can be decomposed into three terms: a between-group component, that accounts for differences across group-specific means, a within-group component, that reflects inequalities inside pre-defined groups, and a residual term that collects the overlapping between both, the within and between components. We analyze income and wealth inequalities across classes. Those between-group Gini inequality results are estimated by substituting every y_i and y_j in Eq. 1 by the weighted average outcome in the groups or classes the observation belongs to. For robustness, we use the Mean Logarithmic Deviation (MLD), because it is the only

scale-invariant, path-independent, and perfectly additively decomposable inequality index (Foster & Shneyerov, 2000). The MLD, is defined as:

$$MLD(y) = \frac{1}{N}\sum_{i=1}^{N} ln\frac{\bar{y}}{y_i} \tag{3}$$

The MLD has an intrinsic limitation, as it is only defined for strictly positive values due to the logarithm in its formulation. This implies that it cannot be directly applied to capital incomes (which have many zeros and can theoretically achieve negative values) and wealth, which often have several negative values due to debts. Thus, the MLD results are obtained from total incomes and assets without subtracting debts. Being the logarithmic transformation non-linear, the MLD is more sensitive to inequalities in the tails than the Gini, which weighs more those observations around the median of the distribution. According to the central limit theorem, type means are likely to cluster nearer to the overall mean compared to the entire distribution. For this reason, we expect the between-class inequality measured with the Gini to be higher than the one measured with the MLD.

3.3.2 Class Stratification

Both measures illustrate the evolution of income and wealth inequality and their share between social classes. Between-group inequality measures describe to what extent sociodemographic groups account for economic inequality. However, they cannot fully disentangle inequality from stratification. Decomposition methods depend on the variation measure and the extent of within-group variation. Changes in within- and between-class inequality are not mechanically related to stratification levels, as they rely on the class-specific distributional shapes. Thus, we employ the stratification index (Zhou, 2012) to address these issues.

The index ranges from 0 to 1, where 0 denotes no stratification or between-group rank differences across the outcome distribution, and 1 indicates complete stratification with no income/wealth ranges overlapping across groups. This way, the index assesses the degree of rank segmentation between a set g mutually exclusive population subgroups (six in our case: five classes and the unemployed) in a quantitative ordered outcome (income or wealth). Let y_{si} be the outcome of the ith member in the sth group ($1 \leq s \leq g$). Then, (1) all individuals are ranked in increasing order by the value y, thus building relative ranks (r) of n individual observations; (2) the average ranks (R) of the g subgroups to which individuals belong are estimated. Then, we have r_{si} for the ith member in the sth group, and R_s for the average rank of the sth subgroup, with n_s and n_t denoting the number of individuals in group s and t, respectively. The stratification index (S) can be defined as the following concordance score between individuals' and subgroups' sets of ranks:

$$S = \frac{\sum_{s=1}^{g}\sum_{t=1}^{g}\sum_{i=1}^{n_s}\sum_{j=1}^{n_t}\left[1\left(r_{si} > r_{tj}\right) - 1\left(r_{si} < r_{tj}\right)\right]1(R_s > R_t)}{\sum_{s=1}^{g}\sum_{t=1}^{g}\sum_{i=1}^{n_s}\sum_{j=1}^{n_t}1(R_s > R_t)} \tag{4}$$

Based on the following transformation of the above relation (Zhou, 2012), $P_{agree=}\frac{1}{2}(1+S)$, the S index can also be expressed as the probability that the rank in the outcome of two individuals from different groups r_{si} and r_{tj} matches the rank of the groups they belong $R_s and R_t$ (i.e., the probability that a randomly selected upper-class individual

is wealthier than a randomly selected working-class incumbent): the level of certainty with which one can predict the relative position or order of two individuals from different groups based on the relative position of their corresponding groups.

3.3.3 The Wealth-to-Income Ratio

Beyond inequality and stratification measures, the wealth-to-income ratio (WIR) summarises wealth accumulation and how wealth compares with income (Piketty & Zucman, 2014). Examining WIR trends by class, we discern wealth accumulation patterns and at-risk groups to understand better economic inequality.

3.3.4 Aggregate Economic Inequality Trends

Appendix Figure A1 illustrates aggregate wealth and income inequality levels and trends with the Gini index to contextualise the economic inequality trends during the period analysed. The "Overall" metric, as in the remaining figures, presents the average of all five countries in 2010–2015 and 2015–2020—if a country has more than one observation within a period, it is averaged out before taking the total average. Unsurprisingly, overall wealth values are always above income inequality levels. This is driven by the heavy concentration of asset resources at the very top of the wealth distribution. This is particularly evident in the case of financial wealth: while most households allocate the bulk of their portfolios to real estate assets, accumulating little in financial ones, the most affluent focus their wealth on stocks, investment funds, and similar resources (Piketty, 2014a). This imbalance in asset composition directly contributes to high inequality coefficients. Over time, overall wealth and income estimates increase by approximately equal magnitudes (about 3 Gini points), with some countries (Greece, Slovakia, and Spain) experiencing a substantial rise in wealth inequality, especially after the Great Recession. Income inequality remained stable in Greece, Germany and Finland. In Slovakia and Spain, it rose considerably (2 and 7.5 Gini points, respectively).

4 Results

4.1 Income and Wealth by Social Classes

To begin with, Fig. 1 shows each class's median wealth and income averaged over the period. It shows a sharp rank order across social classes in all countries, especially for wealth. While this is not surprising, it is worth highlighting the very large differences between the bottom and top classes in countries like Greece and, especially, Germany, where the median low-skilled household has wealth levels close to zero. This reflects the low levels of homeownership rates among lower social classes. Given lower income inequality, absolute median disparities are more nuanced for income than wealth. Unlike wealth, where the upper class attains the highest median values in most countries, in Greece and Spain, with a high share of small business managers and owners, the top earning class is the upper-middle, mainly made of higher-grade professionals.

Figure 2 deploys the difference between the population share of each social class (and the unemployed) and their respective wealth (Panel A) and income (Panel B) shares. In

white, a baseline scenario of even distribution where all groups receive the income or wealth shares matching their relative population sizes. Deviations from this scenario are represented in red when a group holds a smaller share of income or wealth relative to its size, with the magnitude specified in percentage points (p.p.) in each square. Conversely, a blue hue expresses a larger outcome share than its population share.

Panel A displays pronounced disparities in wealth shares by classes.[2] The overall box shows that, in line with the observed mild wealth inequality increase, the upper and middle classes have increased their relative wealth shares, with the working classes and the unemployed losing ground.[3] Slovakia, Greece, and Spain, which experienced the steepest wealth inequality rise observed in Appendix Figure A1, also present rising divergences in wealth shares across classes. Spain is outstanding, with the upper class owning 14.1 p.p. more wealth than it would correspond in the equality scenario, while the low-skilled class ranges between − 12.2 p.p. (2002) and − 14 p.p. (2008 and 2014). Similarly, in Slovakia, the upper class rose their relative share from 4.8 (2010) to 11 (2017) p.p., while the skilled-working class diminished it from − 5.4 to − 10.8 p.p. Germany shows a mild convergence in wealth distribution instead. Specifically, the upper class decreased its relative shares from 7.3 to 6.4 p.p. between 2002 and 2017 and the skilled-working class gained from − 12.1 in 2002 to 9.7 in 2017.

Figure 2's Panel B also shows how income shares are unequally divided by class, with the upper and middle classes persistently obtaining higher relative shares, especially in Finland and Germany, with upper-middle class shares at about 10 p.p. Unsurprisingly, the low-skilled and unemployed tend to show negative relative shares. However, as with the median wealth values, the income share differences between the upper and bottom classes are less pronounced than wealth.

4.2 Wealth Composition

Turning to the composition of wealth by social class, Fig. 3 illustrates how various types of wealth are distributed among the different social classes: financial assets (including stocks and bonds), cash and deposits, business holdings, secondary residences, and primary residences.[4]Results in this plot focus on the last wave available and exclude Germany due to the impossibility of distinguishing among some wealth definitions.

We observe a pronounced disparity in the composition of wealth across social classes. Financial wealth, encompassing assets with potentially higher returns and liquidity, such as stocks and bonds, but also savings, appears predominantly held by the upper and upper-middle classes, having the financial insight to manage such investments effectively. In turn, business assets are more prominent in the upper- (employers) and middle-class (self-employed) portfolios, the latter being especially the case in countries with relatively high self-employment rates (Greece and Spain).

[2] In Finland, Greece and Slovakia, time trends depend on the base year around the end of the Great Recession, after asset prices peaked.

[3] Appendix Table A6 shows wealth level ratios between the upper and remaining classes, reflecting sizeable (e.g., in Germany, the median wealth of the low-skilled class is less than 1% of the upper class in some years) and increasing disparities in most countries.

[4] Financial wealth and capital income are traditionally underreported, especially by wealthy households. The Spanish data accurately represents the wealthy by oversampling and reweighing, while surveys that do not correct non-responses in the distribution top tails lead to downward inequality (Meriküll & Room, 2022).

Fig. 1 Median household wealth and income by class (average over the period). *Source*: Own elaboration with LWS data. *Note*: Thousands of 2017 USD. Average median values over available waves ▶

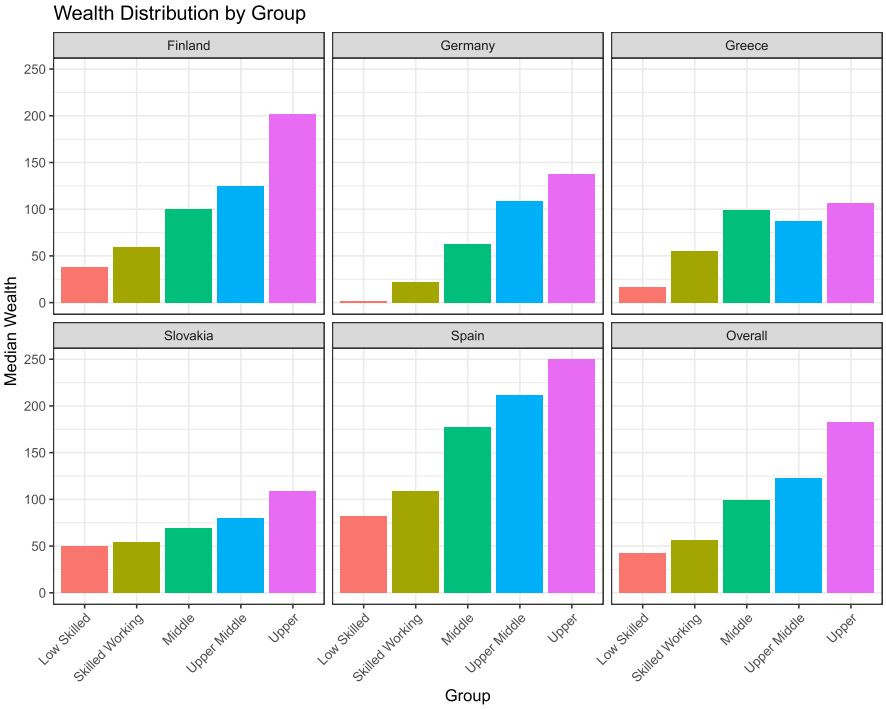
On the contrary, the wealth composition of the lower social classes (low-skilled and skilled working classes) is heavily concentrated on real estate. Homeownership is widespread across the analysed countries, so the salience of primary residences is unsurprising, especially considering the average age of the sample (49) among cohorts born between the 1950s and 1970s. Secondary residence shares, commonly inherited, are also prevalent across the working and middle classes, indicating reliance on safe and price-stable assets for renting or leisure without high expenses.[5] Still, the dependence of the working classes on real estate reflects a limited capacity for diversified investment strategies, impacting their financial flexibility and response to economic downturns. Despite primary and secondary residencies representing the lion's share of the total wealth accumulated by the working classes, their average market value is considerably lower than those of the upper classes, even when real estate represents a smaller share of their portfolio.

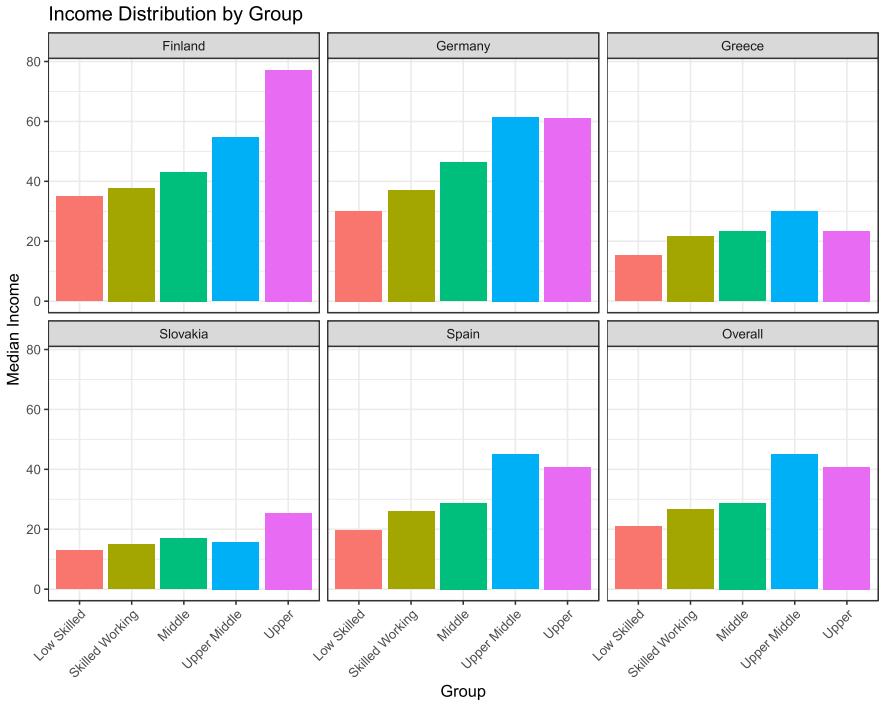
4.3 Wealth-to-Income Ratios

Figure 4 displays WIRs by classes and countries over time. As expected, WIR values increase as we escalate the class ladder from the low-skilled to the middle and upper classes, following a consistent hierarchical class ordering across countries. In line with Figs. 1 and 2, this rank suggests a higher capacity for wealth accumulation among the upper (9.5 in Spain in 2005 or approximately 7 in Slovakia in 2010) and middle classes, thanks to their savings from high incomes (e.g., the middle-upper class made of higher-grade professionals) and wealth composition (e.g., financial and business assets mainly owned by the upper and middle classes and high-value real estate). By contrast, the low levels recorded by the working classes indicate limited wealth accumulation from savings and real state value, being vulnerable to adverse income shocks, such as falling into unemployment and negative welfare consequences (Azpitarte, 2012), and housing bubbles.

The most evident cross-national difference is the absolute WIR level and the distance between the top and bottom classes. Greece, Spain, and Slovakia (in 2010) recorded the highest WIRs, reflecting their relatively high wealth due to a more even distribution thanks to widespread homeownership in a sample of individuals aged, on average, 49. In addition to these structural features, in countries like Spain, the pre-crisis housing price boom should also be taken into account as a relevant factor in driving up the WIR. Regarding time trends, overall, WIRs in the lower classes decreased in most countries during the period covered, while the upper class remained constant or diverged upward, especially in Spain. It is also interesting to note that in this country the only class that maintains its levels of WIR is the upper class, marking a clear divergent trend with other classes.

[5] LWS data in Spain (2017) reveals high inheritance inequality between the upper (93.5 thousand euros), middle (13 thousand euros) and low-skilled (5.4 thousand euros) classes.


Wealth Distribution by Group
Finland
Germany
Greece
Slovakia
Spain
Overall
Median Wealth
0
50
100
150
200
250
Low Skilled
Skilled Working
Middle
Upper Middle
Upper
Group


Income Distribution by Group
Finland
Germany
Greece
Slovakia
Spain
Overall
Median Income
0
20
40
60
80
Low Skilled
Skilled Working
Middle
Upper Middle
Upper
Group

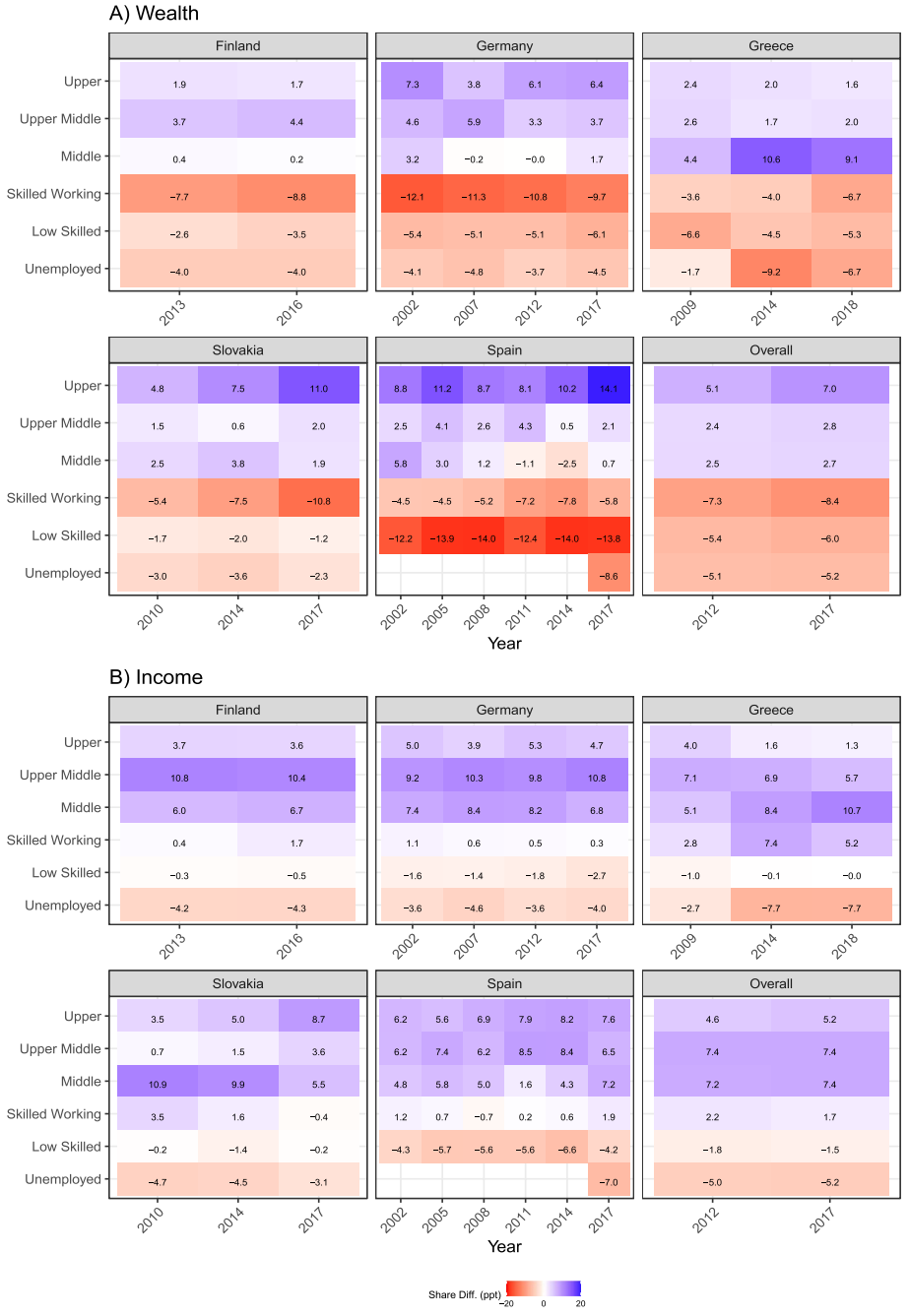


Fig. 2 Relative household wealth and income shares. *Source*: Own elaboration with LWS data. *Note*: The data represents the difference in percentage points between the population and wealth/income shares. If red(blue), the share of income is lower(higher) than the group's population share

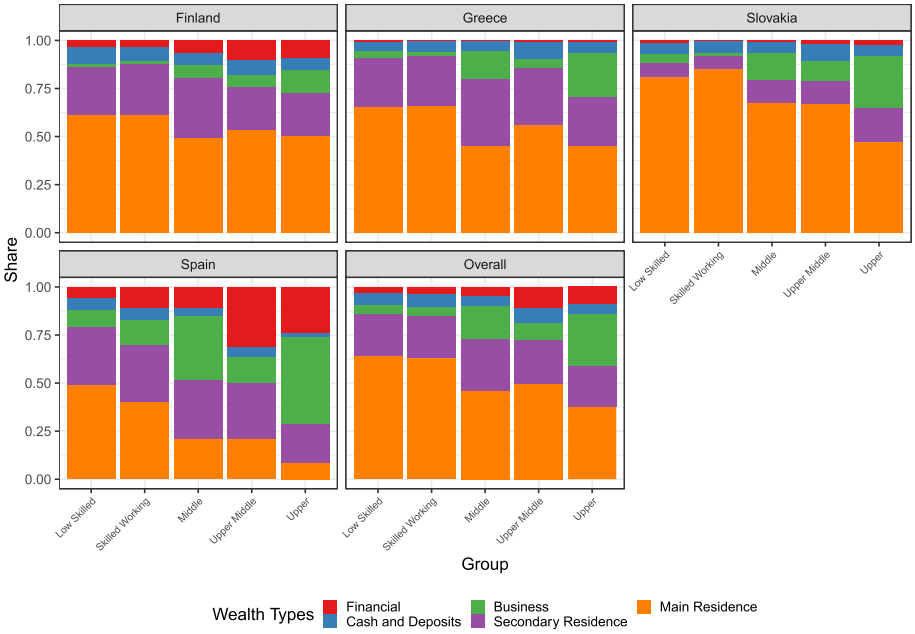


Fig. 3 Wealth portfolio by social classes and countries. *Source*: Own elaboration with LWS data. *Note*: Average share values over the whole period

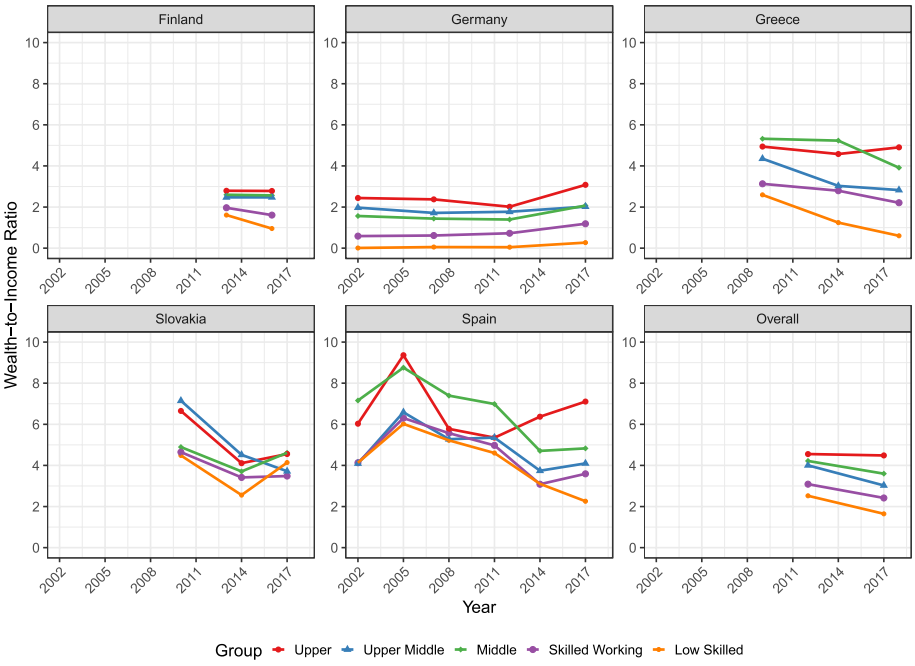


Fig. 4 Wealth-to-income ratio by social class. *Source*: Own elaboration with LWS data. *Note*: The figure shows the ratio of the level of median wealth to median income by social class

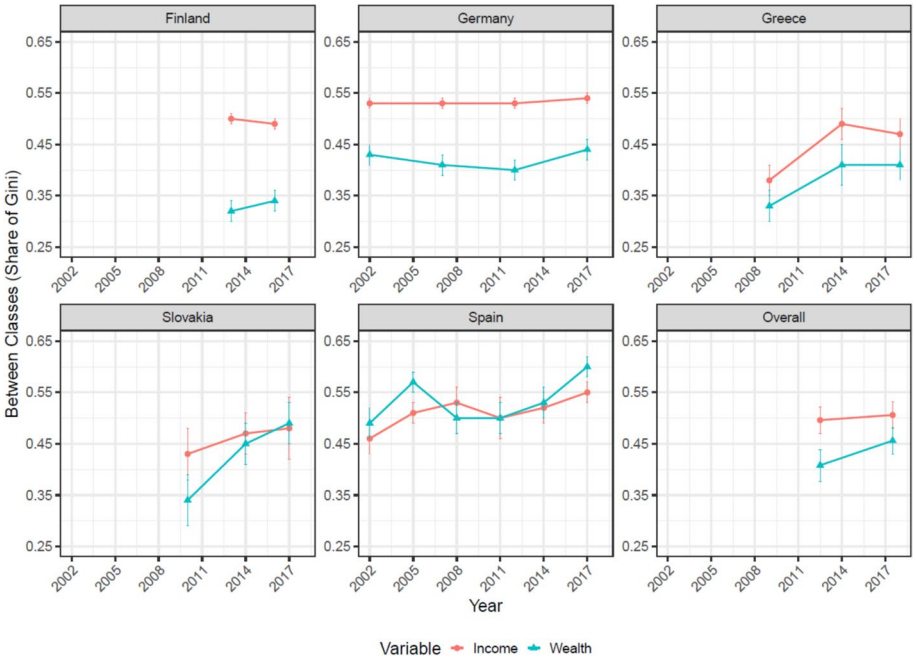


Fig. 5 Gini index decomposition: Between-class inequality. *Source*: Own elaboration with LWS data. *Note*: The between-group component reflects how much inequality exists *because* of disparities in wealth between social classes, as opposed to inequality within social class. Standard errors are estimated with 200 bootstrapped repetitions

4.4 Between-Class Inequality and Stratification

Figure 5 shows the share of total income and wealth inequality (indicated by the Gini coefficient in Appendix Figure A1) explained by mean-outcome disparities across classes. Class accounts for a remarkable share of economic inequalities, with the Overall measure around 50% of income and 40% of wealth Gini indexes. The latter increased substantially over the period, potentially related to class-based changes in homeownership, financial frictions, or redistributive policies.

Figure 5 identifies two country groups. First, Finland, Germany, and Greece have incomes above wealth values, suggesting that occupational classes better explain economic inequalities resulting from the division of labour (e.g., wages) than asset ownership. Second, in Slovakia and Spain, wealth and income values overlap during the period, indicating that occupational classes account for inequalities resulting from wealth accumulation (e.g., primary residencies, financial assets, business value) as well as those from labour market attachment. Notably, the growth in the between-group inequality component in this second group of countries aligns with the observed rise in upper-class WIRs (Fig. 4), and sharp class divides in relative wealth shares (Fig. 2, Panel A).

Figure 6 presents the income and wealth stratification index by country and survey wave to overcome the limitations in mean between-group inequality measures mentioned above. In line with the patterns observed in Fig. 5, income is generally more stratified by social class than wealth in most countries over the period analysed, especially in Finland and

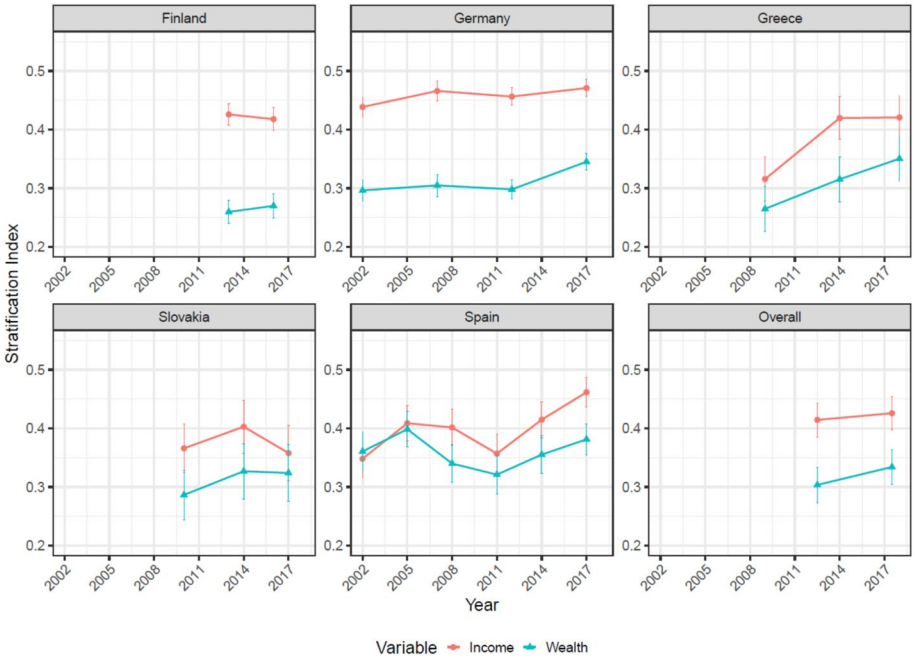


Fig. 6 Class stratification. *Source*: Own elaboration with LWSS data. Note: Higher values indicate greater concentration of wealth within specific classes while lower values suggest more overlap in wealth distributions across classes, Standard errors estimated with 200 bootstrapped repetitions

Germany. Overall, the average stratification index stands at 0.41 for income and 0.32 for wealth, meaning a 71% probability of a higher-class member earning more than a lower-class individual or a 66% probability of owning more wealth.[6] Income stratification goes from 0.32 (Greece) to 0.47 (Germany), while wealth stratification ranges between 0.26 (Finland) and 0.4 (Spain). For income and wealth, the stratification index remained constant over the period covered in Slovakia, Finland and Germany and sharply increased after 2011 in Spain and Greece.

5 Conclusion and Discussion

Wealth is a central indicator of socioeconomic status attainment in contemporary societies, receiving increasing attention in social stratification research. Nevertheless, its role in class measurement and class-based economic inequality remains underexplored. This article contributes to this emerging literature by combining economic and sociological visions of class and inequality. We use novel data from the *Luxembourg Wealth Study* covering the early twenty-first century in five European countries to address two research questions: (1) How is wealth distributed and stratified by big occupational classes over time

[6] We replicated analyses by the three broad educational attainment groups for substantive benchmarking, yielding considerably smaller estimates than by class.

and cross-nationally compared with income? (2) Can big occupational classes account for aggregate wealth inequality trends?

We report four main findings that are in line with our empirical expectations. First, examining median wealth by class reveals a steep rank, even more hierarchically ordered than income, possibly related to higher aggregate wealth inequality levels. Besides, in a 2002–2018 period of slight-to-moderate wealth inequality rise, the upper classes enjoyed an increasing advantage in wealth shares, owning, on average, about 6% more than their relative population share in most countries. In contrast, the working classes dwindled their portion of the total wealth share.

Second, exploring wealth composition by financial and non-financial assets highlights significant class-based disparities. The upper and middle classes mainly hold more profitable and liquid financial (stocks and savings) and business assets, while the working classes rely on primary residences. Thus, the portfolios of the upper and middle classes might explain the steep class-based wealth inequalities in median values and shares observed.

Third, the wealth-to-income ratio analysis reveals marked class differences. While notable variations exist in absolute WIR values between countries related to home and business ownership rates, class differences are pervasive. Thanks to their higher savings and wealth composition, the upper class owns assets representing, on average, about 4.5 years of accumulated annual gross income, which could be further invested. By contrast, the working classes, with low savings from incomes and mainly relying on primary residencies, contend with reduced wealth stock to cope with unforeseen income shocks.

Fourth, in contrast to predictions on the *death* or *decomposition* of class as a fine-tuned instrument, big occupational classes account for a considerable share of economic inequality—up to 50% of the Gini coefficient—and stratification. Even when measuring different dimensions, between-class inequality and class stratification evolved hand in hand, keeping constant (income) or increasing (wealth) from 2002 to 2018. Still, occupational classes better capture disparities in income than wealth. This highlights the importance of economic resources unrelated to labour market attachment (rent-generating assets) driving wealth inequality levels (Sørensen, 2000). The share of income inequality explained between classes (Albertini et al., 2020) and the class stratification index (Zhou & Wodtke, 2019) closely align with former estimates in Europe and the US. As far as we know, our study provides the first evidence of between-class wealth inequality shares and stratification.

Taken together, these findings show that big occupational class schemes, the most widespread and operationalisable class measure in sociology (Barone et al., 2022), are better suited to capture income than wealth inequalities. Still, they can also broadly depict wealth stratification and its dynamics in contemporary capitalism. None of the mainstream neo-Weberian (Goldthorpe, 2007) or neo-Marxist (Wright, 2005) occupational class approaches explicitly formalised wealth and asset composition as a central indicator of life chances or class-generating mechanism beyond business ownership. Yet, if we leave aside the super-rich, the main wealth accumulators from financial and non-financial assets are located within the standard occupational upper classes: big employers, higher-grade managers and professionals (Fana & Villani, 2024). Thus, increasing inequality of outcomes in wealth is firmly stratified by big occupational classes (Duvoux & Papuchon, 2022), posing a significant threat to equal opportunity and social mobility for future generations (Hansen & Toft, 2021). The entrenched stratification of economic resources across the class ranks fosters status reproduction and social closure strategies (Waitkus et al., 2024), particularly through the intergenerational transmission of rent-generating assets (Sørensen, 2000).

We further argue that, beyond absolute or relative wealth accumulation, looking at class inequalities in wealth composition is critical (Beckert, 2023). Not all types of assets

produce the same returns, buffer against shocks, and status reproduction strategies. Upper classes with diversified and profitable portfolios can further invest and accumulate wealth, leading to high wealth-to-income ratios, economic security, and available bequests to boost the opportunities of their children (Hansen & Wiborg, 2019). Conversely, the portfolios of lower social classes are predominantly composed of primary home ownership. This certainly fulfils the basic need for housing, especially when its access is increasingly stratified by social classes among the younger generations (Blanden et al., 2023). However, it also represents an immobilised asset that cannot be easily converted into cash without significant trade-offs. Its role as a financial resource for addressing unforeseen needs or seizing economic opportunities is limited, primarily serving as a vehicle for intergenerational wealth transmission (Lersch & Luijkx, 2014).

In this article, we were interested in the commonalities of stratification systems across European countries mainly for theoretical reasons, but also methodological limitations prevented us from directly analysing institutional factors. We disregarded welfare state redistribution by focusing on market income and wealth before taxes and transfers to facilitate cross-country comparability and overcome data limitations. However, we run additional analyses using alternative measures of income (disposable income), wealth (assets) and sample selection (including the retired or excluding the unemployed), replicating the main findings.

Still, it is important to recognize that for any given level of wealth distribution or inequality, varying welfare regimes might play a crucial role in mitigating the adverse effects of wealth disparities (Pfeffer & Waitkus, 2021). In countries with stronger welfare systems (e.g., Finland) (Esping-Andersen, 1999), public services such as healthcare, education, and housing can help reduce the reliance on personal wealth, providing a safety net for those with lower assets. In contrast, countries with poorer welfare systems (e.g., Greece) may exacerbate the effects of wealth inequality, as individuals are more dependent on their wealth to access essential services, deepening economic disparities and limiting opportunities for social mobility. The relationship between wealth inequality and the welfare state is undoubtedly an underexplored area of research that deserves further inquiry.

Our study has further limitations that can also pave the way for future research. First, due to data collection issues and underreporting, a recurrent problem in this research strand, capital income and financial wealth (i.e., pensions) are generally underestimated and noisy compared to national accounts, implying lower-bound inequality driven by the wealthiest and self-employed (Bavaro & Paradowski, 2023). Second, due to data constraints, our big class scheme lacks detailed information on occupational titles and supervisory roles to depict a more fine-grained picture of the class structure. However, our 5-class scheme (Moawad & Oesch, 2024) represents a steep wealth and income hierarchy in absolute and relative terms while closely matching the ESeC, the most widespread and standardised scheme. Besides, we reassuringly identified estimates virtually identical to investigations that applied standard class schemes (Albertini et al., 2020; Zhou & Wodtke, 2019). Third, using the household as the unit of analysis was necessary to study wealth inequality. However, household analysis, with most heads being men, might mask substantial intra-household gender inequalities (Kapelle & Lersch, 2020) and obscure the theoretical and empirical links between individual market situations, the backbone of occupational social classes, and income inequalities depending on partners' class homogamy patterns.

Against the backdrop of previous research and our article's findings and limitations, there is room for improving class measurement to portray the increasingly important role of wealth by gender, ethnicity, and age groups in cross-sectional and intergenerational inequality (Savage, 2014). Refined data collection and cross-country harmonisation can

alleviate the underestimation of inequality, especially considering capital income and financial wealth. Combining tax administrative data with detailed occupational titles and large sample sizes might ease the depiction of the entire social hierarchy (Hansen & Toft, 2021), including the very top elites and the rent-generating assets explaining its reproduction. Besides, primary sources of income and wealth (Giangregorio & Villani, 2024) might improve class measurement as additional definition criteria to the occupational division of labour.

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Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose. The authors have no competing interests to declare that are relevant to the content of this article. All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript. The authors have no financial or proprietary interests in any material discussed in this article.

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