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Evidence from a Panel Analysis**

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Abstract

This paper proposes a theoretical framework of the factors affecting the gap between the rich and the poor in the European Union, and utilizes a twelve-year panel (2000-2012) of 27 countries to identify the short-term effects of the macroeconomic performance, the level of household income inequality, and the social protection expenditure, controlling for several structural factors of income disparities. It is assessed their impact on the bottom, median and top shares of household income; it is found a different effect of the three core determinants before the Great Recession and during the crisis years, and a different public commitment depending on the type of welfare regime.

JEL: C33, D31, I31, I32, I38.

Keywords: European Union, Great Recession, household disposable income distribution, income inequality, panel models, structural determinants.

Introduction

The increase of income inequality in many advanced countries has been widely documented (Atkinson, 1997; OECD, 2011). European countries are included in various international comparative studies on income disparities as a subset of the OECD countries (among others, Atkinson et al., 2005; Forster and d’Ercole, 2005; OECD, 2011); in analyses of the distribution of income across the world (for example, Deininger and Squire, 1996; Barro, 2000); or again, in studies concerned about specific issues on poverty or social inclusion (for instance, Chen and Corak (2005) deal with child poverty; Jenkins and Van Kerm (2006) with social mobility). Moreover, some papers focus on the dynamics of overall income inequality for the European Union taken as an aggregate, and the comparison of the whole Union with other selected OECD countries, for example the US (among others, Bonesmo Fredriksen, 2012; Dauderstadt and Kelmttek, 2011; Brandolini, 2007).

However, little attention has been placed on both the extremes of income distribution and on the evolution of income shares for rich and poor households.

An exception is represented by the debate on income polarization, started in the 1980s to describe the disappearance of the middle class (Thurow, 1984 is one of the first contribute for the US). The literature also focused on the methodology for the correct measure of polarization and the definition of aggregate indices (see, among others, Foster and Wolfson, 2010; Duclos, Esteban and Ray, 2004; Ytzhaki, 2010) and other more specific analyses provided evidence on wage polarization (Afxentiou and Kutasovic, 2011) or compared income disparities in the European Union on regional or micro bases (Ezcurra et al., 2005; Holzner, 2012). As for Europe, the study of the extremes of the income distribution and the related evolution of the income shares is rather limited. In fact, few studies considering

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The views in this paper are those of the authors. All remaining errors are our own.

poverty focused implicitly on the lower part of the income distribution (Blank, 2000) and few analyses concentrated on the top share and the higher tail (Atkinson et al., 2011).

Starting from a different point of view and with a different aim, the recent literature on the causes of the Great Recession (GR from now on) has paid renewed attention on the dynamics of income inequality before and after the recent phenomena. In particular, there is a rising debate concerning the increased inequality (among others, Piketty and Saez, 2003) at the top of the income distribution in the last two decades and its role in explaining the trends of global inequality, before and after the crisis, especially for the US. Top incomes have risen in recent years also in many European countries. Nevertheless, their impact cannot account for the evolution of income inequality in Europe since the macroeconomic, institutional and policies differences of these countries give reason for the distinctive patterns of their income distribution (Alvaredo et al., 2013).

Consequently, the characteristics of the European income distribution according to the structural differences existing among the EU countries are not completely understood. Moreover, the driving forces of the concentration of income at the extremes of the distribution are not fully investigated and, in this regard, the effects of the GR on these forces are still unknown.

The aim of the paper is as follows. To understand the gap between the rich and the poor in the EU, an approach is adopted that assesses the impact of the macroeconomic performance, the degree of inequality, and the social public expenditure on the shares of national equivalised income pertaining to the extremes (and the median shares) of the household income distribution, controlling for economic, structural and social factors. The hypothesis tested is that the level of the macroeconomic performance, income inequality and social protection expenditure have affected differently the lower and upper tail of the income distribution over the whole period. With regard to this, we test the hypothesis that their impact is different during the years preceding the Great Recession (the so-called Great Moderation pre-financial crisis) and over the years of the crisis. Then, it is studied the impact of the social public expenditure

depending on the different types of welfare systems of the EU countries and its behaviour over the pre-crisis and crisis years.

This analysis, studying separately the bottom part and the top tail of the household income distribution, allows a theoretical investigation of the causes of the gap between the rich and a poor and implicitly a more effective targeting of the policy measures for a set of countries that share mutual strategies of socio-economic cohesion.

The paper is organized as follows. In Section 2, it is provided a theoretical analysis of the main economic, social and institutional causes of concentration at the tails of the household income distribution. It is discussed their expected effects on the EU countries, considering the impact of the Great Recession and the different welfare regimes existing among the European Union. Section 3 presents the data, the reasons underlying the specification and the econometric methodology implemented; some descriptive statistics are also provided. This is followed by a presentation of the results (Section 4) and this section discusses their theoretical implications. Section 5 concludes.

1. The theoretical framework

Rising levels of inequality in the last decades have been documented for many developed countries (Heathcote et al., 2010) and there is some evidence, especially for the US, that there has also been an increasing disparity between the top and the bottom of income distribution. This evidence reinforces the need for a deeper understanding of the evolution of income shares at the top and at the bottom of the income distribution as a theoretical issue separated from that of income inequality or of poverty (Leigh, 2007). Along these lines, there are only few recent analyses for the US that want to research what is the impact on the actual shares of middle and/or low-income households, given the rise of top share (e.g. Thompson and Leight, 2012, find that income shares at the bottom and in the middle of the distribution have not risen following increases of the share of income held by the richest households since the 1980s).

The penury of analysis is considerable for Europe. There are only few studies on the top share of income distribution (Atkinson et al. 2011) and on poverty (Blank, 2000), which indirectly give indications about the economic, social, and structural determinants of the concentration of income at the tails of the household income distribution that is the focus of our work.

Theoretically, three are the fundamental determinants that shape the distribution of income: the level of economic development, income inequality and the social public expenditure.

Very few studies are concerned explicitly on the impact of growth, of its cyclical dynamics, on the bottom tail and on the median share of the distribution, especially for the more recent period¹. Understanding the impact of the macroeconomic cycle (GDP per capita levels; Barro, 2000) on income distributional shares for a set of countries, the EU, which exhibits similar institutions, may be, on one side, a new contribution to the literature and, on the other, may provide indications for inclusion policies aimed to move the EU out of the recent downturns.

However, when studying the distribution of income, both the level of income inequality and the effect of the government redistributive policies are to be considered. In fact, firstly, the information given by the extent of the standard of living must be adjusted by the level of income inequality that influences the income shares held by the bottom and the top of the distribution and the related concentration of income. Secondly, households income distribution is affected by the government's spending policies: different decisions about the amount, potential beneficiaries and characteristics by functions of the public expenditure can create not only fairer or less equal society but also more or less generous public interventions favouring the poorest, especially during recessive times and whenever automatic stabilizers are not used.

Moreover, the concentration of income and the evolution of the income shares of the tails of the distribution in Europe can be related

¹ The literature on the link between economic cycles and inequality, normally referred to previous recessions, can be an opportune guideline (see, between others, Muriel and Sibietta, 2009). This debate is developed in section 2.2.

to the different structural features of the labour market, to the sector transformation of the economy, the demographic composition, and the social mobility.

Taken together, these research lines allows the identification of the forces shaping income inequality in Europe. Formally, our theoretical paradigm can be expressed as:

$$IS = f(ECON, INEQ, EXP, STRUCT, RES) \quad (1)$$

where IS, the chosen income share, depends on economic measures of the macroeconomic performance; on the prevailing income inequality, measured by Gini coefficient; on the social public expenditure towards individuals and families; on structural controls concerning the labour market, the population, the household structure and the social mobility; and on other residual factors, which can be specific to each country over time.

1.1. Economic performance, employment and income shares

According to the theoretical and empirical literature, economic growth is the most traditional macroeconomic determinant of inequality in the long run but there exists also evidence of the relation between business cycles, during recession times, and earning discrepancies.

This last debate is important to study the impact of the recent downturn on income distribution in Europe². In particular, what matters for our analysis is the evidence on, firstly, the link between macroeconomic cyclical performance and income distribution and, secondly, on the distributional impacts of recession on the extreme tails.

² This brief review does not consider the long run relationship between growth and income distribution (therefore the wide debate on the so called Kuznets curve, 1955) and is not interested in the literature on the importance of previous long run inequality dynamics as origin of the GR, existing well documented results only for the US.

With respect to the economic performance, the main stream formal models relating business cycles and macroeconomic policies normally include the distributional characteristics of the economy as control (Heer, 2007; Schorfheide, 2011), but present the problem of modelling individuals rather than households and of taking into account implicitly only labour income and working age people.

Some broad indications on the impact of the macroeconomic performance can be given by the decomposition analyses that associate different groups of individuals within the population to the principal source of income of their household (Jenkins et al., 2011). Along this reasoning, it is plausible, *ceteris paribus*³, that downturns can hit household capital incomes via a decline of stock prices and interest rates on financial assets and of housing values in real wealth and in rents. There could also be a decrease of the living standards for working households due to employment and pay cuts in some sectors of the economy. Moreover, incomes among non-employed households depend on the nature of changes in benefits, state retirement pensions and taxes used to finance them (given fiscal consolidation policies). If there are growing gaps between incomes of unemployed, *rentiers*, pensioners and working households, inequality increases (as inequality between groups is rising) and different effects on the tails of the distribution must be expected if each group of recipients is unequally represented in the income clusters. These effects on the overall income distribution depend also by the weight of the shares of each income source and the total impact of the economic cycle is highly ambiguous and specific for each country, which reinforces the need of using panel analysis in the empirical estimations. Additionally, there is some evidence that recessions can be associated with greater inequality in earnings, especially at the bottom for working-age households, that is mitigated by automatic stabilizers which reduce disposable income

³ Income loss as a consequence of recession or decline of living standards may lead people to change previous behaviors by returning to work for pensioners or rentiers, by moving in other regions or countries for low paid workers and unemployed, by sharing accommodation or returning home for younger adults.

inequality (Krueger et al., 2010). However, what happens to the whole population and to any income source is not straightforward.

The literature on the impact of business cycles on the respective shares of the rich and the poor is rare and mainly on national base. The country usually analysed is the US and there are some studies on the Nordic crisis at the beginning of the 1990s (Aaberge et al., 2000) and on the recessions in the UK in the 1970s and 1980s (for a review, Parker, 1998-99). These analyses support the conclusion that the downturns impact strongly on the bottom of the distribution via an increase of unemployment that seems to be regressive. Similar extensions to the recent period are questionable (especially using panel models) and the association between business cycles and poverty reduction is less strong after the 1980s than in the previous downturns (see, Bitler and Hoynes, 2010, for the US). Thus, people at the bottom of the distribution do badly in recession but the extent depends on labour market institutions, on public safety-nets and on family and demographic characteristics. The analyses for the EU confirm this evidence since poverty is not reduced during the years of growth prior to the GR even if employment and average incomes have increased (Vandenbroucke and Vleminckx, 2011).

Cantillon (2011) justifies similar results arguing that workless households have not benefited of employment rise, income protection for working-age population out of work become less adequate and redistribution policies less pro-poor, given a reduction of income tax for top brackets. In fact, the impact of income protection and social redistribution in a deep downturn such as the GR is very important to maintain a minimum living standard to households at the bottom of the distribution.

The evolution of income shares, especially during the GR, is related to that of labour income, the principal source for most households, which can adjust via changes in wages and mainly via changes in employment. During a recession, the latter are probably more important since the fall of labour demand affects primarily the number of people employed and the number of hours worked by those who have a job. These effects can act differently within households and can be controlled by a change in individual rates of

unemployment and/or by a change in jobless (in working age) households⁴. Our results are controlled for both unemployment rates and jobless household shares (working age people that live in households where no-one works) to assess the different impact of business cycles on the EU labour markets.

As for the employment rates, a further dimension to control for is the cyclical evolution of female employment. In fact, on the one hand, the rise of female employment in the last decades may have reduced the individual earning discrepancy in EU and, on the other, it may have affected negatively the households labour income inequality via a concentration of two-career partners at the top of the distribution (Malerba and Spreafico, 2014).⁵ If the second effect prevails, the female employment could have a negative impact for the income share by poor families and a positive effect for that of the affluent households.

Finally, the more recent debate (Roine et al., 2009) on the increase of top incomes considers the sector transformation of employment due in part to skill-biased evolution of the economy and to a rapid rise, among high-skill professions, of the financial activities in many developed countries. Following this evidence, we control for the share of the financial activities employees that can be a proxy of two different effects favouring the top share: first, the out-of market remunerations of top financial professions (individual bargaining is not related to labour market clearing or indirectly to the economic growth) with the related increase in capital gains (bankers and top managers, for example, had compensations related to corporate profits) especially before the GR and, second, the impact of globalization that moves low-skill jobs (more concentrated in the traditional manufacturing occupations) towards less developed countries. Hence, this sector evolution of the European economies

⁴ The changes in individual unemployment rates can be conditioned by the participation rates that can decline during recessions since some workers do not look for a new job. This effect is irrelevant if we consider the share of jobless households (Gregg et al., 2010).

⁵ The so-called assortative match hypothesis supports this high correlation between partners' income at the top of the distribution.

towards an increasing of the tertiary employment is expected to influence negatively the bottom of the distribution and positively the top income shares.

In synthesis, the impact of economic performance on income shares at the bottom and at the top of the distribution is strongly related to the effects of the evolution of earning inequality in the EU, which basically depends on the cross-country dynamic of unemployment, shares of jobless households, female employment and financial activities employees. These control variables are indeed proxies of institutional, structural and social determinants of earning inequality since they can modify the relationship between cyclical economic performance and households disposable income distribution.

1.2. The impact of income inequality and social mobility

Recently, the literature (Perri and Steinberg, 2012) on the link between recessions and disposable income inequality wonders whether the GR can be associated with any change in unfairness between rich and less affluent households. The evidence is not wide but seems that income distribution for many OECD countries during the GR has changed little and that the effects could be observed in the long run only for the top share. In no country, in fact, there is a sharp change in the overall earning inequality or in either half of the distribution by comparing with the trends over earlier years of the decade (Jenkins, et al., 2011). For most of the EU countries, in the 2000's, the cyclical evolution of inequality is slight, given the structural and institutional determinants of each national trend.

There is evidence (Barlevy and Tsiddon, 2006) that trends and cycles of earning inequality can be related and even if there is a technical distinction between the distribution of wages and disposable income, it is plausible to hypothesize the existence of a potential link between trends and cycles of disposable income as well. In particular, they show that the impact of recession on individual earnings inequality depends on the trends in inequality: recessions can be more equalising when inequality is not rising. The general ratio of this reasoning is that the contextual trends matter in considering the

present cyclical dynamics of inequality. Hence, the level of inequality in the previous period is a determinant of the evolution of income distribution and its dynamics affects the concentration of top and bottom income shares.

When considering bottom and top shares, social mobility and the relationship between income inequality and equality of opportunities ought to be taken into account. There is a well-known phenomenon, called Great Gatsby curve, which suggests that there exists a cross-country inverse link between income inequality and social mobility at least in the long run. Some studies (Chetty et al., 2014) found for the US that, social mobility has not changed in the last decades even if income inequality has increased. This evidence is probably due to a reduction of discriminations by gender and race mainly in education and labour market participation, whereas the increasing share of income going to the top 1 percent could instead have reduced the opportunities to the rest of the income ladders to moderate the existing gap with the elite. Barriers due to individual discrimination may be low even in the EU, where social class immobility is more related to strong links between family generations, via the transmission of wealth, to social background and professional status.

Along this reasoning, social mobility can be interpreted as intergenerational mobility, due to the relationships among family members, mainly via education and wealth transmission. Thus, the impact of inequality on income shares is controlled, on the one hand, for the levels of tertiary education attainments and, on the other, for the proportion of housing ownership.

The expansion of higher education matters for the equalisation of educational opportunities (Breen and Jonsson, 2007), and over the last century, most European countries, have certainly experienced a general increase in the average level of schooling. In general terms, if on the whole the proportion of people entering the educational system increases, more people from less favourable backgrounds are likely to enter too, thus reducing the gap with more advantaged people.

Secondly, equal opportunities are related to wealth transmission. Although good statistics for estimating the effects of wealth on income inequality are hard to find, some indication of the potential partial effect can be given by information about housing tenure (Norris and Winston, 2012). In fact, home ownership is a widespread component of population wealth in many countries and it varies widely across Europe, since the choice to live in a house as owner is strongly related to institutions and cultural traditions, which are country specific.⁶ Among the national distinctive patterns, it can be included the wealth transmission (via bequests and inheritances) between family generations that is likely to contribute to maintain the distances between social classes.⁷ The more widespread the housing ownership, the more influential the family transmission.

1.3. Welfare regimes and Government commitments

In general, the literature gives support to the positive impact of welfare generosity and social spending on both income inequality and poverty in Europe (Jenkins et al., 2011). However, the influence of governments' commitment towards income distribution is less documented. The aim of this paper is to fill this gap by considering not only the role of the social public spending on the shares of income held by the poor and the rich but also assessing its effects depending on the different types of the EU welfare regimes and the period studied.

Disposable income is known to decrease more smoothly than GDP during recession time. The reason is that public intervention, especially in Europe, plays a key role to mitigate the effects of

⁶ It is implicitly assumed that financial wealth accumulation is more similar across Europe than it is for property wealth.

⁷ Picketty (2011), for example, estimates an increase in the inheritance flows as percentage of disposable income in France in the last three decades and the same evolution can be inferred for other EU countries as well. This process is important in those countries where the wealth accumulation is relatively higher and there are diffused preferences towards wealth transmission between generations.

downturns: without the support of tax and benefit systems, the household income would have fallen dramatically.⁸

Statistics on social protection expenditure as a percentage of GDP show on average an increase in social public spending in Europe, especially after the 2007.⁹ This in part reflects the effects of automatic stabilizers (unemployment benefits is the more diffused example) and in part the impact of economic stimulus packages used discretionally by governments which normally include also more generous monetary transfers to individuals and families in needs or temporary cash benefits for people in working age not entitled to unemployment benefits.¹⁰ The impact of public commitment on disposable income is not homogenous and is normally related to the different levels of effectiveness of welfare state regimes. Traditionally, in Europe, we have at least four different regimes of welfare state. These are: the Social Democratic (Denmark, Finland, Netherlands and Sweden), the Conservative-corporatist (Austria, Belgium, France, Germany and Luxembourg), the Liberal (Ireland and United Kingdom) and the Southern European (Cyprus, Greece, Italy, Malta, Portugal and Spain) systems, which are characterized by different combinations of taxes and benefits and by different collective preferences concerning the universal targeting of the

⁸ Our analysis employs statistics of *equivalised household disposable income* to define income shares. Hence, we are implicitly considering, on the one hand, some dimensions of family composition (via equivalence scales) and, on the other, the redistributive effects of taxes and benefits on gross incomes. The only available statistics for all the EU countries are on disposable income and thus they include monetary benefits (mainly social security benefits) and exclude taxes and employees' social security contributions. Hence, it is reasonable to expect that some sort of redistribution has already been achieved via taxation and cash benefits. Furthermore, as we are using a monetary definition of income, data on income in kind, including free benefits from public services such as health, primary education and child care services that are not supplied in cash, are not considered.

⁹ The overall average raises from 15.50% to 17.24% after 2007.

Source: Eurostat, Government Finance Statistics.

¹⁰ Unemployment benefits have normally a defined duration (often related to the duration of the previous employment status) and in some countries the length of the coverage has been extended to avoid a reduction of living standard for workers less protected or less involved in the labour participation.

recipients.¹¹ More generally, in the traditional debate on the European welfare states (Esping-Andersen et al., 2002), the effectiveness of public social policies in reducing inequality and poverty depends, on the one hand, on the opportune balance between cash transfers (normally means-tested) and in-kind benefits (mainly universal services) and, on the other, on the correct targeting mechanisms of the transfers (or tax reductions) for specific groups of the population.

A share of at least 20% of total household income in many EU countries is not due to labour and/or capital incomes. Rather, it consists of government transfers, mainly benefits for the elderly, as revealed by many official statistics (Eurostat, 2011; Eurostat, 2013). In fact, the main monetary resources of the elderly in Europe consist of public pensions, since private pensions are virtually non-existent, with a few notable exceptions (for example, the Anglo-Saxon regime). Thus, a large share of public benefits is designated for old people, especially if social insurance contributions are not well calibrated. This represents one of the most important channels of redistributive intervention between groups across EU countries.¹²

Since it is not possible to exclude public pensions from social expenditure¹³, the effect on the income shares of social public spending is controlled for the share of elderly people (65 years and above) in each country. The impact of this variable is expected to be strong on the top and the bottom of the distribution but as the result

¹¹ Following Dafermos and Papatheodorou (2013), this distinction comes from the work of Esping-Andersen (1990) and the study of the features of the welfare systems in Southern Europe (Leibfried 1992; Ferrera 1996; Petmesidou 1996).

¹² An OECD recent analysis (2011) shows that in the last two decades the share of “non-elderly” benefits has declined in the overall public social expenditure. Spending on non-elderly benefits tend to be less cyclical than other social expenditures, even if the latter include unemployment benefits that follow growth patterns (Immervoll and Richardson, 2011).

¹³ Due to the lack of statistics on the share of pension benefits for all the countries and the period covered by this study, it is not possible to exclude such component of public transfers from social expenditure. In the recent literature, there are few analyses only for the EU-15 countries over a shorter period (i.e., Dafermos and Papatheodorou, 2013).

of different determinants. If welfare state regimes are more generous with elderly people, the share of elderly people produces, on one hand, a reduction of the bottom share, mainly via a less redistributive social expenditure towards other households, and on the other an increase of the top share of the distribution. Such increase is probably related to the earning age profiles that produce higher labour incomes for older workers (and more generous pension schemes). Even capital income from investments is normally more concentrated for older households due to the increasing concentration of wealth during maturity age in many countries.

2. Data and methodology

2.1. Data and descriptive statistics

We used a data set of twenty-seven EU member states¹⁴ over the 2000-2012 period. The gap between the rich and the poor is quantified by the shares of national equivalised income held by different quantiles in each country in a specific year.¹⁵ In particular, the *first* and *second deciles* are considered to catch the bottom of the income distribution, the *fifth* and the *eighth* to look at the boundaries of a sort of middle class, whereas the *tenth decile* and the *hundredth percentile* to capture the top and the richest part of it.¹⁶ All these are the dependent variables of our empirical specification since the study of neighbouring parts of the income distribution may display on the one hand a different impact of the supposed determinants and on the other may act as a robustness check of the estimated results.

¹⁴ These are Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. Croatia is excluded from the dataset due to missing statistics for several variables.

¹⁵ Data are not available for every year. Data Source: Eurostat, EU-SILC Statistics Database.

¹⁶ These are noncumulative shares.

Table 1 shows the average shares over the studied period of the national equivalised income held by the first, second, fifth, eighth, tenth deciles and the hundredth percentile in the EU countries classified, according to the literature, by the type of welfare system.

Table 1 - *Average shares of national equivalised income over the 2000-2012 period*

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
SOCIAL DEMOCRATIC						
<i>Denmark</i>	2.91	5.98	8.91	12	20.83	4.76
<i>Finland</i>	4.06	5.64	8.52	11.84	21.81	4.95
<i>Netherlands</i>	3.55	5.85	8.43	11.82	22.16	4.77
<i>Sweden</i>	3.6	5.95	8.95	12.08	19.74	3.65
CONSERVATIVE CORPORATIST						
<i>Austria</i>	3.73	5.67	8.49	11.93	21.77	4.18
<i>Belgium</i>	3.48	5.47	8.58	12.17	21.64	4.69
<i>Germany</i>	3.2	5.31	8.37	11.97	23.08	5.11
<i>France</i>	3.63	5.34	8.16	11.71	24.13	5.4
<i>Luxembourg</i>	3.63	5.41	8.31	11.99	22.46	4.44
LIBERAL						
<i>Ireland</i>	3.33	4.91	8	12.26	24.16	5.52
<i>United Kingdom</i>	2.76	4.71	7.78	12.1	25.91	6.08
SOUTHERN EUROPEAN						
<i>Cyprus</i>	3.58	5.1	8.13	11.93	23.98	5.73
<i>Greece</i>	2.3	4.47	7.93	12.46	25.38	5.43
<i>Italy</i>	2.51	4.72	8.12	12.33	24.42	5.13
<i>Malta</i>	3.62	5.37	8.41	12.32	21.61	3.87
<i>Portugal</i>	2.67	4.33	7.38	11.77	28.4	5.96
<i>Spain</i>	1.98	4.51	8.16	12.82	23.84	4.14
EASTERN						
<i>Bulgaria</i>	2.4	4.28	7.94	12.42	25.6	5.5
<i>Czech Republic</i>	4.13	5.98	8.45	11.63	21.86	4.58
<i>Estonia</i>	2.65	4.65	7.8	12.51	24.88	4.73
<i>Hungary</i>	3.75	5.55	8.46	11.86	22.3	4.68
<i>Latvia</i>	2.13	4.05	7.47	12.56	27.4	5.62
<i>Lithuania</i>	2.36	4.33	7.71	12.41	26.02	5.05
<i>Poland</i>	2.88	4.7	7.95	12.18	25.06	5.11
<i>Romania</i>	2.13	4.05	7.93	12.8	25.26	4.8
<i>Slovenia</i>	3.98	5.93	8.85	12.03	19.66	3.28
<i>Slovakia</i>	3.67	5.83	8.58	11.92	21.27	4.38

Table 2 - *Descriptive statistics: dependent variables*

<i>Variable</i>		<i>Mean</i>	<i>Std.Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Observations^a</i>
<i>First decile</i>	<i>Overall</i>	3.1891	.6921	1.3	4.2	N = 257
	<i>Between</i>		.6472	2.1333	4.1375	n = 27
	<i>Within</i>		.3048	1.6791	4.0791	T-bar = 9.518
<i>Second decile</i>	<i>Overall</i>	5.1478	.6499	3.6	6.2	N = 257
	<i>Between</i>		.6522	4.05	5.9875	n = 27
	<i>Within</i>		.1953	4.4978	5.6978	T-bar = 9.518
<i>Fifth decile</i>	<i>Overall</i>	8.2357	.4398	7	9.2	N = 257
	<i>Between</i>		.4076	7.4090	8.9555	n = 27
	<i>Within</i>		.1915	7.6732	9.1448	T-bar = 9.518
<i>Eighth decile</i>	<i>Overall</i>	12.1354	.3507	11	13.2	N = 257
	<i>Between</i>		.3065	11.6375	12.8	n = 27
	<i>Within</i>		.1919	11.0770	12.6808	T-bar = 9.518
<i>Tenth decile</i>	<i>Overall</i>	23.3894	2.3764	19	30.3	N = 257
	<i>Between</i>		2.2151	19.6625	28.3272	n = 27
	<i>Within</i>		1.0246	21.2644	28.4894	T-bar = 9.518
<i>Hundredth percentile</i>	<i>Overall</i>	4.8679	.9247	3	7.8	N = 231
	<i>Between</i>		.6858	3.2875	6.0875	n = 27
	<i>Within</i>		.6366	3.6457	7.9804	T-bar = 8.555

^a: *N* is the number of observations; *n*, the number of countries; *T*-bar, the average time periods

In general terms, considering the tails of the income distribution, it is worth noting that the Nordic and the Central European countries display the highest shares of income held by the poorest (first and second deciles) and the lowest shares held by the richest (tenth decile). The reverse is true for Southern European and Eastern countries. Some EU members deserve attention. Czech Republic, Hungary, Slovenia and Slovakia are the more egalitarian countries compare both to their group and the whole sample: the average 20

shares held by the bottom part (first and second deciles) and the top part (tenth decile) of the income distribution are consistent with the Nordic group, particularly Finland. The more unequal countries are United Kingdom, Italy, Greece, Portugal, Spain and the other Eastern countries: they present, on average, low shares of income held by the poor and high shares held by the rich. Concerning the richest, the top 1 percent, a same ranking can be found. The greater shares are those of the Liberal group (Ireland and United Kingdom), the Southern European (Cyprus, Greece, Italy and Portugal) and the Eastern set (Bulgaria, Latvia, Lithuania and Poland).

On the whole, as to the tails of the income distribution, between and within group of countries belonging to the same welfare state regime, there exists a substantial disparity, whereas, as to the median share and the upper-middle class, countries are less dissimilar.

This evidence can be confirmed if the descriptive statistics are considered (Table 2). Every variable exhibits a *between* standard deviation considerably higher than the *within* one. This means that the difference in terms of inequality between these countries is greater than the longitudinal variation each of them has experienced. This is indeed why EU institutions have been placing for several years great emphasis on economic and social cohesion policies and emphasizing the aims of raising the standard of living and the quality of life of all citizens throughout the Union for the present decade.

The fundamental determinants of a country's income distribution are the level of economic development, its macroeconomic performance, the level of income inequality and the government's commitment towards redistributive policies. The macroeconomic performance is measured by the *GDP per head* (expressed in logarithmic terms).¹⁷ The state of income disparity is assessed by the *Gini* coefficient¹⁸, which measures the extent to which the distribution of income among individuals or households within an economy deviates from a

¹⁷ GDP per capita PPP constant 2005 international \$. Data Source: World Development Indicators Database

¹⁸ Gini coefficient of equivalised disposable income. Data Source: Eurostat, EU-SILC Statistics Database

perfectly equal distribution and thus ‘adjusts’ what the GDP per head tells. Government intervention is measured by the general government *social protection expenditure* expressed as a percentage of GDP.¹⁹

Following the theoretical discussion (Section 2), their effect is controlled for several dimensions concerning the labour market, the social mobility and the demographic and households structure.

As for the labour market, the impact of the economic cycle (GDP per head) on income shares is controlled for the dynamics of earning inequality which depends on the total *unemployment* rate (20-64 years), the share of people (aged 18-59) that live in households where no-one works (*people jobless hh*), the rate of *female employment* (20-64 years) and the share of the employees (25-64 years) of the financial services sector (*financial activities employees*).²⁰ Concerning social mobility, thought in terms of intergenerational mobility, the effect of inequality on income shares is controlled for the percentage of people (aged 25-64) with *tertiary education* attainment and for the distribution of population owning the house (housing ownership)²¹. To take into account the dynamics of the population, which matters for the social protection policies, the impact of the government’s expenditure is controlled for the share of *elderly people* (aged 65 and above).²²

¹⁹ Data Source: Eurostat, Government Finance Statistics

²⁰ Data Source: Eurostat, Labour Market Statistics Database (EU-SILC, Labour Force Survey)

Concerning the employees of the financial services sector, the share is the ratio between the number of the people employed in the ‘financial and insurance activities’ sector and the number of people employed in ‘All NACE activities’ sector.

²¹ Data Source: Eurostat, EU-SILC Statistics Database

²² Data Source: Data Source: World Development Indicators Database

Table 3 - Descriptive statistics: independent variables

<i>Variable</i>	<i>Mean</i>	<i>Std.Dev.</i>	<i>Min.</i>	<i>Max</i>	<i>Observations^a</i>
(ln) GDP per head					
Overall	10.064	.450	8.830	11.212	N = 351
Between		.445	9.156	11.113	n = 27
Within		.106	9.671	10.351	T-bar =13
Gini Index					
Overall	29.326	4.028	22	39.2	N = 303
Between		3.771	23.008	36.355	n = 27
Within		1.659	23.356	36.276	T-bar=12.922
Social Protection Expenditure					
Overall	16.178	4.138	7.9	25.3	N = 349
Between		3.926	10.092	23.646	n = 27
Within		1.467	12.478	21.124	T-bar =12.925
Housing Owner					
Overall	57.428	9.6591	42	91	N = 284
Between		10.102	44.133	86.725	n = 27
Within		2.660	48.069	72.528	T-bar =10.518
People jobless hh					
Overall	9.458	2.567	4.4	17.7	N = 336
Between		2.069	5.453	13.453	n = 27
Within		1.535	5.004	17.027	T-bar =12.444
Tertiary Education					
Overall	23.738	8.240	5.4	42.4	N = 347
Between		7.593	11.738	35.5	n = 27
Within		3.448	11.569	37.038	T-bar =12.851
Unemployment					
Overall	8.110	4.090	1.7	24.5	N = 351
Between		3.125	3.261	14.515	n = 27
Within		2.700	.625	20.841	T-bar =13
Female employment					
Overall	61.556	8.707	32.7	77.2	N = 351
Between		8.458	37.492	76.138	n = 27
Within		2.593	53.079	70.863	T-bar =13
Financial activities employees					
Overall	3.148	2.027	.876	13.370	N = 349
Between		2.034	1.207	11.707	n = 27
Within		.322	1.653	4.810	T-bar =12.925
Elderly people					
Overall	15.713	2.329	10.228	21.100	N = 351
Between		2.237	10.958	19.642	n = 27
Within		.767	12.929	18.039	T-bar =13

^a: N is the number of observations; n, the number of countries; T-bar, the average time periods

Table (3) displays the descriptive statistics of the independent variables. On the whole, the *between* standard deviation of each variable is higher than the *within* one. This difference is considerable if the housing ownership, the rate of female employment, the tertiary education, the employees of the financial activities sector, and the percentage of old people are considered, which confirms the ‘structural’ heterogeneity existing among the EU-members.

2.2. The econometric specification

Consistent with the theoretical argument, we specified the following equation model:

$$y_{i,t} = \alpha + \beta (GDP\ per\ head)_{i,t-1} + \gamma (Gini)_{i,t-1} + \delta (Social\ Exp.)_{i,t-1} + \vartheta X_{i,t-1} + \phi_i + \psi_t + \varepsilon_{i,t} \quad (2)$$

where $y_{i,t}$ are the share of national equivalised income held by the quantiles studied²³, $X_{i,t-1}$ is the vector of the control variables. To avoid endogeneity problems, the three core independent variables and the controls are specified at time $t-1$: this procedure estimates the impact that all the hypothesized determinants at time $t-1$ have on the quantile’s share of national income at time t .

The model attempts to explain the income distribution in terms of the measures of economic performance, income inequality and government’s social protection expenditure, controlling progressively for the other variables, whereas time dummies (ψ_t) and country-group dummies (ϕ_i) are added to all regressions to control further the estimation results. Country-group dummies may account of any economic and political heterogeneity across them. These are defined on the basis of the different welfare regimes the EU countries have (Section 2.3).²⁴

²³ First, second, fifth, eighth, tenth deciles and hundredth percentile.

²⁴ According to the literature, fifth types of welfare systems can be defined. Thus, the first group dummy is formed by the Social Democratic (SD) countries; the second, by the Conservative-corporatist (CC) countries; the third, by the Liberal

The model specification was estimated through different estimation techniques.²⁵

Firstly, pooled ordinary least squared (POLS) regressions were run to provide preliminary reference evidence. Although very basic, these POLS regressions were controlled for heteroskedasticity (we used the Eicker/Huber/White sandwich estimator to compute robust standard errors) and for a complete set of two batteries of dummies, namely time and country-group dummies (Tables B.1 and B.2, Appendix B).

Secondly, since preliminary tests with this model indicate the presence of heteroskedasticity and within panel AR(1) autocorrelation²⁶, feasible generalized least squares regressions were run in order to provide reliable estimate results (Wooldridge, 2002) controlled (as before) for the entire batteries of dummies (Tables 4, 5, 6, 7, 8, 9 and Table C.1 of Appendix C). We will consider them in Section 4 that is devoted to discuss the econometrics results.

3. Econometric analysis

Tables 4, 5, 6, 7, 8, 9²⁷ report the estimated impact of the macroeconomic performance, the level of income disparity and the

(LIB) countries; the fourth, by the Southern European (SE) countries; the fifth, by the Eastern (EAST) ones. In the specified model, the latter is the excluded category.

²⁵ As briefly said before (footnote 2), the original panel is unbalanced. To study whether the core regressors had a different impact before the Great Recession and during the crisis years (Section 4), we needed to complete the dataset to have a sufficient number of observations. We used simple moving average between available observations or the latest available one. This procedure does not distort the series even that with the fewest observations. In fact, as Tables A.1 and A.2 (Appendix A) show, the values of the between and within standard deviation for the “balanced” series are in line with those unbalanced. Moreover, general model regressions (POLS and FGLS) were run over the unbalanced sample showing that the estimates of the balanced case are consistent with those unbalanced.

²⁶ Drukker, 2003; Im et al., 2003; Levin et al., 2002

²⁷ Table C.1 (Appendix C) reports the FGLS estimates of the model run over the unbalanced sample.

government's social protection policies, controlling for the two batteries of dummies and progressively for the other controls.

Turning first to Tables 4 and 5, which studies the bottom of the income distribution, the lower tail, it can be noticed that economic development (*GDP per head*) and the social protection expenditure affect positively (it is statistically significant when the percentage of elderly people is controlled for, columns i and j) the share of national equivalised income held by the first (the poorest) and the second deciles, while the level of income inequality (Gini coefficient) has a negative effect. This evidence shows that the higher the level of per capita GDP and government's social protection expenditure, the lower the degree of income inequality, the higher is the share of income held by the poor.

Table 4 - GLS regressions. Bottom tail. Share of income held by the First Decile

	a	b	c	d	e	f	g	h	i	j
<i>GDP per head_{t-1}</i>	1.5985*** (.1527)	1.0302*** (.1195)	1.2390*** (.1211)	.6597*** (.1379)	1.0332*** (.1195)	.7908*** (.1326)	1.0248*** (.1217)	1.3191*** (.1422)	.9908*** (.1212)	1.1724*** (.1684)
<i>Gini_{t-1}</i>		-.0763*** (.0074)	-.0592*** (.0080)	-.0758*** (.0073)	-.0750*** (.0073)	-.0747*** (.0074)	-.0768*** (.0075)	-.0719*** (.0074)	-.0583*** (.0079)	-.0441*** (.0084)
<i>Social Protection Expenditure_{t-1}</i>		-.0067 (.0091)	.0152 (.0104)	-.0115 (.0097)	-.0090 (.0092)	.0015 (.0094)	-.0058 (.0093)	-.0100 (.0095)	.0231*** (.0103)	.0503*** (.0119)
<i>Owner_{t-1}</i>			.0147*** (.0032)							.0112*** (.0031)
<i>People jobless hh_{t-1}</i>				-.0605*** (.0128)						-.0364* (.0196)
<i>Tertiary Education_{t-1}</i>					-.0115*** (.0040)					-.0032 (.0043)
<i>Unemployment_{t-1}</i>						-.0289*** (.0079)				-.0199** (.0099)
<i>Female Employment_{t-1}</i>							.0056 (.0043)			-.0017 (.0054)
<i>Financial Activities Employees_{t-1}</i>								-.0832*** (.0204)		-.1232*** (.0206)
<i>Elderly people_{t-1}</i>									-.0882*** (.0136)	-.1048*** (.0176)
<i>SD</i>	-.0040*** (.0019)	-.0036*** (.0012)	-.0039*** (.0012)	-.0023* (.0012)	-.0025* (.0013)	-.0038*** (.0011)	-.0041*** (.0012)	-.0048*** (.0012)	-.0036*** (.0012)	-.0045*** (.0015)
<i>CC</i>	-.0067*** (.0017)	-.0037*** (.0011)	-.0061*** (.0012)	-.0020* (.0012)	-.0031** (.0012)	-.0033*** (.0011)	-.0036*** (.0012)	-.0036*** (.0011)	-.0031*** (.0012)	-.0028*** (.0012)
<i>LJB</i>	-.0134*** (.0017)	-.0064*** (.0012)	-.0074*** (.0012)	-.0031** (.0014)	-.0053*** (.0013)	-.0059*** (.0012)	-.0065*** (.0013)	-.0067*** (.0012)	-.0074*** (.0013)	-.0060*** (.0017)
<i>SE</i>	-.0088*** (.0013)	-.0038*** (.0009)	-.0049*** (.0009)	-.0037*** (.0009)	-.0040*** (.0009)	-.0033*** (.0009)	-.0034*** (.0010)	-.0041*** (.0009)	-.0037*** (.0008)	-.0045*** (.0009)
<i>constant</i>	-.1255*** (.0148)	-.0470*** (.0130)	-.0846*** (.0144)	-.0074 (.0150)	-.0445*** (.0131)	-.0221 (.0143)	-.0501*** (.0132)	-.0740*** (.0147)	-.0388*** (.0130)	-.0578*** (.0186)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27	27	27	27	27
N	324	324	324	324	324	324	324	324	324	324
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

Table 5 - GLS regressions. Bottom tail. Share of income held by the Second Decile

	a	b	c	d	e	f	g	h	i	j
GDP per head _{t-1}	1.2216*** (.1558)	.9909*** (.0910)	1.1048*** (.0975)	.8343*** (.1052)	.9986*** (.0921)	.9064*** (.0994)	1.0194*** (.0931)	1.0650*** (.1025)	.9454*** (.0898)	1.0980*** (.1181)
Gini _{t-1}		-.0704*** (.0054)	-.0637*** (.0059)	-.0738*** (.0054)	-.0690*** (.0056)	-.0702*** (.0055)	-.0679*** (.0055)	-.0728*** (.0055)	-.0623*** (.0056)	-.0588*** (.0059)
Social Protection Expenditure _{t-1}		.0136** (.0061)	.0236*** (.0074)	.0181*** (.0065)	.0107* (.0063)	.0165** (.0064)	.0154*** (.0063)	.0112* (.0064)	.0304*** (.0070)	.0377*** (.0078)
Owner _{t-1}			.0062*** (.0023)							.0052*** (.0023)
People jobless hh _{t-1}				-.0205** (.0088)						-.0159 (.0137)
Tertiary Education _{t-1}					-.0078** (.0031)					-.0042 (.0032)
Unemployment _{t-1}						-.0110* (.0057)				-.0109 (.0077)
Female Employment _{t-1}							-.0049* (.0029)			-.0113*** (.0035)
Financial Activities Employees _{t-1}								-.0391** (.0157)		-.0907*** (.0166)
Elderly people _{t-1}									-.0510*** (.0099)	-.0680*** (.0131)
SD	-.0006 (.0015)	-.0022*** (.0007)	-.0026*** (.0007)	-.0017** (.0007)	-.0013 (.0008)	-.0022*** (.0007)	-.0019** (.0008)	-.0024*** (.0007)	-.0027*** (.0007)	-.0016* (.0009)
CC	-.0060*** (.0018)	-.0053*** (.0008)	-.0063*** (.0009)	-.0044*** (.0008)	-.0049*** (.0008)	-.0051*** (.0008)	-.0055*** (.0009)	-.0050*** (.0008)	-.0052*** (.0008)	-.0048*** (.0008)
LIB	-.0105*** (.0019)	-.0074*** (.0009)	-.0080*** (.0009)	-.0059*** (.0011)	-.0068*** (.0010)	-.0071*** (.0009)	-.0076*** (.0010)	-.0069*** (.0009)	-.0084*** (.0010)	-.0070*** (.0013)
SE	-.0086*** (.0013)	-.0057*** (.0006)	-.0062*** (.0006)	-.0055*** (.0006)	-.0061*** (.0007)	-.0055*** (.0007)	-.0062*** (.0007)	-.0057*** (.0007)	-.0056*** (.0006)	-.0064*** (.0007)
constant	-.0687*** (.0151)	-.0277*** (.0098)	-.0463*** (.0116)	-.0101 (.0113)	-.0265*** (.0100)	-.0189* (.0106)	-.0284*** (.0099)	-.0330*** (.0106)	-.0197** (.0095)	-.0240* (.0129)
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27	27	27	27	27
N	324	324	324	324	324	324	324	324	324	324
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

All the other regressors take the expected sign. In particular, the rate of unemployment and the percentage of people in jobless households affect negatively the share of income held by the first decile (Table 4, column j), whereas they are not statistically significant when the second decile is considered (Table 5, column j). The share of employees of the financial activities sector affects negatively both parts of the income distribution (Tables 4 and 5, columns j), whereas the rate of female employment has a significant effect only on the share of income held by the second decile of households. Concerning social mobility, the estimated coefficient of housing ownership is positive and statistically significant for both groups when it is added alone and in the general specification (Tables 4 and 5, columns c and j); whereas, the percentage of people with tertiary education attainment is not statistically significant in the general specification (Tables 4 and 5, columns j). It is worth noting that this regressor displays a negative and statistically significant sign when added alone (Tables 4 and 5, columns e), suggesting that there is no equalisation of educational opportunities as people from disadvantaged backgrounds are less likely to enter the tertiary educational system. Finally, the proportion of elderly people affects negatively the bottom part of the income distribution due to less redistributive social expenditures towards other households.

Tables 6 and 7 display the regression results when the share of national income held by the median part and the eighth decile of the income distribution are considered. These constitute the boundaries of a sort of middle class and separate the bottom tail and the top tail of the income distribution.

These regression results matter for two reasons. Firstly, they show the part of the income distribution from where the impact of the core determinants changes. Secondly, they constitute a benchmark and a robustness check with respect to the tails of the distribution.

Turning first to Table 6, GDP per head affects positively the dependent variable, the magnitude of its coefficient is smaller than previous cases. Gini coefficient has a negative impact, whereas

social expenditure a positive effect. The other regressors, when statistically significant, take the expected sign. In particular, the rate of unemployment, the rate of female employment, the share of the employees of the financial activities sector and the percentage of old people affect negatively the income held by the median part of the income distribution.

As far as the eighth decile is concerned, the signs of the three core regressors are just the reverse. Both GDP per head (with the lowest significance level) and the social protection expenditure have a negative impact. The Gini coefficient has a positive effect. This evidence shows that the lower the level of economic development, the lower the social protection expenditure, the higher the level of income disparity, the lower is the share of national equivalised income held by the eighth decile.

The social mobility proxies deserve some comments (columns c, e and j). The estimated impacts of housing ownership and the percentage of people with tertiary education attainments have a opposite impact compared to that on the bottom part of the income distribution. The higher the proportion of the population owing the house, the lower the share of income held by the upper-middle class. The higher the percentage of people with tertiary education, the higher the share of income held by the eighth decile. This strengthens the idea that equalisation of educational opportunities has not been achieved.

Table 6 - GLS regressions. Median class. Share of income held by the Fifth Decile.

	a	b	c	d	e	f	g	h	i	j
<i>GDP per head_t</i>	.7099*** (.0937)	.2597*** (.0675)	.2765*** (.0688)	.3351*** (.0807)	.2633*** (.0677)	.2501*** (.0702)	.3082*** (.0691)	.3615*** (.0767)	.2528*** (.0670)	.5044*** (.0934)
<i>Gini_t</i>		-.0725*** (.0044)	-.0700*** (.005)	-.0741*** (.0044)	-.0721*** (.0044)	-.0719*** (.0047)	-.0680*** (.0044)	-.0741*** (.0042)	-.0735*** (.0047)	-.0627*** (.0051)
<i>Social Protection Expenditure_t</i>		.0297*** (.0046)	.0332*** (.0059)	.0222*** (.0056)	.0289*** (.0047)	.0305*** (.0050)	.0242*** (.0053)	.0244*** (.0049)	.0289*** (.0056)	.0209*** (.0076)
<i>Owner_t</i>		.0013 (.0017)								.0023 (.0019)
<i>People jobless hh_t</i>				.0154* (.0082)						.0169 (.0123)
<i>Tertiary Education_t</i>					-.0006 (.0022)					.0050* (.0030)
<i>Unemployment_t</i>						-.0019 (.0047)				-.0149** (.0061)
<i>Female Employment_t</i>							-.0069*** (.0019)			-.0083*** (.0028)
<i>Financial Activities Employees_t</i>								-.0317*** (.0108)		-.0541*** (.0132)
<i>Elderly people_t</i>									.0020 (.0079)	-.0199** (.0099)
<i>SD</i>	.0008 (.0010)	-.0009* (.0005)	-.0011* (.0005)	-.0009 (.0006)	-.0008 (.0006)	-.0010* (.0005)	.0000 (.0006)	-.0011** (.0005)	-.0009 (.0005)	-.0018** (.0008)
<i>CC</i>	-.0034*** (.0011)	-.0027*** (.0006)	-.0030*** (.0006)	-.0028*** (.0006)	-.0027*** (.0006)	-.0027*** (.0006)	-.0025*** (.0007)	-.0023*** (.0006)	-.0026*** (.0006)	-.0033*** (.0007)
<i>LIB</i>	-.0072*** (.0014)	-.0021** (.0008)	-.0022*** (.0008)	-.0027*** (.0009)	-.0020*** (.0008)	-.0021** (.0008)	-.0022** (.0008)	-.0019** (.0008)	-.0020** (.0008)	-.0038*** (.0010)
<i>SE</i>	-.0034*** (.0007)	-8.57e-06 (.0004)	-.0001 (.0004)	-.0000 (.0004)	2.32e-06 (.0004)	-.0000 (.0004)	-.0009* (.0005)	-.0001 (.0004)	.0000 (.0004)	-.0010* (.0005)
<i>constant</i>	.0136 (.0091)	.0732*** (.0074)	.0694*** (.0084)	.0658*** (.0086)	.0730*** (.0074)	.0740*** (.0076)	.0723*** (.0073)	.0653*** (.0080)	.0739*** (.0074)	.0534*** (.0097)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
<i>Nr. of groups</i>	27	27	27	27	27	27	27	27	27	27
<i>N</i>	324	324	324	324	324	324	324	324	324	324
<i>Wald test p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts *, **, *** denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

Table 7 - GLS regressions. Upper-middle class. Share of income held by the Eighth Decile

	a	b	c	d	e	f	g	h	i	j
<i>GDP per head_t</i>	-.3737*** (.0851)	-.2528*** (.0926)	-.3164*** (.0999)	-.1533 (.1024)	-.2409*** (.0839)	-.1691* (.0992)	-.2538*** (.0946)	-.2580** (.1021)	-.2267** (.0955)	-.2186* (.1125)
<i>Gini_{t-1}</i>		.0193*** (.0044)	.0181*** (.0046)	.0193*** (.0044)	.0189*** (.0044)	.0177*** (.0044)	.0196*** (.0046)	.0193*** (.0044)	.0190*** (.0044)	.0174*** (.0047)
<i>Social Protection Expenditure_{t-1}</i>		-.0119* (.0066)	-.0154** (.0070)	-.0189*** (.0070)	-.0087 (.0063)	-.0181*** (.0069)	-.0130* (.0070)	-.0118* (.0067)	-.0127* (.0067)	-.0209*** (.0075)
<i>Owner_{t-1}</i>			-.0048*** (.0024)							-.0052*** (.0021)
<i>People jobless hh_{t-1}</i>				.0197** (.0077)						-.0255** (.0120)
<i>Tertiary Education_{t-1}</i>					.0042* (.0025)					.0060** (.0027)
<i>Unemployment_{t-1}</i>						.0093*** (.0046)				-.0055 (.0066)
<i>Female Employment_{t-1}</i>							-.0039 (.0033)			-.0049 (.0040)
<i>Financial Activities Employees_{t-1}</i>								-.0000 (.0184)		.0124 (.0182)
<i>Elderly people_{t-1}</i>									.0144 (.0123)	.0138 (.0123)
<i>SD</i>	.0001 (.0008)	.0007 (.0010)	.0006 (.0010)	.0006 (.0009)	-.0000 (.0009)	.0008 (.0009)	.0011 (.0011)	-.0007 (.0010)	-.0004 (.0010)	-.0001 (.0011)
<i>CC</i>	.0006 (.0009)	.0008 (.0010)	.0012 (.0011)	.0007 (.0010)	.0005 (.0009)	.0009 (.0010)	.0010 (.0010)	-.0009 (.0010)	.0003 (.0011)	.0000 (.0010)
<i>LIB</i>	-.0023* (.0012)	.0007 (.0013)	.0009 (.0014)	-.0000 (.0013)	.0004 (.0012)	.0005 (.0013)	.0008 (.0013)	-.0008 (.0013)	.0007 (.0014)	-.0005 (.0013)
<i>SE</i>	.0026*** (.0008)	.0019** (.0008)	.0019** (.0009)	.0020** (.0008)	.0021*** (.0007)	.0018** (.0008)	.0012 (.0009)	.0020** (.0008)	.0017** (.0008)	.0013 (.0008)
<i>constant</i>	.1592*** (.0082)	.1436*** (.0096)	.1536*** (.0109)	.1327*** (.0106)	.1409*** (.0088)	.1357*** (.0101)	.1462*** (.0097)	.1440*** (.0103)	.1389*** (.0103)	.1422*** (.0123)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
<i>Nr. of groups</i>	27	27	27	27	27	27	27	27	27	27
<i>N</i>	324	324	324	324	324	324	324	324	324	324
<i>Wald test p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscriptus *, **, *** denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

The last two tables (Tables 8 and 9) show what happens when the top (tenth decile) and the richest part (hundredth percentile) of the income distribution is studied. Both specifications exhibit a negative and statistically significant coefficient for GDP per head and a positive and statistically significant coefficient for the Gini coefficient, which however displays a lower magnitude when the hundredth percentile is the quantile considered. Social protection public expenditure carries a negative sign and it is significant at a modest significance level only when the share of income held by the tenth decile is the dependent variable.

Housing ownership does not affect the top part of the income distribution, whereas tertiary education affects negatively the income of the rich showing that the access to the highest level of education redistributes only on behalf of the median and upper-class. The rate of female employment and the share of employees of the financial activities sector have a positive effect on the income held by the top tail. This confirms, on the one hand, the so-called 'assortative mating' hypothesis; on the other, the effect of the out-of market remunerations of top financial professions and the impact of globalization that is moving low-skill jobs (more concentrated in manufacturing) towards less developed countries. Finally, with respect to the bottom tail, it is worth noting that the percentage of old people affect positively the top part of the income distribution.

Table 8 - GLS regressions. Top tail. Share of income held by the Tenth Decile

	a	b	c	d	e	f	g	h	i	j
GDP per head _{t-1}	-4.8629*** (.5814)	-2.5372*** (.3483)	-2.5584*** (.5668)	-2.9523*** (.4330)	-2.5486*** (.5510)	-2.4234*** (.3726)	-2.4677*** (.3689)	-3.2603*** (.3906)	-2.5117*** (.3544)	-3.4513*** (.5115)
Gini _{t-1}		.3740*** (.0246)	.3729*** (.0275)	.3739*** (.0249)	.3741*** (.0246)	.3704*** (.0252)	.3679*** (.0251)	.3972*** (.0228)	.3731*** (.0263)	.3493*** (.0284)
Social Protection Expenditure _{t-1}		-.0684*** (.0259)	-.0703*** (.0317)	-.0333 (.0303)	-.0674*** (.0265)	-.0745*** (.0271)	-.0247 (.0288)	-.0344 (.0253)	-.0641*** (.0312)	-.0739* (.0396)
Owner _{t-1}			-.0010 (.0092)							.0009 (.0100)
People jobless hh _{t-1}				-.0748* (.0412)						-1.146* (.0666)
Tertiary Education _{t-1}					-.0040 (.0128)					-.0431*** (.0152)
Unemployment _{t-1}						.0187 (.0237)				.1225*** (.0342)
Female Employment _{t-1}							-.0534*** (.0128)			-.0676*** (.0162)
Financial Activities Employees _{t-1}								.2248*** (.0549)		.3589*** (.0705)
Elderly people _{t-1}									-.0079 (.0435)	.1641*** (.0534)
SD	.0094** (.0047)	.0109*** (.0030)	.0112*** (.0030)	.0104*** (.0032)	.0116*** (.0039)	.0111*** (.0030)	.0011 (.0038)	.0130*** (.0027)	.0105*** (.0031)	.0163*** (.0049)
CC	.0268*** (.0064)	.0185*** (.0055)	.0189*** (.0056)	.0187*** (.0058)	.0188*** (.0057)	.0185*** (.0055)	.0128*** (.0059)	.0170*** (.0052)	.0170*** (.0056)	.0173*** (.0042)
LIB	.0438*** (.0077)	.0181*** (.0042)	.0184*** (.0042)	.0215*** (.0048)	.0186*** (.0045)	.0179*** (.0042)	.0155*** (.0044)	.0180*** (.0038)	.0176*** (.0043)	.0291*** (.0058)
SE	.0290*** (.0045)	.0090*** (.0027)	.0094*** (.0027)	.0092*** (.0028)	.0092*** (.0028)	.0087*** (.0027)	.0121*** (.0028)	.0086*** (.0025)	.0088*** (.0028)	.0126*** (.0032)
constant	.7091*** (.0569)	.3634*** (.0388)	.3865*** (.0457)	.4269*** (.0470)	.3853*** (.0594)	.3723*** (.0408)	.3392*** (.0404)	.4364*** (.0407)	.3819*** (.0397)	.4113*** (.0559)
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27	27	27	27	27
N	324	324	324	324	324	324	324	324	324	324
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

Table 9 - GLS regressions. Top tail. Share of income held by the Hundredth Percentile

	a	b	c	d	e	f	g	h	i	j
GDP per head _{t-1}	-1.3057*** (.2421)	-1.0243*** (.2393)	-1.0447*** (.2426)	-1.0474*** (.2763)	-1.0187*** (.2391)	-1.0304*** (.2310)	-.9585*** (.2310)	-1.3652*** (.2852)	-.9516*** (.2380)	-1.2957*** (.3409)
Gini _{t-1}		.0549*** (.0167)	.0558*** (.0179)	.0549*** (.0167)	.0548*** (.0168)	.0541*** (.0171)	.0513*** (.0161)	.0564*** (.0167)	.0515*** (.0169)	.0477*** (.0173)
Social Protection Expenditure _{t-1}		.0045 (.0202)	.0044 (.0219)	.0083 (.0234)	.0049 (.0203)	.0067 (.0221)	.0226 (.0203)	.0106 (.0202)	-.0028 (.0216)	-.0009 (.0257)
Owner _{t-1}			.0001 (.0068)							-.0012 (.0068)
People jobless hh _{t-1}				-.0067 (.0282)						.0395 (.0469)
Tertiary Education _{t-1}					-.0008 (.0091)					-.0169* (.0099)
Unemployment _{t-1}										.0106 (.0227)
Female Employment _{t-1}						-.0010 (.0159)				.0442*** (.0110)
Financial Activities Employees _{t-1}							.0291*** (.0083)	.0844* (.0469)		.1724*** (.0534)
Elderly people _{t-1}									.0385 (.0313)	.0682* (.0358)
SD	.0094*** (.0022)	.0087*** (.0025)	.0091*** (.0026)	.0084*** (.0025)	.0089*** (.0029)	.0084*** (.0026)	.0036 (.0027)	.0104*** (.0025)	.0083*** (.0025)	.0075*** (.0036)
CC	.0099*** (.0025)	.0085*** (.0026)	.0088*** (.0027)	.0084*** (.0026)	.0084*** (.0027)	.0083*** (.0027)	.0056* (.0026)	.0088*** (.0026)	.0073*** (.0027)	.0050* (.0029)
LIB	.0197*** (.0041)	.0159*** (.0036)	.0162*** (.0036)	.0160*** (.0038)	.0161*** (.0037)	.0159*** (.0036)	.0141*** (.0034)	.0168*** (.0035)	.0159*** (.0035)	.0158*** (.0042)
SE	.0086*** (.0019)	.0058*** (.0020)	.0062*** (.0021)	.0056*** (.0020)	.0059*** (.0020)	.0056*** (.0021)	.0069*** (.0021)	.0064*** (.0020)	.0050*** (.0021)	.0081*** (.0022)
constant	.1723*** (.0236)	.1284*** (.0264)	.1298*** (.0284)	.1309*** (.0300)	.1279*** (.0263)	.1291*** (.0274)	.1025*** (.0253)	.1582*** (.0297)	.1171*** (.0267)	.1146*** (.0368)
Time dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27	27	27	27	27
N	324	324	324	324	324	324	324	324	324	324
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

Starting from the whole sample estimates, which are the reference evidence for the following analyses, we investigate firstly whether or not the estimated impact of the core regressors has changed over time. Secondly, whether the social protection expenditure has a different profile depending on the different welfare regimes and the period considered.

Turning to the first issue, the econometric specification at (1) is run over two different time periods. Studying the behaviour of the time dummies (namely, when the magnitude of the coefficients and their significance levels vary) that reveal that a break occurred at 2007 and considering that the regressors are specified at time $t-1$, we split the sample at 2007 and identify the 2000-2007 interval as the pre-crisis period and the 2008-2012 interval as the Great Recession period.

Tables 10 and 11 present the regression results.

During the 2000-2007 interval, GDP per head is always statistically significant and displays the expected sign consistent with the above discussion. The Gini Index is highly statistically significant with negative sign for the bottom and median shares; it affects positively the upper-middle class and the top tail. It has no effect during the pre-crisis years. The social protection expenditure is statistically significant at considerable levels for the poor, the rich and the median share. It has a minor impact on the top 1 percent. This means that before the Great Recession, redistribution went from the tenth decile to the first part of the income distribution and the redistributive policies were progressive towards the poor and less advantaged households.

Table 10 - GLS regressions. General model estimation over 2000-2007

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8thdecile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	1.6392*** (.1989)	1.3801*** (.1626)	.4874*** (.0781)	-.3130*** (.1069)	-3.9324*** (.5563)	-.9946*** (.3427)
<i>Gini_{t-1}</i>	-.0318*** (.0108)	-.0550*** (.0085)	-.0761*** (.0055)	.0272*** (.0050)	.3979*** (.0330)	.0250 (.0209)
<i>Social Protection Expenditure_{t-1}</i>	.0525*** (.0159)	.0408*** (.0119)	.0366*** (.0082)	-.0053 (.0086)	-.1547*** (.0496)	-.0583* (.0325)
<i>Owner_{t-1}</i>	.0101** (.0044)	.0068** (.0034)	.0019 (.0020)	.0012 (.0022)	-.0143 (.0112)	-.0119 (.0089)
<i>People jobless hh_{t-1}</i>	.0193 (.0235)	.0112 (.0192)	.0082 (.0131)	.0099 (.0140)	-.0904 (.0871)	.0822 (.0551)
<i>Tertiary Education_{t-1}</i>	-.0062 (.0039)	-.0011 (.0039)	.0094*** (.0031)	.0035 (.0027)	-.0682*** (.0163)	-.0190** (.0095)
<i>Unemployment_{t-1}</i>	-.0205* (.0115)	-.0118 (.0105)	-.0107* (.0064)	-.0106 (.0071)	.1046*** (.0392)	-.0009 (.0284)
<i>Female Employment_{t-1}</i>	-.0018 (.0058)	-.0116** (.0046)	-.0095*** (.0031)	-.0096** (.0038)	.0895*** (.0199)	.0549*** (.0138)
<i>Financial Activities Employees_{t-1}</i>	-.1494*** (.0272)	-.1045*** (.0222)	-.0610*** (.0145)	-.0018 (.0178)	.4179*** (.0678)	.1252** (.0499)
<i>Elderly people_{t-1}</i>	-.1503*** (.0248)	-.0845*** (.0195)	-.0302*** (.0109)	.0210 (.0129)	.2122*** (.0640)	.0899* (.0537)
<i>SD</i>	-.0061*** (.0020)	-.0031** (.0013)	-.0024*** (.0008)	.0014 (.0012)	.0215*** (.0056)	.0065 (.0049)
<i>CC</i>	-.0049*** (.0016)	-.0066*** (.0012)	-.0029*** (.0007)	.0005 (.0010)	.0217*** (.0044)	.0043 (.0038)
<i>LIB</i>	-.0096*** (.0022)	-.0102*** (.0018)	-.0018* (.0011)	.0011 (.0015)	.0247*** (.0071)	.0131** (.0054)
<i>SE</i>	-.0042*** (.0012)	-.0068*** (.0010)	-.0002 (.0006)	.0016* (.0009)	.0119*** (.0037)	.0079*** (.0028)
<i>constant</i>	-.1038*** (.0213)	-.0543*** (.0177)	.0600*** (.0081)	-.1459*** (.0112)	.4521*** (.0606)	.0994*** (.0376)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
Wald GDP per head_{t-1} (p-value)	67.89*** (0.000)	71.99*** (0.000)	38.92*** (0.000)	8.56*** (0.003)	49.96*** (0.000)	8.42*** (0.003)
Wald Gini_{t-1} (p-value)	8.64*** (0.003)	41.42*** (0.000)	189.93*** (0.000)	28.89*** (0.000)	145.30*** (0.000)	1.43 (0.231)
Wald Social Protection Expenditure_{t-1} (p-value)	10.89*** (0.001)	11.61*** (0.000)	19.77*** (0.000)	0.37 (0.5404)	9.70*** (0.001)	3.21* (0.073)
Nr. of groups	27	27	27	27	27	27
N	189	189	189	189	189	189
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets. For the three core regressors, Wald test of significance are also reported.

Table 11 - GLS regressions. General model estimation over 2008-2012

	1 st decile	2 nd decile	5 th decile	8 th decile	10 th decile	100 th percentile
<i>GDP per head_{t-1}</i>	.3800 (.2319)	.4561*** (.1409)	.2650* (.1361)	-.3681** (.1811)	-1.5161** (.7535)	-.5571 (.5196)
<i>Gini_{t-1}</i>	-.0839*** (.0112)	-.1072*** (.0066)	-.0705*** (.0066)	.0081 (.0082)	.4637*** (.0370)	.1413*** (.0241)
<i>Social Protection Expenditure_{t-1}</i>	.0361*** (.0138)	.0135* (.0079)	-.0076 (.0091)	-.0333*** (.0100)	.1260*** (.0417)	.1018*** (.0280)
<i>Owner_{t-1}</i>	.0098*** (.0031)	.0043* (.0024)	-.0011 (.0024)	-.0100*** (.0030)	.0236** (.0120)	.0153 (.0094)
<i>People jobless hh_{t-1}</i>	-.0723*** (.0235)	-.0467*** (.0151)	.0437*** (.0143)	.0114 (.0182)	-.2132*** (.0673)	-.0740 (.0488)
<i>Tertiary Education_{t-1}</i>	-.0024 (.0057)	-.0076** (.0033)	-.0015 (.0036)	.0223*** (.0058)	-.0062 (.0159)	.0063 (.0123)
<i>Unemployment_{t-1}</i>	-.0089 (.0115)	.0129 (.0079)	-.0136* (.0079)	-.0063 (.0090)	.0778** (.0394)	-.0097 (.0286)
<i>Female Employment_{t-1}</i>	.0054 (.0072)	-.0035 (.0039)	-.0011 (.0036)	-.0147** (.0067)	.0168 (.0177)	.0043 (.0146)
<i>Financial Activities Employees_{t-1}</i>	-.0591*** (.0223)	-.0437** (.0179)	-.0246 (.0174)	.0411* (.0235)	.1014 (.0985)	.0298 (.0782)
<i>Elderly people_{t-1}</i>	-.0741*** (.0142)	-.0195* (.0114)	-.0004 (.0114)	.0475*** (.0144)	-.0035 (.0607)	-.0383 (.0432)
<i>SD</i>	-.0029 (.0018)	.0018* (.0010)	.0007 (.0011)	-.0011 (.0015)	.0021 (.0057)	.0037 (.0038)
<i>CC</i>	.0004 (.0014)	-.0007 (.0008)	-.0008 (.0008)	-.0008 (.0013)	-.0056 (.0047)	.0056* (.0034)
<i>LIB</i>	-.0004 (.0019)	.0003 (.0012)	-.0036*** (.0011)	-.0004 (.0017)	.0200*** (.0070)	.0096* (.0056)
<i>SE</i>	-.0024** (.0009)	-.0027*** (.0007)	-.0002 (.0006)	.0002 (.0011)	-.0046 (.0036)	.0035 (.0030)
<i>constant</i>	.0258 (.0271)	.0445*** (.0146)	.0778*** (.0133)	.1621*** (.0200)	.2124*** (.0781)	.0399 (.0533)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
Wald GDP per head_{t-1} (p-value)	2.68 (0.101)	10.48*** (0.001)	3.79* (0.051)	4.13** (0.042)	4.05** (0.044)	1.15 (0.283)
Wald Gini_{t-1} (p-value)	55.87*** (0.000)	259.10*** (0.000)	111.90*** (0.000)	0.97 (0.324)	156.48*** (0.000)	34.33*** (0.000)
Wald Social Protection Expenditure_{t-1} (p-value)	6.85*** (0.008)	2.86* (0.090)	0.70 (0.403)	11.04*** (0.000)	9.11*** (0.002)	13.17*** (0.000)
Nr. of groups	27	27	27	27	27	27
N	135	135	135	135	135	135
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts */**/** denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets. For the three core regressors, Wald test of significance are also reported.

During the crisis years (2008-2007), GDP per head is fully statistically significant only when the share held by the second decile is the dependent variable. Also the Gini coefficient behave as expected. With respect to the pre-crisis period, it plays no role for the share of income held by the eighth decile, whereas it has a significant effect for the richest part of the distribution. The social protection public expenditure deserves attention. It affects positively both the lowest part of the income distribution (first decile at considerable significance level) *and* the highest part (tenth decile and hundredth percentile). It affects negatively only the share of income held by the eighth decile. This means that, contrary to any expectation, social expenditure during the Great Recession period has been regressive on behalf of the rich. If any redistribution has occurred, this has been supported by the upper-middle class.

The evidence gained about the different impact of the social protection expenditure over the two time periods (Tables 10 and 11) suggests to analyze whether the social protection expenditure has had a different profile depending on the different welfare regimes existing across the European Union.

Hence, in the last tables (Tables 12 and 13), we test for slope differences and proceed with the same models as before except interaction terms for the social protection expenditure variable and the country-group dummies are included.

Table 12 - GLS regressions. Social expenditure and institutional systems over 2000-2007

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	1.8126*** (.2022)	1.6924*** (.1617)	.7294*** (.0987)	-.2118* (.1171)	-5.5830*** (.6370)	-1.1651*** (.3948)
<i>Gini_{t-1}</i>	-.0281*** (.0107)	-.0494*** (.0088)	-.0706*** (.0055)	.0283*** (.0050)	.3237*** (.0344)	.0119 (.0209)
<i>Social Protection Expenditure_{t-1}</i>	.0519** (.0215)	.0186 (.0163)	.0047 (.0125)	-.0351*** (.0132)	.0323 (.0796)	-.0094 (.0520)
<i>Social Protection Expenditure_{t-1}* SD</i>	.0119 (.0346)	.0230 (.0173)	.0602*** (.0152)	.0630*** (.0181)	-.2893*** (.0975)	-.2201*** (.0777)
<i>Social Protection Expenditure_{t-1}* CC</i>	.0240 (.0515)	.1376*** (.0402)	.1408*** (.0327)	.0393 (.0291)	-.5982*** (.1569)	-.1517 (.1074)
<i>Social Protection Expenditure_{t-1}* LIB</i>	.1297*** (.0447)	.1225*** (.0335)	-.0030 (.0372)	.0246 (.0406)	-.3786** (.1664)	-.0549 (.1298)
<i>Social Protection Expenditure_{t-1}* SE</i>	-.0699* (.0390)	-.0810*** (.0285)	-.0074 (.0210)	.0564* (.0318)	.1273 (.1271)	.1035 (.0805)
<i>Owner_{t-1}</i>	.0111** (.0043)	.0064** (.0030)	.0009 (.0020)	.0034 (.0021)	-.0241** (.0116)	-.0113 (.0083)
<i>People jobless hh_{t-1}</i>	.0006 (.0241)	.0245 (.0193)	.0324** (.0147)	.0132 (.0141)	-.1481* (.0890)	.1059* (.0575)
<i>Tertiary Education_{t-1}</i>	-.0079** (.0039)	-.0080** (.0040)	.0066** (.0029)	.0033 (.0025)	-.0333*** (.0151)	-.0134 (.0102)
<i>Unemployment_{t-1}</i>	-.0124 (.0112)	-.0158 (.0100)	-.0160** (.0067)	-.0072 (.0067)	.0980** (.0403)	.0032 (.0282)
<i>Female Employment_{t-1}</i>	-.0130** (.0065)	-.0200*** (.0051)	-.0120*** (.0030)	-.0113*** (.0042)	.1349*** (.0198)	.0777*** (.0135)
<i>Financial Activities Employees_{t-1}</i>	-.1746*** (.0319)	-.0920*** (.0236)	-.0337** (.0158)	.0050 (.0179)	.3752*** (.0837)	.0986 (.0623)
<i>Elderly people_{t-1}</i>	-.1341*** (.0275)	-.0452** (.0211)	-.0165 (.0124)	.0038 (.0156)	.1337* (.0774)	.0332 (.0545)
<i>SD</i>	-.0082 (.0067)	-.0075** (.0035)	-.0146*** (.0030)	-.0090*** (.0032)	.0664*** (.0178)	.0445*** (.0142)
<i>CC</i>	-.0100 (.0107)	-.0355*** (.0085)	-.0318*** (.0067)	-.0055 (.0060)	.1421*** (.0323)	.0341 (.0221)
<i>LIB</i>	-.0266*** (.0065)	-.0278*** (.0048)	-.0042 (.0055)	-.0028 (.0054)	.0840*** (.0229)	.0212 (.0180)
<i>SE</i>	.0029 (.0051)	.0013 (.0037)	-.0011 (.0028)	-.0064 (.0041)	.0072 (.0160)	-.0024 (.0103)
<i>constant</i>	-.1157*** (.0208)	-.0834*** (.0171)	.0379*** (.0093)	.1412*** (.0116)	.5974*** (.0631)	.1040*** (.0401)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
<i>Nr. of groups</i>	27	27	27	27	27	27
<i>N</i>	189	189	189	189	189	189
<i>Wald test p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts */**/** denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

Table 13 - GLS regressions. Social expenditure and institutional systems over 2008-2012

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	.6930*** (.2406)	.7590*** (.1548)	.5584*** (.1705)	-.4548** (.1965)	-2.7417*** (.7746)	-1.3159** (.6351)
<i>Gini_{t-1}</i>	-.0816*** (.0107)	-.0980*** (.0069)	-.0586*** (.0077)	.0049 (.0086)	.4190*** (.0371)	.1121*** (.0283)
<i>Social Protection Expenditure_{t-1}</i>	.0337** (.0148)	.0081 (.0117)	-.0156 (.0121)	-.0424*** (.0108)	.1657*** (.0581)	.0965** (.0427)
<i>Social Protection Expenditure_{t-1}* SD</i>	-.0074 (.0315)	.0036 (.0145)	.0444*** (.0140)	.0398** (.0179)	-.1748*** (.0667)	-.0233 (.0463)
<i>Social Protection Expenditure_{t-1}* CC</i>	.0348 (.0237)	.0330 (.0210)	-.0108 (.0214)	-.0176 (.0241)	.1420 (.1145)	.1016 (.0876)
<i>Social Protection Expenditure_{t-1}* LIB</i>	-.0502* (.0269)	.0243 (.0282)	-.0512** (.0204)	-.0279 (.0326)	.2680* (.1577)	.0302 (.1516)
<i>Social Protection Expenditure_{t-1}* SE</i>	-.0888*** (.0245)	-.0320** (.0159)	-.0312* (.0188)	.0385* (.0222)	.1468* (.0769)	.1245* (.0649)
<i>Owner_{t-1}</i>	.0084*** (.0028)	.0051** (.0023)	-.0013 (.0023)	-.0094*** (.0026)	.0257** (.0110)	.0162 (.0099)
<i>People jobless hh_{t-1}</i>	-.0447* (.0234)	-.0342** (.0151)	.0586*** (.0140)	.0156 (.0186)	-2.2763*** (.0616)	-1.1058** (.0531)
<i>Tertiary Education_{t-1}</i>	-.0060 (.0053)	-.0119*** (.0035)	-.0064* (.0038)	-.0235*** (.0054)	.0115 (.0160)	.0221 (.0138)
<i>Unemployment_{t-1}</i>	-.0095 (.0101)	.0142* (.0078)	-.0140* (.0074)	-.0084 (.0089)	.0763** (.0358)	.0077 (.0285)
<i>Female Employment_{t-1}</i>	-.0034 (.0073)	-.0048 (.0037)	-.0020 (.0034)	-.0136** (.0062)	.0281* (.0157)	.0068 (.0151)
<i>Financial Activities Employees_{t-1}</i>	-.0575*** (.0203)	-.0545*** (.0177)	-.0424** (.0187)	.0366 (.0235)	.1988** (.0990)	.1032 (.0871)
<i>Elderly people_{t-1}</i>	-.0380** (.0151)	-.0098 (.0120)	.0046 (.0114)	.0334** (.0139)	-.0296 (.0582)	-.0498 (.0476)
<i>SD</i>	-.0026 (.0060)	.0004 (.0028)	-.0083*** (.0027)	-.0080** (.0034)	.0383*** (.0130)	.0101 (.0094)
<i>CC</i>	-.0089* (.0051)	-.0086** (.0043)	.0006 (.0043)	.0040 (.0050)	-.0192 (.0230)	-.0117 (.0181)
<i>LIB</i>	-.0058 (.0044)	-.0049 (.0046)	.0033 (.0035)	-.0044 (.0053)	-.0189 (.0260)	.0075 (.0245)
<i>SE</i>	.0101*** (.0035)	.0014 (.0023)	.0039 (.0026)	-.0051 (.0033)	-.0158 (.0114)	-.0142 (.0097)
<i>constant</i>	-.0060 (.0272)	.0117 (.0163)	.0467*** (.0180)	.1735*** (.0216)	.3347*** (.0818)	.1212* (.0667)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
<i>Nr. of groups</i>	27	27	27	27	27	27
<i>N</i>	135	135	135	135	135	135
<i>Wald test p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00

Superscripts ***/**/* denote 10, 5, and 1 percent significance levels. Standard errors are reported in brackets.

The social expenditure effect is now measured for the different types of the EU welfare regimes.²⁸ On the whole, the data reject the hypothesis that the slopes of the several systems are equal. In fact, the estimated regressions show that the coefficient of the social expenditure may be significantly different from zero and hence have a different impact with respect to the excluded category.²⁹

Turning first to Table 12, during the pre-crisis years, social expenditure played a positive role in increasing the share of income held by the poorest for all the welfare regimes except the Southern European system. Indeed, although at a modest significance level, the slope of the Southern European system profile is negative. Concerning the second decile, only the Conservative-corporatist, the Liberal, and the Southern European profiles have an impact at considerable significance levels. The slope of the latter, however, is negative. As for the median class, only the social expenditure for the Social Democratic and Conservative-corporatist regimes has a statistically significant and positive impact. Government's social expenditure reduced the share of income held by the upper middle class (eighth decile) for all the regimes except the Social

²⁸ The regressions were also run over the 2000-2012 period (Table D.1, Appendix D). It can be noticed the positive impact of the social protection expenditure on the share of income held by the first and second decile for all the welfare regimes except the Southern European system; the positive impact for all the welfare regime types, except the Liberal and the Southern European, on the median part of the income distribution; the negative effect of the social protection expenditure on the eighth decile for the Eastern, Conservative-corporatist, Liberal and Southern European systems, and the positive one for the Social Democratic profile. As for the top of the income distribution, only the Southern European system has a statistically significant and positive impact, whereas the others do not have any significant effect. This evidence shows that social expenditure is regressive on behalf of the rich among the Southern European countries. It is progressive in the other welfare systems, where redistribution is supported by the upper-middle class. In the Liberal countries, redistribution is supported also by the median class. Finally, it is worth noting that in the Social Democratic countries, social protection has a modest but positive impact on the share of income held by the eighth decile.

²⁹ In the specified model, the Eastern countries are the excluded category.

Democratic and Southern European systems, whose slopes are significantly different from zero and positive. Concerning the top, as for the tenth decile, the slope of the Social Democratic, the Conservative-corporatist and Liberal profiles are statistically significant and negative; as for the hundredth percentile, they all are not significantly different from zero except the Social Democratic profile. This evidence shows that the social expenditure of the Social Democratic, the Conservative-corporatist and the Liberal countries is progressive on behalf of the poor during the pre-crisis years, whereas the Southern European regime is regressive on behalf of the upper-middle class.

Table 13 shows the estimated regressions run over the 2008-2012 period. The Social Democratic profile is progressive towards to the poor: social expenditure affects positively the share of income held by the first decile, the fifth decile and negatively those held by the eighth and tenth decile. This is the only group where redistribution affects negatively also the tenth decile. However, as for the top 1 percent, its slope is not statistically different from zero. The Conservative-corporatist profile has advantaged the top tail: social public expenditure affects positively the share of income held by the first decile, negatively that held by the eighth decile and positively the share held by the rich (tenth decile and hundredth percentile). This means that redistributive policies are supported by the upper-middle class. Finally, the slopes of the Liberal and Southern European profiles reveal that the social protection expenditure is ‘fully’ regressive on behalf of the top tail and to the detriment of the poor. In fact, it affects negatively the share of income held by the bottom, the median and the upper-middle class, whereas it has a positive effect on the share of income of the top tai

Conclusion

It is theoretically considered that the distribution of income is basically shaped by the country's macroeconomic performance, the state of household income inequality and the government's commitment to reduce the gap between the rich and the poor via social expenditure policies. This paper shows these are the core determinants of the income distribution of the European Union countries. This hypothesis was tested using panel data regression analysis which assesses their short-term effects on the bottom part and the top tail of income distribution. The higher the standard of living of a country, the higher the share of income held by the poor. The higher the level of income disparity, the greater the concentration of income among the rich (upper tail). The higher the government's social expenditure, the higher the share of income held by the poor (lower tail).

Then, the effect of the Great Recession and the related break is shown. Specifically, compared to the 2000-2007 period, during the crisis years, the macroeconomic performance has lost its equalizing effect; the impact on the income distribution of the level of income disparity has worsened; the social public expenditure is found to be regressive on behalf of the top tail of the distribution. Consequently, *ceteris paribus*, the Great Recession has increased the gap between poor households and rich households that are the favoured class.

In terms of the governments' commitment to reduce this gap via social expenditure policies, differences among the different welfare regimes of the European Union and over time can be found. In fact, social public expenditure is progressive for all the welfare systems profiles (where, however, the redistribution is supported by the upper-middle class) except the Southern European regime that it is regressive on behalf of the top tail and to the detriment of the bottom of the income distribution.

Furthermore, during the crisis years, the public commitment towards social expenditure of both the Liberal and Southern European regimes has been 'fully' regressive.

On the whole, after the recent macroeconomic events the public commitment in reducing inequality has been ineffective or (worse) has increased the gap between less and more favoured households. Consequently, this evidence may indicate the direction of the appropriate policy measures to control the extent of income disparity and the related gap between the poor and the rich, which is a declared target for effective cohesion among all the citizens of the European Union.

Appendix A

Table A.1 - Dependent variables: descriptive statistics; 'balanced' series

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Observations</i>
First decile					
Overall	3.1611	.7081	1.3	4.2	N = 351
Between		.6548	2.0076	4.0846	Countries = 27
Within		.2955	1.4918	3.8918	Time periods = 13
Second decile					
Overall	5.1135	.6921	3.6	6.2	N = 351
Between		.6736	3.8076	6	Countries = 27
Within		.2018	4.4827	5.6058	Time periods = 13
Fifth decile					
Overall	8.2151	.4587	7	9.2	N = 351
Between		.4275	7.3692	8.9692	Countries = 27
Within		.1841	7.6766	9.0920	Time periods = 13
Eighth decile					
Overall	12.1434	.3304	11	13.2	N = 351
Between		.2831	11.7	12.6384	Countries = 27
Within		.1783	11.0819	12.7049	Time periods = 13
Tenth decile					
Overall	23.501	2.5199	19	30.3	N = 351
Between		2.3465	19.5153	28.4615	Countries = 27
Within		1.0161	20.1163	28.2548	Time periods = 13
Hundredth percentile					
Overall	4.9282	.91603	3	7.8	N = 351
Between		.7207	3.2923	6.3615	Countries = 27
Within		.5808	3.3897	7.7820	Time periods = 13

Table A.2 - Independent variables: descriptive statistics; 'balanced' series

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min.</i>	<i>Max</i>	<i>Observations</i>
(ln) GDP per head					
<i>Overall</i>	10.0642	.4508	8.8302	11.2121	N = 351
<i>Between</i>		.4457	9.1564	11.1136	Countries = 27
<i>Within</i>		.1065	9.6710	10.3517	Time periods = 13
Gini Index					
<i>Overall</i>	29.2666	4.0380	22	39.2	N = 351
<i>Between</i>		3.7765	23	36.2923	Countries = 27
<i>Within</i>		1.5916	23.2974	36.1435	Time periods = 13
Social Protection Expenditure					
<i>Overall</i>	16.1906	4.1293	7.9	25.3	N = 351
<i>Between</i>		3.9281	10.0923	23.6461	Countries = 27
<i>Within</i>		1.4666	12.4906	21.1367	Time periods = 13
Housing Owner					
<i>Overall</i>	58.5484	10.5399	42	91	N = 351
<i>Between</i>		10.3414	44.9076	86.2153	Countries = 27
<i>Within</i>		2.7950	49.4099	68.6292	Time periods = 13
People jobless hh					
<i>Overall</i>	9.5242	2.5435	4.4	17.7	N = 351
<i>Between</i>		2.0847	5.4538	13.4538	Countries = 27
<i>Within</i>		1.5074	5.0703	17.0934	Time periods = 13
Tertiary Education					
<i>Overall</i>	23.6769	8.2138	5.4	42.4	N = 351
<i>Between</i>		7.5954	11.7384	35.5	Countries = 27
<i>Within</i>		3.4284	11.5076	36.9769	Time periods = 13
Unemployment					
<i>Overall</i>	8.1102	4.0900	1.7	24.5	N = 351
<i>Between</i>		3.1255	3.2615	14.5153	Countries = 27
<i>Within</i>		2.7008	.6256	20.8410	Time periods = 13

<i>Female employment</i>	Overall	61.5561	8.7070	32.7	77.2	N = 351
	Between		8.4581	37.4923	76.1384	Countries = 27
	Within		2.5934	53.0792	70.8638	Time periods = 13
<i>Financial activities employees</i>	Overall	3.1418	2.0253	.8767657	13.37006	N = 351
	Between		2.0346	1.207865	11.70768	Countries = 27
	Within		.3227	1.646888	4.804177	Time periods = 13
<i>Elderly people</i>	Overall	15.7139	2.3293	10.2287	21.1009	N = 351
	Between		2.2378	10.9581	19.6421	Countries = 27
	Within		.7677	12.9296	18.0391	Time periods = 13

Appendix B

Table B.1 - *POLS regressions. General model estimation. Unbalanced sample.*

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	.5085* (.2720)	.6471*** (.1663)	.2538* (.1427)	-.2140*** (.1492)	-1.8769*** (.7003)	-.8622* (.4837)
<i>Gini_{t-1}</i>	-.0958*** (.0125)	-.1055*** (.0087)	-.0753*** (.0075)	.0207*** (.0070)	.4174*** (.0370)	.0912*** (.0231)
<i>Social Protection Expenditure_{t-1}</i>	.0230 (.0191)	.0198** (.0095)	.0148 (.0097)	-.0317*** (.0107)	.0009 (.0486)	.0251 (.0331)
<i>Owner_{t-1}</i>	.0055 (.0035)	.0008 (.0023)	.0018 (.0025)	-.0065** (.0026)	.0086 (.0131)	.0103 (.0091)
<i>People jobless hh_{t-1}</i>	-.0103 (.0313)	-.0090 (.0184)	.0120 (.0179)	.0097 (.0228)	-.0566 (.1036)	.0396 (.0790)
<i>Tertiary Education_{t-1}</i>	-.00673 (.0052)	-.0079** (.0031)	.0043 (.0034)	.0211*** (.0044)	-.0356** (.0166)	-.0114 (.0126)
<i>Unemployment_{t-1}</i>	-.0314** (.0156)	-.0018 (.0101)	-.0061 (.0082)	-.0028 (.0115)	.0541 (.0529)	-.0177 (.0416)
<i>Female Employment_{t-1}</i>	.0045 (.0062)	.0005 (.0042)	-.0112*** (.0040)	-.0225*** (.0053)	.0731*** (.0210)	.0383** (.0151)
<i>Financial Activities Employees_{t-1}</i>	-.0795*** (.0282)	-.0624*** (.0175)	-.0286* (.0148)	.0207 (.0154)	.1743** (.0753)	.0486 (.0530)
<i>Elderly people_{t-1}</i>	-.0945*** (.0177)	-.0459*** (.0134)	.0033 (.0112)	.0460*** (.0123)	.0326 (.0618)	-.0309 (.0381)
<i>SD</i>	-.0043** (.0021)	-.0008 (.0013)	-.0000 (.0011)	.0003 (.0012)	.0056 (.0069)	.0063 (.0044)
<i>CC</i>	-.0003 (.0016)	-.0020* (.0010)	-.0020** (.0009)	-.0008 (.0011)	.0124** (.0055)	.0079** (.0035)
<i>LIB</i>	-.0028 (.0023)	-.0033** (.0016)	-.0020 (.0015)	-.0006 (.0012)	.0187** (.0078)	.0136** (.0052)
<i>SE</i>	-.0019* (.0011)	-.0029*** (.0008)	-.0014** (.0007)	-.0006 (.0007)	.0126*** (.0035)	.0083*** (.0023)
<i>constant</i>	.0219 (.0281)	.0267 (.0174)	.0820*** (.0152)	.1464*** (.0164)	.2406*** (.0745)	.0723 (.0520)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27
N	208	208	208	208	208	197
F test p-value	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.6975	0.8957	0.7686	0.5529	0.8044	0.4017

Table B.2 - POLS regressions. General model estimation. Balanced sample.

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8thdecile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	1.0130*** (.2018)	1.0878*** (.1416)	.4527*** (.0935)	-.2753*** (.1001)	-3.2510*** (.4853)	-1.2039*** (.2967)
<i>Gini_{t-1}</i>	-.0870*** (.0082)	-.0981*** (.0064)	-.0777*** (.0053)	.0149*** (.0049)	.4200*** (.0278)	.0954*** (.0139)
<i>Social Protection Expenditure_{t-1}</i>	.0165 (.0156)	.0161* (.0097)	.0165** (.0076)	-.0205*** (.0072)	-.0221 (.0389)	.0043 (.0216)
<i>Owner_{t-1}</i>	.0050* (.0029)	.00040 (.0022)	-.0018 (.0019)	-.0025 (.0018)	-.0036 (.0097)	-.0015 (.0053)
<i>People jobless hh_{t-1}</i>	.0017 (.0238)	-.0063 (.0145)	.0090 (.0119)	.0045 (.0154)	-.0211 (.0696)	.0460 (.0479)
<i>Tertiary Education_{t-1}</i>	-.0016 (.0044)	-.0028 (.0033)	.0037 (.0029)	.0142*** (.0031)	-.0362** (.0147)	-.0137* (.0082)
<i>Unemployment_{t-1}</i>	-.0354*** (.0099)	-.0048 (.0078)	-.0056 (.0058)	.0023 (.0076)	.0445 (.0362)	-.0063 (.0220)
<i>Female Employment_{t-1}</i>	-.0021 (.0051)	-.0047 (.0035)	-.0094*** (.0026)	-.0168*** (.0037)	.0753*** (.0155)	.0357*** (.0105)
<i>Financial Activities Employees_{t-1}</i>	-.1172*** (.0200)	-.0936*** (.0146)	-.0493*** (.0107)	.0202* (.0108)	.3209*** (.0540)	.1361*** (.0373)
<i>Elderly people_{t-1}</i>	-.0847*** (.0133)	-.0439*** (.0103)	-.0044 (.0087)	.0344*** (.0096)	.0714 (.0487)	.0048 (.0300)
<i>SD</i>	-.0055*** (.0016)	-.0023** (.0010)	-.0007 (.0008)	.0013 (.0009)	.0075 (.0047)	.0058* (.0030)
<i>CC</i>	-.00160 (.0012)	-.0038*** (.0010)	-.0023*** (.0006)	-.0000 (.0008)	.0145*** (.0040)	.0068*** (.0024)
<i>LIB</i>	-.0052*** (.0017)	-.0056*** (.0013)	-.0023** (.0010)	.0004 (.0010)	.0196*** (.0055)	.0131*** (.0034)
<i>SE</i>	-.0028*** (.0010)	-.0040*** (.0007)	-.0011** (.0005)	.0004 (.0006)	.0120*** (.0028)	.0067*** (.0018)
<i>constant</i>	-.0273 (.0213)	-.0158 (.0155)	.0628*** (.0099)	.1491*** (.0108)	.3797*** (.0534)	.1120*** (.0318)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27
N	324	324	324	324	324	324
F test p-value	0.00	0.00	0.00	0.00	0.00	0.00
R-squared	0.7231	0.8703	0.8075	0.4883	0.8242	0.4271

Appendix C

Table C.1 - GLS regressions: general model. Unbalanced Sample.

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	.7437*** (.1998)	.7079*** (.1347)	.3721*** (.1166)	-.0633 (.1473)	-1.8295*** (.5125)	-1.0322** (.4466)
<i>Gini_{t-1}</i>	-.0553*** (.0087)	-.0833*** (.0065)	-.0686*** (.0060)	.0147*** (.0055)	.3812*** (.0318)	.0585*** (.0210)
<i>Social Protection Expenditure_{t-1}</i>	.0632*** (.0110)	.0241*** (.0078)	.0188** (.0084)	-.0180** (.0090)	-.0468 (.0438)	-.0307 (.0310)
<i>Owner_{t-1}</i>	.0116*** (.0031)	.0001 (.0024)	.0054** (.0021)	-.0031 (.0025)	.0092 (.0097)	.0018 (.0079)
<i>People jobless hh_{t-1}</i>	-.0430** (.0207)	.0019 (.0141)	.0032 (.0140)	-.0029 (.0161)	-.0056 (.0652)	.1315** (.0581)
<i>Tertiary Education_{t-1}</i>	-.0029 (.0044)	-.0057* (.0031)	.0046 (.0032)	.0239*** (.0039)	-.0493*** (.0156)	-.0297** (.0126)
<i>Unemployment_{t-1}</i>	-.0259** (.0105)	-.0102 (.0075)	-.0008 (.0063)	-.0015 (.0081)	.0451 (.0315)	-.0460* (.0250)
<i>Female Employment_{t-1}</i>	-.0013 (.0078)	-.0032 (.0040)	-.0114*** (.0037)	-.0164*** (.0062)	.0863*** (.0162)	.0601*** (.0155)
<i>Financial Activities Employees_{t-1}</i>	-.1024*** (.0199)	-.0730*** (.0176)	-.0448*** (.0129)	.0068 (.0165)	.2539*** (.0652)	.0892* (.0529)
<i>Elderly people_{t-1}</i>	-.1023*** (.0182)	-.0706*** (.0125)	.0000 (.0095)	.0315** (.0131)	.0997* (.0545)	-.0184 (.0340)
<i>SD</i>	-.0047*** (.0011)	-.0002 (.0010)	-.0010 (.0009)	-.0032** (.0013)	.0069 (.0051)	.0097*** (.0036)
<i>CC</i>	-.0019** (.0009)	-.0021** (.0008)	-.0018** (.0008)	-.0021** (.0010)	.0077** (.0038)	.0091*** (.0034)
<i>LIB</i>	-.0047*** (.0015)	-.0053*** (.0014)	-.0019* (.0010)	-.0024** (.0011)	.0200*** (.0051)	.0131*** (.0039)
<i>SE</i>	-.0054*** (.0014)	-.0041*** (.0007)	-.0014** (.0006)	.0004 (.0013)	.0122*** (.0028)	.0119*** (.0023)
<i>constant</i>	-.0106 (.0223)	.0204 (.0144)	.0658*** (.0119)	.1287*** (.0147)	.2305*** (.0512)	.0954* (.0490)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
Nr. of groups	27	27	27	27	27	27
N	208	208	208	208	208	197
Wald test p-value	0.00	0.00	0.00	0.00	0.00	0.00

Appendix D

Table D.1 - GLS regressions.

Social protection expenditure and institutional systems

	<i>1st decile</i>	<i>2nd decile</i>	<i>5th decile</i>	<i>8th decile</i>	<i>10th decile</i>	<i>100th percentile</i>
<i>GDP per head_{t-1}</i>	1.3495*** (.1689)	1.2770*** (.1226)	.6168*** (.0969)	-.1996* (.1148)	-4.1464*** (.5550)	-1.4282*** (.3558)
<i>Gini_{t-1}</i>	-.0378*** (.0082)	-.0542*** (.0059)	-.0603*** (.0048)	.0176*** (.0046)	.3192*** (.0283)	.0420** (.0175)
<i>Social Protection Expenditure_{t-1}</i>	.0553*** (.0140)	.0328*** (.0116)	.0219*** (.0100)	-.0300*** (.0092)	-.0733 (.0592)	-.0128 (.0378)
<i>Social Protection Expenditure_{t-1}* SD</i>	.0156 (.0257)	.0031 (.0129)	.0340*** (.0125)	.0356** (.0144)	-.0602 (.0712)	-.0475 (.0509)
<i>Social Protection Expenditure_{t-1}* CC</i>	.0173 (.0272)	.0460* (.0237)	.0503** (.0230)	-.0041 (.0217)	-.1488 (.1241)	.1237 (.0773)
<i>Social Protection Expenditure_{t-1}* LIB</i>	.0246 (.0258)	.0639*** (.0210)	-.0608*** (.0233)	.0005 (.0246)	.1340 (.1010)	.0010 (.0880)
<i>Social Protection Expenditure_{t-1}* SE</i>	-.0930*** (.0232)	-.0519*** (.0173)	-.0376*** (.0145)	.0175 (.0200)	.2644*** (.0809)	.1359*** (.0495)
<i>Owner_{t-1}</i>	.0094*** (.0031)	.0050** (.0023)	.0016 (.0018)	-.0047** (.0020)	.0039 (.0098)	.0010 (.0069)
<i>People jobless hh_{t-1}</i>	-.0402** (.0196)	-.0098 (.0139)	.0293** (.0120)	.0238** (.0120)	-.1968*** (.0685)	.0270 (.0469)
<i>Tertiary Education_{t-1}</i>	-.0060 (.0044)	-.0086** (.0034)	.0015 (.0029)	.0061** (.0026)	-.0134 (.0161)	-.0053 (.0106)
<i>Unemployment_{t-1}</i>	-.0139 (.0095)	-.0115 (.0075)	-.0122** (.0059)	-.0043 (.0065)	.1194*** (.0339)	.0022 (.0227)
<i>Female Employment_{t-1}</i>	-.0119** (.0057)	-.0146*** (.0036)	-.0096*** (.0026)	-.0063 (.0040)	.0747*** (.0158)	.0477*** (.0109)
<i>Financial Activities Employees_{t-1}</i>	-.1318*** (.0204)	-.0926*** (.0165)	-.0425*** (.0130)	.0112 (.0179)	.3246*** (.0738)	.2167*** (.0584)
<i>Elderly people_{t-1}</i>	-.0744*** (.0184)	-.0451*** (.0133)	-.0001 (.0102)	.0086 (.0131)	.0805 (.0559)	.0511 (.0381)
<i>SD</i>	-.0078 (.0050)	-.0022 (.0026)	-.0086*** (.0024)	-.0065** (.0027)	.0280** (.0136)	.0158* (.0095)
<i>CC</i>	-.0077 (.0057)	-.0150*** (.0049)	-.0139*** (.0047)	.0015 (.0045)	.0527** (.0255)	-.0198 (.0159)
<i>LIB</i>	-.0099** (.0041)	-.0167*** (.0033)	.0046 (.0037)	-.0006 (.0036)	.0135 (.0155)	.0139 (.0132)
<i>SE</i>	.0073** (.0033)	.0001 (.0025)	.0037* (.0020)	-.0012 (.0028)	-.0225* (.0115)	-.0118 (.0074)
<i>constant</i>	-.0742*** (.0184)	-.0431*** (.0131)	.0403*** (.0099)	.1429*** (.0124)	.4959*** (.0586)	.1281*** (.0371)
<i>Time dummies</i>	yes	yes	yes	yes	yes	yes
<i>Nr. of groups</i>	27	27	27	27	27	27
<i>N</i>	324	324	324	324	324	324
<i>Wald test p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00

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