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Giuseppina Malerba, Istituto di Politica Economica, Università Cattolica del Sacro Cuore, Milano

Marta Spreafico, Istituto di Politica Economica, Università Cattolica del Sacro Cuore, Milano

✉ giuseppina.malerba@unicatt.it

✉ marta.spreafico@unicatt.it

I quaderni possono essere richiesti a:
Istituto di Politica Economica, Università Cattolica del Sacro Cuore
Largo Gemelli 1 – 20123 Milano – Tel. 02-7234.2921

✉ ist.politicaeconomica@unicatt.it

www.vitaepensiero.it

ISBN 978-88-343-2553-7

Abstract

Understanding the reasons underlying income inequality has generated considerable interest in the last years and various theoretical analyses have been developed to explain international differences in income distribution between groups of countries at different stages of economic development. However, structural investigations of the contemporary effects of the forces shaping the evolution of income inequality are difficult to find. Moreover, little attention has been given to the increasing inequality merelyamongadvanced economies. For these reasons, we develop a theoretical framework to provide a comprehensive analysis of the factors affecting income distribution in a particular set of advanced economies, the European Union countries, and utilize a fifteen year panel of 25 countries to identify the short term effects of several considerable determinants of household income inequality. On the basis of the main findings, we conclude providing some policy indications.

JEL: C33, D31, I31, I32, I38.
Key words:Household disposable income distribution, European Union, structural determinants, panel models.

Introduction

After a period wherein redistribution as a topic of research has been somehow neglected, the inequality increase in many advanced countries has led the economists in the last two decades to care again about this issue. Thus, a new debate on the correct measures and the main determinants of income inequality has been raised, and Atkinson (1997) can be seen as the manifesto of this renew.

In literature, there is a very large amount of analyses on inequality in labour incomes, where the attention is on individual wage variability by sectors, skills, professions and labour institutions (among others, Koeninger et al., 2007; Atkinson, 2008); fewer works focus on the variability of factor shares (labour and capital) of total income and the consequent inequality in rewards of different factors (as in Bentolila and Saint-Paul, 2003). Other studies, the most interesting for our analysis, deal with inequality in disposable incomes, formed by different labour incomes, government transfers (financed by taxations) and other forms of incomes (mainly, rents, interests on financial investments, dividends), where demographic, institutional, political, and social factorsshow their relevance.

Along these lines, our focus is on the definition of *household* disposable income inequality and on its determinants. We are explicitly considering households, not individuals, since the observation points of disposable income distribution and the concept of inequality are referred not only to the individual earnings dispersion, as implicitly assumed in many analyses in literature, but to income of any sources.

More specifically, our aim is to analyse the forces that shape inequality in household disposable income across the European Union, a particular sample of developed countries, which share a set of institutions, economic policy targets and social issues. Our approach differs from the various international comparative studies, since they include only some European countries as a subset of the OECD countries (among others, Atkinson et al., 2005; Forster and d'Ercole, 2005; OECD, 2011), or as a part of the distribution of income across the world (for example, Deininger and Squire, 1996;

Barro, 2000), or, again, as part of specific issues on poverty or social inclusion (for instance, Chen and Corak (2005) is concerned with child poverty; Jenkins and Van Kerm (2006) with social mobility). A set of recent papers focuses 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, namely the US (among others, BonesmoFredriksen, 2012; Dauderstadt and Kelmtek, 2011; Brandolini, 2007). Unlike these works,our analysis, starting with the basic assumption that the process of social cohesion is not completely fulfilled, stresses that it is worth studying income distribution for each European country, given their strong differences in terms of national "institutional" arrangements.

The relevance of income distribution in the European Union (EU from now on) is due to its social and political implications, especially after the 2004 and 2007 enlargements and the consequent entrance of countries with average levels of income well below those of the EU-15. As a consequence, the EU has become more heterogeneous. Such differences matter for the Union political goals to raise the standard of living and the quality of life of all citizens, and promote economic and social cohesion throughout the Union itself. Purposes that, first, have been stressed in the "Lisbon Agenda" and, then, reiterated, along with the relative strategies, in the "Europa 2020" program. The evolution of income inequality among different countries is a phenomenon that the EU has decided to monitor with particular emphasis. In fact, wide differences across countries in income distribution, degrees of inequality, taxation schemes, labour market structures and regulations must be taken into account and carefully supervised in the process towards fiscal unification (a long-run objective often declared by many European politicians), if the EU institutions intend to avoid undesirable results about the standard of living of European citizens.

The literature lacks a thorough and comprehensive analysis of all the potential forces affecting the evolution of household disposable income inequality in EU, since some recent studies including institutional views of the determinants of inequalities in Europe are

concentrated on individual earnings dispersion (i.e., Beher and Potter, 2010) or on the specific issue of the integration process dynamics (as in Bertola, 2010).
A specific attention to household perspective is worthwhile for European institutions and policies, given the recent weakening of traditional welfare States, the changes in family structure and the cultural evolution of the relationships between family members and generations. For these reasons, our work includes a broad set of determinants of income inequality, such as macroeconomic, institutional, cultural and social factors, and at the same time emphasizes the role of redistributive effects, due to public expenditure,which are more relevant for a wider comprehension of the dimensions affecting household disposable income inequality and for a more precise targeting of the cohesion of policy measures for European countries. Growing income inequality is knownto lead to economic, political and social problems, such as increased (relative or absolute) poverty, greater inequalities of income and wealth in subsequent generations, the weakening of social cohesion, and slower economic growth in the long run. Our hypothesis is that a household perspective, explicitly modelled in a wider frame,can be enlightening and can reinforce many of the above results for the specific set of EU countries.
The paper is organized as follows. In section 2, guided by the literature results, we provide a theoretical analysis of the main economic, social and institutional causes of household income inequality and discuss their expected results for the EU countries. Section 3 presents the specification of the model andthe variables used,and provides some descriptive statistics. Section 4 discusses the econometric results. Section 5 concludes the study and offers some policy indications.

1. *Structural, social and institutional determinants of inequalities in household income distribution*

To explain international differences in income distribution, various theories have been developed and several empirical analyses have

been done to test their relevance. Our study on European countries relies on these theories and analyses, which provide the "guide lines" to define a theoretical framework able to depict the numerous issues affecting inequality and define the empirical strategy to check their importance.
In the literature debate, the first line emphasises the impact of macroeconomic performance, in particular of economic growth, as a determinant of inequalities in (individual labour) income. A second trend underlines the role of structural determinants such as the composition of employment (by sector, qualification and education, mainly due to technological changes); the demographic characteristics of population (and, in fewer cases, households); and the relevance of sociological, political and cultural constraints in class and intergenerational mobility. A third line stresses the role of redistributive policy instruments, different welfare state regimes in general, or specific policy systems and collective choices. Each welfare state regime can be related to a particular income distribution, which depends on the incidence of redistributive programmes and the amount of public expenditure, which in turn are the results of more or less equalitarian choices and political preferences of the national electorate. Finally, few studies concentrate on the role of institutions, with particular emphasis on the degree of democracy in less developed countries or on the relevance of economic freedoms in more advanced countries (for example, Alesina and Perotti, 1996).

On the whole, all these research lines allow identifying the forces shaping income inequality in Europe. Formally, our theoretical paradigm can be expressed as:

$$IE = f(ECON, STRUCT, EXP, INST, RES) \quad \textbf{(1)}$$

where IE, the (chosen) measure of income InEquality, depends on ECONomic measures of the macroeconomic performance; on STRUCTural variables concerning the labour market, the population, the household structure; on public EXPenditure for social and

redistributive proposals to individuals and families; on the INSTitutions that can guarantee more or less economic freedoms in the markets and equal opportunity to citizens; and on other RESidual factors, which can be specific of each country and over time.

1.1. MacroECONomic performance

Economic growth is the most traditional macroeconomic determinant of inequality, following the theoretical and empirical literatureand, more recently, also the globalization effects on world competition are considered in many analyses, given the unsatisfactory results[1] of the previous approaches to explain the increase of inequality in advanced countries.

The more cited contributions in literature, starting from the seminal study of Kuznets (1955), concentrate on the relationship between inequality and growth in the long run. On this basis, it is supposed that, in the initial stages of the development process, the link should be positive and, at a later stage, with further developments of the economy, the link itself could become negative. This formulation implies that a change in inequality should be the result of the expansion of a high income modern sector of the economy at the expense of a low income traditional one.

The literature presents arguments in favour and others against all these conclusions with respect to the inevitability of the development

[1] The more recent debate in the empirical literature seems to underline that, in general, the link between growth and inequality depends strongly on the length of time horizon, on the quality and homogeneity of disposable data on inequality measures (Atkinson and Brandolini, 2009) and on the use of panels instead of cross-country techniques (Forster, 2000) in the econometric analysis. A recent study investigating cross-country links between the rate of growth and inequality concludes that among developed countries growth could be even distributional neutral on average (Ravallion, 2004); it is not growth per se that affects inequality but the way in which growth is produced and what are the specific effects in each country. Others analyses (Bourguignon, 2005) remark the relevance of structural, cultural and institutional characteristics of each country in conditioning the specific effects of growth on income inequality.

process (Atkinson, 2001) and to the direct causation emerging from the inverted-U Kuznets curve (Ravaillon and Chen, 1997). In many panel data analyses, the impact of growth on inequality is weak or not significant (Frazer, 2006), while some researches (Cornia and Court, 2001) find a U shaped relation between growth and inequality by using a hypothesis different from the Kuznets study. There is an "efficient inequality range" so that very low and very high degrees of inequality tend to slow growth, while inequalities in the middle range represent a more favourable environment for economic development.
This interpretation deserves attention in our analysissince it is well known that in EU there is a first group of countries (especially, the Nordic) with low income inequality, a second group (mainly, the Mediterranean countries) with high inequality and a third group with a medium level of inequality. More recent statistics seem to show that the New Member countries belong to each of the previous groups and this means that there is not a strong concentration of these countries on the middle range regime favouring economic development.Nevertheless, even if common institutions are working to reduce the gap in macroeconomic growth between more and less dynamic countries, it is plausible that the EU enlargement may have modified both the intensity of the link growth-inequalityalong time and the weight of the between and within country differences in income inequality.
Policies aimed to reduce those gaps in economic performances and to enlarge social cohesion among new and old member countries have been traditionally used by EU institutions;however, the structural differences remain relevant. This relevance can justify an analysis of the determinants of income inequality that includes a wide set of other factors, together with the macroeconomic ones, as we are going to develop in our model. Moreover, the mechanisms underlying the link between growth and income distribution need to be clarified further for a set of countries where national redistributive policies are relevant, paying particular attention on the role of various institutions transferring macroeconomic growth to social developments and, via the social interrelationships, to individual and family well-beings.

The aim of our study is along this perspective, since we want to analyse income distribution in European Union and we are considering the impact of macroeconomic performance on (earning) inequality as part of a model, where structural, social and institutional variables are also included, in line with the set of literature on the so-called augmented Kuznets hypothesis (Milanovic, 1994). We expect, as in the mainstream analysis on developed countries, a negative (perhaps not very strong but significant) link between growth and income inequalities, mainly via inequality of (individual) earnings between sectors of the economy. Earning dispersion depends, directly, on differences in productivity dynamics and/or, indirectly, on employment adjustments (which could be related, broadly speaking, to education attainments, to public expenditure and to social mobility). Productivity growth effects are expected to be more relevant among the EU new entrants, mainly Eastern countries, where the technological catching up has continued during the more recent years. In addition, the employment dynamics can be linked, for all the countries, to other structural variables related to demographic and household characteristics, education achievements and labour markets institutions as well as macroeconomic growth.

To complete this section, it is worth noting that many models in literature include the degree of openness of the economy among the macroeconomic determinants of inequality. However, by using different indices of openness, the main results about developed countries are ambiguous in understanding the links between growth, globalisation and inequality. Moreover, in most of the analyses about Europe, the relationships are not clear and strong, probably because the discrepancies in the degree of openness are not so large and tend to follow common time paths related to the degree of development and economic growth (a recent survey for OECD countries is in Chusseau et al., 2008 and in OECD, 2011). Given this evidence, we treat the specific effects of globalisation, not explained by growth, in the set of RESidual determinants.

Empirically (Section 4),to get a better insight of the impact of macroeconomic performance on income distribution, we evaluate the

hypothesis of different intensity of the link growth-inequality analyzing separately the model for the set of countries with a higher rate of growth; then, we study theimpact of the productivity growth effectsfor the EU new entrants,running a separate regression for the set of "Western" (older) countries[2]; finally, we compare the growth estimated coefficientson different measures of inequality.

1.2. STRUCTural changes

After having discussed the impact of macroeconomic performance, we complete the previous analysis by considering the role of structural changes on inequality. To do this, we follow three steps.First (section 2.2.1), we further study the link development-inequality, which can explain earnings dispersion, by including explicitly structural effects on *individual earning* inequality. Second (section 2.2.2), we introduce additional evidence from the theoretical and empirical debate about structural changes, which can explain *household labour income* distribution, instead of individual earnings dispersion. Finally, (section 2.2.3), we concentrate on those structural changes that are crucial for what is our main interest of research, which is *household total income* inequality. The focus is on the impact of structural changes on inequality of incomes of any source, not only labour income as in the previous sections.

1.2.1. Structural determinants of individual earnings inequality

Growth (and globalisation) might have distributional consequences and one channel is the process of skill-biased technological change, which can impact on between-group earning differentials. A common argument is that earnings inequality increase in the developed countries is a result of technological change that tends to raise the productivity of higher educated people; the consequence of higher productivity may be wage premium for education, which tends to raise more if there is a shortage of educated people in the

[2] The new EU members are the countries that joined the Union in 2004 and 2007.

short run (for a review, see Aghion et al. 1999 or Gottschalk and Smeeding 1997). Sudden technological changes might also change the steepness of the age-earning profile, if the education of younger people may be more adapted to the requirements of new technologies than the skills of older workers. The labour demand will increase more for the younger educated people and less for older workers, which will result in a less steep age-earning profile. This effect, hence, may compensate the impact of the experience gained on the job, which in turn tends to favour the older workers than the younger ones in terms of labour income distribution.

Along this debate, the effects of technological changes on cross-country (earning) inequality could be not homogeneous as they are related to structural characteristics of each economy. In particular, this *between* countries variability is produced by (i) different combinations of shares of young and mature people in the demographic structure; (ii) labour market related institutional characteristics that can have different impact on technological changes on employment and earning profiles and (iii) education levels that can introduce more or less shortage of skilled people. Hence, national structural changes in the demographic composition of labour force, in employment by sectors of the economyand in education attainments of working age population[3] can produce different impact on earning inequality between countries and, as a result, on total income distribution in Europe.

1.2.2. Determinants of household labour market inequality

Once considered the effects of structural change on individual earning dispersion, it is important to consider such effects on household labour income inequality. More specifically, as inequality indices are typically related to household disposable income, it is

[3] The employment determinants are more extensively considered in the next sub-paragraph, while the link between education attainments and inequality is analysed in the following paragraphs (2.3 and 2.4). The structural composition of the population and labour force are never significant in our model and thus are neglected.

necessary to focus on the household structure and, because of this, the individual earnings dispersion has to be transformed, first, in household labour market inequality and, then, in household total income inequality.

The most relevant transformation in European labour market in the last decades has been the increase of employment, due mainly to a raise in female participation. This evolution of female labour force is strongly related to changes in household structure. Consequently, the analysis of structural determinants on inequality requiresto move from the individual perspective towards a household one. For instance, a given employment increase could reduce inequality among individuals in each country, since it increases the number of those with labour income and reduces the jobless. But the impact of the employment raise on cross-country distribution of household labour income is more ambiguous to evaluate, as we need to consider the family compositions (i.e., the number of dependents and/or jobless) and the different correlations between earnings (price-effect) and employment (quantity-effect) of household members in working age, which again can produce different degrees of concentration of labour incomes in households with specific characteristics. Employment increases (mainly due to female participation in many EU countries) can have direct positive effects in reducing disposable income inequality if they tend to reduce the proportion of those living in jobless households, and therefore they contribute to a more equitable distribution of labour income between households. Moreover, if employment increases are concentrated in particular high skilled sectors and favour higher educated people, they can contribute indirectly to raise (earning) inequality between households, via educational premium, especially in societies with less social and professional mobility, and where the family background is particularly relevant.

Consequently, it is worthwhile to focus on structural effects that are more pertinent to a deeper understanding of household labour income inequality instead of individual earnings dispersion. Some analysis of the European Observatory on the Social Situation and Demography (a summary of four years researches of the SSO is

presented in Ward et al., 2009), based on static decompositions measures of income inequality, show that education of the household head is the most important structural factor in explaining income inequality among European countries and that both households structure and education explain the highest proportion of total inequality in countries where the effect of education are the strongest ones.Given these results, the education and the related employment status of the household head lead (individual) earnings dispersion to household earnings inequality[4], since they can be used as a good proxy of the household labour involvement. Household labour inequality can be explained as well by the inclusion of total hours worked by all the members of the households (labour intensity)[5] instead of using information only on household head characteristics. Labour intensity is expected, following the literature, to increase income inequality and is strongly dependent on household composition, since it is higher in households with more (educated) working age members and fewer dependents (young children) or other jobless components. Labour income differences arise according to the number of very young children in families with a working age household head, since this particular family composition can condition the participation of one parent in the labour force[6] and reduces labour intensity. But parents' labour supply is in turn depending on labour market arrangements, the effectiveness of conciliation policies and the availability of public care services.
Therefore, for a better understanding of the relationship between labour intensity and inequality, it is important to investigate how the

[4] Men's earning dispersion is the main determinant driving household labour income inequality in 23 OECD (18 European) countries from mid-1980s to mid-2000s, contributing between one-third to one-half of the overall increase (OECD, 2011).
[5] We do not have enough data to determine measures of labour intensity for all the countries and for the whole period and for this reason we cannot include such a variable in our panel.
[6] A recent analysis for OECD countries shows that the inclusion in the labour force of part-time workers, who are relevant in EU as they are typically mothers of young children, contributed to increase earnings distribution dispersion since part-timers are more concentrated in low paid jobs and have less career development prospects (OECD, 2011; Sandor, 2011).

employment transformations affect the distribution of labour income among households. Some analyses show the presence of employment polarisation effects on the distribution of (labour) income (Redmond and Kattuman, 2001) due to the evidence that the distribution of employed people among households is becoming more unequal. Both an increase in the proportion of jobless households and of households with multiple workers can be found. There is international evidence that changes in family formation rather than demographic ones can influence income inequality (Harkness, 2010). The increase, on one side, of the share of single-parent families combined with a rising relevance, and on the other, of the so called "assortative mating" hypothesis (high correlation of income and social status between partners in couples) have produced a higher inequality that may compensate the equalising impact of women's employment increase (OECD, 2011). There is evidence that employment rates increase more among wives of men in the top rather than in the bottom earnings deciles and that those spouses do not earn lower wages than those of low-earning husbands. Hence, the employment polarisation effect can increase household income inequality via a higher concentration of labour incomes at the top decile of the distribution.

Good statistics to estimate (across countries and over time) such hypotheses of employment polarisation on one side, and of assortative mating on the other, are hard to find. We then concentrate on the household characteristics, trying to identify by reasoning a likely proxy for the household labour involvement. Specifically, the increase of jobless households can be related to the raise of single parents with young children, who face difficulties in conciliating work and family care and, more generally, the presence of children is likely to reduce the probability to have multiple workers in households and/or to have both parents working full-time. The share of households with children[7] could be a broad proxy of the

[7] In our model, employment and unemployment measures are never significant in explaining household income inequalities even when we try different disaggregation by gender, age, professional qualifications; the share of workless households is significant only in some cases and the estimated impact not robust. By using the

household labour involvement, measuring different cumulated effects on income inequality: a weaker participation to labour market in one-parent family is a factor increasing inequality (that can off-set the equalising effect of employment rise, especially for mothers) and a lower concentration of labour income for multi-workers households is related to a decrease of income inequality (that can off-set the likely increase of inequality if one parent works part-time). We expect that the prevailing effect of the share of households with children on inequality could be related, as well, to cultural differences on the social role of mothers and that a social consensus on working mothers can also favour the diffusion of public children care and conciliation policies in each country. The impact of such cultural determinants on household income distribution may significantly explain between countries variability, but as they are difficult to measure homogenously in a panel, in line with the literature results, they are treated as a RESidual factor in our model.

1.2.3. Determinants of household income inequality

Moving from household labour income to *disposable income* distribution - the concept of income we are considering in our model - requires the inclusion of resources of other sources. This means taking into account all earnings, public transfers and capital incomes that are at family members' disposal. In the previous paragraph (2.2.2), we have already implicitly considered all components of labour income[8]; the topic of public transfers will be discussed

share of households with children, we take account, indirectly, of the mothers' disincentive to participate in the labour market, which can reduce the probability to have two workers in the households and, at the same time, raise the probability to have a jobless household in the case of single-parent families.

[8] We have not considered in the previous analyses any distinction between wages, salaries and self-employment income, and therefore we have introduced (at least) two kinds of approximation. First, that the shares of labour earnings and of self-employment follow a common path among EU countries; second, the shares have the same impact on total inequality. There is evidence that in advanced countries, especially in Europe, self-employment is correlated to economic cycles; that self-employment income can be associated with a larger inequality than other earnings

extensively in the next section (2.3).Now,our main consideration is on the trends of capital income in Europe and their impact on inequality. This analysis can complete also the understanding of the macroeconomic link between structural changes (related to growth effects in developed countries) and inequality. We can find in the literature, a minority debate, probably requiring further research, on the relationship between factor income shares composition and personal distribution. Those studies underline that the effects of technological changes on household income distribution could depend indirectly on the distribution of the increase in value-added between capital and labour, favouring the first factor share as a consequence of economic development (Spector, 2004).This rise in capital share could eventually convey to a structural increase in capital disposable income share and consequently more inequality, since capital income is much more unevenly distributed to households than is labour income in almost all the developed countries (Fraßdorf et al., 2008). If a small number of households can gain very high income from business capitals and other investments, as a consequence of a raise of the share of capital in the value-added of the economy, income inequality is likely to increase. The relationship between factor shares and personal distribution has some complexity and it is not opportune to translate empirical results from the former to the latter in many European countries without further research (this is the warning in Atkinson, 2007).

In general, inequality of disposable income can rise if a particular source of income becomes more unequally distributed; if the share of such source of income increases; if a particular source of income is allocated in such a way to favour the rich. European statistics underline that the share of labour income is on average about 3/4 of total disposable income if we include the share of self-employment income. Both these shares of household labour income tend to be relatively stable in the last twenty years across countries and their

and that the development of inequality among self-employment has little effect on inequality among all workers (OECD, 2011). Self-employment income is often not fully reported and difficult to evaluate; therefore, we do not include this decomposition.

contribution to total inequality tend to slightly reduce after the mid-90s (the period we are considering) and mostly at the bottom of the distribution in many countries. The share of capital income, which rewards the household sector, is about 5-7% on average (this has slightly increased in the last decade in each country, due to financial market performances and it is more concentrated only in rich households) and the residual share (about 20%) is given largely by public transfers to individuals and families mainly at the bottom of the distribution, as we will see in the next section. Finally, in each country we have a very small share of disposable income that is related to private transfers between individuals, frequently linked by family relationships,which is distributional neutral and can be neglected. Therefore, the empirical data on EU support, first, a global stability in the medium term of the shares in disposable income between capital, labour and government transfers, and, second, thatthe contribution of each share to total income inequality can be considered broadly constant. For this reason, we are not including explicitly this kind of structural change in our model. Given this evidence on time stability, we are considering implicitly income shares decomposition among the RESidual effects,since we may have structural differences in income shares that are specific for each country.

1.3. Redistributive EXPenditures and social policies.

Public finance and government social policies produce distributional effects, generally positive, which can be evaluated from different perspectives in terms of their effectiveness to reduce income inequality. In the traditional debate on European welfare states, the effectiveness of public social policies in reducing inequality mainly depends, on one side, 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 population.

Hence, the variability of social policies between countries may be still significant, even if the redistributive role of the welfare state is generally weakening in the EU, especially in the last decade, due to public finance restrictions. Following these lines, in the next sections, we discuss the respective role of monetary and in-kind benefits in reducing inequality (section 2.3.1.) and the redistributive effects of public expenses on different groups of population (section 2.3.2.).

1.3.1. The role of cash transfers and benefits in-kind

As done in the empirical literature, our model employs statistics of *equivalised household disposable income* to define inequality measures (Sections 3 and 4). Hence, we are implicitly considering, on one side, some dimensions of family composition (via equivalence scales) and, on the other, the redistributive effects related to taxes and benefits on gross incomes. The available statistics on disposable income include monetary benefits (mainly social security benefits) and exclude taxes and employees social security contributions. Thus, it is reasonable to expect that some sort of redistribution has already been included via taxation. Furthermore, as we are using a definition of monetary income, data on income in kind are not considered, including free benefits from public services such as health, primary education and child care services that are not supplied by cash. Since there is evidence (among others, Paulus et al., 2010) that, first, in many EU countries benefits in-kind (as a percentage of GDP) are more relevant than the ones in cash and, second, that benefits could be more redistributive than taxation, their effects on income inequality, in the set of the redistributive policies,should be, at least indirectly, taken into account.

Even for the more widespread cash transfers discussed in the literature, we could have different redistributive impacts. Especially after the mid-90s, some analyses support the conclusion that public monetary benefits are relaxing their equalising effects on household income distribution in many EU countries, since only in few cases they introduce more progressivity in the targeting mechanisms via

means-tested reforms. Nevertheless, as in the literature (Bargain and Callan, 2010; Dardoni and Lambert, 2002), we expect that the social expenditure (for transfers in cash) will maintain a negative relationship with income distribution for EU countries and, in general, high variability between (rather than within) the countries that are monitored.

As a first specific contribution to the debate, we try to enlarge the definition of social expenditure as a determinant of household income inequality.Normally, the empirical models in the literature use only the share of social protection expenditure, in relation to GDP, as the redistributive determinant of inequality. In this way, the other components of public expenditure (for our purpose, basically expenditure on health and compulsory education) are not considered, though they areregarded as universal services, which produce benefits in the more complete systems of welfare state of many EU countries (Esping-Andersen et.al., 2002). Therefore, it is generally assumed[9] that these benefits in kind are allocated in a way that can be implicitly considered as distributional neutralbetween households and among groups of population. Since a standard methodology for the imputation and enough statistics of good quality are not available, we prefer to include those benefits in kind (related only to health and education) in the aggregate of social expenditure, as a global determinant of redistributive effects of public policies on household income inequality.

Public expenditure on health can be relevant for the well-being, especially, of very young children, disabled and old people. It can contribute to reduce inequalities in the all society, whether the richest share of population pays more (via progressive taxes on income) for the universal service, and whether equal opportunity and correct information guarantee the effective access to the service to all the citizens in the same conditions. These are the declared characteristics of the national health services in many EU countries, mainly the Nordic ones, where the taxation structures are more progressive

[9] In few recent analyses (i.e., Vaalavuo, 2010), the evaluation of extended disposable income inequality measures (including benefits of publicly provided services) are proposed.

(even on cash benefits) and the access to services is effective and widespread to all who are in need.
The same argument can be used for theeducation expenditure.In this case, the links with income inequality can be even straighter and stronger, but less homogenous acrosscountries, than health public services. Primary and lower secondary education, as healthcare, present the characteristic of universal service in many EU countries, although this is not true for higher education levels. We have already noted (Section 2.2.2) that (tertiary) education could be one of the main determinants of individual earning inequality in Europe and so the role of governments to guarantee the enrolment of young people from lower family backgrounds can represent a public policy aimed to reduce inequality even in the long run. Public expenditure on higher education is,in the international scenario, a peculiarity of some European welfare systems, since governments commonly believe that this can incentive class mobility (as we will discuss in the next paragraph) and reduce the income related inequalities[10].
Defining a broader aggregate of public transfers than in literature, we want to verify whether the inclusion of health and education in social expenditure can have a stronger (and negative) effect on inequality, given the weight of these benefits in kind in public expenditure for many EU countries. Considering different welfare state regimes and relevant between countries variability, to evaluate implicitly the impact of public transfers and social policies in reducing inequalities,our model is separately run over the countries thatexhibit larger social expenditures.

1.3.2. The redistributive effects between groups of population

Each welfare system has different redistributive impact on income distribution and in the more recent years new reforms to correct specific inefficiencies have been introduced.Even considering the

[10] In the literature, we can find analyses showing that complete public financing of tertiary education, aimed to reduce liquidity constraints, can be fiscally regressive and not equitable from a social point of view (Chapman, 2006; OECD, 2008).

impactof such corrections, the balance between benefits and taxation,which characterizes each system, can be a relevant factor explaining between country variability of redistributive policy determinants. In fact, governments influence income distribution basically by the combined system of benefits and personal taxes. Taxes tend to be more progressive (especially for single people and childless couples) and benefits are normally targeted at the poor or at people with particular needs. The extent of this redistribution can vary significantly across countries, depending not only on the scale of social security regimes, on the universality of publicly provided services and on the total personal tax burden, but also on how benefits are targeted towards individuals and families.

In particular, the analysis of this balance, which is expected to be important for the purpose of our model on household income inequality, requires a brief comment about the share of benefits, mainly public pensions and health services, transferred to old people. This somehow completes also the study of the impact of income shares decomposition on inequality we have developed previously.

As already mentioned, a share of 20-25% of total household income in many EU countries is not due to labour and/or capital incomes: it consists of government transfers, mainly elderly benefits, as showed in many statistics (Eurostat, 2011). In fact,the main monetary resources for elderly population 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, especially if social insurance contributions are not well calibrated, is designated to old people and this can represent one of the most important channelsof redistributive policies between groups across EU countries[11].

Given this evidence, we are proposing awider definition of public expenditure for social purposes than the traditional one, which

[11] An OECD recent analysis (2011), which includes many EU countries, shows that in the last two decades the share of “non-elderly” benefits declines in overall public social expenditure; spending on non-elderly benefits tend to be less cyclical than other social expenditures, even if they include unemployment benefits, which follow the growth patterns (Immervoll and Richardson, 2011).

includes mainly social security benefits targeted to elderly people. Hence, by including the public expenditure on universal services (health and education, in our case) in the redistributive determinant of inequality, the composition of household across countries could be at least as relevant as age in explaining changes in income distribution.Moreover, the redistributive role of welfare policies towards different groups of population (families, children, jobless and disabled of different ages) has to be monitored carefully as well.
Some researches indicate that the support for children and families in the EU is not homogeneous and mainly less generous than the benefits to the elderly. The share of families with children can be seen as the extent of population that is less privileged in the redistribution policies, even considering that public expenditure for pre-school, child care and educational subsidized services are normally addressed only to households with children andthat poverty subsidies and food benefits are more generous for lone parents or larger families.
This evidence enlarges the number of plausible links between the share of household with children and disposable income inequality.It reinforcessomehow the hypothesis of a positive relationship with inequality measures, via between demographic groups' effects, since old people live in small (basically single) families and mainly in childless households. These two types of households (singles andchildless couples), if the head is old and retired, receive a relatively larger share of net transfers from Governments for redistributive purposes than family with children, whose head is normally younger and in working age.

1.4. INSTitutions, opportunities and social mobility

The last set of determinants of disposable income inequality we are going to discuss is related to the role of institutions. In literature, the debate, in a multi-disciplinary and more general sense, is very wide. Due to this, we choose to concentrate on the institutions more

directly affecting household income distribution and mainly related to the links between families, society and markets[12].
The frame in which the role of institutions can be better reconsidered is given by the theoretical and empirical debate on inequality of opportunities. The extent to which people life chances are affected by their family background (parents' income and wealth, social relations, education level, job status) and how far it is possible for someone to escape from less advantaged background provides a measure of social mobility. Thus, social class immobility can be related to strong links between family generations, via transmissions of wealth, social and political relations and professional status. They produce an indication of the existing constraints within a given society on personal advancement and, on the contrary, of the effective opportunities to overcome the obstacles arising from the negative circumstances where a person happens to be born. Removing such obstacles - which limit the achievement of true equality of opportunity to people and do not guarantee to attain the full potential for rising living standards - is one of the main objectives of EU social cohesion programs (for a more complete analysis on EU cohesion policies, see, among others, GHK, 2010).
Along this approach, our model considers only the constraints to the living standards increase more related to economic determinants and interprets social mobility as intergenerational mobility, due to the relationships among family members, mainly via education and professional status (given a set of labour market regulations) and via wealth transmission. There is wide evidence in the economic literature about the impact of family background on education and job status, while the latter effect related to wealth transmission is not taken into account adequately. Our original contribution to the debate is to include a proxy of intergenerational (im)mobility, due to wealth

[12] As the degree of overall democracy in EU countries, despite the recent enlargements of the Union, can be assumed nearly homogeneous (Polity IV Country Report, 2010), our attention will be concentrated on the institutional arrangements governing those economic sectors where public interventions and governments regulation activities can be more effective (Section 2.4.2).

transmission, as a factor that can play a rolein theincome inequalities increase in Europe.

1.4.1. Equality of opportunities and social mobility

The economic literature on the measurement of *inequality of opportunities* is not wide (for examples, Villar, 2006; World Bank, 2006) and is basically concentrated on the so called *ex-ante* approach. Along this reasoning, there is equality of opportunities if the set of opportunities is the same for all individuals, regardless of their circumstances. Instead, the alternative *ex-post* approach proposes that there is equality of opportunities if all those who exert the same effort obtain the same outcome. The first approach, in the empirical analysis, is generally measured with a positive correlation between equality of opportunities and education investment, whereas the second approach introduces a positive correlation with labour market institutions. The results for both approaches are not always homogeneous and strong (either geographically or temporally) and so they probably need further researches and developments.
Although recently there have been a wave of theoretical contributions on this topic and new empirical results focusing on the relevance of policies that could reduce income inequalities via a control on inequality of opportunities, the analyses on Europe are few. There is some new evidence about the importance of inequality of opportunities as one of the main inequality determinants for the whole income distribution (among others, Checchi et al., 2010). In particular, Marrero and Rodriguez (2012) find that correcting inequality of opportunity would not only result in a fairer society but it would also channel economic efficiency and growth, and in this way reduce income inequality; Aristei and Perugini (2012) emphasise the importance of institutional factors, which characterise different groups of EU countries, and propose that appropriate policy drivers are required to reduce inequalities, via a rise of social mobility in specific European contexts.
Following a more general and traditional debate, high level of inequality of opportunities via social backgrounds is problematic for

a society because inequality in the parents' generation leads to income inequality in subsequent generations. The transmission of ability within the family, plus income-related inequalities in education investment, can conduct to inequalities in the earnings and incomes of the children generation (Erikson and Goldthorpe, 2002; d'Addio, 2007). The literature on intergenerational mobility extensively shows that there is a persistent link between parents and children educational attainments in modern society (Roemer, 1998; Black and Devereux, 2010). This link between family generations is even more relevant since higher education could be related to better professional status and wage premium in many countries (Iannelli, 2002). A report of EC (2008) on EU countriesshows that,given labour market institutions, the educational level of someone's father seems to have in general more influence on the job of young people than their father occupations; individuals seem to have more chance to have a high occupational status, if their father has a tertiary level of education than if their father also has a high level job.

The expansion of education is an important determinant of equalisation of educational opportunities and certainly, over the last century, most European countries experienced a general increase of the average level of schooling. However, with respect to higher education, as national dynamics have been rather different, the share of graduated people remains quite uneven. In Europe, there exists a remarkable variation in educational outcomes both in terms of levels and dispersion; especially in the late schooling countries, the level of educational inequalities is still important (Breen and Jonsson, 2007). 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.

Given the relevant contribute of public expenditure to education in Europe, the association between social family background and young people educational attainment can be less significant than elsewhere and, consequently, the "odds" ratio can be more easily reduced. Notwithstanding,the sociological literature (Shavit et al. (eds.), 2007) indicates that social inequalities are resistant to changes in many advanced countries, including some EU members.

There isalso evidence that different regulations and policy approaches to public education investments are importantto explain between country variability in Europe. Social and family background can introduce inequalities between higher and lower education attainment, especially in those countries where we have shorter duration of compulsory schooling, early tracking in the system, higher academic access selection and greater variance in the quality of school organization, accountability and educational institutions by region, area, social environments (Marks, 2005; Braga et al, 2011). Hence, different cultural determinants and the operation of institutional factors and policies on education are expected to produce some country variations in the extent to which the origin families could affect younger generation educational attainments. Family backgrounds are expected to favour an increase in income inequality via unfair opportunities for younger generations.
Along these lines, which justify the presence of educational inequalities among EU countries, we assess the (im)mobility effects due to education, "weighting" the tertiary school enrolment rate by the degree of correlation between younger and older generations, in order to account of the role of the family educational background on younger people education chances. The effect of this proxy of intergenerational transmission of social opportunities is expected to be significant in increasing household income inequality even in the last decades.

1.4.2. Labour market institutions and inequalities

There are two plausible links involved in the increasing of income inequality via social (im)mobility. First, young people with highly educated parents have higher chances to achieve higher educational qualifications (previous section 2.4.1). Second, these high qualifications are crucial for securing better occupational destination for younger generations. There is evidence that the causality of these two processes cannot be taken for granted in the case of some EU countries given their institutional frame. Since they may mitigate the social immobility effects and break the links between education

inequality and earnings inequality, the role of European labour market institutions must be considered.
In the literature, we can find some analyses on the positive link between equality in opportunities and labour market regulations. To provide a measure of labour market characteristics and institutions, proxies related to the share of unionization of workers, degree of coordination of wage bargaining procedure, unemployment benefits regulation, minimum wages coverage (and so on) are normally introduced.The general hypothesis is, on one side, that the more a labour market is heavily regulated, the less the wage determination is related to individual features: this can reduce individual income variability and therefore wage inequalities. But, on the other side, labour market regulation can affect the equality in opportunities at the moment of the entrance into the labour market itself. The working conditions and wage regulation become less related to effort and personal abilities and more related to characteristics of the job. Hence, institutional rigidities tend to maintain dual labour markets, between more and less guaranteed jobs, and produce negative effects on income distribution via inequality in wage premium to sectors (for example, with more or less union density), to careers (with implicit forms of discriminations by gender, age, profession status and social background), to difference in unemployment benefits coverage and duration (related to the size of the firms, to the duration of the previous labour contract or to be employed in the public sector).
The empirical results on the impact of labour institutions on income inequalities are not always satisfactory and they are quite heterogeneous since dataset of good quality on institutions and national labour market regulation proxies are not available, even for developed countries and for a sufficient numbers of observations. One recognized common reason is that the total effects on income distribution could be ambiguous if the negative impact of labour institutions on unemployment levels is taken into account (Blanchard and Wolfers, 2000). A higher rate of unemployment, often a consequence of regulations, will increase the fraction of individual with lower incomes and hence raise inequalities. It is opportune to compare the positive effect of labour institutions on inequality, via

wage dispersion reduction, with the negative effect related to the increase of the rate of unemployment. Furthermore, each instrument of labour regulation can produce on unemployment and/or wage dispersion aneffect that can be different in sign and magnitude.Thus, the general impact on income distribution can be ambiguous.
Given these shortcomings, we prefer to consider a proxy of labour institutions that can provide a general measure of various aspects of the regulatory framework of national labour markets in Europe, instead of considering particular labour market institutions separately. To take into account the presence of institutions aimed to remove barriers in the labour market entrance and to promote the equality in working conditions and regulations, we introduce a measure of labour freedom that is calculated by the Heritage Foundation as part of the more general Index of Economic Freedom (Heritage, 2011)[13].
A higher degree of labour freedom is expected to produce a more equal distribution of income in the EU. This can counterbalance the effect of social mobility on inequality, on one side, but it can represent, on the other, a more opportune measure of political and economic freedoms with respect to countries that certainly can be defined equally democratic. The presence of democratic institutions, as a determinant of inequality, is common in the literature but seems more relevant to explain cross-country differences between less developed and more advanced countries (for example, Alesina and Perotti, 1996) than across Europe.

1.4.3. Intergenerational mobility and wealth transmission

Within non-industrialized societies, family of origin and direct inheritance determine social status, occupational destinations and future professional roles. Direct family transmission of social

[13] "The labour freedom component is a quantitative measure that looks into various aspects of the legal and regulatory framework of a country's labour market. It provides cross-country data on regulations concerning minimum wages; laws inhibiting layoffs; severance requirements; and measurable regulatory burdens on hiring, hours, and so on" (Source: The Heritage Foundation).

advantages may still play a significant role in developed economies; but indirect family transmission (mainly through cultural, relational and financial credit support) is likely to be more effective to guarantee good opportunities and higher standard of living to future generations.

A significant aspect of intergenerational mobility is related to the mechanisms of transfer of wealth between successive generations. The difficulties in identifying and evaluating assets,which may not have a clearly defined price, make the estimates including wealth less robust. Therefore, inequality in the wealth distribution is not introduced explicitly in international comparison of standard of living. But this does not mean that the effects of wealth on income distribution are unimportant as a determinant of inequality. For instance, it is plausible to believe that younger generations are likely to have accumulated less wealth than the older ones.

Sincestatistics of good quality to take account of the effects of wealth on income inequality do not exist, some indication of the potential partial effect can be given by the information about housing tenure.In fact, home ownership is a widespread component of wealth in the population of many countries and it can vary widely across Europe, since the choice to live in a house as owner is strongly related to institutions and cultural traditions, which are proper of each country. The standard analyses based on monetary disposable income take into account household wealth only through cash property incomes received by landlords and through interests, rents and dividends on other owned financial assets. In the last decade, the literature (Smeeding and Weinberg, 2001) and the institutional reports (for example, Canberra Group, 2001) strongly support the inclusion of the impact of the housing component of wealth in disposable income even for owner-occupiers, especially for international comparison. Home ownership yields value to the owner both as an asset (the house can be sold in difficult times, likely with a monetary gain, or it can be a collateral value to acquire credit for housing and non-housing consumption) and as a flow via imputed rent (the house can

produce a flow of services at below-market price)[14]. Even if there are great differences in the empirical results, which depend mainly on the different estimation methods employed to evaluate imputed rents, the inclusion of this value in household disposable incomes produce a reduction of inequalities, a raise in mean incomes and a reduction in the poverty risk rates across European countries.

Moreover, it is important to consider the share of not outright owner-occupiers across Europe, since housing loans constitute the largest liability of households. In each country, we expect that the share of outright owner-occupiers could be more related to structural determinants, while the share of family with mortgage could be better explained by market conditions, especially credit rationing for households without financial assets or collaterals. Among the structural factors, besides demographic effects, we can mention cultural determinants (i.e., the age of independence of young people from parents), social determinants (i.e., intergenerational transfers of wealth as bequests or heritages), and institutional determinants (i.e., the previous communist regime could mean an above average share of ownership for many new entrants in the EU). Statistics on tenure characteristics at EU level show that on average over the 70% of households live in a house as owner, but this value can be more than 90% in many of the new entrants; on the contrary, Germany has a share close to 50% and other countries just above 60% (for example, Scandinavian and central Europe countries). The differences are even more considerable in the share of families on mortgage: the value is very low for Eastern and Mediterranean countries (less than 10%) while, in many Scandinavian and Central Europe countries, the percentage of households with a loan is about half of the owner-occupiers. Furthermore, there may be tenants that are not paying market rents, since they live in rent-subsidized housing by public institution (including social housing) or by private landlords (family,

[14] Imputed rents can be seen as a proxy of housing wealth effects on income distribution, but their inclusion in the definition of disposable income has become common in the European statistics only since 2007. For this reason, they are not included in our data set.

friends, employer) and, occasionally, rent-free. Therefore, even the share of private market (non-subsidized) rents can have an important between-countries variability that depends on family backgrounds, on welfare state regimes for public-subsidized housing, and on personal relationships in the case of private-subsidized housing.
Globally, owners are better off than tenants and, in many countries, families on mortgage are better off than outright owners. These differences are explained by the fact that normally older households are more likely to be outright owner-occupiers (and frequently worse off than people still working) and, on the other side, loan markets are less rationedfor wealthy households. A recent study on housing finance by ECB (2009) shows that in many European countries the shares of households with mortgages are concentrated in the upper two quartiles of income distribution and in the working age of the household heads (35-54 years old),though few exceptions can be observed. For the period covered by the ECB report, the shares of younger and not wealthy households (in the bottom quartile) that are paying loans for the house purchase are above average in Northern countries (in the Netherlands, these are the more relevant ones).
There are not many other contributions in literature about the impact of housing tenure on income distribution, but the ECB analysis seems to reinforce the relevance of household indebtedness expressed by changes in the share of families on loan for the period (1995-2010) we are considering in our model. Household debt for house purchases, expressed as a percentage of GDP, has increased in the euro area from 27% in 1999 to 42% in 2007 (the average growth was around 10%) and doubled from 12% at the end of 2004 to 23% by end of 2007, in the non-euro EU new members of Central and Eastern Europe. Various factors can explain, in the ECB evaluation, the strong growth of housing loans: mainly, lower interest rates, income and population growth, liberalization and better competition in the mortgage market (given the opening to foreign banks) have led to the introduction of new products and facilitated longer maturities of loan supply and more flexibility in repayments schedules. The increased *per capita* indebtedness in the euro area as a whole was less dispersed among countries in 2007, when compared with 1999,

reflecting the catching-up of countries with less-indebted households and, probably, a different rise in housing prices. But the degree of dispersion is still important if we consider, besides the euro area, also the non-euro countries and the new EU members (as we do in our model).
In conclusion, the few contributions, on one side, show that we would have plausible relationships between housing tenure and income inequality via inequalities of opportunities and, on the other, underline the particular relevance of intergenerational mobility and family background in explaining home ownership variability between EU countries. In the last decades, the increasing share of families on loan can mitigate such effects and in this sense it could have a positive effect in reducing inequalities created by wealth transmission. Therefore, in our model, we introduce the share of owners on mortgage as proxy of intergenerational mobility, which is expected to have a negative impact on income inequality, given the strong link of this variable with credit market conditions that can balance other structural, cultural, relational and social determinants of housing tenure in Europe.

2. *The model*

Our work studies the impact of the dimensions previously outlined on the dynamics of income inequality for twenty-five EU's members: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom[15]. All of them are studied over the 1995-2010 period in order to track the evolution of their income distribution from the beginning[16] to date. In fact, 1995 and 2010 are respectively the first and thelast years of available evidence.

[15] Malta and Cyprus are excluded from the dataset due to missing statistics for several variables.
[16] The EU was created by the Maastricht Treaty, which entered into force on November 1, 1993.

By considering this set of countries, which constitutes a homogenous sample belonging to (at least formally) the same institutional framework, our work introduces different departures from the previous literature. First, the European countries are never analysed altogether but typically just a subset of them is studied as "representative" of the category of the developed countries. Second, the analyses of income inequalities are predominantly cross-sectional. This allows capturing the differences among the units considered, but avoids following each unit and explaining the dynamics over time (Frees, 2004). Third, our theoretical framework defines a new formal empirical strategy for the comprehension of the forces that shape the evolution of household disposable income inequality. In this perspective, new structural determinants, related to household changes (instead of demographic evolution) and intergenerational wealth transmission, and original proxies for labour market institutions and social mobility are considered.

2.1. Dependent Variables

To assess income inequality, following the literature, we use four different measures[17]: the *Gini coefficient*, and the *ninth to first*, *ninth to fifth*, *fifth to first*deciles ratios[18]. The first, the Gini Index, which measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution, is known to assign more weight to the centre of the frequency distribution. Due to this, other indicators are considered. In fact, the deciles ratios allow respectively to study the relation between the top and the bottom (P90/P10), the top and the medium (P90/P50), the medium and the bottom percentiles

[17] Our data comes from the Eurostat Database, in particular the EU-SILC statistics, which aim at collecting homogenous cross-sectional and longitudinal data. Although these figures are often criticized due to comparability issues especially for earlier years, we make use of them as they constitute the only available evidence to conduct this kind of analysis.

[18] Gini coefficients and deciles are not available for every year.

(P50/P10) of the income distribution[19]. All these measures constitute the dependent variables of our model, since there is evidence that they may give different countries rankings (Figure 1 and 2) and each of them could eventually highlightspecific factors better explaining income dispersion. Moreover, the determinants of inequality are not necessarily the same when income inequality is measured by the Gini Index or by indicators related to the tails of the distribution. For this reason, we like testing the impact of the supposed forces depending on the measure used.

But before proceeding with the description and the study of the supposed determinants (regressors), it is worthwhile to understand the state of inequality in Europe. To this end, we firstly perform a comparative exercise (Figure 1 and Figure 2) and then provide some descriptive statistics (Table 1).

The comparative exercise considers the average of the four measures employed over the defined sample. A deeper investigation reveals that there exists a significant difference among the EU countries and it becomes interesting to check whether the classification of the countries that appear as less or more unequal, according to each of these indicators, is coherent on the whole. Therefore, it is worth to verify whether, in general, our model is consistent with the chosen measures of income inequality and, in particular, the impact in each case of the original regressors (household structure, housing ownership, labour freedom, education (im)mobility) we have definedas proxies of the forces explaining inequality.

[19] They are calculated as the ratio of the *ninth to first, ninth to fifth, fifth to first* deciles, considering the top cut off point, as income and living conditions indicator, expressed in purchasing power standard.

Figure 1 - *Average of Gini Index for the EU 25 countries.*

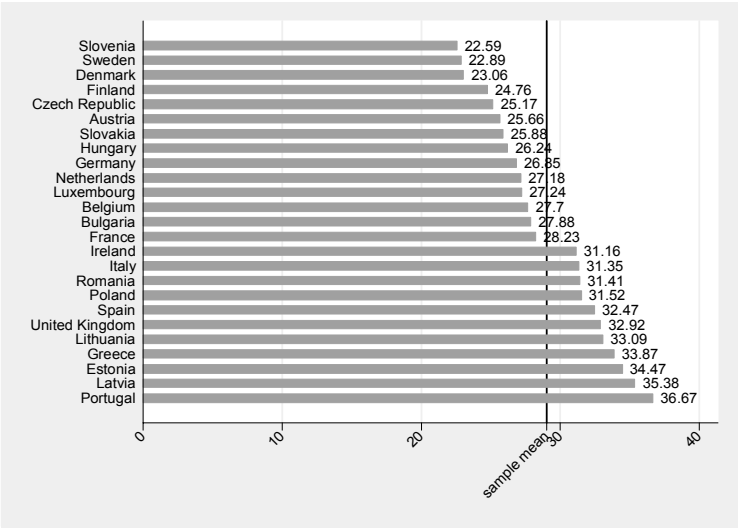


Figure 2 - *Average of the ninth to first deciles ratio for the EU 25 countries.*

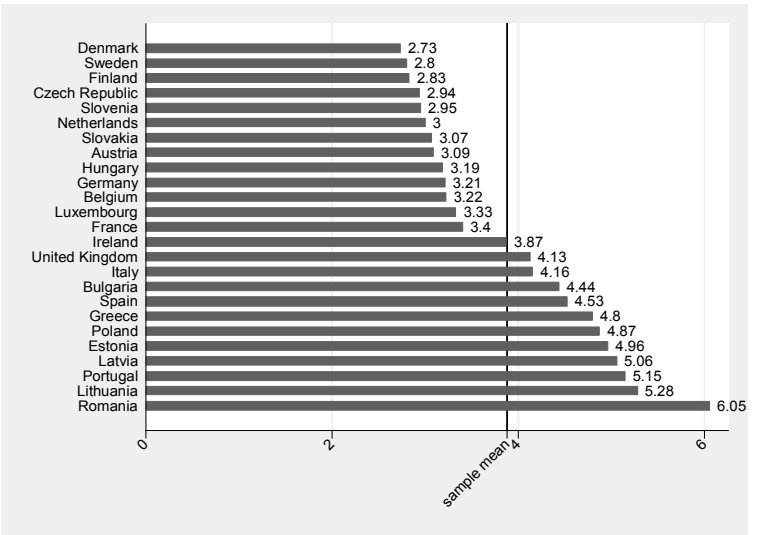


Figure 3 - *Average of Gini Index for the EU 25 countries over different time periods.*

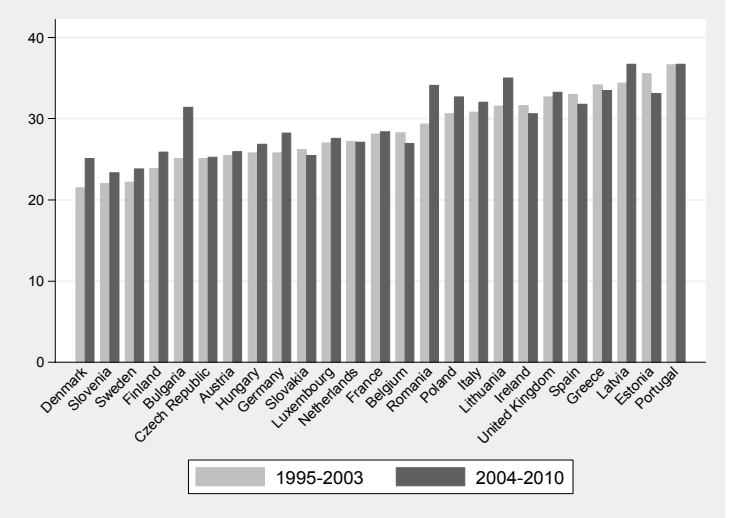
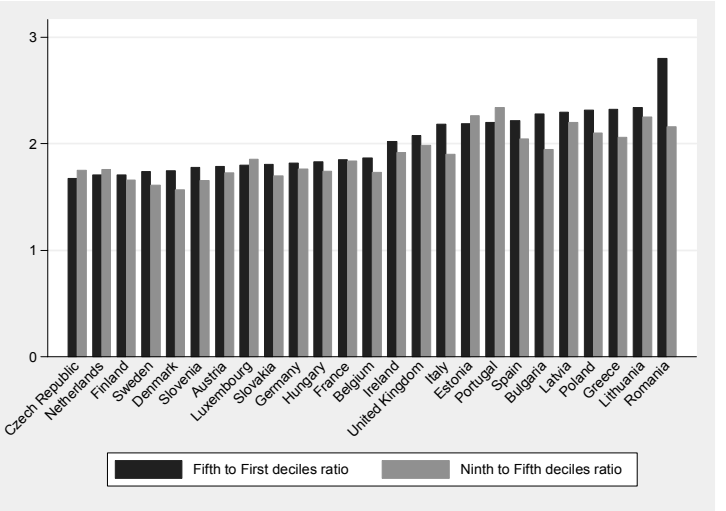


Figure 4 - *Distribution of income by fifth to first and ninth to fifth (average) deciles ratio.*



Considering the Gini Index (average values), the less unequal countries are Slovenia, Sweden, Denmark, Finland, and Czech Republic; the more unequal are Lithuania, Greece, Estonia, Latvia, Portugal (Figure 1). According to the *ninth to first* deciles ratio (again in average terms) the less unequal are Denmark, Sweden, Finland, Czech Republic and Slovenia; the more unequal, Estonia, Latvia, Portugal, Lithuania, and Romania (Figure 2). With respect to both measures, it can be noticed that the countries arrangement is quite similar and, as theoretically expected, the Scandinavian countries belong to the less unequal group, some Mediterranean ones to the more unfair, while recent EU members can be found in both groups.

Concerning the evolution of income inequality over time (Figure 3)[20], it is worth observing that Denmark, Finland, Bulgaria, Germany, Romania and Lithuania have known an increase of income inequality since 2004, whereas Slovakia, Belgium, Ireland, Spain and Estonia a downturn of it. Our analyses broadly support the same results of the empirical literature: a relative increase in inequality can be observedin the recent years mainly for the Scandinavian countries, which anyhow continue to be the less unequal, and for many of the new members (in particular, income inequality has been relatively low for Bulgaria and Romania until 2003 and afterward it has rapidly grown).

Finally, the last figure (Figure 4) adds information about the distribution of income disparity according to two differentmeasures, namely *ninth to fifth* and *fifth to first* deciles ratio[21]. In particular, comparing the two countries arrangements from the less unequal one, it has to be highlighted that Slovakia, Hungary, Belgium, Bulgaria, and Greece are characterized by less income disparity, when the higher part of the frequency distribution is considered (the *ninthto fifth* deciles ratio).This evidence meansthat inequalitymay be relatively higher for lower incomes even for countries with an

[20] Countries are ranked from the less unequal, considering the average value of the Gini Index over the first period.

[21] Countries are ranked from the less unequal, on the basis of the average of the *fifth to first* deciles ratio.

averageGiniIndex well below the sample mean. Czech Republic, Netherlands, Luxembourg, Estonia and Portugal are characterized by less inequality, when the lower part is taken into account.The Gini Index is relatively high for the last two countries, whereasthe distribution is not completely unfair for lower incomes.

This investigation shows that the four indicators depict an exhaustive picture of the differences in terms of income disparity among the EU countries and the diverse classification they provide, although the dissimilarity is small, corroborates the strategy of using all the variables as dependent ones. In fact, this procedure allows to have a more complete description of the inequality distribution and to study the behaviour of the supposed explanatory dimensions, according to the section of the income distribution considered.Moreover, the descriptive statistics (Table 1) justify empirically the methodology employed: all the measures exhibit a *between* standard deviation considerably higher than the *within* one. This means that the difference in terms of inequality among these countries is greater than the longitudinal variation each of them has known, which however deserves attention and must be taken into account in order to give reliable results. That's why the EU institutions have been placing a great value on economic and social cohesion policies for several years and emphasize the targets to raise the standard of living and the quality of life of all citizens throughout the Union for the present decade.

Table 1 - *Dependent Variables. Descriptive Statistics.*

Variables		*Mean*	*Std. Dev.*	*Observations*
Gini Index				
	Overall	29.026	4.392	N = 400
	Between		4.128	Countries = 25
	Within		1.698	Time periods = 16
Ninth/First				
	Overall	3.883	.987	N = 400
	Between		.975	Countries = 25
	Within		.247	Time periods = 16
Ninth/Fifth				
	Overall	1.901	.227	N = 400
	Between		.224	countries = 25
	Within		.059	Time periods = 16
Fifth/First				
	Overall	2.014	.293	N = 400
	Between		.287	Countries = 25
	Within		.081	Time periods = 16

2.2. Independent Variables

As explained theoretically, in our framework, the hypothesised determinants of inequality are the macroeconomic performance, the so called structural features (household structure and housing ownership), the redistributive policies (social public expenditure) and the institutional dimensions affecting social and intergenerational mobility (labour institutions, economic and educational parental background)[22].

To assess the countries' macroeconomic performance, we rely on GDP *per capita* growth[23], which is expected to have a negative impact on income inequality, due to earnings disparity related to the differences in terms of dynamics of productivity and/or educational

[22] Although observations are not always available for every year, we employ these variables anyway as they allow to proxy new determinants and give a new insight about the causes of income inequality.

[23] Data Source: World Development Indicators Database.

achievements. The structural features basically pertain to the household structure (we consider families with dependent children) and the housing ownership by tenure status (we consider the "*owner on loan*" status)[24]. The household structure considers indirectly the demographic dimension (since dependent children are less present in older households) and implicitly the labour market involvement of parents in working age. As already discussed (section 2.2.2.), a couple can show a greater concentration of workers than a single parent, whereas the presence of dependent children can increase the probability to have a part-timer with respect to a household with two (or more) members in working age. The share of households with children, following this reasoning, is expected to affect income inequality either positively or negatively, since it may produce effects on labour market involvement in both directions. The housing ownership on loan[25] can be a structural proxy of the access to the credit market and in this sense it is negatively related to income inequality; this regressor allows also to capture intergenerational mobility. The transfer of wealth between generations, as discussed in paragraph 2.4.3., can be a determinant of social (im)mobility and a factor increasing inequality; this effect of family background can be balanced by a greater openness of mortgage markets especially in the last decades. The government behaviour is supposed to affect negatively the evolution of income disparity and, in particular, we study the impact of the more general redistributive policies financing health care, educational and social protection systems[26], as typical of the welfare regimes that characterize European countries. Finally, the institutional arrangements affecting the social and intergenerational mobility are proxied by the labour freedom indicator[27], which assesses various aspects of the legal and regulatory framework of a country labour market and can off-set inequality of opportunities in entering top professional status;the housing ownership variable

[24] Households with Dependent Children; Households by Tenure Status. Data Source: Eurostat, EU-SILC Statistics Database.
[25] Data Source: Eurostat, EU-SILC Statistics Database.
[26] Data Source: Eurostat, Government Finance Statistics.
[27] Data Source: The Heritage Foundation.

(already discussed) that accounts of the effects of intergenerational transmission of wealth;and the education (im)mobility effect, assessed by the interaction term between the tertiary school enrolment rate[28] and the degree of correlation between persons of different age (25-34 and 55-69) with tertiary education attainment[29], as the family education background is expected to favour inequality increase via unfair opportunities for younger generations (i.e. intergenerational transmission of education (social) opportunities). This variable not only quantifies the educational opportunities but implicitly allows controlling for the level of human capital in these countries. Labour freedom and housing ownership with loan are expected to have a negative impact, while educational (im)mobility a positive one.

The following table (Table 2) provides the descriptive statistics for these variables. Except for GDP *per capita* growthfor which this evidence is totally expected since European countries tend to follow a common path, all the variables exhibit a *between* standard deviation greater than the *within* one. This is coherent with the evidence obtained for the dependent variables and confirms that the panel analysis is the best estimation strategy to exhaustively study the role played by the identified determinants ofincome distribution among the EU countries.

Formally, the specification of our model is:

$$y_{i,t} = a + bx_{i,t} + cz_{i,t} + d\vartheta_{i,t} + e\zeta_{i,t} + f\kappa_{i,t} + g\mathrm{I}_{\mathrm{i,t}} + \psi_t + \epsilon_{i,t} \quad \textbf{(2)}$$

where i=1,…,25; t=1995,…,2010; $x_{i,t}$ is the macroeconomic variable; $z_{i,t}$ represents the redistributive policies; $\vartheta_{i,t}$,$\zeta_{i,t}$, $\kappa_{i,t}$, the set of structural features; $I_{i,t}$, the institutional arrangements; $\varepsilon_{i,t}$ are the idiosyncratic errors; ψ_t captures the time effects, which allow to eliminate the bias arising from unobserved variables that change over time. The dependent variable $y_{i,t}$ can alternatively be one of the

[28] Data Source: World Development Indicators Database.
[29] Data Source: Eurostat, Educational Attainment Database.

measures of income inequality defined above (Gini Index, P90/P10, P90/P50, and P50/P10 deciles ratios).

Table 2 - *Descriptive Statistics. Independent Variables.*

Variables		*Mean*	*Std. Dev.*	*Observations*
Gpd p.c. growth				
	Overall	2.695	3.839	N = 400
	Between		1.381	Countries = 25
	Within		3.592	Time periods = 16
Social Public Expenditure				
	Overall	27.590	5.672	N = 400
	Between		5.441	Countries = 25
	Within		1.918	Time periods = 16
Housing Owner Loan				
	Overall	23.743	18.050	N = 400
	Between		18.307	countries = 25
	Within		1.797	Time periods = 16
HH dep children				
	Overall	55.360	5.916	N = 400
	Between		5.509	Countries = 25
	Within		2.406	Time periods = 16
Educ(Im)mobility				
	Overall	46.507	16.339	N = 400
	Between		13.060	Countries = 25
	Within		10.139	Time periods = 16
Labour Freedom				
	Overall	62.159	13.991	N = 400
	Between		14.091	Countries = 25
	Within		2.155	Time periods = 16

3. *Econometric Results*

The particular structure of the dataset and preliminary tests, which indicate the presence of cross-sectional dependence[30], heteroskedasticity and within panel AR(1) autocorrelation[31], suggest to fit this linear panel-data model by feasible generalized least squares[32] (Wooldridge, 2002).

We start considering the Gini coefficient as dependent variable (Table 3). Our first regression (column I) provides the estimates of the model on the entire sample. All the variables are statistically significant and the estimated coefficients exhibit the expected sign. As theoretically explained, growth affects negatively the evolution of income distribution; the redistributive policies, namely the public commitment towards health, education and social protection[33], have a negative impact.

The housing ownership, catching on one hand the "material" parental background and on the other the chance people of different income levels have to access the credit market, may theoretically affect income inequality in both directions. Outright housing ownership,as proxy of low social mobility and strong family background relationships via intergenerational transfers, is positively related to income inequality. However, its impact is different when the tenure status is considered, and more specifically when the share of those

[30] Frees, 1995; Pesaran, 2004; Sarafidis et al., 2006.

[31] Drukker, 2003; Im et al., 2003; Levin et al., 2002; Wooldridge, 2002.

[32] As said before (footnotes 19 and 23), in some cases, data are not available for every year. To complete the dataset, we therefore use simple moving average between available observations or the latest available one. As we can see (Tables A.1 and A.2, Appendix A) this procedure does not distort series, even those with the fewest observations (i.e. housing ownership and labour freedom), as both inequality measures and structural determinants are by their nature supposed to change slowly over brief time periods (like that covered by our analysis).

[33] The model has been estimated also considering the sole social protection expenditure and the results are confirmed for each dependent variable. However, we like showing the results when also the other components are included, as they all are universal services according to the welfare systems of the majority of EU countries.

who are paying a mortgage[34] is observed. In this sense, the more open are mortgage market opportunities to all households, the lower should be income inequalities. And this precisely is what happens in our model.
The household structure, which explains the demographic conditions and implicitly control for the involvement of the household in the labour market, affects positively income inequality. The shares of household with children, as introduced in paragraph 2.2.2 and 2.3, can be a proxy of different combined effects, which overall produce an increase of inequality in our model. Three are the effects that work in this direction: a greater probability to have two workers in the top income households; a greater share of part-timers in many countries, given the presence of mothers of young children; less generosity of public net benefits, with respect to other types of households and different age groups.
The educational (im)mobility proxy plays a positive role for the dynamics of the Gini Index. In the mobility process, a crucial role is played by public investment in education, to remove liquidity constraints, and by more active policies towards social barriers. In fact, only both types of government interventions could allow lower background young people to attend higher education. Actually, also the process of transition from school to work should enter in the agenda of equal opportunity policies, since some education systems are more effective at achieving equality in the labour market entrance. Only the opportune combination of different types of policies, affecting also the labour market structure, can interrupt the negative chain of inequalities from a generation to the successive.
To this regard, it is worth noting the negative sign of the labour freedom indicator, which confirms that the policies aimed at removing obstacles in entering the job markets and increasing social fluidity can create a more equal distribution of income. As discussed before (paragraph 2.4.2), among EU countries, the impact of labour market institutions on income inequality is ambiguous since labour

[34] Personal parents' guarantees are frequently used in some Mediterranean countries to allow younger households to obtain a loan for housing purchase.

regulation may have either a positive effect on wage dispersion or a negative one, due to a likely increasing of the rate of unemployment. The variable used as general indicator for this determinant maintains sign and significance through different specifications, confirming its cumulative effect of reducing income inequality.
The last columns (II-IV) show the estimates of the model on different parts of the sample. All the regressors are highly statistically significant, behave as expected, and this coherence confirms the stability of the specified model. Moreover, the estimates prove the relevance of our original proxies: a more general definition of social public expenditure, the inclusion of family structure, intergenerational and social mobility, and labour market institutions.
Looking at the estimated coefficients, it is worthwhile to say a few words about the government expenditure, the housing ownership and the household structure variables. As we can see, the estimated impact of the government expenditure for the Euro participants and the Western countries is greater than the one estimated for the entire and the North countries samples. This happens because the Euro participants and the Western (old members[35]) countries have, on average, a higher public expenditure (29% and 30%, respectively) than the whole sample (27%) and that of North countries (28%), among which there are economies with lower income inequality, where a reduced redistributive effectbetween demographic groups and different welfare functions is required. In particular, it is worth to remember that the Scandinavian countries are characterized on one hand by generous welfare regimes that supply universal public services of good quality and on the other by a strongly progressive taxation. Thus, a more equal income distribution is the outcome of the balance between taxes and benefits.With regard to the housing ownership (with loan), the estimated coefficient over the sample of Western countries is greater than the other cases. This is due to the fact that the countries with a communist tradition, which present the

[35] As the new EU members are just ten, we infer results from the sample of the "old members".

lowest shares, have been excluded[36]. Finally, it can be noticed that the estimated impact of the households with dependent children variable is a little bit lower over the three sub-samples: the reason is the persistence among them of countries with low birth rates, high population aging and a reduced participation of women in the labour market[37].

[36] On average over the 1995-2010 period, Bulgaria 4.68%; Czech Republic 12.45%; Estonia 14.5%; Hungary 15.88%; Latvia, 6.8%; Lithuania 6.28%; Poland 4.95%; Romania 0.825%; Slovakia 5.56%; Slovenia 4.7%. The overall sample mean is 26%.

[37] Concerning the women participation, Belgium, Greece, Ireland, Italy, Luxembourg, Poland, Slovakia, Spain exhibit, over the 1995-2010 period, an average rate lower than the sample one (62.45%). Regarding people aging (population ages 65 and above), over the same time period, Austria, Belgium, France, Germany, Greece, Italy, Portugal, Spain, Sweden, United Kingdom present an average percentage greater than that of the entire sample (15.37%). Concerning birth rates over the 1995-2010 period, Austria, Czech Republic, Estonia, Germany, Greece, Italy, Latvia, Lithuania, Poland, Portugal, Slovakia, Slovenia, Spain display an average fertility rate (births per woman) minor than the sample mean (1.49%). (Source: World Development Indicators).

Table 3 - *GLS Regressions. General Model and Different Sub-Samples.*

Dependent variable: Gini Index				
Estimation method: GLS regressions				
	I	II	III	IV
	All countries	*North Countries*[1]	*Euro participants*[2]	*Western Countries*[3]
Gdp pc growth	-.0369***	-.0768***	-.0544***	-.0738***
	(.0127)	(.0027)	(.0088)	(.0173)
Social Public Expenditure	-.2713***	-.2986***	-.4050***	-.4591***
	(.0265)	(.0066)	(.0124)	(.0167)
Housingownerloan	-.0979***	-.0704***	-.0671***	-.1190***
	(.0125)	(.0049)	(.0126)	(.0067)
Hhdepchildren	.1168***	.0899***	.0429***	.0889***
	(.0203)	(.0056)	(.0130)	(.0207)
Educ (Im)mobility	.0559***	.0735***	.0477***	.0243***
	(.0099)	(.0026)	(.0035)	(.0046)
Labourfreedom	-.0843***	-.0257***	-.0289***	-.0254***
	(.0174)	(.0033)	(.0098)	(.0066)
constant	.3654***	.3355***	.4054***	.4399***
	(.0166)	(.0039)	(.0088)	(.0133)
Time Dummies	yes	yes	yes	yes
N	400	240	224	240
Wald test	483.77	6411.53	7338.41	295611.87
Chi2(21)	p-val=0.00	p-val=0.00	p-val=0.00	p-val=0.00

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

[1]: Belgium, Czech Republic, Denmark, Estonia, Finland, Germany, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Slovakia, Sweden, United Kingdom.

[2]: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovakia, Slovenia, Spain.Estonia entered in the Euro area in 2011. It is not included as our sample covers the 1995-2010 period.

[3]: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

We proceed the analysis estimating our general model with the four defined measures of income inequality. The importance of this strategy is two-fold. It allows on one hand to check the empirical stability of the model and the coherence of the main findings (Table 4) through different specifications, on the other, to understand whether the supposed determinants affect differently the evolution of

income, according to the dimension considered. On the whole, except for the macroeconomic control, whose estimated coefficient is not significant when the highest part of the income distribution is taken into account(as in literature, the earning dispersion related to technological changes and employment dynamics for the top of the distribution are relatively reduced), the other regressors behave as expected. It is worth noting that the public spending has a smaller impact on the *ninth to fifth* deciles ratio, meaning that the redistributive effects are,as expected, pro-poor; that owing a house with a granted loan has a greater effect on income inequality, whenever income inequality is measured over the poorest brackets,whichin particular are the most rationed in the credit market; that the household structure has a smaller impact on the *fifth to first* deciles ratio, which is due to the fact that in this pool there is the highest share of households with dependent children[38] and a smaller probability to have two working parents, which in turn impacts negatively on (labour) income distribution.

[38] Households with dependent children: on average, below 60% of median equalised income, the share is 57.10%; on average, above 60%, it is 53.15%.

Table 4 - *GLS Regressions. Different measures of income inequality*.

	DependentVariable			
	I	II	III	IV
	Gini Index	*Ninth/First*	*Ninth/Fifth*	*Fifth/First*
Gdp pc growth	-.0366***	-.0468***	-.0009	-.0260***
	(.0127)	(.0126)	(.0036)	(.0050)
Social Public Expenditure	-.2713***	-.1795***	-.0873***	-.1478***
	(.0265736)	(.0386)	(.0107)	(.0128)
Housingownerloan	-.0979***	-.1955***	-.0197***	-.1054***
	(.0125)	(.0124)	(.0053)	(.0045)
HH depchildren	.1168***	.1062***	.0852***	.0404***
	(.0203)	(.0297)	(.0093)	(.0123)
Educ(Im)mobility	.0559***	.0240*	.0124**	.0132***
	(.0099)	(.0140)	(.0055)	(.0042)
Labourfreedom	-.0843***	-.0691***	-.0417***	-.0419***
	(.0174)	(.0234)	(.0048)	(.0059)
constant	.3654***	.4582***	.1942***	.2712***
	(.0166)	(.0253)	(.0070)	(.0080)
Time Dummies	yes	yes	yes	yes
N	400	400	400	400
Wald test	483.77	880.23	641.14	4919.71
Chi2(21)	p-val=0.00	p-val=0.00	p-val=0.00	p-val=0.00

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

Then, to evaluate the robustness of the model, we like studying what happens when the general specification is regressed over different sub-samples of countries, chosen on the basis of precise economic characteristics.

We start considering (Tables 5 and 6) the sample of the *lessunequal* and *more unequal* countries.The sample called "less unequal countries" does not include those countries whose average Gini is equal to or greater than 33, namely United Kingdom, Lithuania, Greece, Estonia, Latvia and Portugal. Symmetrically, the sample called "more unequal countries" leaves out the six countries with an average Gini lower than 26. These are Slovenia, Sweden, Denmark, Finland, Czech Republic, and Austria[39]. More specifically, this

[39] The overall average sample is 29.

sample partition[40], according to the previous comparative analysis (Figure 1), excludes the extremes of the countries arrangement and includes in both cases (Tables 5 and 6) the countries being around ± 10% of the sample mean[41].

Table 5 - *GLS Regressions. Income inequality over the lessunequal[l] countries.*

	Dependent Variable			
	I	II	III	IV
	Gini Index	*Ninth/First*	*Ninth/Fifth*	*Fifth/First*
Gdp pc growth	-.0604***	-.0173**	-.0026	-.0097**
	(.01118)	(.0083)	(.0025)	(.0039)
Social Public Expenditure	-.3055***	-.3393***	-.0696***	-.1262***
	(.0202)	(.0167)	(.0066)	(.0078)
Housingownerloan	-.0160*	-.1864***	-.0106***	-.0789***
	(.0090)	(.0127)	(.0032)	(.0040)
Hhdepchildren	.0919***	.1800***	.0545***	.0450***
	(.0180)	(.0176)	(.0070)	(.0072)
Educ(Im)mobility	.0345***	.0463***	-.0046	.0293***
	(.0043)	(.0096)	(.0033)	(.0031)
Labourfreedom	-.0414***	-.0543***	-.0143***	-.0157***
	(.0116)	(.0170)	(.0036)	(.0018)
constant	.3422***	.4286***	.1878***	.2268***
	(.0134)	(.0183)	(.0048)	(.0064)
Time Dummies	yes	yes	yes	yes
N	304	304	304	304
Wald test	1109.12	5541.99	4137.41	3519.70
Chi2(21)	p-val=0.00	p-val=0.00	p-val=0.00	p-val=0.00

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

[1]: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Hungary, Ireland, Italy, Germany, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden.

[40] Our choice is econometrically guided by the need to keep a well-balanced relation between the number of years and the number of groups. In fact, since the time periods are sixteen, the model is no longer stable with less than nineteen countries.

[41] As some countries are present in either cases, to understand the prevailing effect we show the estimated regressions run over both samples.

Table 6 - *GLS Regressions. Income inequality over the more unequal*[1] *countries.*

	DependentVariable			
	I	II	III	IV
	Gini Index	*Ninth/First*	*Ninth/Fifth*	*Fifth/First*
Gdp pc growth	-.0352***	-.0594***	.0021	-.0364***
	(.0059)	(.0128)	(.0044)	(.0052)
Social Public Expenditure	-.1310***	-.2685***	.0087	-.1931***
	(.0237)	(.0319)	(.0144)	(.0084)
Housingownerloan	-.0235***	-.2467***	-.0368***	-.0784***
	(.0053)	(.0099)	(.0036)	(.0034)
Hhdepchildren	.0920***	.1887***	.0389***	.0724***
	(.0123)	(.0314)	(.0107)	(.0048)
Educ(Im)mobility	.1158***	.0873***	.0117***	.0410***
	(.0060)	(.0151)	(.0038)	(.0023)
Labourfreedom	-.1136***	-.2339***	-.0587***	-.0515***
	(.0148)	(.0218)	(.0069)	(.0029)
constant	.3096***	.5319***	.2083***	.2503***
	(.0110)	(.0284)	(.0088)	(.0046)
Time Dummies	yes	yes	yes	yes
N	304	304	304	304
Wald test chi2(21)	2771.53 p-val=0.00	95263.72 p-val=0.00	3678.75 p-val=0.00	18297.02 p-val=0.00

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

[1]: Belgium, Bulgaria, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, United Kingdom.

As far as the public expenditure is concerned, among the "lessunequal" countries, the estimated impact is greater when the Gini coefficient and the *ninth to first* deciles ratio are the dependent variables. These countries, on average, spend more on social services in an universalistic perspective and tax more progressively. Thus, considering the centre and the extremes of the frequency distribution, these coefficients constitute a sort of "measure" of the effectiveness of the public intervention. Among the "more unequal" countries, the redistributive policies are not significant when the dependent variable is the *ninth to fifth* deciles ratio (Table 6, III column). As

this variable considers the “richest” people, it is clear that where inequality is higher, redistribution is less effective associal policies are mainly directed to the poorest.Owing the house with a granted loan, with respect to the estimates obtained over the entire sample, has a bigger effect among the “more unequal” countries when the top and the bottom of the income distribution are studied (Table 6, II column). It has a smaller impact (Table 5, I III and IV columns) overthe “lessunequal” ones,asthe obstacles created by the social immobility may predominantly be less relevant and the equality of opportunities more realized for all the society. As for the household structure, since the share of people in households with dependent children is greater on average among the poorest, an increase of this variable will raise inequality in these groups of people. This effect becomes more evident when the relation between the *ninth* and the *first* deciles is considered (Table 5 and Table 6, II columns).

In the case of intergenerational education mobility, higher coefficients can be observed in the sub-sample of the “more unequal” countries. In fact, the evidence suggests that over the countries labelled as “less unequal” (Table 5),there may existmore mechanisms able to encourage the access to tertiary education, regardless of the family background: the non-significance of its estimated coefficient in the case of the *ninth to fifth* deciles ratio corroborates this insight (Table 5, III column).The last regressor, the labour freedom indicator, has a bigger impact on the various measures of income disparity among the “more unequal” countries, as greater freedom means lower inequality. As in literature, labour market institutions can reduce the impact of social and family background on professional status.

To conclude, our quantitative analysis takes into account other two partitions of the sample: the first formed by countries with a low social public expenditure (Table 7) and the second formed by the high growing countries (Table 8). More specifically, starting from the former, it is worth noting that even though we are considering the low spending countries, the government commitment has a greater impact on the *ninth to first* deciles ratio anyway. This highlights that the redistributive policies have in general a greater impact on the

tails of the distribution than on the whole population. If we keep on looking at this part of the income distribution, we can also notice that the *housing* variable has a bigger effect: as there are fewer government transfers, families will not buy the house, given the reduced social fluidityin the wealth transmission. On the same measure of income inequality, also the estimated coefficient of the labour freedom indicator has a bigger effect, because a freedom increase is supposed to primarily reduce the gap between the rich and the poor in labour participation.

Table 7 - *GLS Regressions. Income inequality among the less spending countries.*

	Low Public Expenditure Countries[1]			
	Dependent Variable			
	I	II	III	IV
	Gini Index	*Ninth/First*	*Ninth/Fifth*	*Fifth/First*
Gdp pc growth	-.0372***	-.0707***	.0024	-.0435***
	(.0120)	(.0132)	(.0067)	(.0078)
Social Public Expenditure	-.1129***	-.1524***	-.0553***	-.1116***
	(.0296)	(.0335)	(.0144)	(.0151)
Housingownerloan	-.1042***	-.3303***	-.0266***	-.0639***
	(.0129)	(.0079)	(.0039)	(.0050)
Hhdepchildren	.0949***	.0928***	.0946***	.0493***
	(.0162)	(.0258)	(.0111)	(.0086)
Educ(Im)mobility	.0546***	.0401***	.0247***	.0213***
	(.0069)	(.0098)	(.0032)	(.0055)
Labourfreedom	-.0933***	-.1887***	-.0462***	-.0121*
	(.0127)	(.0166)	(.0063)	(.0069)
constant	.3387***	.5693***	.1774***	.2203***
	(.0139)	(.0174)	(.0083)	(.0081)
Time Dummies	yes	yes	yes	yes
N	320	320	320	320
Wald test	1176.30	3259.48	928.62	1297.92
Chi2(21)	p-val=0.00	p-val=0.00	p-val=0.00	p-val=0.00

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

[5]: Belgium, Bulgaria, Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, United Kingdom.

For the last sub-sample of countries, the main findings are confirmed and, in the case of the more dynamic economies (Table 8), growth presents a small negative impact even on the richest tail of the distribution. In addition, if we look at the government expenditure, at the housing variable,at labour freedom and at educational (im)mobility, we can see that the estimated impact is lower on the *ninth to fifth* and on the *fifth to first* deciles ratios and more relevant on the *ninth to first*. The chosen determinants seem to produce bigger,positive or negative, effects on the tails of income distribution, particularly in the countries with higher development. The estimated effect of the households with dependent children variable is stronger on both the *ninth to first* and the *fifth to first* deciles ratios; this happens because it is in the poorest tails that the cumulated phenomena caught by this variable are more concentrated. For all the indicators, among the more dynamic EU countries, the bigger impact (with the respective expected sign) can be found when the poorest groups are considered.

Table 8 - *GLS Regressions. Income inequality among high growing countries.*

	High Growth Countries[1]			
	DependentVariable			
	I	II	III	IV
	Gini Index	*Ninth/First*	*Ninth/Fifth*	*Fifth/First*
Gdp pc growth	-.0358***	-.0415***	-.0023*	-.0257***
	(.0079)	(.0064)	(.0013)	(.0005)
Social Public Expenditure	-.2230***	-.2256***	-.0710***	-.0197***
	(.0195)	(.0154)	(.0035)	(.0019)
Housingownerloan	-.0348***	-.2928***	-.0401***	-.0361***
	(.0062)	(.0049)	(.0010)	(.0011)
Hhdepchildren	.0928***	.1788***	.0392***	.2282***
	(.0174)	(.0155)	(.0028)	(.0035)
Educ(Im)mobility	.0179***	.0388***	.0035***	.0428***
	(.0056)	(.0052)	(.0010)	(.0006)
Labourfreedom	-.0488***	-.1078***	-.0462***	-.0574***
	(.0068)	(.0094)	(.0016)	(.0010)
constant	.3262***	.4693***	.2231***	.1102***
	(.0107)	(.0095)	(.0019)	(.0016)
Time Dummies	yes	yes	yes	yes
N	256	256	256	256
Wald test	10187.36	11072.58	38491.56	42165.86
Chi2(21)	p-val=0.00	p-val=0.00	p-val=0.00	p-val=0.00

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

[6]: Bulgaria, Czech Republic, Estonia, Finland, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia, Sweden.

On the whole, our estimation strategy testifies the stability of the model, and the coherence of the signs and the magnitude of the estimated coefficients, according to the various specifications, confirms the validity of our results. By means of several original proxies, our findings allow to understand the forces shaping the evolution of household disposable income inequalities in a "homogeneous" sample of countriesand may indicate the direction of the appropriatepolicy measures able to control the extent of this phenomenon,which is a declared target for an effective cohesion of all the citizens in the European Union.

4. *Conclusion and policy implications*

Focusingon the definition of *household* disposable income, our paper studies the course of income inequality among twenty-five EU members during the 1995-2010 period. These countries constitute, at least theoretically, a "homogenous" sample belonging to a general institutional framework, which aims for an effective and organic cohesion of all its associates, and at the same time offer the opportunity to develop a theoretical and empirical analysis of the forces that affect income disparity among developed economies. Our work identifies a wide set of determinants of income inequality, namely, government commitment, macroeconomic, institutional, cultural and social factors, and defines original proxies to assess the impact of public and market institutions, household structure and intergenerational (im)mobility.

To gain a thorough picture of income dispersion, we consider different measures of income inequality and check our hypotheses running regressions over different sub-samples.Considering the *Gini Index*, over the general sample, all the (independent) variables are statistically significant and the estimated coefficients exhibit the expected sign. Growth affects negatively the evolution of income distribution; the public commitment towards health, education and social protection has a negative impact; the housing ownership by tenure status, the "on loan status", has a negative effect, due to the advantages deriving from the mortgage market opportunities; the share of households with children, capturing several combined effects, affects positively income inequality; the educational (im)mobility variable has a positive effect, because of the social barriers and the consequent obstacles of the mobility process; the labour freedom indicator, a negative one, which confirms the crucial importance of reducing the hindrances and rigidities of the labour market.These results are also confirmed when the model is estimated over different sub-groups of EU members. The differences (with respect to the general case) stem from the peculiarities of the units involved, namely the nature of the welfare state regimes, cultural and demographic issues.

Then, we study what happens when other measures (*ninth to first*, *ninth to fifth*, *fifth to first* deciles ratios) of income disparity are used. It is interesting to note that all but the macroeconomic control behave as expected; that the government commitment exhibit a lower impact whenever the richest segments of the population are considered; that for the poorest brackets, owing a house with a loan means a lot, as these people are the most rationed in the credit market; that the household structure matter less when the lower segments are taken into account, since the highest share of dependent children is among this pool.

More specifically, housing ownership with a granted loan count more among the more unequal countries, when the top and the bottom of the income distribution are observed, while it has a smaller impact among the more equal ones, where it can be assumed there is "more"equality of opportunity. Both among the more and the less unequal countries, an increase of the share of households with dependent children has a bigger effect when the extremes of the distribution are studied. Among the set of the more unequal EU members, both the intergenerational (im)mobility and labour freedom indicators display a bigger impact on the various measures of income disparity.

Focusing on the low spending countries and on the tails of the distribution, it has to be highlighted the higher effect of the housing and labour freedom variables. For the former, this evidence stresses the social role of wealth transmission; for the second, the importance of the gap between the rich and the poor in the labour participation. Finally, in the case of the higher growth countries, all the regressors present bigger effects on the tails of income distribution, highlighting the importance of controlling the distance between rich and poor households in the development process.

On the whole, our analysis confirms the importance and shows the role played by the different causes of income inequality,conceived specifically for the EU sample. Everyone agree that inequality is a challenging issue and, especially for the developed countries, its importance has become nowadays more dramatic. Hence, a first, general, conclusion is the warning about the need to watch out and

tackle income disparity, whose origins are numerous and whose effects dangerous and pervasive. But more specifically, some policy indications stand out.

First. It is shown that growth affects negatively income inequality, via individual earnings dispersion between sectors of the economy. This suggests that both the measures that boost growth and thosethat mitigate the productivity differences and produce efficient employment adjustments may concretely hamper inequality.

Second. Inequality can be attacked by the social spending. This, as our theoretical analysis explains, is a crucial tool to struggle inequality: itmust be targeted at the less advantaged and more effective at fostering class mobility. To this end, the policy makers should get rid of all the distortions between demographic groupsand among welfare functions that affect redistributionand define a fairer and real progressive system in balancing benefits and taxation burdens.

Third. Inequality can be also combated by rebalancing the access to the credit market. It is shown that housing ownership "bother" inequality when the on loan status is considered. More generally, thismeans that a more open, in the sense of more equitable, credit market, where projects are rationed not only on the basis of the people means but on their effective economic appeal, is a condition to remove income concentration and related distortions created by social immobility.

Fourth. The presence of dependent children in a household is another source of income disparity. To this regard, a policy prescriptionis to remove the barriers that prevent parentsfrom participatingin the labour market according to their effective expertise,with more accessible childhood structures, more extensive conciliation strategies and redistributive policies in behalf of needy and young households.

Fifth. Efforts to achieve equality of opportunity should be high on the policy makers' agenda. The governments should seriously make the commitment to allow lower background young people to attend higher education and attain the level they "can", regardless of the liquidity constraints and social barriers they face. This requires a

focused public investment in education and active policies able to reduce the negative intergenerational effects and encourage the access to tertiary education, no matter the education level and the job of the previous generation.

Sixth. The characteristics of the labour market cause the rise of inequality: entrance barriers and labour market regulation are recognized to affect equality of opportunities. Hence, policies promoting "equal" working conditions and regulations related to the worker efforts and abilities, and reducing the distance between more and less guaranteed jobs, can effectively interrupt the chain of inequality deriving from wage premium, different forms of discrimination and unemployment benefits favouring particular workers or sectors of the economy.

Appendix A

Table A.1 - *Descriptive Statistics. Dependent Variables. "Unbalanced" series.*

Variables		*Mean*	*Std. Dev.*	*Observations*
Gini Index				
	Overall	29.232	4.319	N = 294
	Between		4.200	Countries = 25
	Within		1.723	Average Time periods = 11.76
Ninth/First				
	Overall	3.775	.862	N = 246
	Between		.947	Countries = 25
	Within		.227	Average Time periods = 9.84
Ninth/Fifth				
	Overall	1.887	.207	N = 246
	Between		.215	countries = 25
	Within		.060	AverageTime periods = 9.84
Fifth/First				
	Overall	1.978	.253	N = 246
	Between		.282	Countries = 25
	Within		.081	Average Time periods = 9.84

Table A.2 - *Descriptive Statistics. Independent Variables. "Unbalanced" series.*

Variables		*Mean*	*Std. Dev.*	*Observations*
Gpd p.c. growth				
	Overall	2.695	3.839	N = 400
	Between		1.381	Countries = 25
	Within		3.592	Time periods = 16
Social Public Expenditure				
	Overall	27.530	5.748	N = 359
	Between		5.498	Countries = 25
	Within		1.746	Time periods = 14.36
HousingOwnerLoan				
	Overall	25.880	18.266	N = 136
	Between		17.902	countries = 25
	Within		2.327	AverageTime periods = 5.44
HH depchildren				
	Overall	54.624	5.659	N = 288
	Between		5.208	Countries = 25
	Within		2.664	AverageTime periods = 11.52
Educ(Im)mobility				
	Overall	46.407	15.761	N = 349
	Between		12.866	Countries = 25
	Within		10.160	AverageTime periods = 13.96
LabourFreedom				
	Overall	62.112	14.187	N = 150
	Between		14.125	Countries = 25
	Within		2.909	Time periods = 6

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Printed by
Gi&Gi srl - Triuggio (MB)
April 2013

ISBN 978-88-343-2553-7