

# Income inequality, top shares of income and social classes in the 21<sup>st</sup> century

JRC Working Papers Series on  
Social Classes in the Digital Age  
2023/05

Luca Giangregorio  
Davide Villani



This Working Paper is part of a Working paper series on Social Classes in the Digital Age by the Joint Research Centre (JRC) The JRC is the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The scientific output expressed does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication. The Working paper series on Social Classes in the Digital Age is intended to give visibility to early stage research to stimulate debate, incorporate feedback and engage into further developments of the research. This Working Paper is subject to the Commission Reuse Decision which allows authors to reuse the material without the need of an individual application.

#### Contact information

Name: Davide Villani

Address: Joint Research Centre, European Commission (Seville, Spain)

Email: [davide.villani@ec.europa.eu](mailto:davide.villani@ec.europa.eu)

EU Science Hub

<https://ec.europa.eu/jrc>

<https://ec.europa.eu/jrc/en/research/centre-advanced-studies/digclass>



JRC130501

Seville: European Commission, 2023

© European Union, 2023

Credits of the Image in the cover page: kras99, Adobe Stock image n. [175461355](https://www.adobe.com/stock/175461355)



The reuse policy of the European Commission is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Except otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) [licence](https://creativecommons.org/licenses/by/4.0/). This means that reuse is allowed provided appropriate credit is given and any changes are indicated. For any use or reproduction of photos or other material that is not owned by the EU, permission must be sought directly from the copyright holders.

All content © European Union, 2023

How to cite this report: Giangregorio, L., Villani, D., *Income inequality, top shares of income and contemporary social classes in the 21<sup>st</sup> century*, European Commission, Seville, 2023, JRC130501.

## Contents

1	Introduction.....	4
2	Class definitions.....	5
3	Construction of the Dataset.....	7
3.1	Socio-demographic variables .....	8
3.2	Labour market variables.....	8
3.3	Flows of income .....	9
3.4	Stock of wealth .....	9
4	Findings.....	10
4.1	Income inequality by source of income .....	15
4.2	Wages and top distribution of income .....	19
5	Conclusions and discussion .....	26
6	References.....	29
7	Appendix .....	32
7.1	Codebook .....	36

# Income inequality, top shares of income and social classes in the 21<sup>st</sup> century.

Luca Giangregorio (University Pompeu Fabra)

Davide Villani (Joint Research Centre, EC Seville)

## Abstract

This paper studies income distribution and inequality in Germany, Spain and Italy by adapting the approach described in Fana and Villani (2022a). This framework provides a novel classification of labourers and capitalists that considers some features of contemporary capitalism, namely the fact that individuals/households can receive multiple types of incomes, and the role of managers in the definition of class belonging.

From this perspective, the paper addresses two objectives. First, we perform a decomposition of the Gini index to study which sources of income contribute to the level of inequality. We find that marginal increases in wages would contribute to the reduction of the overall level of inequality, while profits and property income augment it. Furthermore, it is not that *any* type of wage would reduce inequality; only the growth of wages received by labourers would help to lower inequality, whereas those received by capitalists would increase it.

Second, we discuss how our approach links to the literature on wages at the top of the distribution of income, assessing whether the growth of wages at the top of the distribution of income is evident in our dataset and we explore who receives these wages at the top of the distribution of income. We find that there is a growing presence of wages at the top of the distribution of income. However, this growth corresponds mostly to wages received by what we call capitalists, not labourers.

To perform the empirical analysis, we build a novel dataset for three countries (Germany, Spain and Italy) using household finances surveys over the period 2000–2016.

Our findings contribute to the literature on labour income and top shares from an innovative angle. We conclude that it is true that a linear correspondence between income source and class location is more blurred today than it was 200 years ago, nonetheless a class divide is still clear, at least in the three countries analysed.

**Keywords:** Social classes, Income distribution, Income inequality, Top incomes, Households surveys.

**Authors:** Luca Giangregorio (University Pompeu Fabra) Davide Villani (Joint Research Centre – European Commission, Seville)

Acknowledgements: The authors would like to thank Marco Ranaldi, Enrique Fernández-Macías for their useful comments. The usual disclaimers apply.

Joint Research Centre reference number: JRC130501

Related publications and reports:

Oesch, D., Contemporary Class Analysis, European Commission, Seville, 2022, JRC126506 [https://joint-research-centre.ec.europa.eu/publications/contemporary-class-analysis\\_es](https://joint-research-centre.ec.europa.eu/publications/contemporary-class-analysis_es)

Muñoz de Bustillo Llorente, R., Esteve Mora, F., Social classes in economic analysis. A brief historical account, European Commission, Seville, 2022, JRC127236 <https://joint-research-centre.ec.europa.eu/system/files/2022-03/JRC127236.pdf>

Passaretta, G., Gil-Hernández, C. J., *The early root of the digital divide: Socioeconomic inequality in children's ICT literacy from primary to secondary schooling*, European Commission, Seville, 2022, JRC128931 <https://joint-research-centre.ec.europa.eu/system/files/2022-06/JRC128931.pdf>

Gil-Hernández, C. J., Vidal Lorda, G., Torrejón Pérez, S., *Technology, Tasks and Social Classes in Europe*, European Commission, Seville, 2022, JRC129522 [https://joint-research-centre.ec.europa.eu/document/download/cbd9a9a4-e6cd-46e1-9453-60748359814c\\_en?filename=JRC129522.pdf](https://joint-research-centre.ec.europa.eu/document/download/cbd9a9a4-e6cd-46e1-9453-60748359814c_en?filename=JRC129522.pdf)

Fana, M., Villani, D., *Reconsidering social classes and functional income distribution in the 21st century. A theoretical and empirical assessment*, European Commission, Seville, 2022, JRC128667 [https://joint-research-centre.ec.europa.eu/publications/reconsidering-social-classes-and-functional-income-distribution-21st-century-theoretical-and\\_en](https://joint-research-centre.ec.europa.eu/publications/reconsidering-social-classes-and-functional-income-distribution-21st-century-theoretical-and_en)

Esteve Mora, F. Muñoz de Bustillo Llorente, R. The economics of class. A dual approach, European Commission, Seville, 2022, JRC129746 [https://joint-research-centre.ec.europa.eu/document/download/32d7c1dd-1650-41de-ae53-c2934dace11b\\_en?filename=JRC129746.pdf](https://joint-research-centre.ec.europa.eu/document/download/32d7c1dd-1650-41de-ae53-c2934dace11b_en?filename=JRC129746.pdf)

## 1 Introduction

The relationship between social classes and income distribution is a traditional area of inquiry in political economy and, more broadly, in the social sciences. Even though during the 20<sup>th</sup> century the focus of researchers has progressively shifted from a class-based analysis to an individual-based approach, the interest in social classes and inequality is regaining importance (Atkinson 2009). A related issue in this discussion concerns the conceptualisation and redefinition of social classes to capture the salient features of contemporary capitalism. The debates on this issue involve both authors with a sociological background (e.g. Erikson et al. 1979; Wright 1997; Oesch 2006) and economists (Glyn, 2009; Krueger, 1999; Mohun, 2006; Rehm et al., 2016, among others)

A recent attempt in this regard is represented by Fana and Villani (2022a). Drawing from previous contributions, these authors propose a revised classification of labourer and capitalist households that takes into consideration key features of contemporary capitalism. First, nowadays it is common that individuals/households to have multiple sources of income (e.g., Ranaldi & Milanovic 2022, Atkinson, 2009). This blurs the original income-based classification of social classes used by classical political economists. Additionally, managers represent another important complication. Although they are formally wage earners, a long and diverse list of authors (among others, Friedman 1970; Krueger 1999; Mohun 2006; Glyn 2009; Sotiropoulos et al. 2013; Milios 2018; Wright 1996) have argued that their functions (and interests) are more aligned with those of capitalists and that therefore they should not be included among the labouring class.

In this paper, we apply this novel class approach to social classes using data from three countries (Germany, Spain and Italy), to address two research objectives. First, we assess how this new class definition relates to more conventional contributions to the study of inequality. Specifically, we perform a decomposition of the Gini index to study which source of income —wages, profits or financial income — contributes more to the level of inequality. We find that marginal increases in wages reduce the overall level of inequality, while profits and property income (financial and rental income) augment it. More interestingly, it is not *any* type of wage that reduces inequality. Only wages received by labourers help to lower inequality, while those received by capitalists (including managers) increase it. Although this seems a logical consequence of capitalists being richer than labourers, this evidence implies that a (revised) class approach still matters and contributes to explaining the polarized patterns between labour and capital.

Second, we study the class composition of top incomes, linking the class analysis to the existing literature on wages at the top of the distribution of income (Piketty & Saez 2007; Atkinson et al. 2011; Piketty & Saez 2013; Aaberge et al. 2018; Berman & Milanovic 2020; Atkinson & Lakner 2021). This literature has evidenced that there is a growing presence of wages at the top of the distribution of income, which was traditionally dominated by profits. Atkinson (2009) argues that it is more difficult today than in the period of classical economy to link the factor shares to the personal distribution precisely because of such changes. Along similar lines, Milanovic (2017) maintains that our societies are shifting from what he terms Classical capitalism to so-called New capitalism. In Classical capitalism, workers receive exclusively wages while capitalists' income is composed exclusively of profits. In this setting, workers are poorer than capitalists, with the result that the top (bottom) distribution of income is composed of profits (wages). In New capitalism, all individuals receive both labour and income sources, and wages (profits) can equally be found at the top (bottom) of the distribution of income. As a result, this shift nuances the traditional class division based on income source that is typical of Classical capitalism.

To tackle this research objective specifically, we study to what extent the presence of wages increases at the top of the distribution of income in the three countries and, more importantly, we determine who receives wages at the top of the income distribution. In line with the existing literature, we find that there is a growing presence of wages at the top of the distribution of income. Notably, however,

this growth often corresponds to wages received by managers, who in our approach should be considered as part of the capitalist class, not as labourers. These findings contribute to the literature on labour income and top shares from an innovative angle. Our results imply that it is true that a linear correspondence between income source and class location is more blurred today than it was at the beginning of capitalism but that a class divide is still clear, at least in the three countries analysed.

To perform the empirical analysis, we build a novel dataset that collects data on household finances in Germany, Spain and Italy. There is a growing interest in household surveys that gather information on both the income and wealth of European households. One of the most important initiatives in this respect is the Household Finance and Consumption Survey (HFCS) carried out by the European Central Bank since 2010. This dataset represents a valuable source given the size and the amount of information it provides. Nevertheless, an important drawback of this source is that it covers only a limited span of years. To address this limitation, we have built a dataset using information before 2010. Some individual countries have been carrying out household surveys that meet our scope for longer than the HFCS. Specifically, these countries are Italy (2000-2016), Germany (2000-2016) and Spain (2002-2017). For Italy, we use the Survey on Household Income and Finance (SHIW), in Spain the Household Income Survey (*Encuesta Financiera de las Familias*, EFF), while for Germany data come from the Socio-Economic Panel (SOEP).

After this introduction, the next section briefly sets out the theoretical approach and the criteria employed to define labourer and capitalist households. Section 3 describes the steps followed in the creation of the dataset. Since the construction of the dataset is central to our approach, the paper devotes particular attention to this aspect. Section 4 presents and discusses the findings. It provides figures on the general trends of the shares and levels of income before addressing the two specific objectives of the paper, that is, the relationship between income inequality and source of income (section 4.1) and the distribution of wages at the top of the income distribution (section 4.2). Section 5 concludes the paper.

## 2 Class definitions

According to classical political economists, there was a correspondence between class location (and class interests) and type of income. Workers received only wages, while capitalists obtained profits and rents. As a result, functional income distribution<sup>1</sup> reflected the share of income received by the two main social classes. However, this straightforward classification does not fit contemporary capitalism well for at least two reasons.

First, nowadays many individuals and households have an income composed of multiple sources, such as wages and financial income. For example, receivers of large sums of financial incomes can also be salaried workers or it is common that many wage earners also receive rents or financial income. This creates a tension with the conventional class division, which implicitly assumes that each class receives one type of income exclusively. It is therefore necessary to find some criteria to allocate individuals/households in a certain class rather than another in case they receive multiple sources of income.

To disentangle this point, the main rationale employed in this paper for defining labourers and capitalists is to observe their *main* source of income. We assume that an individual or household will

---

<sup>1</sup> A growing number of studies deal with functional income distribution and link it with different areas of inquiry, such as the relationship with inequality (e.g. Daudey & García-Peñalosa 2007; Adler & Schmid 2012), financialisation (Milberg 2008; Panico et al. 2012), corporate net lending (Villani 2021), growth (Hein & van Treeck 2010) and global value chains (Fana & Villani 2022b; Ricci et al. 2022).

be more interested in their main source of income, and this will determine their class location. For example, a salaried worker who also receives property or entrepreneurial income that is greater than their labour income will be more interested in preserving the property and entrepreneurial income rather than the labour income. Therefore, in this case the worker are considered part of the capitalist class. On the other hand, workers who receive an entrepreneurial or property income that is lower than their salary will be considered labourers.

The second important feature involves the role of managers. Managers are peculiar type of workers as, despite being wage earners, a long and diverse list of authors argues that their functions are in line with capitalists' interests.

For example Milios (2018, p. 100) maintains that, in the case of managers, 'certain functions belonging to the relation of possession of the means of production have been conferred on them'. The intensification of division of labour and the sophistication of production processes fuelled the process of separation between ownership and management, and helped to consolidate a managerial class in charge of guaranteeing the functioning of the capitalist firm (Braverman, 1974).

Authors from different background share the same view on the role of managers. In this respect, Friedman (1970) claimed that 'the manager is the agent of the individuals who own the corporation ... and his primary responsibility is to them'. Also, Chandler (1984, p. 473) maintained that so-called 'managerial capitalism' is characterised by the fact that 'basic decisions concerning the production and distribution of goods and services were made by ... salaried managers who had little or no equity ownership in the enterprise they operated'.

for the necessity of a redefinition of income and corresponding class allocation is proposed by is Krueger, according to whom 'because corporate officers control the firm's capital and in many cases include the owners of the firm, one could argue that much of their compensation should be classified as capital income' (Krueger, 1999, p. 46). From these considerations, we considered managers as part of the capitalist class.

By using these criteria, it is possible to distinguish between the revised capitalist class and the revised labourer class, each one composed of subgroups. Table 1 summarises the main criteria employed to classify labourers and capitalists, and each subgroup within these categories.

*Table 1. Class definition.*

<b>Labourers</b>	
Wage earners	This group includes all units whose main income is represented by wages. Households in this group could also have other sources of income in addition to wages as long as these do not represent the main source of income.
Self-employed (bottom 2/3)	This includes the bottom 2/3 of the distribution of income of those households whose main source of income is self-employment. In this case, self-employed income includes only those activities that do not involve any employee.
<b>Capitalists</b>	
Traditional capitalists	This category closely reflects the conventional idea of the capitalist. It comprises all units whose main source income is represented by profits, as defined above.
Managers	This category includes managers and management cadres.
Self-employed (top 1/3)	This group comprises the top 1/3 of the distribution of income of those households whose main source of income is self-employment.
Rentiers	This category includes households whose property incomes (rents from properties plus financial income) represent their main source of income and who have above the average income.

Source: adapted from Fana and Villani (2022a).



Income received by each class (or subgroup) can be estimated as follows. Total income ( $Y$ ) is equal to:

$$Y = Y_l + Y_e + Y_s + Y_p \quad 1$$

Where  $Y_l$  is the income from labour,  $Y_e$  is entrepreneurial income,  $Y_s$  is self-employment and  $Y_p$  is the income from properties, which includes income from rents and income from financial assets.<sup>2</sup>

Total income is split between the income received by capitalists ( $Y^K$ ) and labourers ( $Y^L$ ).<sup>3</sup> Given our classification, capitalists' income and labourers' income can include all components of equation 1 although the proportions will vary considerably across each group. Consequently, the capitalists' and labourers' shares of income can be estimated as follows:

$$k = \frac{Y^K}{Y} \quad 2$$

$$l = \frac{Y^L}{Y} \quad 3$$

### 3 Construction of the Dataset

To address the research objectives of this paper it is necessary to obtain comparable micro-data on a specific set of variables required for the current analysis.

To the best of our knowledge, the most suitable micro-data available to this purpose are available for Italy, Germany, and Spain, as they provide all the required information in terms of flows of income, stock of wealth and occupational details. Even though other countries also publish household surveys, for various reasons (mostly related to the availability of wealth data that is key to our analysis, as will be shown in detail below) it was not possible to include other countries.

For Italy, we use the Survey on Household Income and Wealth (SHIW), which is a bi-annual panel running from 1976 to 2020 published by the Bank of Italy. Given the lack of some variables of interest for some years, we restrict the dataset to the period 1991-2016. Similarly, the Bank of Spain distributes the Survey of Household Finances (EFF) every three years starting from 2002, with the last available data in 2017. Lastly, the Deutsche Institut für Wirtschaftsforschung (DIW) produces the Socio-Economic Panel (SOEP) from 1990 to 2019 (last available wave). To ensure the highest comparability, among the three countries, we select the bi-annual years starting from 2000 for Italy and Germany up to 2016.

These three sources are longitudinal datasets at the household level that also provide information about the individuals within the households, allowing for longitudinal and/or cross-sectional analysis. One of the major challenges is to reach a level of consistency between the different sources of data that allows for comparative analysis over time. To do so, it is necessary that all the variables contained in the final dataset share a similar definition and are consistent at different points in time. For this purpose, it is necessary to harmonize the different sources, especially in terms of income. When a

---

<sup>2</sup> As in other studies (e.g. Iacono and Ranaldi, 2020), we exclude pensions and other transfers from the analysis because our interest lies in defining how the income derived from the production process is distributed among those that actively contribute to creating it.

<sup>3</sup> And any of the subgroups detailed in Table 1.

homogenization procedure was not possible or led to a significant loss of information, country-specific variables have been selected.

Following the World Inequality Database (WID) Distributional National Accounts guidelines (World Inequality Lab, 2020), we do not apply equivalence scales. In computing measures of inequality, the WID does not apply the equivalences because of practical and conceptual reasons. In practical terms, using equivalence scales would make impossible to match survey (or tax) data to the aggregate income at national level. Conceptually, the equivalised measures aims to provide a picture of wellbeing and 'welfare' of the households. However, since the main aim in this paper is to measure income distributions between two social classes (independently of the household composition) it is more appropriate not to adjust the income levels to address our research objectives. Nevertheless, some findings will also provide figures using equivalised income where this approach may provide relevant information and as robustness test.

The next subsections describe the main characteristics of the key variables. In the appendix, we report the codebook that includes information availability for all variables employed in the dataset.

### **3.1 Socio-demographic variables**

Socio-demographic variables include information on gender, age and highest educational attainment defined as ISCED 97.<sup>4</sup> We also include variables on the household characteristics – e.g., single household, or couple with/without children (this variable is not available in the case of Spain) – the corresponding size and marital status. All these variables share a common definition across countries and over time, ensuring perfect comparability.

In addition to this standard socio-demographic information, we also include characteristics of the household head's social background, thus allowing for intergenerational studies. In this regard, some cross-country differences emerge. Italy provides information exclusively for the level of education of father and mother defined at the ISCED 97, while in the case of Spain and Germany we have parental occupational information.<sup>5</sup> Therefore, intergenerational studies could not be reproduced identically for the three countries.

Lastly, when possible, we include the geographical location within each country. This may represent an important factor of heterogeneity as in the case of East vs West Germany, or the North-South divide in Italy. This information is not available in Spain.

### **3.2 Labour market variables**

To revise the factor shares detailing the social classes to which each unit of analysis (in our case, each household head) belongs, we require sufficient information on the occupational qualification of the respondent. Therefore, the most relevant labour market variable is the main occupation.

Italy has the least detailed information in this respect, although it allows us to distinguish sufficiently between types of occupation and – most importantly – to identify the managerial class. By contrast, Spain provides the national occupational code (CNO) at one digit (which is almost identical to the ISCO-88 one digit), while Germany provides the four-digit for both ISCO-88 and ISCO-08 code.

---

<sup>4</sup> In this case, using the old international classification allows for almost perfect comparability across countries, which would have been more problematic using the new ISCED version.

<sup>5</sup> Spain presents the father/mother national occupational code (CNO) at one digit, which is closely related to a one digit ISCO-88 code. Germany has a detailed four-digit ISCO-88 for both mother and father.

A similar harmonization problem applies at the industry level in classifying where the household head works. In the case of Italy, the classification is close to one digit NACE code classification, while Spain and Germany provide NACE (rev 1.1) classification at one digit.

Therefore, for granular analysis at the occupational/job level, it is necessary to consider these cross-country differences. Nonetheless, despite these differences, it is possible to trace uniquely managerial occupations in all countries, which in this paper is the key concern in distinguishing between a labourer and capitalist location.

On the other hand, information regarding employment status, contractual arrangements, working hours and number of employees in the case of self-employment is all standardised across countries and over time.

### **3.3 Flows of income**

This dimension is crucial to the study of the evolution of income distribution. In this case, it is possible to trace the same sources of income in all countries: employee income, self-employed income, profits and property income, which is composed of rental and financial income.

Employee income refers to the wages and salaries of employees in annual terms. Spain reports monthly wages, so the annual values are obtained by multiplying the monthly income by 12. However, the most important differences across countries refer to the role of taxation: Italy displays net values only while Spain reports only gross values. Germany is the only country allowing both estimations as it is possible to subtract the income taxes from the gross values. Therefore, in the dataset there exists a flag to detail whether the value is gross or net.

The distinction between self-employment income and profits (or entrepreneurial income) is more problematic. In fact, the classification of what is considered to be self-employment income varies in the original datasets. To homogenise data across sources, we restrict self-employed income to the income generated by those who are self-employed and have no employees. Profits are represented all the incomes obtained by the self-employed and entrepreneurs with at least one employee. As will be discussed in more detail below, this classification leads to a reduction in the number of self-employed compared to other types of estimations. Nevertheless, this classification allows us to have a consistent approach across countries and divide consistently between profits and self-employment income.

Financial income refers to the annual interest and dividends on accounts, and from bonds/stocks and other financial activities. This source of income is homogenous across countries. This is also the case for rental income, which is harmonised in the three countries. Finally, imputed rents are available in Italy and Germany but not for Spain.

### **3.4 Stock of wealth**

The last set of variables concerns the wealth dimension. The final dataset includes variables on define net wealth, real and financial wealth, and overall debt at the household level. All the components share the same definitions across countries, with some minor differences in the details of elements included. For example, there is no specific information on what assets constitute the financial wealth in Germany. Net wealth is obtained by discounting the overall debt (including both commercial and financial debts) from the sum of financial and real wealth. Financial wealth includes accounts, stocks, bonds, credits and other financial activities, while real wealth comprises real estate properties, business values and valuables.

In other words, data on financial wealth do not detail the type of asset from which this wealth originates. In this occasion, this dimension is not included in the analysis but could be employed in future research.

## 4 Findings

In this section, we analyse the income distribution between capitalist and labourer households. The purpose is to show how total income distributes between the classes described in section 2 and to establish what factors contribute to the changes in time, whether it is changes between the level of income or the composition effects of classes. This exercise is functional to our specific research objectives (that are addressed in section 4.1 and 4.2) as they provide information regarding the three countries analysed and their social class composition.

Figure 1 shows the evolution of the revised labourers' share of income, following the class definition presented in section 2.<sup>6</sup> First, it appears that the revised labourers' share of income is lower than the standard share in Italy and Spain. In the case of Germany, it tends to widen during the early 2000's and the financial crisis of 2008, to closer again the gap in the last years.

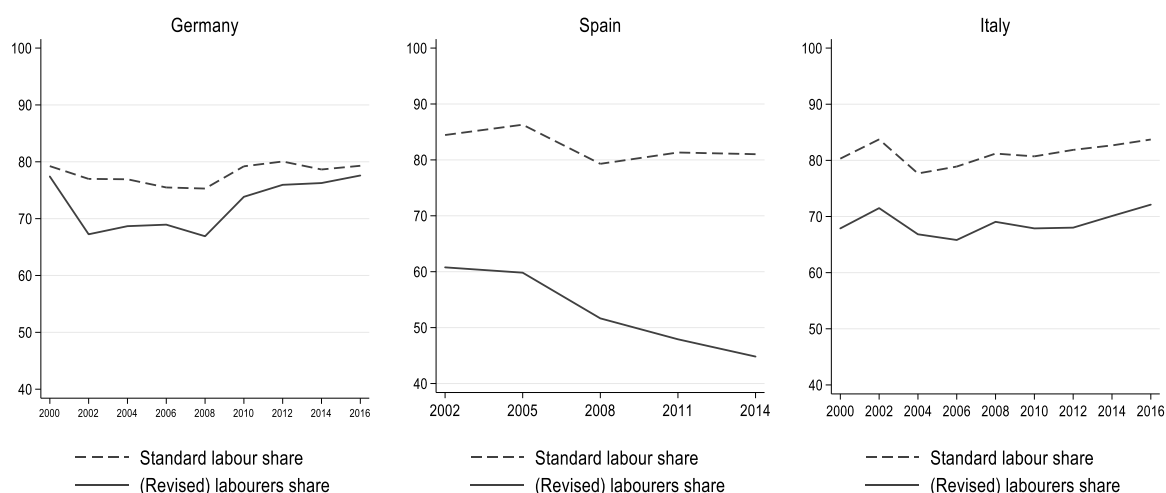
The standard labour share of income obtained using our dataset is higher than the one that is normally reported in national accounts statistics that, for the selected countries, is between 58 and 64% of income during the period covered. This discrepancy is largely related to the fact that in our study we do not include imputed rents in the calculations, which would have lowered the standard labour share.<sup>7</sup> At the same time, it should be noted that our estimation of the standard labour/capital share of income without imputed rents does not differ significantly from estimations performed with a similar methodology to ours (e.g. Iacono & Ranaldi 2021). It is interesting to observe that there are different trends among the three countries. The gap between the standard labour share and the labourers' share of income is especially pronounced (and widening) in Spain, whereas it is more contained in Germany. In this country, the (revised) labourers' share of income shows an upward trend, while in Spain it decreases by almost ten points during the period. In Italy, the distance between the two lines is rather steady and so is the labourers' share of income, which shows only a mildly inverted "U" shape during the period.

---

<sup>6</sup> Even though 1991 is the first available year for Italy, we restrict the analysis to the new century to have a similar time span as for Germany and Spain, whose first year of available data is 2002. The last observable year is 2016 for Italy, 2014 for Spain and 2017 for Germany.

<sup>7</sup> In a previous study for Italy (Fana & Villani 2022a), it was possible to include imputed rents in the estimations, and, in fact, the resulting standard labour share is lower and in line with aggregate national accounts data, while the labourers' share of income is not majorly affected.

Figure 1. Standard labour share and (revised) labourers' share (%) of income.



Source: Authors' elaboration using SHIW, EFF and SOEP data.

The detailed decomposition of the labourers' and capitalists' share of income is shown in Figure 2. Germany records a growth of the labourers' share, which is compensated by a reduction in the share of income received by traditional capitalists, managers and rentiers. In Spain, the evolution was the opposite. The reduction in the labourers' share of income corresponded to a growth in the share received by traditional capitalists, managers, and rentiers. In Italy, the distribution of income across subclasses was more stable compared to the other two countries, with no major changes.

A closer look at the data shows that the share of income received by labourers is almost exclusively represented by that of wage earners, while the share of self-employed is marginal.

On the other hand, the composition of the capitalists' share of income is more diverse and deserves a closer look. Traditional capitalists' income presents different evolutions in the three countries. In Germany, their income slightly decreased over the period, moving from 9% to 8% of income. In Spain, by contrast, this share tended to increase from approximately 15.6% to 22% of total income, while in Italy this group of households moved from 9 to 11.5% of total income.

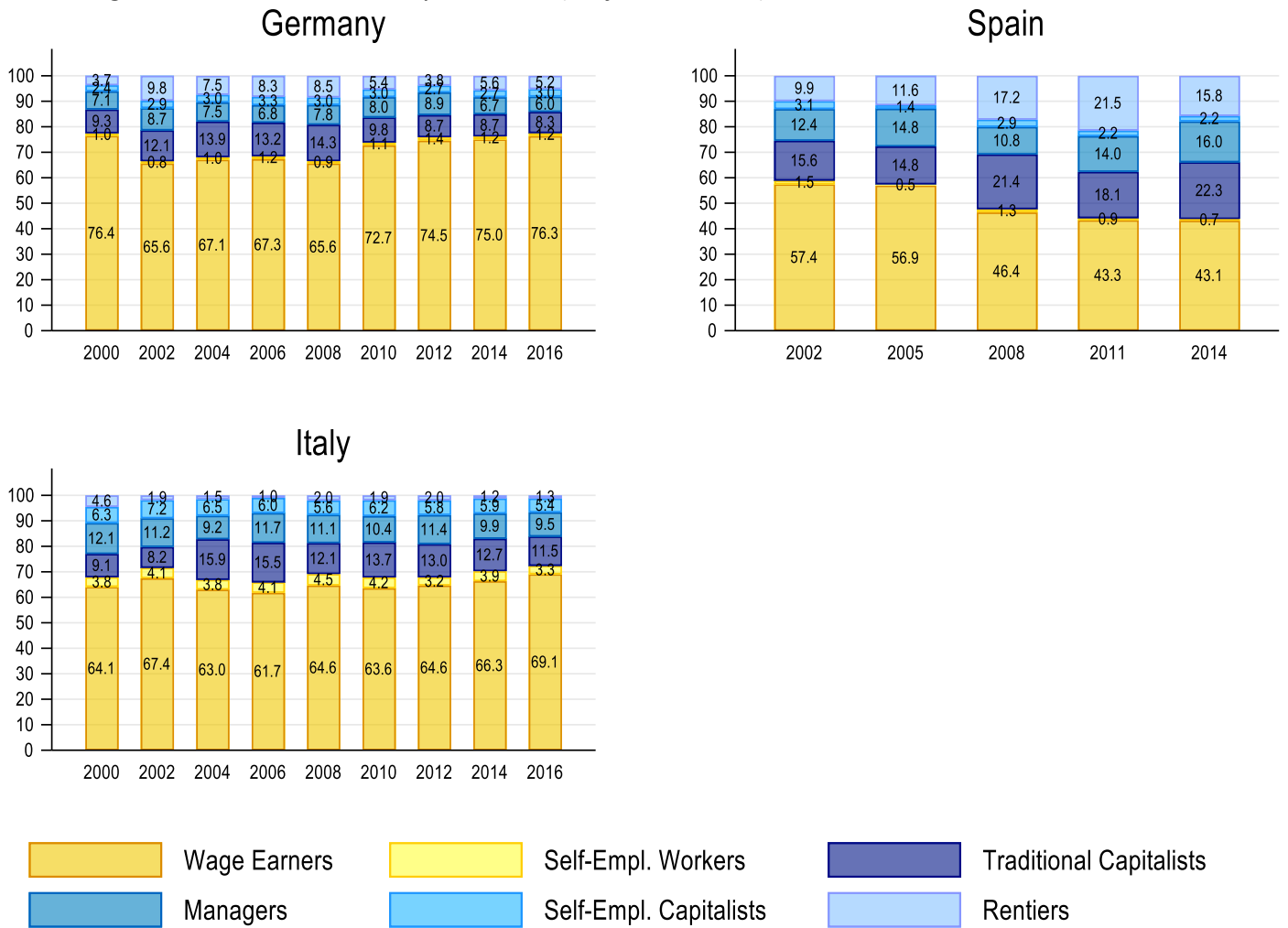
Germany and Italy record a mild reduction in managers' share of income, while in Spain the share of income that accrues to managers show a marked growth (see Table A1 in the appendix).

While the role of rentiers is small in Italy,<sup>8</sup> in Germany and (especially) in Spain this group of households is much more important. In Germany, rentiers' income grew at the beginning of the century, but this share dropped during the financial crisis (2.8% in 2012) and slightly recovered afterwards (5.2% in 2016). In Spain, despite the financial crisis, rentiers increased their share of income at the end of the period grew and reached 15.8% of total income, despite a reduction from the remarkable figure of 21.5% in 2011.

---

<sup>8</sup> The decreasing rentiers' share seems to be related to the lower returns from financial incomes, probably due to the consequences of the financial crisis.

Figure 2. Income distribution by subclasses (% of total income).



Source: Authors' elaboration using SHIW, EFF and SOEP data.

These findings are informative regarding the distribution of income across classes but give only a partial picture of the underlying dynamics in these countries. This is because the share of income received by a certain class (or subclass) is the result of two trends: a composition effect, that is, the variation in the relative size of a class compared to the other(s), and an income effect, that is, the evolution of the absolute level of income received by this class. The advantage of the approach employed here to classify the distribution of income is that, unlike the standard estimations of functional income distribution, it is possible to identify the receivers of income and therefore to assess the role of the composition and level effect in the changes of the distribution of income. Table A1 in the appendix shows that in Italy and Germany the share of labourer households decreased during the period, while in Spain it increased. At the end of the period, labourers represented almost 88% of total households in Italy and 83% in Germany and Spain. It is also interesting to observe that everywhere the presence of self-employed diminished, while the predominant type of household are wage earners, which indicates that traditional salaried relations are still the main type of work relationship for the great majority of households.

To establish if the changing levels in the total income of each class are determined by changes in income or in the size of the population of each class of household, we perform a structural

decomposition analysis. We decompose the change in the *total* income between the first and last year available in each country for each class  $i$  ( $\Delta Y_t^i$ ) in the *between* effect and a *within* effect. The former captures the reallocation of households across class (subgroups) and the latter grasps the role of changes in the level of income within each class (subgroup). In other words, the between and within terms decompose, respectively, the change in composition households and the total income change into the change in income levels (or averages). In formal terms, this is:

$$\Delta Y_t^i = \bar{Y}^i \Delta E_t^i + \bar{E}^i \Delta Y_t^i + \varepsilon^i = Y^{iB} + Y^{iW} + \varepsilon^i \quad 4$$

Where  $E^i$  is the share of households of class  $i$  in period  $t$ . The term  $\bar{Y}^i$  represents the average income and  $\bar{E}^i$  is the average share of households of class  $i$ . The symbol  $\Delta$  is the difference operator between the last and first-year values. The resulting  $Y^{iB}$  and  $Y^{iW}$  refer, respectively, to the resulting between and within component. The between component indicates how much the change in size of class  $i$  affects the change in total income  $Y_t^i$  while the within component captures the role played by the evolution in the level of income of class  $i$ . Finally,  $\varepsilon_i$  is the correlation between the two components, which can be computed as residual.

In Germany and Italy, labourers reduce sizeably their level of average income while they increase their presence. The higher presence of labourers is compensated by a reduction in that of capitalist households, that in both countries diminish during the period. As to capitalists' income, in German's capitalists increase their level, while Italians' capitalists reduce it, although this reduction is lower than that of labourers. In Spain, the scenario is different. Labourers decrease their presence, while capitalists increase it, while the within component is substantially unchanged for labourers and increases considerably for capitalists.

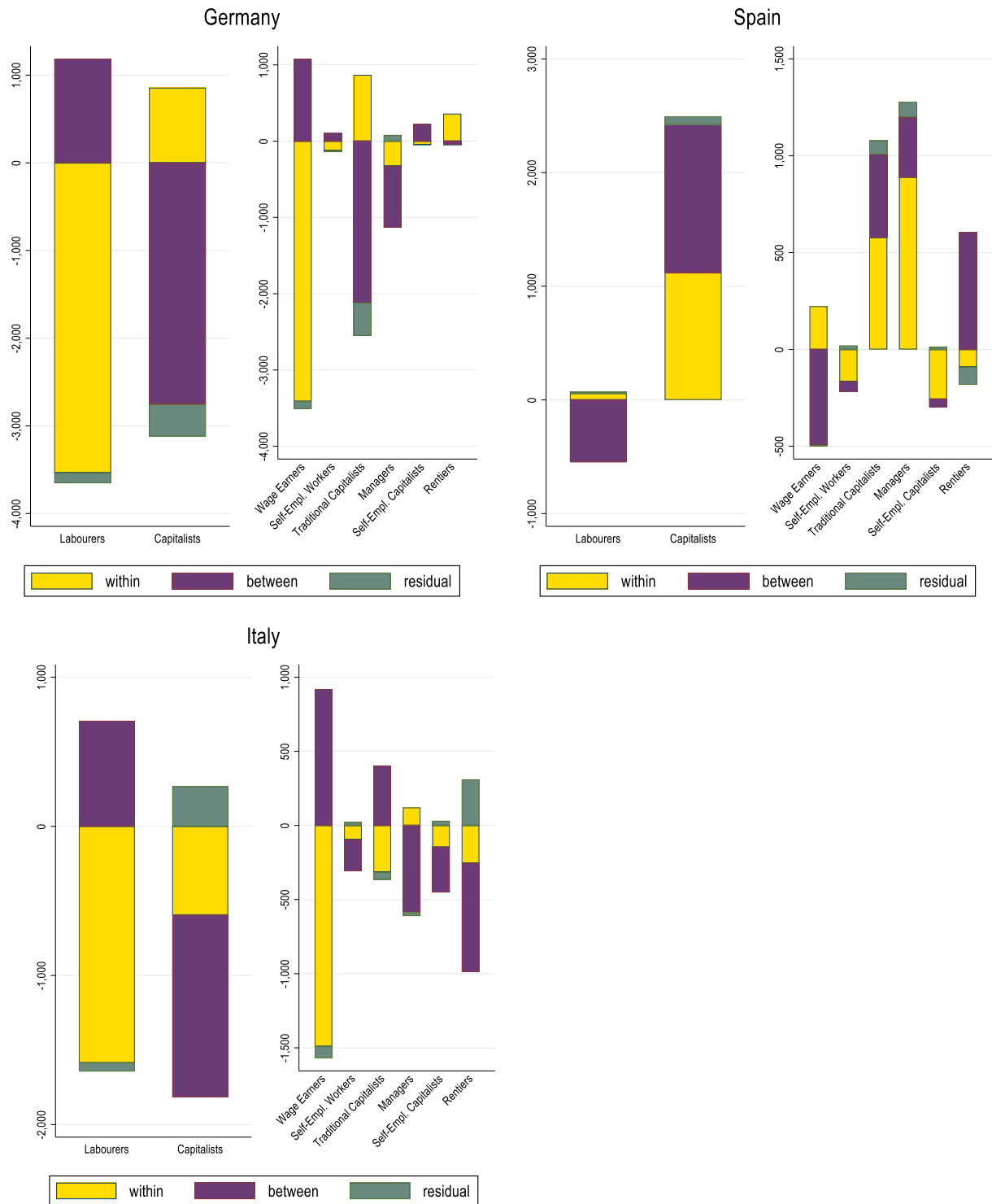
These findings are relevant as they indicate that the growth of the labourers' share of income in Germany is not the result of an improvement in the living conditions of labourers, compared to that of capitalists. Labourer households were *absolutely* and *relatively* better off at the beginning of the period. The growth in their share of income received is mainly due to their increase in number and a corresponding reduction in the number of capitalist households.

At the same time, the reduction in the labourers' share of income in Spain can be seen as the result of the increase in income and the expansion of its size. This has the merit of revealing that an observation of the evolution of the labour(ers') share of income alone may hide important compositional dynamics that may end up affecting the shares of income received by the two groups of households. This implies that the growth (reduction) of the labour share *alone* may not necessarily reflect an improvement in the living conditions of labourer (capitalist) households.

With regard to the household subgroups, a few aspects should be highlighted. In Germany, traditional capitalists and rentiers are the groups that increases their income, although their presence decreases. In Spain, both traditional capitalists and managers grew in terms of income and size. It is also interesting to observe that the number of rentiers increased, despite the financial crisis, while they suffer only a minor reduction in income level.

In Italy, there is a generalised reduction in the within component, which reflects the fact that, since the beginning of the 1990s this country has faced a stagnation of income (Brandolini et al. 2020). The only exception is represented by managers, which are the only type of household that increase their level of income during the period.

Figure 3. Shift share analysis (first year vs. last year). Note: the between component indicates the reallocation of households across class (subgroups) and the within component grasps the role of changes in the level of income within each group.



Source: Authors' elaboration using SHIW, EFF and SOEP data.

Overall, despite the country specificities, there are some common trends across the three countries. The shift share analysis shows that there is a clear worsening in the level of income received by labourers, both in absolute terms and relative to capitalist households. Even in Italy, where both



capitalists and labourers experience a reduction in income, the labourers' losses are more pronounced than those of capitalists. Moreover, in Germany and Italy, the growth in the labourer population counterbalanced the negative impact of the within effect on the income share so the labourers' share of income grew (Figure 2). In Germany, the reduction in the capitalists' share of income shown in Figure 1 does not reflect an improvement in the living standards of labourer households, but rather it reflects changes in the class composition of the country.

Furthermore, the fact the within component mostly explains the change in the overall population income suggests that the corresponding inequality index should be mostly determined by changes within the grouping factor i.e., class. To confirm this logical consequence, we also apply the Gini decomposition by class (labourers vs capitalists) and report the main results in the Appendix. We observe that in all countries the class factor seems to contribute quite well to the total income inequality, with a residual component ranging around 8-9% in Germany, between 10-11% in Italy and around 10-15% in Spain. Considering the residual, in all countries, the market income inequality within each class is systematically higher than the inequality between classes, consistently with the shift-share predictions.

After these descriptive trends, the next subsections address the specific research objectives of this paper.

#### 4.1 Income inequality by source of income

In this section, we address the first research objective, that is, to link the class analysis proposed above with the study of income inequality. In particular, we are interested in establishing how the growth in each source of income would contribute to the level of inequality. Total income inequality, measured by the Gini index, is shown in Table 2. As market income inequality is the sum of different income components, the overall distribution – and in turn the inequality index – is determined by the contribution of each source of income.

*Table 2. Gini index.*

	Germany	Spain	Italy
2000	0.391		0.354
2002	0.417	0.359	0.355
2004	0.435		0.354
2005		0.372	
2006	0.437		0.344
2008	0.448	0.389	0.342
2010	0.429		0.343
2011		0.420	
2012	0.434		0.360
2014	0.446	0.438	0.349
2016	0.448		0.351

*Note: Gini is computed on the gross market income for Spain and Germany, while it is the net market income in the case of Italy.*

*Source: Authors' elaboration using SHIW, EFF and SOEP data*

To decompose the Gini index by sources of income, we rely on the Lerman and Yitzhaki (1985) decomposition that extended the Shorrocks (1982) method of decomposition of income to the Gini coefficient and that has been typically employed in the literature (e.g. Milanovic & Yitzhaki 2002; Amarante 2016; Nolan et al. 2021). Lerman and Yitzhaki's decomposition makes it possible to estimate the marginal contributions of each source of income to total inequality. These contributions can be

considered the elasticities of the Gini coefficient because of a marginal change in a given income source (holding everything else constant). Analytically, they demonstrate that the total income inequality measured by the Gini coefficient can be decomposed in the following way:

$$G = \sum_{k=1}^K S_k G_k R_k \quad 5$$

That is, the total Gini coefficient is equal to the sum of the product of three elements for each income component  $k$ :

$S_k$  is the share of the income source  $k$  on the total income.

$G_k$  is the Gini index for the specific  $k^{\text{th}}$  source of income.

$R_k$  is the (rank) correlation between the  $k^{\text{th}}$  income source and the total income. A positive (negative) value means that factor  $k$  is positively (negatively) correlated with total income.

This means that if an income source is unequally distributed (high  $G_k$ ) and negatively correlated ( $R_k < 0$ ) with total income, its increase might reduce income inequality. Conversely, if the  $k^{\text{th}}$  source is unequally distributed and significantly and positively correlated with total income, then its increase might contribute to deepening income inequality.

As anticipated, an important aspect of the Lerman and Yitzhaki (1985) approach is that it makes it possible to estimate the effect on inequality of a marginal change in each income source. For example, consider a marginal change in the income source  $k$  equal to  $\varepsilon$ . The partial derivative of the Gini coefficient with respect to  $\varepsilon$  is:

$$\frac{\partial G}{\partial \varepsilon} = S_k (G_k R_k - G) \quad 6$$

Therefore, the percentage change in income inequality derived from a 1-percentage point change in income source  $k$  is:

$$\frac{\partial G / \partial \varepsilon}{G} = \frac{S_k G_k R_k}{G} - S_k \quad 7$$

In other words, the Gini elasticity is equal to the relative contribution ( $\frac{S_k G_k R_k}{G}$ ) to inequality of income source  $k$  minus the share of source  $k$  in the total income.

We apply this method to estimate the elasticity of total income inequality for each source of income. In our case, there are three types of income ( $k = 3$ ), labour income, self-employed income & profits and property income.<sup>9</sup> The results of this decomposition (Figure 4) show that the growth of wages has a negative impact on inequality. At the beginning of the period, for a 1% increase of labour income, the Gini coefficient tends to decrease by around 0.12% in Germany, by 0.13% in Italy, and around 0.10% in Spain. These values are only slightly different at the end of the period and do not change the overall picture.

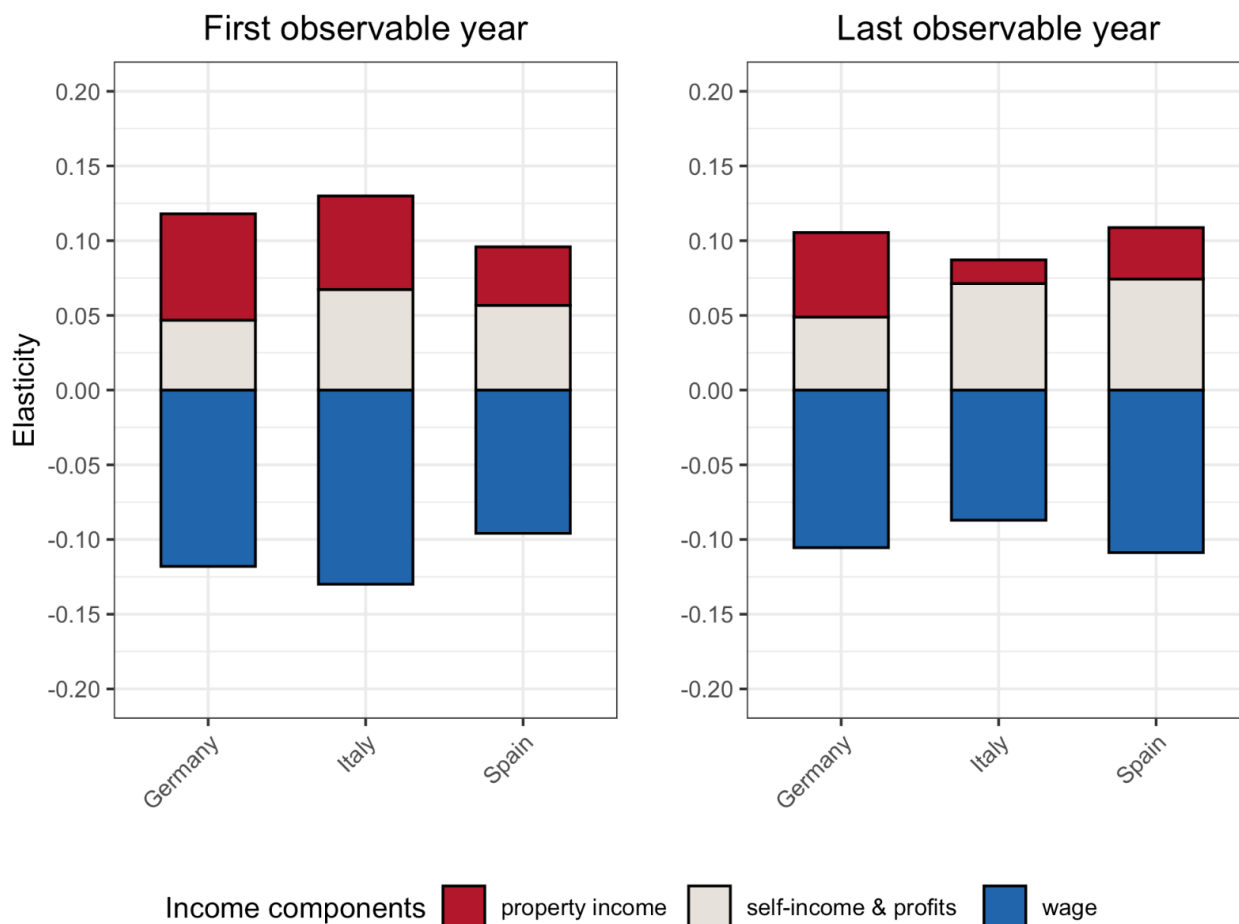
By contrast, a marginal increase in the self-employed income & profits and property incomes contributes to rising inequality, although with some differences across countries. In Germany and Italy

---

<sup>9</sup> For simplicity, we have combined profits and self-employment income. Self-employment income is only a minor source of total income, so this operation allows us to report the results in a more concise way without significantly altering the results.

property income has similar disequalizing effects, with an elasticity of around 0.07% and 0.06% (respectively); this effect is smaller in Spain, while it has comparable. With respect profits, Italy and Spain present similar elasticities of around 0.06% increase in Gini coefficient, while in Germany the effect is smaller. In the last observable year, it is relevant to notice the case of Italy, the disequalizing impact of property income significantly reduces.

Figure 4. Decomposition of the Gini index by income source (elasticities).



Source: Authors' elaboration using SHIW, EFF and SOEP data.  
 Note: First and last year: Germany, 2000-2016; Spain, 2002-2014; Italy, 2000-2016.

However, to have a better idea of what the determinants of inequality *variation* are between the first and last available year, we apply an additional property of the Lerman and Yitzhaki (1985) method:

$$\Delta Gini = \sum_{k=1}^K \Delta(S_k G_k R_k) \quad 8$$

Equation 8 shows that the change in income inequality equals the sum of the changes in the contributions to income inequality of each single income component  $k$ . This can be further decomposed as the sum of the share effect and the concentration coefficient effect. The former represents the change in the Gini coefficient due to changes in the shares of the different sources of

income ( $S_k$ ); the latter is the change in the inequality over time because of changes in the concentration coefficient ( $G_k R_k$ ).

A positive (negative) value for a type of income  $k$  implies that the concentration coefficient for that source of income has increased (decreased), lowering (augmenting) its equalising power thus contributing to the growth of the Gini coefficient from the first and last available year. Growing (lowering) concentration coefficients depend on a more unequal distribution of that source of income and/or a higher (lower) rank correlation with total income.

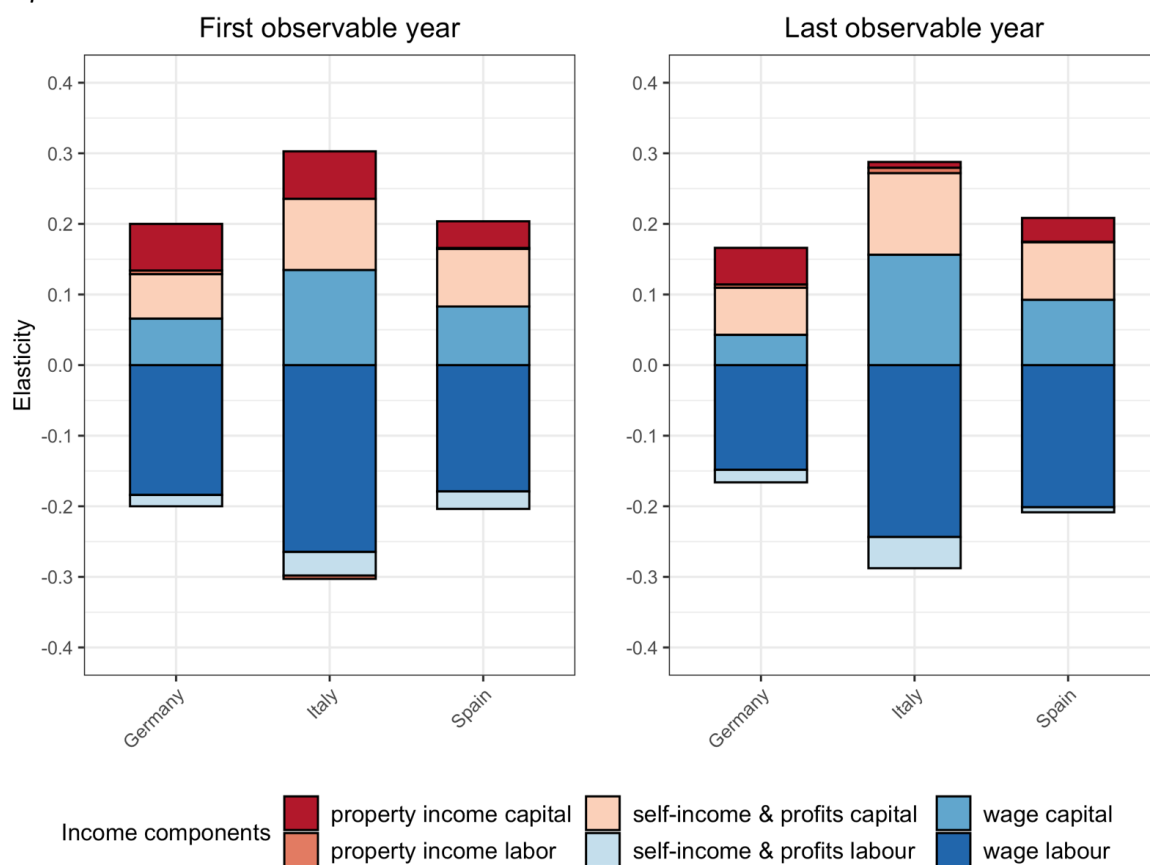
Figure A2 in the Appendix reports the results. Differently from Figure 4, here we observe how the changes in the contribution ( $S_k G_k R_k$ ) of source  $k$  contributes over time to income inequality dynamics. Therefore, positive values for a certain source of income mean that the change is towards an increase in inequality; negative values mean that the change is towards a decrease in inequality.

We observe that wages have contributed to the increase of income inequality – i.e., positive values – in all countries. However, it mostly explains the increase of the Gini coefficient in Germany. This is because a more unequal wage distribution over time leads to a higher concentration coefficient ( $G_k R_k$ ), which explains the lower equalizing power of wages and, in turn, the corresponding overall Gini index. In Spain, the self-employed & profits income is also an important source behind inequality changes. In Italy, there is a significant negative contribution to the inequality variation from property income, which counterbalances the effects of wages (and self-employment income & profits), contributing to keep mostly constant the Gini coefficient, as observed in Table 2

We should bear in mind that the analysis of Figure 4 does not consider explicitly the class perspective. To account for this dimension, we expand this analysis by observing what happens to the overall inequality when we distinguish between the three sources of income by class, labourers and capitalists. The results for this exercise are presented in Figure 5. It can be appreciated that – in all countries – a marginal increase in wages (and, to a minor extent, profits & self-employment income) received by labourer households would lead to a reduction in total inequality. By contrast, wages received by capitalists contribute to an increase in the Gini coefficient.

These findings deserve attention as they indicate that not all types of wages have an equalising effect in society. It is the labourers' wages that would provide the largest contribution to income inequality in these countries. Note that a marginal increase in the other sources of income received by labourers (profits & self-employment income and property income) would also contribute to diminishing inequality. Nevertheless, their contribution is much minor than that of wages. Moreover, as presented in Figure 4, an indiscriminate increase in profits and self-employment income and property income would bring an increase in inequality. Once again, these results imply that class belonging and its relation to the source of income is relevant when assessing the potential impact of changes in the level of income on inequality. In other words, they stress that the position along the income distribution is not sufficient to explain inequality dynamics, but it needs to be complemented with the class belonging factor to fully capture the formation and evolution of income inequality. It is not only the type of income that matters, but also who receives it. It follows that it would not be sufficient to increase wages indiscriminately, but for an egalitarian policy it will be necessary to increase the wages of the labourers, or in other words, to reduce the wage ratio between capitalists and labourers. This leads to the discussion of the growth of labour income in the top of the distribution, which is dealt with in the next section.

Figure 5. Decomposition of the Gini index by income source (elasticities) received by labourers and capitalists.



Source: Authors' elaboration using SHIW, EFF and SOEP data.

Note: First and last year: Germany, 2000-2016; Spain, 2002-2014; Italy, 2000-2016.

## 4.2 Wages and top distribution of income

The findings of the previous subsection link to the second objective of the paper, that is, the analysis of the growing presence of wages at the top of the income distribution. To approach this topic, Table 3 shows how each class (and subclass) is distributed in each quintile of income. It can be appreciated that in the three countries the presence of labourers across the quintiles of income is quite stable at the beginning and end of the period. In Spain and Italy, there is a mild downgrade of capitalists, whose presence increases in the bottom of the distribution. Germany records the opposite trend, with a movement of capitalists towards the top 4<sup>th</sup> and 5<sup>th</sup> quintiles.

As to capitalists, it is interesting to observe that there are similar shifts in the three countries. In Spain and Italy, the more pronounced movement towards the bottom of the distribution involves traditional capitalists and, to a lesser extent, self-employed capitalists and rentiers. Another common feature is the growth in the presence of managers in the 5<sup>th</sup> quintile, which is evident in Spain and Italy. This increase reflects the higher presence of managers in the top of the distribution of income, which is common in western economies (on the causes and implications of this phenomenon, see Huber et al. 2019).

Overall, it can be appreciated that the movement towards the top of the distribution of income is contained for labourers. The most significant upgrading is that of managers, who move to the top quintile of income in all three countries (especially in Spain and Italy).

*Table 3. Distribution of classes across income quintiles. First and last year available in each country.*

Germany										
Quintile	2000					2016				
	1	2	3	4	5	1	2	3	4	5
Wage Earners	21.5	21.2	21.0	20.1	16.1	21.4	20.4	21.0	20.1	17.1
Self-Empl. Lab.	47.0	33.7	19.3	0.0	0.0	38.5	42.2	19.3	0.0	0.0
<b>Total Labourers</b>	<b>22.4</b>	<b>21.6</b>	<b>21.0</b>	<b>19.5</b>	<b>15.6</b>	<b>22.0</b>	<b>21.2</b>	<b>20.9</b>	<b>19.4</b>	<b>16.5</b>
Traditional capitalists	6.2	13.7	14.0	21.2	44.9	1.7	16.8	12.0	17.3	52.3
Managers	5.8	10.5	15.3	26.0	42.5	5.7	11.3	14.1	28.5	40.4
Self-Empl. Capitalists	0.0	0.0	12.8	35.5	51.6	0.0	0.0	4.5	41.2	54.2
Rentiers	0.0	0.0	10.3	11.5	78.3	0.0	0.0	13.6	18.0	68.4
<b>Total Capitalists</b>	<b>4.7</b>	<b>9.5</b>	<b>13.9</b>	<b>23.4</b>	<b>48.6</b>	<b>2.6</b>	<b>9.5</b>	<b>11.8</b>	<b>25.5</b>	<b>50.6</b>

Spain										
Quintile	2002					2014				
	1	2	3	4	5	1	2	3	4	5
Wage Earners	21.0	21.7	20.7	20.2	16.4	19.6	20.5	23.0	21.3	15.6
Self-Empl. Lab.	43.9	24.8	20.3	11.0	0.0	61.4	35.4	3.2	0.0	0.0
<b>Total Labourers</b>	<b>21.9</b>	<b>21.8</b>	<b>20.7</b>	<b>19.9</b>	<b>15.8</b>	<b>21.1</b>	<b>21.1</b>	<b>22.3</b>	<b>20.6</b>	<b>15.0</b>
Traditional capitalists	9.7	18.4	14.4	22.1	35.4	23.4	14.1	12.0	13.4	37.1
Managers	11.0	12.6	14.6	17.2	44.6	12.7	20.6	6.8	11.1	48.8
Self-Empl. Capitalists	0.0	0.0	0.0	28.7	71.3	0.0	0.0	25.8	31.3	42.9
Rentiers	0.0	0.0	5.0	25.1	69.9	0.0	0.0	5.1	25.7	69.2
<b>Total Capitalists</b>	<b>8.9</b>	<b>13.3</b>	<b>12.6</b>	<b>20.8</b>	<b>44.4</b>	<b>15.1</b>	<b>14.4</b>	<b>10.7</b>	<b>15.1</b>	<b>44.8</b>

Italy										
Quintile	2000					2016				
	1	2	3	4	5	1	2	3	4	5
Wage Earners	20.7	23.3	20.5	21.6	13.9	20.0	23.0	21.7	19.9	15.4
Self-Empl. Lab.	48.0	21.6	30.4	0.1	0.0	46.6	22.9	30.2	0.3	0.0
<b>Total Labourers</b>	<b>23.3</b>	<b>23.1</b>	<b>21.4</b>	<b>19.6</b>	<b>12.6</b>	<b>21.9</b>	<b>23.0</b>	<b>22.3</b>	<b>18.5</b>	<b>14.4</b>
Traditional capitalists	15.9	15.4	15.2	13.9	39.7	21.8	9.9	8.9	22.0	37.4
Managers	2.6	8.6	17.6	18.4	52.8	2.5	2.4	9.9	21.5	63.6
Self-Empl. Capitalists	0.0	0.0	0.0	43.6	56.4	0.0	0.0	0.0	52.2	47.8
Rentiers	0.4	2.0	11.8	13.2	72.6	0.0	2.0	36.3	27.8	33.9
<b>Total Capitalists</b>	<b>6.2</b>	<b>8.4</b>	<b>12.7</b>	<b>21.3</b>	<b>51.3</b>	<b>10.5</b>	<b>5.3</b>	<b>8.4</b>	<b>27.6</b>	<b>48.2</b>

Source: Authors' elaboration using SHIW, EFF and SOEP data.

Regarding these results, the following caveat should be considered. As discussed above, the definition of profit income includes any self-employed income received by individuals whose business accounts at least one employee. Hence, this definition accounts for some income that would otherwise be classified as self-employed income. It is possible that a relevant part of the traditional capitalists' income at the bottom of the distribution corresponds to households that, with an alternative classification would be part of self-employed households. This is attested by the case of Italy. A previous study (Fana & Villani 2022a), which followed the original Bank of Italy definition of self-employed income (that is, without imposing the condition that self-employed have zero employees) calculated a larger number for the category of self-employed workers that are considered traditional capitalists in Table 3. In that case, the presence of traditional capitalists at the bottom of the distribution is smaller than the in Table 3.

Hence, we can assert that the presence of traditional capitalists at the bottom of the distribution partly depends on households that can be considered self-employed workers, which can vary according to whether a condition on the number of employees is imposed.

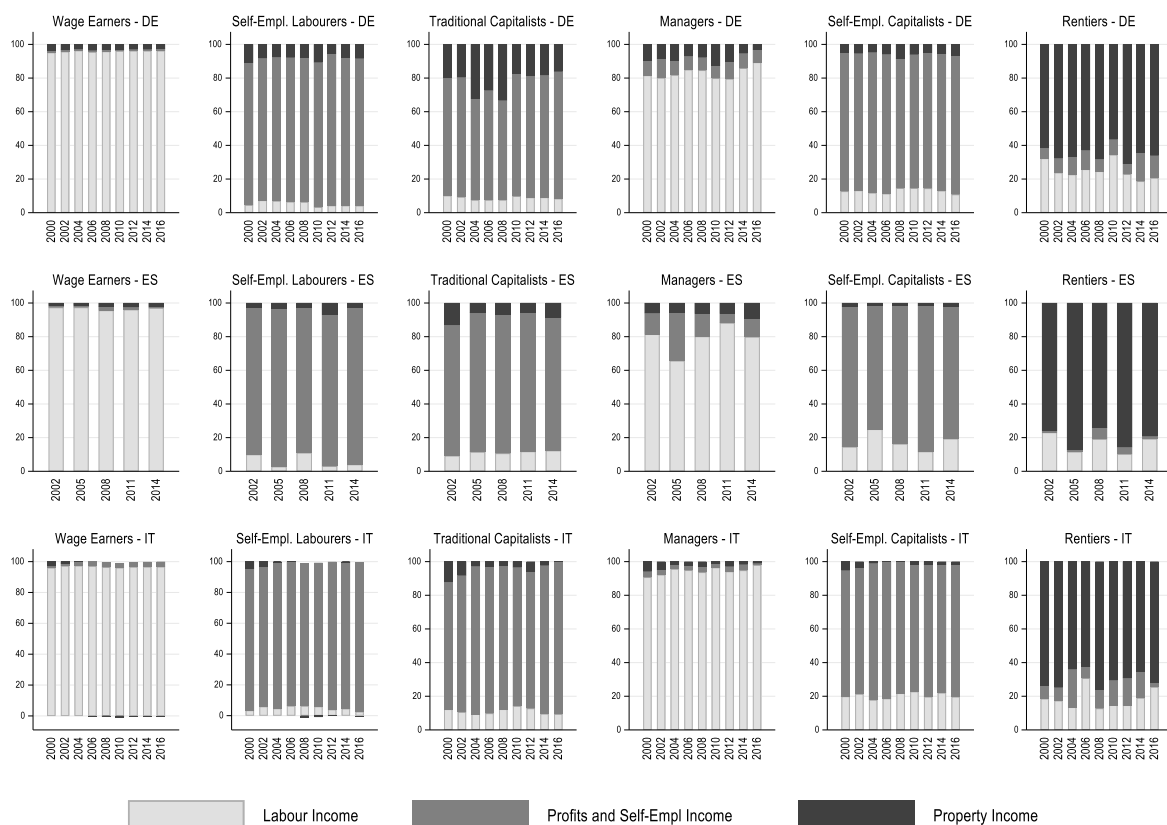
To deepen the analysis of income distribution and social classes, Figure 6 shows the decomposition of total income by source of income for each subgroup of households. This is relevant to assess to what extent the mix of income sources in each type of household varies during the period. What is immediately evident is that there are no major changes in the mix of sources of income by type of household. Wage earners' income is largely constituted by wages. While this could be expected, it is interesting to observe that even during the period of financialisation – characterised by a higher diffusion of financial instruments – property income continues to represent a very small fraction of the total. Looking more closely at each country's dynamics, we can see that in Spain there is a small growth in property income in 2008 and 2011, corresponding to the final phase of the financial boom. In Italy, the situation is the opposite. In fact, within wage earners and self-employed households, this source of income has become negative since 2004.

Unsurprisingly, in traditional capitalist households the lion's share of income is represented by profits and self-employed income. It is also interesting to observe that in Germany property incomes represent around 20% of total income for this type of household, peaking before the global financial crisis. In Spain, this share is more negligible although growing after 2005, while in Italy this share is decreasing.

Managers' income composition does not modify significantly, but it can be noted that Germany and Spain have a certain income mix that is particularly due to the role played by property income and profits. In Italy, this share is not significant and is decreasing.

Despite these changes, the mix of sources of income received by these subgroups is quite stable. This is important because it indicates that despite the general growth of financial instruments recorded during the period, property income has not increased its importance to a significant extent (in Italy, its presence even decreased). Moreover, this type of income has been mostly localised among capitalists, while wage earners receive very little share of this type of income (more on this below). Therefore, the rather static composition of income suggests that it is true that there is a mix in the sources of income. However, this heterogeneity does not apply extensively to these countries, there are no major changes during the period and involve mostly capitalist households.

Figure 6. Average composition of income (% of the total) by income source. Note: for the sake of simplicity, self-employed income and profits are presented jointly. Property income = income from financial assets + income from rents

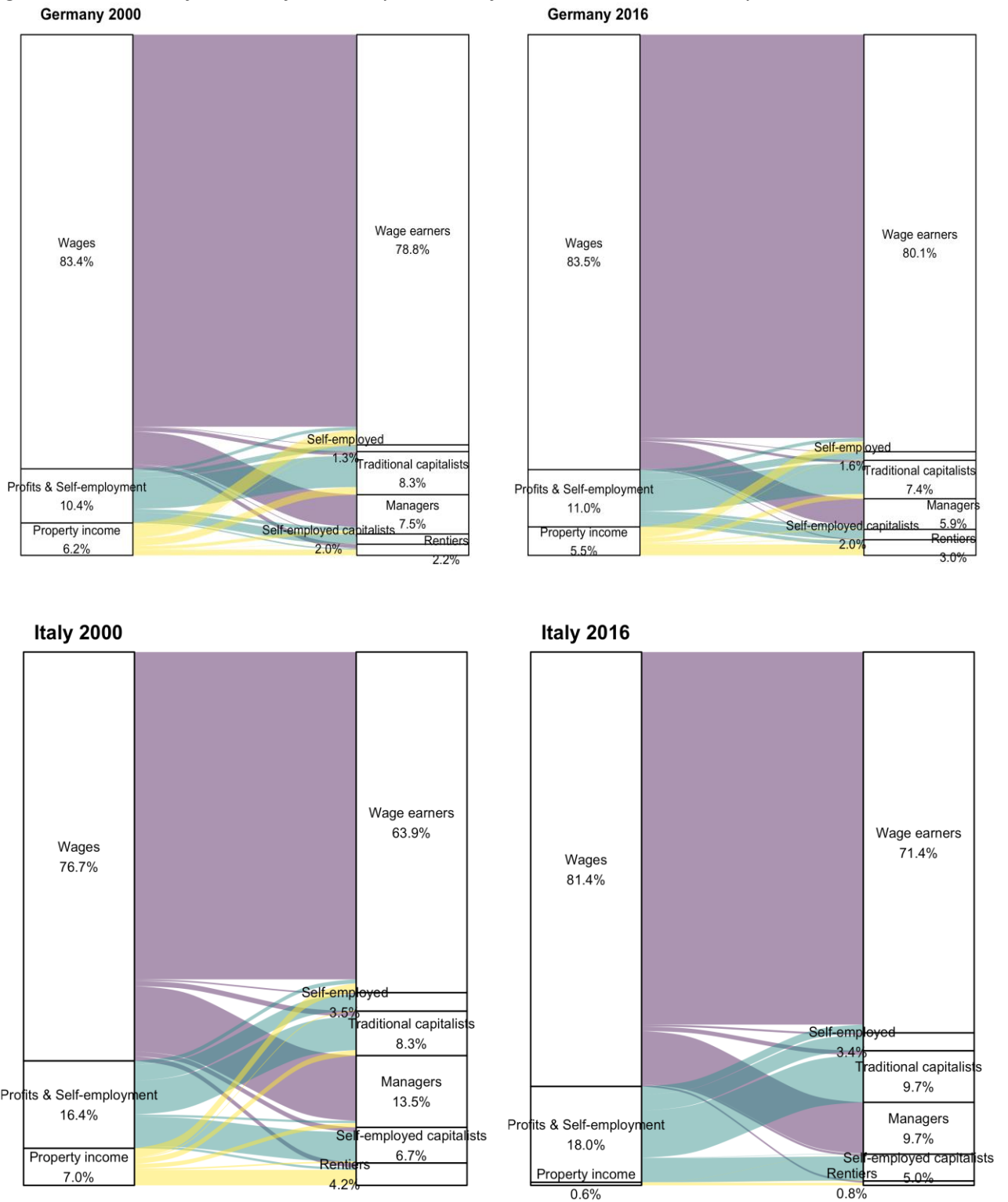


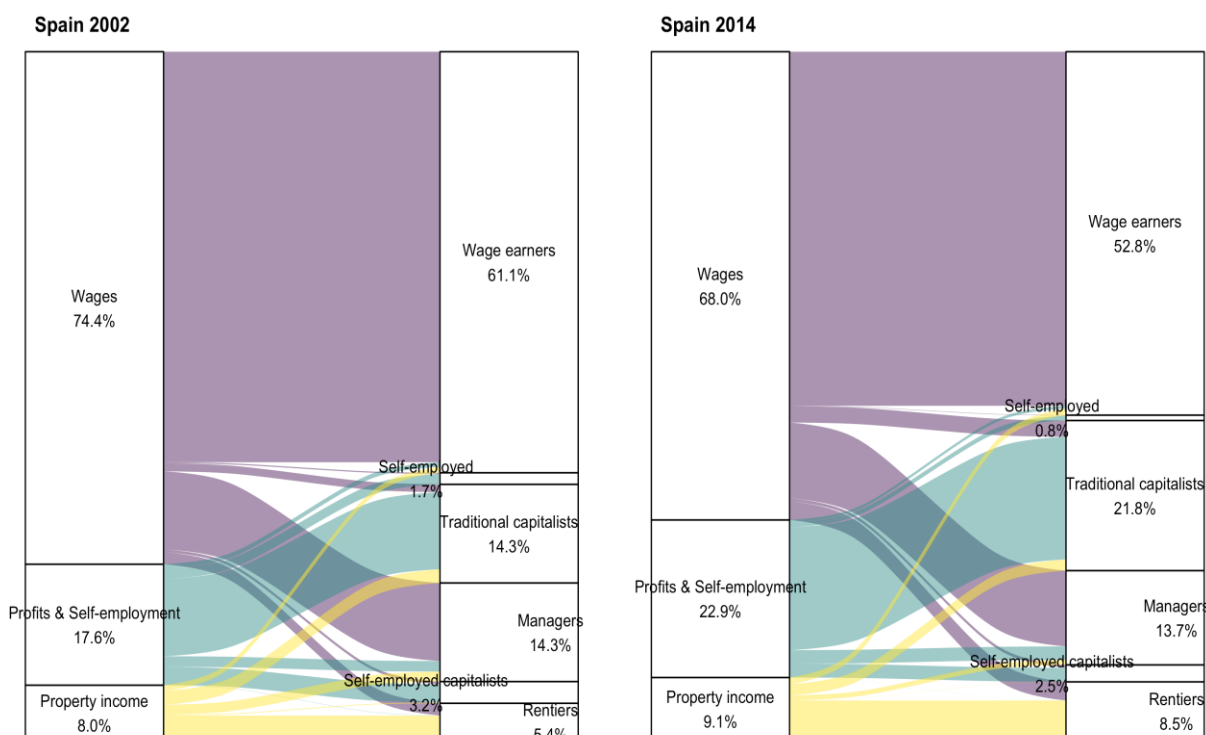
Source: Authors' elaboration using SHIW, EFF and SOEP data.

To complement the information regarding the allocation of types of income, Figure 7 shows how the three sources of income are distributed between classes. On the one hand, it can be appreciated that there is a substantial flow of wages that accrues to managers and wealthy households. On the other hand and in line with Figure 6, only a minor part of profits & self-employment income and property income ends up in wage earners' households. The distribution of the flows is very similar at the beginning and at the end of the period, confirming that there are no major shifts in the allocation of type of income across classes. Importantly, this figure allows to show that capitalist households are those that receive most of the property income. While this is expected because of the presence of rentier households, a non negligible portion is also received by traditional capitalists and, to a lesser extent, managers.



Figure 7. Allocation of sources of income by subclass of households. First and last year available.





Source: Authors' elaboration using SHIW, EFF and SOEP data.

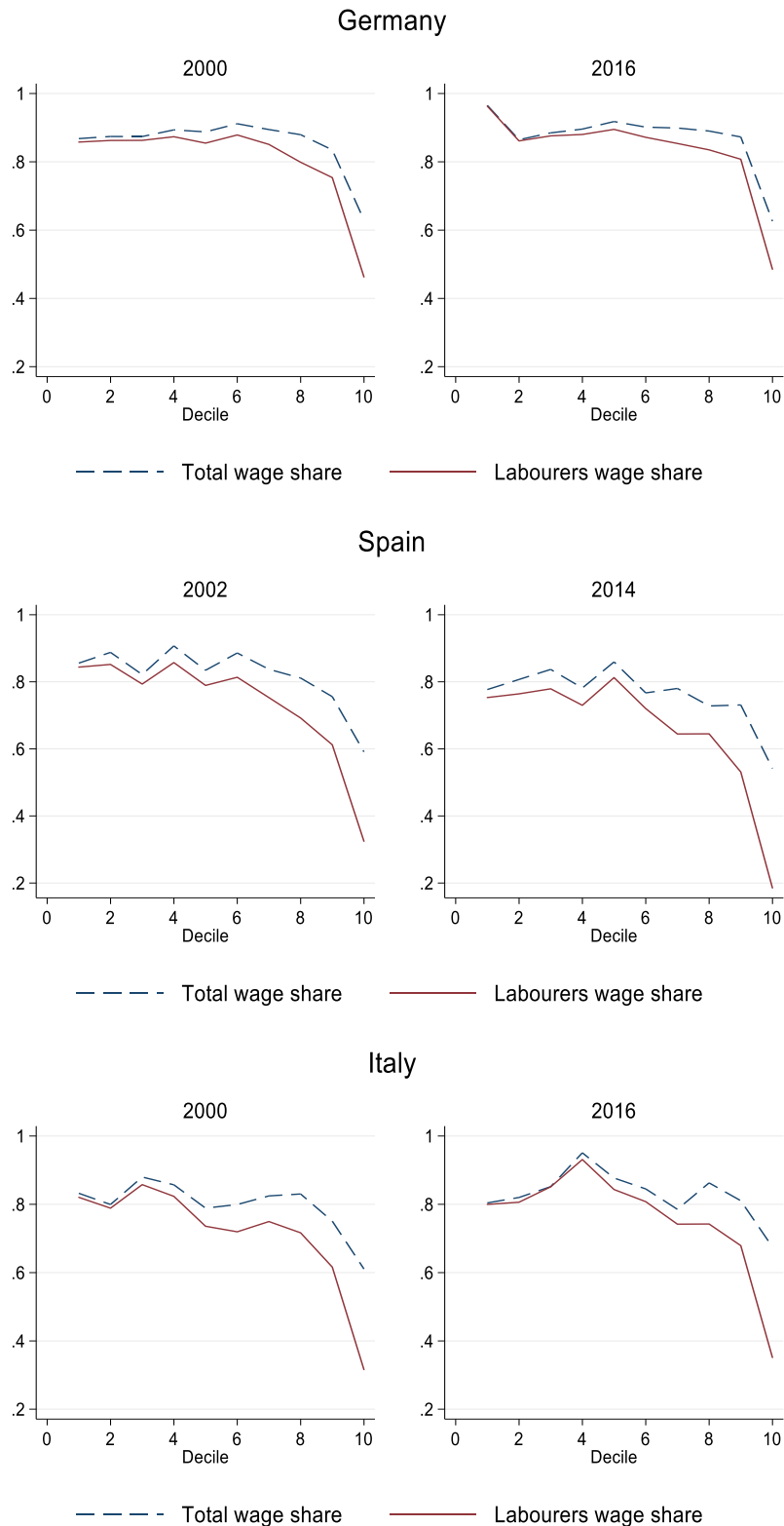
The evidence presented so far provides shows how households distribute along the distribution of income and how the different sources of income allocate among classes, but does not address directly the second research objective, i.e. discussing the distribution of labour income along the total distribution of income. To do so, we estimate the wage share by deciles of total income (i.e., irrespective of the class of belonging) and compare it with the wage share of labourers only (Figure 8). The standard claim in the literature on the growth of wages at the top of the distribution is that there is a growing presence of wages at the top of the income distribution. By estimating, for each decile of total income, the *total* wage share and the wage share for *labourers only* we are able to establish what class contributes to the presence of wages at the top of the distribution of income.

As expected, the share of wages over total income decreases as we move along the distribution of income because capital income tends to be concentrated at the top. Regarding the evolution of the total wage share at the top of the distribution of income, it is interesting to observe that only in Italy there is a clear growth of the total wage share between the first and last year of the period, in line with the argument proposed by the literature (e.g., Milanovic 2017; Aaberge et al. 2018). In Germany the wages at the top 10% of the distribution is substantially unchanged while in Spain the presence of wages in the top of the distribution is slightly lower in 2014 than in 2002.

Furthermore, the added value of this type of analysis emerges clearly when comparing the two lines in the Figure 8, which makes possible to establish what class is responsible for the presence of wages at the top of the distribution of income. Naturally, it can be appreciated that the labourers' wage share is lower than the total wage share. This is because labourers' wages are a subsample of total wages. Nevertheless, what is more relevant to our analysis is that the gap between the two lines increases considerably as we move towards the top of the distribution and becomes very pronounced in the top 10% of income. The presence of wages in the top 10% of income for labourers is about half of the total wage share in Spain and Italy. In these countries, the share of labourers' wages in the 10<sup>th</sup> decile is around 20-30% compared to the 60-70% in the case of the total wage share. This is a considerable gap that reveals that major differences can emerge once class location of households, and not just the type

of income, is taken into consideration. The case of Germany is a bit different. In this country the gap between the two lines is more reduced, revealing that even in the top decile of income a large share of wages is received by labourers.

Figure 8. Share of wages over total income by decile of income. Total wages and wages received by labourers only.



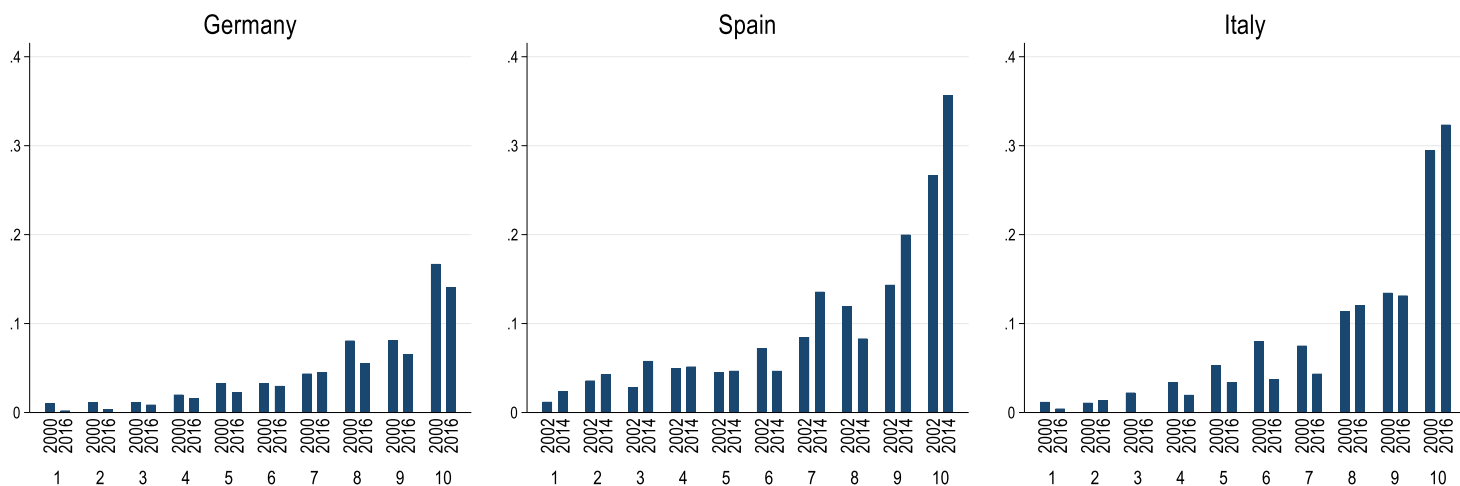
Source: Authors' elaboration using SHIW, EFF and SOEP data.

To have a clearer perspective of the changes occurred through time, Figure 9 shows the values of the difference between the total wage share and the labourers' wage share of income between the first and last year available by decile of income. When this difference is small, the total wage share is a good proxy of the labourers' wage share. In this case, the share of wages appropriated by capitalists is limited. On the contrary, larger differences between these two measures indicate that the total wage share is not a good proxy of the share of wages received by labourers, meaning that this difference is appropriated by capitalist households.

What appears clear immediately from Figure 9 is that the distance between the total and labourer's wage share of income tends to lower at the end of the period than at the beginning for bottom deciles, while it tends to increase at the top of the distribution (except in Germany). This implies that at the bottom of the distribution the total wage share of income captures increasingly well the labourers' wage share. On the contrary, the total wage share at the top of the distribution is far from capturing (and decreasingly so, in Spain and Italy) the labourer's wage share.

Hence, these findings reinforce the previous analysis (Table 3 and Figure 8) and have important consequences for the literature on the growth of wages in the top of the distribution. It is true that a relatively high share of wages can be found at the top of the income distribution, but this presence corresponds to a large extent to wages received by households that belong to the capitalist class according to our approach. What is more, in Spain and Italy, capitalist households are those that contribute majorly to the growing presence wages at the top of the distribution is captured mainly by those that in our framework are considered capitalist households.

Figure 9. Difference between the total wage share and the labourers' wage share by decile of income. First and last year available.



Source: Authors' elaboration using SHIW, EFF and SOEP data.

## 5 Conclusions and discussion

This paper investigates the relationship between social classes, inequality and top incomes in Germany, Spain and Italy. To do so, we adapt the approach of Fana and Villani (2022a) to classify labourer and capitalist households. In the definition of social classes this approach takes on board

some characteristics of contemporary capitalism that have been extensively highlighted in the literature, namely the fact that individuals and households can receive multiple sources of income (Atkinson 2009; Milanovic 2017) and the role of managers who, despite being mostly wage earners, have their interests and functions largely aligned with those of traditional capitalists (e.g. Krueger 1999; Glyn 2009; Milios 2018).

From this perspective, we addressed two specific objectives. First, we apply the Lerman and Yitzhaki (1985) decomposition technique in order to understand what the marginal effects of each source of income on the Gini coefficient are. We find that a marginal increase in labour income contributes to the reduction of the overall inequality in the three countries, while the increase of profits and property income foster to its growth. Importantly, not any type of labour income contributes to the reduction of inequality. Only wages received by labourers contribute to the reduction of inequality, while a marginal increase of those received by capitalists (mostly concentrated in the managerial group) boost it. These findings have important policy implications as they indicate that the reduction of income inequality must involve the increase of labourers' wages (as defined in this paper) in absolute and relative terms.

This issue connects closely with the second area of inquiry, that is, the growth of wages in the top of the distribution. Different with the relevant literature (among others, Piketty & Saez 2007; Atkinson et al. 2011; Piketty & Saez 2013; Aaberge et al. 2018; Atkinson & Lakner 2021), we find that only in Italy there is a growing share of labour income in the top of the income distribution. Part of this discrepancy relates to the years employed in the analysis. It is possible that using different period we would obtain a different picture and that, over the long run, also in these countries there was an increase in the presence of wages at the top of the distribution of income.

What is more relevant, however, is how wages among top earners distribute between classes. Indeed, labourers are present at the top of the distribution, indicating that they can be found along the whole distribution of income. However, the share of wages received by this class in the top decile is considerably lower than the total share of wages and this gap increases with the decile of income. This implies that as we move towards the top of the distribution of income the presence of wages is largely imputable to what we have defined as capitalist. Specifically, this major presence is mostly related to managers who, in Italy and Spain, increased their presence in the 5<sup>th</sup> quintile of the income distribution over time (Table 3) and that are the type of household that, among capitalists, receive the higher share of labour income (Figure 7 and Figure 8).

A special case is that of Germany where these findings are more nuanced. The distance between the total and labourers' wage share of income is lower than in the other two countries. In this respect, it is significant that Germany is the only country where managers do not increase their presence in the top quintile of income (Table 3). The lack of relative upgrading of managers' income in this country may explain the lower gap between the two curves at the top income in figure 8.

These results, in our view, are crucial in the current debate regarding the presence of wages among top incomes. It is undeniable that there is a high presence of labour income in the top of the distribution, but this income is largely received by households whose interests are closer to those of capitalists than of labourers. It is true that, even employing the alternative approach used in this paper, that considers the salient characteristics of contemporary capitalism, labourers are present along the entire distribution of income, but it can be claimed that a class divide is still relevant and in some cases it is even growing, as indicated by the diverging gap between total and labourers' wage share at the top of the distribution (Figure 9).

To conclude, a main message of our paper is that it is important to consider explicitly the role of property income and managerial functions in shaping class belonging. This exercise may be useful to better link the macroeconomic aggregates with the households' perceptions of their income position and evolution, which Atkinson (2009) describes as one of the main reasons for the factor shares

analysis. Further research may also involve other countries, exploiting other datasets. More generally, we hope that this contribution will feed into future discussion on the dichotomy between labour(ers) and capital(ists) in our times.

## 6 References

- Aaberge R, Atkinson AB, Königs S. 2018. From classes to copulas: wages, capital, and top incomes. *J Econ Inequal*. 16(2):295–320.
- Adler M, Schmid KD. 2012. Factor Shares and Income Inequality – Empirical Evidence from Germany 2002-2008. IAW Discuss Pap. 82.
- Amarante V. 2016. Income Inequality in Latin America: A Factor Component Analysis. *Rev Income Wealth*. 62(August):S4–S21.
- Atkinson AB. 2009. Factor shares: The principal problem of political economy. *Oxford Rev Econ Policy*. 25(1):3–16.
- Atkinson AB, Lakner C. 2021. Capital and Labor: The Factor Income Composition of Top Incomes in the United States, 1962 – 2006. *Rev Econ Stat*. 103(5):892–904.
- Atkinson AB, Piketty T, Saez E. 2011. Top incomes in the long run of history. *J Econ Lit*. 49(1):3–71.
- Berman Y, Milanovic B. 2020. Homoploutia: Top Labor and Capital Incomes in the United States, 1950-2020. *World Inequal Lab - WP N2020/27* [Internet]. <https://halshs.archives-ouvertes.fr/halshs-03130546>
- Bhattacharya N, Mahalanobis B. 1967. Regional Disparities in Household Consumption in India. *J Am Stat Assoc*. 62:143–161.
- Brandolini A, Gambacorta R, Rosolia A. 2020. Inequality amid income stagnation: Italy over the last quarter of a century. *Quest di Econ e Finanz (Occasional Paper n 422, Banca d'Italia)*.
- Daudey E, García-Peñalosa C. 2007. The personal and the factor distributions of income in a cross-section of countries. *J Dev Stud*. 43(5):812–829.
- Erikson R, Goldthorpe JH, Portocarero L. 1979. Intergenerational Class Mobility in Three Western European Societies: England, France and Sweden. *Br J Sociol*. 30(4):415–441.
- Fana M, Villani D. 2022a. Reconsidering social classes and functional income distribution in the 21st century. A theoretical and empirical assessment. *Eur Comm Seville, JRC128667*.
- Fana M, Villani D. 2022b. Decomposing the Automotive Supply Chain: Employment, Value Added and Occupational Structure. *Struct Chang Econ Dyn* [Internet].(xxxx). <https://doi.org/10.1016/j.strueco.2022.04.004>
- Friedman M. 1970. The social responsibility of business is to increase its profits. *N Y Times Mag*.(September 13):31–35.
- Glyn A. 2009. Functional Distribution and Inequality. In: Nolan B, Salverda W, Smeeding TM, editors. *Oxford Handb Econ Inequal*. [place unknown]: Oxford University Press.
- Gollin D. 2002. Getting Income Shares Right. *J Polit Econ*. 110(2):458–474.
- Hein E, van Treeck T. 2010. ‘Financialisation’ in Post-Keynesian Models of Distribution and Growth: A Systematic Review. In: Setterfield M, editor. *Handb Altern Theor Econ Growth*. [place unknown]: Edward Elgar.
- Huber E, Huo J, Stephens JD. 2019. Power, policy, and top income shares. *Socio-Economic Rev*. 17(2):231–253.
- Iacono R, Ranaldi M. 2020. Poor Laborers and Rich Capitalists? On the Evolution of Income Composition Inequality in Italy 1989-2016. *STONE Cent SOCIO-ECONOMIC Inequal Work Pap Ser No 13*.(13).

- Iacono R, Ranaldi M. 2021. The evolution of income composition inequality in Italy, 1989–2016. *Rev Income Wealth*.:1–26.
- Krueger BAB. 1999. Measuring Labor's Share. *Am Econ Rev*. 89(2):45–51.
- Lerman R, Yitzhaki S. 1985. Income Inequality Effects by Income. *Rev Econ Stat*. 67(1 February):151–156.
- Milanovic B. 2017. Increasing Capital Income Share and its Effect on Personal Income Inequality. In: Boushey H, de Long B, Steinbaum M, editors. *After Piketty Agenda Econ Inequal*. [place unknown]: Harvard University Press.
- Milanovic B, Yitzhaki S. 2002. Decomposing world income distribution: Does the world have a middle class? *Rev Income Wealth*. 48(2):155–178.
- Milberg W. 2008. Shifting Sources and Uses of Profits: Sustaining US Financialization with Global Value Chains. *Econ Soc*. 37(3):420–451.
- Milios J. 2018. *The origin of Capitalism as a Social System*. Oxon: Routledge.
- Mohun S. 2006. Distributive shares in the US economy, 1964–2001. *Cambridge J Econ*. 30(3):347–370.
- Nolan B, Palomino JC, Van Kerm P, Morelli S. 2021. Intergenerational wealth transfers and wealth inequality in rich countries: What do we learn from Gini decomposition? *Econ Lett* [Internet]. 199:109701. <https://doi.org/10.1016/j.econlet.2020.109701>
- OECD. 2015. The Labour Share in G20 Economies. Rep Prep G20 Employ Work Gr Antalya, Turkey, 26–27 Febr 2015.(February):26–27.
- Oesch D. 2006. Redrawing the class map: stratification and institutions in Britain, Germany, Sweden and Switzerland. [place unknown]: Palgrave Macmillan.
- Onaran Ö, Stockhammer E, Grafl L. 2011. Financialisation, Income Distribution and Aggregate Demand in the USA. *Cambridge J Econ*. 35(4):637–661.
- Panico C, Pinto A, Anyul MP. 2012. Income distribution and the size of the financial sector: A Sraffian analysis. *Cambridge J Econ*. 36(6):1455–1477.
- Piketty T, Saez E. 2007. Income and Wage Inequality in the USA. In: Atkinson AB, Piketty T, editors. *Top Incomes over Twent Century*. Oxford: Oxford University Press.
- Piketty T, Saez E. 2013. Top Incomes and the Great Recession: Recent Evolutions and Policy Implications. *IMF Econ Rev*. 61(3):456–478.
- Pyatt G. 1976. On the Interpretation and Disaggregation of Gini Coefficients. *Econ J*. 86:243–255.
- Ranaldi M, Milanovic B. 2022. Capitalist systems and income inequality. *J Comp Econ*. 50(1):20–32.
- Rehm M, Wien A, Hofmann J. 2016. Different but equal? Classes, wealth, and perceptions in Europe. :1–22.
- Ricci F, Cresti L, Virgillito ME. 2022. The labour share along global value chains. Perspectives and evidence from sectoral interdependence. *LEM Pap Ser 2022/11*.
- Shorrocks AF. 1982. Inequality Decomposition by Factor Components. *Econometrica*. 50(1):193–211.
- Shorrocks AF. 1984. Inequality decomposition by population subgroups. *Econometrica*. 52(6).
- Sotiropoulos DP, Milios J, Lapatsioras S. 2013. Household debt and Financial Innovation: the link revisited. London, Open Univ.
- Villani D. 2021. The Rise of Corporate Net Lending Among G7 Countries: A Firm-Level Analysis. *Rev Polit Econ*. 33(2):212–235.



WID (2020), Distributional National Accounts Guidelines. Methods and concepts used in the World Inequality Lab, WID Working Paper

Wolff EN, Zacharias A. 2013. Class structure and economic inequality. *Cambridge J Econ.* 37(6):1381–1406.

Wright EO. 1997. *Class Counts: Comparative Studies in Class Analysis*. Cambridge: Cambridge university press.

## 7 Appendix

Table A1. Distribution of households (% of the total).

	Labourers			Capitalists				Total Cap.
	Wage Earn.	Self-empl. Lab.	Total Lab.	Trad. Cap.	Manager	Self-empl. Cap.	Rentiers	
<b>Germany</b>								
2000	83.9	2.8	<b>86.7</b>	5.4	4.9	1.4	1.6	<b>13.3</b>
2002	84.6	2.7	<b>87.3</b>	4.7	5.0	1.4	1.6	<b>12.7</b>
2004	84.5	3.0	<b>87.5</b>	4.4	4.8	1.5	1.8	<b>12.5</b>
2006	84.8	3.5	<b>88.3</b>	4.3	3.9	1.7	1.8	<b>11.7</b>
2008	84.9	3.2	<b>88.1</b>	3.8	4.5	1.6	2.1	<b>11.9</b>
2010	85.1	3.3	<b>88.4</b>	4.0	4.3	1.8	1.6	<b>11.6</b>
2012	84.6	3.7	<b>88.3</b>	3.9	4.6	1.8	1.4	<b>11.7</b>
2014	85.7	3.6	<b>89.3</b>	3.7	3.8	1.8	1.4	<b>10.7</b>
2016	86.4	3.3	<b>89.7</b>	3.3	3.8	1.7	1.5	<b>10.3</b>
<b>Spain</b>								
2002	82.1	3.3	<b>85.4</b>	6.3	6.3	1.7	0.4	<b>14.6</b>
2005	85.3	1.4	<b>86.8</b>	4.9	7.2	0.7	0.5	<b>13.2</b>
2008	81.1	2.7	<b>83.8</b>	7.8	6.4	1.3	0.7	<b>16.2</b>
2011	80.8	2.9	<b>83.7</b>	7.8	6.3	1.5	0.7	<b>16.3</b>
2014	80.3	2.9	<b>83.3</b>	7.1	6.9	1.6	1.2	<b>16.8</b>
<b>Italy</b>								
2000	73.4	7.5	<b>80.9</b>	6.3	7.0	3.8	2.1	<b>19.1</b>
2002	75.8	8.1	<b>83.9</b>	5.4	5.7	4.1	0.9	<b>16.1</b>
2004	75.1	6.9	<b>82.0</b>	9.0	5.0	3.5	0.5	<b>18.0</b>
2006	74.0	6.5	<b>80.5</b>	9.0	6.8	3.3	0.4	<b>19.5</b>
2008	74.7	7.0	<b>81.7</b>	8.0	6.0	3.5	0.9	<b>18.3</b>
2010	74.3	7.0	<b>81.3</b>	8.8	5.7	3.6	0.7	<b>18.7</b>
2012	76.8	5.5	<b>82.3</b>	8.2	6.1	2.7	0.7	<b>17.7</b>
2014	76.4	6.5	<b>82.9</b>	7.4	5.9	3.3	0.6	<b>17.1</b>
2016	77.5	5.9	<b>83.4</b>	7.4	5.7	3.1	0.5	<b>16.6</b>

Source: Authors' elaboration using SHIW, EFF and SOEP data.

Table A2. Average income by household. (Constant 2010 €)

<b>Germany</b>		
	<b>Labourers</b>	<b>Capitalists</b>
2000	44,844	89,142
2002	42,893	104,895
2004	42,284	103,627
2006	40,692	105,891
2008	39,660	106,596
2010	40,035	92,893
2012	40,357	90,292
2014	40,148	96,762
2016	40,733	96,734
<b>Spain</b>		
	<b>Labourers</b>	<b>Capitalists</b>
2002	27,623	49,070
2005	30,827	52,772
2008	31,592	62,032
2011	29,187	57,664
2014	27,744	57,238
<b>Italy</b>		
	<b>Labourers</b>	<b>Capitalists</b>
2000	22,643	44,039
2002	22,480	44,655
2004	23,334	47,507
2006	23,513	48,890
2008	22,238	44,275
2010	22,232	42,559
2012	20,075	39,247
2014	20,330	38,635
2016	20,911	39,734

Source: Authors' elaboration using SHIW, EFF and SOEP data.

### Gini decomposition by class

Following the seminal contributions by Bhattacharya and Mahalanobis (1967) and Pyatt (1976), the inequality index can be decomposed into inequality within and between group(s) (where the population subgroups are indexed by  $k=1,2,\dots,n$ ) using the following identity:

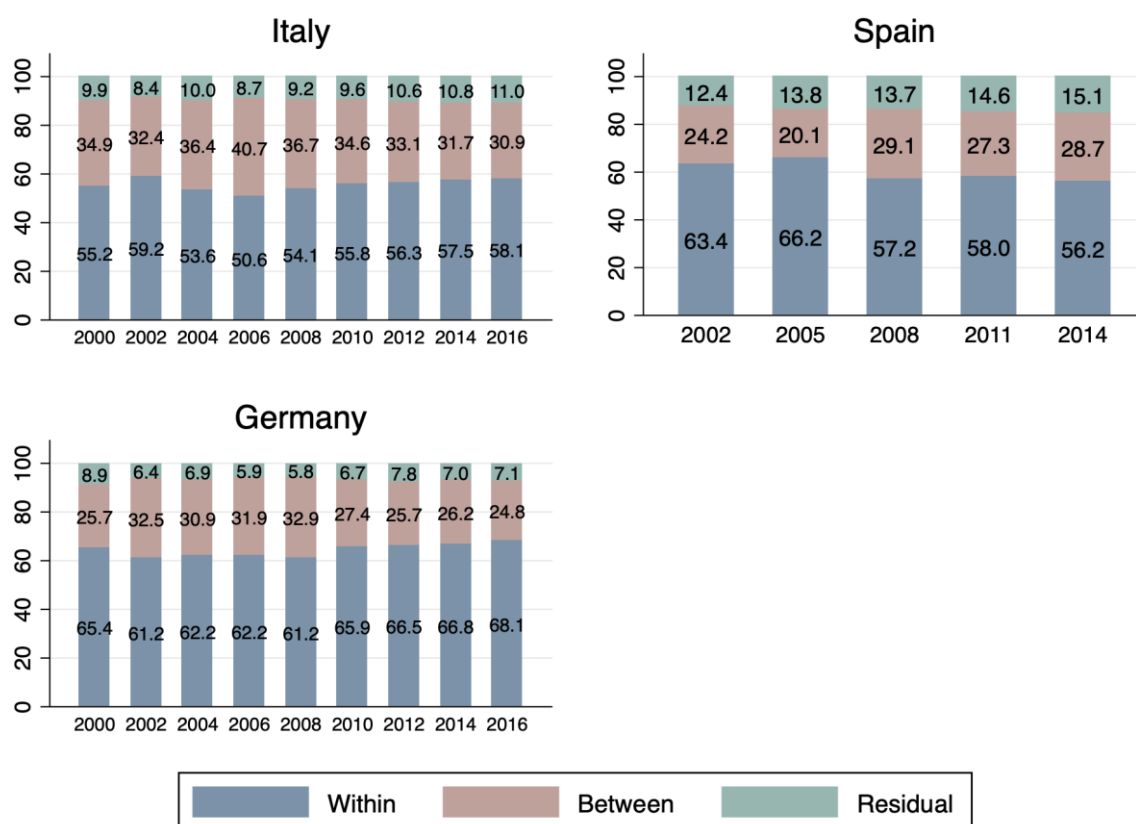
$$G = G_B + \sum s_k G_K + R$$

Where  $G$  is the total Gini on the overall population;  $G_B$  is the between-group (aggregate social class in our case) Gini inequality, which is equal to the one obtained if the incomes of the individual observations in the subgroup(s) are replaced by the mean of the income of the groups the observations belong to. The term  $\sum s_k G_K$  is the within-component, which is the sum of the products of the population share and income share in each subgroup ( $s_k$ ) and the Gini coefficient for the income within the subgroup  $k$  ( $G_K$ ).

The  $R$  term is the residual. As Shorrocks (1984) argued, the additivity property does not apply to the Gini coefficient, which can be decomposed by groups if and only if the residual term is zero. This term – and its magnitude – depends on whether the distributions of the subgroups overlap to each other. To better explain this term, consider our example. Overlapping occurs when a unit in the labourer class

(the poorer group of households) is ranked higher than a unit in the capitalist class (the richest group). The higher the overlapping, the lower the explanatory power of the class factor to the explanation of the total inequality. Figure A1 shows that the class factor seems to contribute quite well to the total income inequality, mostly determined by the inequality within labourers and capitalists rather than differences between the two classes.

Figure A1. Gini decomposition by class location (labourers vs capitalists)



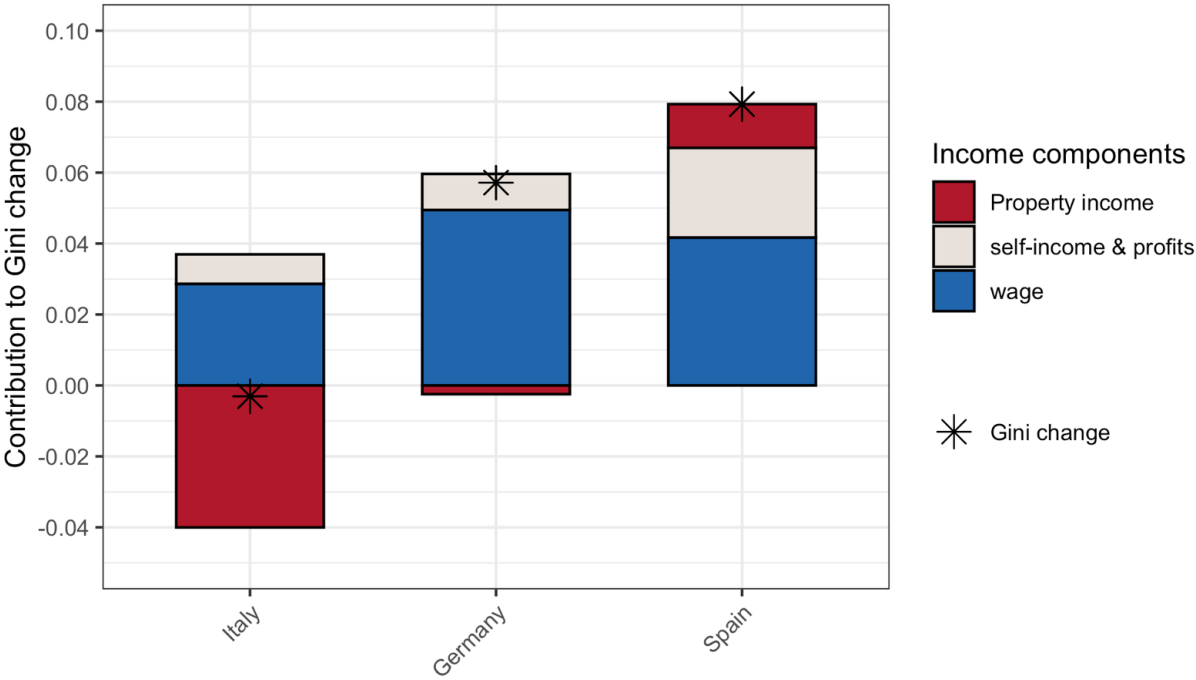
Source: Authors' elaboration using SHIW, EFF and SOEP data.

### Estimates dividing by the household size

To consider a measure of 'wellbeing' and 'welfare' redistribution within households i.e., assuming the income pooling in the household, it is possible to consider the insurance role against individual risks. In practical terms, this means taking into account the different household size: the same total income is not the same for a household composed by two adults and two children compared to a couple of adults.

Applying the household size denominator, however, does not change the overall picture we obtain. In terms of standard vs revisited labour shares, we observe a closer gap between the two curves, but the same substantial meaning is preserved. The same holds in terms of Gini decomposition by income sources distinguishing by labourer's vs capitalists: wages earned by labourers contribute to reducing income inequality. 'Equalised' results confirm that class belonging and its relation to the source of income is relevant when assessing the potential impact of changes in the level of income on inequality.

Figure A2. Dynamic source decomposition: contribution to the Gini change over time by country.



Source: Authors' elaboration using SHIW, EFF and SOEP data.

## 7.1 Codebook

### Sociodemographic variables

Concept	Italy	Spain	Germany
Household identifier	hh_id	hh_id	hh_id
Year of survey	year –  <i>Note: since 1991 to 2016 with 2 years gap</i>	year –  <i>Note: since 2002 up to 2017 with 3 years gap</i>	year –  <i>Note: 2002, 2007, 2017 and 2017 are the waves with available wealth modules</i>
Country	country	country	country
Gender	gender –  1 Men 0 Women	gender –  1 Men 0 Women	gender –  1 Men 0 Women
Age	age –  numeric	age –  numeric defined as: <i>year of survey – p1_2b</i>	age –  numeric
Year of birth	birth_year –  numeric	birth_year –  numeric	birth_year –  numeric
Household size	hh_size –  numeric	hh_size –  numeric	hh_size –  numeric
Household type	hh_type –  1 Single 2 Single-parents 3 Couples without child 4 Couples with child 5 Other	<i>Not defined</i>	hh_type –  1 Single 2 Single parentes 3 Couples without child 4 Couples with child 5 Other
Marital status	marital_status –  1 Married 2 Single 3 Separated/divorced 4 Widowed	marital_status –  1 Married 2 Single 3 Separated/divorced 4 Widowed	marital_status –  1 Married 2 Single 3 Separated/divorced 4 Widowed
Father/mother education	father_edu / mother_edu	<i>Not defined</i>	<i>Not defined</i>

	1 Isced97 = 0 2 Isced97 = 1 3 Isced97 = 2 4 Isced97 = 3 5 Isced97 = 5 6 Isced97 = 6 <i>Don't know is set to missing</i>		
Father/mother occupation	<i>Not defined</i>	father_occupation/ mother_occupation  1 Managers & Legislators 2 Professionals 3 Technicians & associate professionals 4 Clerks 5 Service workers 6 Skilled agricultural workers 7 Craft & related trade 8 Plant & machine operators 9 Elementary occupations 10 Armed forces 11 Home care	father_isco88/ mother_isco88  <i>Isco code 88 at 4 digits</i>
Highest educational attainment	iscd97 – 1 Isced97 = 0 2 Isced97 = 1 3 Isced97 = 2 4 Isced97 = 3 5 Isced97 = 5 6 Isced97 = 6 <i>Note: Isced 4 is not defined</i>	iscd97 – 1 Isced97 = 0 2 Isced97 = 1 3 Isced97 = 2 4 Isced97 = 3 5 Isced97 = 5 6 Isced97 = 6 <i>Note: Isced 4 is not defined</i>	iscd97 – 1 Isced97 = 0 2 Isced97 = 1 3 Isced97 = 2 4 Isced97 = 3 5 Isced97 = 5 6 Isced97 = 6  edu_years – numbers of educational years <i>Note: Isced 4 is not defined</i>
Geographical area	area5 – 1 North-west 2 North-east 3 Centre 4 South 5 Islands	<i>Not defined</i>	east_west – 1 West 0 East  east_west1989 – 1 West 0 East

Municipality size	acom5 – 1 < 5000 inhabitants 2 Between 5000 and 19999 3 Between 20000 and 49999 4 Between 50000 and 199999 5 >= 200000 inhabitants	<i>Not defined</i>	<i>Not defined</i>
Tenant status	tenant_status – 1 Owner 2 Tenant 3 Usufructuary/free rent 4 Rent to buy	tenant_stuts 1 Owner 2 Tenant 3 Usufructuary/free rent 5 Other	tenant_de – 1 Owner 2 Tenant
Panel household	<i>Not defined</i>	hh_panel 0 No 1 Yes  <i>Note: it identifies whether the household participated in the previous waves</i>	<i>Not defined</i>

### Labour market sociodemographic variables

Concept	Italy	Spain	Germany
Employment status	emp_status – 1 Employee 2 Self-employed 3 Retired 4 Unemployed 5 Students 6 Other inactives	emp_status – 1 Employee 2 Self-employed 3 Retired 4 Unemployed 5 Students 6 Other inactives	emp_status 1 Employee 2 Self-employed 3 Retired 4 Unemployed 5 Students 6 Other inactives
Occupation	occupation_it – 1 Blue-collar worker 2 Employee/teachers 3 Junior Manager 4 Managers 5 Liberal professionals 6 Individual entrepreneur 7 Autonomous workers	occupation_es – 1 Managers & Legislators 2 Professionals 3 Technicians & Associate professionals 4 Clerks 5 Service workers	isco88_4d / isco08_4d  <i>Isco code 88 and Isco code 08 at 4 digits</i>



	8 Family business 9 Business partner 10 Not employed	6 Skilled agricultural workers 7 Craft & related trade workers 8 Plant & Machine operators assemblers 9 Elementary occupations 10 Armed forces  <i>Note: refers to the main occupation</i>	
Sector of occupation	nace1_it –  1 A – Agriculture 2 D – Manufacturing 3 F – Constructions 4 G+H – Retail, restaurants & hotels 5 I – Transports & Communications 6 J – Financial intermediation 7 K – Real estate, renting & business activities 8 L – Public administration 9 P – Private household services 10 Q – Extraterritorial organizations	nace1 –  <i>Nace Rev. 1.1 at 1 digit</i>  <i>Note: refers to the main occupation</i>	nace1 –  <i>Nace Rev. 1.1 at one digit</i>  nace1_2d – <i>Nace Rev. 1.1 at two digits</i>
Public employment	public_employee 0 No 1 Yes  <i>Note: this information has been obtained by nace1_it: Yes if nace1_it=8</i>	public_employee 0 No 1 Yes  <i>Note: this information has been obtained by nace1: Yes if nace1= Public administration, Education, Health.</i>	public_employee 0 No 1 Yes  <i>Note: this information has been obtained by nace1: Yes if nace1= Public administration, Education, Health.</i>
Type of self-employment	type_selfemp_it 1 Liberal professions 2 Single entrepreneur 3 Autonomous 4 Firm partner  <i>Note: this information applies to self-</i>	type_selfemp_x – 1 Liberal Professions, single entrepreneur, autonomous 2 Family business 3 Firm partner	<i>Not defined</i>

	<i>employed only (national dataset linb)</i>	<i>Note: this information applies to self- employed only; x stands for each of the 3 asked occupations</i>	
Main occupation	<i>Not defined</i>	main_occupation_x 0 No 1 Yes  <i>Note: x stands for each of the 3 asked occupations</i>	<i>Not defined</i>
Contract duration	contract_type_it 1 Permanent 2 Temporary 3 Agency contract	contract_type_x - 1 Permanent 2 Temporary 3 Without contract 4 Other contracts  <i>Note: x stands for each of the 3 asked occupations</i>	<i>Not defined</i>
Full-time or part-time	ptime – 0 No 1 Yes	ptime_x - 0 No 1 Yes  <i>Note: x stands for each of the 3 asked occupations</i>	ptime – 0 No 1 Yes
Working hours	wk_hours – numeric  extra_wk_hours – overtime hours, numeric  <i>Note: weekly hours; overtime applies to employees only</i>	wk_hours_x - numeric  <i>Note: weekly hours; x stands for each of the 3 asked occupations for both self-employed and employees</i>	wk_hours – numeric  extra_wk_hours – overtime hours, numeric  <i>Note: weekly hours</i>
Firm size (for employees)	firm_size_it –  1 < 4 employees 2 5-19 employees 3 20-49 employees 4 50-99 employees 5 100-499 employees 6 > 500 7 Public employees	firm_size_x –  1 < 10 employees 2 10-19 employees 3 20-99 employees 4 100-499 employees 5 >= 500 employees  <i>Note: x stands for each of the 3 asked occupations</i>	firm_size_de –  1 £ 5 employees 2 6-19 employees 3 20-100 employees 4 101-199 employees 5 <sup>3</sup> 200 employees

Number of employees (for self-employed with employees)	num_employees_it – numeric	num_employees_x – numeric  <i>Note: x stands for each of the 6 firms asked. (3 up to 2005 and 6 starting from 2008).</i>	<i>Not defined</i>
--	----------------------------	--	--------------------

### Income variables

Concept	Italy	Spain	Germany
Employee income	empl_income_it numeric  <i>Note: annual and <b>net</b> amounts</i>	empl_income_es numeric  <i>Note: annual and <b>gross amounts</b>; annual values obtained by monthly income*12</i>	empl_income_de numeric  <i>Note: annual and <b>gross</b> amounts</i>
Self-employed income	selfemp_income_it numeric  <i>Note: annual amounts</i>	selfemp_income_es numeric  <i>Note: annual and gross amounts</i>	selfemp_income_de numeric  <i>Note: annual and gross amounts</i>
Financial income	financial_income_it numeric  <i>Note: annual amount; includes net interests on accounts, treasury bonds and other financial actives</i>	financial_income_es numeric  <i>Note: annual amount; includes interests on accounts, interests and dividends from stocks/bonds and other financial activities</i>	financial_income_de numeric  <i>Note: annual amount; includes interests and dividend income</i>
Rental income	rental_income_it numeric  <i>Note: annual amount</i>	rental_income_es numeric  <i>Note: annual amount</i>	rental_income_de numeric  <i>Note: annual amount</i>
Imputed rents	imputed_rents_it numeric  <i>Note: annual amount</i>	<i>Not defined</i>	imputed_rents_de numeric  <i>Note: annual amount</i>
Profits	profit_it numeric  <i>Note: annual amount net of depreciation</i>	profit_es numeric  <i>Note: annual and gross amounts</i>	profit_de numeric  <i>Note: annual and gross amounts</i>

Income taxes	<i>Not defined</i>	<i>Not defined</i>	income_tax numeric  <i>Note: includes annual income taxes and payroll taxes (e.g. health, unemployment, nursing home and retirement insurance taxes) at household level.</i>
Profit sharing income	<i>Not defined</i>	<i>Not defined</i>	profit_sharing numeric  <i>Note: includes annual income from profit-sharing</i>

#### Wealth variables

Concept	Italy	Spain	Germany
Net wealth	net_wealth numeric  <i>Note: annual and net amounts defined as real wealth + financial wealth – overall debts</i>	net_wealth numeric  <i>Note: annual and net amounts defined as real wealth + financial wealth – overall debts</i>	net_wealth numeric  <i>Note: annual and net amounts defined as real wealth + financial wealth – overall debts</i>
Real wealth	real_wealth numeric  <i>Note: annual amounts; includes real estate properties, business values and valuables</i>	real_wealth numeric  <i>Note: annual amounts; includes real estate properties, business values and valuables</i>	real_wealth numeric  <i>Note: annual amounts; includes real estate properties, business values and valuables</i>
Financial wealth	financial_wealth numeric  <i>Note: annual amount; includes accounts, stocks, bonds, credits,</i>	financial_wealth numeric  <i>Note: annual amount; includes accounts, stocks, bonds, credits,</i>	financial_wealth numeric  <i>Note: annual amount; includes non-detailed financial assets</i>

	<i>and other financial activities.</i>	<i>and other financial activities</i>	
Overall debts	overall_debts numeric <i>Note: annual amount; includes both commercial and financial debts</i>	overall_debts numeric <i>Note: annual amount; includes both commercial and financial debts</i>	overall_debts numeric <i>Note: annual amount; includes real estate debts and other properties and consumer debts.</i>

### Weights and deflators

Concept	Italy	Spain	Germany
Cross-sectional weight	pesopop	facine3	phrf
Weights	It is the created unique variable that equals the cross-sectional weights of each corresponding country. In other words, weights=pesopop for Italy, facine3 for Spain and phrf in the case of Germany.		

Concept	Italy	Spain	Germany
Deflator	deflator <i>Note: 2002-2016. Base year: 2015</i>	deflator <i>Note: 2002-2016. Base year: 2015</i>	deflator <i>Note: 2002-2016. Base year: 2015</i>
Country-specific deflator	defl_italy <i>Note: 1991-2016. Base year: 2010</i>	<i>Not defined</i>	<i>Not defined</i>

### Country specific variables

	Italy	Spain	Germany
Codebooks	<a href="#">Italian codebook</a>	<a href="#">Spanish codebook</a>	<a href="#">German codebook</a>



## GETTING IN TOUCH WITH THE EU

### In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

### On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),

- at the following standard number: +32 22999696, or

- by electronic mail via: [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)

## FINDING INFORMATION ABOUT THE EU

### Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: [https://europa.eu/european-union/index\\_en](https://europa.eu/european-union/index_en)

### EU publications

You can download or order free and priced EU publications from EU Bookshop at: <https://publications.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see [https://europa.eu/european-union/contact\\_en](https://europa.eu/european-union/contact_en)).

## The European Commission's science and knowledge service

Joint Research Centre

### JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.



**EU Science Hub**

[ec.europa.eu/jrc](https://ec.europa.eu/jrc)



@EU\_ScienceHub



EU Science Hub - Joint Research Centre



EU Science, Research and Innovation



EU Science Hub