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Shaping economic inequality: the starring role of the household in the 'welfare triad'

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Introduction:
Why and how I do study economic inequality and its determinants?

Concerns about economic inequality can be dated back to the ancient Greece and in the Roman law (cf. Roemer 1996; World Bank 2006), and inequality has continued to be a subject of interest up to nowadays (an example can be found in Van Parijs 1995; 2015).

Notwithstanding, the empirical interest on inequality vanished after the WWII. This was a reaction to the decline, and the following stagnation, that income inequality experienced in that period. In this regard, Aaron observed in 1978 that studying inequality were as exciting as watching the grass grow. However, as also Figure 1 shows, since the 1980s the vast majority of industrialized countries experienced rising income inequality. The sharpest increase in relative terms has been observed in northern Europe, traditionally characterized by low levels of inequality, but an even greater increase in absolute terms has been registered in countries reporting the highest levels of inequality: such as the United States and the United Kingdom (Atkinson, Rainwater and Smeeding 1995; Gottschalk and Smeeding 2000; OECD 2008; 2011; Brandolini 2009; Brandolini and Smeeding 2009; Esping-Andersen 2009).1

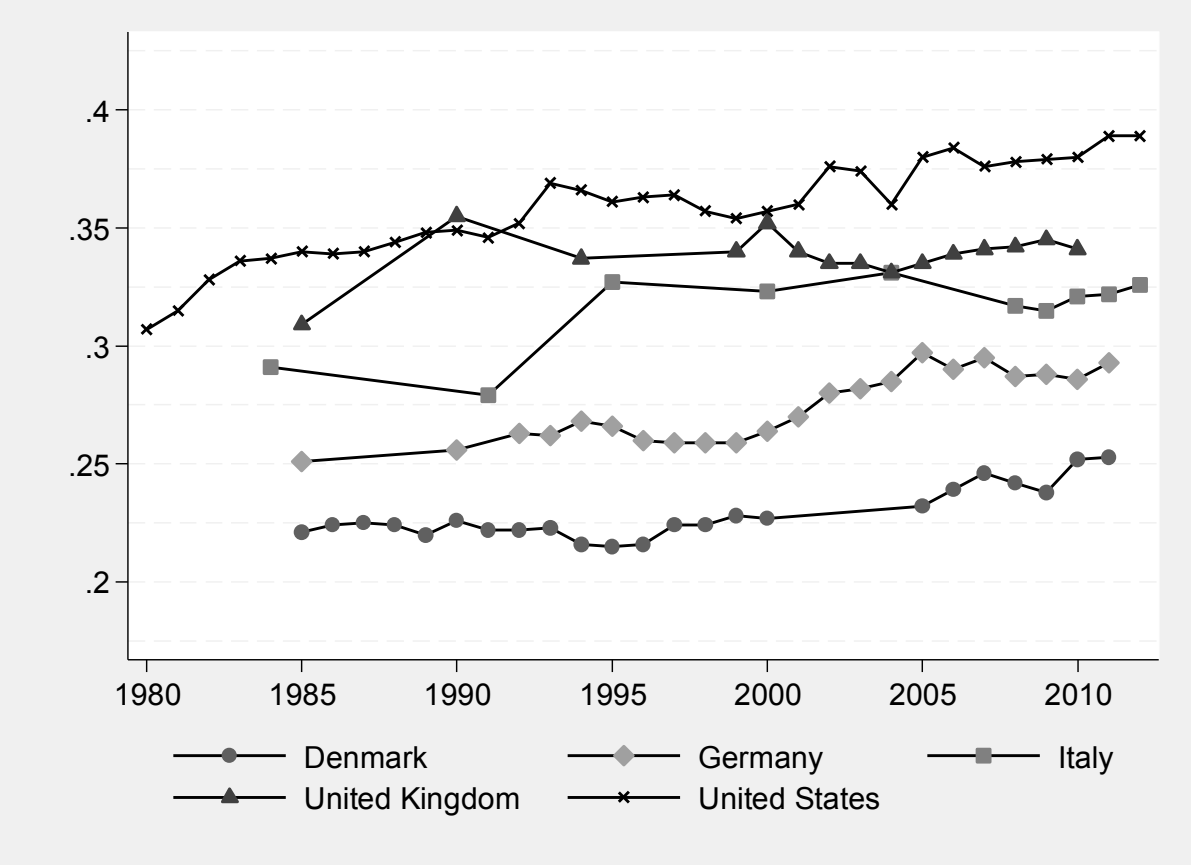
Consequently, as Atkinson observed in 1997, income distribution has been 'brought in from the cold' (cf. also Jenkins and Micklewright 2007; Salvedra, Nolan and Smeeding 2009). Indeed, from the 1980s onwards the interest in economic inequality has been

[1] The trends in inequality that I sketched out here refer to the last few decades of the 20th century. The vast majority of the literature on inequality has focused on this period or mainly after the second half of the last century. However, in the literature it is possible to recognize also studies that have looked at the secular levels and trends of inequality. Among them, probably the most important studies that can be cited are those of Kuznets (1955) and Lenski (1966). Both have investigated income inequality over a very long time span. According to both of them, the trend of inequality over time assumes an inverted U shaped form. Kuznets looked at the relationship between economic growth and inequality, and the relationship he found took the name of 'Kuznets curve'. Roughly speaking and simplifying his work, one of the hypotheses that he advanced regards the shifts from agricultural to nonagricultural sectors. The historical analysis of Lenski covers a much more ample time span. He studied the evolution of societies that have existed throughout the world history, and he categorized them according to their system of production: starting from hunting-and-gathering societies up to industrial societies. According to him, the inversed U shaped relationship between inequality and the course of the history is determined by the distribution of power. Lenski started from the premise that inequality can operate only on the proportion of economic production that is a surplus beyond subsistence level. This implies that as the productivity rises, also potential inequality rises. Now, according to his theory of social stratification, given that the surplus is distributed according to power, the higher the concentration of power and the higher the level of inequality. Looking at the different types of societies that have evolved over history, one can trace shifts in the organization of power that permit to explain the evolution of inequality.

revitalized, and represents now one of the core concerns and an important field of research of many disciplines, including sociology, economics, and demography.

This thesis is inserted in this recent debate, and will mainly profit from the theoretical and empirical contributions of the last three decades.

Figure 1 *Inequality trends, Gini index for equivalent disposable household income, total population*



Sources: *OECD statistics*

Economic inequality is a rather broad concept that refers to inequalities in the distribution of income and of other resources such as wealth, employment, and human capital. However, as argued by Salverda, Nolan, and Smeeding (2009), the core of economic inequality lies in the distribution of income among households – though other aspects, especially wealth and income from capital, are increasingly important (OECD 2011a).[2]

[2] Inequality in the distribution of wealth is generally higher than that of disposable income. Among OECD countries, while inequality in disposable income present a Gini coefficient ranging from 0.30 to 0.50, inequality in wealth ranges from 0.50 to 0.80 (Davies *et al.* 2007). However, it has been recognized that higher wealth inequality is not an indicator of greater inequality in well-being. For example, this is the case for some

In this regard, notwithstanding wealth and income from capital gained importance in contributing to inequality, as also the recent best seller of Piketty (2014) shows (and also OECD 2011), I will not deserve to them much space. On the one hand, a detailed investigation of wealth inequality and wealth-driven inequality is beyond the scope and possibilities of the thesis, and information about wealth is not available in the dataset I will use. On the other hand, the increases in capital income are not as huge as one would expect. Indeed, in the OECD countries, between the mid-1980s and the late 2000s, the share of total household income coming from capital income has increased by about 4 percentage points only for the richer households (in the top quintile), thus contributing only little to overall inequality (OECD 2011; 2015).

Although the study of economic inequality represents a central and urgent topic in academic and public agenda, a unified theory of income distribution still does not exist. However, a very prominent aspect of inequality is represented by the distribution of income among households and the way it is produced (Salverda, Nolan and Smeeding 2009).

This thesis builds on this theoretical contribution by highlighting the importance of analysing the role of household in producing and reproducing inequality in contemporary societies. While the individual and macro level factors influencing economic inequality have been widely investigated, meso level factors have received much less attention so far. It is thus crucial to investigate, as I will do in this thesis, how the sorting of individuals in households and their dynamics in time and space contribute to deepen inequality. In fact, whether, on the one hand, the household represents an important unit in which economic and domestic and caring services are enjoyed, on the other hand, it is also an institution that – together with the state and the market – plays a considerable role in managing social risks and in allocating and redistributing resources. Thus, it has the capacity to shape the distribution of resources, income included, across the population (Albertini, Kohli and Voge 2007; Albertini 2008).

These considerations lead to two main questions: to what extent has the household/family (still) the capacity to shape the distribution of income? To what extent have changes in families (household compositions) contributed to mitigate/exacerbate inequality levels?

Scandinavian countries presenting very low level of inequality in disposable income while showing very high levels of inequality in wealth (cf. Davies 2009).

According to the welfare regimes theory, the 'activity' of risk management and allocation/redistribution of resources is performed by three institutions: the state, the market, and the family/household. Indeed, a country level of inequality derives from the redistributive processes that take place within and among them (Esping-Andersen 1990; 1999). Thus, household's activities, its coping strategies as well as its effectiveness vary among context/countries, according to how the state and the market operates and according to how the three institutions are interrelated (McManus and DiPrete 2000; DiPrete 2002).

In the light of these considerations, this thesis aims to examine empirically the extent to which the institutions mentioned influence the process of income distribution by paying a special attention to the household and its change (Karoly and Burtless 1995; Esping-Andersen 2007; McLanahan and Percheski 2008; McCall and Percheski 2010).

In the next chapter, I will elaborate on the theoretical framework that will drive this thesis. However, I think it is appropriate to anticipate the basic points here:

1. If we want to study economic inequality the perspective should shift from individuals to households, as they represent the final unit where resources are pooled and shared, and thus redistributed;
2. The redistribution capacity of different households varies according to their economic and demographic composition, namely it varies according to household types;
3. Over the last four decades, households have changed and nowadays household types vary much more than in the past. Moreover they also vary among countries – according to the country's welfare state and labour market arrangements;
4. As a consequence, also the household redistributive capacity varies across countries (welfare regimes) as well as it changed over time;
5. The extent to which households – together and in the interplay with the state and the market – are able to redistribute resources (i.e. income) contributes to determine the extent of inequality.

The empirical work of the thesis builds on these considerations, and can be split in two parts. The first part (chapters 2 and 3) shall approach the topic at the aggregate level and addresses the following research questions:

a. To what extent households characteristics can account for the level of societal inequality?

b. To what extent transformations in households' composition can account for changes in societal inequality?
c. What is the contribution of the similarity between partners (in terms of their earning) to explain changes in societal inequality?

Locating these questions in a temporal perspective and, above all, in an international comparison allows addressing also the following issues:

d. How does the household operate in shaping the distribution of resources – and thus income inequality?
e. How household realise that in different contexts characterized by different welfare states and labour markets and by different interrelationships among them and the household itself?

These questions will be approached by studying how the aggregation of micro behaviours is associated with macro outcomes, namely inequality levels measured via inequality indices. The first empirical chapter (chapter 2) investigates how changes in the household structure, i.e. increases in single-headed households, and changes in household economic composition, most notably the massive entry of women in the labour market, have affected income inequality. The second empirical chapter (chapter 3) focuses only on couple-headed households and analyses how changes in heads of households' economic behaviour have contributed to inequality. More specifically, I will examine the increased similarity in employment patterns and earnings among partners. These issues will be investigated by using cross-sectional data over two decades for several industrialized countries – Denmark, Germany, Italy, the United Kingdom, and the United States. These mostly differ in institutional settings.

The second part of the thesis (chapter 4) constitutes a more specific examination of the above subject and addresses the study of micro income dynamics employing a life-course perspective and longitudinal data.

We know that economic and demographic characteristics of households matter in determining disposable household income. Now, by moving towards a dynamic perspective, it follows that changes in economic composition of households, i.e. economic events, may lead to changes in their income and thus move them over the income distribution – that is to say, households experience income mobility. A shift in the economic composition of a household

means one (or more) household member experiencing an economic event, such as unemployment.

Thus, the third empirical chapter aims to study how a specific life-courses event, namely job loss, affects the household's income trajectories.

This raises the following questions:

a. To what extent do **economic events** affect mobility and inequality?
b. Does the role of these events vary among households placed in different social strata?
c. Are households' coping strategies – or to borrow the terms used by DiPrete, **counter-mobility events** – effective in compensate for variation in household income?
d. How are these issues patterned in different mobility regimes – namely how do they interact with the institutional features characterizing different contexts?

From the literature, it emerges that, at the aggregate level, income mobility reduces inequality, and therefore that (permanent) inequality measured longitudinally is lower than inequality usually measured cross-sectionally (Burkhauser and Poupore 1997; Aaberge *et al.* 2002). However, very little is known about the micro mechanisms leading to such outcome, namely how events impact on income. In this thesis, I intend to shed some light on this. In this regard, the key issues are understanding 1) which households move, because the consequences of events for overall inequality may be different whether events/movements are more likely to be experienced by advantaged rather than disadvantaged individuals/households; and 2) to what extent they move, namely which are the consequences of events for individuals' and households' standards of living.

Accordingly, I address the above research questions by studying the consequences of job loss across different social strata. The idea is that social risks may strengthen or weaken social stratification if risks, and their consequences, are unevenly distributed across social groups. For example, the likelihood to experience an event such as job loss and, more importantly, the consequences of the event may be stratified by groups defined according to some attribute.

According to the mobility regimes theory, the context where households operate matters in favouring or preventing the experience of some specific events as well as it matters in determining the consequences for households that from these events derive.

Institutions – the market, family and welfare state –, in fact, have the capacity to buffer the economic consequences of the event. The extent to which their buffering capacities vary

across countries, as well as across strata, will also be object of the third empirical chapter (chapter 4).

In order to assume a dynamic perspective, longitudinal data are required. Given the limitation in the availability of suitable longitudinal data, Germany and the United States only will be studied.

By addressing the issues presented above, this thesis aims to feed into the current literature in various ways. The first chapter cover a long time span up to recent years and does that in comparative perspective. Moreover, the systematic comparison across countries and employing different concepts of income provides new insights on how income is distributed as well as on the redistributive capacities of the various institutions in different welfare regimes. By evaluating the impact of household characteristics on inequality for different income concepts it is possible to identify to which extent the market, the family and the state are able to mediate the link between the household and the overall distribution of income.

The contribution of the second chapter is twofold. Firstly, in studying the association between partners' earnings, I consider the earnings of partners in relative rather than in absolute terms. I do this by employing an empirical strategy that is different from previous research that has mainly focused on the correlation coefficient (a measure that hides possible different processes contributing to changes in the association). In this respect, my contribution is also methodological. By using this methodological tool it is possible to isolate changes in partners' similarity due to shifts in the absolute level of earning from those due to changes in the association in terms of relative position in the earning distribution – i.e. in the way partners are ranked in their own sex earning distribution –, which, I claim, can be considered as the most relevant dimension. Moreover, variation in partners' similarity can be the result of two different processes: on the one hand the likelihood to be employed or not employed and, on the other hand, the association between earnings among those employed. Therefore, to disentangle the role of these different phenomena (with possible opposite consequences), I also decompose transformations in the distribution of households according to the changes associated with these two phenomena separately.

Finally, the last chapter advances the current study of inequality by merging three dimensions of analysis: the life-course; social stratification; and cross-country comparison. I build on the idea that *events* interact with *attributes* in *context*. While one similar example can be found in the literature (Ehlert 2013), my study investigates job loss not only in terms of

transition to unemployment, but also focuses on all the transitions from employment to non-employment (irrespective of the status after job loss). This aims to provide a better understanding of the economic consequences that the loss of the income from employment imply. Moreover, I use an original strategy to define attributes, where attributes are meant to proxy the individual and household position in the social stratification system. I define social stratification in terms of strata based on the distribution of 'permanent' income. By defining social stratification in this way, the individual position in the social stratification system can be interpreted as a latent measure of advantages and disadvantages that over time households accumulate, as well as an indicator of the – human, social, and economic – resources that contributed to the accumulation of those advantages and disadvantages. In addition, I introduce the study of the consequences of job loss events with the investigation of the risks of experiencing such events. I do that by taking advantage of a particular specification of random-effects dynamic probit model. Overall, in this chapter I study how and to what extent the economic losses triggered by job loss vary between strata and between countries, namely in context characterized by differences in the institutions that manage social risks.

1 Theoretical framework

This chapter aims to present the general theoretical framework of this thesis. It is not intended as a complete review of the literature and especially of the theoretical considerations upon which past studies have been based. The empirical chapters that constitute the thesis, although they may be located under the same theoretical frame, address the issue of inequality and the household in different ways. For these reasons, specific theoretical considerations will be discussed in each empirical chapter, in accordance with the specific research questions that will be addressed.

The chapter is structured as follows: it begins with a presentation of the relevance of the topic of (in)equality in paragraph 1.1. Next, I define my unit of analysis, namely the household. Paragraph 1.3 presents the general theoretical framework through which the issue of household income inequality will be approached. Here, the attention is directed to the integration of the three main inequality-shaping institutions: the state, the market and the family. Paragraph 1.4, focuses on the specific role that families/households play in the allocation and redistribution of resources – i.e. income. The issue is presented posing particular attention on how the demographic and economic composition of households is linked to inequality and how, consequently, household changes can lead to changes in inequality. The chapter concludes with a focus on 'life-time-inequality' linking household's – demographic and economic – events to income dynamics.

1.1 Why should we care about inequality?

If we omit the fact that the study of inequality can be simply driven by our scientific interest in this topic – and that this scientific interest can be simply driven by personal preferences – we can list mainly two reasons to support the relevance of the topic: a normative reason and an instrumental one (Salverda, Nolan and Smeeding 2009).

1.1.1 Normative justifications

One normative reason is based on the acceptance that societies have on inequality and equity (fairness) (Osberg and Smeeding 2006; McCall and Kenworthy 2009). For example,

the study of Osberg and Smeeding, covering 27 countries, reveals that the majority of the interviewed agree on the fact that 'income differences are too large'.

Although this feeling should be enough to motivate scientific research on inequality, normative point of views can also be traced in the history of human thought: several thinkers have approached the topic of equality by grounding it in the idea of justice. Equality and justice are closely related, indeed. As Roemer pointed out, the object of the theories of distributive justice concerns with '*how a society or group should allocate its scarce resources or product among individuals with competing needs or claims*' (1996: p. 1). Concerns about (in)equality and justice can be dated starting from thousands of years ago. Probably the oldest manifestations of concerns with equality come from religion. In a few major world religions, the principle of equality is present in, or can be derived from, their *credo*. Concerning the secular tradition, the theme of equality can be historically traced in the ancient Greece in Plato and Aristotle and in the Roman law (cf. Roemer 1996; World Bank 2006).

If we make a jump ahead of a couple of millenniums, thinking about social justice was greatly influenced by utilitarians, according to whom the social goal should be to achieve '*the greatest happiness for the greatest number*' (Bentham [1781] 1970; Mill [1861] 1998). Utilitarianism, in its strict classical doctrine, postulate that society is rightly ordered, and therefore just, when its major institutions are arranged so as to achieve the greatest net balance of satisfaction summed over all the individuals belonging to it. Thus, utilitarians postulate the maximization of the sum of the utilities (or well-being or human welfare) of all people taken together, irrespectively of the utility of each person taken singularly. If this is the case, utilitarians cannot be considered as egalitarians. However, we have to recognize that in a certain sense they are. Indeed, equality enters in the utilitarian formula in terms of equal treatment of individuals in the space of gains and losses of utilities: each individual counts one in the process of utilities aggregation.

Therefore, also utilitarianism seems to request equality. This point is clearly expressed in Sen (1992). According to him, the common feature of every normative theory of social arrangements is the request of equality in something. What changes among these theories is the 'space' in which equality is request.

A step beyond utilitarianism was made from the '70s of the 20th century by a number of influential thinkers including John Rawls, Robert Nozick, Amartya Sen, Ronald Dworkin, and John Roemer. Although the theorization of each of these authors shares much in common,

they differ in an important respect: the space for which they request equality. This last issue is a fundamental one, and indeed it occupies a relevant place in Sen's 'Inequality reexamined' (1992). In this book he argues that there are two focal issues for ethical analysis of equality: 'why equality?' and, 'equality of what?'. In his treatise, it is the second question that represents the main issue because, as he wrote, it is not possible '*to defend or criticize equality without knowing what on earth we are talking about, i.e. equality of what feature (e.g. incomes, wealths, opportunities, achievements, freedoms, rights)? We cannot answer the first question without addressing the second*' (Sen 1992: p. 12). As said, different theories give different answers to this question, namely they focus on different spaces.

John Rawls, for example, in 'A theory of justice' (1971) contested the utilitarian view of distributive justice. In his theory of justice as fairness, the space of equality should not be the utility (or well-being), but rather the 'primary goods'. Primary goods are first defined by Rawls in broad categories, as '*rights and liberties, opportunities and powers, income and wealth*' (p. 92). In a more recent work, he gave a more specific formulation of what primary goods are: basic liberties, including for example freedom of association; freedom of movement and choice of occupation; powers and prerogatives of offices and positions of responsibility; income and wealth; the social bases of self-respect (1982).

Moreover, what Rawls contested to the utilitarians is the equality 'formula': rather than maximize the sum of some goods, it should be equalized the distribution of primary goods across persons or, according to the words of Rawls, it should be maximized 'the minimum bundle of primary goods' (1971). Rawls called this moral mandate the 'difference principle'.

A second response to utilitarianism comes from the Nobel Prize Amartya Sen, who indicates another space in which the equality should be requested: what he called the abilities to 'function'. Functionings are defined as 'beings and doings', namely, states of human beings and activities that a person can undertake. The first category – beings – includes, for example, being educated, being well-nourished, being healthy; while the second – doings – includes activities such as travelling, caring for a child, voting in an election. The abilities to function or, better stated, a person's real freedoms or opportunities to achieve functionings are named by Sen 'capabilities'. Therefore, what he claims is the equality of 'capabilities'.

He recognized that the capabilities may generate utility or welfare but, he argues, it is the capability to function that come closest to the notion of standard of living. Sen supports this claim, for example, in his discussion 'against' the use of income as the space for equality.

According to him, what makes income valuable is the fact that it represents a means to other ends and, inter alia, it is one means among others – Rawls' primary goods, for example, can be considered a more inclusive list of means. Income matter only because '*it helps the person to do things that she values doing and to achieve states of being that she has reasons to desire*' (Sen 1997: p. 385). The problem with income emerges once the relationship between income (or other resources) and individual achievements and freedoms is considered. This relationship is, indeed, not constant. Different types of contingencies make individuals asymmetric with respect to the conversion of incomes into the distinct functionings they can achieve, and that affects the lifestyle they can enjoy.

Sen argues that this asymmetry is mainly due to five sources of variation: personal heterogeneities that make individuals needs diverse; environmental diversities; variations in social climate; differences in relational perspectives; and distribution within the family. This last element is a crucial one, indeed as he highlights, the family is '*the basic unit for consideration of incomes from the point of view of their use*' (p. 386). In this thesis, I adopt this view.

Following Roemer (1996), one of the elements that Sen has in common with Rawls is that neither the first nor the second advocate a distribution of the final outcome type, this means that they reserve a role to the responsibilities in individuals' accomplishment. While utilitarians advocate a distribution of final outcomes, '*both primary goods and functionings are inputs into what a person can accomplish by his own volition*' (Roemer 1996: p. 164). In this resides the personal responsibility.

However, whether on the one hand the responsibility issue remains only germinal in Rawls's and Sen's theorization, on the other hand the issue has been object of a sharper focus by Dworkin. The particular attention in the role of responsibility in distributive justice marks the significance of the contribution of this author, in fact (Roemer 1996).

The position of Dworkin with respect to equality is traceable in two articles he published in 1981 (1981a; 1981b). In the first one he presented his position against equality of welfare while, in the second one, he argued in favour of equality of resources. Dworkin starts his treatise with an example:

'*Suppose, for example, that a man of some wealth has several children, one of whom is blind, another a playboy with expensive tastes, a third a prospective politician with expensive ambitions, another a poet with humble needs, another a sculptor who works in expensive*

material, and so forth. How shall he draw his will? If he takes equality of welfare as his goal, then he will take these differences among his children into account, so that he will not leave them equal shares. Of course he will have to decide on some interpretation of welfare and whether, for example, expensive tastes should figure in his calculations in the same way as handicaps or expensive ambitions. But if, on the contrary, he takes equality of resources as his goal then, assuming his children have roughly equal wealth already, he may well decide that his goal requires an equal division of his wealth. In any case the questions he will put into himself will then be very different' (1981a: p. 186-187).

This example is based on the two different theories of distributional justice presented in the two articles mentioned above. According to the theory of the equality of welfare, people are treated as equals when a distributional scheme distributes or transfers resources among them until no further transfer would leave them more equal in welfare. Following the equality of resources theory, people are treated as equals when resources are distributed or transferred in a way that no further transfers would leave people's shares of the total resources more equal.

What Dworkin concludes is that equality of welfare is incoherent because of the incommensurability of the conceptions of well-being that different people have. Moreover, even if comparisons were possible, it would be ethically undesirable equalize welfare because of 'expensive tastes': people with 'champagne tastes' – such as the playboy – needs more resources to achieve the same amount of welfare with respect to people with beer tastes (1981a). A society committed to equalize welfare would have to give more resources to those individuals with expensive tastes and this, according to Dworkin, is ethically unacceptable. Rather, he sustains, the right egalitarian space is resources. What he means with the term resources, comprises wealth and commodities, internal traits of persons that can favour or limit what they can achieve, as well as the environments and families into which they are born.

In the Dworkin's view, '*the natural distribution of resources is unjust, because it is unequal, but once equality of initial resources has been implemented, inequalities in outcomes which emerge from the exercise of choices emanating from preferences are morally acceptable*' (Roemer 2009: p. 29). As said earlier, in Dworkin it is possible to recognize a particular emphasis on individual responsibilities for his preferences and choices. Therefore, summarizing, Dworkin's egalitarianism aims at compensate for inequalities in people's

circumstances, which are the aspects for which they are not responsible, but does not aims at compensating people for inequality for which they are responsible, such as inequality deriving from people's exercise of preferences which they are glad to have.

Alongside these egalitarian theorists, the antiegalitarian contribution of Robert Nozick has to be cited. In 'Anarchy, State, and Utopia' (1974), he proposed his 'entitlement theory'. Nozick argues that given the fact that outcomes – such as welfare, utility, and so on – are the results of processes, the right space for a theory of justice should be the processes.

Nozick bases his theory of distributive justice upon two notion: the notion of 'justice in transfers', which specify the conditions that a transfer must satisfy in order to be just; and the notion of 'justice in acquisition', which governs the gaining of exclusive property rights over the material world. The idea at the basis of his entitlement theory is that a person is entitled to some holding if he acquired the holding in accordance with the principles of justice in transfers and justice in acquisition. Therefore, what this theory implies is that '*a distribution is just if everyone is entitled to the holdings they possess under the distribution*' (1974: p. 151). If people are 'entitled' to some resource that were justly acquired or that were transferred to them according to a just process, according to Nozick there are no problems for justice even if this means that those people will be immensely rich, and that their riches may be of no benefit to the poor. Justice does not entail equalizing some outcome, what it should entail is the fairness of the processes that have led to some outcome.

This discussion about the numerous theories that have approached the issues of distributive justice and equality is clearly far from exhaustive, but concentrated on the most influential ones. This is true for both the long list of contributions as well as for the discussion of each specific theory. Moreover, all the contribution proposed have been subjected to many critics over time (see for example Roemer 1996). For what concerns the scope of this paragraph, what is important is to recognize the variety of the spaces for which equality could be requested.

Indeed, there is not a single answer to the Sen's question 'equality of what?' (1992). However, considering the contributions of the thinkers mentioned, it is possible to distinguish between two broad classes in which equality is requested: the first refers to the distribution of final outcomes, the second to the procedure which takes place in the achievement of some outcome. To the 'final outcome' class belongs, for example, the utilitarian view, while the

'procedural' class includes Rawls' primary goods, Sen's capabilities and Dworkin's equality of resources.

Considering this thesis, the equality space I focus on belongs to the outcome class, and specifically concerns individual equivalent disposable income.[3]

1.1.2 Instrumental justifications

Instrumental justifications have to do with the possible negative consequences that inequality can have for societies. 'Consequences of Economic Inequality' is the title of a special issue published by the journal 'Research in Social Stratification and Mobility' in December 2012. In the introduction of the issue, Van de Werfhorst and Salverda write: '*The reason why economic inequalities have been so high on the agenda of sociologists is that inequalities are said to have important consequences that erode social cohesion in society. Inequality leads to political conflicts and revolt, it augments crime rates, and it decreases the solidarity between groups in society*' (2012: p. 377).

However, although the title of the journal issue refers to economic inequality, all the contributions of the issue deal with income and income inequality. At this point, before moving forward with that discussion, it is important to clarify one point, in order to avoid confusion. Very often, the notion of 'economic inequality' is used as a synonymous of 'income inequality', which is not correct. Certainly, the distribution of income can be considered as being at the core of economic inequality, and has been the focus of the vast majority of the research on the topic, especially among economists. However, economic inequality will not end with inequality in income. According to Salverda, Nolan, and Smeeding, indeed, '*Economic inequality can be conceived of as inequalities with an economic effect or an economic origin, being as much an outcome of the underlying economic process as an input into these processes*' (2009: p. 8). This is clearly a broad definition, which surely includes income inequality but cannot be limited to it. Economic inequality, in fact, refers also to inequality in the distribution of other economic resources such as wealth, employment, and human capital. Inequality in income is only part of the story.

The misunderstanding that usually leads to overlap income inequality with economic inequality is probably due to the fact that, as said, much of the research on the topic has

[3] Although the unit of interest is the household, considered as the unit of aggregation where individuals pool and share their resources, the unit of analysis is the individual. For this reason, the income concept mentioned refers to the individual.

focused on income. This is because income inequality still accounts for the lion's share of economic inequality, and because income is considered as the main determinant of individuals' and households' standards of living. This thesis will not make an exception to this. Though this thesis contributes to the (broader) topic of economic inequality, it specifically focuses on the narrower concept of 'income inequality'.

Now that the focus has been defined, it is possible to continue with the examination of the possible consequences of inequality, without (or at least limiting) the risk of misunderstandings.

A vast amount of research has investigated the relation between income inequality and a wide range of socially relevant outcomes. The question driving the interest in the topic was: is inequality harmful for society? According to Wilkinson and Pickett (2009) income inequality is harmful for societies because more unequal societies have also negative societal outcomes including higher crime rates, worse physical and mental health and higher mortality rates, lower social trust and higher educational inequalities.

Moreover, a situation of income inequality in one generation contributes to determining the prospects of future generations: the amount of resources that parents are able to invest in improving their children's situation largely depends on their incomes (Voitchovsky 2009).[4] It is indeed well recognized that as families are the primary institution for rising children, they experiences play a prominent role in shaping children's life chances and can be considered as an important mechanism for the reproduction of inequality (Parsons 1949; McLanahan and Percheski 2008; Barbieri and Bozzon 2015; Barbieri *et al.* 2015). Also Blank (2011) observes that inequality may depress mobility – which can be considered as an indicator of openness and opportunities in a society. For these reasons, intergenerational mobility has received much attention in the literature (Solon 1992; Zimmerman 1992; Beller and Hout 2006; Bjorklund and Jantti 2009; Ichino, Karabarbounis and Moretti 2011).

In the economic discourse, especially, instrumental justifications for the study of economic inequality have also been related to the end of economic efficiency, namely the much discussed trade-off between equality and efficiency (cf. Salvedra, Nolan and Smeeding 2009; Blank 2011; Gornick and Jantti 2013).

[4] Both economic and sociological literature recognizes an association between income inequality and opportunities (Esping-Andersen 2007). Indeed, according to the theory of intergenerational mobility, children's chances are closely related to parents' investments in children's human capital (Becker and Tomes 1986).

1.2 Definition of the household

After having defined the aspect of economic inequality I am interested in, and the space of equality I focus on, it is now time to define what the 'household' represents in this thesis. Here, the 'household' is considered as an institution that operates in managing social risks that its members can face, and in distributing resources among them. 'Household' assumes in this thesis a different meaning than 'family'. In the scientific literature, there is not a general consensus about the distinction between the two terms and what 'household' or 'family' exactly mean. Sometimes they are used as interchangeable concepts, sometimes both are specifically and narrowly connoted. At the same time, what they refer to, varies over time and space, historically and across cultures.

To clarify what in this thesis the concept of household refers to, it is helpful to make use of Laslett's (1972) criteria. He identifies three main criteria, people belong to a family or household if they share a certain space (the location criterion); they share a number of activities (the functional criterion); and they are related to one another by blood or marriage (the kinship criterion).

Based on these three criteria, in the literature household is generally defined with the first and the second criteria, and in the present study the household is defined accordingly. Concerning the family, in the literature the use of the term is less uniform (Saraceno and Naldini 2007). On the one hand it is sometimes conceived based on all the three criteria, and therefore in a more strict way. On the other hand, it is sometimes conceived in a broader way by including also kin who do not live 'under the same roof'. In this last definition of family also the parents living outside the home, for example, are included.

Therefore, along the thesis my unit of analysis refers to individuals that live under the same roof and share some activities.

This discussion concerns the household in a 'technical sense', as unit of analysis. However, another specification merits some attention: the double perspective through which the household can be seen, namely the double significance that the terms household/family may assume. In fact, these terms are used on the one hand to refer to the unit of analysis (as discussed above) and, on the other hand to refer to the institution. In these respects, I think that the term household could be used in referring to the unit of analysis, while the term family could be used in referring to the institution. In some cases, however, these two

different meanings cannot be disentangled so easily. For this reason and for the sake of simplicity I decided to use only the term 'household' in the following.

1.3 The three inequality-shaping institutions: state, market and household

Atkinson and Bourguignon (2000) stressed that a unified theory of income distribution does not exist yet. Salverda, Nolan and Smeeding (2009), however, recently sketched some starting points to define a framework within which to locate the various aspects of inequality and proposed to consider '*the distribution of income among households, which is at the core of economic inequality, and the way it is produced*' (p. 11).

Regarding the way that distribution is produced, they mention *mainly* two elements.[5] First, the distribution of income among households is affected by the earnings from work that different household members receive – and then pool. At this regard, one should focus on two issues: 1) individuals in the labour market, namely how labour income of individuals is determined – this implies to consider individuals' endowments, and labour market institutions such as unions and minimum wage regulation; and 2) the patterns of household formation and specifically how individual earners sort into households.

Second, another very important source of household income is represented by public transfers to household members. Related to this source of income are income taxes and social insurance contributions, which represent the main sources that finance the states spending on transfers. All these elements play a prominent role in shaping the income distribution. This issue, moreover, links back to the way in which individuals are sorted into households. Indeed, the economic and demographic composition of a household defines the amount of transfers it is entitled to as well as the tax-burden it is subjected to.

The lack of a unified theory of the income distribution has led the vast majority of studies to focus *simultaneously* on just few aspects. However, given the complexity of the role that institutions play in influencing the distribution of income, an almost infinite list of factors has

[5] A third element – although less important than earnings, as the authors recognize – that contributes in determining household income is income derived as return on capital. This component includes interests, dividends, rent and capital gains and profits. That relates to the issue of wealth distribution. According to the OECD this component represents a small part of household income but is rising in importance.

been explored (see Gottshalk and Smeeding 1997; and Gustafsson and Johansson 1999). In 'searching for smoking guns', namely in looking for those drivers of income inequality that are more important than others, Gustafsson and Johansson offer five sets of factors contributing to the distribution of income: (i) economic development and/or the size of the industrial sector (cf. Kuznets 1955); (ii) the international division of labour (cf. Burtless 1995); (iii) macroeconomic performance (in the literature mainly measured via unemployment and inflation); (iv) reasons that lie outside a strictly defined market sphere (such as share of unionized workers and the size of public sector or minimum wage legislation); (v) demography (including household size, age structure and woman participation in the labour force) (cf. Cancian, Danziger and Gottshalk 1993; Karoly and Burtless 1995).

This list can be easily further expanded. For example, another set of factors concerns the welfare state and its variation across countries (welfare regimes). Welfare states have indeed the capacity to shape the way income is (re-)distributed across the population (Esping-Andersen 1990; 1999).

The vast range of factors identified in the literature can be sociologically traced back to mainly three institutions affecting the distribution of income: the state, the market and the household.

According to the welfare regime theory (Esping-Andersen 1990; 1999), these institutions play a prominent role in managing the social risks individuals face during their life-courses and in allocating/redistributing welfare – income included – among individuals. The three institutions distribute and redistribute resources in different ways: the state operates mainly via transfers and taxes; the market especially via income from labour; while the household via domestic production and by sharing its members' resources. They also operate according to different principles. As argued by Esping-Andersen (1990; 1999) – who is inspired by Polanyi (1968) and Titmuss (1974) –, the state allocates resources following the principle of authoritative redistribution; the market distributes via the cash nexus; while the household follows a principle of reciprocity.

In the Esping-Andersen's theorization (1990), it is possible to identify three principles coming into play in the identification of the welfare regimes typology: *de-commodification*, *stratification,* and *integration*. The first principle mirrors the capacity of social policy to guarantee individuals' social reproduction outside the labour contract. The principle of

stratification refers instead to the role that the welfare state plays in the structuring of class and the social order. The welfare state is indeed an institution that, according to the way it allocates resources, reproduces or modifies a society's system of stratification.

According to these two first principles, Esping-Andersen identifies three welfare regime types. The 'liberal' regime characterizing the Anglo-Saxon countries; the 'social-democratic' regime that includes the Scandinavian countries; and the 'conservative' regime that is represented by the continental European countries.

Moreover, in observing the way in which the principles of de-commodification and stratification lead to the identification of the three welfare regime types, the third principle comes to the forefront.

Integration refers to the ways in which risks management and welfare production and re-distribution are allocated to the three risks-managing institutions: state, market, and household, and the combination and interrelation among them. The presence of three different institutions at work does not imply that they are functional equivalents and thus mutually substitutable. State, market, and household form instead the 'welfare triad'. All operate simultaneously in managing social risks (although the role played by each varies according to the context) and are indeed inter-related – the action of one of them inevitably affects also the others. Different contexts, or country clusters, are characterized by different ways in which these 'activities' are distributed among the three institutions and by different interrelationships among them. From what has been argued above, each regime type can be characterized by an institution that plays the main role in the risk managing and in welfare provision/allocation/redistribution. The state represents the chief institution in the social-democratic regime, the market embodies the liberal nature of Anglo-Saxon countries' regime, while the household plays the main role in the conservative regime. Nonetheless, in each regime, obviously, also the other two continue to be at work in risks managing and allocation and redistribution of resources. What vary among welfare regimes is the principal institution responsible for these activities and the way the three institutions are interrelated.

What has been mentioned here is clearly expressed by the words of Esping-Andersen: '*How risks are pooled defines, in effect, a welfare regime*' (1999: p. 33). Then he continues, '*A welfare regime can be defined as the combined, interdependent way in which welfare is produced and allocated between state, market, and family. The family, however, tends to disappear within the perspective of comparative political economy. Political economy needs*

to become more sociological' (1999: p. 34-35). This thesis intends to provide some contributions in this direction.

In this last sentence, Esping-Andersen also rises another point. He highlights the role that the household should play in the scientific discourse and pushes towards a more sociological look at how resources are redistributed and allocated. Indeed, although the vast majority of the literature on income inequality comes from economics, there is ample room for approaching the topic also from a sociological perspective. Esping-Andersen reminded this point recently in considering household changes as a foremost sociological explanation for the rise of economic inequality in many industrialized countries (Esping-Andersen 2007; Karoly and Burtless 1995; McLanahan and Percheski 2008; McCall and Percheski 2010).

However, while in Esping-Andersen (1990; 1999) the principles of de-commodification and stratification have been empirically operationalized, the principle of integration has been based (just) on a theoretical ground, deriving it from the empirical results based on the other two dimensions, thus leaving the process of operationalization of the theoretical pillars of the welfare regime theory incomplete.[6]

One of the aims of this thesis is to study the process of *integration*. Indeed, a country's level of inequality derives from the redistributive processes that take place within and among these institutions. In studying the interrelationship among the state, the market and the household, particular attention will be paid to the household, the final unit in which individuals enjoy the welfare: the household manages and allocates the resources deriving from the market, the state and the household itself, and it is the 'unit' which benefits from the resources therein allocated. The way in which the household is inter-related with the state and the market will be taken into account by studying how the household operates in different welfare regimes. This international comparison permits to take into account how the household – or better, different types of households – operate in defining the distribution of resources and thus in shaping income inequality and how it does so in different contexts characterized by different welfare regimes and (related) labour markets.

So far, a comparison over space has been privileged, pointing to an international comparison. Yet, the comparison over time is equally important. Household types not only vary across countries but also within countries over time, as vary also the interrelationship of household with the other institutions. Adding the temporal dimension to the spatial one

[6] Oddly enough, although 25 years have passed since 1990, literature still lacks of a theoretical or empirical contribution which explicitly addresses this issue. Esping-Andersen came back on this point later (2005).

furnishes a further and precious source of variation for understanding allocative processes and thus the process of integration. More specifically, the role that the time-dimension plays is twofold: the flow of the time 'operates' in terms of historical time and in terms of life-time; and the two may also interact.

Over the last decades, important changes occurred especially in the household and in how it operates and interrelates with the other two institutions. These changes come with consequences for households' capacity to handle the welfare of their members and at the same time vary according to social and institutional contexts. For example, increases in union dissolution led to increases in single households, and among them especially in lone mothers. Lone motherhood implies high social exclusion and poverty risks. Lone mother's capacity to handle household welfare is indeed quite limited and depends on how the risks management is allocated among state, market, and household itself. In this example, household welfare highly depends on social transfers from the state and especially on the income that the mother can earn in the market (Barbieri and Bozzon 2015). However, her possibility to earn an income depends also on the availability of affordable private childcare services purchasable in the market or on public childcare services – or, in other words, that possibility depends on the degree of de-familialization promoted in a welfare regime. This is only an example to show how changes in household characteristics can affect household redistributive capacity.

Considering the two temporal dimensions – historical time and life-time – the way in which they interact clearly emerges if we observe changes in households' economic composition. During the post-WWII period, when the *male-breadwinner* model was the typical household model and where boosting economies and growing labour markets were diffused, social risks were confined at the two extreme of households' life cycles: in childhood (and especially in large households) and among the elderly (Rowntree 1901).

However, after the 1970s, the capacity of households and labour markets to provide basic welfare has changed. As a consequence, new risks have been generated by these changes, and the risks' timing over the life cycle has changed. Indeed, as it has been stressed in the literature, in the post-industrial society, characterized by increased household instability, widespread unemployment and more insecure careers, life-course risks are now concentrated in different age and social categories, according to the institutional context (Esping-Andersen 1999; Barbieri 2009).

Taking a 'micro' perspective, it also emerges that households are not stable units but rather are affected by their life cycles. During their life course, indeed, households (may) experience many events: a childbirth or a child leaving home, union dissolution, unemployment spells, a member entering the labour market or a member who retires. All these events, by impacting on the total income that household has at its disposal and on the composition of household and of their needs, have clearly the capacity to affect household's standard of living and redistributive capacity. At the same time, the risks that the household can face as well as its integration with the other institutions vary with the household's attributes (e.g. class position) and the household's life cycle (cf. Barbieri and Bozzon 2015).

Some of the major changes refer exactly to changes in households' life cycles, and thus require a real longitudinal perspective alongside with its comparison over historical time. However, some additional theoretical considerations arise if one moves toward a longitudinal perspective. An important contribution in this direction comes from the life course approach and in particular from DiPrete's (2002; 2003; DiPrete *et al.* 1997; DiPrete and McManus 2000) works on life course mobility regimes theory.

The author proposes a redefinition of mobility regimes by focusing on the household level. DiPrete's approach lies in '*directly considering the factors that potentially create major and not always predictable changes in household standard of living*' (p. 275). In particular, the focus is on life course mobility produced by economic events and demographic events as they are sources of significant changes in standards of living. At this regard, he makes a consideration that is strictly linked with what was argued above, conceptually distinguishing between the likelihood of experiencing these events and their socio-economic consequences. This distinction is based on two reasons: among countries, the distribution of the rates and their consequences may be influenced by different societal factors; industrialized countries have tax and social policies that modify the socio-economic consequences of economic and demographic events.

Building on the permanent income theory (Friedman 1957) – according to which individuals seek stability in living conditions and average their consumption to smooth fluctuations in living standards –, he argues that societies '*differ in the extent to which their institutional structure* [that has to be intended in terms of market and welfare state] *promotes stability in household living conditions over the life course, and in the mechanisms for achieving this stability*' (p. 277).

At this regard, two groups of societal mechanism are mentioned. The first one affects the rate at which mobility-generating events occur by both manipulating the vacancy structure itself (such as via creating public-sector jobs to reduce unemployment), and by increasing or decreasing the incentives of individuals or households to initiate events (such as by altering the cost and benefits of divorce).

The second group of societal mechanisms affects instead the consequences of events. These mechanisms can do that by directly affecting the variance of outcomes (compressing wage distribution reduces earnings consequences of job change), or through insurance against adverse events and through taxation against the potential gains of positive events. A third mechanism – of particular importance for the focus of this thesis – is what DiPrete calls *counter-mobility events*. This mechanism permits to reduce life course risks by the opportunity to recover from a previous event. For example, a drop in standard of living due to job loss can be recovered by reemployment or by another household member entering the labour market. Therefore, counter-mobility events have the capacity to translate the consequences of adverse events to a 'transitory' as opposed to a 'permanent' change in standard of living.

However, according to DiPrete's argument, the possibility for individuals and households to rapidly recover their initial position via counter-mobility events clearly depends on the society's mobility regime (I will address this issue in Chapter 4). This implies that possible mid- and long-term consequences of negative (but also positive) events vary across contexts as thus varies the degree to which inequality crystallizes in the form of 'permanent inequality'. Again, that brings back to the issue of *integration* among state, market, and household.

Also Western and colleagues (2012) recognize the interrelation of these institutions, posing also an accent on the dynamic perspective: '*The risk pooling that smoothes incomes over time is a collective endeavour, organized in households and through social programs whose benefits often depend on family structure and employment or income. From the dynamic perspective, insecurity is formed through the interaction of the labour market with the household, in an institutional context provided by the welfare state*' (p. 344).

The next paragraph (1.4) deals with the ways through which the household affects the distribution of income in integration with the other two institutions. Before, however, it is useful to mention the ways in which state and market affect the income distribution.

1.3.1 The State

The state affects households' income mainly in two ways: directly, providing households with transfers and services; and indirectly, through the regulation of the labour market (for example by minimum wage settings) and through the taxation system. For virtually all OECD countries, the inequality measured on disposable income is lower than inequality in market income (although the capacity to reduce inequality varies between countries) (OECD 2011a). Therefore, the role of the state in redistributing economic resources among households is indisputable. Two dimensions of redistribution can be identified: horizontal redistribution and vertical redistribution (Hills 2004). The first dimension aims at protecting individuals from social risks by the reallocation of income over the life cycle – thus redistribution within individual. The purpose is to guarantee the wellbeing of individuals in the case of both unexpected events, such as illness or unemployment spells, and future situations including old-age. The second dimension aims at the satisfaction of individuals' needs and at the reduction of poverty, and has its goal in the pursuit of equality – between individuals. The degree to which the state pursues equality varies according to the country considered and it is manly associated with, on the one hand, the extent to which the fiscal system is progressive and, on the other hand, the targeting and generosity of the resources provision in terms of cash transfers or services (Esping-Andersen and Myles 2009).

As said earlier, the (welfare) state affects the distribution of individual's disposable income not only directly, but also indirectly. Direct effects are straightforward, as we have seen. Indirect ones are less so. Social policies play an important role here. Indeed policies influence the market-based income distribution manly in two ways. First, the welfare state produces inequality in the market income by producing a large share of population with any or low market income, via policies of labour supply reduction (early retirement schema, leave policies, decommodification measures, etc.).

By operating in these ways, the social protection as well as the tax system affect work incentives and thus labour incomes (Atkinson 1995; Milanovic 2000). Second, the welfare state affects also the earning potential of individuals. In this way, it plays a role on individuals' market income also in the long-run – and not only at a given point in time. Some examples in this regard are the supply of services such as education, health care, active labour market policies or services which support working mothers. Policies like these are able to

produce a more equal distribution of opportunities and might favour a more equal distribution of market income. Moreover, they also play an important role in moderating the intergenerational transmission of social and economic risks (Esping-Andersen and Myles 2009; Castles *et al.* 2010; Barr 2012).

1.3.2 The market

The role of market in influencing household income is rather clear given that income from labour represents the main component of the household disposable income (Kalleberg and Sørensen 1979; Kalleberg 1988; Bernardi 2001). Indeed, '*for most people, during most of their lives, the market is undoubtedly the chief source of well-being*' (Esping-Andersen and Myles 2009: pp. 645). Therefore, given that the level of income inequality is strongly influenced by the level of inequality in earnings generated by the market (Blau and Kahn 2009), the increase in inequality in market income that many OECD countries have experienced from the mid-1980s can be seen as a driving force of the increase in income inequality (OECD 2008). [7] To emphasize the importance of this institution, Piketty ([2002] 2003) stated that in order to understand income inequality, the formation of inequality in market incomes should be identified.

Inequality in market income and its changes can be influenced by many factors including the national employment structure, the economic returns from skills, and the skill-biased consequences of globalization and technological progress (Jenkins 1995; Acemoglu 2000; OECD 2011a). Some factors that have been considered in explaining the recent evolution of inequality concern the changes in the demand and supply of labour that many countries have experienced since the 1970s. One of these factors is the technological progress and in particular the progress in the information and communication technologies (ICT). These changes are considered to be 'skill-biased', ICT needs high skilled labour (which is characterized by higher wages than low-skilled labour) and therefore moves the labour demand from low- to high-skilled labour, determining in this way an increase in the dispersion of wages.

A second factor that has been considered 'skill-biased' is globalization. The increasing integration of the world economies and the transfer of low-skilled production from advanced

[7] Labour market income includes gross wage, income from self-employment, capital income, and returns from savings.

to developing economies have led to the increase in inequality. According to the traditional international trade theory, the increasing economic integration is associated with growing wages for skilled labour and the consequent increase of wages differentials between skilled and non-skilled workers in advanced countries. Moreover, economic integration leads to economic competition between non-skilled workers in advanced and in developing countries, leading to decreasing wages for the firsts (Atkinson and Brandolini 2004; Kremer and Masking 2006; Esping-Andersen 2009; OECD 1996; 2011).

Globalization and advances in information and communication technologies are probably the most relevant and most often mentioned market-driven factors that are considered responsible for the increase in inequality observed in many industrialized countries from the 1970s.

1.4 The role of the household

Although recognizing that many aspects can come into play in shaping a country's level of inequality – including labour market institutions and state redistribution capacity – (Gustafsson and Johansson 1999; Esping-Andersen and Myles 2009), the specific focus here is on the household.

To what extent does the household work to allocate/redistribute welfare? Does it manage to effectively buffer the risks deriving from the market? To what extent varies its role among different nations and welfare regimes? Do household's changes affect its capacity to manage social risks and to redistribute resources in an equalizing way? Do demographic and economic events that the household can face during the life-course have a different impact on disposable household income in context characterized by different institutional arrangements? These are only a few questions that emerge focusing on households while taking into account the context in which it operates.

1.4.1 Linking household to inequality: household's composition, its changes, and the (possible) impact on income inequality

'The household is the ultimate destination of welfare consumption and allocation. It is the unit 'at risk'. How social risks are managed and distributed between state, market, and families themselves makes a huge difference.' (Esping-Andersen 1999: p. 36).

This passage re-marks the double perspective through which the household can be seen: on the one hand, the household is an institution that takes part – together with the state and the market – in the complex activity of risk management and resources allocation. On the other hand, the household is also the final beneficiary of the result of that activity; it is the 'place' where welfare is enjoyed by the individuals. With this in mind, the following pages will address the role that household plays in distributing and redistributing incomes.

As highlighted earlier, the household has to be considered an important source of welfare and, since it provides its members with variable amount of resources, it maintains its role in shaping inequality (Albertini, Kohli and Voge 2007; Albertini 2008a). From the existing literature it emerges that income inequality measured at the individual level is higher compared to inequality measured at the household level. This is due to the household's redistribution capacity.

This thesis focuses on *demographic* and *economic characteristics* of the household. The two are strongly associated with income inequality. Nonetheless, demographic and economic characteristics are no way the only sources of inequality. For example, also household members' characteristics including education are relevant, as well as other factors outside the household matter. However, given that the focus here is on the resources' allocation/redistribution capacity of the household, economic and demographic aspects are more important as they are more strictly connected with the amount of resources that is pooled and with the way resources are shared.

Households characterized by different compositions have in fact different incomes capacities (Biewen and Juhasz 2012). The relevant changes that households have experienced in their composition clearly raise concerns about if and how these changes have affected inequality. But households – which means: different *types* of households – are embedded in context-specific welfare and labour market arrangements, so that this situation shapes and reproduces specific constellations of households' risks management capabilities (Barbieri,

Cutuli and Tosi 2012; Barbieri *et al.* 2015) which in turn affects the distribution of inequality at the societal level.

Moreover, different household types (defined in terms of both demographic and economic characteristics) emerge according to the welfare state and labour market context. An example is the rise of dual earners households. Indeed, although dual earners households increased in almost all industrialized countries, they did so with a different pace and starting from (and arriving at) different levels. Welfare states that support households with childcare services, or labour market characterized by a strong presence of part-time job, clearly permit mothers to reconcile household and work and thus favour the increase of dual-earners couples. Many trends are common among countries – including the increase of single headed households, the rise in female labour market participation and the rise in assortative mating (at least among high educated people) – but the way state, market and household operate can affect the extent to which these trends run.

In the following, I will discuss the main changes that households have experienced with regard to its demographic and economic characteristics, and how these characteristics are associated with the distribution of income.

Over the last four decades, while income inequality was on the rise for many developed countries and stimulated increasing research, many economically advanced countries have experienced important changes in the composition of households. There are mainly two mechanisms by which household influence the distribution of welfare: income pooling and economies of scale. Although these two mechanisms pertain to different aspects of welfare, income poling operates on income while economies of scale operate on consumptions, the literature usually considers them jointly in studying inequality and in determining the redistributive capacity of the household. In this thesis I will do the same.

Therefore, household plays an important role for the distribution of disposable income (or economic resources in general) among individuals as it pools and redistributes incomes of its members and protects them, to some extent, from temporary income losses or other shocks (Lam 1997; Western *et al.* 2012). Further, by generating economies of scale, the household distribute public goods – such as housing. Indeed, though household's needs rise with the growth of its size (the number of members) it does not do so in a proportional way.

The demographic changes that many countries have witnessed include, first of all, the change in household size. This phenomenon reflects the fertility decline, and the rise of

single-headed households mainly attributable to the increase of divorces and of people who do not marry (Burtless 1999, 2009; Brandolini and D'Alessio 2001; Daly and Valletta 2006; OECD 2008; 2011; Esping-Andersen 2009). Single-headed households are in a disadvantaged position because they profit neither from the redistribution of resources nor from the economies of scale that occur in larger households. Moreover, single-headed households are also highly vulnerable to shocks such as sickness or job loss that individuals may experience over their life courses.

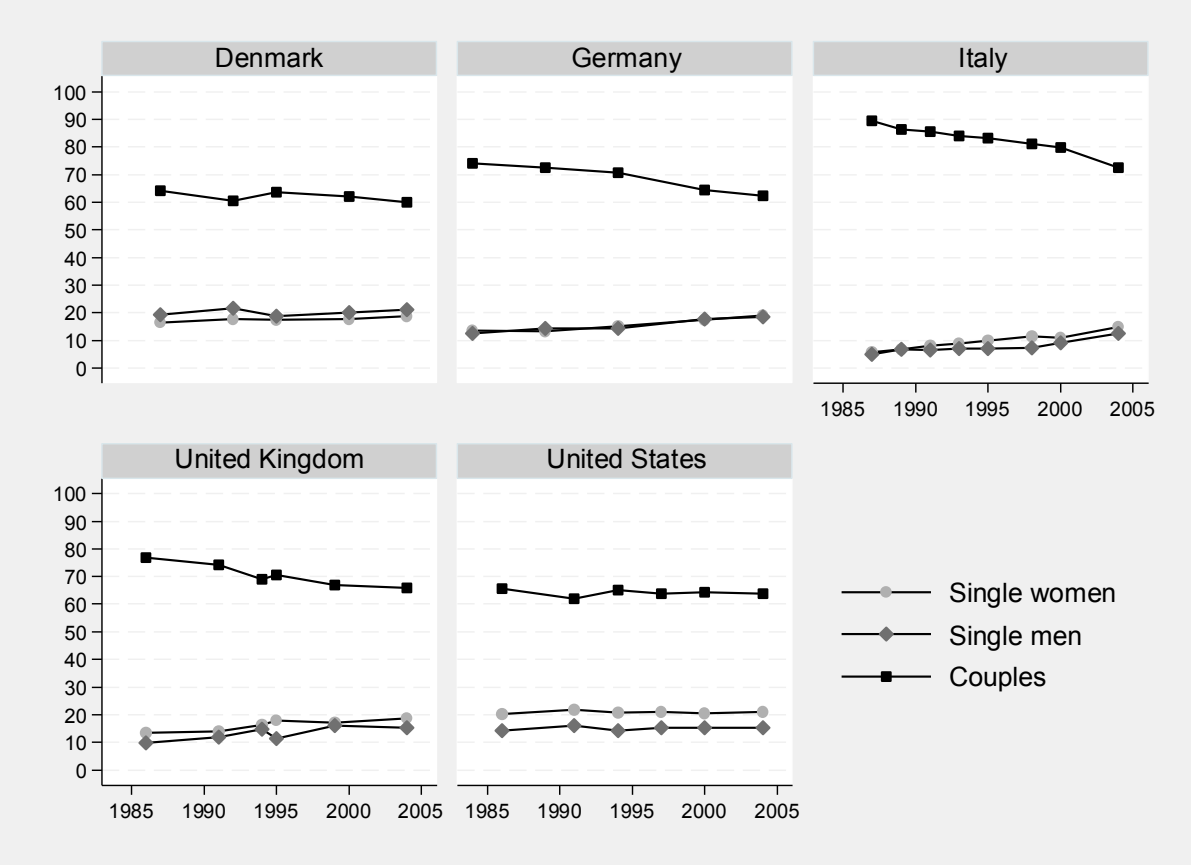
As Oppenheimer (1997) argues, married couples are involved in long-term relationships and are therefore able to distribute parental and economic responsibilities and resources between husbands and wives. On the contrary, single-headed households are economically more insecure. Consequently, when individuals pool their incomes in a couple, the societal inequality in household income is considerably lower compared to cases where individuals form separate households (Burtless 2009). As Karoly and Burtless (1995) observe, 50 percent of the increase in inequality that occurred in the United States during the '70s can be attributed to the rise in female-single-headed households. Another study of income inequality in the United States found that changes in household demographic structure (mainly the increase in single households) explain the 41 percent of the increase in inequality between the mid-1970s and 2000 (Martin 2006). In the same direction goes the study of Western and colleagues (2008) who considered household structure closely associated with inequality between the 1975 and 1995, permitting to explain one fifth of the inequality increase.

Figure 1.1 reports the distribution of living arrangements for the countries that I will examine in this thesis. Overall, in the figure we can observe a more or less marked decrease in couple-headed households.[8] Pronounced increases in singlehood have been experienced by those countries characterized by the highest shares of households headed by a couple, i.e. Germany, the United Kingdom and especially Italy. The share of couple-headed households has fallen by almost 20 percent in Italy, by about 10 percent in Germany and the United Kingdom, while only little decreases can be observed for Denmark and the United States. Notwithstanding Italy has experienced the greatest changes in the two decades considered, it still present the highest share of couple-headed household among the counties considered. Based on the previous consideration, therefore, one would expect an increase in inequality for almost all countries where Italy would be the country more affected. However, if we look at

[8] Couple-headed households include both married and unmarried couples. The declining trends in the share of couples would have been more dramatic if only married couples had been considered.

the levels rather than at the changes in households' living arrangements, given that couples are better able to redistribute resources, one would also expect that countries such as Italy and the United Kingdom present the lower levels of inequality. As discussed earlier, this is surely not the case. Other factors, indeed, contribute to determining inequality.

Figure 1.1 *Living arrangements, men and women aged 25-54, percentages*



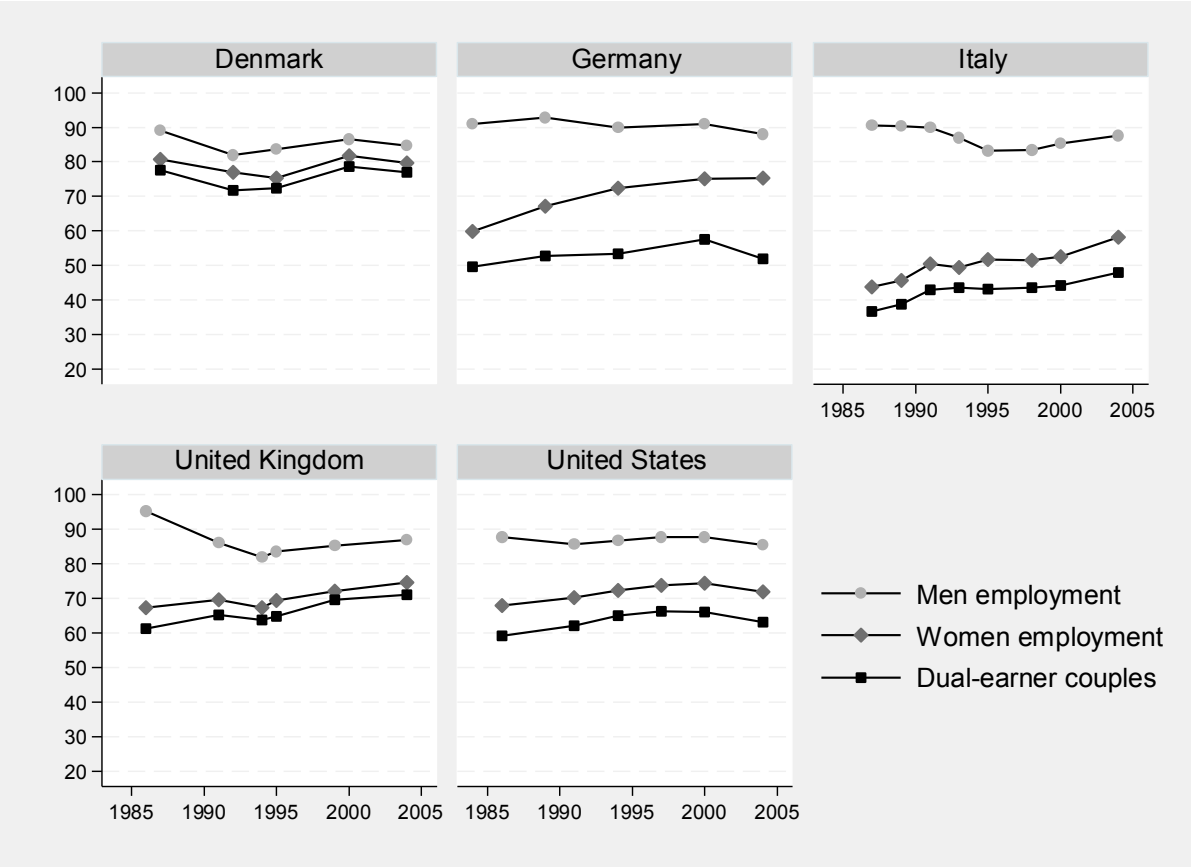
Sources: *calculation based on LIS data*

A second household characteristic directly associated with inequality is household's economic composition in terms of earners and non-earners as well as in terms of work intensity of earners. In the last four decades, many economically advanced countries have experienced increases in female labour market participation. As a consequence, dual-earner households have risen and male-breadwinner households have declined.

Although starting from different levels and with different pace, the employment trends mentioned have been observed in all the five countries that I will examine (Figure 1.2). Differences between countries in women employment have diminished over time, however, significant differences are still present. In the mid-2000s, on the one extreme we find

Denmark where employed women are the 80 percent and about three fourth of couples are dual-earners. On the other extreme, we find Italy where women (25-54 y.o.) at work are about the 60 percent and only in half of the couples both partners work. In the same period, the share of employed women in Germany is considerably higher than in Italy but both countries present similar shares of dual-earner couples.

Figure 1.2 *Employment trends, men and women aged 25-54*



Note: Men and Women employment refers to the total population aged 25-54; Dual-earner couples refer to couples aged 25-54.
Sources: *calculation based on LIS data*

Looking at the overall levels and trends in employment, four clusters emerge. The first is embodied by Denmark, which presents very high levels of both women employment and dual-earner couples; the second by Germany where women employment is relatively high (increased in the last decade) but the (modified) male-breadwinner model is still dominant; the third by Italy where the presence of both women employment and dual-earner couples is comparatively low; and the fourth by the United Kingdom and the United States where the share of women at work is similar to Germany but also present a high share of couples where

both partners are employed. How women employment and dual-earner couples are patterned reflects the institutional settings of these countries, i.e. identifies different welfare regimes.

Women's earnings, in their evolution over time and notwithstanding their significant variations between countries, have therefore gained increasing relevance for household income and consequently in accounting for the level of income inequality. However, how women's earnings have contributed to societal inequality is not entirely clear. Whether the increase in women's labour market participation alleviates or exacerbates inequality depends on the characteristics of those women who have increased their participation. Notwithstanding several studies have investigated the equalizing or dis-equalizing effect of (changes in) women's labour market participation, results are still inconclusive in that contrasting findings emerge from the literature (cf. Breen and Salazar 2010). I will approach these issues in detail in Chapter 2.

Another related element concerns with the correlation between partners' earnings. A positive correlation implies that high-income men are married with high-income women while low-income men are married with low-income women implying high levels of inequality. In the case of a negative correlation, it is the other way round. This issue is rather under-investigated in the literature, and will be the object of Chapter 3.

1.4.2 Household's events and income mobility

The vast majority of the literature produced so far on the topic of household and inequality is represented by cross-sectional studies. However, life-time inequality can be considered as the more socially relevant phenomenon because it refers to income differences that persist over the life course (DiPrete 2002). Therefore, approaching the topic from a longitudinal perspective is more adequate (Friedman 1962; Shorrocks 1978; Esping-Andersen 2005). The longitudinal perspective will permit to pinpoint the *persistence* of the income differences, which is what 'really' structures a society's system of economic inequality.

Most studies on income inequality rely on snapshot measures at a single point in time. In recent years, some scholars have noted that inequality should be measured over a broader time span in order to capture its dynamic features.[9] When long-term income is considered, it

[9] A relevant issue that has been at the core of the empirical studies on intragenerational mobility concerns the association between cross-sectional inequality and the degree of intragenerational mobility. The idea behind this issue was that the market-oriented countries characterized by high cross-sectional inequality – such as the United State – would have also high degrees of mobility and therefore less permanent inequality. However, most studies

is possible to distinguish between 'transitory' and 'permanent' inequality. 'Transitory' inequality refers to transitory fluctuations of incomes that over time move households up and down over the income distribution. 'Permanent' inequality refers to the extent to which income differences in a given year persist over time, and can be considered as the 'real' level of inequality.

It has been shown that due to income mobility, inequality longitudinally observed is usually lower, compared to inequality measured in a single year, because income mobility over time will tend to equalize individuals' and households' long-term incomes. Indeed, as Gangl (2005) observed for European countries, over time individuals' incomes experience a regression toward the mean and therefore income dispersion between households is lower when household's income is averaged over a multi-year period.[10] In the same study, Gangl observed that all the countries considered experienced a similar reduction in inequality in relative terms (between 30 and 35%) and that the country ranking experienced only little changes once inequality are calculated over a multi-year period. Consequently, the standard approach based on snapshot measures reveals higher levels of inequality because it does not consider the equalizing capacities of income gains and losses that individuals and households usually experience over their life course.

Hence, considering the mobility of individuals and households over the income ladder has become a key issue. Indeed, empirical evidence shows that income mobility over time entails a considerable compression of single-year inequality. In a study on the United States on a 4-year period, a reduction of inequality of about 12 to 26 percent for wages and 25 percent for earnings has been observed, compared to single-year inequality (Buchinsky and Hunt 1999). On a similar time span, Burkhauser and Poupore (1997) found a reduction in inequality of about 15 to 20 percent for equivalent income before and after government taxes and transfers, while in a 10-year period Aaberge *et al.* (2002) reported an income inequality reduction ranging between 25 and 30 percent.

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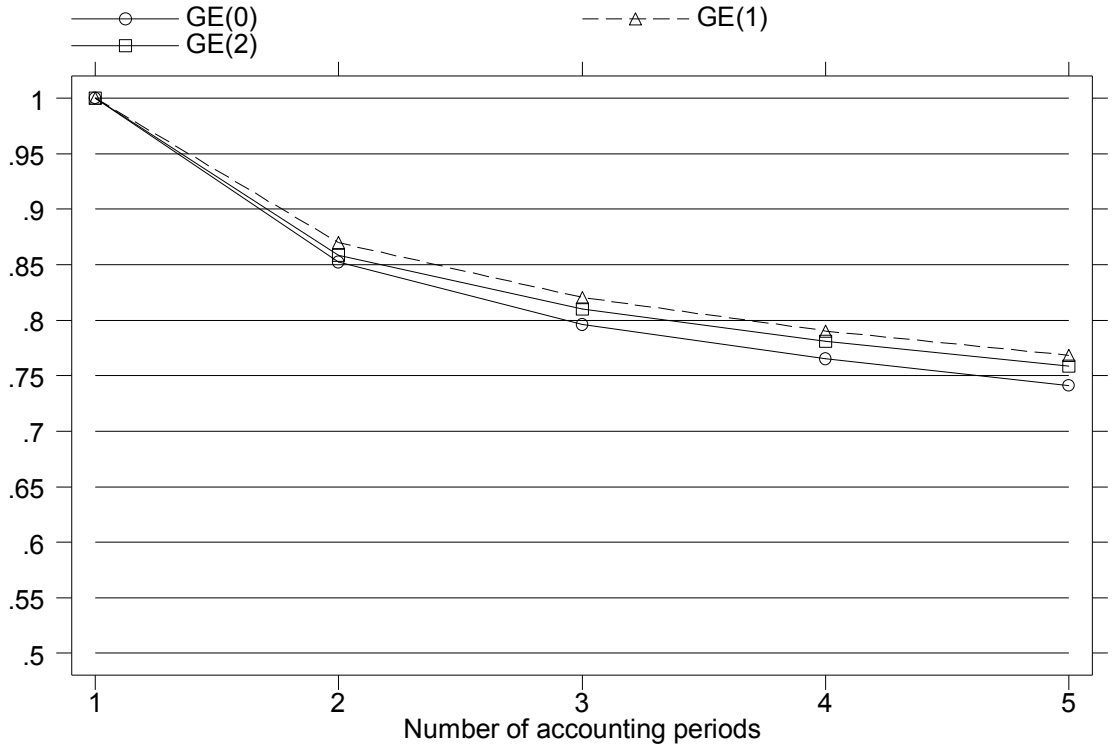
rejected this hypothesis by finding no relationship between cross-sectional inequality and mobility. Indeed, countries with relatively high inequality do not present systematically higher mobility (Maasuomi and Trede 2001; Gangl 2005; Jenkins and Van Kerm 2006).

[10] At this regard it has been observed that the greater extent of inequality reduction due to mobility occur in the first years of the analysis. This is because the largest extent of the 'regression toward the mean' occurs by averaging just few years. Indeed, the pace of inequality reduction decreases with the lengthening of the time horizon (Shorrocks 1981; Jarvis and Jenkins 1998). For example, Gittleman and Joyce (1999) by focusing on the United States for a ten years span observe that around two-thirds of the inequality reduction occurs in the firsts five years. Similar conclusions were reached by Gustafsson (1994) for Sweden.

Aaberge *et al.* (2002) also compared the US with the Scandinavian countries. Their results show that a relative reduction in inequality measured on a multi-year period is much the same between these countries. In analysing 11 European countries and the US, Gangl (2005) showed that over a 6-year period, the transitory part of inequality accounts for about 30 to 35 percent of the total inequality for all countries. Jarvis and Jenkins (1998) observed for the United Kingdom a reduction in income inequality by about 20 percent over a 4-year span; Cantó (2000) reported similar findings for Spain.

To give some feeling about the issues discussed above, in Figure 1.3 I show how mobility is able to affect inequality. These results refer to inequality in equivalent disposable household income for the case of Germany. Results are based on Shorrocks' index, usually called *stability index* or *immobility index*, which tell us the extent to which inequality decreases, in relative terms, when the accounting period lengthens (Shorrocks 1978; Maasoumi and Zandvakili 1986; 1990).

Figure 1.3 *Shorrocks' (im)mobility index, trends in the reduction of cross-sectional inequality when the time horizon lengthens, Germany*



Note: Shorrocks' index computed for equivalent disposable household income. Households present at least 5 waves (the first five), no matter the year they start
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

The first year of the accounting period represents the 'classical' cross-sectional measure of inequality and is thus equal to one (100 percent). If we then average incomes over more than one year and compute the level of inequality, inequality decreases. It decreases by 15 percent if we average 2-years incomes, by 20 percent if we consider 3 years and so on. The definition of income used here already includes the redistributing/smoothing capacity of the household and state, and should thus be the less sensible to income changes over time. Nevertheless, in a 5 years period, the reduction of inequality is as high as one fourth.

The inequality reduction shown in Figure 1.3 is computed according to different generalized entropy (GE) indices that differ in their sensitivities to income differences in different parts of the income distribution. The more positive the parameter is, the more sensitive the index is to income differences at the top of the income distribution.[11] Considering the case of Germany, we observe very similar trends in inequality reduction, suggesting that movements are not concentrated in particular pieces of the distribution. A quite different picture emerges if we look at the United States – the other country that will be considered in the last empirical chapter of the thesis (Figure A1.1 in the Appendix). In this country, indeed, is registered a more pronounced inequality reduction when the index gives more weight to the bottom of the income distribution, suggesting thus a greater mobility in the lower part of the distribution.

Overall, the implications of considering income in a longitudinal perspective are thus evident.

These measures are clearly useful tools to build a bridge between inequality and the mobility framework; however a step forward is needed. Beyond these aggregate measures of mobility, it is more interesting and fruitful to focus on dynamics at the micro level, namely studying why and to what extent individuals and households move.

Movements of households over the income distribution are mainly amenable to events that households and their members experience. Studies of household income dynamics have focused mainly on two sources of economic mobility: (I) changes in household composition and (II) employment transitions of household members (Fritzel 1990; DiPrete and McManus 2000; Aaberge *et al.* 2002; Ehlert 2012; 2013). Considering the firsts, these events include

[11] More precisely, GE(0) is the mean logarithmic deviation that gives more weight to the bottom of the income distribution, GE(1) is the Theil index that weights more the middle, and GE(2) is the half the square of the coefficient of variation that weights more the top.

joining events such as a partnership formation or the birth of a child, and leaving events, such as marital dissolution, the death of a partner or a child leaving home. As the seconds, particular attention has been paid to individual's and partner's and other members' employment transitions such as changes from employment to non-employment – and the other way round – or changes in employment intensity.

In a study of the causes of economic mobility in Sweden between 1973 and 1980, Fritzell (1990) found a significant and considerable effect of household composition changes including marriage and divorce, childbirth and child leaving. Indeed, the author has emphasized the '*great role played by family composition changes in explaining changes in income over time*' (Fritzell 1990: p. 20). At the same time, he found also a significant effect of changes in individual's and partner's labour market position. More recently, Aaberge *et al.* (2002) replicated Fritzell's analysis for the US and the Scandinavian countries for the period 1986-1990. These authors confirmed Fritzell's results, emphasizing that income changes are associated with changes in labour market and marital status in all countries included in the study. In a study of household income mobility in the US and Germany, DiPrete and McManus (2000) focused on the consequences of triggering events involving labour market and household transition as these events can activate a change in a household's future income trajectory. Moreover, they have highlighted that the impact and the rate of these events are characteristics of the institutional structure of a society, including its system of taxation, its social welfare programs, and its labour and marriage market (see also McManus and DiPrete 2000).

Only a few studies on household income dynamics have analysed the determinants of income mobility by considering both individual and household characteristics – including household changes and labour market events (Duncan and Morgan 1981; Fritzell 1990; DiPrete and McManus 2000; Aaberge *et al.* 2002). However, it could be argued that these studies lack a direct link between mobility and inequality. For those individuals who move, these studies do not answer to the question: from where do individuals move and to where do they move? Indeed, the inequality reduction observed in a multi-year period can be determined in many ways.

To clarify this point an example might be useful. Suppose to have two societies, A and B, both with the same level of inequality and the same degree of mobility, and therefore the same reduction in multi-year inequality. Now consider that while in the first society the

reduction of inequality derives from the compression of incomes between the middle and the upper part of the income distribution, in the second society the reduction is driven by the compression of incomes between the middle and the lower part of the distribution. It is clear that while the aggregate degree of inequality and mobility are the same, the societal consequences for the two societies are rather different. In the society B, low-income individuals ameliorate their position not only in relative terms but also in absolute terms by improving their incomes and thus their standards of living. In the society A, high-income individuals regress to the mean but low-income individuals continue to experience bad standards of living.

Therefore, from where inequality reduction comes from make a huge difference for individuals and households wellbeing and can thus leads to different societal consequences.

2 Are household structure and economic composition responsible for inequality? A comparison across welfare regimes

Abstract

Over the last decades, many industrialized countries have experienced several important changes, including substantive variations in their economic composition as well as in their demographic structure, and the increase of income inequality.

The household plays a key role in fostering or containing countries' overall inequality levels. Indeed households, beyond being an important source of welfare, redistribute resources among its members and thus might level out differences in earnings among individuals. In this regard households characterized by different compositions have different incomes capacities. From this it follows that changes in the distribution of households due to changes in individual's behaviour (as for instance the increase in single-headed households and the growth of double income households through increased women's employment) will lead to changes in the overall distribution of income or even the inequality structure of societies.

Women's increased labour market participation is one of the most relevant trends regarding the economic situation of households. The diffusion of dual-earner households contributes, overall, to changing inequalities within and between households. While women's earnings led to an increasing gender equity within couples, the contribution to the overall inequality is yet not entirely clear, with contrasting results emerging from the literature.

This comparative chapter contributes to the still open debate on the consequences of changes in households for economic inequality. It does so in two ways: first, it analyses the extent to which households characteristics account for inequality in different European countries and in the US. Second, using counterfactual exercises it assess to which extent changes in the composition of households and the economic behaviour of their members account for trends in inequality. In order to considering the role that different institutions play, different income concepts are used – the first income concept account for the role of the market, the second includes also the role of the household while in the third the role of the state is also considered.

Empirical analysis employs data from the Luxembourg Income Study, which allows for comparisons over time and space. Analyses are based on the decomposition of inequality measures and their counterfactuals.

2. *Are household structure and economic composition responsible for inequality?*

2.1 Introduction

From the 1980s onwards, the vast majority of industrialized countries experienced the rise in income inequality paralleled by changes in both the demographic and economic composition of households. Demographic changes include the growth of single-headed households, while economic changes comprise the increasing labour market participation of women.[12]

These transformations are of particular interest, and presumably related to the overall inequality trend, because household characteristics are associated with the distribution of income and changes in the distribution of different household types can affect overall inequality. First, household pool and redistribute different incomes of its members (at least to some extent) and can profit from an economy of scale. Single-headed households are in this sense disadvantaged with respect to couple-headed households, because they cannot benefit from any redistributive processes. Their increase could lead to increasing levels of overall income inequality. Second, the fact that incomes from labour are the main source of household income implies that changes in households' economic composition have consequences on the distribution of income among households. The observed increase in women's labour market participation is an important force contributing to the changing economic composition and income capacity of households.

In this chapter, I investigate the role of household's demographic and economic composition for inequality levels and their changes: to what extend do household characteristics account for levels of income inequality, and do changes in the distribution of households explain changes in income inequality?

The household, though, is only one of the 'inequality generating institutions' and operates in contexts structured by other institutions. The overall amount of welfare/income individuals have at their disposition is the result of a joint activity of the market, the state, and the household. I will therefore also focus on the extent to which these institutions affect inequality and mediate the link between household transformations and income inequality. This is done by comparing different income concepts as well as different national contexts.

[12] In the following of the chapter with the term 'demographic composition', I will refer to the living arrangement of the household distinguishing between single-headed households and couple-headed households.

2.2 Inequality and its drivers

2.2.1 Market, State and Household

A vast amount of research documented the importance of the market and the state for economic and social inequality (Atkinson, Rainwater and Smeeding 1995; Gottschalk and Smeeding 1997; Gustafsson and Johansson 1999). Household income, for instance, is heavily influenced by the labour market situation: individual income from employment still provides the lion's share of household income (Kalleberg and Sørensen 1979; Kalleberg 1988; Bernardi 2001). The market can thus be considered as the main source of economic well-being during most parts of individuals lives (Esping-Andersen and Myles 2009). The increasing inequality in market income is therefore an important driver of the increasing overall income inequality (OECD 2008; Blau and Kahn 2009).[13]

Moreover, the (welfare and fiscal) state affects inequality; the equality promoted can depend on the progressivity of the tax system and on the degree to which social-benefits are directed mainly to the least well-off. In addition, the state influences opportunities and costs to participate in the labour market: it can favour female labour market participation by policies aimed to reconcile household and work. The state also can foster employment by active labour market policies, or contribute to inequality in market income by allowing for the emergence of low wage sectors, by creating large share of population with none or low incomes, as well as by influencing the situation of retired people (Esping-Andersen and Myles 2009).

State, market, and household, thus, operate in different ways and follow different principles. However, a country's level of inequality not only derives from these redistributive processes, but also from the processes taking place among them. They are indeed integrated and interrelated – meaning that the action of each one inevitably affects also the others. The importance of these institutions as well as their integration varies between countries calling thus for a comparative perspective. I rely on the Esping-Andersen's welfare regime theory that categorizes countries according to their different configuration of state, market and

[13] Labour market income includes gross wage, income from self-employment, capital income, and returns from savings.

household (Esping-Andersen 1990), extended by a forth cluster: the Mediterranean regime (Ferrera 1996).[14]

Denmark has been chosen as the candidate to represent the social democratic regime; the United Kingdom and the United States embody the liberal regime; Germany represents the conservative regime while Italy the Mediterranean one – although in the treble classification it would fall in the conservative regime.

Alongside the differences in the ways welfare is produced and redistributed, the countries I consider are also characterized by differences in households, namely their structure and economic composition. These aspects are particularly important because they strongly affect the extent to which households are able to redistribute resources – via the generation of economies of scale and income pooling. In this respect, over the last decades these countries have experienced considerable transformations, most notably the rise of single headed households and the increase in labour force participation of women. However, although these changes have affected the vast majority of industrialized countries, the starting level and the extent of these transformations vary considerably across countries (see Figure 1.1 and Figure 1.2).

2.3 The transformation of households and inequality

As said, many economically advanced countries experienced the rise of single-headed and the increase of female labour market participation.

These transformations have consequences for inequality. Indeed, it has been shown that when individuals pool their incomes in a couple, the inequality in household income is considerably lower in comparison to cases in which individuals form separate households

[14] Welfare regimes theory recognizes three clusters of countries. The first is the social-democratic regime – which includes Scandinavian countries – where the state represents the chief institution: in this regime, indeed, the state is highly committed to de-commodify as well as de-familialize individuals. The second is the liberal regime that comprises the Anglo-Saxon countries. Here the market role is at the forefront: also this regime is de-familistic, but, differently from the first, it is highly commodifying: individuals should secure their well-being through the market and buy welfare services in the private sector – de-familization is indeed pursued in this way. The third is the conservative regime characterizing the majority of Continental European countries. Here the household is the main institution at work. Indeed, the state intervention is limited – because it follows a subsidiarity principle – and the development of the private sector is negligible. Finally, the Mediterranean regime encompasses the Southern European countries. It is particularly familistic and sub-protective and is characterized by a very scarce state support to households and by a very strong role of the household as well as the kinship and informal networks that operate as a social security cushion in place of the state.

(Burtless 2009). Some authors have in fact observed that the changes in the structure of households that occurred in the United States from the 1970s are responsible from 20 to 40 percent of the registered increase in inequality (Karoly and Burtless 1995; Martin 2006).

Probably an even more important aspect that links the household to inequality concerns the economic composition of households. This has to do with the prominent role that employment behaviours play in determining households' income. In this respect, the most relevant transformation is represented by the increased labour market participation of women, with the consequent rise of dual-earner households and the decline of male-breadwinner households.

Women's earnings have therefore gained increasing relevance in contributing to household income and, as a consequence, in accounting for income inequality. However, the direction in which women's earnings have contributed to inequality is not entirely clear. Whether the increase in women's labour market participation weakens or strengthens inequality depends on characteristics of women who have increased their participation. If these women are concentrated in high-income households, inequality should increase. In contrast, if women mainly increase their participation in low-income households, inequality should decrease because women's participation would furnish a supplementary source of income to the least well off.

Several studies have investigated the consequences of (changes in) women's labour market participation reaching mixed results (cf. Breen and Salazar 2010). For example, in the United States Mincer has noted a negative relationship between husband's income and wife's labour supply, finding that inequality in household income tends to be lower than inequality in husband's income (1962; 1974). More recent studies have reached the same conclusion claiming that the 'new role' of women has contributed to reducing inequality because women have increased their participation mainly in low-income households (Cancian and Reed 1998; Cohen and Bianchi 1999; Reed and Cancian; 2001; Esping-Andersen 2009).

Opposing results have been instead observed by other scholars that found a larger increase in labour market participation among highly educated women that, in turn, has contributed to the growth of inequality (Karoly and Burtles 1995; Blau, Ferber and Winkler 2006). Concerning Europe, Esping-Andersen (2007) observed that women's participation has had an equalizing effect for northern countries while a disequalizing effect for the United Kingdom and for some countries of central and southern Europe. However, Breen and Salazar

(2010) observed little if any disequalizing effect in United Kingdom and findings of Del Boca and Pasqua (2003) show that in Italy if women had not increased their participation, income would have been distributed much more unequally. For Italy, more puzzling results are recently reported by Fiorio (2011) who observed that between the end of the 1970s and the beginning of the 1990s female participation had a disequalizing effect for household in the left tail of the income distribution while an equalizing effect in the right tail, i.e. among higher income households. In the period from the beginning of the 1990s to the mid-2000s, instead, he observed a more generalized disequalizing effect of women's employment. According to the author, this is due to the type of women that entered in the labour market. While initially the likelihood to work was lower for women coupled with well-educated partners (and thus with higher market income), later this association has reversed.

2.4 Data and methods

The data used in this chapter is the Luxembourg Income Study (LIS). This source of data provides detailed information on incomes and on other characteristics at both individual and household levels. Moreover, this data furnishes harmonized information for many European and non-European countries over a long time span (for the majority of countries, data are available starting from the mid-1980s). The countries I focus on are Denmark (1987, 1995 and 2004), Germany (1984, 1994 and 2004), Italy (1987, 1995 and 2004), the United Kingdom (1986, 1995 and 2004) and the United States (1986, 1994 and 2004). I deliberately limit the observation to the pre-crisis period. Samples sizes are reported in Table A2.1 in the Appendix.

As said, the unit that I am interested in is the household, considered as the aggregation unit, where individuals pool and share their resources (i.e. incomes). However, the unit of analysis is the individual. Indeed, I measure inequality at the individual level under the assumption that income is equally shared among members within the household.

Given that the interest is on household structure and household economic composition, I select all households headed by individuals aged 25-54 years old. I chose this age group in order to include in the analyses only individuals that are potentially apt to form a household and to be employed. Therefore, all the analyses presented are based on this sample of households.

I present various indices to measure inequality, all coming with specific strength and weaknesses, which can be systematically exploited comparing them (Cowell 1995). The principal analyses are based on inequality decomposition techniques of the Theil index. This index, belonging to the family of the generalized entropy indices, can be decomposed by population subgroups in two inequality components: inequality between groups and inequality within groups – where groups are in this case represented by household types defined according to demographic and economic characteristics.

The Theil index can be written as

$$T = \sum_j p_j \frac{\bar{x}_j}{\bar{x}} \ln\left(\frac{\bar{x}_j}{\bar{x}}\right) + \sum_j p_j \frac{\bar{x}_j}{\bar{x}} T_j \quad (1)$$

where the subscript j represents the groups by which the measure of inequality is decomposed. $\bar{x}_j$ represents the mean income of group j, p_j represents the proportion of individuals belonging to the group j and T_j stands for the level of inequality within the group j. Finally, $\bar{x}$ represents the mean income of the overall population.

The parts to the left- and on the right-hand side of the sign plus represent, respectively, the between- and within-group inequality components. The first one correspond to the sum of the logarithm of the ratio between the mean income of group j and the overall mean income, weighted by $p_j \frac{\bar{x}_j}{\bar{x}}$, which is the proportion of population and income belonging to each group. Therefore, the between-group component measures mean income differences between groups. The second component measures income dispersion within each group, is weighted by the same factor as the between-group component, and can be written as follows:

$$T_j = \frac{1}{n_j} \sum_{i=1}^{n_j} \frac{x_{i|j}}{\bar{x}_j} \ln\left(\frac{x_{i|j}}{\bar{x}_j}\right) \quad (2)$$

In this equation, n_j stands for the number of individuals belonging to the group j, while the term $x_{i|j}$ represents the income of individual i in the group j.

Now, given that the term $\bar{x}$ corresponds to the following

(3) $$\bar{x} = \sum_j p_j \bar{x}_j$$

it is possible to arrive at the decomposed equation of this index

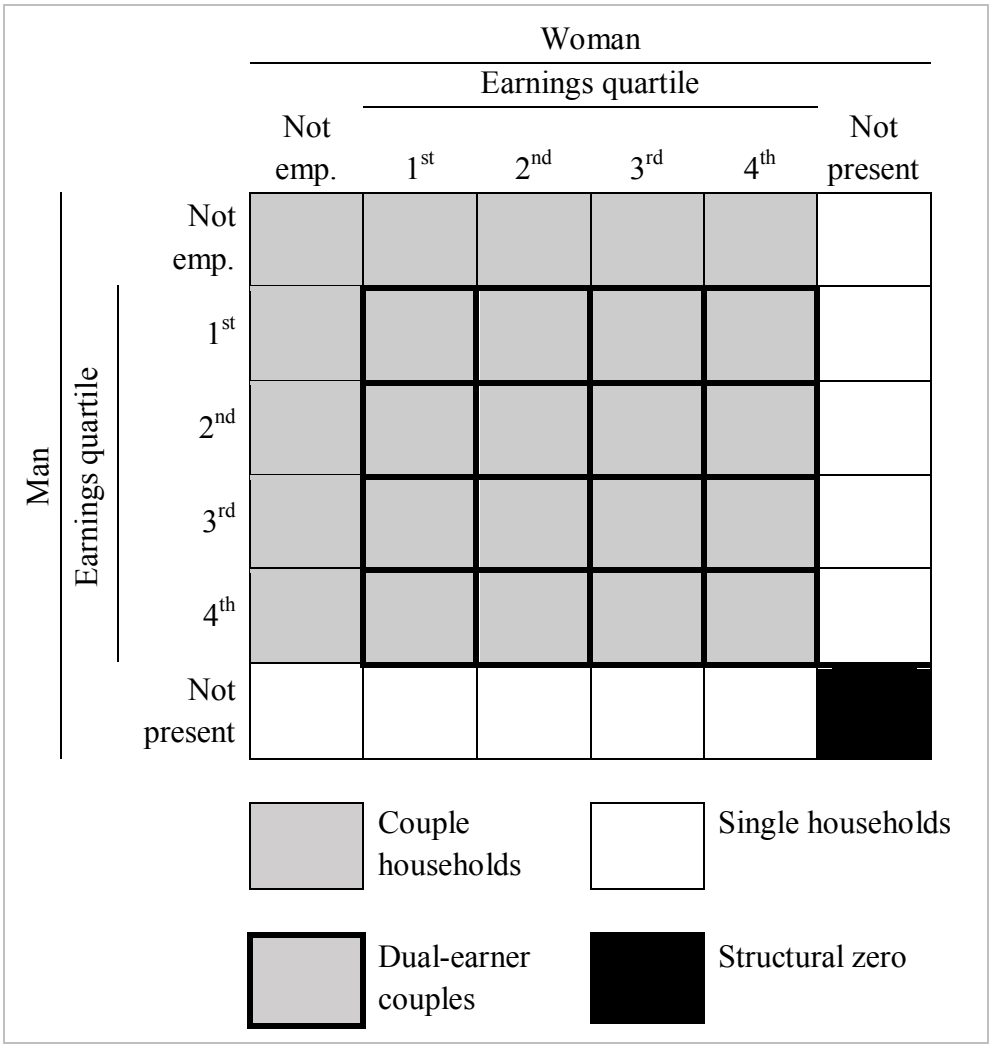
(4) $$T = \sum_j p_j \frac{\bar{x}_j}{\sum_j p_j \bar{x}_j} \ln\left(\frac{\bar{x}_j}{\sum_j p_j \bar{x}_j}\right) + \sum_j p_j \frac{\bar{x}_j}{\sum_j p_j \bar{x}_j} T_j$$

From equation (4), it is easy to note how there are only three quantities that enter into play: the group mean income ($\bar{x}_j$), the group population share (p_j) and the within-group Theil value (T_j).

Starting from this equation it is possible to estimate three counterfactual inequality values by changing one of the three quantities just mentioned. This permit to answer, for example, to the following question: how would have been today the level of inequality if only the distribution of households (p_j) had changed since the 80s? This counterfactual is computed by holding fixed the within group inequality (T_j) and the group mean income ($\bar{x}_j$) at their observed value in the 1980s while fixing the distribution of households (p_j) at its value observed today. In this way, it is possible to evaluate the role played by changes in households' composition on inequality changes.

Concerning the groups (j), I break the sample in groups defined by household living arrangement and economic composition. Coupled households are classified according to man's and woman's employment status distinguishing between not employed and, if employed, according to their position in the distribution of labour income (defined by the quartile to which he/she belongs in his/her own sex labour income distribution). If the household head has no partner, the household is classified according to the head position. In this way, it is possible to take into account the distribution of single individuals and the employment behaviours of individuals. The result is a six by six two-way table build as in Figure 2.1.

Figure 2.1 *Household types according to demographic and economic characteristics*



The decomposition technique I use has the advantage to provide an intuitive assessment about the importance of attributes defining groups and of the impact of changes in the distribution of groups (and other quantities as well) on inequality. However, I need also to acknowledge some drawbacks or little realistic assumptions. The calculation of counterfactuals implies to assume the distribution of income within and between household types were independent from the distribution of household types, and more in general that the three quantities that enter into the Theil equation were independent. It is hardly credible that changes in the distribution of household types would not translate also in changes in income dispersion within types of households as well as in income differences between them. Moreover, the non-exogeneity of changes in households is another important point. Changes in the distribution of household types, indeed, may not be considered as exogenous, but they

are instead affected by the socio and economic climate. For example, increases in single-headed households, might not be independent from increased economic independence of women.

Another example in this direction may relate to the increased labour market flexibilization which many industrialized countries have experienced. On the one hand, it may increase inequality by widening the earnings gap (OECD 2011), while on the other hand it may impact on household types by increasing the number of people who is not able to form an autonomous household and/or having children, at least in some contexts (Barbieri et al 2015).

Therefore, the results I am going to present have not to be interpreted as causal impacts of changes in households on inequality, but rather as a description of the association between changes in households and changes in inequality.

2.5 Trends and institutions

2.5.1 Time trends in economic inequality

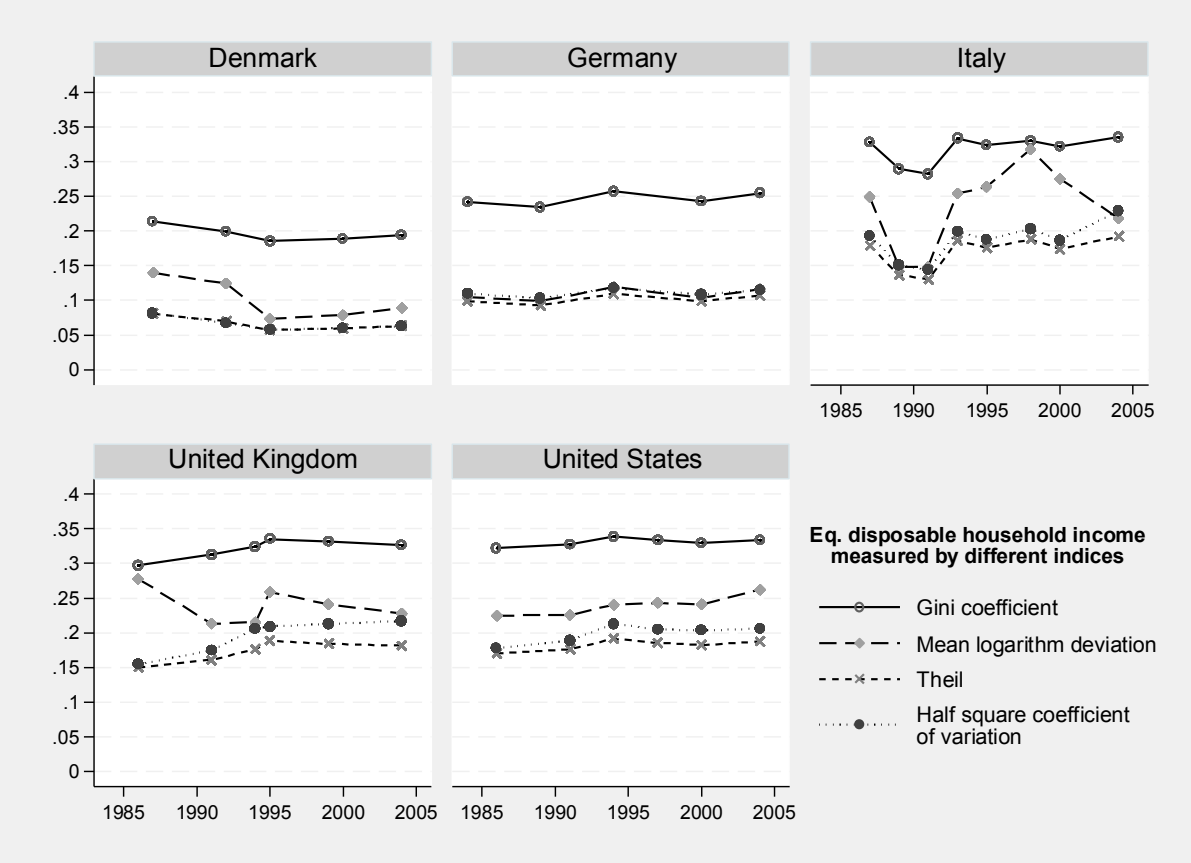
Before presenting decomposition results, it is informative to look at the inequality trends, in order to get an idea about the existing country differences in (a) level (b) kind of (c) trends in inequality. Figure 2.2 shows inequality in equivalent disposable household income – the final measure of well-being – according to different inequality measures. The indices presented differ in their sensitivity to different part of the income distribution. The Gini coefficient and the Theil index are more sensitive to the middle of the distribution, the MLD (Mean Logarithm Deviation) is sensitive to the bottom while the HSCV (Half the Square of the Coefficient of Variation) to the top of the distribution (Cowell 1995).[15]

[15] The Gini coefficient ranges between 0 (its minimum, when all individuals hold the same amount of income) and 1 (when all the income is held by a single individual). The other three indices belong to the family of the generalized entropy indices and have their lower bound at 0 (no inequality) while are not upper bounded. Although all the generalized entropy indices permit to decompose inequality by population subgroups, I chosen the Theil index because it better mirrors the Gini index, the most known and used measure of inequality.

Concerning the interpretation of inequality changes, in the literature, it is nearly impossible to find a definition of what is a meaningful change in inequality. Here, I mainly followed the suggestion of Atkinson who consider a change of 0.03 for the Gini index as a meaningful change in inequality. To the best of my knowledge, this is the only case in which a benchmark can be found. In this case, however, Atkinson refers to the Gini index, while I mainly use the Theil index. As I said, the Gini and the Theil index are both sensible to the middle of the income distribution. Actually, they follow practically identical trends, although on different levels. On average, the Theil index presents values that are half the Gini coefficient. Therefore, as a rule of thumb, I considered changes in inequality as meaningful if they are at least 0.015.

If we focus on Denmark, we observe an overall decline in inequality that is concentrated in the first decade of observation (of 0.025 points measured by the Theil index). This is the case according to all indices, although the MLD measures a stronger decline meaning that the distribution of income has experienced a compression especially at the bottom. Conversely, Germany has experienced a trivial increase (0.01 of Theil) in inequality, concentrated in the first decade, and we do not observe differences among the different measures. For the US, instead, we observe an increase according to the Gini coefficient and the Theil index (0.02) – they are indeed parallel given their sensibility to the same portion of the income distribution – , but we also observe some differences for the other indices.

Figure 2.2 *Inequality in equivalent disposable household income measured by various indices*



Sources: *calculation based on LIS data*

The increase in inequality is indeed more marked for the HSCV and especially for the MLD, which suggests that the distribution of income became more unequal at the extremes of the distribution, especially at the bottom. A greater increase – almost 0.05 points as measured

by the Gini coefficient, and more than 0.03 of Theil – in inequality has been instead experienced by the UK, the increase is even more market if we look at the HSCV. Conversely, we observe a fluctuating trend for the MLD with a marked decline in the first decade, then a sudden increase in the mid '90s, and again a little decline in the last ten years. Overall, during the two decades under study, the United Kingdom has experienced a steady increase in inequality. Finally, concerning Italy, inequality in the mid-2000s is only slightly higher than in the mid-80s if we look at the Gini and Theil index (0.013 of Theil). However, during those two decades Italy presents an 'unusual' trend characterized by significant inequality variations (Fiorio 2011). Indeed, inequality has initially decreased while in the early '90s has rapidly grown. This sudden increase is usually attributed to the September 1992 currency and financial crisis (Brandolini 2009; Fiorio 2011). After that, inequality presents a slightly fluctuating trend (in the second decade, however, inequality increased by almost 0.02 points of Theil). This is true for all indices but the MLD. Inequality in the lower part of the distribution has indeed experienced more dramatic changes, from the beginning up to the latter '90s inequality has doubled while it has strongly declined in the following years. Overall, comparing the first and the last point of our observational window, inequality has decreased of about 0.05 points for that inequality measure.

Results shown in Figure 2.2 already give us an idea of the great heterogeneity of the countries under investigation. Between countries, indeed, inequality presents substantial variations in levels, trends, as well as in the way income is distributed in different part of the distribution. This supports the need to go more in depth.

2.5.2 The redistributive capacity of institutions

As mentioned, the amount of income that individuals and households have at their disposition, and consequently the level of inequality, depends heavily on the operate of three institutions: the state, the market, and the household, and on the specific ways these are integrated. In order to quantify their capacity to shape inequality in different national contexts I compare inequality in different income concepts which are meant to capture the different mechanisms of production and allocation of income. Figure 2.3 shows inequality based on *Individual labour income* which represents the operate of the market.[16] With the second and

[16] In computing inequality in individual labour income I included only households' heads. This choice comes from the necessity to be able to compare the various steps of redistribution carried out by the household.

the third income concepts, I disaggregate the role of the household. The second concept, *Heads labour income*, sums the incomes of the household head and that of his/her partner, if present, and thus refers to the household role via income pooling among partners.[17] The third concept, *Equivalent household market income plus private transfers*, includes also incomes of other household members, capital income and private transfers as well as economies of scale permitting to capture the whole role of the household – for the sake of clarity I will refer to this income concept also as *Household income*. Finally, *Equivalent disposable household income* adds the operate of the state via transfers and taxes. This is also the main income concept I will use because it represents the one that the more get close to individuals well-being.

The first thing that emerges from Figure 2.3 is the different levels, and to some extent, the different trends, of inequality measured by the four income concepts. Market-generated inequality (individual labour income) is clearly the highest; the market is indeed the institution that distributes income very unequally, though to different extents in the five countries: Italy and the UK are characterized by the highest inequality levels (this holds true also looking at Figure A2.1), while Denmark by the lowest. Looking at its evolution over

Excluding other household members results in lower inequality levels. However, if I had considered all household members inequality trends would have been substantially the same.

Information on incomes for Italy is unfortunately not consistent in all the time years. Labour income is net of taxes and contribution during the entire time-span. Concerning household income, the LIS furnishes gross information starting from 2004. Comparing the trends in household income and in disposable income, this should not be a problem of major concerns.

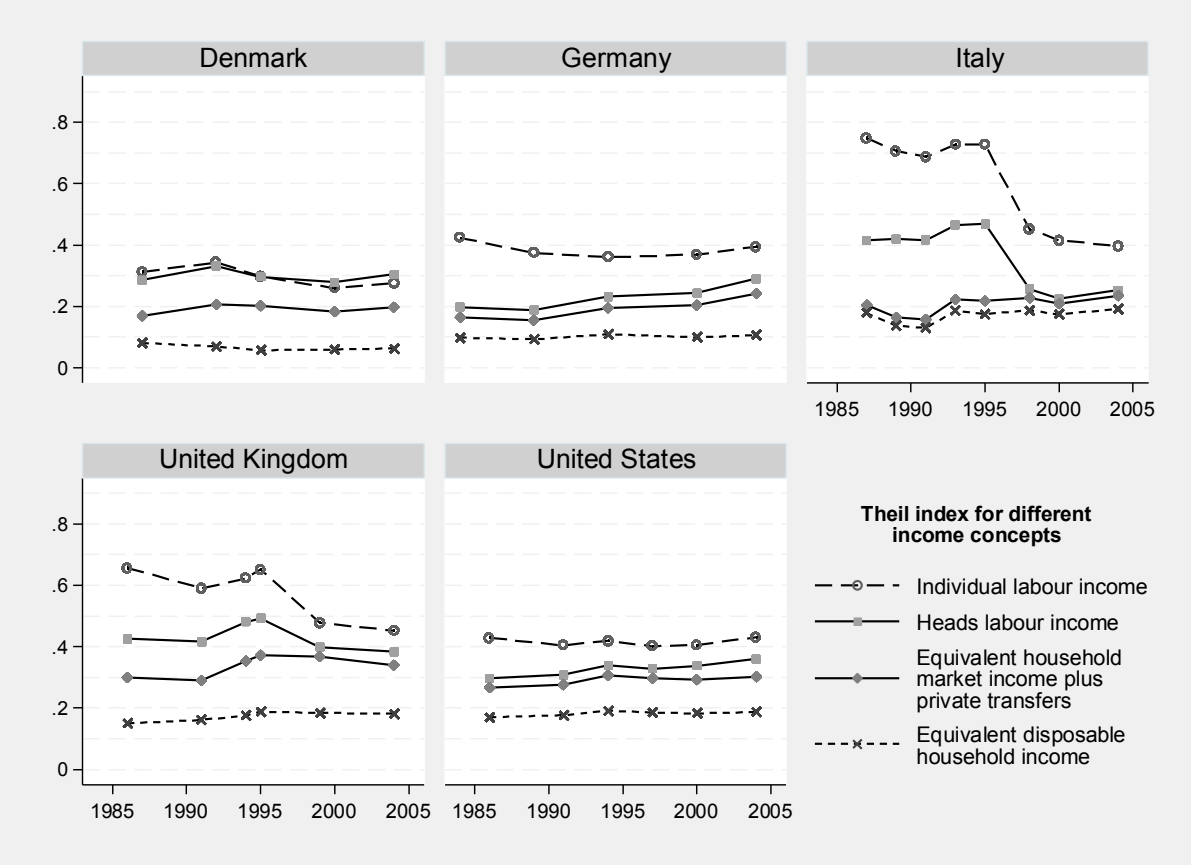
In addition, for Italy, the United Kingdom, and Denmark, labour income information for self-employed are not consistent throughout the entire period. Specifically, up to the mid-'90s labour income information are not valid for the entire group of self-employed (report labour income coded at zero) – and this is not due to possible negative incomes for self-employed. In Figure A2.1 in the Appendix, I report inequality trends based on a subsample that excludes employed individuals reporting no labour income. This is not at all an issue for Denmark, but it is especially for Italy where self-employment is particular widespread. This implies the overestimation of inequality in individual labour income and in heads labour income up to 1995. As a consequence, this also implies an overestimation of the role of the household measured as the difference between inequality in household income and inequality in individual labour income. Household level incomes, however, are not affected by this drawback. Inequality levels in the income concepts at the household level, indeed, are in line with official statistics for the entire time span. Moreover, while this problem could be an issue for the levels of inequality in labour income, it should not be the case for the definition of household types. For these reasons, and given that equivalent disposable household income is the concept of major interest to me, I decided to do not limit the analyses on the subsample because it would furnish underestimated inequality levels for all income concepts, disposable income included. Results concerning the comparison of the income concepts, namely about cross-country differences in the role of institutions, are consistent between the two samples.

[17] *Individual labour income* permits to isolate the role of the market only (it refers to the income that individuals receive from the market – thus a non-working individual will have an income equal to zero) and is measured at the individual level. *Heads labour income*, instead, is measured at the household level and represents the sum of the earnings of the household's head and his/her partner (if present). In case of single-headed households, the first income concept coincides with the second.

These income concepts refer to 'labour income'. However, for the sake of simplicity, I will use the terms 'labour income' and 'earnings' interchangeably'.

time, we do not observe much change for Denmark, Germany, and the US, especially comparing the first with the last time point. For Italy and the UK, instead, we observe a general inequality decline, at least for the mid-1990s onward (which is confirmed also by Figure A2.1).

Figure 2.3 *Inequality measured by the Theil index for different income concepts*



Sources: *calculation based on LIS data*

Beyond inequality levels and trends, the most interesting part lies in the comparison of the income concepts. Given the large variability in inequality levels between countries, it is more appropriate to compare the redistributive capacities of institutions across countries in relative terms. The comparison of inequality between income concepts in absolute terms might lead to erroneous conclusions, for example in evaluating the redistributive role of pooling between partners. In fact, in case of two countries with a similar distribution of household types, but with very different levels of inequality in individual income, I might overestimate the redistributive process in the country with the highest inequality. This is because similar distributions of household types would reduce inequality to a similar extent,

let's say halve inequality. Thus, if inequality in individual income is of 0.4, inequality in heads' income would be of 0.2; while if it is of 0.2, then it would be of 0.1. A comparison in absolute terms implies that the redistributive capacity in the first country is double compared to the second; while a comparison in relative terms implies that in both countries the redistributive processes are the same.

The second income concept considers household heads' labour income, which captures the role of the compensation among partners/within the couple. As to be expected, inequality measured in this way is lower than based on individual income. This is because through pooling individual's incomes, resources are redistributed among partners with (a lot) and those without or little income. The inequality reduction through this mechanism is particularly strong in countries where female non-employment is still rather common. By definition, among single headed household there is no such redistribution process.

Italy is a good example for the compensation among partners. The male-breadwinner model is still dominant (Figure 1.2) and, for this reason, people may benefit the most from income pooling. Alongside with that, Italy also presents the lowest share of single-headed household (Figure 1.1), which implies the lowest share of people that do not benefit from within household redistribution. These aspects are mirrored in the largest inequality reduction after the couple buffer (this is confirmed also according to Figure A2.1). On the other extreme, there is Denmark where we observe no or even a negative compensation among partners. This is likely because, first, almost all men and women are employed – dual-earner couples represent between the 70 and 80% of couples (Figure 1.2). This implies that redistribution via income pooling should make little difference for individuals' welfare. Second, among couples, the high similarity of Danish partners in their incomes may contribute to increase inequality when incomes are pooled – Denmark presents in fact a considerable (and increasing) similarity in partners' earnings, as Figure 3.3 shows. I will approach this topic in the next chapter.

If we focus on trends, we observe declining differences between the trends in individual and heads labour incomes, i.e. the inequality reduction coming from the income pooling within couples. Among the forces that may have contributed to this phenomenon, we can list the changes in the distribution of single over time. Indeed, if singlehood increases, as it has been observed in chapter 1 – Figure 1.1 –, the overall buffering capacity of income pooling should decline.

Once we take into account not just couples' incomes but all incomes of the whole household as well as its composition and thus the households' capacity to redistribute resources, the picture does not change considerably.[18] The distribution of income becomes more equal, though only to a moderate extent. Much of the household role, therefore, comes from the pooling of income among partners rather than from economies of scale or from other income sources.

As to be expected, the reduction of inequality due to the overall role of the household varies largely between countries. Confirming the expectation, in relative terms, on the one extreme end of the spectrum we find the highly defamilistic Denmark, while on the other extreme Italy, a country where the household continues to play a foremost role in supporting its members.

Concluding with the role of the household, the household capacity to compensate for market-generated inequality is time decreasing in all countries considered. Overall, we observe that while inequality driven by the market remained unchanged or declined, inequality after the household action increased. The loss of effective compensation for market generated inequalities by the household might be driven by changes in the household structure like the significant increase of single headed households (who lack the possibility to generate economies of scale) witnessed by Italy and the United Kingdom.

The final step is to take into account also the operate of the state, coming with further decreases in inequality. Taxes and transfers contribute to level out inequality by redistribution across households. Not only the design of welfare state institutions are relevant elements in accounting for the extent of redistribution, but their differences between welfare states also leads to important cross-national variation in state redistribution capacity (Korpi 1980; Palme 1990; Korpi and Palme 1998; Carrol 1999). For example, according to some authors, social transfers play a particular role in explaining cross-national variations in inequality (Smeeding, O'Higgins and Rainwater 1990; Moller *et al.* 2003).

In line with previous research, important variations between countries can be observed. In particular, in Denmark – a country with a generous welfare state committed to de-commodify and de-familize individuals –, the state more than halves inequality and in mid-'90s reduce inequality by even more than two third (from 0.20 to 0.06, see Table 2.1 below). On the other extreme, there are the US, a residual system of welfare where the state reduces inequality by

[18] Here, for Italy and the UK, I refer to Figure A2.1.

slightly more than 30% in the mid-2000s, and above all Italy, a familistic and sub-protective regime (less than 20%). Finally, as expected, Germany falls in between for what concern the redistributive capacity of the state.

The general picture emerging from Figure 2.3 shows that the redistributive capacity and prominence of institutions are in line with the expectations, e.g. Italy is the country where the household is at the forefront in producing/redistributing welfare while Denmark is where the role of the state is the strongest. Concerning instead the evolution over time of these processes, we observe a general trend of decreasing equalization capacity of the household, especially for Italy and the United Kingdom, while trends in the redistributive capacity of the state do not present clear pattern of changes.

2.6 Household's economic and demographic composition: accounting for inequality levels and changes?

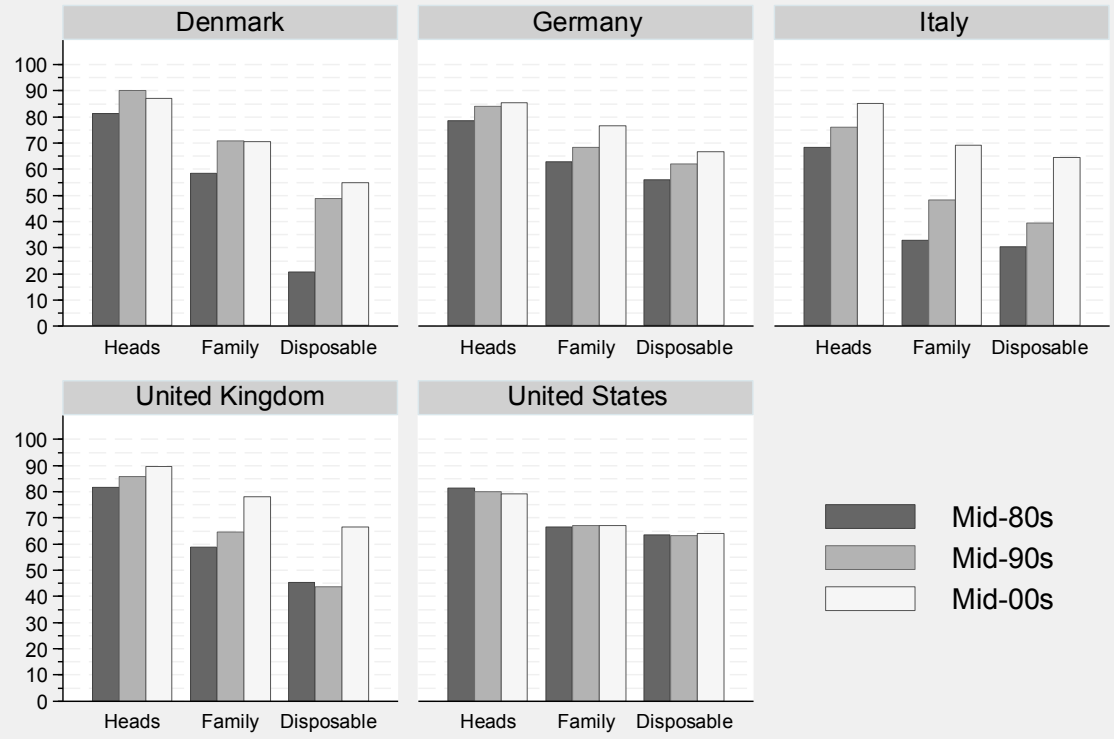
2.6.1 Inequality between households

So far, I quantified the importance of different situations in generating and attenuating economic inequality presenting a general picture without taking into account details about the household and its change. I now turn to the main focus of this empirical work, that is the impact on the level of inequality and the consequences of household changes on economic inequality. In general, the distribution of income among households can be viewed as the result of the combination of two elements: the earnings from market work of households' members, and its integration by public transfers and the reduction by taxes and social insurance (Salverda, Nolan and Smeeding 2009). The economic and demographic composition of households is thus fundamental for its economic well-being, as it influences its incomes, not least by determining the amount of transfers a household is entitled to/benefits from, as well as the tax-burden it is subjected to. Changes in the household composition, therefore, likely will affect the income distribution. In the next step, I consider the contribution of household composition to inequality and then examine whether changes in the former have contributed to changes in the latter.

Figure 2.4 shows the percentage of the between-groups inequality. *Between*-group inequality represents the amount of inequality deriving from income differences between homogeneous groups of the population – i.e. the household types as presented in Figure 2.1 –,

and can be interpreted as an indicator of the importance of the attributes used to define these groups. Therefore, the higher the income dispersion between the groups defined according to some attributes, the more these attributes, or the economic returns deriving from them, are associated with inequality.

Figure 2.4 *Between-groups component of the Theil index for different income concepts*



Heads: Heads labour income; **Family:** Equivalent household market income plus private transfers;
Disposable: Equivalent disposable household income

Sources: *calculation based on LIS data*

Focusing on heads' earnings the composition of households clearly matters. Individual's position in the earning distribution as well as the way individuals are sorted in households account for the greatest part of inequality ranging from about 70% to more than 90%. The income dispersion *within* household types accounts for the remainder – about 30% of inequality at the most. This huge proportion of inequality attributable to the between-groups component is not surprising given that the income concept considered includes income from labour only. More interesting, however, is to compare this figure with those relative to the other income concepts. The picture, indeed, changes when we fully include the contribution

of the household – in equivalent household market income plus private transfers (household income).[19]

While, in comparing income concepts, reductions in the inequality index may be interpreted as the redistributive role of household and state respectively, as I did commenting Figure 2.3, reductions in the between component may be interpreted as an indicator of the extent to which redistribution contributes to decrease income differences between groups, i.e. different types of households.

In the case of household income, the share due to between inequality is obviously lower – about 35-70%. The link between household composition and inequality is indeed mediated by the household that operates through the employment strategies of other household members, the generation of economies of scale and via private transfers. The reduction, compared to inequality in earnings, of the share of between-group inequality signals that the household operates in a 'targeted' way across groups, significantly relaxing the stratification produced by the market. This means that the household helps to a greater extent individuals belonging to lower-earning households than to higher-earning households.

Italy, again, is an interesting case here. This country, not only is the one that experiences the greatest reduction in terms of inequality level from one income concept to the other, as shown in the previous section, but it also presents the greatest decrease in the share of inequality explained by the differences between groups. This suggests that the redistributive function of the household is particularly strong, and certainly more so than in other countries, also for levelling off differences between household types. Over time, though, the household loses this capacity with the between share being on the rise.

Finally, considering equivalent disposable household income, and thus including the role of the state, the share of between inequality declines again. Also the state acts as a mediator in the link between household composition and inequality. At this point, the way in which individuals are distributed across household types is no more as prominent as it was for the second and especially for the first income concept examined, coming down to 20-60%.

Summing up, household and state not only influence i.e. lower overall inequality levels by redistributing resources (Figure 2.3), but also effectively reduce stratification by targeting redistribution in order to reduces income differences between social groups, i.e. household types.

[19] I used the word 'fully' to recognize that, to some extent, the household role is present also in the first income concept presented. Indeed, in the case of couple headed households, income pooling is at work.

Focusing on the evolution over time of the between-groups component, we observe some important aspects. First the share of the between component regarding earnings (of household heads) is astonishingly stable (if not increasing), beyond being very high. This runs clearly counter theories suggesting a reduced stratification of changes in post-modern societies (Beck 1992; Giddens 1990). This picture becomes more complex once the redistribution of households and states is accounted for, thus for the other income concepts. The between part increases for both household income and disposable income, which, at first sight, might be interpreted that over time the characteristics defining the household types even increased in importance in accounting for inequality. Yet, given the above mentioned stability of the between component for earnings, it actually suggests a substantive loss in the 'targeting' redistribution capacity of the household and the state, in other words: their capacity to off-set stratification. As a results differences in (disposable) household income have grown between social groups (household types) while incomes of households with the same characteristics have become more homogeneous.

2.6.2 The role of household composition for inequality: accounting for inequality changes

In the previous section I showed that the household characteristics considered are important stratifiers for income, although their weight decreases when the role of the household and the state are taken into account. Given that these characteristics are relevant in determining the level of inequality, is reasonable to expect changes in these characteristics – namely changes in the distribution of household types – to be associated with changes in inequality. The natural question is then to what extent changes in the household, i.e. in household types, account for changes in income inequality, which is whether changes in the demographic and economic composition of households are responsible for changes in economic inequality as sustained by some authors (Karoly and Burtless 1995; Reed and Cancian; 2001; Martin 2006; Esping-Andersen 2007; Schwarz 2010).

A huge amount of literature (for an overview see OECD 2011b) documents substantive changes in households' compositions. Regarding demographic composition, the increase in single-headed households is most prominent and present in all countries, but especially strong in Italy and Germany (Figure 1.1). Concerning the economic composition, changes in women's labour supply are most influential. Female labour market participation has initially

decreased and then increased in Denmark while we observe an increasing trend in the other countries, especially in Italy and Germany where it has been driven mainly by single women. However, these two countries, and above all Italy, still present the lowest participation rate among the countries under investigation (Figure 1.2). Overall, the possible consequences of these changes for inequality are mixed because each trend can lead to (possible) opposite outcomes. Counterfactual exercises can help to shed some light on that.

For the counterfactual analysis, I focus on three points in time for each country and estimate predicted inequality for the changes between the mid-1980s and the mid-1990s and between the mid-1990s and the mid-2000s.

Following equation (4) presented earlier, I start by fixing the groups' mean income ($\bar{x}_j$) and the within-groups' Theil (T_j) at their observed initial value and permit to the distribution of households' types (p_j) to vary as observed. This is the prediction of main interest here because it permits to assess the role that changes in the distribution of household types play by comparing the predicted inequality value with the observed one. Results are presented inTable 2.1.

Predicted inequalities are estimated for the three income concepts discussed above. The contribution of changes in households' distribution should mirror the findings presented above: the role of household and state should also mediate the link between household changes and inequality changes. Accordingly, a strong link should be observed for heads earnings while equivalent disposable household income should be less affected. Results in Table 2.1 confirm this.

Panel A presents observed and predicted inequality in heads earnings. It emerges that over the first decade the *predicted* value of inequality is about the same as the observed value in the mid-'90s. This suggests that changes in p_j is responsible for almost the entire change in inequality. To make an example, consider the case of Germany: in the mid-80s and in the mid-'90s we observe a value of inequality of 0.1986 and 0.2325 respectively, while the predicted inequality in the mid-'90s is equal to 0.2248. Therefore, all being equal, if only the distribution of household types had changed between the mid-'80 and the mid-'90, the (predicted) inequality in the second period would have been very similar to the observed real value. That is true for all countries, the United States excluded. The increase in inequality observed for the United States could be attributed to changes in the other quantities that contribute to inequality, and probably especially to changes in the groups' mean income – that

also enter into the computation of the between-groups component of inequality. The picture in the second decade partly changes. Between mid-‘90s and mid-2000s changes in household types have contributed to a lesser extent to changes in inequality with respect to the previous decade.

Table 2.1 *Predicted inequality due to changes in the distribution of households types*

	Denmark	Germany	Italy	United Kingdom	United States
Panel A. Heads earnings					
Mid-‘80s observed	0.2857	0.1986	0.4147	0.4260	0.2962
Change ‘80-‘90	0.3015	0.2248	0.4533	0.5043	0.3041
Mid-‘90s observed	0.2966	0.2325	0.4690	0.4928	0.3390
Change ‘90-‘00	0.2995	0.2544	0.2950	0.3909	0.3505
Mid-‘00s observed	0.3053	0.2909	0.2530	0.3831	0.3605
Panel B. Equivalent household market income plus private transfers					
Mid-‘80s observed	0.1690	0.1657	0.2045	0.2996	0.2671
Change ‘80-‘90	0.2018	0.1753	0.2372	0.3700	0.2706
Mid-‘90s observed	0.2023	0.1938	0.2182	0.3732	0.3058
Change ‘90-‘00	0.1975	0.2065	0.1777	0.3118	0.3041
Mid-‘00s observed	0.1982	0.2412	0.2354	0.3403	0.3021
Panel C. Equivalent disposable household income					
Mid-‘80s observed	0.0808	0.0985	0.1790	0.1503	0.1700
Change ‘80-‘90	0.0836	0.1017	0.1777	0.1508	0.1730
Mid-‘90s observed	0.0572	0.1092	0.1755	0.1884	0.1916
Change ‘90-‘00	0.0579	0.1150	0.1467	0.1623	0.1915
Mid-‘00s observed	0.0629	0.1067	0.1921	0.1814	0.1875

Focusing on household income (equivalent household market income plus private transfers) Panel B of Table 2.1 repeats the procedure from above. Overall, for this income concept the degree to which changes in p_j is linked to changes in inequality is smaller and changes in the distribution of household types contribute to a lower extent to changes in inequality then when focussing on heads earnings. Again, consider Germany, which experienced significant increases in inequality from the mid-‘80s to the mid-2000s. If we compare observed with predicted inequality, changes in households contributed only partially

to changes in inequality. In other cases, instead, predicted changes in inequality may be larger than those observed, or may go in the opposite direction, such as in the case of Italy.

This makes clear how, in reality, different changes come with different and partly off-setting consequences especially once we deal with more complex income concepts. Overall, and notwithstanding the household mediates in a significant way the link between household changes and inequality, changes in household types still contribute to drive changes in inequality. The exception continues to be the United States.

Finally, Panel C looks at final welfare – equivalent disposable household income –, where, as shown before, changes in inequality are little pronounced. At the same time, predicted inequalities do not differ substantially from the initial observed value. Therefore, the more we move away from simple income concepts such as earnings the less changes in the distribution of household types account for changes in inequality. This reconfirms again that household and state also reduce the stratification process associated to the labour market (and largely dependent on the old stratifiers, such as education – as reported in Figure A2.2/Figure A2.6 in the Appendix), beyond their influence on inequality levels.

Concluding, we might say that focussing on the most complex income concept, which is the one that approach better individual and household welfare, changes in inequality cannot be attributed to the changing household compositions. At this point, the question that arises is: where do changes in inequality come from?

2.6.3 Inequality decomposition taking a more detailed look inside

The previous section showed that changes in the distribution of household types can hardly be seen as the reason for changes in inequality levels. This contradicts clearly the expectations present in the literature, and partly also other empirical findings (Karoly and Burtless 1995; Reed and Cancian; 2001; Martin 2006; Esping-Andersen 2007; Schwarz 2010). Yet, in the decomposition analysis presented, I jointly considered the demographic and economic composition of households. In addition, given the detailed typology of households, changes that enter into play regard several aspects of household composition, including aspects that are not the specific focus of this chapter. Therefore, while such detailed households typology allows to be close to empirically observed changes, it has the disadvantage of less analytical clarity, conflating distinct processes, namely changes in partner choice, in labour supply and in their interaction – including partners' earnings

similarity –, possibly leading to opposing consequences for inequality. For example, if an increase in singles would increase inequality, this could be off-set by the equalizing effect of female employment resulting in overall stability.

To avoid this, in Table 2.2 I decompose changes in the overall distribution of household types in changes due to changes in the distribution of single-headed households only (Panel A) and to changes in female employment only (Panel B).[20]

Table 2.2 *Predicted inequality due to decomposed changes in household types*

	Denmark	Germany	Italy	United Kingdom	United States
Panel A. Inequality changes due to changes in the distribution of singles only					
Mid-‘80s observed	0.0808	0.0985	0.1790	0.1503	0.1700
Change ‘80-‘90	0.0838	0.1015	0.1803	0.1525	0.1701
Mid-‘90s observed	0.0572	0.1092	0.1755	0.1884	0.1916
Change ‘90-‘00	0.0581	0.1167	0.1746	0.1910	0.1922
Mid-‘00s observed	0.0629	0.1067	0.1921	0.1814	0.1875
Panel B. Inequality changes due to changes in female employment only					
Mid-‘80s observed	0.0808	0.0985	0.1790	0.1503	0.1700
Change ‘80-‘90	0.0845	0.0997	0.1758	0.1523	0.1712
Mid-‘90s observed	0.0572	0.1092	0.1755	0.1884	0.1916
Change ‘90-‘00	0.0568	0.1120	0.1582	0.1805	0.1870
Mid-‘00s observed	0.0629	0.1067	0.1921	0.1814	0.1875

In this way, is possible to predict inequality levels we would have observed if I changed the distribution of household types in one specific aspect only. It clearly emerges that, focussing on all households and on disposable household income, neither changes in the

[20] To understand how these counterfactual distributions are constructed, consider the case in which only the distribution of single-headed household is allowed to change between mid-80s and mid-90s. I first construct the 36-cells table of household types (where the 6, 6 cell contains a zero) and I fix the marginal distribution of the last row and last column of the table (which refer respectively to single women and single men) at their value observed in the mid-1990s – namely with the proportion of single women and men observed. At this point, I distribute the new marginal distribution of single men over the last column, in a proportional way according to the observed distribution of the column in the mid-1980s. In this way, only the total share of single men changes but their labour market behaviour does not. Then I do the same with single women. Once the last row and last column are filled in, I continue with the rest of the table representing couples. Given the proportion of single is increased, the proportion of couples is decreased, therefore I reweight each entry of the couple sub-table to the new proportion of couples. Also in this case the total proportion of couples has changed but their labour market behaviour does not. This is then the counterfactual table for changes in partnership behaviour only. The exactly analogous method was used to form counterfactual table in which only the female labour market participation changes (cf. Breen and Salazar 2011).

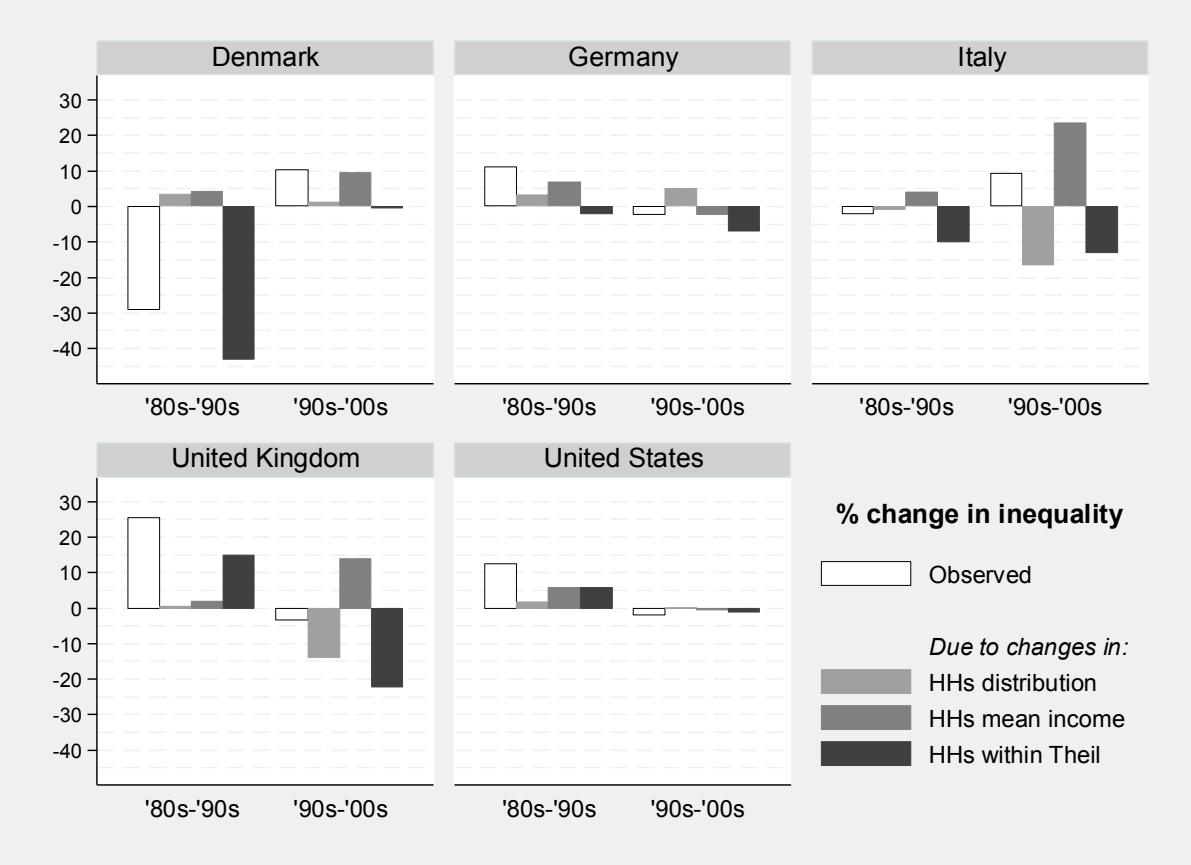
distribution of single, nor changes in female labour market participation had any substantial impact on inequality, and in particular when inequality varies significantly changes in households do not substantially contribute to those inequality variations.

As Table 2.2 shows, the changes in singlehood and in female employment do not produce changes in inequality that conceal one another.

Therefore, although changes in the distribution of household types seem to be associated with changes in inequality in market and in household income, they can be discarded as a possible explanation of changes in inequality in disposable income.

Given changes in the distribution of household types have not been responsible for changes in inequality, changes in their mean income ($\bar{x}_j$) and in the dispersion within them (T_j) can be considered as the drivers behind inequality changes.

Figure 2.5 *Observed and Predicted change in inequality, percentages*



Sources: *calculation based on LIS data*

In order to verify if this is the case and to quantify their (possible) impact, I present predicted inequality changes due to changes in groups mean income and to changes in within groups' inequality. As I did with the household types distribution, these predicted values are estimated following equation *(4)*. Figure 2.5 reports the results, expressed in percentages.

First of all, this Figure offers an interesting insight in what a single aggregate measure of inequality usually hides. Even a small change or an unvaried level of inequality can hide substantial variations in the three quantities that determine the Theil index.

Figure 2.5 also underlines how the changes in inequality are mainly driven by changes in the mean income and in the within-Theil of household types. These findings are in line with results of Fiorio (2011) for Italy who observed that the changed dispersion of individual incomes has accounted for the majority of the changes in inequality while changes in household structure and in labour market participation of women have contributed only little, if anything. In particular, while changes in mean income lead inequality to increase, changes in the within-Theil tend to operate in both the directions. Overall, for all countries, differences in income between household types are growing while the dispersion of income within households with the same composition does not follow a unique pattern.

Now the questions that emerge are: what has driven the increase in differences between groups' mean income? Where the changes of within-Theil come from?

Figure A2.7\Figure A2.11 in the Appendix report for each country and for each point in time the values that the quantity (p_j), $(\bar{x}_j)$ and (T_j) assume for the 35 household types. These figures show that, over time, households mean income has grown for each type of household, but much more so for households on the top of the income distribution. This led to the polarization between households and increased overall inequality. For example, in each country, the richer households, where both partners are employed and both belong to the fourth earning quartile, are those who have experienced the highest increase in equivalent disposable income. Conversely, the lower income growth has been experienced by the poorer households in which both partners are not employed. Therefore, changes in groups' mean income increased inequality because richest households have become even richer.

These results are in line with most of the previous literature on economic inequality that recognized the increase in earnings inequality, and the disproportionate earnings growth at the top of the distribution, as one of the main drivers of the rise in income inequality (OECD 2008; 2011a). In particular, the growing premiums for educational credentials and

occupational skills in the period of economic restructuring, globalization and technological change have led to a disproportionate increase in the earnings of well-paid workers and, as a consequence, to the growth of earnings inequality (Blackburn and Bloom 1987; Danziger and Gottshalk 1993; Morris and Western 1999)

On the contrary, changes in inequality due to heterogeneity within groups – the within Theil – derives from the income variability of households at the bottom end of the income distribution. These groups, represented mainly by single-headed households with low or any income and by couples-headed households where both heads are not employed, have the highest and more variable levels of within inequality. The main issue that emerges from these last analyses is that the aggregate levels of inequality are a composite fact, indeed opposite forces have driven their changes. The role of the household and the state turned out to be fundamental for lowering levels of overall inequality, and to compensate for the stratification produced by the market. Yet, I cannot say that changes in the household, its demographic and economic composition, would have driven changes in income inequality to any substantive extent.

2.7 Conclusions

Aim of this chapter was to investigate the role of households in the redistribution of resources (i.e. income) and therefore in shaping inequality and stratification. Particular attention has been paid to demographic and economic characteristics of households and their change over time.

I investigated to what extent households compensate for market driven income inequality and stratification, and whether changes in the distribution of households account for changes in income inequality.

These questions have been investigated for four European countries – Denmark, Germany, Italy and the United Kingdom – and the United States, and for a time span covering two decades – from the mid-1980s to mid-2000s. These specific countries have been chosen because they embody different welfare state regimes, namely, different ways in which institutions – i.e. the state, market and household – are integrated among each other and operate in redistributing resources among individuals and households.

In line with other research, I confirm that countries differ substantively in the amount of market-generated inequality, measured through earnings. Moreover, also considering more socially relevant and complex income concepts like equivalent disposable household income, country differences in inequality levels persist. At one extreme, there is Denmark that, like other Nordic countries, presents the lower income dispersion; at the other extreme there are Anglo-Saxon countries together with Italy, while Germany falls in the middle. Regarding changes in income levels, the picture heavily depends on the index employed to measure inequality and, above all, on the concept of income considered. Changes mainly occurred at the extremes of the income distribution, and regard mainly household income.

Comparing different income concepts, the redistribution capacities of institutions in different countries became evident. In all countries, the household and the state contribute to significantly lower inequality levels as well as the stratification of income as it is created by the market. Still, as to be expected, the degree of redistribution that institutions exhibit in different countries varies: the strong welfare state in Denmark enhance the role of the state in reducing inequality, while in Italy the household is the institution mainly responsible for reducing inequality in the distribution of resources.

Households' characteristics – their demographic and economic composition –, show to have a very strong and constant, if not increasing, importance even for the more encompassing income concepts, like household and disposable income.[21] Yet their impact is strongly linked to the national importance of the various institutions. This relevance of household characteristics, following largely the traditional lines of stratification, is in stark contrast to the prediction of individualization theory.

The situation is less straightforward with regard to the importance of changes in household composition for changes in inequality levels. Employing counterfactual decomposition techniques, I observed that changes in households are strictly associated with changes in market inequality, but their impact is certainly very limited regrading household income or almost absent for disposable income. Instead, changes in the distribution of disposable income have been driven by other, opposing forces. On the one hand, an increased 'polarization' between high- and low-income households increased inequality: households' mean income has grown the most for households on the top of the income distribution, and

[21] Indeed, household structure and economic composition have a huge weight in accounting for inequality in market income. Notwithstanding this weight is markedly reduced after having taken into account the role of the household and the state, it continues to be much relevant.

much less so for the poorer households. On the other hand, the potential increase in income that had resulted from this trend has been somehow counterbalanced by a reduction of the income dispersion within household types.

Therefore, if nothing else, I can conclude that the aggregate levels of inequality reported at the beginning of the chapter hide important aspects. Inequality is a product of different and possibly opposing forces and looking at the single value coming from an aggregate measure would lead to miss out relevant pieces. The household is certainly one of these relevant pieces though its impact regards mainly the reduction of inequality and stratification created by the market – even more so in context with a relative absence of a state –, but its role for explaining changes in inequality is much more limited.

3 Does gender equity boost economic inequality? Evidence from five countries

Abstract

Men and women became increasingly similar in their education, employment and earnings over recent decades. These changes have been argued to come with implications for economic inequality, not least because couples tend to be formed by persons with similar traits. Given the household's role in pooling and redistributing resources, increased equality within households, i.e. the accumulation of (un)favorable situations, has been expected to increase inequality between households. I investigate to what extent the increased similarity in partners' employment participation and earnings accounts for changes in income inequality among households.

I use LIS data for Denmark, Germany, Italy, the UK and the US from the mid-1980s to the mid-2000s and employ decomposition techniques of the Theil index. I enrich the existing literature by providing internationally comparative evidence for a long time period up to more recent dates, and make use of an innovative method to account for effects of employment and earnings similarity separately, and independently form changes in the overall earnings distribution. Moreover, differently from previous literature, partners' association is based on relative position in the earning distribution rather than on absolute earnings.

In contrast to the expectations, I show that an increased similarity among partners does not augment inequality to a relevant degree, and that the inflow of women in employment contributed to reduce inequality among households rather than augmenting it. Observed increases in inequality are instead driven by the increased polarization between high- and low-income households and by changes in the income dispersion within household types, suggesting important social stratifiers to be at work, other than gender. Notwithstanding key institutional differences, this holds true for all five countries.

3.1 Introduction

Recent decades witnessed men and women becoming increasingly similar with regard to their education, employment and earnings – prevalently, due to changes in women's behaviour (Esping-Andersen 2009). These changes have been argued to come with important implications for the inequality structure of societies, not least because couples tend to be formed by persons with rather similar traits, usually referred to as assortative mating (Mare 1991; Schwarz and Mare 2005). In fact, inequality is the result of the resource allocation to individuals and their sorting in households (Breen and Salazar 2011). Changes in the association of partner's earnings is, therefore, expected to lead to changes in inequality (Esping-Andersen 2007, Schwartz 2010): increasing equality within the households, i.e. the accumulation of (un)favourable situation therein, may result in increasing inequality between households. In order to fully understand economic inequality it is thus necessary to enlarge the focus on the distribution of earnings among individuals and to the way incomes are pooled and (re-)distributed within and across households (McCall and Percheski 2010).

Economic inequality is central also from a sociological perspective because of its far-reaching (negative) societal consequences on, among others, life-expectancy, educational attainment, fertility, social cohesion (ILO 2008; Wilkinson and Pickett 2009; Van de Werfhorst and Salverda 2012) and the fact that inequality in one generation contributes to determining the prospects of future generations reproducing in this way a society's stratification system (Solon 1999; Voitchovsky 2009; Corak 2013).

For the time being, empirical findings on the implications of changes in households – in terms of similarity of partners' employment and earnings –, for economic inequality are still inconclusive (McCall and Percheski 2010; McLanahan 2004; Breen and Salazar 2011). In this chapter I investigate to what extent the increased similarity in partners' labour supply and earnings account for changes in income inequality among households. I enrich the existing literature by providing internationally comparative evidence for a long time period up to more recent dates, by examining partners' earnings association in relative rather than in absolute terms and using a method which permits to account for effects of employment and earnings similarity separately, and independently form changes in the overall earnings distribution.

Few studies focused on the resemblance of partners and its consequences for inequality. Previous research prevalently studied partner's similarity by focusing on the correlation between partners earnings (sometimes including zero earnings) and thus either mix effects of

employment decisions and earnings similarities, or concentrate on dual income couples only. I disentangle the two (and thus include all couples), which is relevant for various reasons: non-employment strongly affects the income distribution and still remains a widespread option in some (but not all) countries. Moreover, the most relevant changes occurred probably in (women's) employment participation and regard to lesser extent earnings. Finally, the dynamics behind employment decisions and earnings are different, so that for an understanding of household related drivers of inequality the separation of their roles is important. I further extend the existing literature in various ways. While almost all existing studies focused on the US and examined the phenomenon up to the 1990s, I address, first, the question in an international comparison of different institutional settings for four European countries (Denmark, Germany, Italy and the UK) and the United States. Second, I widen the observational window focusing on two decades from the mid-1980s up to the mid-2000s including thus also more recent developments. Third, differently from the vast majority of studies that employed the decomposition of the squared coefficient of variation (CV2), I use a subgroup decomposition technique and measure earnings similarity in relative terms, which permits to isolate the effect imputable to sorting from changes in the absolute earnings distribution.

In contrast to expectations and a diffused reading in the literature (Esping-Andersen 2007; Blossfeld and Timm 2003) I show that more similarity among partners does not increase inequality to a relevant degree, and that increased female employment decreases inequality rather than augmenting it.

The next section summarizes the existing literature and addresses the reasons for an international comparison. I then present data, methods and definitions. Descriptive trends of female employment, partners' earnings similarity and inequality are presented before analysing if and to what extent changes in partners' employment behaviours and their earnings similarity affected inequality. The final section summarizes and concludes.

3.2 Partners' similarity and income inequality

Economic inequality (i.e. the distribution of income within and between households) is largely determined, firstly, by the allocation of resources to individuals, which mainly depends on their earnings and thus on employment, and secondly, by the way in which

individuals with different endowments are grouped in households (Breen and Salazar 2011).[22] In fact, according to their (economic) composition, households face very different economic situations (and capacities) (Biewen and Juhasz 2012). A positive correlation in earnings among household members, i.e. partners in first place, should therefore, else being equal, lead to higher inequality and potentially a polarization in high-earnings and low-earnings households. A negative correlation of earnings among partners, as it comes with Becker's (1991) idea of economic specialization of partners, would imply lower inequality (Mincer 1962; Lam 1997; Esping-Andersen 2009; Breen and Salazar 2010). [23]

Many countries witnessed some relevant transformations over the last decades which possibly influence inequality: men and women in general, and partners within couples in specific, became increasingly similar in their labour market participation and earnings (Mastekaasa and Birkelund 2011; Harkness 2013). Among the reasons leading to an increased economic similarity among partners are usually listed the increased level of education and the amplified educational homogamy among partners (Blossfeld and Timm 2003), and – at least partly driven by education –[24] changing gender roles, women's higher labour market attachment, and a more equal share of housework among partners (Blossfeld and Drobnic 2001; Schwartz and Mare 2005; Bianchi, Robinson and Milkie 2006).

Recent empirical analyses (Breen and Salazar 2010; 2011; Breen and Andersen 2012) show that in the United States, the United Kingdom and Denmark the increased educational homogamy does not account for the rise in inequality.

Several studies dealt with the consequences of rising female labour market participation on economic inequality (cf. Harkness 2013 for an overview). Women's 'new role' in the labour market made her earnings increasingly relevant, also in accounting for the level of income inequality. However, whether the increase in female labour market participation alleviates or exacerbates inequality depends on the characteristics of those women who increased their participation (Esping-Andersen 2009). If mainly women from 'high-income households' increased participation, inequality should rise as their earnings would accumulate

[22] The assumption I make, together with the major part of the literature, is that individuals pool and share equally their resources within the household.

[23] Lam (1988) argues that in the case the gains to marriage derive from a joint consumption of household public goods, Becker's prediction may not hold and a positive assortative mating on wages is possible – even when characteristics including education, experience and age are controlled for. Lam (1997) underlines the implication of partners' similarity for the distribution of household income.

[24] Cacian, Danziger and Gottshalk (1993) argue that the increasing pay-off of education, observed for some but not all countries, should have further fuelled the consequences of these trends.

to the ones of their high-income partner with the possible consequence of a polarization between households. If instead mainly women from low-income households increased their labour supply, inequality should decrease because women's employment would furnish supplementary earnings contributing to reduce the earnings gap between households located in the lower and the upper part of the income distribution. Recent evidence suggests that increasing female employment reduces inequality (Reed and Cancian 2001; Mastekaasa and Birkelund 2011; Harkness 2013), yet results are still inconclusive in that contrasting findings emerge from the literature (Del Boca and Pasqua 2003; Esping-Andersen 2007; Albertini 2008a; and cf. Breen and Salazar 2010).

Also among studies focusing on the consequences of increased earnings similarity of partners, findings are mixed. Some report a significant impact of the increased correlation of partner's earnings on inequality in household incomes in the US. For instance, Burtless (1999) found the increased association to account for 13 per cent of the rise in inequality in equivalent income between 1979 and 1996; Blackburn and Bloom (1995) show that it increased the overall inequality in household income by 44 per cent between 1979 and 1987; Cancian, Danziger and Gottshalk (1993) came to the same result for white couples. According to Cancian and Reed (1998, 1999), between 1967 and 1994 changes in the correlation have played only a limited role for inequality. Hyslop (2001) reports that the increased correlation in spouses' earnings explains about 17 per cent of the overall increase in household earnings inequality and almost 25 per cent of the permanent component of inequality between 1979 and 1985. In a more recent work, Schwartz (2010) studied earnings inequality between 1967 and 2005 using log linear models. She shows that changes in the correlation among dual-earner couples account for almost 15 per cent of the changes in inequality, measured by the CV2.[25] In roughly the same time span, Reed and Cancian (2012) report that partners' increased income similarity accounted for more than half of the rise in household income inequality. Finally, Larrimore (2014) analysed inequality in equivalent household income documenting that between 1979 and 1989 the increased correlation accounted for a 0.14 per cent-per-year increase in inequality. This factor decreased in the following ten years to 0.02 per cent-per-year and turned to be negative from 2000 to 2007 (-0.05), contributing thus to a decrease in inequality.

[25] Schwarz (2010) decomposes the total impact of a changing association between partners' earnings in: the increases in the association between dual-earners, the decrease in the negative association between husband earnings and the odds that the wife works, and the increase in the prevalence of dual-earner couples.

Few studies focused on countries other than the United States and came to mixed results. Blackburn and Bloom (1995) report a positive effect on inequality of household income in Canada, but this increase has been offset by the reduction in earnings dispersion among women. In Australia the very modest increase in the correlation contributed little to the inequality increase. A more recent study on Australia reports a substantial contribution of the rise in partners' earnings correlation to the increase in household income inequality between 1982 and 1995-6 while, between 1995-6 and 2007-8, the declined correlation contributed to the inequality decrease (Austen and Redmond 2012). Results for Norway (Mastekaasa and Birkelund 2011) show that the main driver of inequality has been the changes in the dispersion of earnings among women, which had a strong equalizing effect, while the increased correlation between partners' earnings made only a small contribution to inequality increase. A study examining the determinants of households earnings distribution in 23 OECD countries (Chen, Foster and Llena-Nozal 2013) from the mid-1980s to the mid-2000s shows that, in all countries, the main drivers of household earnings inequality are labour market related, while changes in marital sorting contributed only modestly to increasing inequality. Recent research on Germany (Pestel 2014) focusing on earnings inequality between 1984 and 2012 instead shows marital sorting to have a strong disequalizing effect and argues that the increasing association of partners' earnings is mainly driven by changes in labour supply behaviour of women, in particular those with high earning men – rather than changes in income similarity.

In sum, empirical results are not completely straightforward and vary among countries and over time periods. I therefore propose a more systematic international and temporal comparison and focus on an income measure which better captures individuals' and households' standard of living.

3.3 Taking into account context: the international comparison

It is well known that the unequal distribution of income among households depends on many factors and different institutions intervene in the distribution process (Atkinson 1995; OECD 2008; 2011). Reasonably, also the link between the partners' employment and (market) earnings association with income inequality is moderated by the institutional context

– in particular when measured by equivalent disposable household income (as a proxy of welfare enjoyed by households).

The most relevant institution is the market as earnings represent the main source of household's income (Kalleberg 1988; Esping-Andersen and Myles 2009). Important aspects regard the national employment structure, including the availability of part-time and public employment – key to favour female employment –, the economic returns from skills, and the skill-biased consequences of globalization and technological progress (Jenkins 1995; OECD 2011a). Second, the state intervenes significantly in the (re)-distribution of incomes, affecting households' income directly by providing transfers (and services) and through (negative) taxation, and indirectly through the regulation of the labour market (for example by minimum wage settings). Finally, the household pools and redistributes incomes of its members, generates economies of scale, and protects its members, to some extent, from temporary income losses or other shocks (Lam 1997; Western *et al.* 2012). These considerations led me to choose countries that can be clustered in different welfare regimes following an extended version of the typology proposed by Esping-Andersen (1990), and that differ systematically in crucial aspects of the market, the state (social and fiscal policies) and the role of the household.[26]

The way and the extent to which these institutions operate, influences households' and individuals' behaviour as well as their welfare. It is well documented that the macro context influences the distribution of household types and thus also the income association among partners (Atkinson 1995; Milanovic 2000; Blossfeld and Drobnic 2001; Jaumotte 2003; Blau and Kahn 2013). Fiscal systems and social policies, together with the labour market structure, influence employment supply decisions, as well as their (socio-)economic consequences: welfare states help (or discourage) women to enter the labour market, and at the same time moderate the link between individual earnings and the final distribution of disposable household income (Atkinson 1995; Milanovic 2000). Female employment, indeed, presents important and persistent differences between countries in levels and trends (OECD 2002; Jaumotte 2003): countries like the United Kingdom and Germany experienced the greatest increase in female employment over the last decades, but mothers' employment only became the norm in Scandinavian countries and in the US, while in southern Europe, notwithstanding

[26] I am aware that in this way it is not possible to disentangle the impact of single institutional aspects (market, state and household), but I rather observe the consequences of their combination. Not least because the endogenous development of intuitional assets led to empirically limited combinations of the various aspects.

important recent changes, female employment remained comparably low. Further, partner's resources affect women's labour supply depending on the national context.[27] Blossfeld and Drobnic (2001) report a negative effect of his (economic) resources on her supply in Mediterranean (Italy) and central European countries (Germany), a positive association in Scandinavian countries (Denmark) and no association in the liberal Anglo-Saxon countries (United Kingdom). These labour supply patterns may initially reduce similarities among partners and consequently inequality between households in some states but increase them in others.

Moreover, also the consequences of changed similarities among partners might vary according to the more or less strong redistributive role of the state (increased similarity should have less effects on equivalent disposable household income in countries like Denmark and in Germany, but come with stronger consequences in Italy, and in the United States and the United Kingdom, where also minor changes might come with some implications for inequalities). Overall, I might expect the extent and the consequences for inequality of increased similarity among partners in employment and earnings to vary among countries.

3.4 Data and methods

Also in this chapter, I use Luxembourg Income Study (LIS) which provides detailed and harmonized information on incomes and characteristics at the individual and household level over a relatively long time span (LIS 2014). I present trends in income inequality and in the association among partners' earnings for all observed points in time, but focus on a comparison of three time-points for the decomposition analysis: the mid-1980s, mid-1990s and mid-2000s; in detail: Denmark (1987, 1995 and 2004), Germany (1984, 1994 and 2004), Italy (1987, 1995 and 2004), the United Kingdom (1986, 1995 and 2004) and the United States (1984, 1984 and 2004). The sizes of samples used are presented in Table A3.1 in the Appendix.

Analyses include households with two adult partners both in their economically active years, between 25 and 54 years old. Single-headed households, thus, are not included in the

[27] Man's resources not only affect labour supply of his partner, but also many other aspects of occupational/economic success. These aspects include working hours (Verbakel, Luijkx and deGraaf 2008), wages (Del Boca and Pasqua 2003), prestige (Robert and Bukodi 2002) and the type of contract (Grotti and Scherer 2014).

analyses.[28] In operating such sample selection there is the risk to incur in some selection bias. This is true if singles are characterized by traits that are associated with inequality. An example of this sort is if singles are collocated at the extreme of the income distribution, which could be very the case. According to Blossfeld and Timm (2003), low-educated men and high-educated women are those more at risk to remain unpartnered. They are also probably collocated at the extreme of the income distribution being characterized, respectively, by low- and high-income potential. In general, thus, the risk of such selection is to underestimate the overall level of inequality. Moreover, and more important, the risk is to underestimate also the impact that the increase in female labour market participation have had on inequality. This is because had high-educated women partnered, much probably, they would have partnered a high-educated/high-income men, with a consequent exacerbation of income differences between households. Although I am aware of this possible source of bias, unfortunately, the technique that I use does not permit to control for such selection process.

The income concepts that I use are adjusted using the Purchase Power Parity (PPP) rate, in order to permit the comparison of incomes among countries and over time, and are converted into international dollars with 2005 as the reference year.

I measure income inequality based on equivalent disposable household income, defined as the total household income (from labour as well as capital) from all members, net of taxes and transfers (private as well as from social security), and divided by the square root of the number of household members (OECD 2008, 2011), which is generally considered the most relevant income concept to measure economic inequality (Salverda, Nolan, and Smeeding 2009). Equivalent disposable household income accounts for the roles of market and state in generating the economic situation, as it considers market incomes as well as taxes and transfers, and introduces the economy of scale (i.e. considers the fact that household needs rise not in a proportional way with the increasing number of members), by correcting income by the deflator.[29] While the household is considered as the unit of economic aggregation, the unit of analysis is the individual and inequality is calculated on an individual basis assigning to each individual the equivalised measure. The similarity measure of partners' earnings is

[28] Focusing on coupled households, i.e. excluding single-headed households, means that the measured levels of inequality are lower than those usually presented in official statistics.

[29] Incomes have also been subjected to top coding at the 99th percentile.

based on their labour income. I focus on earnings-similarity as the main source of total income and the prime determinant of standards of living (Atkinson and Bourguignon 2000).[30]

3.4.1 Empirical strategy

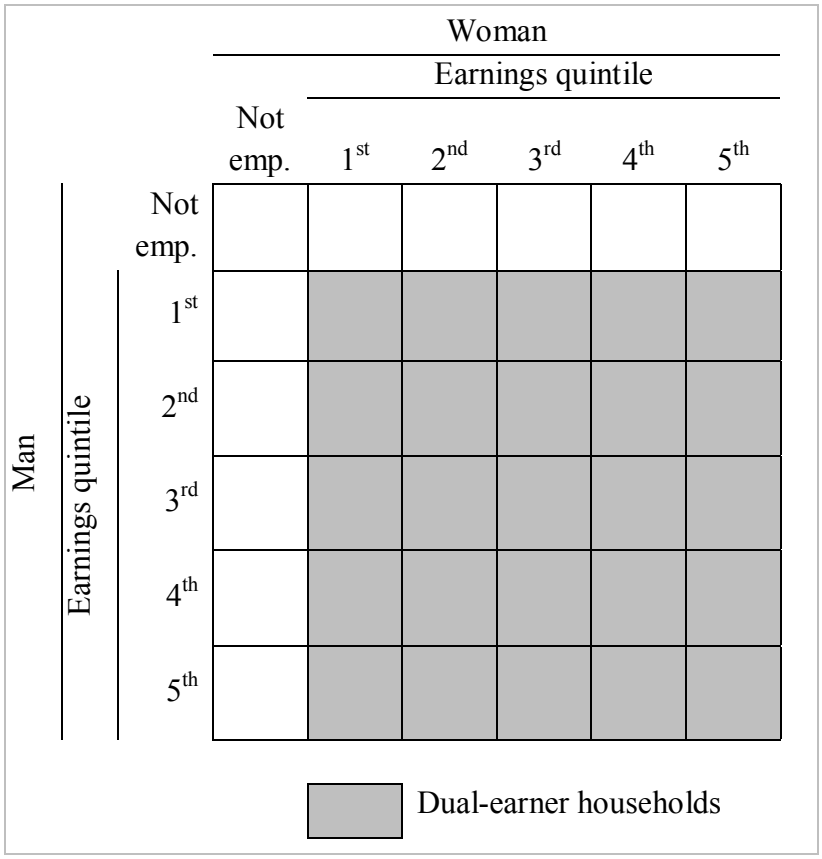
Most of the literature examining the effects of changes in partners' similarity on inequality employs a decomposition of the CV2 in which the correlation coefficient between partners' earnings enters directly the equation. Yet, the correlation coefficient is not the most appropriate measure of the association of partners' earnings (Schwartz 2010). It is based on absolute measures and does not permit to separate changes in the sex-specific marginal distribution from changes in the association between partners (cf. Bredemeier and Juessen 2013). This, risks to measure changes in the association of partners' earnings even when there is actually no change except in the levels of earnings (see Mare 1991; Hou and Myles 2008 for a similar discussion about educational homogamy).[31] To avoid this, I employ a strategy based on relative positions in the gender specific earnings distribution that is, by construction, independent from changes in the marginal distribution of earnings. Further, I distinguish the effects of labour supply from earnings. Therefore, I categorize individuals according to their employment status (distinguishing employment and non-employment), and, among the employed, according to the position within the own sex's distribution of labour income, defined in quintiles. Crossing partners' positions results in a six by six two-way table containing the different household types as shown in Figure 3.1:

Defining groups in this way I measure changes in earning's association in terms of *relative* positions of partners in their gender specific earnings distribution. This permits to investigate the association among partners' earnings and the distribution of not employed individuals both jointly and separately and it has the advantage to do that independently from changes in the marginal distribution of earnings – the marginal distribution of quintiles is constant over time by construction. This means that changes in the association are not affected by changes in the levels of earnings (Mare 1991; Hou and Myles 2008).

[30] I use 'earnings' and 'labor income' as synonymous. Labor income, in the LIS documentation, refers to 'payments received in counterpart for labor', including both dependent employment and self-employment.

[31] These advantages could be partially offset by the fact that I use the individual as unit of analysis because the number of household members might vary among household types. However, when replicating the analyses at the household level, results do not differ substantively.

Figure 3.1 *Households types according to economic characteristics*



Based on the groups defined above I employ inequality subgroup decomposition techniques of the Theil index.[32] Theil belongs to the family of generalized entropy indices and thus allows the decomposition of inequality in a between- and within-group part.

In the computation of the index, three quantities enter into play (cf. equation (4) presented in the Data and methods section of Chapter 2): the group mean income ($\bar{x}_j$), the group population share (p_j) and the within-group Theil value (T_j), where j represents the groups/household types. Based on these quantities it is possible to estimate three predicted inequality values by changing one-by-one the three quantities just mentioned, which allows to

[32] Although the most widely diffused inequality measure is the Gini coefficient I choose the Theil index as it presents important properties for my analyses. While the Gini coefficient can be decomposed by income sources, generalized entropy indices allow for subgroup decomposition. To this family belong the Theil index, the MLD (Mean Logarithm Deviation) and the HSCV (Half the Squared Coefficient of Variation). In particular I chosen the Theil index because, differently from the MLD and the HSCV that are more sensible to the bottom and to the top of the income distribution respectively, the Theil index is more sensible to the middle of the distribution, exactly like the Gini coefficient – permitting in this way the comparison with other results, at least in the trends. Moreover, differently from the Gini coefficient which ranges between 0 – maximum level of equality – and 1 – maximum inequality level –, the Theil index is not upper bounded meaning that its minimum value is 0 in case of maximum equality but does not have a maximum value.

develop counterfactual scenarios and answer questions like: how would the level of inequality have been in the 2000s if only the distribution of households (p_j) had changed since the 1990ies? This predicted value of inequality is computed by holding the within group inequality (T_j) and the group mean income ($\bar{x}_j$) fixed at their observed value in the mid-1990s while permitting to the distribution of households (p_j) to assume its observed value in the mid-2000s. By comparing the predicted values to the observed ones it is possible to assess the possible impact of changes in households' composition on inequality.

I first examine the impact of changes in the overall distribution of households. For this purpose, I predict inequality allowing only the distribution of household types to change, while the other entities are fixed to their previous value. However, as said, focusing on the overall distribution the risk is to conflate the consequences of changes in labour supply (mainly of women) and changes in the earnings similarity among partners in terms of partners' earnings quintile association.[33] To avoid this, I then decompose the changes in the two. For this sake a new distribution of households is generated where the association among partners' positions changes but the labour supply behaviour does not. This new distribution is then used to predict inequality.

To understand how this counterfactual distribution is produced, consider the changes between two points in time *t1* and *t2*. I first produce the 36-cells table of household types (reported in Figure 3.1) and fix the marginal distribution of the first row and first column of the table (which refers respectively to not employed men and not employed women) to their observed values in *t1*. Then I fix the entry 1-1 at its observed value in *t1*, this means that I am holding the proportion of households where both are not employed at its observed value in the first period. At this point, I fill in the first row by holding the proportion of employed women (coupled with a not employed man) as observed in *t1* (this is clear as I fixed at the *t1* value the marginal distribution of the row as well as the value taken by the cell representing not employed women), but re-weighting these women to mirror the relative distribution among quintile as observed in *t2*. I then do the same for men (the first column). In this way, I only permit changes in the association among partner's earnings, but not in the proportion of employed women/men given that the proportion of dual-earner couples is held constant. With the proportion of dual-earners fixed at its observed value in *t1*, the final step is to reweight the

[33] As highlighted by Larrimore (2014), 'correlation changes can come either from shifts in the correlation of earnings among dual-earner couples or from changes in where in the income distribution women are entering the labor market and men are leaving the labor market' (pp. 693-694).

entries of the dual-earner sub-table to reflect the relative distribution observed in *t2*. Also in this case, the overall proportion of couples where both partners are employed has not changed while the mating among them does. This is then the counterfactual table for changes in assortative mating only, namely my new p_j table.

3.5 Descriptive results

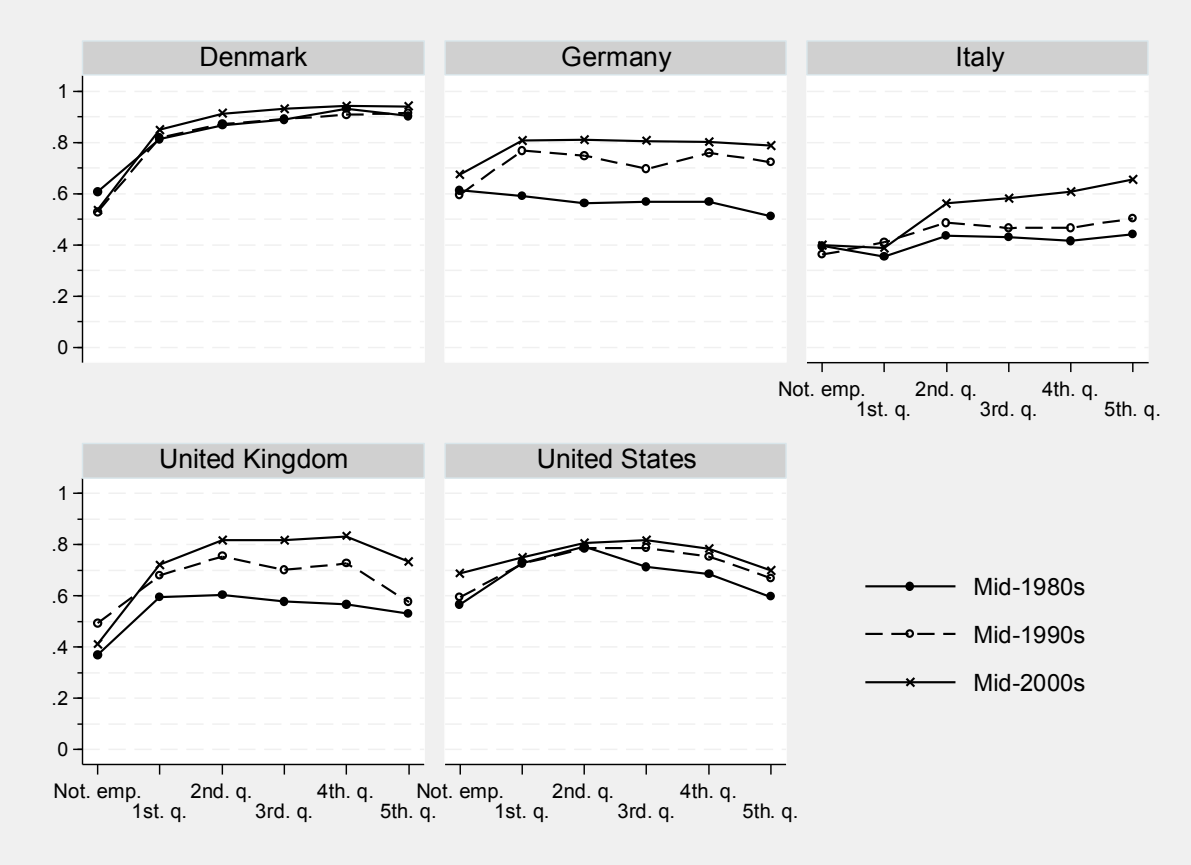
3.5.1 Female employment and earnings correlation among partners

Before answering the question to what extent changes in partners' similarity came with consequences for economic inequality I present descriptive trends.

To what extend did partners become more similar over the last decades? The well documented (OECD 2011a; Harkness 2013) general increase of dual-earner couples is not very helpful for deriving expectations about its consequences for inequality. Observing which women increased their participation most is more informative. Figure 3.2 shows that from the mid-1980s to the mid-2000s female labour market participation increased for all women, but was strongest for those living with men belonging to the better-earning quintiles, and almost null for those living with a not employed partner.

This general picture holds for all countries, with some important differences, though. As to be expected, Denmark and the United States did not experience much change as women have been inserted in the labour market already in the 1980ies (the slight increase in the US observable in the mid-1990s regarded those living with men belonging to the upper half of the earnings distribution). Starting from lower levels, the increase in women's employment was generally higher in Germany, Italy and the United Kingdom, though Italy still has limited female participation rates. Labour supply increased particularly among women living with men in the intermediate part of the income distribution, for the United Kingdom, and the upper part for Italy, but was less stratified in Germany. Interestingly, in the two market societies, the United States and United Kingdom, female employment follows an inverse U-shape with employment being lowest for the highest and the lowest income households.

Figure 3.2 *Female employment by male employment and earning quintiles*



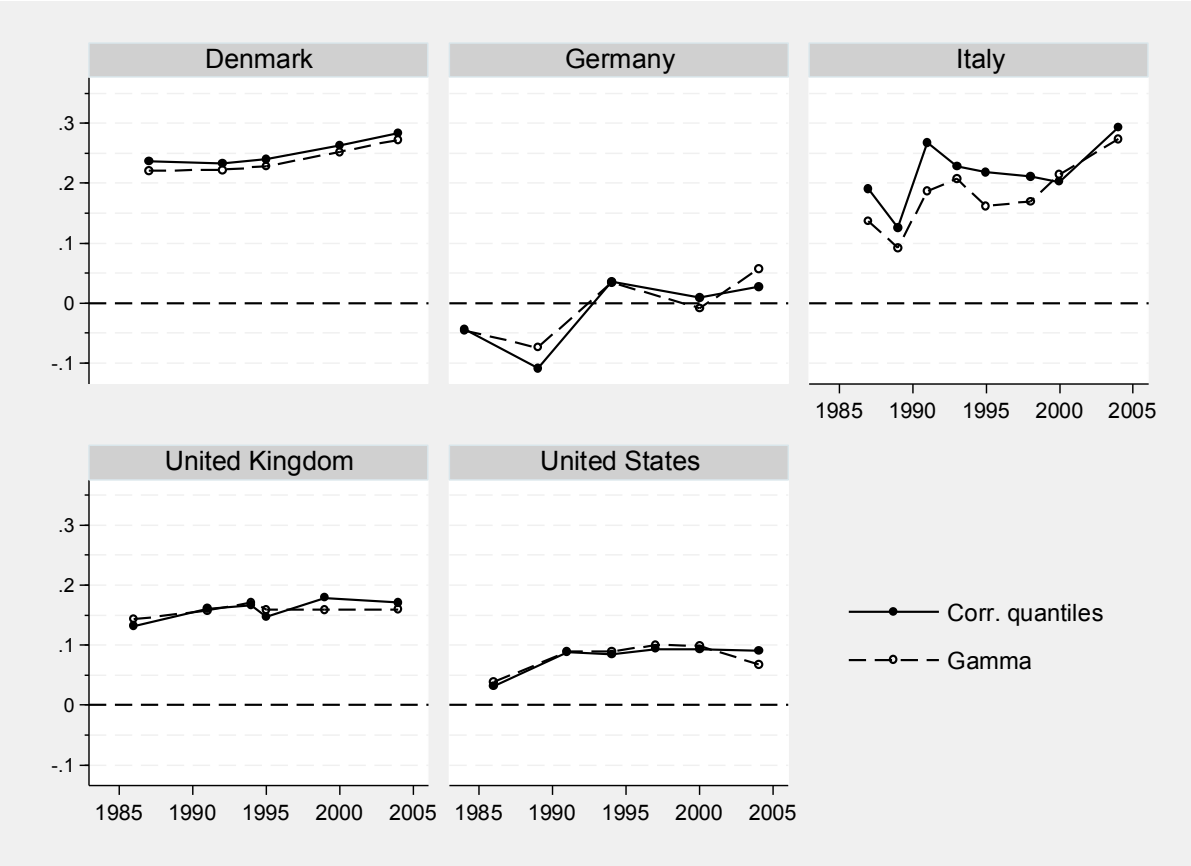
Sources: *calculation based on LIS data*

The fact that labour supply increased more among women with an employed partner collocated in the upper half of the earnings distribution, would suggest a polarization between households and therefore an increase in inequality. The strongest impact should be expected for Italy.

There is clear evidence of earnings' similarity among partners. Similarity increased in all countries, but to different extent. The association, shown in Figure 3.3, is measured through the correlation coefficient and the Goodman and Kruskal's gamma based on partners' positions presented in Figure 3.1.

Small increases are visible for the United Kingdom and the United State, while in Germany and Italy the association between partners' position increased the most. In Germany the initially negative association turned positive, i.e. from a situation of 'income compensation' to a situation of 'accumulation' which, though, still presents very low levels of similarity.

Figure 3.3 *Earning's similarity measured by the Pearson's correlation and the Goodman and Kruskal's gamma*



Sources: *calculation based on LIS data*

The United State and United Kingdom show moderate levels of earnings similarity among partners (below .2), which instead are highest in Italy and Denmark (up to around .3). Effects on inequality of the changes outlined above are not completely straightforward, yet the major changes and levels would suggest inequality to rise due to partners becoming increasingly similar in their earnings in Italy and, to a lesser extent, Denmark.

3.5.2 Trends in income inequality

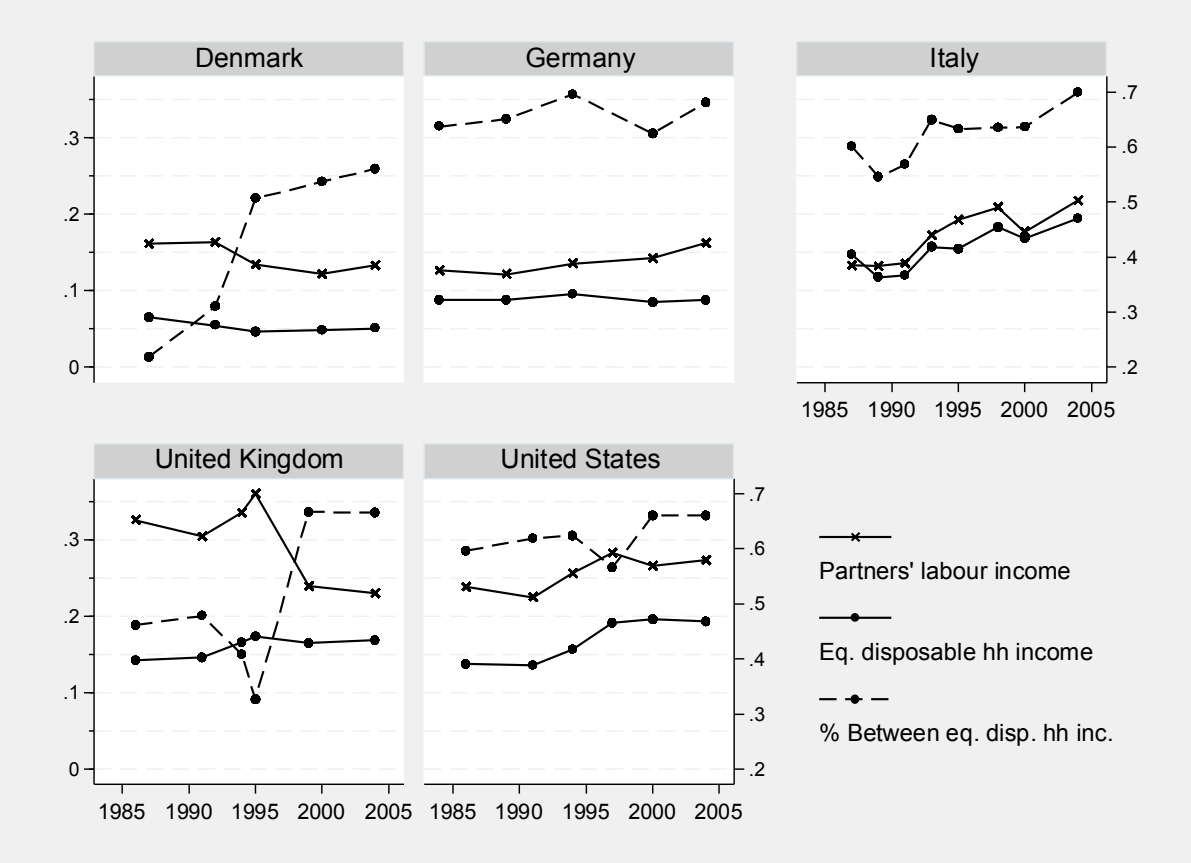
Effects on inequality of the changes outlined above are not completely straightforward. Figure 3.4 shows inequality trends over the last two decades, measured by the Theil index according to different income concepts.

The equivalent disposable household income (EDHI) approaches best persons' standards of living, which is why I employ it here (DiPrete 2003). In line with previous research (OECD 2008; 2011) my results confirm the strong differences in the level of inequality among

countries, with Italy, the United Kingdom and the United States displaying high levels of inequality, and Germany and especially Denmark much lower ones. The increase in inequality is particularly pronounced in Italy and, since the 2000s, also in the United States. Inequality increased slightly in the United Kingdom and is almost stable in Germany and in Denmark.

As mentioned, disposable household income results from many sources and various institutions enter into play in generating it. Similarity in partner's earnings is thus only one aspect. In order to assess the role of the various 'actors' in generating inequality (state and the household beyond the couple) I compare inequality based on equivalent disposable household income (solid line with dot, left axis) to an income concept taking into account only market generated inequalities and the pooling of income among partners, using the sum of partners' earnings only (solid line with x, left axis). As to be expected, inequality in earnings (i.e. market driven) is much higher.

Figure 3.4 *Inequality for different income concepts measured by the Theil index (left axis) and the between-groups component for equivalent disposable household income (right axis)*



Sources: *calculation based on LIS data*

Thus, state and household do effectively redistribute, and significantly lower inequality, yet, to very different extents in different countries: inequality reduction is negligible in Italy (due to the almost absence of the welfare state), Germany increased its redistribution capacity and is offsetting trends in increasing market driven inequality, in the United States the gap between the two curves remains constant, and Denmark and, even more so, the United Kingdom combine declines in earnings driven inequality with increases in inequality based on equivalent disposable household income, thus losing redistribution capacity.

3.6 Household changes and income inequality: decomposition results

In order to understand the impact of changes in partner's similarity, I decompose the inequality in equivalent disposable household income by population subgroups (as in Figure 3.1) and present a counterfactual simulation analysis. Figure 3.4, beyond the Theil index, also reports the share of the between-groups inequality component of the Theil index (dashed line, scale on the right axis).

Between-group inequality represents the amount of inequality deriving from income differences between the defined groups, and is an indicator of the importance of the attributes used to build these groups. The within-groups inequality (complement to the between part), refers to income dispersion within groups. From Figure 3.4 we note that the overall Theil index hides interesting changes and behind an aggregate stability, there might be changes in the way income is distributed between households. While at the beginning of the period the within-groups inequality was principally contributing to inequality in Denmark and the United Kingdom, the between-groups inequality gained importance and is nowadays the main component in all five countries. This indicates that partners' characteristics have become more important in stratifying economic inequality also in these countries. For example, today in relative terms, the between component in United Kingdom accounts for almost 70% of the total inequality while in the mid-1980s this quantity accounted for less than the 50%. This confirms that the characteristics used here to define households are increasingly important to explain inequality.

Increase in inequality observed for Italy and the United States comes from increasing inequalities between groups (with a minor contribution of rising within-group inequality for

the United States). For Germany, the situation remained rather constant, in Denmark the slight decline is due to increased homogeneity within groups. Finally, in the United Kingdom the inequality increase in the mid 1990ies can be attributed to the increase in with-groups inequality, but with a clear inversion from 2000 onwards when the between group component gained importance and within-groups heterogeneity declined.

3.6.1 Changes in the overall distribution and their decomposition

For the simulation analysis I focus on changes form the mid-1980s to the mid-1990s and from the mid-1990s to the mid-2000s. Panel A in Table 3.1 shows observed and simulated inequality according to the changes in each of the three quantities that contribute to inequality. I start by fixing the group mean income ($\bar{x}_j$) and the within-group Theil (T_j) at their observed initial value and allow the distribution of household types (p_j) to vary as observed (see equation (4)). This is the simulated/counter-factual inequality of main interest because it permits to assess the role of changing employment behaviour and partner's similarity by comparing the simulated with the observed inequality values.

Between the mid-1980s and the mid-1990s changes in p_j have contributed very little, if at all, to changes in inequality. Changes in simulated inequality are in line with observed changes (decreasing in Denmark and increasing in the other countries), but, more interesting, the counterfactual values are very similar to the observed initial values of inequality. This is true for all countries. For example, looking at the United Kingdom we observe a considerable increase in the observed value of inequality between the mid-1980s (Theil index of 0.1424) and the mid-1990s (0.1735). However, if only the distribution of household types had changed, the level of inequality in the mid-1990s would have been only slightly higher (counterfactual value of 0.1468) than in the 1980ies. Therefore, changes in the distribution of household types have not contributed to the increase in inequality observed in the first period.

In stark contrast with parts of the narratives in the literature, in the second time span, changes in p_j (the distribution of household types) would have led to a (more or less strong) reduction of inequality in all countries, which is likely due to changes in employment behaviour rather than earnings association which remained unchanged or increased (Figure 3.3). For instance, if in the United Kingdom only the distribution of household types had changed, inequality would have been almost 0.05 points lower than observed inequality in the

mid-2000s, and also considerably lower than the observed values in the mid 1990ies. This is a considerable impact of changes in p_j.

Table 3.1 *Observed and simulated inequality*

		Denmark	Germany	Italy	United Kingdom	United States
Panel A Changes in the overall distribution of household types						
Mid-'80s observed		0.0658	0.0882	0.1475	0.1424	0.1372
Change '80-'90 in:	$\boldsymbol{p_j}$	**0.0590**	**0.0884**	**0.1507**	**0.1468**	**0.1372**
	$\bar{x}_j$	0.0733	0.0943	0.1571	0.1414	0.1481
	T_j	0.0394	0.0874	0.1370	0.1662	0.1452
Mid-'90s observed		0.0466	0.0954	0.1553	0.1735	0.1566
Change '90-'00 in:	$\boldsymbol{p_j}$	**0.0462**	**0.0946**	**0.1476**	**0.1207**	**0.1487**
	$\bar{x}_j$	0.0513	0.0893	0.1822	0.2249	0.1890
	T_j	0.0469	0.0945	0.1667	0.1264	0.1786
Mid-'00s observed		0.0507	0.0880	0.1950	0.1685	0.1933
Panel B Changes due to earnings association only						
Mid-'80s observed		0.0658	0.0882	0.1475	0.1424	0.1372
Change '80-'90		0.0673	0.0898	0.1496	0.1443	0.1413
Mid-'90s observed		0.0466	0.0954	0.1553	0.1735	0.1566
Change '90-'00		0.0480	0.0954	0.1625	0.1759	0.1614
Mid-'00s observed		0.0507	0.0880	0.1950	0.1685	0.1933

In the present chapter, the income concept of interest is disposable income, which already includes the redistributive action of household and state. The fact that I do not observe any association between changes in partners' economic behaviours and inequality might be because institutions relax this association (as shown in chapter 2). If it is the case, one would expect a substantial impact of changes in households on inequality once labour income is considered. In fact, this is partially true (see Table A3.2 in the Appendix): changes in households' economic composition do drive inequality, at least to some extent. This is particularly the case in the first decade, although the association is far from perfect.

In the decomposition analysis presented so far, households types/groups are defined according to both partners' employment behaviour and earnings association, which has the advantage of considering their effects jointly, but conflate the consequences of very different,

and possibly off-setting, phenomena, namely changes in labour market participation decisions and earnings similarities due to assortative mating. The negligible contribution of changes in p_j (in the first period) may be the result of different processes with opposite consequences. To rule this out, changes in the distribution of households are decomposed permitting only the earnings association to change while holding partners' employment behaviour constant. Results are presented in Panel B of Table 3.1, and suggest that changes in earnings association as such had no substantial impact on inequality changes. This is true for all countries and for both periods. Counterfactual values are indeed very similar to observed values in the respective previous reference period.

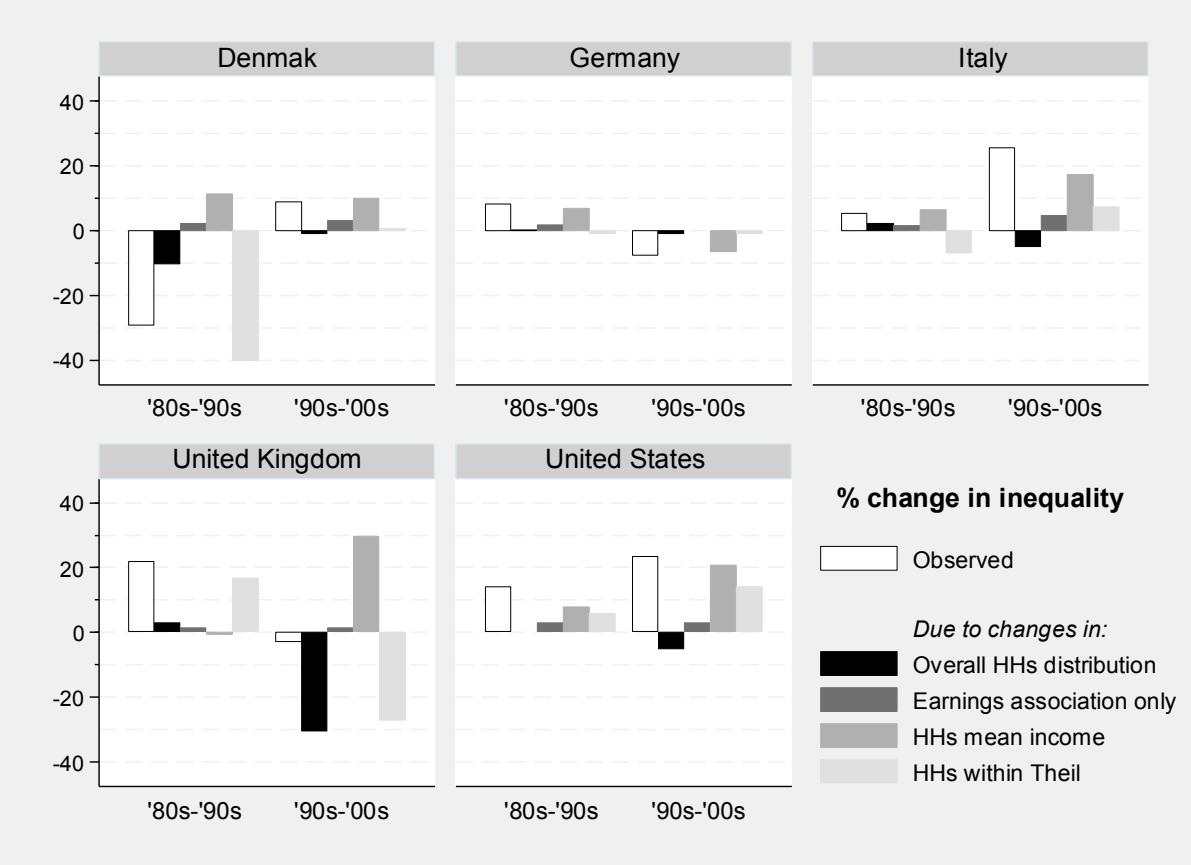
Overall, I can conclude that changes in earnings similarities did not contribute to account for changes in inequality to any relevant extent. If anything, increased similarity in partners' labour supply behaviour had reduced inequality, especially from the mid-'90s onwards, and was certainly not a driver for inequality increase. This equalizing effect of female employment seems to be slightly stronger in the United Kingdom.

If changes in partners' similarity, i.e. in the different households types, are not responsible for changes in inequality, the possible inequality drivers might be the changes in household's mean income ($\bar{x}_j$) and in the dispersion within them (T_j). To investigate this possibility, Figure 3.5 shows simulated changes in inequality due to these two quantities. To ease the interpretation, results are expressed as percentages (simulated changes refer to results reported in the Panel A of Table 3.1).

The figure shows that the major part of inequality changes derives from changes in the mean income of household types and the within Theil. In detail, changes in group's mean income lead to an overall increase in inequality, while changes in the within Theil operate in both the directions. To get an idea where the increased differences between groups' mean income and the compression of within Theil come from, Figure A3.1\Figure A3.5 in the Appendix report for each of the 35 household types at the three time point the values of (p_j), ($\bar{x}_j$) and (T_j). Households' mean income has grown over time for all household types, but much more so for those at the upper end of the income distribution: the higher the income, the greater the gain. Consequently, income differences between household types are growing. This confirms results from Figure 3.4, i.e. the general growth of the between-groups inequality component. In all countries the richer households, where both partners are employed and belong to the fifth earning quintile are those who gained the most, while the

poorer households experienced the least income growth. This is in line with well know results (OECD 2011a) confirming that considerable part of the recent inequality growth comes from the richest becoming even richer.

Figure 3.5 *Observed and Predicted change in inequality, percentages*



Sources: *calculation based on LIS data*

Looking at changes in the dispersion of income within household types, the story is more complex. I do not observe a clear pattern of change over time and across countries. This heterogeneity is beyond the scopes of this chapter, but some comments can be done. In Denmark the decrease in the within Theil observed between the mid-1980s and the mid-1990s can be almost totally attributed to the declined income dispersion within households with some components of non-employment. In Italy the initial decrease and the following increase can be attributed to male breadwinner households. The within dispersion of these households, indeed, decreased in the first time span while increased in the second. The opposite is true for the United Kingdom where, especially among households collocated at the bottom of the income distribution, the within dispersion increased from the mid-1980s to the mid-1990s and

decreased afterwards. Concerning Germany, in the aggregate, I observe no changes. Finally, in the United States, within inequality increased over the entire period under investigation. In this case, the main drivers have been the increased dispersion among, on the one hand, households where both partners are not employed and, on the other hand, households collocated at the top of the income distribution (where the man belongs to the fifth earning quintile) – this last point suggest what has been widely recognize in the literature, namely that increasing inequality in the United States has been largely driven by the increased wage dispersion among men (cf. Blau and Kahn 2009).

3.7 Conclusions

Numerous studies investigated the reasons of increasing income inequality experienced by many industrialized countries over the last decades. Many focused on market forces. To a lesser extent, also demographic factors have been considered as inequality-drivers. The increased similarity among men and women in general, and among partners within couples in specific, has repeatedly been suspected to be among these drivers (Esping-Andersen 2007; Breen and Salazar 2011). I investigated if and to what extent this has been true for four European countries – Denmark, Germany, Italy and the United Kingdom – and the United States, from the mid-1980s to the mid-2000s.

Results based on decomposition technique show that changes in partners' similarity, approached through the distribution of different household types defined on the basis of partners' economic situations, do not account to a relevant degree for changes in inequality. Yet, the negligible role played by changes in the overall distribution in household types might be due to different phenomena with opposite consequences for inequality. Therefore, I distinguished changes in labour supply of partners, and the earnings association among them. Changes in earnings similarity among partners cannot explain changes in inequality. Instead, in most cases, the increase in dual income households would have, taken alone, led to lower levels of inequality than the observed ones. Hence, other factors determined the observed changes in inequality. The driving forces can be traced in an increased income difference between household types, which lead to a (increased) polarization among households, and in changes in income dispersion within household types. Certainly, other important stratifiers are at work, beyond gender and the increased similarity of men and women.

A comparison of my results with other studies is possible for the United States only, due to a lack of studies on European countries. Given the similar time period I can confront my results with those by Schwartz (2010) and Larrimore (2013), although comparing studies based on different methodologies and data might be risky. Overall, my findings confirm their results. According to Larrimore, while the correlation between partners' earnings accounted for inequality increases in the 1980s, it did not contribute significantly in the following decades. Schwartz shows that changing partners' earnings correlation among dual-earner couples accounted for 15 per cent of inequality increase. However, as Schwartz measured inequality in earnings, she overestimates (or I am underestimating) the impact of changes in the association on inequality.

I can only speculate why changes in earnings similarity contribute so little to inequality. My inequality measure is based on equivalent disposable household income, and I underlined that many factors, beyond earnings, influence it. Different institutions, indeed, play a certain role as the link between partners' earnings and equivalent disposable household income is moderated by many institutions: by market forces via the earnings that other household members bring in the household; by the state through its (more or less marked) redistributive commitment via transfers and taxes; and finally by the household itself via income pooling and economies of scale.

That might justify why even in the country where descriptive trends would have suggested major consequences for inequality of the increased similarity, i.e. Italy, changes in the distribution of household types contributed to reduce inequality.

Following the welfare regime theory, and according to the results I showed in chapter 2, I would speculate the state to be the chief institution in welfare allocation/redistribution in Denmark, the household should have the key role in Germany and especially in Italy, while market forces should be stronger in the United Kingdom and the United States. To assess empirically the extent to which these institutions are at play, one should systematically compare various income concepts. This is an interesting issue I leave to future research.

Turning to the somewhat provocative question in the title, I can clearly state that increased gender equality did not come with increased inequality. Instead, women's employment can be an important equalizer especially in those societies characterized by rather high levels of economic inequality.

4 The economic consequences of job-loss. Evidence from Germany and the US

Abstract

Income inequality has been a topic of major concerns in the literature, yet its 'permanent' dimension has been scarcely investigated notwithstanding 'life-time-inequality' is the socially much more relevant dimension. Previous studies show that, due to income mobility, permanent inequality is considerably lower than snapshot-measures. However, very little is known about the micro mechanisms that lead to such outcome. Income mobility is mainly attributable to labour market events which individuals experience over their life-course. Though temporary income fluctuation levels out over the long-term, these events can also trigger changes in households' income trajectories and thus may have long-term consequences on the overall inequality structure of a society, i.e. its stratification. This is especially true as the likelihood to experience these trigger events, as well as their consequences, are stratified by several social characteristics, and consequently might originate processes of cumulative (dis)advantage. The distinction between inequality and its stratification becomes thus very relevant, as well as the distinction between permanent and dynamic aspects of income.

This chapter investigates one of the most crucial event: job-loss. Specifically, the focus is on the way job-loss affects household income dynamics and on the extent to which its economic consequences are unevenly distributed among social groups/strata. Whilst groups are usually defined according to individuals' socio-demographic characteristics, I use a more encompassing strategy: groups/strata are defined as quartiles of the distribution of 'permanent income'.

Being social strata defined in this way, individual position in the social stratification system can be interpreted as a latent measure of advantages and disadvantages that over time households accumulate. Therefore, given its link to permanent income, this measure of stratification captures advantages and disadvantages cumulated at both household level and over the life-course.

Further, the way social risks hit households, and thus the overall income distribution, depends on the society's specific mobility regime. Labour market and the welfare state play an important role in shaping both the rate and, above all, the consequences of events. To take into consideration these aspects I approach these research questions in an international comparison employing longitudinal data for Germany and the US – two countries which strongly differ in structural characteristics relevant for income dynamics. Empirical results come from an innovative statistical model: the distributed fixed-effects.

4.1 Introduction

In the existing literature, income inequality has been studied from two different perspectives: from a static perspective and from a dynamic one. The first, refers to inequality measured cross-sectionally – as in chapter 2 and 3 –, the second refers to inequality measured longitudinally – and is usually referred to as permanent inequality, long-run inequality, long-term inequality or as life-time inequality. The second concept is the socially more relevant (DiPrete 2002).

The heart of long-run inequality is represented by the income dynamics that individuals and households experience over their life-course. These dynamics are the result of the events that individuals face in their social and economic life. Therefore, understanding income dynamics, how specific (employment or household) events impact on individuals' and their household's income trajectories implies distinguish life-time inequality from the transitory parts and to understand the ways long-run/permanent inequality is generated. This chapter takes a step in this direction.

The (few) studies focusing on the longitudinal perspective of inequality usually emphasizes the *permanent* component of inequality, which embodies the persistent character of inequality as opposed to the *transitory* component of inequality. However, whether we study permanency or mobility we always need to deal with inequality dynamics in a longitudinal way. I argue that individuals' income mobility is the more interesting and informative aspect. Understanding its determinants, including the role of certain trigger events and how they interact with individuals' characteristics, assets and overall context, will enhance our knowledge on the mechanisms at the basis of inequality.

In the same vein are claims made by Western and colleagues (2012) who exhort scholars to move their research work from the static to the dynamic approach and in particular to income mobility. As a matter of fact, movements over the income ladder – i.e. income mobility – are mainly determined by events in social and economic life that individuals experience over their life-course. Events that have the capacity to affect income trajectories, in the literature are named 'trigger events' (DiPrete 2002).

Though, temporary income fluctuations may level out over the long-term, these events can also trigger changes in households' income trajectories and thus may have mid- and long-

term consequences on the overall inequality structure of a society, i.e. its stratification. This is especially true as the likelihood of experiencing these events, and their consequences, may be stratified by several social characteristics. Consequently, this would originate processes of cumulative (dis)advantage.

Whether the experience of an event contributes to equalize or instead to dis-equalize the distribution of long-run income depends on whether the economic consequences of such event are stratified across social groups.

In the following, I will focus on labour market related events and, more specifically, on the transition from employment to unemployment.[34] More precisely, I am interested in how the loss of a labour income, which represents the main source of individuals' and households' incomes, triggers changes in economic resources. The loss of employment, might indeed translates in a considerable and severe reduction in individual welfare. I study the effect of job-loss on income applying an innovative statistical model: the distributed fixed-effects.

In addition, as already mentioned, I examine the impact of unemployment events across social stratification, i.e. social strata. Here, social strata are conceptualized to reflect advantages and disadvantages that individuals and households have accumulated over the life course (DiPrete and Eirich 2006; Mayer 2004). In particular, as I will explain later, I operationalize social strata as quartiles of the distribution of households' permanent income.

Moreover, focusing on welfare implies to consider the fact that the individuals are not isolated atoms but inserted first in a meso level environment – the household –, and second in a macro context – the country. Both these levels enter into play to shape, at least to some extent, the severity of the consequences of individual (trigger) events or transitions. Therefore, I study the impact of job loss on welfare using different income concepts as well as in comparative perspective that permits to disentangle the role of institutions: the market, the household, and the welfare state.

Up to now, I stressed that the main contribution of this chapter is the study of income trajectories around unemployment transitions. Yet, the overall contribution of the chapter is much wider. First of all, I introduce and complement the analyses on unemployment consequences with the study of the risks of experiencing such event. Studying how job loss events are distributed – along with studying their consequences – is very important too, and

[34] In the following, I use 'transition from employment to unemployment' and 'job loss' interchangeably.

may give us relevant insights about stratification processes. In fact, as already mentioned, two aspects should be distinguished for the study of life course mobility: the likelihood of experiencing an event, and the socio-economic consequences of such event (DiPrete 2002). Moreover, the comparative dimension is not only important for the second aspect mentioned, but differences between countries are also present in the way institutions shape the rate at which some events occur. Thus, it is not enough to look at the event's consequences if we want to say something on households' standards of living, and more in general on the society's structure of stratification.

The second contribution of the chapter is the study of income trajectories of 'employment exit', the effort to widen the focus toward the economic consequences of all transitions out of employment, beyond the narrow focus on unemployment. Thus, I will move the focus toward intrinsically very different events but which lead to the very same outcome: the loss of a source of labour income. This is particularly important because all the transitions involved may strongly impact on households' standards of living just like the specific event of unemployment (especially in the short term). Considering a set of possibly heterogeneous events may provide insights on the heterogeneity of the income trajectories that different transitions imply, and possibly on the different role that institutions play in managing different social risks.

4.2 Theoretical considerations

This chapter builds on the idea that events interact with attributes in context. *Events*, *attributes*, and *contexts* may be respectively led back to three branches of research (or dimensions). Events are the object of life-course research; attributes, which in my case are represented by the individual's position in the system of social stratification, are at the core of the social stratification research; while contexts, usually in terms of countries, represent the 'arena' of comparative research. Here, I try to integrate these three strands of research and I will focus on job loss as one of the most significant events coming with income loss.

This chapter aims to understand if, and to what extent, advantaged and disadvantaged groups are object of different income dynamics after the experience of an event. Life conditions are indeed affected by the individual's position within social stratification. This position may also trigger processes of cumulative (dis)advantage over the life course – or, as

Merton would name it, a 'Matthew effect' (Merton 1968; DiPrete and Eirich 2006). Cumulative advantage is at work when the advantage of a group over another group accumulates over time, when a given amount of resources 'predicts' future accumulation of resources. For example, the likelihood to experience an event and, more importantly, the consequences of the event (e.g. in terms of income change and its persistence) may be stratified by groups defined according to certain attributes. Integrating the insights from the life-course perspective with those from social stratification studies, the following research questions emerge:

Do different social strata experience different income trajectories after job loss? Do the negative consequences of unemployment accumulate on already disadvantaged strata?

The interaction between events and social stratification, moreover, takes place embedded in contexts. The context, characterized by its specific structure of opportunity and constraints, not only contributes to define the likelihood that an event is experienced, but also the consequences deriving from it. The (economic) consequences, indeed, are shaped by a set of institutions, namely the labour market, the state, and the household. For example, the configuration of the labour market can influence the possibility to recover from the income lost with unemployment, by affecting individuals' reemployment chances and their wages after reemployment. The household may instead mitigate job loss consequences by pooling and sharing the incomes of other household members, while the state may support individuals via unemployment benefits.

The role of these institutions, as I have also shown in the previous chapters, is undoubted. However, their role varies between contexts according to their specific configuration. These considerations permit to advance further research questions:

To what extent do institutions shape income loss, its persistence, and the subsequent trajectory after unemployment? Do they do so differently for different social groups? How do they operate in different contexts? Do labour market, state, and household capacities to define and shape the economic consequences of job loss vary between Germany and the United States? Does institutions' role in reducing or reproducing inequality between strata varies in different countries?

4.2.1 Defining the event: job loss

Among the mechanisms that have the potential to produce social stratification, the stratification literature recognizes the role of 'trigger events' (DiPrete 2002). Events of this sort are considered life-course events that may have strong implications for economic conditions as well as for intragenerational mobility processes. In addition, they may also have implications for the dynamic dimension of social stratification because the incidence and the socio-economic consequences of the events that characterize individual life-courses are linked with processes of economic and social change (Gangl 2003). Job loss falls under the umbrella of 'trigger events'.

Income from labour represents the largest share of income that individuals and households dispose. Job loss, therefore, has the capacity to negatively affect the economic conditions of individuals and their households. This implies the need to study income trajectories not only in individual labour income but also in the 'final' income that households dispose.

The number of labour income recipients present in a household is a rather good indicator of household's economic resources. From this follows that variations in the number of labour income recipients should be associated with variations also in the total amount of household income. Bringing these considerations from a static to a dynamic perspective, it follows that a transition from non-employment to employment or, on the contrary, from employment to non-employment would imply, respectively, a considerable gain or loss of income. Although also other types of transitions – such as household transitions – have the capacity to alter household income, employment events seem those which may have the largest impact on household income and its dynamic.

These considerations, and the implications associated with job loss as a trigger event, lead me to focus on this particular event in this chapter (cf. Brand 2015). In doing that, moreover, I also consider the heterogeneity by which this event affects individuals and households economic conditions between social groups. Indeed, the negative effect of job loss depends on attributes, income concepts and contexts, i.e. institutions. I will discuss this in the following paragraphs after having defined the event.

Up to now, much literature focusing on the economic consequences of job loss studied the impact of (involuntary) unemployment on earnings, but only little research has studied its impact also on other income concepts.

In this chapter, I define job loss as the transition from employment to *unemployment*, and I investigate its consequences for various concepts of income – as I will explain later.

Although this definition of the event represents my main interest and the core of the chapter, I will also devote some space to complement it with a more encompassing definition of the event: the transition between employment and not-employment. Non-employment, in this case, does not distinguish the specific entry state: being it voluntary or involuntary unemployment, parental leave or additional training, or other types of inactivity.[35]

In this more ample definition of *employment exit*, some workers may for example be laid off and then decide to look for another job (in this case he/she would be considered as an involuntary unemployed), or to make further training, or instead became inactive. Other workers may instead leave their job voluntarily to look for a better job (and thus experience an unemployment period), or for parental leave, or for many other reasons. However, independently from the reasons they exit from employment, and from their subsequent state, it is important that they all experience the loss of their labour income.

Focusing on a closely defined event such as unemployment has the advantage to study a specific population and to identify the event's economic consequences in a precise way. On the contrary, using a more encompassing definition such as employment exit has the advantage to capture the economic consequences faced by all the people experiencing the loss of a labour income, but has the drawback to introduce noise due to the heterogeneity of the population considered.

According to these implications, I prefer to direct the attention toward job loss, i.e. *unemployment* events. However, in order to furnish a more encompassing view on the economic consequences that the loss of a labour income may have on the welfare of individuals and households I complement the analyses on unemployment with a wider definition of the event, i.e. *employment exit*.

Moreover, whether on the one hand job loss may have significant consequences on individuals' and household' standards of living because it deprives people of a source of income, on the other hand, it may also affect trajectories after individuals have re-entered to employment. Existing literature, indeed, agrees that job loss has negative and persistent consequences on workers' careers. Scholars use the term 'scar effect' to indicate the loss of

[35] I excluded only disabled people from the analyses.

earnings that reemployed individuals experience in their new job compared with their earnings before job loss. Among others, a well-known study on the United States found a persistent scar effect of job loss: up to four years later, workers did not completely recover their initial earnings (Ruhm 1991). The same conclusion has been reached more recently by Brand (2003). Studies on Germany also report a scarring effect of job loss, although with a lower magnitude (Burda and Mertens 2001; Gangl 2006).

After having experienced a job loss, reemployment can be viewed as a 'counter-mobility strategy' that individuals may adopt to recover their initial level of income (DiPrete 2002). The extent to which reemployment contributes to recover the initial level of income depends on wages in the new job, and indirectly on the time spent out of employment.

Among the explanations considered in the literature to address earnings trajectories after job loss, some have received particular attentions. These explanations have been mainly derived from the human capital theory, the signalling theory, and the job search theory and are connected with the time spent in unemployment.

The human capital theory posits that the longer the duration of unemployment, the lower the wages in the new job will be (Becker 1975). This is because human capital, i.e. individual marketable skills, devaluates if unused. Therefore, the longer the time spent out of employment and the larger the extent to which human capital deteriorates. This translates into both declining reemployment probabilities and declining wages as duration after job loss grows.

Signalling theory leads to the same conclusion, although via a different mechanism (Spence 1973). According to this theory, unemployment is used by the employer to assess worker productivity. Given that employers cannot directly judge the productivity of the worker, they base their assessment on observable factors. This means that spells and duration of unemployment are considered as indicators of low productivity and, in turn, employers will be more reluctant to hire and will pay low wages to low productivity workers.

The mechanisms derived from these two theories are of a demand-side kind, it is the employer decision that defines wages. There are no choices for the job seeker, only the set of opportunities and constrains define its future wage. Search theory, on the contrary, takes into consideration the two-sided process that entails both opportunities and choice (Mortensen and Pissarides 1999). Job search theory derives the level of wage from the quality of the match between employer and employee.

The mechanism proposed by this theory builds on these considerations: job seekers receive job offers at a certain rate and decide whether to accept or decline the offer. The demand for specific marketable skills defines the rate of the offers. Those with valued skills will receive job offers at a higher rate, which implies that they will experience shorter period of unemployment and higher wages in the new job because they can chose among many offers.[36]

However, following search theory, offers that match individual's skills are not so frequent and the job seeker has to search for some time before a good match is met and consequently a well-paid job is found. Therefore, following this reasoning, search theory predicts a positive association between time spent out of employment (time spent searching) and reemployment wages.

These theories are standard tools in labour market research and fruitful tools for the interpretation of my results, although my aim is not to isolate the duration of unemployment spells from wage levels, nor to test the mechanisms underlying the human capital and signalling theories.

The implications from job search theory deserve major attention, especially once the micro mechanisms it implies are approached in the comparative perspective. As said, individuals' options and strategies are situated in contexts characterized by specific institutions. In this case, the outcome of reemployment depends on the structure of the labour market in which individuals are inserted and on the welfare state arrangements supporting unemployed people – most prominently unemployment insurance (Gangl 2003; 2004).

I will discuss the comparative dimension and the way the job search theory may be interpreted in comparative perspective in section 4.2.3.4, after having described the contexts in which they take place.

4.2.2 Defining attributes: social strata

Attributes are usually defined according to individual's or household's characteristics such as their demographic or socio-economic characteristics. As mentioned before, here attributes are intended as the individual's position within the social stratification system.

In considering social stratification, two issues should be taken into account. The first is the interrelatedness between the situations and behaviours of individuals that live in the same

[36] This line of reasoning is also at the base of the others theories proposed.

household. The literature recognizes that within household, decisions, for example to participate in the labour market, are jointly taken (Becker 1991). In addition, Sorensen (1986) argues that in order to fully understand the mechanisms of access to positions in the labour market – and thus also in the social stratification system –, we have to acknowledge the degree to which employment histories and household processes are related. That is what Drobnic and Blossfeld (2004) call the principle of 'interdependent or linked lives'. Therefore, to define individual's position in the social stratification system requires taking into account this interrelatedness, i.e. a household level measure of social stratification.

The second issue to be considered is what can be seen as the 'crystallization' of social stratification, its life-course dimension. Individuals' position in social stratification is itself the result of processes of accumulation of resources over time. The outcome of the accumulation processes and what leads to it is thus what social stratification should measure.

Social stratification has been measured in various ways. The most widespread indicator of social stratification used in sociological literature is probably social class, usually operationalized with EGP class schema (Erikson, Goldthorpe and Portocarero 1979; Erikson and Goldthorpe, 1992).[37] This kind of schema would satisfy an important aspect: it well approximates individual's economic advantage and disadvantage. Indeed, as Goldthorpe and colleagues have (more) recently shown, class declared in this way, is associated with individuals' income levels as well as with individuals' income security, short-term income stability and long-term income prospects (Goldthorpe and McKnight 2006; Chan and Goldthorpe 2007).

However, while this kind of schema may be suitable if the focus is on individual's earnings or income, in my case it is not at all appropriate given that the attention here is directed also to the household role and household income concepts are considered. If the approach based on individual class would have been a good measure also of household's class in the past, with the departure from the male-breadwinner model observed in many industrialized societies it is no more the case. The entry of women into the labour market and the associated rise in dual-earner households have increased household complexity and made the class approach based on individual's job characteristics incapable to fully capture household's living and economic conditions. More in general, DiPrete highlights that '*Welfare and well-being are fundamentally (even if not exclusively) about material standard*

[37] Class refers to the male head as in Goldthorpe (1983), or to the adult with the highest occupational status as in the 'dominance model' of Erikson (1984).

of living, and standard of living also depends on the number of dependents supported by a breadwinner's income-producing assets and on the income streams from other adults in the household' (2002: p. 270).

Therefore, the 'class approach' is not a very useful tool to capture also these aspects. According to these considerations, with the aim to have a measure that satisfies the interrelatedness of individuals' lives dimension as well as the life-course dimension of social stratification, I rely on what is termed 'resource approach' (Sorensen 2000; DiPrete and McManus 2000).[38] This approach implies that living conditions are proxied by economic resources, such as (life time) income, which appears to be a better indicator then class based on individual's job characteristics (DiPrete 2003).

Following the resource approach, I define resources using household income over time. More specifically, the first dimension is captured by equivalent disposable household income, which can be considered as a good measure of economic well-being; while concerning the second dimension, as a proxy of permanent income, I average annual income over three randomly chosen years – following Brady and colleagues (2015), this can be considered an adequate measure of the permanent dimension of income. Finally, the individuals' positions in social stratification are defined as social strata corresponding to quartiles of this permanent income distribution.

As highlighted by Mayer, over the life-course '*early influences shape and direct later trajectories in a cumulative manner*' (Mayer 2004: p. 33). In light of what has been said, individual position in the social stratification system can be interpreted as a latent measure of advantages and disadvantages that over the life-course are accumulated (Mayer 2004; DiPrete and Eirich 2006).

[38] DiPrete and McManus (2000) enumerate four reasons to neglect class-based measures and in favour of resource-based measures. Firstly, according to them, these kind of measures do not measure in an adequate fashion the 'permanent' household income because do not take into consideration the work activity of other household members. Secondly, they also miss the fluctuation in living condition that may derive from unemployment spells, from variation in hours worked or job changes. Moreover, the increase in employment instability that characterized many industrialized countries over the last decades undermines even more the appropriateness of class approach. Thirdly, individual class does not take into account changes in household composition that come with changes in household standard of living. Finally, welfare state's role is not captured because welfare programs usually affect household income rather than the individual class position. This discourse, of course, is not only valid if we are looking at stratification as an independent variable – as I am discussing now – but it is also valid, and probably more so, if we consider standard of living as the dependent variable – as I am doing in the entire thesis.

4.2.3 Defining the context: the market, household and state in Germany and the US

In the following, I compare Germany and the United States. This decision is theory and data driven. The availability of suitable data for this kind of study is very limited. Yet, Germany and the United States are useful cases because they are characterized by different institutional settings and can indeed be categorized as distinct capitalism or welfare state (Esping-Andersen 1990; 1999; Hall and Soskice 2001), providing thus the necessary variation in market, household, and state, which possibly shape income trajectories. Germany and the United States also allow the comparison of my results with those of previous studies, which mainly focused on these two countries.

An extension of the analysis towards the Nordic and Mediterranean countries would certainly be an important enrichment I will leave for future research.

The cases/countries differ in many ways. It is therefore not possible to attribute potential differences in the outcomes to specific institutional arrangements, but only to the general macro context.

Given previous knowledge, I would expect differences between the two countries in the distribution of the event as well as with regard to the event's consequences. More in detail, differences between countries may emerge mainly regarding three aspects, which are related to the three institutions into play. First, in labour income losses and the trajectories after job loss, which are also functions of the rate and the duration of the events. Second, in the capacity that the household has in buffering income losses. Third, in the extent to which the welfare state buffers the losses.

In the following, I will discuss the way in which income losses after job loss can be buffered and how this may vary between Germany and the United States according to their configuration in terms of labour market structure, household, and welfare state, and the interplay among them.

4.2.3.1 Individual counter-mobility strategy across labour markets

In the previous pages, I mentioned that individuals might adopt strategies to buffer the loss of income after having lost the job. The main strategy is certainly reemployment. As mentioned before discussing the various theories, the 'buffer capacity' of reemployment may vary according to the time spent out of employment and, partly associated to it, to the re-entry

wage. The extent to which reemployment levels out previous income losses, however, is also determined by the context, more specifically by the labour market structure and the structure of welfare state support to the unemployed. Micro-level mechanisms are thus mediated by macro-level institutions and circumstances.

Germany and the United States are characterized by considerable differences in their labour market structure that should also imply differences in the weight of the counter-mobility strategy. Germany is characterized by occupational labour markets (OLM), the United States by what has been labelled internal labour markets (ILM) (Marsden 1986; 1990).

In OLMs, the labour market is segmented by occupations, and jobs are identified by the content and skills that the job requires. Accordingly, the educational system furnishes the (future) workers with standardized and reliable vocational qualifications. These contexts, thus, are characterized by transferable skills that may be used in many firms. Labour mobility is possible between firms within occupations. Moreover, the standardized and reliable character of workers' educational qualifications will favour a better job-skills match that should imply re-entry wages similar to the wages before job loss.

Differently, ILMs are characterized by labour markets segmented by firms, and skills are mainly acquired within the firm via on-the-job training. In line with this, the educational system provides workers with general qualifications rather than vocational skills (Doeringer and Piore 1971). This implies that in ILMs, skills are much more difficult to transfer because there may not be corresponding jobs in other firms or because the access to such jobs is closed by institutional rules. Labour mobility is in this case possible between jobs within the same firm (Eyraud, Marsden and Silvestre 1990; Marsden 1990). Because of the firm-specific character of the workers' skills, job-skills match in ILMs should be more difficult and wages in the new job lower with respect to wages before job loss.

Such a characterization of the two labour markets has different consequences for individuals that possess different amount of skills.

In OLMs, a major cleavage consists between those with and without (relevant) skills, which puts the low-educated/skilled in a particularly disadvantaged position. High-educated workers will thus receive job offers at a higher rate because of their marketable skills and use their credentials to access to better-paid jobs. They are in a particular strong position of advantage with respect to unskilled workers in terms of both re-entry time and wages in the new job. Therefore, the higher the level of skills and the lower the losses after job loss. On the

contrary, given the job-specific character of skills in ILMs, skills are not easily transferable and employers may give relatively less weight to workers' skills level.

Therefore, considering the valuable character of skills in OLMs, in Germany I expect lower income losses in the years after job loss for the highest strata compared to the lowest. This is because the advantaged people occupying the top of social stratification should experience the higher chances of reemployment and the higher wages. On the contrary, in light of ILMs characteristics, in the United States this stratified pattern should not be observed to the same extent than in Germany (*Hypothesis 1*).

4.2.3.2 Household buffer

The second institution that can have the capacity to cushion the negative consequences of job loss is the household. The main channel through which the household can support its members after a trigger event such as job loss is income pooling. Labour market participation of household members may furnish additional incomes to alleviate income losses after job loss. The partner, in case of couple households, represents the main potential provider of income.

In absence of a partner, individuals should instead face great difficulties to recover their initial level of income. However, the income of a partner is not the only source that can contribute to buffer income losses. Other sources may be the income of other household members, private transfers and private retirement income of retired members living in the household. Therefore, also single-headed households might benefit from the household. However, I expect a lower compensating capacity of the household for single-headed households compared to couple households (*Hypothesis 2*).

In case of couple households, instead, the labour market participation and attachment of the partner can work as an important compensator to income loss.

In the majority of industrialized countries, full-time employment of men is the norm. Concerning women, although over the last decades their labour market participation has experienced a general increase, participation and employment intensity show some variations across countries. In the United States, women's labour market participation has increased more rapidly and we register a higher share of dual-earner couples than in Germany (though the situation is recently changing). In addition, 'employment intensity' is higher because women are more likely to work full-time, compared to Germany where part-time employment

is rather widespread (Drobnic, Blossfeld and Rohwer 1999; Crompton 2006; OECD 2015). In Germany, therefore, women more often occupy the position of a secondary-earner and thus contribute to a lower extent to the household budget (Burkhauser *et al.* 1990).

This implies a diversified role of the household buffer for sexes and for countries. Given the strong labour market attachment of men, if the woman loss the job, her partner is able to considerably compensate for the income loss and smooths economic consequences of the event. On the contrary, if the man loses the job, the lower labour market attachment of women implies a reduced capacity to compensate income loss. This should be especially true for Germany where women participation and intensity is lower than in the United States.

Therefore, I expect that the household buffer is more effective for women than for men (*Hypothesis 3a*). This is even more the case considering the gender-pay gap characterizing both countries (OECD 2015). Moreover, in case it is the men to lose the job, I expect a lower household buffer for German men compared to American men (*Hypothesis 3b*).

Household buffer can also vary across 'social strata'. As discussed above, social strata can be conceived as a measure of advantages and disadvantages that individuals accumulate over time and that furthermore are accumulated within the household. At the same time, social strata may be also viewed as a measure of individuals' and households' economic resources, which include those material and non-material resources that have an economic effect – i.e. resources that generate economic returns, education is one of these assets.

Implications of this for the (possibly) different role of the household across social strata derive from the observation, widely recognized in the literature, that people tend to mate with a person who is similar to them (Kalmijn 1998; Smits, Ultee and Lammers 1998; Blossfeld and Drobnic 2001; Blossfeld and Timm 2003; Schwartz and Mare 2005; Grave and Schmidt 2012). Literature refers to this tendency with the term homogamy or assortative mating meaning that individuals are more likely to form a household with a partner that shares some (socially relevant) traits. This point is important here because these traits are usually also associated with income potential and with economic success more in general. In this respect, both Germany and the United States present high and similar levels of homogamy. Here I refer to educational homogamy because education is the dimension that is more often considered in homogamy research, and because educational homogamy is pertinent with my argumentation as education is associated with economic success (Shavit, Muller 1998; Schwartz and Mare 2005; Blossfeld and Timm 2003).

Following this line of reasoning, the top of the social hierarchy is occupied by couples in which both partners have a high-income potential, while the bottom is composed of low-income potential partners. Partner's potential to furnish income, thus, rises with social strata.

Accordingly, I expect that the capacity of the household to compensate for income losses increases over social strata in both countries (*Hypothesis 4*).

In this way, the household should lead to an accumulation of inequality at the household level by accentuating income differences between households and to a strengthening of a society's system of stratification.

4.2.3.3 Welfare State

A further institution at work in managing social risks and redistributing resources is the welfare state. The state mediates the negative consequences of job loss mainly via transfers and taxes. However, also in this case, the extent to which it is able to contain the economic consequences of the event studied varies between countries according to the generosity of the transfers and the progressivity of the taxation system.

Probably the main state program directed at cushion economic consequences after job loss is unemployment insurance. Germany and the United States greatly differ on this program. A corporatist form of insurance characterizes Germany. The entitlement to benefits is based on occupational category and labour force participation – which is in line with the idea that the welfare state not only decommodifies, but also stratifies (Esping-Andersen 1990; Oesch 2008). Benefits are related to previous earnings, and the insurance is jointly administrated by employers and employees representatives (Carroll 1999; Sjoberg, Palme and Carroll 2010).

Unemployment insurance that characterizes the United States can be considered of a comprehensive form, although the considerable variations which unemployment policies may have between single states. This form is in general characterized by social insurance contribution payments as the basis for the entitlement to benefits right; unemployment insurance of this kind is not differentiated across occupational groups such as in Germany; and benefits are earnings-related and are practically of a flat-rate character (Sjoberg, Palme and Carroll 2010).

Beyond these differences in the setting of unemployment insurance, Germany and the United States present considerably differences, for example, in the net replacement rate of

unemployment benefits, which has been estimated to be of 74% for Germany and 56% for the United States (Korpi and Palme 2007).[39]

However, net replacement rate widely varies also within countries between household types and level of wages as well as according to the duration of unemployment. For example, in the initial phase of unemployment, the net replacement rate in 2005 ranges between 58% for a single person without children and previous earning of one and a half times the average wage earnings of the average worker (full-time worker in the private sector), and 93% for a dual-earner married couple with two children and previous earnings of two-thirds the average level. The same values for the United States are respectively of 47% and 87% (OECD 2007).[40]

These figures tell us that individuals who become unemployed are supported by the welfare state to a greater extent in Germany than in the United States, and receive more support when they have a household. This is true not only in the short-run (within the first year), but also in the long run (over a period of 5 years).

That has clear implications for the buffering effect of the welfare state during the time in which individuals are out of employment. In comparative perspective, given the greater generosity of the German welfare state in unemployment benefits, I thus expect that the welfare state buffer is larger for Germany than for the United States (*Hypothesis 5*).

Alongside unemployment insurance, the state may intervene also through social assistance aimed at providing social protection for people in need. Differently from unemployment insurance, in general social assistance is not directed at covering specific risks, and includes means- or income-tested benefits and minimum income protection (Bahle, Pfeifer and Wendt 2010). These kinds of programs are directed to different needy groups and may complement unemployment insurances.

Also for social assistance, there are significant differences between Germany and the United States. The public system of benefits in Germany includes, among other benefits,

[39] Estimates are based on an average for a single-person household and a family with a dependent spouse and two children of pre-school age.

[40] In addition, a synthetic measure that can be used to measure the generosity of unemployment benefits is the average of the net replacement rate calculated over 60 months of unemployment. OECD computes this measure as the average of net replacement rate over 60 months for four family types (single persons, lone parents, one earner couples with and without children) and two levels of previous earnings (67% and 100% of the average wage earnings of the average worker). This measure gives a general feeling of the differences between the two countries. For Germany, this measure is of about 35% (and about 60% if social assistance is included) while for the United States it is about 5% (30%) (OECD 2007).

unemployment assistance and general social assistance. The first is a means-tested benefit directed to those that are no longer entitled for unemployment insurance.[41] The second, instead, is a non-categorical (general) benefit directed to all residents based on a needs test (Adema, Gray and Kahl 2003).

In the United States, social assistance programs are basically represented by food stamps and public assistance restricted to households with children (Eardley *et al.* 1996; OECD 2007).[42] Another important welfare state measure aimed at supporting income of low-wage workers is the Earned Income Tax Credit. As a negative income tax, low-income household with some labour income do not pay taxes and/or receive a refund. This measure may thus have implications for people who reenter employment with a low-paid job.

The targeted character of these policies suggests that the welfare state buffer is particularly effective for the lowest strata. Therefore, I expect that the more we move up over the social ladder, the lower the role of the welfare state (*Hypothesis 6*).

Over time, both countries have experienced changes in policies that provide supports to unemployed and needy people. However, in comparative perspective, the United States has been and continues to be characterized by the least generous welfare state – in terms of both sum and duration of benefits – between these two countries. The role that social assistance may have in buffering income losses is compatible and even goes in the direction to support *Hypothesis 5* stating a larger impact of the welfare state in Germany compared to the United States.

4.2.3.4 Individual counter-mobility strategy across welfare states

Welfare arrangements directed to unemployed not only stabilize income in the short-run, but may also stabilize individual's career in the long-run (DiPrete and McManus 2000; McManus and DiPrete 2000). They may in fact indirectly affect income trajectories after reemployment. These income guarantees, by decommodifying workers from market forces, affect the labour market behavior of unemployed. This view of the welfare state role is consistent with microeconomic job theory (Gangl 2004a). This brings me back to job search theory introduced in section 4.2.3.1.

[41] From 2004, the Hartz reform replaced Unemployment Assistance with 'Unemployment Benefits II', an unemployment benefit direct to those who exhausted their Unemployment Insurance entitlement or that were not eligible.

[42] These programs include the Aid to Families with Dependent Children program and the Temporary Assistance for Needy Families program that replaced the first in 1996.

Long run positive effects of unemployment arrangements on income trajectory and career continuity are basically due to the possibility for worker to search longer for adequate reemployment. In presence of institutions that secure a certain level of income during periods of unemployment, unemployed individuals set a reservation wage because they have the possibility to search for an adequate job match. This implies that the job seekers will not accept a job offer under such wage threshold (Estevez-Abe, Iversen, and Soskice 2001). Following job search theory, generosity and duration of unemployment benefits permit to search for longer time and to decline job offers that do not match skills and expected wage (i.e. defined by the reservation wage) and will thus improve re-employment outcomes, reentry wages included (Addison and Blackburn 2000; Gangl 2004a; 2006).

These considerations have implications for the comparative dimension. The different structures of welfare state support to the unemployed that characterize Germany and the United States should lead to distinct outcomes in the two countries.

The German welfare state, as already discussed, is characterized by more generous unemployment benefits and longer periods of coverage for unemployed than in the United States. Accordingly, as job search theory posits, it is expected that Germans spend more time in unemployment but when they find/accept a job, their reemployment wages should be higher with respect to their counterpart in the United States. This means that in Germany reemployment, as a counter-mobility mechanism, should be more effective in permitting individuals to recover from income losses due to job loss. Put in another way, the loss of income that individuals experience after having reentered to employment should be smaller for individuals in Germany than in the United States.

Yet, I am not looking at income after reemployment, but I look at income trajectories right after job loss, which then is a combination of reemployment speed and reemployment wages. To be more explicit, in the results I will present, income levels after job loss are defined by both those who have reentered in a new job (and their wages) and those who have not yet reentered (that are still unemployed). Therefore, it is not easy (or even not possible) to formulate precise hypotheses on possible differences between Germany and the United States.

On the one hand, the United States is characterized by higher dynamics of job destruction and creation with respect to Germany, partly because its more liberal labour market regulation (Schettkat 1992; Abraham and Houseman 1993; Grubb and Wells 1993; DiPrete *et all*. 1997). This, together with what has been argued above in the discussion about job search theory,

would suggest faster reemployment in the United States (Gangl 2003; 2006; and cf. Machin and Manning 1999). On the other hand, the insights coming from job search theory with the role of unemployment insurance would suggest that the loss of income that individuals experience after having reentered to employment is smaller for Germans than for Americans. This is because job seekers in Germany will face higher reentry wages due to a better job-skills match. Overall, thus, expectations about country differences may be mixed.

Given I cannot test the specific mechanisms/expectations just discussed, I keep it on a theoretical ground and thus I do not formulate hypotheses on this issue. However, these theoretical considerations may be a useful tool in the interpretation of results and might permit me to advance some speculations.

4.3 What we already know

Research about income mobility determinants, which also consider the role of the various institutions in defining income dynamics, is rather scarce. Moreover, the existing literature focuses almost exclusively on the US and in some cases on Germany. The reason why only few countries have been the object of this interest is twofold and it has to be traced back to the intensive data requirement. First, studies of this kind require detailed information on incomes – and their components – and on employment and demographic history at both individual and household level. Second, they need a long time span in which individuals and households are followed. Unfortunately, data with these characteristics are quite rare, or, where they do exist, it is very difficult having access to them.

To my knowledge, among the first papers published on this issue can be mentioned Fritzell (1990). His study focuses on Sweden between the 1973 and 1980. Among other things, the author examines how changes in household composition and in labour market status of individuals and of their wife/husband lead to a change in economic status, measured in terms of equivalent disposable household income – which, according to Fritzell, can be considered as the most comprehensive measure of economic well-being.[43] After having controlled for background variables, results highlight that labour market events, in terms of transition in and out of employment, have a somewhat considerable impact on income,

[43] More specifically the dependent variable measure income changes in a 7-years span, comparing incomes and statuses in 1973 and 1980, independently of what it does happen in the middle.

although it is differentiated between men and women. Indeed, the income change is sizeable for the first when they enter employment, while it is substantial for the seconds when they exit from employment. Overall, however, as the author recognizes, '*economic well-being of the Swedish population over the life course is to a greater extent independent of performance in the labour market*' (p. 44). On the contrary, changes in household composition largely drive changes in income.

Another study that goes in the same direction is the one by Aaberge and colleagues (2002) which focus on Scandinavian countries (Denmark, Norway, and Sweden) and the US, from 1980 to 1990. Their conclusions, however, deviates somewhat from those of Fritzell for Sweden because they found that employment events do not significantly lead to changes in disposable income – the same hold for Norway. The opposite is true for the US where household economic well-being is considerably hit by the transition from employment to non-employment.

A drawback of these two studies, at least for what is of interest to me, is that both only focus on disposable household income as the final measure of welfare. This measure already encompasses the jointly activity of the market, the state and the household, and thus it does not permit to disentangle the contribution of each of them separately. A study that, instead, goes in this direction is that by DiPrete and McManus (2000) in which they also compare the US (from the 1981 to 1993) with Germany (1984-1996). These authors argue that the economic consequences of labour market and household events can be decomposed into a 'direct' effect and 'compensating' effects of welfare policies and private responses – what they call counter-mobility events. In the paper, the authors analyse the impact of both employment changes of individuals and their partner, and changes in household composition on household's income dynamics. In order to evaluate the mediating role of the state and the household they study the consequences of events on different definitions of income, manly: labour earnings, private household income, and post-government household income. Comparing these income concepts, the authors highlight the capacity of the state and the household to affect the net consequences of events. Looking at employment events, indeed, it emerges that the considerable positive (for employment entry) and negative (for employment exit) effects on labour earnings is highly reduced once private household income is considered and even more so if the focus moves toward post-government income. From the

comparative point of view, moreover, Germany is more effective than the US in buffering the impact of negative employment events via social welfare policies.

A more recent study by Ehlert (2012) investigates how the household and the state shape income trajectories after job loss in Germany and the US. By comparing different income concepts, the author concludes that the consequences of job loss for post-government household income are similar in both countries, although the mix of public and private intervention is different among Germany and the US – as it is different among genders. He also studied the added worker effect finding that the extent of this effect depends on previous labour market attachment and varies between the two countries.

Finally, a contribution that fits well with the present chapter also comes from Ehlert (2013). Building on previous literature (mainly DiPrete and McManus 2000), Ehlert has the big merit to integrate the study of income dynamics with another relevant aspect: social stratification. Studying the economic consequences of job loss in Germany and the US, he found that job loss consequences are unevenly distributed across social strata. Moreover, he shows that the way in which job loss hit household income in different strata varies between the two countries: the most severe income loss is experienced by the poorest quintile in the US while by the middle quintiles in Germany. As suggested by the author, this is due to differences in the factors that buffer income losses between strata.

Although the present chapter addresses the same topic of Ehlert and with a similar approach, as I will explain later, the two works are distinct in a series of important points. First of all, in the way we measure social stratification. In my opinion, this aspect, also taken alone, is enough to justify my study.

4.4 Data and methods

The data I used in this chapter come from the Cross National Equivalent File (CNEF) prepared at the Ohio State University in collaboration with national institutions of those countries that participate at the file (Frick *et al.* 2007). Importantly for my scope, the CNEF includes data for Germany and the US. In particular, data come from the German Socio-Economic Panel (G-SOEP) and from the Panel Study of Income Dynamics (PSID) respectively. This file is particularly suitable because it provides longitudinal and harmonized

information at the individual and household level and has its main strength in furnishing harmonized information on numerous definitions of income.

The PSID is the longest running panel in the world. It started in 1968 on an annual basis but, since 1997, individuals have been interview biannually.[44]

The SOEP started instead in 1984 and furnishes annual information for the entire time span covered. The design of the SOEP has been influenced by the PSID design: they follow households over time and individuals therein, and collect detailed information about employment histories and incomes, among the other topics.

In order to maximize the comparability of results I select all the waves starting from 1984 up to the recent one, which for Germany correspond to the 2010 while for the US to 2007.

Based on these data, I select all individuals from 25 to 54 years old that declared to be the household head or his/her partner. This age selection has been chosen in order to include in the sample individuals that are potentially in the labour market and that may form a household. I than deleted all individuals for which some information about employment and incomes were missing as well as those who never entered in employment. Finally I selected only those who were in the panel for at least 5 years – given I need three years to build the permanent income measure, I decided to widen the time span in order reduce possible problems of endogeneity.

I perform the analyses separately for men and women. That is because I expect different pattern in employment exit behaviours as well as in the buffering capacities of the household and welfare state.

4.4.1 Definition of measures and variables

A way to measure the capacity of the household and the state in buffering household income after job loss is comparing the job loss consequences across different income concepts. For this scope, three income concepts will be considered.

The first concept is individual labour earning. The CNEF data reports annual labour earnings of all individuals older than 15 years. This income concept includes wages and salary from all employment including training, primary and secondary jobs, and self-employment, plus income from bonuses, over-time and profit-sharing (Grabka 2012).

[44] For this reason, results will be presented in two-years intervals: two years before employment exit and two and four years after.

This concept, thus, measures only the role played by the market in contributing to defining individual's economic resources. The second income concept, instead, takes into consideration also the contribution of the household via the generation of economies of scales and income pooling, while the third adds also the contribution of the state via taxes and transfers. How these concepts are defined in the CNEF data, is presented in Table 4.1.

Table 4.1 *Composition of pre- and post-government household income*

Pre-government income	**Post-government income**
Household Labour Earnings	Household Labour Earnings
+	+
Household Assets Income	Household Assets Income
+	+
Household Private Transfers	Household Private Transfers
+	+
Household Private Retirement Income	Household Private Retirement Income
	+
	Household Public Transfers
	+
	Household Social Security Pensions
	–
	Total Household Taxes

All the three income concepts are deflated using the Consumer Price Index at 2010 value, to make them comparable over time. Moreover, household incomes are adjusted for household size using the modified OECD equivalent scale. This scale assigns different weights to household members according to their status and age. A weight of 1 is assigned to the first adult, the second adult and each subsequent person aged 14 and over weight 0.5 while each child under 14 weight 0.3. In this way, it is possible to take into account the role that household plays via the generation of economies of scales. Before adjusting these income measures, I top-coded them at the 99th percentile in order to avoid extreme income values.

Employment information in CNEF is constructed based on earnings and the number of hours worked. An individual is considered employed if he/she has positive wages and worked at least 52 hours during the year. Otherwise, the individual is considered not employed. This information about employment is quite wide, it includes individuals that worked only 52

hours during the year, as well as individuals working 40 hours per week during the entire year. Moreover, such a definition implies that it is not possible to distinguish unemployed from those who are not employed for other reasons. Unfortunately, this is the only information present on employment status in CNEF data.

For this reason, I decided to retrieve employment information from the original G-SOEP and PSID data and merge this information to the harmonized dataset. Variables available in the original datasets furnish more precise and reliable information. They indeed report the individual's employment status at the time of the interview permitting in this way to precisely identify unemployment episodes (rather than 'impute' them on the basis of the number of hours worked) and to distinguish unemployment from other types of non-employment.[45]

The way in which I define job loss event, and I construct the trajectory around the event and manage multiple episodes are important points that differentiates my work from that of Ehlert (2013). Ehlert defines job loss transition as two months of unemployment preceded by more than seven months of employment. Based on the transition, he constructs an event-centered dataset in which each event comprises seven years, two years before the event and 4 after. He does that for each transition. This implies that the period after job loss may include other job loss transitions if, for example, the individual is unemployed at time 0, employed at time 1 and again unemployed at time 2. This might lead to overestimate the income loss in the years after the event in cases of short employment spells and unemployment carousels. Moreover, this could be even more problematic if the risk to experience job loss events is not equally distributed across strata. The result of that is a systematic overestimation of the negative consequences for those strata with higher job loss risks. As explained above, instead, I define the job loss event as the transition from employment to unemployment according to the employment status at the time of the interview. Then I construct income trajectories around the event, similarly to Ehlert. However, in my case the trajectories start 4 years before the event rather than 2 years. Moreover, and above all, I manage multiple episodes in a different way than Ehlert does: in each transition successive to the first one observed, the 'clock' restart from 0 (I will explain in detail this later in section 4.4.3). In this way, each year

[45] For Germany, I distinguished employment and unemployment using the following variable: 'pgemplst' and 'plb0022' regarding the employment status and 'plb0021' reporting whether the individual is a registered unemployed or not. Regarding the United States, I used the variables [84]ER30441 [85]ER30474 [86]ER30509 [87]ER30545 [88]ER30580 [89]ER30616 [90]ER30653 [91]ER30699 [92]ER30744 [93]ER30816 [94]ER33111 [95]ER33211 [96]ER33311 [97]ER33411 [99]ER33512 [01]ER33612 [03]ER33712 [05]ER33813 [07]ER33913 which refer to the employment status in each year.

is included in the analyses only once, and the problems of overestimation that might emerge in considering multiple unemployment transitions within the same event-centered trajectory are avoided.

Based on the variables presented above, I will show the effects of the employment transition on incomes in relative terms. Measuring income changes in percentage terms permits to consider that the severity of losses depends on prior standards of living. For example, an income loss of 25,000 € is far less severe if the individual earn 100,000 € than if he earn 50,000 €. In the first case, indeed, individual's economic resources are reduced by 25%, while in the second case resources are halved. The situation is even more severe if initial earning was 25,000 €. Operationalize income changes in this way permits to better evaluate employment consequences for individuals and households that are in different positions over the income ladder.

Based on these relative measures, I will then be able to disentangle the buffer capacity of the household and the state by comparing income changes in the three income concepts abovementioned.

Following Ehlert (2013), I measure the household buffer as the difference between the lost in labour income (LI) and the lost in equivalent pre-government household income (PreG). For example, if employment exit implies a loss of 80% of labour income while a loss of 50% of pre-government income, the household buffer would be equal to (80% – 50%) 30 percentage points. The effect of the household is thus defined as

$$\widehat{Household\ buffer} = \hat{\gamma}_{LI} - \hat{\gamma}_{PreG}$$

where $\hat{\gamma}_{LI}$, $\hat{\gamma}_{PreG}$ and $\hat{\gamma}_{PostG}$ stand for the estimated percentage changes in labour income, in equivalent pre-government household income, and in equivalent post-government household income (PostG), respectively. In a similar way, the welfare state effect is measured as the difference in income changes between pre-and post-government income and can be expressed as follows:

$$\widehat{Welfare\ State\ buffer} = \hat{\gamma}_{PreG} - \hat{\gamma}_{PostG}$$

These measures have to be interpreted while taking into account the observed losses. Indeed, they represent the observed effect of household and welfare state, and not their potential effect. Ideally, one cannot observe a buffering effect of 30 percentage points if the income loss was of 10%.

4.4.2 Measurement of permanent income and stratification

In defining social stratification, I use an approach similar to Ehlert (2013), to some extent. However, although also he follows DiPrete and Eirich (2006) and Mayer (2004) in conceptualizing the positions of individuals in the social stratification as the results of processes of accumulation over the life course, he leaves this issue on a theoretical ground only, without considering the life-course dimension. Indeed, while my measure of social stratification is represented by quartiles based on (a proxy of) permanent income, implying that the classification of individuals in different strata is constant over time, Ehlert uses income quintiles at the time of the event, implying a possibly time-varying measure of stratification. This is particularly relevant because, if the idea is to capture the cumulation of advantages and disadvantages over the life-course, as he also claims, 'permanent income' is a much better measure.

At the same time, quartiles based on 'permanent income' are also much more appropriate if we want to proxy social stratification, because they capture 'long-term' chances of individuals. In this respect, an example might help to make clearer the point. Let us suppose that the consequences of job loss are stratified, and the lowest stratum pays the largest income losses. This implies that the *long-term* consequences for individuals' standards of living are very different whether individuals belonging to the lowest stratum and experiencing the most negative *short-term* consequences are always the same, such as in my case, or instead are possibly different, such as in the case of Ehlert. If we consider that an individual may experience more than one unemployment event, and that over time he/she can move along the stratification system, it could even be, in principle, that in his/her first event he belongs to the lowest stratum, while in a later event he belongs to the highest stratum. Consequently, he would initially pay the largest consequences, while later the smallest. Therefore, job loss consequences, especially in case of multiple events, may appear as not being too severe for individuals' long run economic well-being. The consequences are, instead, clearly different when considering a time-constant measure of stratification, as I do. Thus, using permanent income rather than income at the time of the event to build the social strata measure permits to capture different aspects, with different consequences for individuals' and households' long-run standards of living as well as for the reproduction of the social stratification system

I now come to the way in which I measure permanent income. This measure of income, at least at the theoretical level, refers to the amount of income that an individual dispose over

his entire life-course, or at least over a considerable part of it. Due to extensive data requirement, this dimension of income is clearly not easy to capture. According to Brady et al. (2015), permanent income is well captured through equivalent disposable household income over a time-span of twenty or more years. Although PSID and SOEP data would permit to follow individuals for such a long span, considering only individuals who are in the panel for this duration would imply problems of sample size.[46] To circumvent this limitation, I follow Brady and colleagues according to whom it is possible to proxy permanent income with a more limited number of years. Indeed, they found that 20 or more years of permanent income are capture with a good approximation by five consecutive years of annual income (they explain more than 70% of permanent income variance) and even better captured if years are randomly. Overall, they claim that the majority of permanent income is predicted within two (explaining about 70% of the variance) to five (about 90%) random years of equivalent disposable household income. In light of these considerations, the measure of permanent income that I will adopt is built on three randomly chosen years of equivalent disposable household income.

In particular, to build this measure empirically, I proceeded as follows. Within each household, I first selected the head in order to have only one record per household. Then, I randomly selected three points in time over the household observational window and summed up the income of these three years. This sum represents the permanent income measure. Strata are thus defined as quartiles of the distribution of permanent income measured in this way – where in determining the whole distribution of permanent income, each household contributes only once, irrespective of the number of years that the household is observed. Finally, I assigned the household's head quartile to his/her partner, if any.

4.4.2.1 Robustness checks of the stratification measure

The choice to compute permanent income using random years instead of consecutive years has also the purpose to capture in a better way the long-term character of advantages and disadvantages. This is possible by distributing the selection of years over different phases of the life cycle.

[46] That, indeed, would lead to a considerable reduction of the sample. Moreover, a strategy of this kind has the risk to incur in endogeneity problems, especially when equivalent disposable household income is present not only in the right hand side of the regression equation, but also in the left-hand side.

From this follows that the longer the period for which I observe individuals, the higher the chances to pick up observation in different life cycle phases. Therefore, I also performed the analyses for a subsample in which I select only individuals observed 10 years or more. Comparing the analyses based on the complete sample (in which individuals are observed at least for 5 years) that I will present in section 4.6 with those based on the subsample (Figure A4.1/Figure A4.4 in the Appendix), I do not find significant differences between the results.

An additional check that I performed consists in selecting only individual observed for at least 10 years, as in the previous check, but computing permanent income using 5 random years. In doing that I use the best measure of permanent income that Brady and colleagues (2015) suggest (the measure that captures 90% of variation of 20+ years of income). Results coming from this specification of permanent income (Figure A4.5/Figure A4.8), although not perfectly overlapping with those I will present in the thesis, are pretty much the same, confirming the conclusions I reach using social strata based on 3 random years.

A problem in which I might incur using social strata defined in this way, concerns endogeneity: social strata might not be exogenous to the effect of job loss. For example, if the permanent income measure was based on years of unemployment, I might observe that the individuals in the lowest strata experience the largest income losses with unemployment, while they are in the lowest strata exactly because of the large income losses they experienced with that event. Moreover, risks of endogeneity may be even greater in cases of frequent and/or long unemployment spells because of a higher probability to select unemployment years.

In this regard, an element goes in the direction to support the goodness of my measure. That is the observation that income trajectories in equivalent disposable household income are not systematically and greatly different between strata, as I would have instead observed in case of endogeneity issues (given that also social strata are constructed on the basis of equivalent disposable household income).

Moreover, in order to have a more stringent check that possibly permits to exclude problems of endogeneity I built my measure by selecting three random years considering only the years in which individuals were employed. Such a measure, therefore, is independent from the labour market event that I am going to study, and can be thus considered exogenous from unemployment events. To do this, I had to discard those individuals for which three years of employment were not present. Results based on this stratification measure are presented in

Figure A4.9/Figure A4.12. Overall, also in this case the results are in line with those based on my original operationalization of permanent income. Given the further selection that this new measure would have implied, I preferred to use the one I proposed at the beginning.

As I have shown, the robustness checks performed go in the direction to support the goodness of my permanent income measure. I am thus confident that the measure of social stratification that I will use throughout the chapter is not affected by possible problems.

Another issue that may emerge regards content validity or what permanent income really measures and means. To support the validity of my stratification measure, one option is to repeat the analyses using, as stratification variable, another characteristics that in the literature is known to be associated with individuals' resources and opportunities, income levels and security as well as with long-term income prospects. In this respect, a classical determinant of individual's labour market outcomes and more in general of advantages and disadvantage is education.

If my measure is valid, I expect that results based on quartiles of permanent income and results based on education present similar patterns. In interpreting these results, one should keep in mind that permanent income used to construct social strata is based on total household income, and that the lion's share of total household income is represented by labour incomes. This implies that the more an individual with its own labour income contributes to the total household income and the more the two measure of stratification are associated, which in turn means that the more results will be similar. Therefore, the position of individuals and households in the social stratification is also determined by the way income is distributed within household, i.e. between partners. Germany and the United States present some differences in this respect. Although in both countries the share of dual-earner couple has considerably increased over the last few decades, that is happened to a larger extent for the United States. Moreover, while American women are more likely to work full-time, a considerable part of German women is employed with a part-time job and are thus more likely to contribute to household income as a secondary earner (OECD 2015). These considerations, of course, may have implication for the distribution of income within households.

Figure A4.13\Figure A4.16 report income trajectories after job loss by level of education. Comparing the results based on the two measures of stratification, it emerges that income trajectories are very similar. Stratification based on permanent income stratify income

trajectory almost in the same way that education does: I can conclude that the measure of stratification that I am going to use in this chapter can be considered as a valid measure of individuals' advantages and disadvantages.

Although very similar, the results are not completely identical. In particular, the differences we can observe mirror the implications that the distribution of labour income within household may have. This, I suggest, does not necessary go against the validity of my measure. On the contrary, I claim that these findings do support my measure which is indeed conceptualized to capture advantages and disadvantages not only at the individual level (such as education), but at the household level as well.

4.4.3 The model – the 'distributed fixed effect'

In order to model income trajectories after job loss, I use a particular specification of fixed-effects model: the distributed fixed-effects model (Dogherty 2006; see also Yankow 2003; Kratz and Bruderl 2012).

A general income equation can be written as

$$y_{it} = \sum_{l} \alpha_l Z_{li} + \sum_{j} \beta_j X_{jit} + \gamma EMP_{it} + u_i + \varepsilon_{it} \quad (5)$$

where y_{it} is a measure of income for individual i at time t, Z_{li} is a vector including the intercept and time-constant covariates, X_{jit} is the vector for time-varying covariates other than the employment status, EMP_{it} stands for the employment status while u_i and ε_{it} are respectively an individual-specific error term representing the effect of unobserved correlates and an idiosyncratic error term. i, l, j and t index over individuals, the observed time-constant and time-varying covariates, and time periods, respectively.

Averaging the covariates for each individuals over time,

$$\bar{y}_i = \sum_{l} \alpha_l \bar{Z}_{li} + \sum_{j} \beta_j \bar{X}_{ji} + \gamma \overline{EMP}_i + \bar{u}_i + \bar{\varepsilon}_i \quad (6)$$

and subtracting this from equation *(5)*, one obtains

$$y_{it} - \bar{y}_i = \sum_l \alpha_l \left(Z_{li} - \bar{Z}_{li}\right) + \sum_j \beta_j \left(X_{jit} - \bar{X}_{ji}\right) + \gamma(EMP_{it} - \overline{EMP}_i) + (u_i - \bar{u}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad (7)$$

From here, the unobserved fixed-effect $\bar{u}_i$ as well as the vector containing the intercept and the time-constant covariates Z_{li} can be removed.

Now, starting from the equation of the fixed-effect model it is possible to formalize the distributed fixed-effect model by disaggregating the employment status over time, i.e. by substituting the dummy variable EMP_{it} in equations *(7)* with a set of dummy variables EMP_{it}^{p} as in equation (8), where p is the number of years before employment exit if negative, and the number of years after employment exit if positive, while s represents the maximum horizon in years backward and forward from time to employment exit.

$$\sum_{p=-s}^{s} EMP_{pit} = EMP_{it} \quad (8)$$

Therefore, as mentioned, this model specification estimates not only the effect of a single event dummy (0 before job loss, 1 afterwards), but estimates 'distributed effects': job loss effects for each year separately, on a process time axis defined by the labour market event.

Moreover, the distributed fixed-effect permits to analyse patterns of the income differential between those who loss the job at a certain point and those who do not, to see whether they are on different income trajectories. Indeed, the model estimates income differential between those who experience and those who do not experience employment exit events for each year before and after employment exit.

Although individuals enter in the model for the whole duration of their participation to the panel, for those who experience some event of employment exit I focus on four years before (–4) to 4 years after (+4) the event. The years smaller than –4 are grouped together as well as the years greater than +4. This time variable is thus centred on the event. To be more precise, on this time axis, individuals are coded with 0 when they experience the transition from employment to unemployment, they are coded between -1 and -4 in the years before the transition to non-employment and are coded between +1 and +4 in the years after, irrespective of their status. If individuals re-enter to employment and then again transit to non-

employment, the time variable starts again from 0. In this way, it is possible to include multiple episodes.

The baseline category of the distributed fixed-effect includes those who are employed for the entire observational window and the earliest observations (<–4) of those who will experience an employment exit at some point in time. Those who are always not employed are instead excluded from the model.

A considerable advantage of this kind of model is that the distributed effects show the development of income before and after the event. In other words, this model permits to see whether the income differential between those who exit employment and those who do not, remains constant or widens over time.

In the following, I will present the results of the chapter. The discussion of the results is composed by two parts. The first part aims at studying how unemployment risks are distributed across strata. The second part, which represents the core of this chapter, deals with the economic consequences of having lost the job: How the event consequences are distributed across strata and to what extent the household and the state are able to cushion income losses after job loss.

4.5 The experience of job loss

Before getting to the core of this chapter, namely the economic consequences of unemployment, an introduction on the risks of experiencing such an event is needed. Indeed, a major aspect of social stratification concerns the risk to transit from employment to unemployment.

In order to understand how individuals' and households' economic inequality and in particular standards of living are affected by unemployment events, two processes have to be considered: the distribution of the event and its consequences. Given that negative consequences of unemployment are expected, individuals who have higher chances to experience the event will also have higher probability to face economic losses. Furthermore, if these individuals are also in a disadvantaged position, i.e. belonging to the lowest strata, their income loss should lead to a strengthening of inequality. On the contrary, inequality should weaken if individuals who experience job loss belong to the most well off groups.

An aspect related to the transition from employment to unemployment is the duration of subsequent non-employment. The longer an individual or a household stays without salary and the more severe will be the consequences for its standard of living. If people rapidly experience reemployment, the economic losses are just a temporary and not too serious issue while, if they spend long time out of employment, mid- and long-term income trajectories may be negatively affected (see paragraph 4.2).

Hence, given that the distribution and the duration of the event have the capacity to affect social and economic inequalities, it is useful to understand who is more at risk to experience the event, by answering to the following question:

Are the risks of entering to unemployment unevenly distributed across social strata? Are the chances of exiting from unemployment, and consequently unemployment duration, unevenly distributed across social strata?

Existing literature supports a scenario of inequality accumulation. Indeed, it has been shown that the risk of losing a job hits the lowest strata more than the highest (McGinnity and Hillmert 2004; Keys and Danziger 2008). Moreover, having experienced a job loss event increases the likelihood of re-exiting from employment in the future and predicts subsequent downward mobility (Layte *et al*. 2000; Kuhn 2002).

Table 4.2 shows the risk of losing the job and the likelihood of reemployment. These descriptive results tell us that the disadvantaged strata are those who experience the highest risk of losing the job. This holds for both men and women, in both Germany and the United States. In particular, individuals belonging to the lowest social stratum experience particularly high risks in comparison with the other strata. This is especially evident for men in the United States, where the risk for those in the lower stratum is more than triple compared with those in the second stratum (11.26 vs 3.67). This suggests an accumulation of disadvantages that is particularly strong for the very bottom of social stratification.

These results are particularly relevant in the way they show how risks are distributed across strata. Unfortunately, it is not possible to make comparisons between countries because the figures for the United States, from 1997 onwards, can only be calculated on the biennial data. Therefore, while it is possible to make comparisons within countries, comparison between countries would lead to erroneous conclusions – the countries differences in the reentry rate may be an example.

Table 4.2 *Transition rates into and out of unemployment, by social strata and sex*

Germany					
	Men				
	1st.	2nd.	3rd.	4th.	Total
Job loss	8.22	3.13	1.78	0.63	2.82
Re-employment	35.10	51.57	65.46	65.49	44.47
	Women				
	1st.	2nd.	3rd.	4th.	Total
Job loss	7.00	3.78	2.45	1.15	3.09
Re-employment	33.22	43.52	59.52	55.76	42.61
United States					
	Men				
	1st.	2nd.	3rd.	4th.	Total
Job loss	11.26	3.67	1.86	1.18	2.92
Re-employment	61.00	75.96	78.84	87.62	71.23
	Women				
	1st.	2nd.	3rd.	4th.	Total
Job loss	8.03	3.07	1.88	1.42	2.91
Re-employment	61.85	82.99	83.26	83.25	73.22

Note: Job loss refers to the transition to unemployment for those who were employed in the previous year; Re-employment refers to the transition to employment for those who were unemployed in the previous year.
Sources: *estimates based on CNEF-GSOEP and PSID data, author's calculation*

Turning the attention toward the chances of reemployment, we can see a pattern that may lead to an exacerbation of inequalities. Indeed, individuals at the bottom of social stratification not only experience the highest risks of losing their job, but they also face the lowest reemployment chances. Overall, the reemployment probability increases with social strata. These figures are even more interesting than figures regarding job loss risks because they have important implications for income trajectories of unemployed. In fact, they suggest flatter recovery trajectories for most disadvantaged strata or, in other words, they may face more difficulties in recovering the income loss due to unemployment.

However, results just discussed are purely descriptive. In order to get a more adequate understanding of how risks of job loss are distributed across social stratification, the phenomenon has to be examined in a more detailed way.

To this scope, I employ a dynamic random effects probit model, increasingly used in the literature concerning the persistence of dichotomous outcome. More precisely, I employ a particular model specification based on Wooldridge's solution to initial condition problem (2005), with the model corrections proposed by Rabe-Hesketh and Skrondal (2013). Such a model specification allows to identify state-dependence processes and to disentangle true state-dependence from unobserved factors associated with the outcome, i.e. unemployment. For the implementation of this model specification see Cutuli and Grotti (2015) (the working paper can be found in the Appendix at Chapter 4).

The independent variables included in the model are: social strata, age, age squared, education, number of children, having a partner, period, states for Germany and race for the United States. Furthermore, the model specification allows to control for unobserved heterogeneity and state dependence. Unobserved heterogeneity and state dependence are modelled including a set of covariates: the dependent variable at $time_0$ and $time_{-1}$, all the time varying independent variables at their initial value (t_0) and their averages.

In Table 4.3, the coefficient $Employment_{t0}$ represents the initial condition. It is not meant to be interpreted substantially, but its statistical significance indicates its association with unobserved characteristics correlated with the outcome.[47]

The coefficient $Employment_{t-1}$ represents the contribution in terms of state dependence. For both countries and sexes, it is statistically significant net of both the correlation between the individual effects and individual averages, individual starting values of time varying variables, and the coefficients measuring initial condition. Precisely, this coefficient tells us that being exposed to unemployment in the previous year increases the risk to be not employed in the subsequent time point.

Concerning the risk to be unemployed according to the social strata people belong to, we see that the higher the individual position is on the stratification ladder, the lower is the risk to be unemployed. This is true for both sexes and both countries, net of state dependence, unobserved factors, and net of socio-demographic characteristics. This means that belonging to a certain social strata has implications *per se* for job loss risks. These results suggest that my social strata measure is strongly associated with unemployment risks.

[47] In order to consider a consistent sample over the entire chapter, those individuals who present no employment episodes have been excluded. That may imply the underestimation of the effects presented. That has been necessary due to the particular specification of the distributed fixed-effects model that I use in the next section.

Table 4.3 *Probability to experience an unemployment event, selected coefficients (Robust Standard Errors in parentheses)*

	Men	Women
Germany		
$Employment_{t0}$	0.801 (0.068)	0.651 (0.067)
$Employment_{t-1}$	0.996 (0.046)	1.047 (0.047)
Strata (ref. 1st Quartile)		
2nd. Quartile	-0.628 (0.058)	-0.518 (0.069)
3rd. Quartile	-0.893 (0.065)	-0.754 (0.075)
4th. Quartile	-1.327 (0.081)	-1.020 (0.086)
United States		
$Employment_{t0}$	0.470 (0.058)	0.426 (0.057)
$Employment_{t-1}$	0.564 (0.048)	0.637 (0.049)
Strata (ref. 1st Quartile)		
2nd. Quartile	-0.575 (0.051)	-0.470 (0.048)
3rd. Quartile	-0.858 (0.057)	-0.588 (0.056)
4th. Quartile	-1.035 (0.064)	-0.660 (0.064)

Note: the models also include age, age squared, education, number of children, whether has a partner, period, and states for Germany and race for the United States.
Source: *estimates based on CNEF-GSOEP/PSID data, author's calculation*

Controlling for other variables that we know to be associated with unemployment risks, such as education, the effect of social strata partially declined (Model without controls not shown). On the one hand, this suggests an association between social strata measure and 'significant' variables affecting unemployment risks. On the other hand, social strata effect continues to persist suggesting its independent effect from the other 'significant' variables. Thus, the measure of social stratification I use results to be a valid and encompassing measure of advantages and disadvantages.

Concluding, the results indicate a possible scenario of accumulation of disadvantages. Becoming unemployed leads to income losses and this may imply severe consequences for individuals' and households' standards of living. Moreover, lower strata are more exposed to the unemployment risk. This may exacerbate the stratification system with substantial consequences for economic inequalities.

The consequences for economic inequality might be even more severe if also the economic consequences of the event are unevenly distributed across social strata. This is the object of the next section.

4.6 The economic consequences of job loss

In this section, I enter in the core of the chapter. As mentioned before, aim of the present chapter is to investigate the economic consequences that individuals experience after job loss. The loss of the labour income may significantly affect individuals' and households' standard of living. Labour incomes, indeed, represent the lion's share of economic resources that people dispose. Here, I approach the issue by studying event's consequences in interaction with social stratification. Namely, I examine if and to what extent economic consequences and income trajectories after job loss vary between social strata. In the previous section, I showed that the risk to exit from employment is unevenly distributed among strata. It is so in a way that goes in the direction to strengthen socio and economic inequalities: the risk to exit employment, and thus the probability to experience an income loss, is higher for the lowest strata than for the highest. The implications of this result might be even stronger if also income losses that job loss implies are stratified in the same way.

However, the link between job loss and standards of living may be mediated by two institutions: the household and the (welfare) state. As DiPrete and McManus (2000) and Ehlert (2012; 2013) have shown, these two institutions have the capacity to smooth the negative consequences that the loss of a labour income may have on the final welfare of individuals. Whether, on the one hand, the household and the state mitigate economic consequences of job loss, on the other hand, they may also exacerbate social stratification. This would be the case if their operate is more effective in already advantaged strata. The opposite scenario would be observed if the role of household and state is more effective in the lowest strata. To understand whether also redistributive processes at work via household and state are in interaction with social stratification, in the following I will investigate the consequences of job loss for different definitions of income and across social strata.

As already discussed in the section on data and methods, I present income trajectories in different income concepts, separately for each social strata defined by the quartile of

permanent income and at different point in time.[48] Results are presented in percentage terms. I start by discussing results for German men and women and I then move to American men and women. The concluding section is devoted to the discussion of the results in comparative perspective.

4.6.1 Germany

Starting with Germany, Figure 4.1 presents income trajectories for the three income concepts considered. Income trajectories are expressed in terms of percentage income loss with respect to the reference year before job loss – as defined in section 4.4.3.[49]

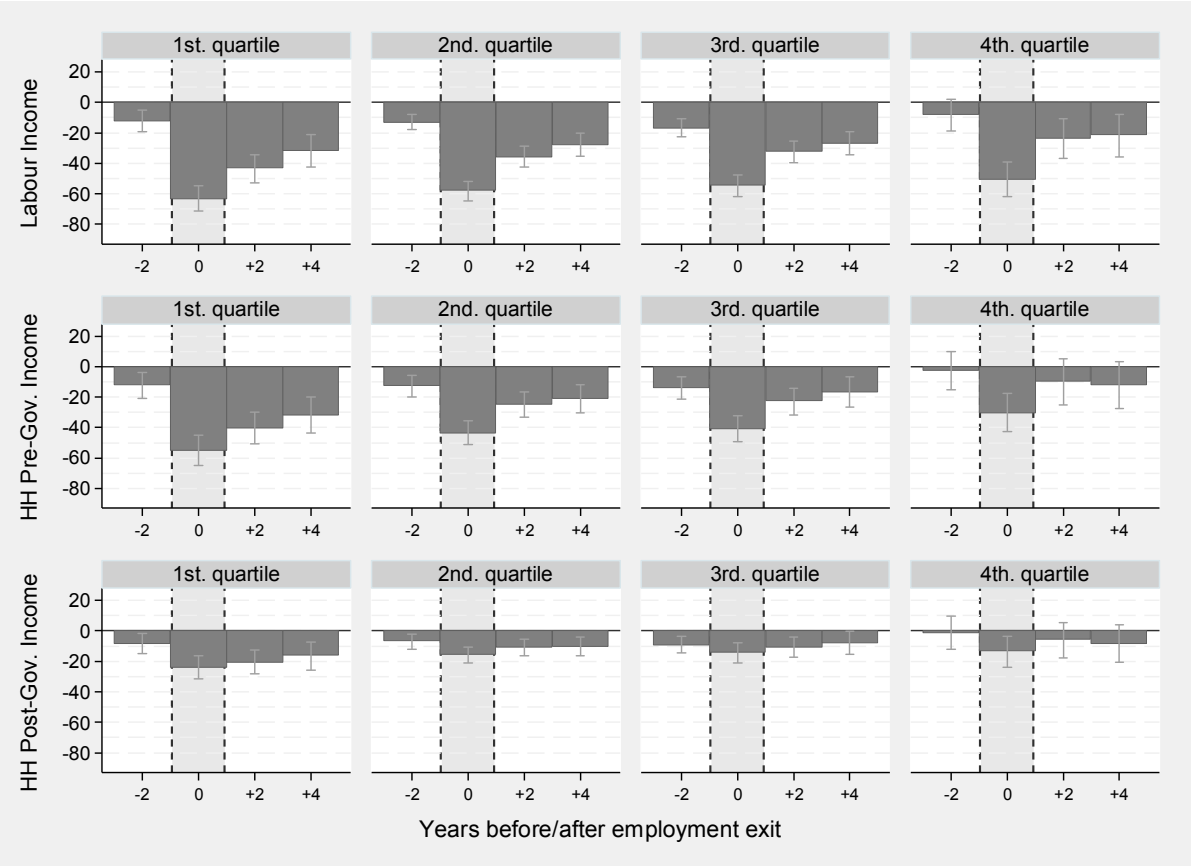
I start with trajectories in labour income, the income concept for which only the market is directly involved. If we look at income trajectories in men's labour income, presented in the top row of the figure, we observe different income losses among social strata. The more we move toward the top of the social hierarchy, the lower the income penalty of unemployment. In the year of unemployment, highlighted in the graph with the vertical light grey band and hemmed in by dashed black lines, German men in the two bottom social strata (1st and 2nd quartile of permanent income) experience a reduction of about 60 percent with respect to the reference category. The losses for the upper two strata (3rd and 4th quartile of permanent income) are instead of about 50 percent.

This can be considered as another signal of accumulation of disadvantages between strata. Those already at the bottom, indeed, not only have the lower income levels (cf. Table A4.1) and are more at risk of experiencing events of unemployment (as shown in section 4.5), but also experiences the larger income loss at the time of the event. Moreover, as I am going to show, in the years after the event they also have more difficulties to recover from their income loss.

[48] The results that I am going to present are based on models for which I did not pally weights. However, I estimated the models also using the weights that the PSID and the G-SOEP provide to the CNEF. By using weights, it has been possible to compensate for unequal probabilities of selection and sample attrition. Weighted results, however, are not significantly different from those that I present in the thesis. In this respect, a valuable aspect of Ehlert's work is the application of 'comparability optimized weights' (Kohler 2009). The weights that he applies are calculated in a similar way for both countries, while weights in the CNEF differ between countries in some respects. Thus, the 'comparability optimized weights' could be a better weighting strategy than using CNEF weights.

[49] As described in section 4.4.1, I present the effect of job loss in percentage terms. This permits me to capture the severity of unemployment events. Indeed, in front of a loss of certain amount, it can make a big difference if the loss is experienced by a low-income individual or instead by a high-income one.

Figure 4.1 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, men*



Sources: *estimates based on CNEF-GSOEP data, author's calculation*

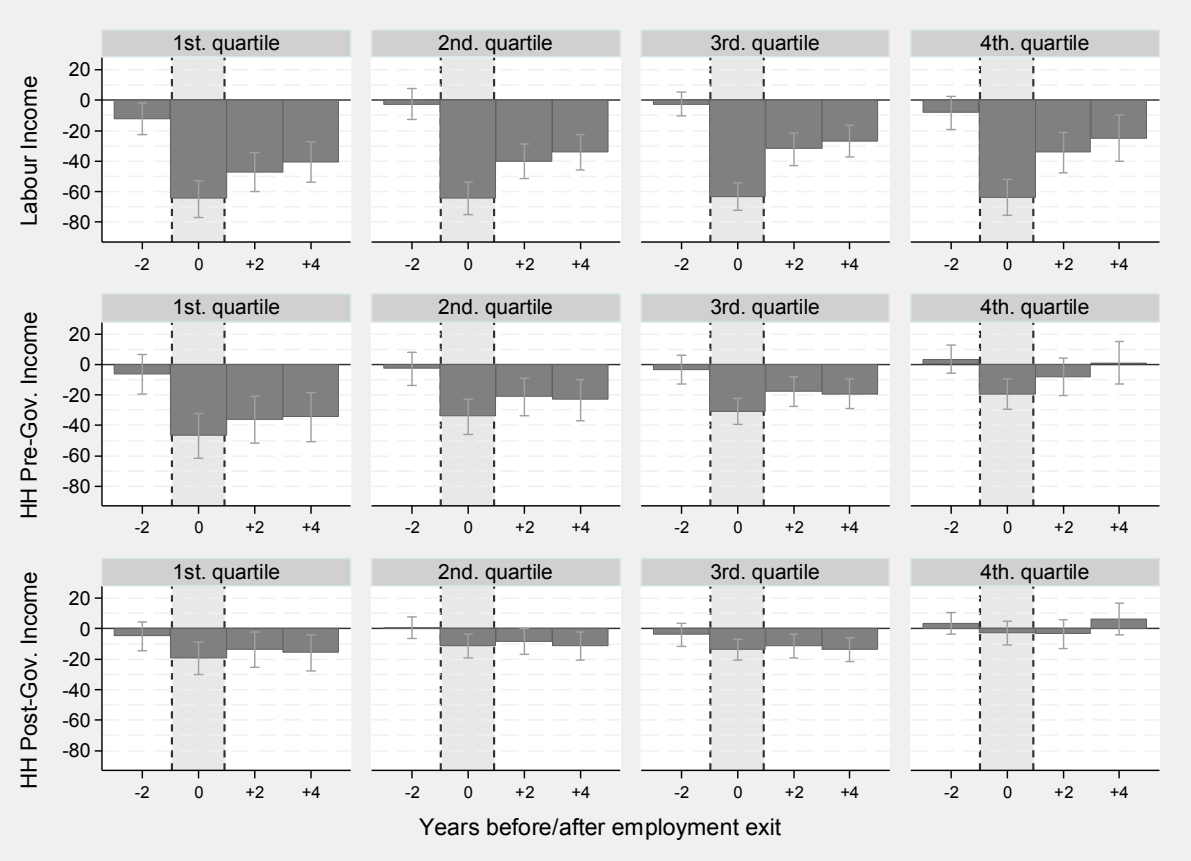
Indeed, looking at the years after the event, we observe a lasting income loss, although decreasing over time. Two years after the event the income loss in the bottom stratum is double with respect to the top stratum (40% vs 20%). Concerning the second and the third, the loss is of about 35 and 30 percent respectively. Hence, going up the social ladder, we observe a monotonically decreasing impact of unemployment. This is also true looking at four years after job loss.

These results go in the direction to confirm my first hypothesis. In that hypothesis I suggested a larger penalty in the years after the event for those at the bottom with respect to those at the top of social stratification. This because the labour market structure (and the educational system) of Germany. In occupational labour markets, such as the German one, skills accumulated and educational qualifications can be transferred from firm to firm. From that follows that resourceful job seekers are in an advantaged position as they receive job offers at an higher rate than less resourceful workers. They have thus the possibility of a faster

reemployment (transition rates to reemployment are in fact considerably higher for the highest strata, as Table 4.2 has shown), as well as to choose the best and well-paid job among the job offers. This implying a faster recovery of the income loss.

To some extent, the same story holds for German women (Figure 4.2). On the one hand we do not observe any difference between social strata at the time of the event. All women, irrespective of the quartile they belong, lose roughly 65 percent of their labour income when they experience the unemployment event. The negative consequences of job loss seem indeed to be equally distributed among women.

Figure 4.2 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, women*



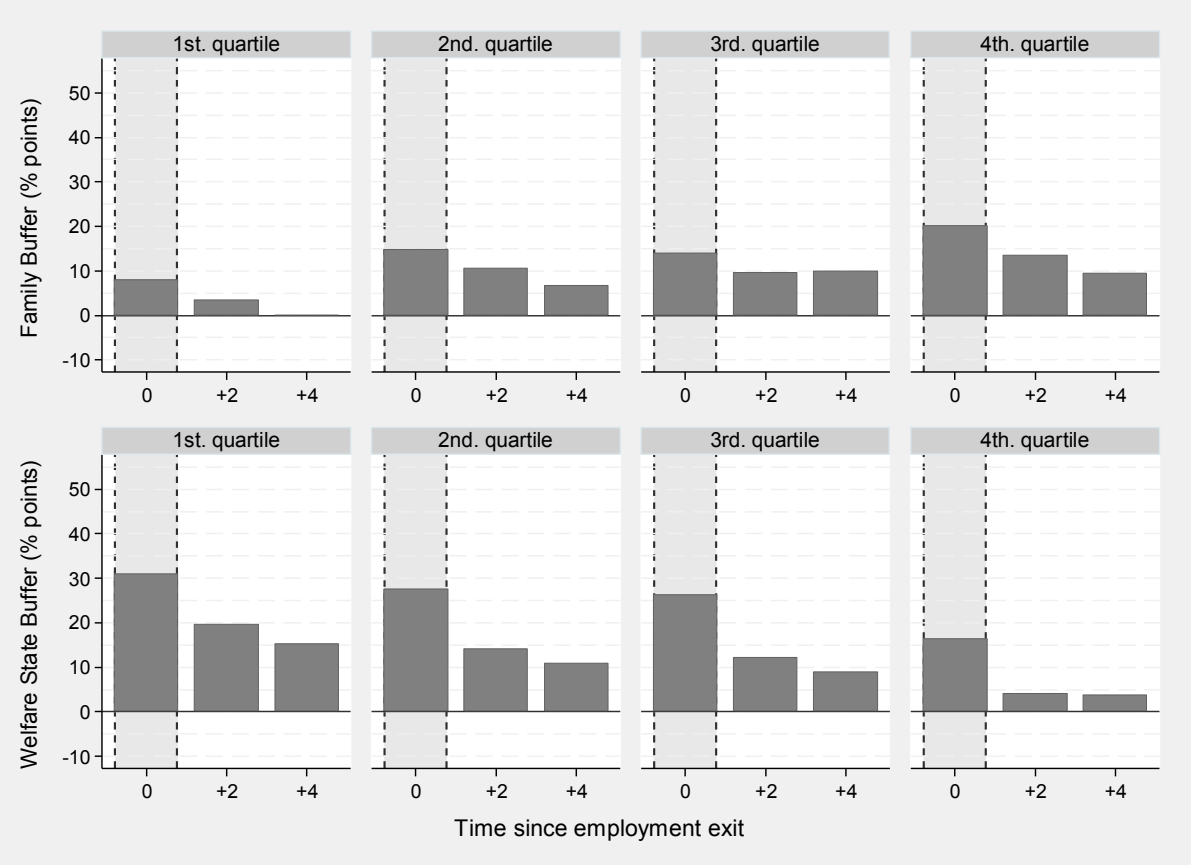
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

On the other hand, the picture changes if we look at income trajectories in the years that follow the event. In this respect their trajectories are in line with those observed for men: decreasing losses over time and above all along the social ladder. Accumulation of disadvantages seems to be at work also for women, confirming *Hypothesis 1* also for them.

Comparing women to men, the consequences for the formers, are slightly more long-lasting with respect to the latter. This may be due to the greater difficulty they face to come back to employment, although their transition rate to reemployment is only little lower than for men.

I turn now the attention toward the other income concepts, and thus toward the role that the household and then the state play in redistribute resources and in managing social risks, such as unemployment.

Figure 4.3 *Household and Welfare State buffer at different points in time, by social strata. Germany, men*



Sources: *estimates based on CNEF-GSOEP data, author's calculation*

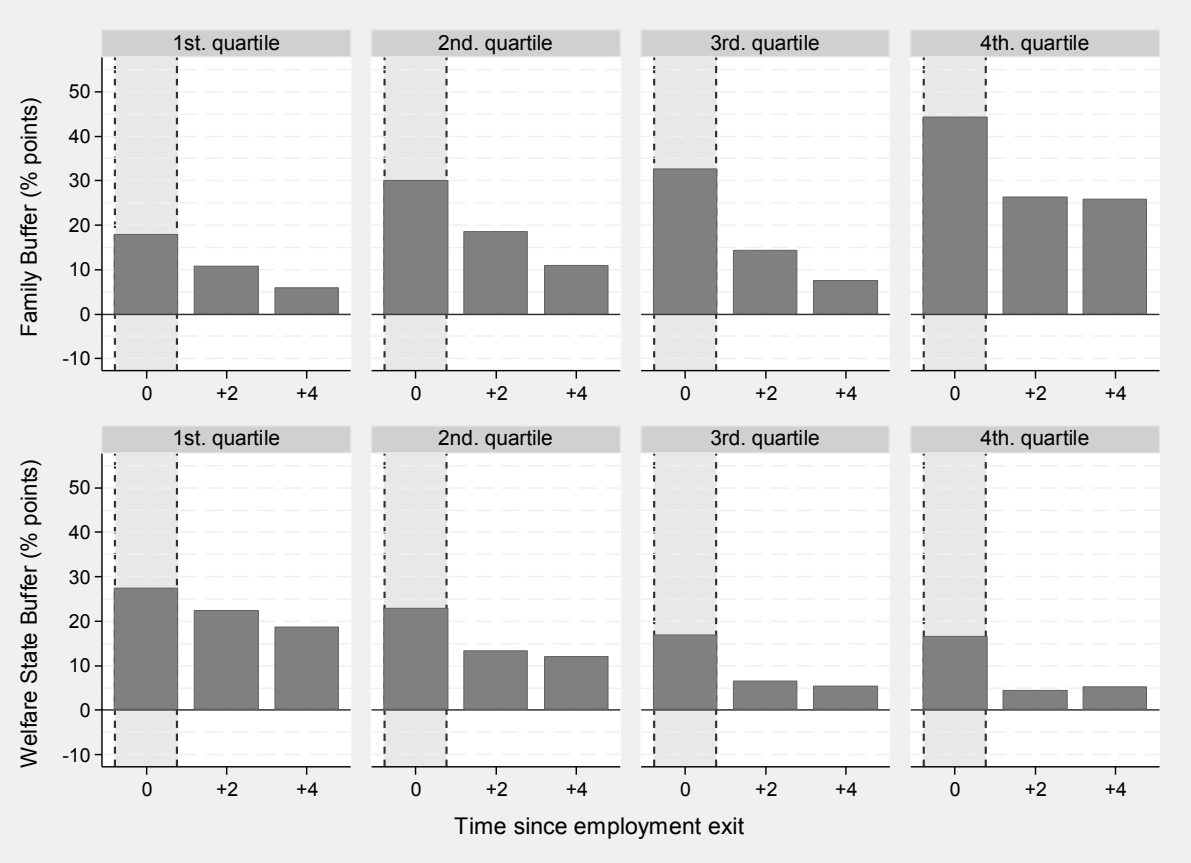
Concerning the household, the second row of Figure 4.1 shows men's income losses in equivalent household income before taxes and transfers. This income concept includes the household's role via the generation of economies of scale, private transfers and above all the pooling of incomes of other household members, mainly coming from the partner in case of couple households. This leads to lower income losses than in the case of individual labour

income. However, it seems that the household plays a moderate role in mitigating the consequences of employment events, especially for some social strata.

To ease the evaluation of the household role, Figure 4.3 reports the 'household buffer' (labelled 'Family buffer' in the figures) measured as the differences in income losses between market income and income after the household intervention. Overall, when the event is experienced, the reduction of income loss due to economies of scale and the labour incomes of other household members ranges between almost 10 and 20 percentage points, and decreases in the following years.

A different picture emerges if we focus on women (in the second row of Figure 4.2). For them, in fact, the household plays a huge role; it permits to reach a reduction in income loss of up to 45 percentage points as Figure 4.4 shows.

Figure 4.4 *Household and Welfare State buffer at different points in time, by social strata. Germany, women*



Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Observing a more effective household buffer for women than for men, therefore, support *Hypothesis 3a*. As suggested in section 4.2.3.2, the marked difference that we observe between men and women should be especially due to the labour income that their spouses furnish. The limited impact for men may be attributed to the role of secondary earner that women play in this country. On the one hand, female employment is considerably lower than male employment (although increasing over time, cf. Figure 1.2), implying lower chances for men to benefit from a partner's income, and on the other hand, when she is employed, she is often employed with a part-time job and thus with a lower capacity to support his income loss.

Turning now the attention toward the differences between social strata, it emerges that for both men and women the household is more effective in already advantaged social strata. The household buffer, indeed, gains weight as we move from the bottom to the top of social stratification. This is particularly true for women: comparing the top with the bottom stratum, we find a difference of about 10 percentage points for men while more than 25 for women.

Therefore, on the one hand, the household is able to support its members when they face the unpredictable events of social life, but on the other hand, it does so to different extent across social groups. That is true not only in the immediate, but also in the medium term. The uneven role of the household as a buffer, indeed, persists also over time. That is also well visible in the diverging income trajectories presented in Figure 4.1 and Figure 4.2.

By operating in this way, the household contributes to strengthen the system of social stratification, even more than the market I would suggest.

What has been observed, seems thus to give support at *Hypothesis 4*. I previously argued that the tendency of people to mate with a person who is similar to them, especially in traits that are associated with economic success, should leads to a 'polarization' between high- and low-income potential households. This should have the consequence that households at the top of the social hierarchy dispose of more resources to compensate for income losses of their members.

This argumentation, however, holds if only couples are considered. Therefore, in order to shed more light on this issue, I evaluate the household role separately for singles and couples. This also permits me to verify my second hypothesis according to which the compensating capacity of the household is expected to be lower for singles with respect to couples.

Separated analyses for single and coupled men and women are presented in the Appendix (Figure A4.17).[50]

Focusing now only on couples, it appears that those in the highest strata do not benefit from the household to a greater extent compared to those in the lowest strata. Significant differences in the household buffer are in fact not visible between strata. This is true for both men and women. This indicates that the uneven role of the household observed in the previous analyses seems not to be due to mating behaviours of individuals, in terms of who marries whom.

Rather, the stratified work of the household buffer can be attributed to household formation behaviours of individuals. This emerges comparing singles with couples. Single households benefit from a really modest or even null support from the household. For example, the extent to which the household reduces income losses among single women ranges between 10 and 15 percentage points. Among couples, instead, the same figure reaches 40 percentage points. This marked difference can be attributed to the fact that singles benefit neither from economies of scale, nor from a partner's income. This difference, together with the fact that single households are particularly overrepresented at the bottom while couples at the top of social stratification (Table A4.1), can explain the stratified compensating capacity of the household observed in Figure 4.3 and Figure 4.4.

Therefore, the *Hypothesis 3a* can be confirmed, although we observe a stronger role of the household at the top of social stratification for different reasons than suggested. Moreover, the results just presented corroborate *Hypothesis 2* as well: the extent to which the household compensates for the negative consequences of unemployment is larger for couple households that for single households.

After having discussed the role of the market, and then of the household, I direct my attention toward the last institution that may have the capacity to affect the negative consequences of unemployment.

My first expectation about the state's capacity to buffer income losses coming with unemployment has to do with cross-countries differences. I let this issue to the discussion of the concluding section. My second expectation, instead, deals with the possible differences across social strata. According to the targeted character of the policies aimed at protecting

[50] In the analyses for single and couples I aggregated the quartiles because of sample size issues.

unemployed people, I hypothesized the state's role to be negatively associated with social stratification, namely the more we climb the social hierarchy, the lower the state intervention.

Starting by looking at men, first of all we note that their economic situation is considerably improved once also the state enters into play (third row of Figure 4.1). Unemployment insurance, and social transfers more in general, as well as the system of taxation make a big difference for their economic situation. For those in the lower social strata, the German welfare state is indeed able to reduce income losses up to about 30 percentage points at the time of the event and, although with a reduced capacity, it continues to work also four years later (second row in Figure 4.3 - In this case, the welfare state buffer refers to the difference in losses between income pre- and post-government). The state role, however, 'vanishes' the more we move toward the upper part of social stratification: for the two middle strata the income loss is reduced by about 25 percentage point while only 15 percentage points for those in the uppermost strata.

Concerning women, we can observe an almost identical pattern than men's (Figure 4.4). Coming back to my expectations, results go in the direction to corroborate *Hypothesis 6*. At both the time of the event and in the following years, the state plays an important role in fist, mitigating, and second, equalizing the negative consequences of job loss for individuals' welfare. Looking at income trajectories in disposable income, indeed, we observe really similar patterns across social strata.

Although the final result is a more or less equal distribution of the consequences of job loss, the institutions at work in determining the final distribution of welfare operate in very different ways. On the one hand, the initial stratification is reproduced by the market – in this respect we observe higher income losses for lower strata; the household, then, by redistributing resources, fosters the accumulation of advantages and disadvantages and strengthen even more this stratification; finally, the state operates in the opposite direction, contributing to equalize the consequences of a negative event such as unemployment.

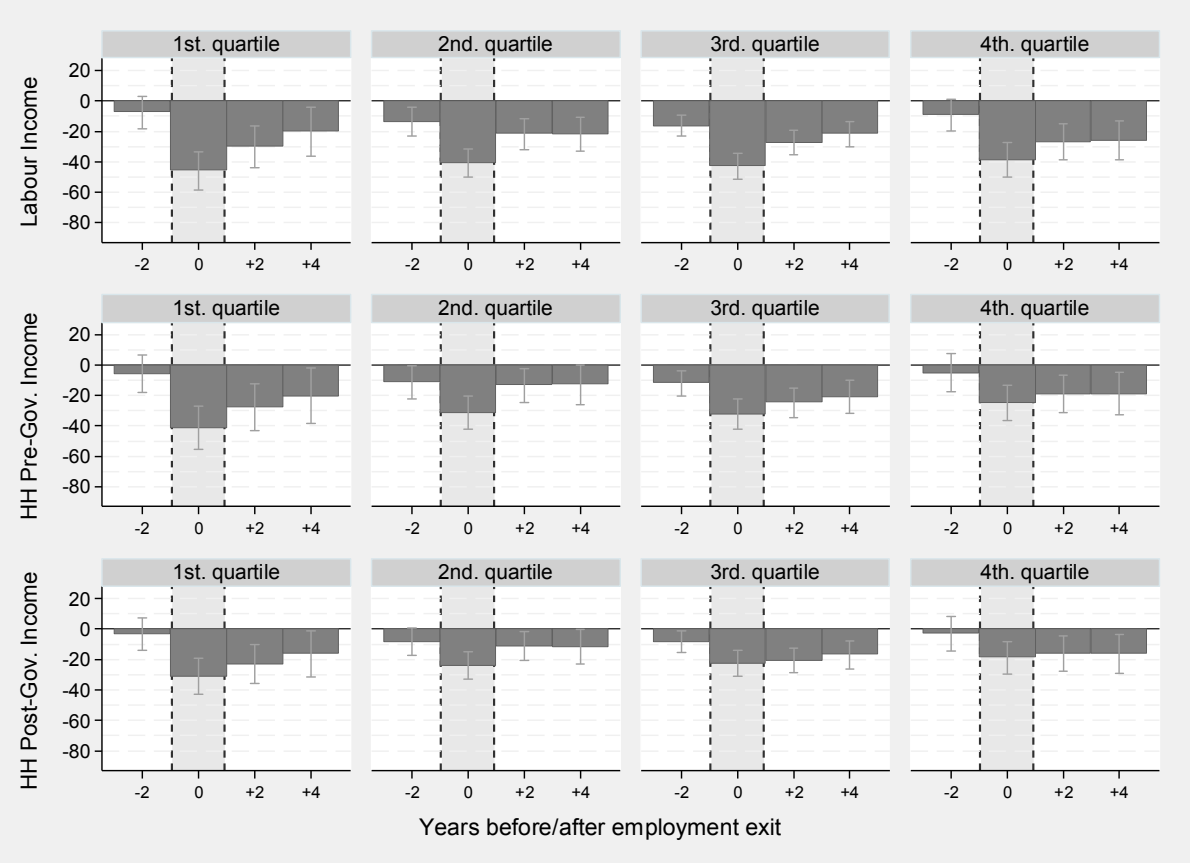
4.6.2 United States

I now turn the attention toward the United States starting with unemployment consequences in labour income, then I turn the attention toward household income and finally toward disposable income.

Regarding the job loss consequences for labour income (first row of Figure 4.5), at the time that the event is experienced we observe an income reduction ranging from 40 to 45 percent of previous income. In the following years, the losses decrease and four years after they ranges between 20 and 25 percent.

Looking at the differences across social strata, results partially go in the direction to support *Hypothesis 1*. In an internal labour market such as the United States labour market, the most resourceful groups seems not to be more advantaged at all in their income trajectories with respect to the least resourceful groups. Income losses after job loss present in fact very similar values for all the strata. This, however, is quite surprising given that the reemployability chances are rather stratified across social strata (Table 4.2).

Figure 4.5 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, men*

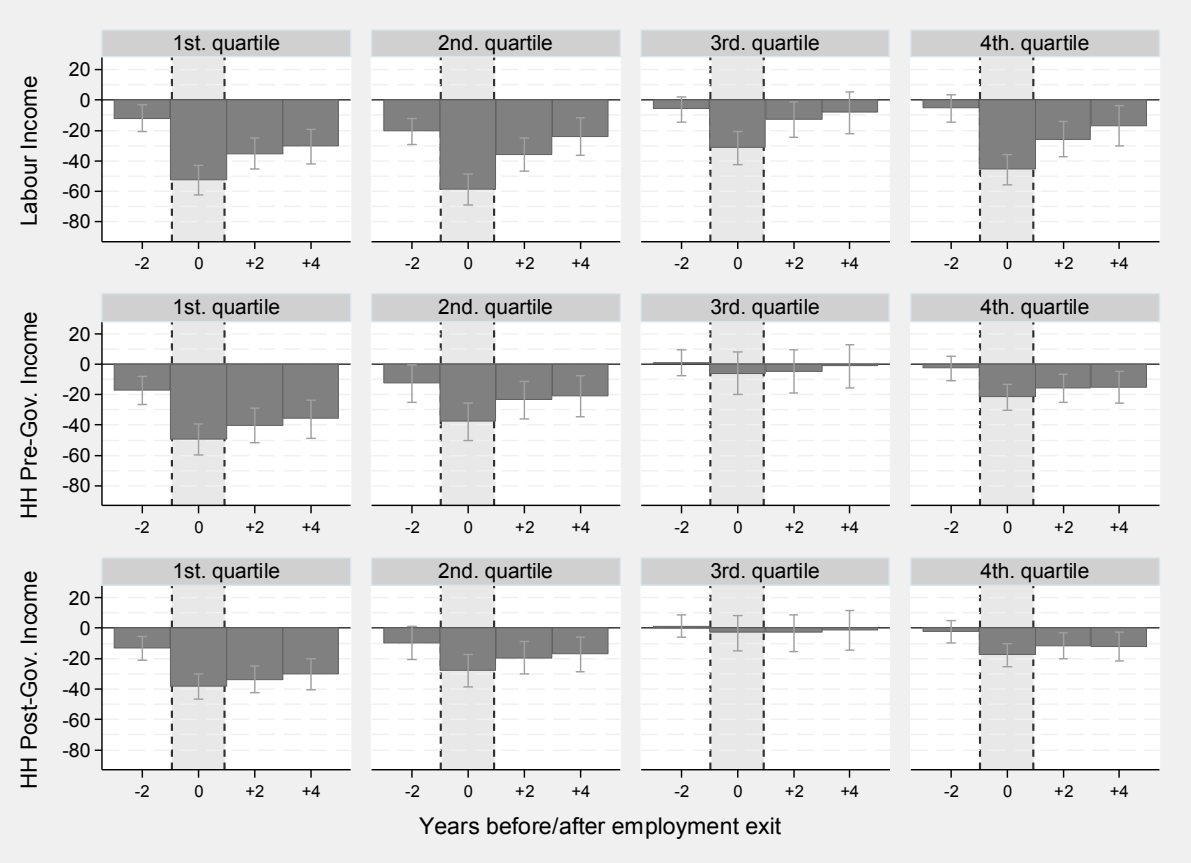


Sources: *estimates based on CNEF-PSID data, author's calculation*

Income trajectories for American women, presented in Figure 4.6, are rather different for those of men. Overall, we observe a larger penalty for the two bottom strata with respect to

the two opposite strata, especially in the years following job lost. Although to a lower extent than in Germany, also for American women we observe different income trajectories leading to the accumulation of disadvantages on the most disadvantaged groups. After four years, indeed, the two bottom strata still experience a reduction in income ranging from 25 and 30 percent compared with the third and fourth strata for which the loss is of about 10 and 15 percent respectively.

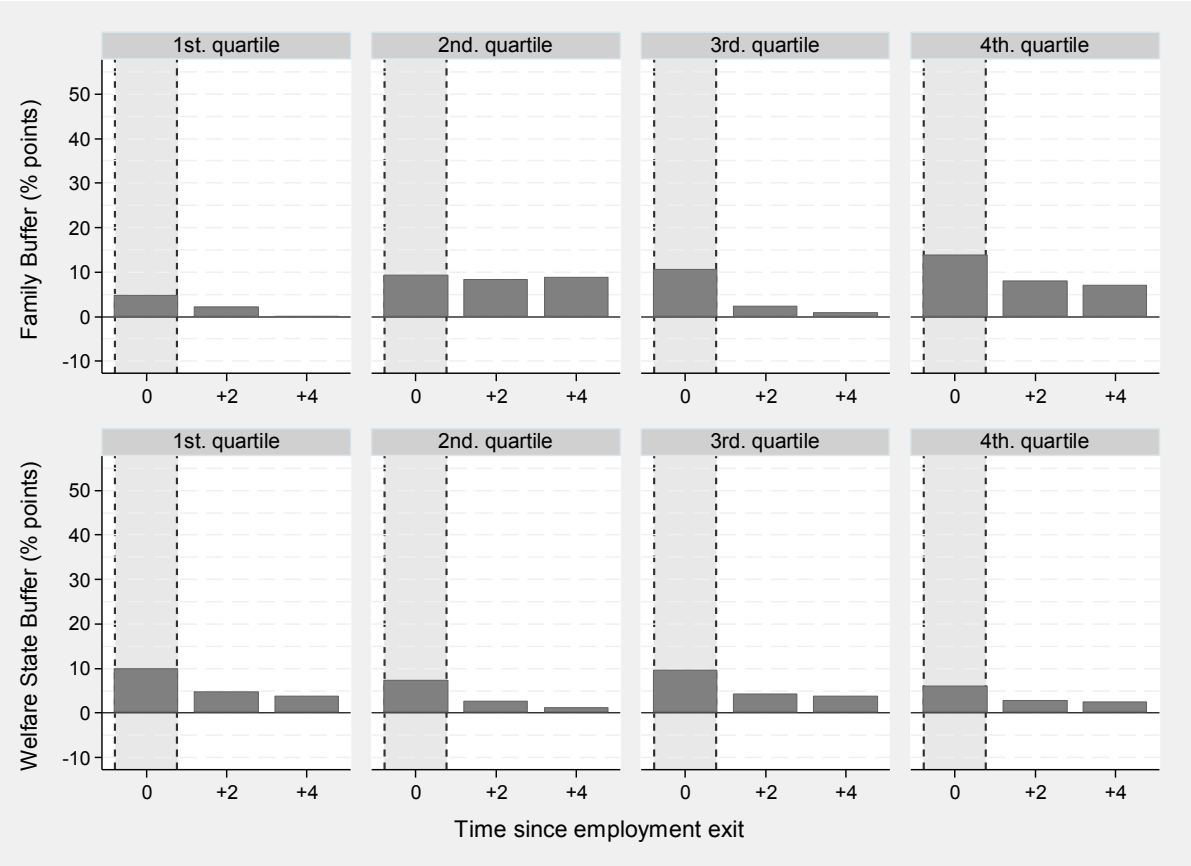
Figure 4.6 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, women*



Sources: *estimates based on CNEF-PSID data, author's calculation*

Once we consider economies of scale and the labour incomes of the partner, if present, and of other household members, the pictures changes for men and even more so for women.

Figure 4.7 *Household and Welfare State buffer at different points in time, by social strata. United States, men*

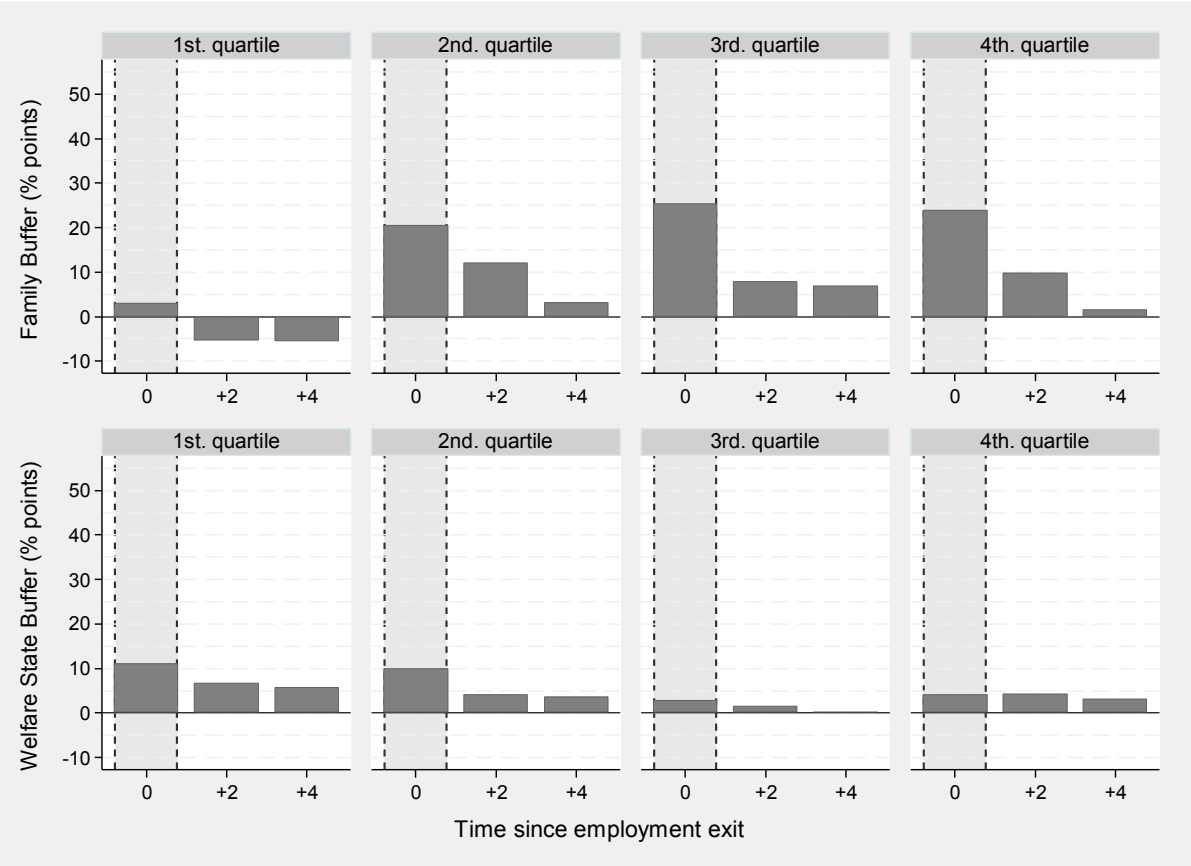


Sources: *estimates based on CNEF-PSID data, author's calculation*

In Figure 4.5 we observe that the loss in equivalent household income before taxes and transfers is reduced with respect to individual labour income. In the year of the event, this reduction ranges between 5 percentage points for men in the first quartile to about 15 percentage points for those at the opposite side of the social hierarchy (Figure 4.7). Therefore, the highest strata are those who benefit the most from the household intervention, although, overall, the household role is quite reduced. Looking at the years after the unemployment event, a clear pattern does not emerge. *Hypothesis 4* seems to be only partially confirmed. The household tends to reinforce pre-existing (dis)advantages, but only in the year of the event.

Hypothesis 3a, instead, is completely corroborated. Looking at income trajectories of women, we observe a considerable larger role of the household for them with respect to men (Figure 4.8).

Figure 4.8 *Household and Welfare State buffer at different points in time, by social strata. United States, women*



Sources: *estimates based on CNEF-PSID data, author's calculation*

Moreover, also in their case the household contributes to strengthen inequalities, especially in the year of the event. In the year of non-employment women in the lower quartile profit from a household buffer of less than 5 percentage points and the buffer increases over quartiles reaching a level of 25 percentage points in the fourth one. *Hypothesis 4* is thus confirmed also for American women. As a result, in terms of income losses, income trajectories have substantially changed with respect to individual labour income. For example, the third strata, after the household intervention, has basically recover the loss of income experienced with unemployment.

Now, it remains to understand whether the stratification produced by the household comes from mating behaviours or rather from household formation behaviours. Unfortunately, though, due to the extensive data requirement that this analysis implies I am not able to investigate this issue for the United States. Looking at the composition of social strata, however, it emerges an overrepresentation of single households in the bottom strata

also for the Unites States (Table A4.2). This is especially true concerning women. They are probably represented by lone mothers which, as also observed by McLanahan and Percheski (2008), are among the most vulnerable groups and are overrepresented in the lowest strata.

This overrepresentation of singles at the bottom of the social ladder, might suggest that, as I showed for Germany, the stratification produced by the household is due to household formation behaviours, at least to some extent.

Finally, when also the state is at work, income trajectories changes again, although only partially. As expected, the residual welfare state characterizing the United States, does not contributes much to manage social risks. Concerning American men, the state mitigate income losses by no more than 10 percentage points at the time of the event. Over time, the state buffer is still present, although to a negligible extent.

This holds true for both men and women, although the latter benefit from slightly less support from the state if they belong to the highest strata.

Hypothesis 6 cannot be fully corroborate. Only for women, if any, the role of the state decreases over social strata. Thus, it does not contribute to equalize the income trajectories shaped by the market and the household.

Overall, differently from Germany, in the United States unemployment insurance and social assistance play a very reduced role in supporting unemployed individuals.

4.6.3 A wider look at employment exit

After having discussed the economic consequences of unemployment, and before proceeding to the conclusion, I devote some space discussing the economic consequences of whatever event that implies the loss of a labour income.[51]

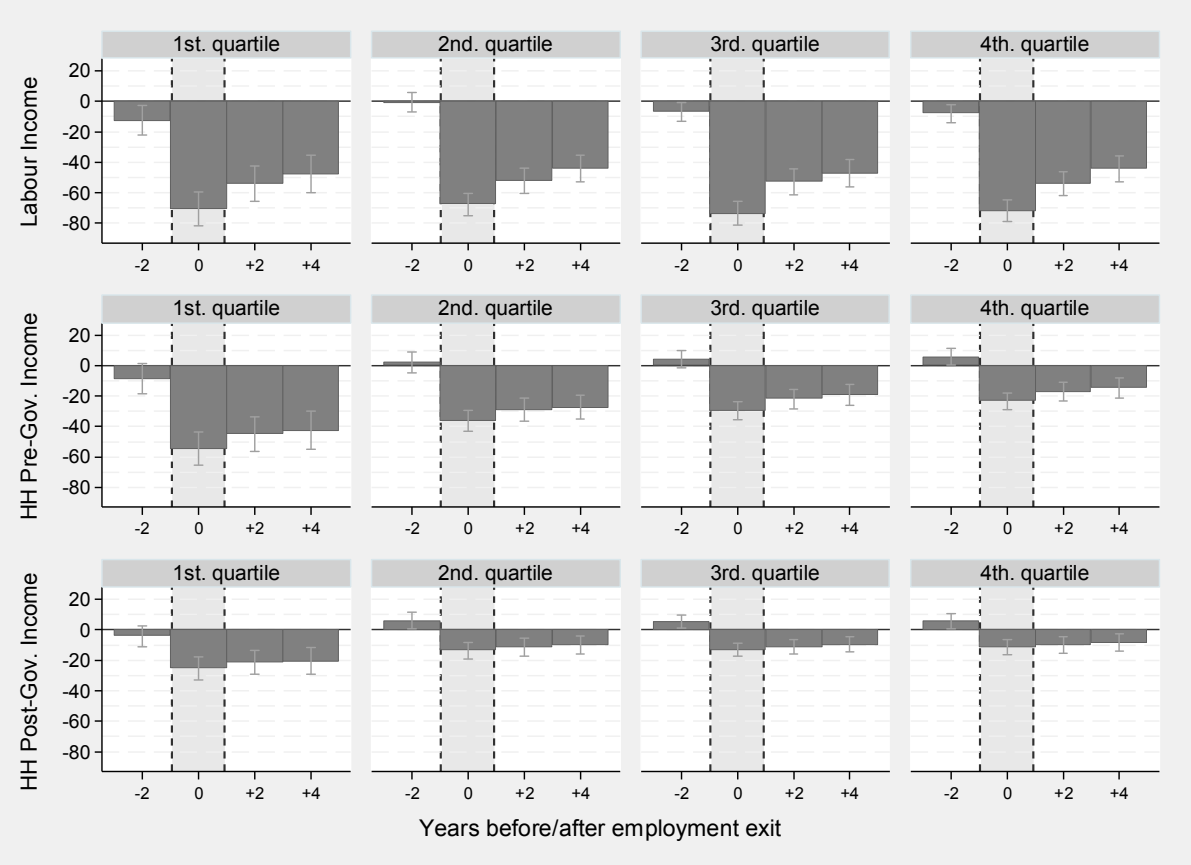
I have already argued that focusing on a broad occurrence such as employment exit have the disadvantage to put together heterogeneous groups of people. Notwithstanding, it permits a more complete impression of the income situation of those who loss a labour income.

Obviously a great number of those who exit from employment are unemployed strictly defined. This is especially the case for men, where unemployed people are the very majority of them. However, it is the opposite among women. Women, indeed, are likely to interrupt their working career to look after a child, for example. This is also reflected on the income

[51] Here, I will use the term 'employment exit' to refer to the transition from employment to non-employment, understood in a wide sense.

trajectories of men and women. While on the one hand men's trajectories are pretty much the same than in the case of unemployment studied above, on the other hand women's trajectories are significantly different. For these reasons, now I focus only on the more interesting case of women.

Figure 4.9 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, employment exit, women*



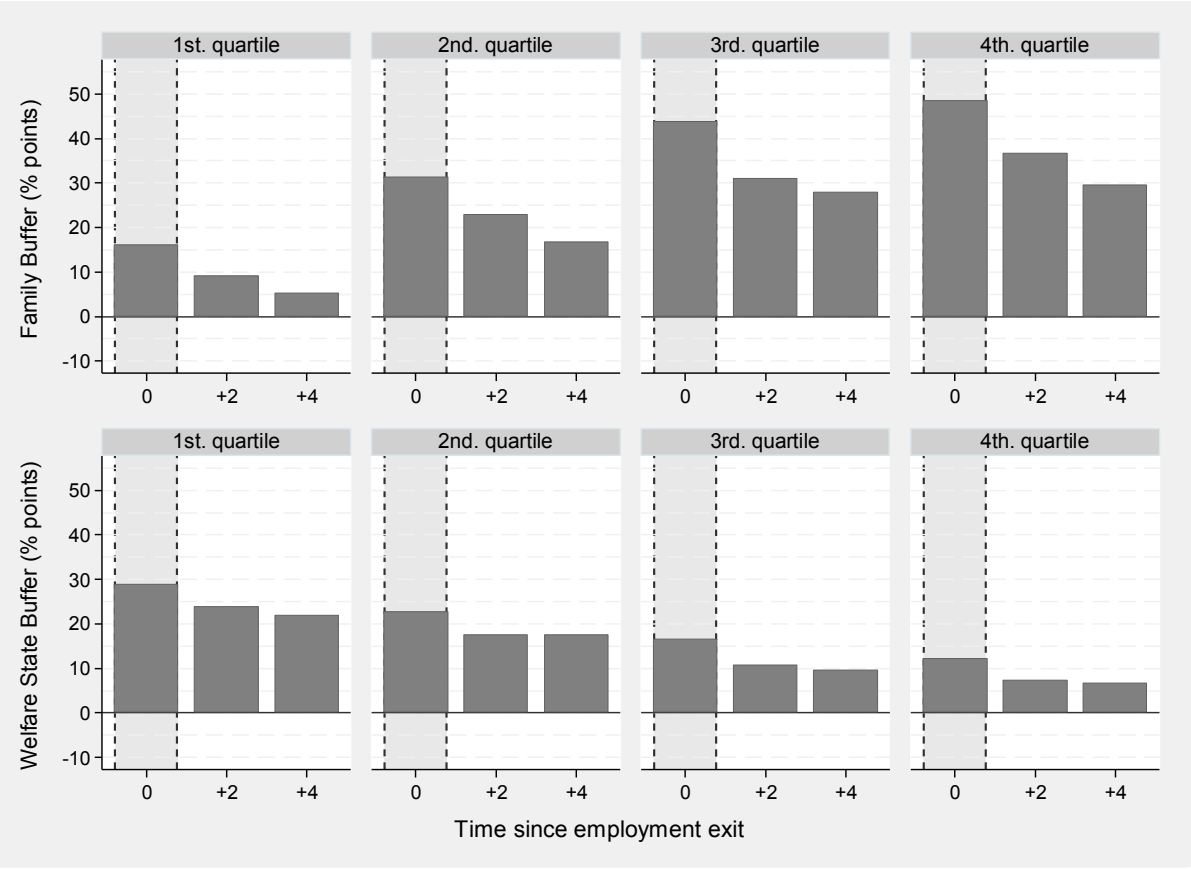
Sources: *estimates based on CNEF-PSID data, author's calculation*

Once we consider non employment rather than unemployment, the first thing that emerges is the great similarities between German and American women. This similarity is not in their income trajectories in terms of levels of income losses, but in the way the trajectories are changed compared to unemployed women and in the way institutions operate. Given this similarity I report in the text only the results for German women in Figure 4.9 and Figure 4.10 (results for American women can be found in the Appendix, Figure A4.19 and Figure A4.20).

Roughly speaking, what we observe, is a more democratic distribution of the economic consequences of employment exit across strata. This is true for women in both countries, and

in both the year of the event and the following years. Therefore, comparing these results with those regarding unemployment only, we can see considerable differences in the trajectories especially in terms of differences between social strata.

Figure 4.10 *Household and Welfare State buffer at different points in time, by social strata. Germany, employment exit, women*



Sources: *estimates based on CNEF-PSID data, author's calculation*

Contrastingly, it is interesting to note the substantial similarity in the trajectories in household income and in disposable income between unemployed and not-employed women. This indicates, on the one hand that the state does not shape income losses to a different extent with respect to unemployment, and on the other hand that the household plays an even stronger role in buffering income losses, and above all, in producing stratification. It is thus more interesting to focus particularly on the household.

In the case of non-employment, the household is even more prominent in mitigating the negative consequences that the loss of a labour income produces. For example, the top

stratum benefits from a household buffer of about 50 percent points at the time of the event. Moreover, in the following years, its support decays rather slowly.

At the same time, the household capacity to (re)generate stratification is magnified. Comparing the two opposite social strata, the bottom one benefits from a household buffer that is 35 percentage points lower with respect to the top one. Also in this case the household emerges as a powerful institution in redistributing resources and in managing social risks, confirming, moreover, that it operates in a (strongly) unequal way.

Taking the loss of a labour income from a wider point of view, in part confirms what has been presented above, and gives also interesting insights. Of particular relevance is the observation that the extent to which institutions operate may considerably vary not only across sexes, across social stratification and across countries, but also according to the specific event upon which one may focus on.

In this respect, even more variation might be expected for very different types of trigger events that have the capacity to affect income trajectories as well. Some example can be household transitions such as the birth of a child and household formation or dissolution. Events, these, that may lead to considerable variations in the standards of living of people and for which institutions may play a great role. Understanding how people's standards of living is affected by these life-course events and how people with different amount of resources are able to cope with and manage their consequences can be an important and interesting direction for future research.

4.7 Conclusions

Aim of the present chapter was to investigate the economic consequences of a labour market related event: the transition from employment to unemployment. In doing that, I considered this life-course risk in interaction with the social stratification system, namely I investigated the extent to which the consequences of employment events are unevenly distributed across social groups. I thus contribute to the existing literature by considering systematically events, attributes (in terms of social stratification and gender), their interaction, as well as contexts (countries with different institutional settings).

Alongside the life-course and the stratification perspectives, a comparative perspective is also considered. This means that the consequences of an event are the result of the interaction

between the event and the individual position within the social hierarchy, as well as of the context in which this interaction takes place.

Social stratification is defined following the resources approach – as counter posed to the traditional class approach: based on the long-term economic resources of the household (i.e. permanent income). The comparative perspective has been introduced to investigate the role of various institutions – the market, the household and the state – in shaping/managing the consequences of life-course events. For this scope, I have chosen two countries characterized by considerable variations in their institutions, namely Germany and the US.

In this conclusion, I focus on the comparative aspect of the chapter by discussing the similarities and differences that have emerged between countries.

Differences between strata in the consequences of unemployment for market income are especially related to income trajectories rather than to the immediate income loss. Concerning the immediate income loss, we observe some differences across strata only for German men: in this case, the market operates as a force that strengthen inequality between the groups given that the higher the individual position in the stratification system and the lower the income loss experienced. Comparing German with U.S. unemployed, we observe lower income losses for the latter. This might be attributed to the higher dynamism of the U.S. labour market where individuals may experience very short spells of unemployment during the year.

Considering income trajectories after the event, I previously advanced some expectations. The main channel through which unemployed can recover their loss of income is reemployment. However, the income trajectory deriving from this counter-mobility strategy depends on the institutional arrangements of each specific context. In this regard, unemployment related institutions should play an important role and lead to some degree of variation between the countries considered. For example, the higher generosity, and the longer duration of unemployment benefits characterizing Germany, should permit the unemployed to search for longer time until they encounter a job offer that matches their skills and expected wage. According to this argument, reemployment income of Germans should be higher than American's, and thus the losses lower.

However, if we look at the trajectories in the years following the event, overall, American men and women present lower income losses compared with Germans. Accordingly, my expectation about a faster recover for Germans does not find support. This might be due to the

faster reemployment that job seekers in the United States may experience given the more dynamism and the more liberal regulation characterizing the U.S. labour market.

In addition to individual's counter-mobility strategy, income losses may be compensated also through other channels. One of them is the household. Concerning its role in managing social risks' consequences, both similarities and differences have emerged between countries. In both countries, indeed, women are those who benefit the most from the support of other household members, principally the partner. Being men usually the primary earners in the household, once incomes are pooled those who benefit the most are the women. Comparing men in the two countries, *Hypothesis 3b* did not found support. American men are not supported to a greater extent by their partner than German men. Given the higher labour market participation and labour market intensity that women have in the United States, I would have expected a larger household buffer in favour of unemployed men in the United States. Instead, results show a slightly larger buffer for German men. This could be explained by the higher share of singles in the United States. Both men and women in the United States are more likely than Germans to not have a partner that support them when facing adverse events. This might also justify the lower household buffer we observe for the U.S. women compared with German women.

Regarding the last institutions at play, I can confirm *Hypothesis 5*: the role of the state is much more prominent in Germany than in the United States. The more generous welfare state characterizing Germany, in fact, performs much better in managing the negative consequences of job loss. Although with different degrees of commitment (where it is very scarce in the United States), in both countries the welfare state operates in the direction to weaken economic inequality. The welfare state buffer, indeed, is inversely related to individuals' position in the stratification system: those at the bottom benefit the most, while those at the top benefit the least.

Comparing my findings with previous research, many similarities can be found. A couple of works are of particular interest for a comparison with my findings, namely those of DiPrete and McManus (2000) and Ehlert (2013). Overall, the analyses presented in this chapter lead to results which are in line with theirs.

First of all, my results have shown that institutions have a substantial role in shaping income trajectories of individuals. However, the extent to which institutions contribute to foster or mitigate the income losses associated with unemployment varies according to several

aspects. It varies between men and women. On the one hand, women are those who benefit the most from the household while, on the other hand, men are better sheltered by the welfare state compared with women. In the same direction go results of DiPrete and McManus (2000) and Ehlert (2013).

Variations in institutions' role are also observed across social strata. In this respect, my findings confirm Ehlert's results (2013). Although using a different definition of the event, a different estimation strategy, and a different measure of social stratification, he also found that the household plays a larger role in the highest strata. I have also shown that for both German and American men, the inequality-producing role of the household is almost entirely counterbalanced by the equality-producing role of the welfare state. Instead, this is not the case for women. For them, indeed, the household buffer is disproportionately stronger for the highest strata than the welfare state buffer is for the lowest strata. This implies that the impact of the welfare state is not able to smooth the inequality generated by the household. In this respect, my results differ with those of Ehlert who find differences between countries: welfare state is able to offset the effect of the household in Germany but does not in the United States.

I also complemented the study of unemployment consequences with the study of employment exit, namely considering all the transitions from employment to non-employment irrespective of the status after the exit. Such a definition of transition has not yet received attention in the literature. Existing research has usually preferred to study unemployment only, disregarding in this way the more diffuse negative consequences that the loss of a labour income may have. Broaden the focus on a wider definition of transition, revealed interesting dynamics, mainly the greater 'equality' in market operate, and the greater inequality in the household operate. Indeed, employment exit hit individuals (women) trajectories in market income in a more equal way than unemployment. However, once the household enters into play, income trajectories become much unequal across social strata. This suggests that events that have not to do with unemployment trigger even more severe consequences for inequality. Disentangle the economic consequences for the various events involved can be an interesting direction for further research.

I want now close this chapter with some additional considerations about similarities and differences between countries, and the implication that these results may have for the overall structure of inequality.

The two countries considered share a very important aspect regarding their capacity to affect the accumulation of advantages and disadvantages and the (re)production of the system of social stratification. The institutions of both countries play a considerable role in strengthening or containing inequality between strata, and thus between individuals and household. More precisely, while on the one hand the household operates as an inequality 'booster' because its role in supporting individuals is larger for the better-off strata, on the other hand the state operates in the opposite direction by targeting its intervention to the worst-off.

These two opposite forces, however, only partially counterbalance one another. As said, indeed, the role of the household is generally larger than the role of the state, especially for women. What these observations imply is that the unevenly distributed consequences of employment events have the capacity to foster inequality even more.

The very last consideration that can be done regards, again, the role of the three institutions at work. While market-related forces are usually declared as the main drivers of income inequality, at least at an aggregated (macro) level of analysis, from the results presented in this chapter emerge that in some cases this is not necessarily the case if the focus moves to a life-course (micro) perspective. Overall, that is especially true looking at income losses at the time of job loss, but also looking at income trajectories. Trajectories in labour (market) income are less unequal than those in household income are. As I showed, the differences between social strata are more marked after the intervention of the household than when income trajectories are defined by market forces only. It seems that it is the household the main institution at work in stratifying resources and in strengthening inequality.

5 Conclusions

At the beginning of this thesis, I posed the following questions: To what extent has the household (still) the capacity to shape the distribution of income? To what extent have changes in households (household compositions) contributed to mitigate/exacerbate inequality levels?

These research questions have emerged from the observation of contemporary macro phenomena, such as a general increase in economic inequality and shifts in households economic composition and dynamics. These phenomena have interested the vast majority of industrialized countries starting from the last two/three decades of the 20th century (Atkinson, Rainwater and Smeeding 1995; OECD 2008; 2011; Brandolini and Smeeding 2009).

This thesis had fed in past and present research which has debated if and to what extent inequality and changes in household composition are associated (Karoly and Burtless 1995; Brandolini and D'Alessio 2001; Blossfeld and Timm 2003; Esping-Andersen 2007; 2009; McLanahan and Percheski 2008; Gornick and Jantti 2013).

While economic inequality is usually the topic of economic research – the recent work of Piketty (2014) is a prominent example – sociology is mostly not concerned with it. However, considering the important social consequences that are associated with it, economic inequality and its determinants should take a leading position in the academic agenda of sociologists.

In fact, economic inequality has been considered harmful for societies because is associated with numerous negative societal outcomes (Wilkinson and Pickett 2009) and is also associated with negative prospects of future generations (Becker and Tomes 1986; Solon 1999).

Economic inequality is a broad concept. Nonetheless, the core of economic inequality can be referred to the unequal distribution of income between households (Salverda, Nolan and Smeeding 2009).

The capacity that the household has in distributing and redistributing economic resources is at the basis of the literature's interest in households' transformations, and justifies the foremost position that the household occupies in this thesis.

The household exerts these capacities mainly in two ways. On the one hand, by generating economies of scale and, on the other hand, by pooling and sharing household

members' incomes. These capacities, thus, are strictly associated with both household's structure and household's economic composition. For these reasons, transformations in households have been considered as a potential driver of changes in inequality.

Although the household is an important source of welfare, is not the only one. A great part of the income available to individuals and households comes from employment, thus from the labour market. Another source of income is the state. The state may influence income directly via transfers and indirectly via taxes. State, market and household, in fact, are the group of institutions called the welfare triad.

Through different focuses or perspectives, the three empirical chapters of this thesis analyse the household and its transformations as a core element of the welfare triad. In particular, to have a better understanding of the household's role and of its interplay with institutions, I used a comparative perspective, namely I considered countries characterized by variations in their specific configuration of market, state and household.

5.1 Key findings

In the first empirical chapter, chapter 2, I investigated the extent to which changes in households are responsible for fluctuations in inequality. There has been an increase of single-headed households (change in structure), and an increased labour market participation of women (change in economic composition). I evaluated how these two phenomena are associated with inequality considering different income concepts. This permitted me to grasp the role that institutions play in mediating this association.

I showed that institutions play a substantial role in shaping inequality in different countries. As expected, I registered the highest inequality in the market income. The household and state contributed greatly to reduce market-generated inequality. In line with the expectations, the household has the strongest redistribution capacity in Italy, a familistic country that is also characterized by few singles and few dual-earner households (single-earner couples are those who benefit the most from pooling). The state, instead, plays the major role in Denmark, which is characterized by a generous welfare state.

The characteristics that define the structure and the economic composition of households, were as expected relevant in accounting for the levels of inequality and associated to the stratification in the distribution of income. This result, on the one hand, strongly contrasts

those authors who maintain that socioeconomic risks are increasingly individualised. On the other hand, it supports Albertini's results (2008a) for Italy; this author argued that household form can be considered as a relevant dimension of inequality clustering, similarly to other classical line of stratification such as social class, gender, education and so on. Household and state, however, effectively reduce this stratification. Yet their capacity to reduce the stratification is strongly linked to their importance in each country.

The systematic comparison across countries and across different income concepts, provides new insights on how income is distributed as well as on the redistributive capacities of the various institutional actors in different welfare regimes.

Given that household composition has a considerable capacity to stratify the distribution of income, it is plausible that its transformations translate in changes in inequality. However, the empirical results did not support this expectation. Differently from part of existing literature (Karoly and Burtless 1995; Burtles 1999; Martin 2006; Western, Bloome and Percheski 2008), I showed that changes in household structure did not contribute to the changes in inequality between the mid-80s and the mid-2000. At the same time, also changes in households economic composition did not drive inequality substantially. In particular, the increase in women employment contributed neither to increase inequality as some authors observed (Karoly and Burtles 1995; Blau, Ferber and Winkler 2006; Breen and Salazar 2010), nor to decrease inequality as observed by others (Reed and Cancian 2001; Del Boca and Pasqua 2003; Western, Bloome and Percheski 2008; Harkness 2013).

I added to previous research by showing the processes that intervenes in the link between changes in household and changes in inequality. I did this by comparing different income concepts that can show the redistributive processes associated with the various institutions at play. Then, I mainly focused on equivalent disposable household income, which is the income concept that better approaches the welfare of individuals. I can conclude that while household transformations did not lead inequality to change in this all-encompassing income concept, they drove changes in inequality in those income concepts that in the literature were mainly considered, namely market income and household income. This might partly justify the differences between my results and those of previous research. Transformations in households, indeed, have almost entirely driven inequality changes in market income. Concerning household income, instead, I observed that shifts in households and in inequality are only partially associated. This means that the household and the state mediated the link

between household changes and inequality changes, confirming their capacity in redistributing economic resources and in reducing the stratification processes associated with the labour market.

With the second empirical chapter, I investigated more in detail household changes associated with labour market-related aspects. I asked if and to what extent the increased similarity in employment participation and earnings of partners accounts for changes in income inequality among households. Past research suggests that the increasing similarity of partners accounts for part of the increases in inequality (Cancian, Danziger and Gottshalk 1993; Blackburn and Bloom 1995; Burtless 1999; Cancian and Reed 1999; Hyslop 2001; Schwartz 2010). However, our understanding of this issue remains limited. Indeed, only few studies investigated this issue and they did this by focusing primarily on earnings or on household income, on the United States, and seldom in comparative perspective.

The guiding idea of the chapter is that the increasing equality within the couples/households has led to increasing inequality across households (Blossfeld and Drobnic 2001; Esping-Andersen 2007). The raised similarity between partners would imply that couples are more likely to consist of two high- or two low-earning partners. In substantive terms, I showed that an increased similarity among partners does not augment inequality to a relevant degree. This result is confirmed from all countries considered. Therefore, my findings are not in line with much of previous literature. This may be because of the specific income concept that I used. While much research focused on individual or household earnings (sometimes also accounting for economies of scale), I focused on the final distribution of welfare. As I showed in chapter 2, both household and the state contribute to mediate the link between household changes and inequality. Therefore, if I would considered partners' earnings instead of equivalent disposable household income, I would have probably observed an impact of changes in partners' similarity on inequality.

Another reason that might justify the difference between my findings and the previous ones is the different technique and inequality measure I used. Many scholars studied the impact of shifts in the correlation of partners' earnings on inequality by decomposing the coefficient of variation. On the one hand, compared with the Theil index, the coefficient of variation gives more weight to earnings at the top of the distribution; this is also the part of the distribution where partners have become more similar (Schwartz and Mare 2005). Thus, this could lead to observe a stronger contribution of changes in the of correlation partners'

earnings. On the other hand, this technique estimates the contribution of partners' similarity on the basis of the correlation coefficient. Such a measure might overestimate the impact of the increases in partners' similarity because the impact comes from both changes in the absolute level of earnings of men and women, and changes in mating behaviors (Schwartz 2010).[52]

As I showed in this thesis, the first changes are driven by market forces, while the second are related to partners' behaviors.[53] I enriched the existing literature by distinguishing these two processes by using a method able to identify the mating behaviours considered as the association between partners' relative positions in their own sex earning distribution.

As said, my analyses showed that changes in the similarity of partners did not contribute substantially to drive changes in absolute values of inequality. On the contrary, the picture partially changes looking at the changes in relative terms. To give an example, below I present the percentage variations in inequality that can be attributed to shifts in partners' similarity (Table 5.1).

Table 5.1 *Changes in inequality due to changes in earnings association only, percentage*

	Denmark	Germany	Italy	United Kingdom	United States
Change '80-'90	-7.81	22.22	26.92	6.11	21.13
Change '90-'00	34.15	0.00	18.14	-48.00	13.08

Note: negative values refer to predicted inequality changes that go in the opposite direction in respect to observed changes.
Source: *calculation based on results presented in Table 3.1, Panel B*

Between the mid-'90s and the mid-2000s, for example, the association between partners' earnings increased in Denmark (Figure 3.3). At the same time, inequality increased from 0.0466 to 0.0507. The predicted inequality I would have observed in mid-2000s had only the partners' earning association changed, would have been 0.0480 (Table 3.1). I could interpret this figure saying that changes in the similarity of partners explain a third (34.15) of the

[52] With the expression 'mating behaviors', I refer to how individuals are sorted in couples at the time of the survey. I do not mean the process through which individuals choose to mate with a partner with similar characteristic.

[53] I consider changes in the levels of earnings as deriving from market forces because, for example, they may be driven by the increasing returns from education. Given that all countries are characterized by substantial homogamy in education, increasing returns may lead to more similar earnings between partners without implying a change in the way partners are sorted.

increase in inequality. However, in absolute terms, the observed as well as the predicted increases in inequality are essentially trivial. Basing my observations on absolute changes, I concluded that changes in partners' similarity did not contribute to increase inequality.

Although changes in partners' earning association had not substantially contributed to changes in the absolute levels of inequality, there was one exception. This is the case of Italy in the period from mid-1990s and mid-2000s. In this period, partners' similarity increased substantially. This trend has been paralleled by a notable increase in inequality, from 0.1553 to 0.1950. In this decade, 18.14% of the increased inequality can be attributed to the increased similarity between partners. In sum, in this case, partners' similarity significantly contributed to inequality.

Finally, I investigated why inequality levels have changed. It has been shown that the major driver of inequality is the change in the mean income of households, partly counterbalanced by decreasing dispersion within household types. On the one hand all households have experienced rising mean income, on the other hand those who benefited the most from this rise have been households at the top of income distribution. The result has been a polarization between low- and high-income households.

Therefore, in line with some previous research (Breen and Salazar 2010; Chen, Foster and Llena-Nozal 2013) and in contrast with other (Blackburn and Bloome 1995; Burtless 1999; Hyslop 2001; Reed and Cancian 2012), I showed that changes in the similarity between partners' earnings cannot be listed among the principal drivers of inequality in the distribution of the 'final' welfare. However, even in the face of contained changes in inequality, the system of social stratification strengthened because of the polarization between household types.

In the last chapter, I investigated the consequences of changes in households' economic composition from a dynamic perspective. In chapter 4 I argued that an even more relevant dimension of inequality than the cross-sectional one, is long-run inequality. This dimension of inequality is shaped by the movements, over time, of individuals and households on the income ladder. These movements, which imply gains and losses of income, come from events that households' members experience over their life course. Thus, by considering the long-run dimension of inequality, it is possible to grasp the implications of those events triggering changes of income in the short- as well as in the long-run.

With this regards, I focused on job loss. A kind of event that may have the capacity to strongly affect individuals' and households' standards of living. I did this by merging three branches of research, namely the life-course approach, social stratification research and comparative analysis. In particular, I investigated trigger events (unemployment events) in interaction with social strata in different contexts (Germany and the United States).

With this chapter, I added to the previous research mainly in three ways. First, I complemented the study of unemployment events with all those events entailing the loss of an income from labour. In doing this, I shed some light also on the negative consequences of those events that lead to the loss of a labour income.

In addition, I give a second contribution to existing literature by using an original strategy to define social strata: I created strata as quartiles of the distribution of households' permanent income. Social strata are intended to represent the advantages and disadvantages that over time households accumulate, as well as an indicator of the – human, social, and economic – resources that contributed to the accumulation of those advantages and disadvantages. Third, the empirical results that I presented come from an innovative statistical model, the distributed fixed-effects, that permitted to identify the consequences of unemployment in the years around the event, namely the income trajectories.

Although from a different perspective, empirical finding that I showed in chapter 4 are in line with those of the two previous empirical chapters. Namely, household's economic composition and institutions strongly matter in determining individuals' and households' welfare.

The overall picture shows that unemployment events come with strong negative consequences. Job loss, indeed, has the capacity to trigger changes in income trajectories. However, institutions play a great role in limiting job loss consequences. Both the household and the state support individuals at the time of the unemployment event as well as in the following years, but with a decreasing intensity. Notwithstanding, I showed considerable variations in unemployment consequences between social strata and genders as well as between countries.

In particular, differences between social strata in the way job loss hit individuals' labour income are more evident looking at their income trajectories rather than at the losses at the time of the event. After the event, individuals can recover their initial level of income via

reemployment. In this regards, those in the highest strata are better able to buffer their income losses experiencing in this way less severe consequences in the long-run.

Between strata, variations are present also in the role of institutions. While household plays a larger role in the highest strata, the state operates in the opposite direction supporting more the lowest strata than the others. However, the equalizing role of the state is not always able to compensate the disequalizing role of the household. As a consequence, the unevenly distributed consequences of employment events can foster inequality even more.

The extent to which institutions contribute to foster or mitigate the income losses associated with unemployment also varies between men and women. Women are those who benefit the most from the household, while men are better sheltered by the welfare state.

The comparison of institutions' work across countries reveals interesting insights. By embedding the interaction event-attributes in the contexts, I showed some common traits between Germany and the United States. For example, I showed that for both German and American men, the inequality-producing role of the household is almost entirely counterbalanced by the equality-producing role of the welfare state. This is not the case for women. For them, indeed, the household buffer is disproportionately stronger for the highest strata than the welfare state buffer is for the lowest strata. This implies that the impact of the welfare state is not able to smooth the inequality generated by the household.

The household, thus, emerges to be an/the most important stratifier, especially for women. This is even more the case if the attention moves from unemployment to employment exit. While employment exit produces more equal trajectories in individual market income, it is associated with more unequal trajectories in household income, compared to unemployment. The uneven role of the household across strata is thus intensified looking at employment exit, namely at the loss of a labour income in general sense. This suggests that this sort of events trigger even more severe consequences for inequality. In this regard, further research should disentangle the economic consequences for the various events involved.

The integration of the life-course dimension with social stratification in comparative perspective has proved to be a fruitful line of research for the understanding of trigger events' consequences as well as for the (re)production of social stratification. By approaching job loss in such a way, I reached interesting conclusions that have important implications for the structure of inequality. Indeed, I showed that Germany and the United States share very important characteristics as they have similar patterns in the accumulation of advantages and

disadvantages, and the (re)production of the system of social stratification. The institutions of both countries play a considerable role in strengthening or containing inequality between strata, and thus between individuals and households. More precisely, while the household operates as an inequality 'booster' because its role in supporting individuals is larger for the better-off strata, the state operates in the opposite direction by targeting its intervention to the worst-off.

The household, thus, is the most important institution in reducing the negative consequences of job loss, as well as the main actor at work in stratifying resources and in strengthening inequality.

5.2 Concluding remarks

Through the various chapters of this thesis, I showed that the household is at the forefront in distributing and redistributing economic resources. The household operates in a double direction. It structures inequality, and mitigates inequality. On the one hand, households' types are strictly associated with income capacities and consequently represent a relevant dimension of stratification – especially looking at market income. This finding is in contrast with the prediction of individualization theories. Moreover, the household's stratifying capacity is associated to the classical lines of stratification. The household, also, acts as a stratifier by supporting individuals in an uneven way. For example, when individuals face life-course risks, such as job loss, the household supports more the already advantaged individuals than the disadvantaged.

On the other hand, the household mitigates stratification via its mechanisms of production and allocation of resources. For example, it mediates the link between household characteristics (structure and economic composition) and inequality. This can be interpreted as a reduction of the stratifying capacity of household types once the household enters into play. Moreover, the household strongly reduces inequality, as inequality in household income is lower than in market income.

The fact that households' characteristics are associated with the income distribution, would also suggest that changes in households are associated with changes in inequality. However, considering how changes in households have contributed to changes in inequality, I

showed that neither changes in households' structure, nor changes in households' economic composition can be considered as driving forces of inequality.

Conversely, integrating this picture with a dynamic perspective, further important aspects have emerged. Indeed, changes in the economic composition of households caused by job loss may exacerbate inequality given that the negative economic consequences of unemployment are unevenly distributed across advantaged and disadvantaged individuals.

The change in perspective, from the use of aggregate measures of inequality and in a static way to the investigation of micro mechanisms in a dynamic way, apparently leads to contrasting results. On this issue, more research is needed. Further research should study how micro mechanisms that affect income dynamics – such as job loss and the operate of household and state – aggregate and produce the macro outcome of inequality. In my specific case, it would imply to study the economic losses coming with job loss also in absolute terms, and to pay deeper attention to those who loss the job.

More in general, we still know too little about how events hit individuals' and households' standards of living. This is true not only concerning events that directly concern with changes in income, such as labour market related events, but also for household events such as union formation or dissolution and childbirth or child leaving home. Knowledge on how social stratification is generated and regenerated would benefit from the study of how the consequences of the various events vary between the possible different lines of social stratification. At the same time, from a policy intervention point of view, important insights would emerge by the integration of this vein of research with a comparative perspective and by the study of how institutions cushion or exacerbate events' consequences.

In a nutshell, what has emerged through this dissertation, has important implications for the welfare of individuals and for the society more in general. My findings showed that the household not only works in producing the today's stratification system but it also contributes to reproduce stratification. Moreover, it might affect the chances of future generations, and thus tomorrow's system of stratification. Given that the state as an institution has the capability to counterbalance the household role, policy makers should pay more attention to these implications and plan public and fiscal policies in order to redistribute resources among households in a more effective way.

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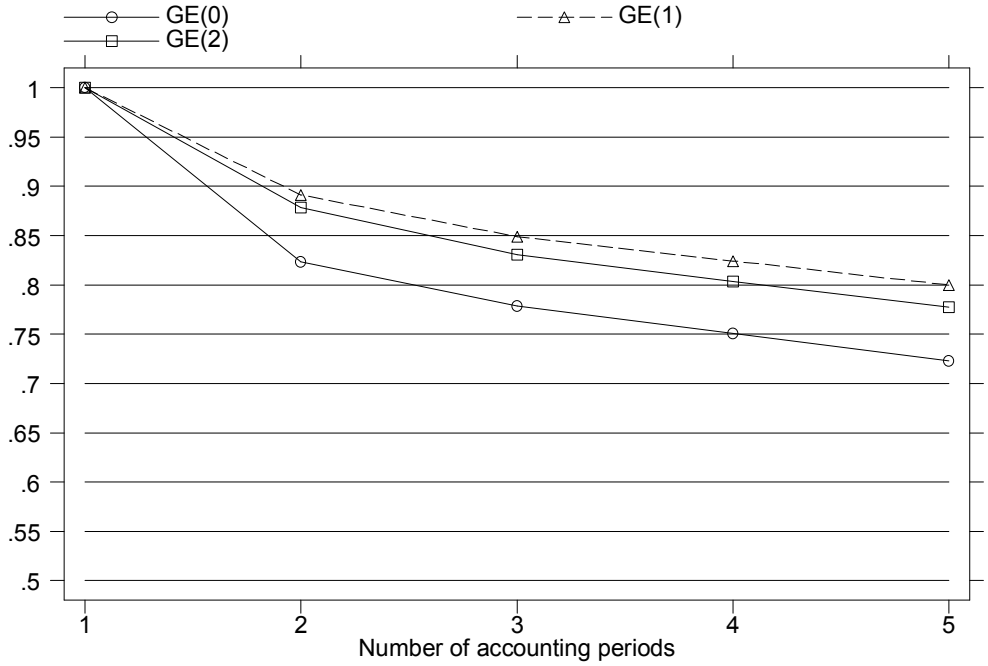
Appendix

Figure A1.1 *Shorrocks' (im)mobility index, trends in the reduction of cross-sectional inequality while the time horizon lengthens, United States*



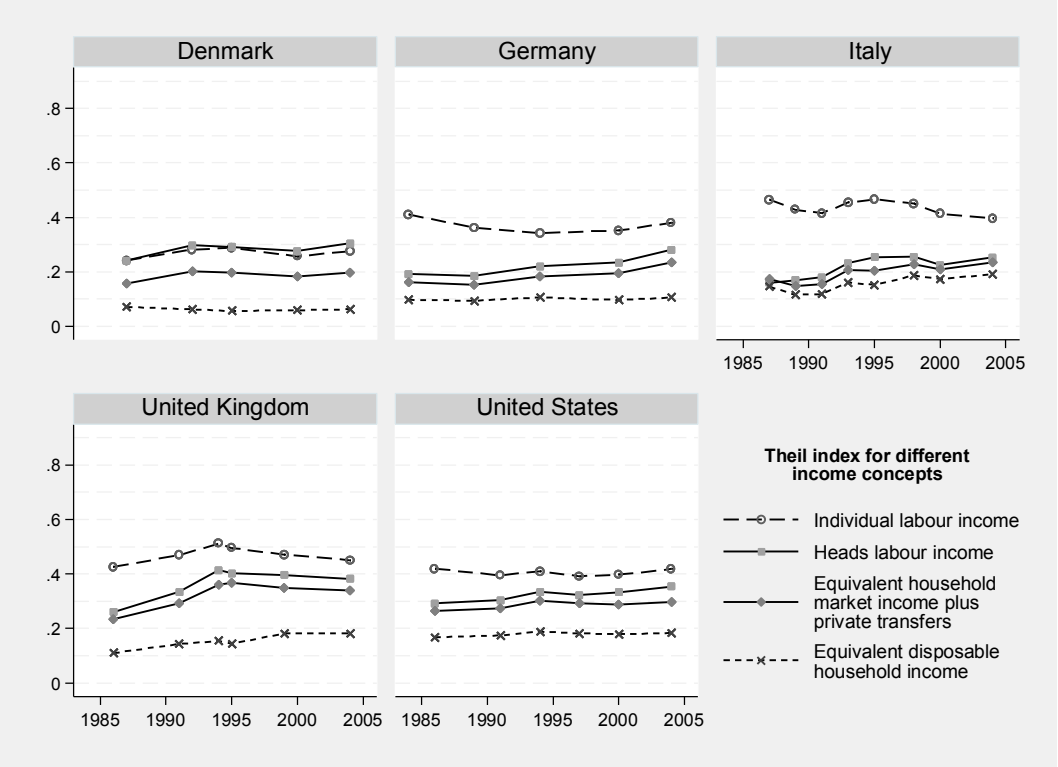
Note: measured for equivalent disposable household income. Households present at least 5 waves (the first five), no matter the year they start
Sources: *estimates based on CNEF-PSID data, author's calculation*

Chapter 2

Table A2.1 *Sample size, number of households*

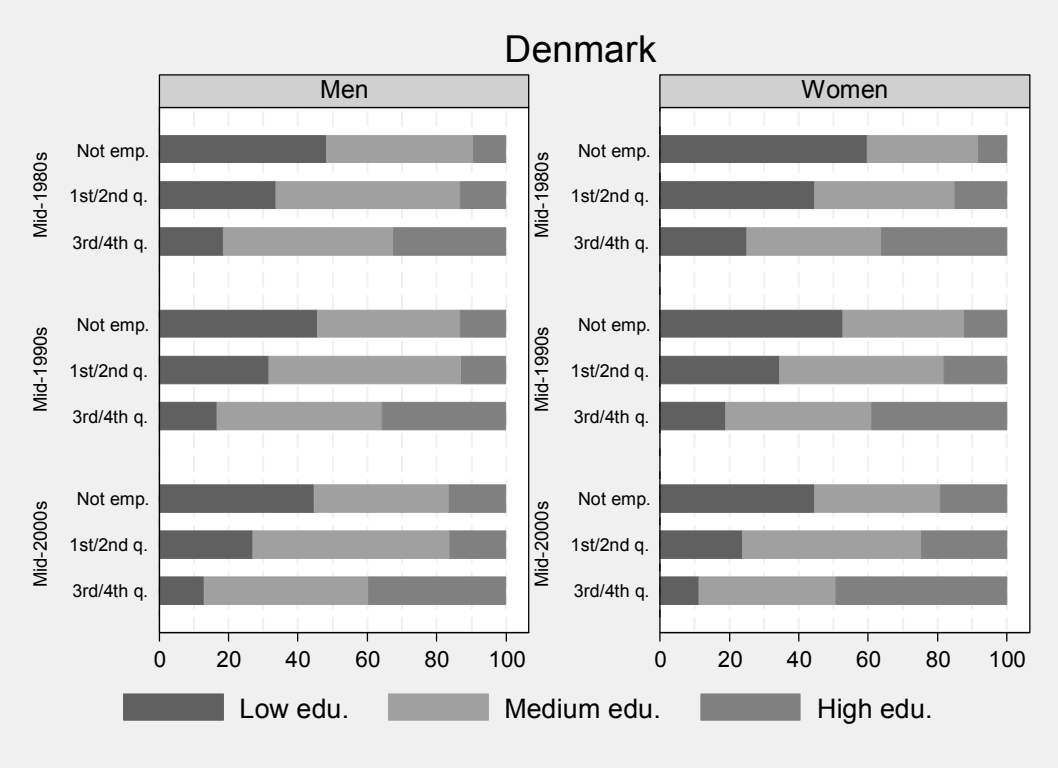
	Mid-1980s	Mid-1990s	Mid-2000s
Denmark	6282	41894	41938
Germany	3176	3522	5344
Italy	4470	3932	3353
United Kingdom	3398	3634	13795
United States	32697	33099	45837

Figure A2.1 *Inequality measured by the Theil index for different income concepts. Adjusted results for Italy (based on a reduced sample)*



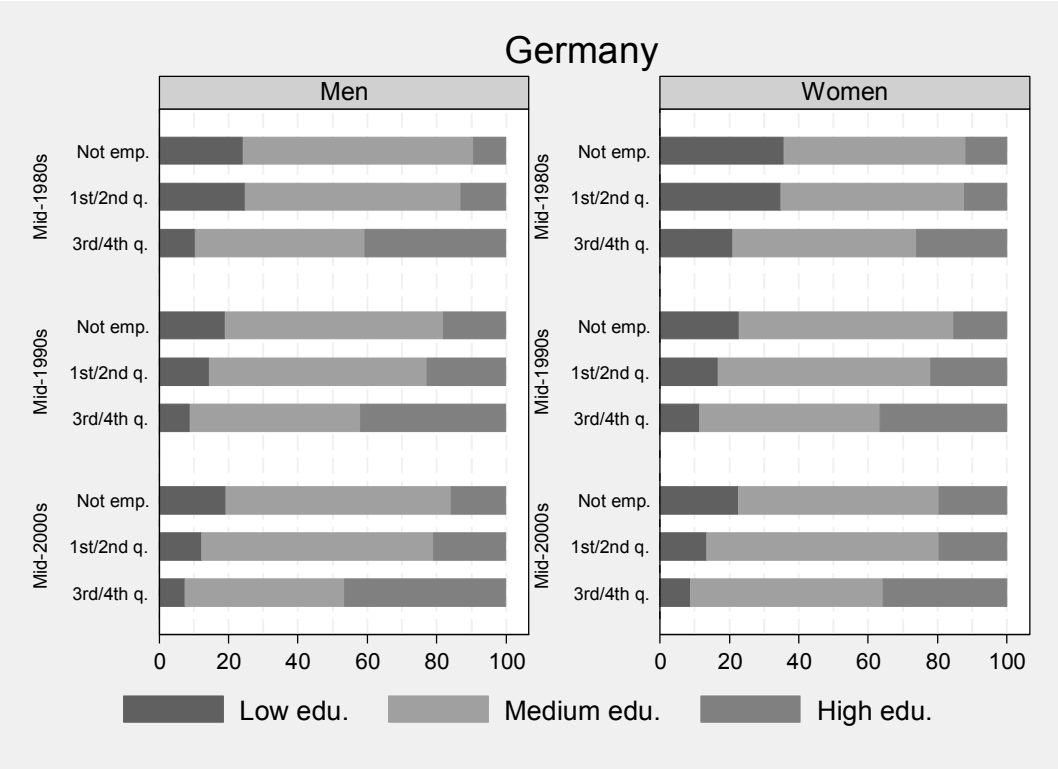
Sources: *calculation based on LIS data*

Figure A2.2 *Composition of employment/earnings situation by education. Denmark, by sex and period*



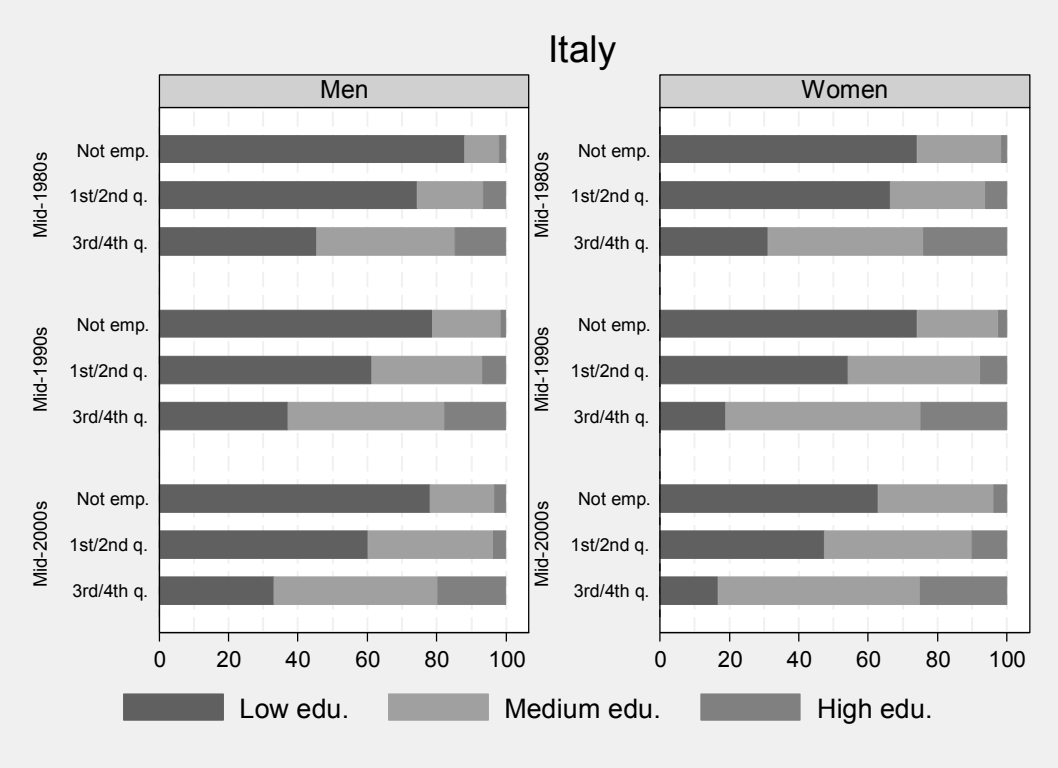
Sources: *calculation based on LIS data*

Figure A2.3 *Composition of employment/earnings situation by education. Germany, by sex and period*



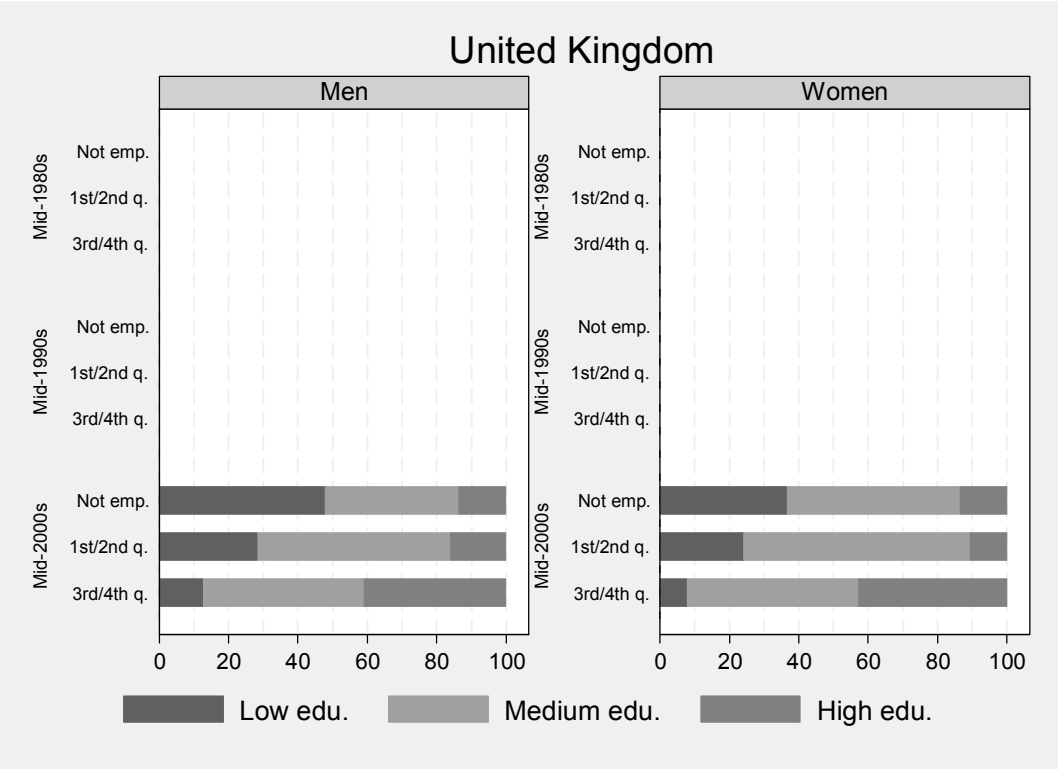
Sources: *calculation based on LIS data*

Figure A2.4 *Composition of employment/earnings situation by education. Italy, by sex and period*



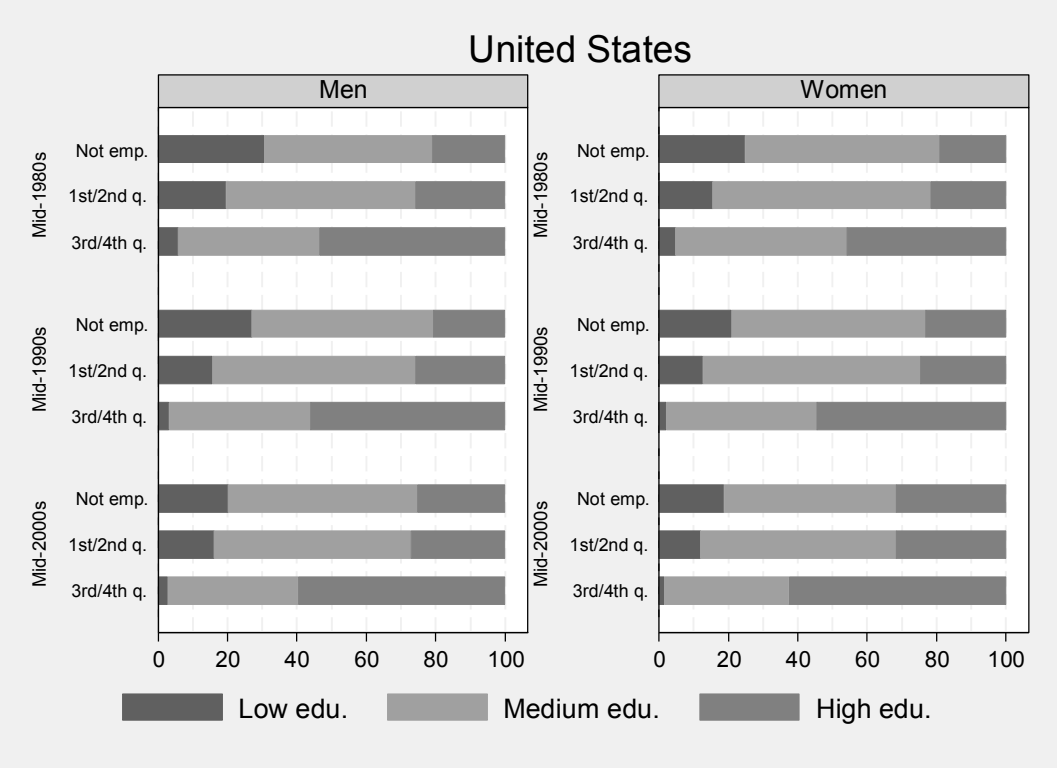
Sources: *calculation based on LIS data*

Figure A2.5 *Composition of employment/earnings situation by education. United Kingdom, by sex and period*



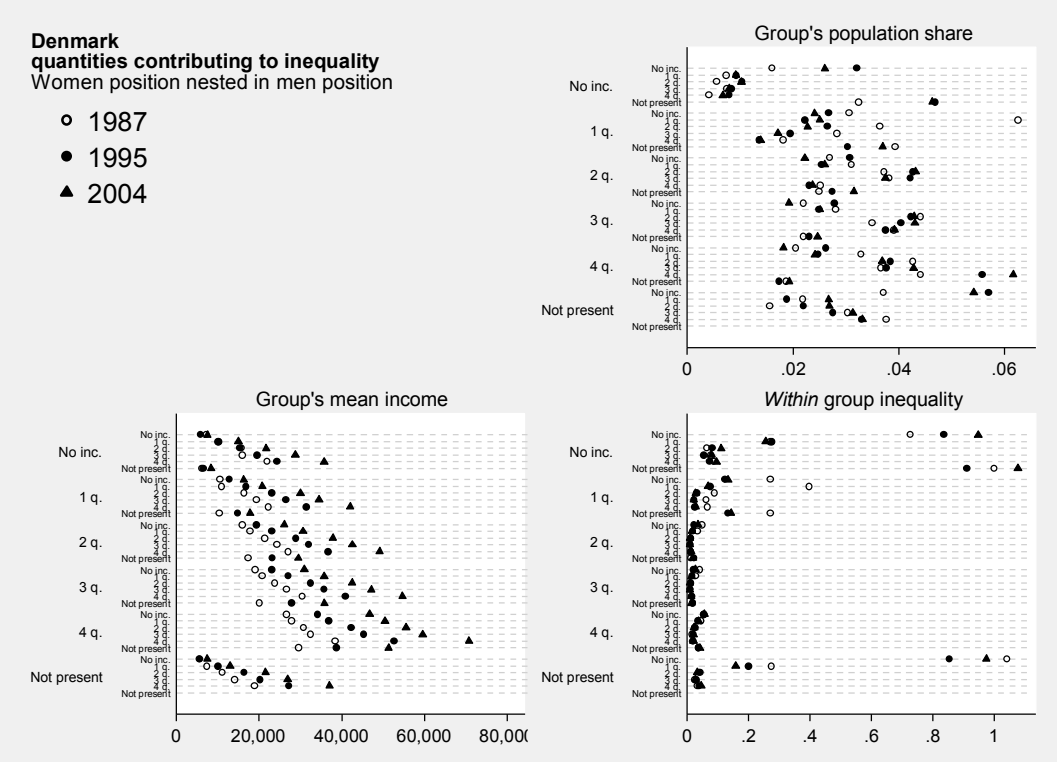
Sources: *calculation based on LIS data*

Figure A2.6 *Composition of employment/earnings situation by education. United States, by sex and period*



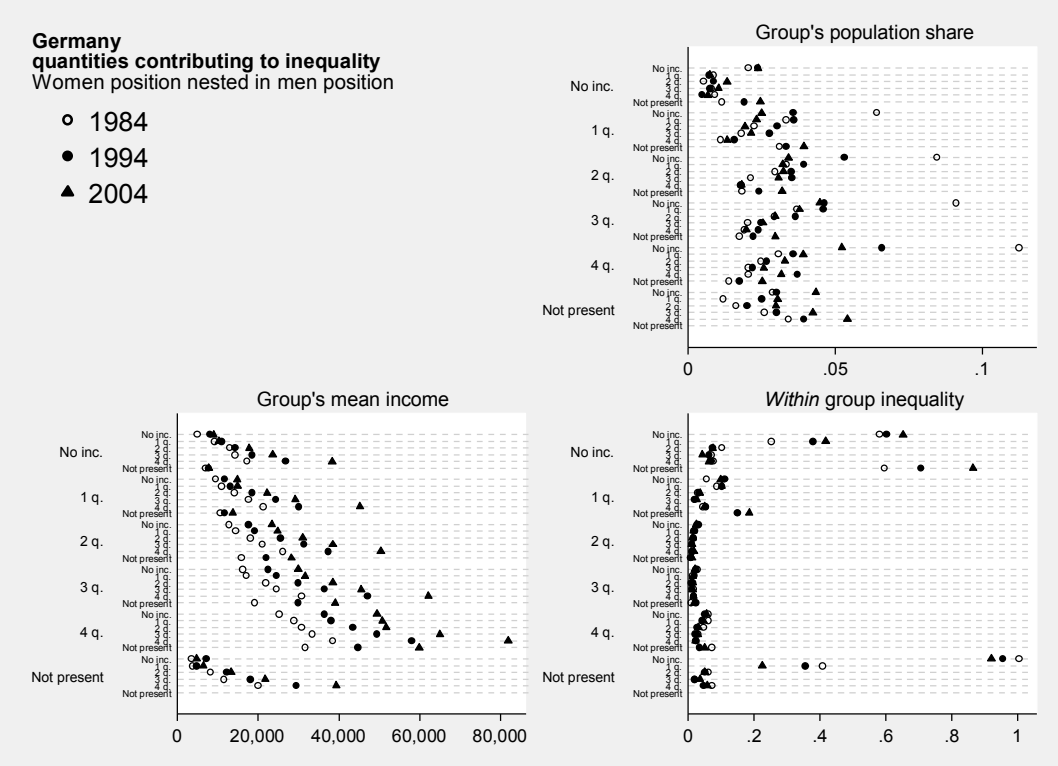
Sources: *calculation based on LIS data*

Figure A2.7 *Quantities contributing to inequality, Denmark*



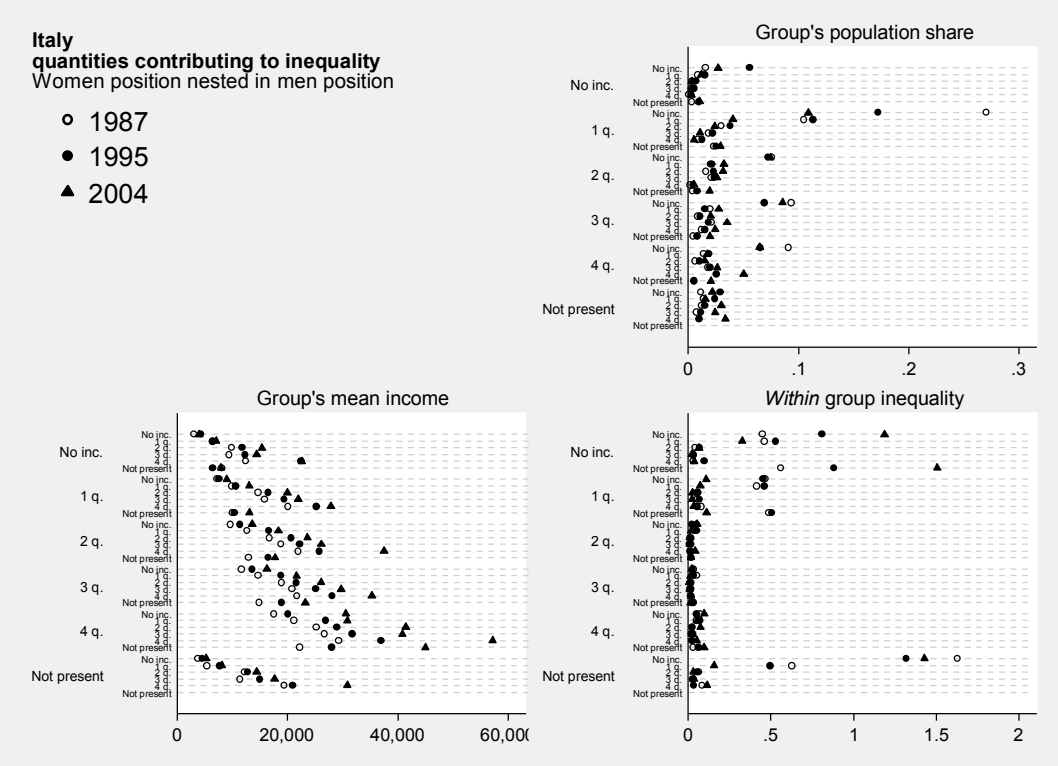
Sources: *calculation based on LIS data*

Figure A2.8 *Quantities contributing to inequality, Germany*



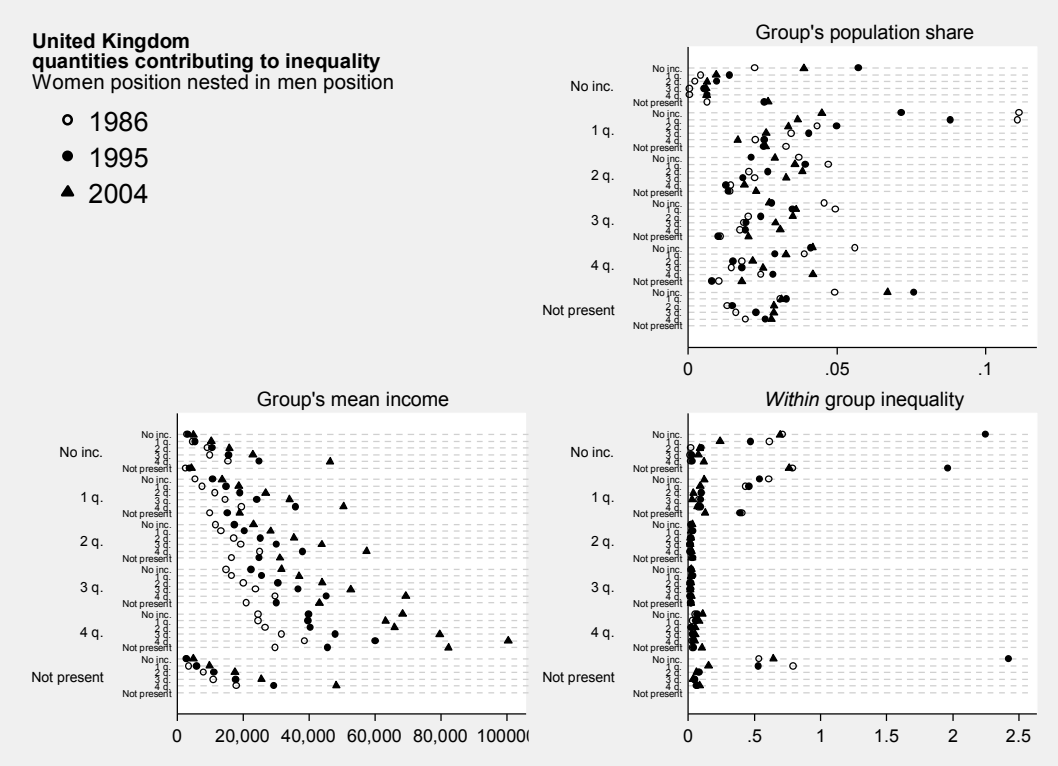
Sources: *calculation based on LIS data*

Figure A2.9 *Quantities contributing to inequality, Italy*



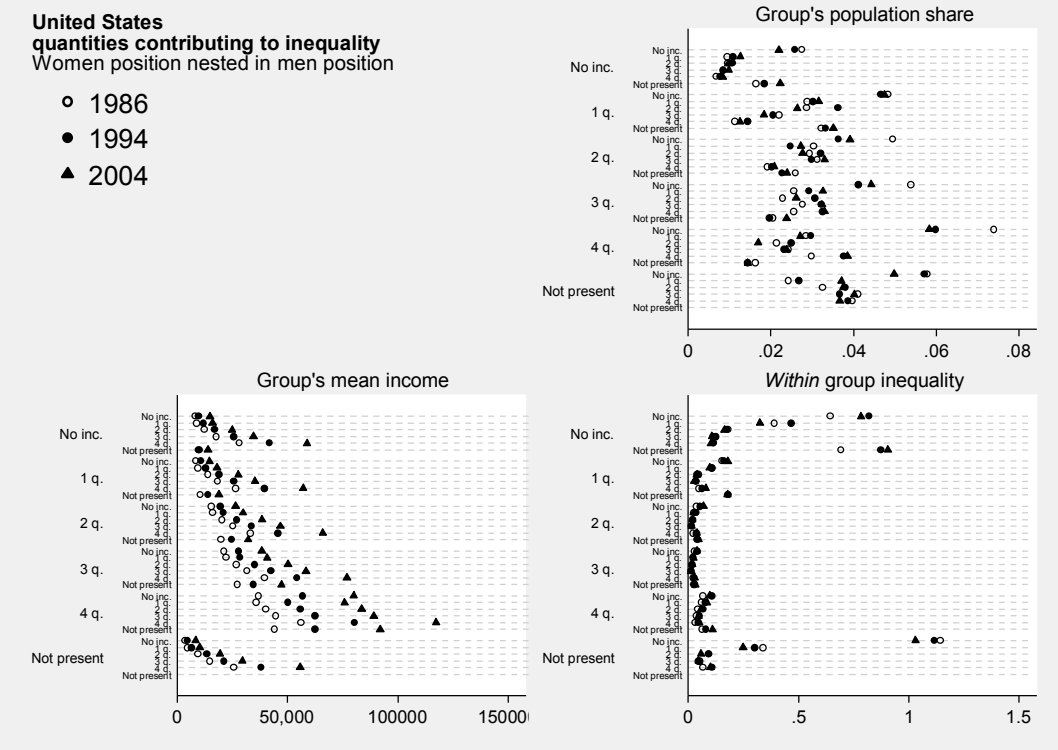
Sources: *calculation based on LIS data*

Figure A2.10 *Quantities contributing to inequality, United Kingdom*



Sources: *calculation based on LIS data*

Figure A2.11 *Quantities contributing to inequality, United States*



Sources: *calculation based on LIS data*

Chapter 3

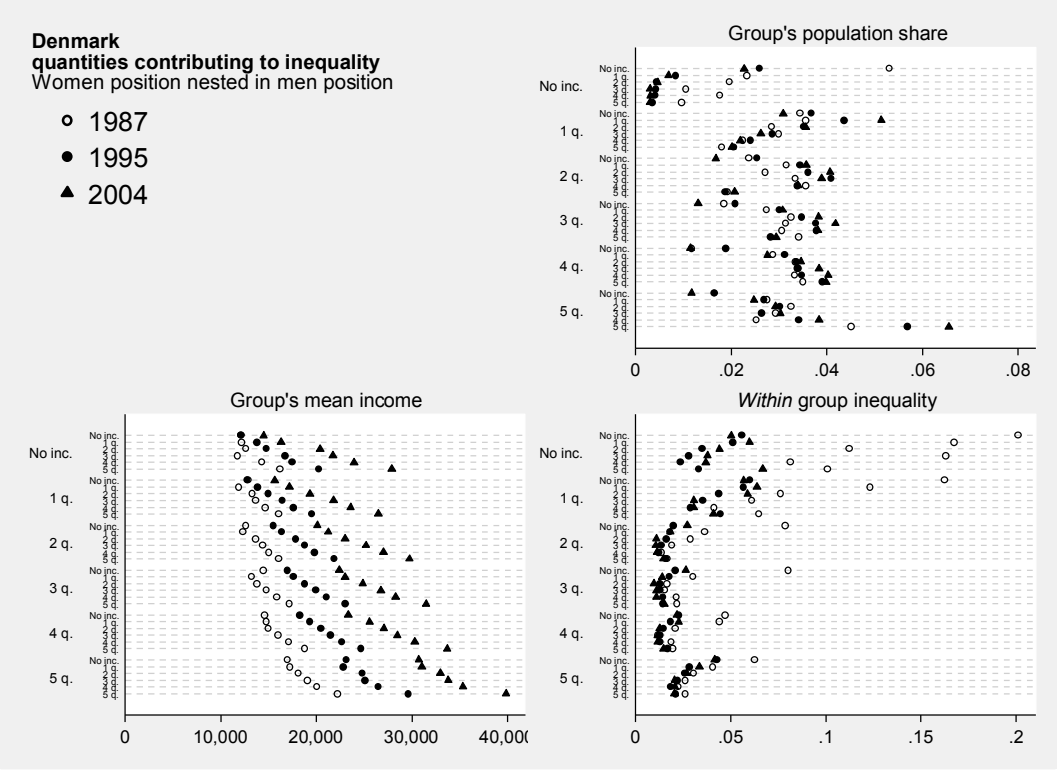
Table A3.1 Sample size, number of households

	Mid-1980s	Mid-1990s	Mid-2000s
Denmark	3695	24665	22940
Germany	2426	2621	3541
Italy	2674	2338	2406
United Kingdom	2465	2456	8304
United States	4233	19431	28831

Table A3.2 Observed and simulated inequality in Heads labour income

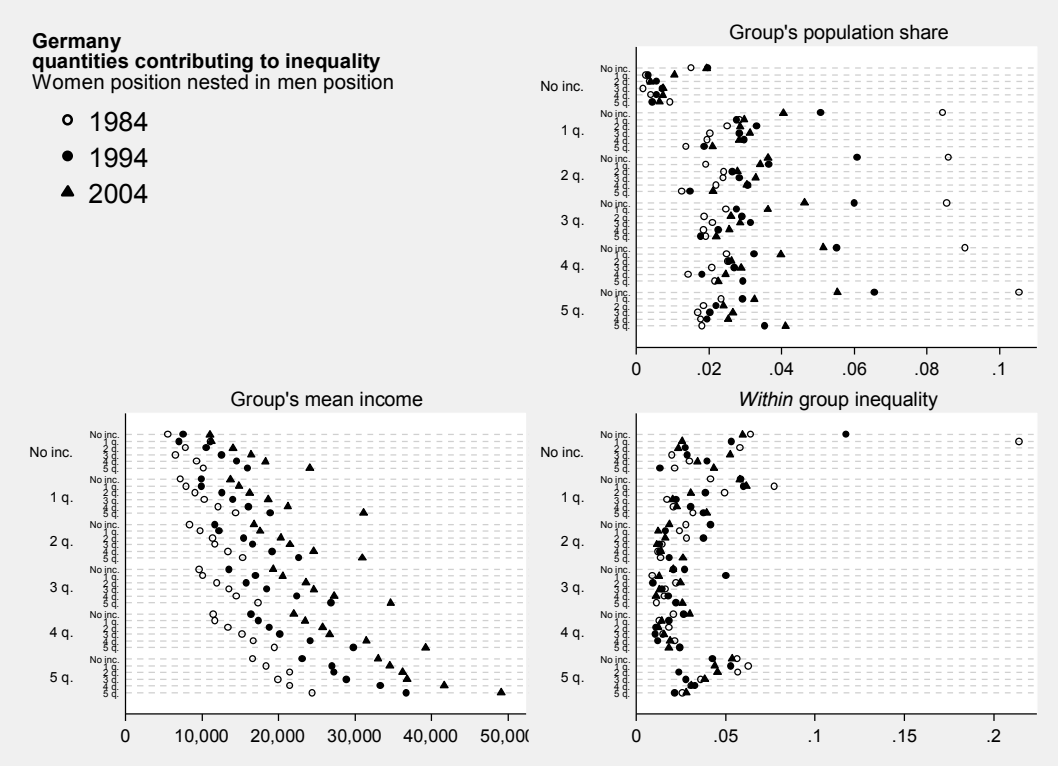
		Denmark	Germany	Italy	United Kingdom	United States
Observed in:	Mid-1980s	0.1615	0.1269	0.1331	0.3258	0.2383
Change in:	p_j	0.1173	0.1292	0.1746	0.3480	0.2287
Observed in:	Mid-1990s	0.1173	0.1357	0.1930	0.3601	0.2566
Change in:	p_j	0.1273	0.1341	0.1534	0.1758	0.2173
Observed in:	Mid-2000s	0.1333	0.1628	0.2185	0.2304	0.2732

Figure A3.1 *Quantities contributing to inequality by household types, Denmark*



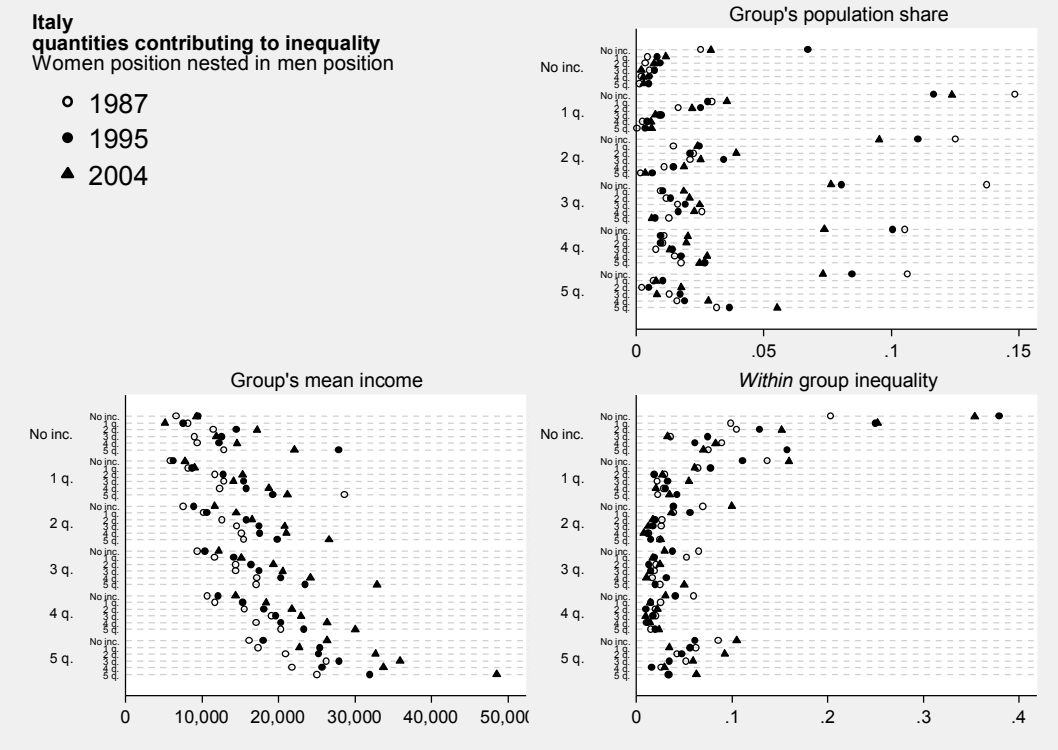
Sources: *calculation based on LIS data*

Figure A3.2 *Quantities contributing to inequality by household types, Germany*



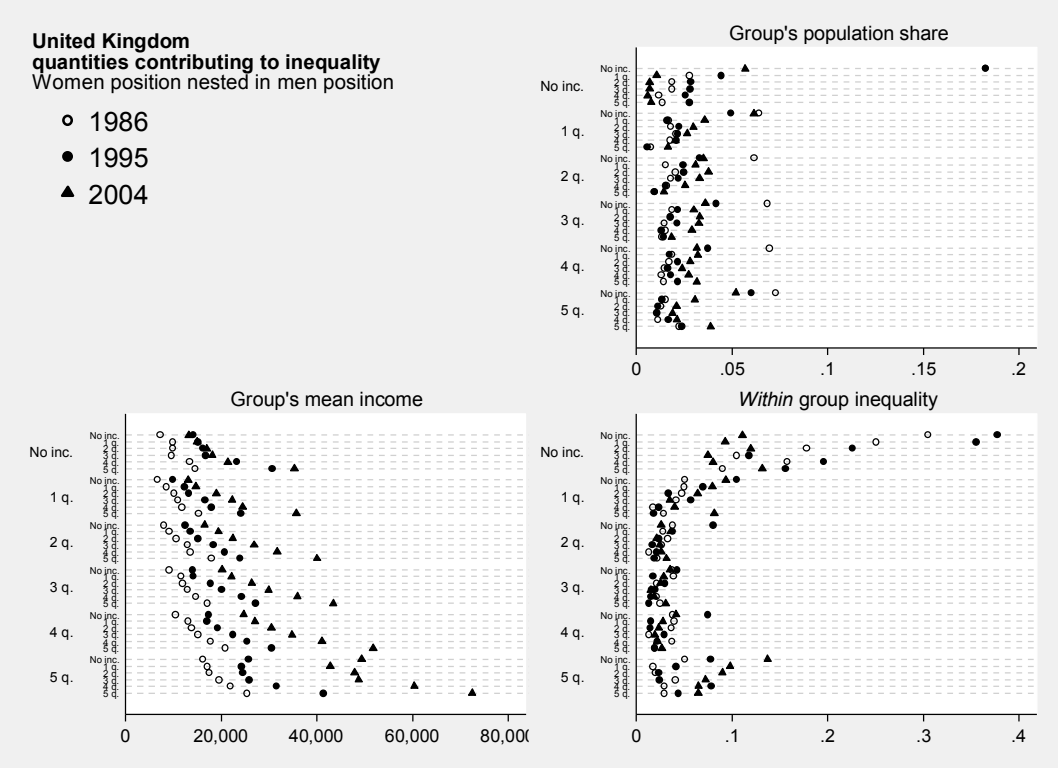
Sources: *calculation based on LIS data*

Figure A3.3 *Quantities contributing to inequality by household types, Italy*



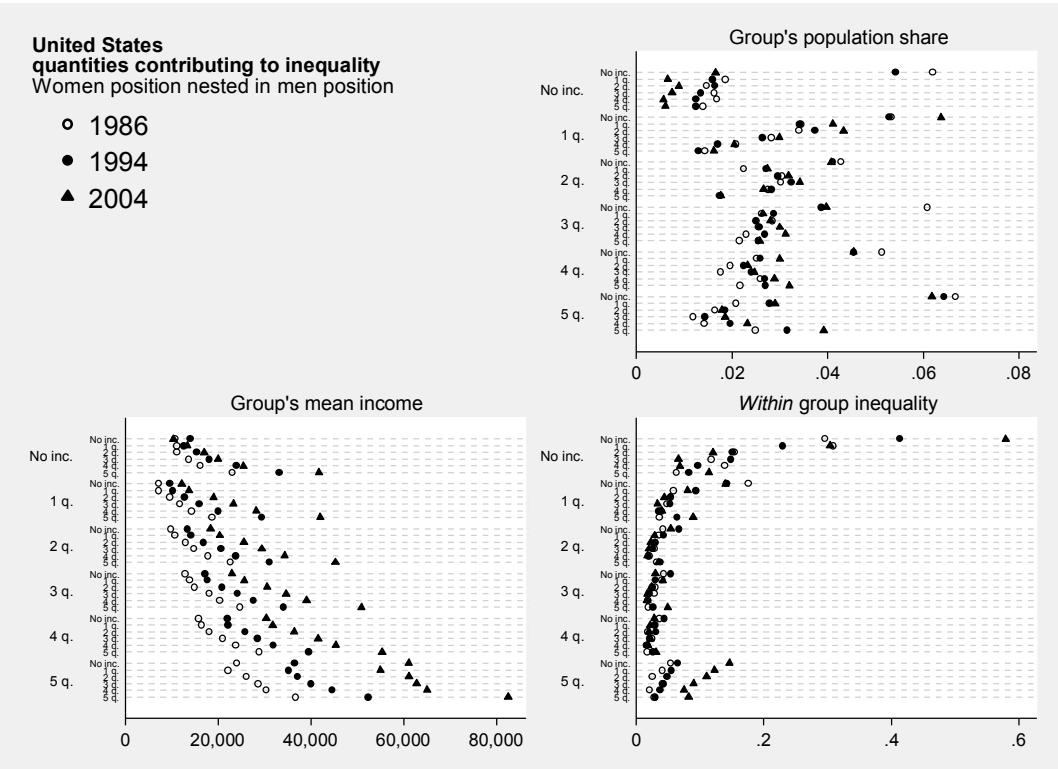
Sources: *calculation based on LIS data*

Figure A3.4 *Quantities contributing to inequality by household types, the United Kingdom*



Sources: *calculation based on LIS data*

Figure A3.5 *Quantities contributing to inequality by household types, the United States*



Sources: *calculation based on LIS data*

Chapter 4

Table A4.1 *Individual characteristics comparing those always employed and those that have experienced at least an episode of non-employment, Germany*

	Men									
	Always employed					With unemployment experience				
	1st.	2nd.	3rd.	4th.	Total	1st.	2nd.	3rd.	4th.	Total
Age	38.66	39.33	40.75	42.29	40.70	39.54	40.07	40.93	42.17	40.32
East-Germany	0.30	0.25	0.17	0.14	0.20	0.47	0.45	0.43	0.24	0.43
Education										
Less than H.S.	0.10	0.06	0.03	0.02	0.04	0.16	0.07	0.02	0.01	0.08
High School	0.77	0.78	0.68	0.46	0.64	0.77	0.82	0.81	0.60	0.78
More than H.S.	0.13	0.16	0.29	0.52	0.32	0.07	0.11	0.16	0.38	0.14
With partner	0.48	0.85	0.93	0.95	0.87	0.60	0.90	0.93	0.95	0.81
HH size	2.00	2.91	3.22	3.43	3.09	2.39	3.19	3.39	3.58	3.01
Mean labour income	25923	31809	38539	56734	41669	19992	25299	30619	44195	27451
Unemployed						0.34	0.20	0.14	0.12	0.22
Individuals	528	1106	1303	1476	4413	350	305	224	87	966
Episodes						1317	734	413	138	2602
Person years	5066	11961	15266	16292	48585	3894	3686	2896	1196	11672

	Women									
	Always employed					With unemployment experience				
	1st.	2nd.	3rd.	4th.	Total	1st.	2nd.	3rd.	4th.	Total
Age	40.15	39.95	40.88	42.25	41.03	40.05	40.75	41.48	42.25	40.94
East-Germany	0.24	0.32	0.29	0.19	0.26	0.52	0.55	0.39	0.30	0.47
Education										
Less than H.S.	0.13	0.10	0.07	0.06	0.08	0.15	0.08	0.13	0.10	0.12
High School	0.64	0.66	0.67	0.55	0.63	0.69	0.76	0.61	0.54	0.67
More than H.S.	0.23	0.24	0.26	0.39	0.29	0.16	0.16	0.26	0.36	0.21
With partner	0.33	0.77	0.91	0.94	0.81	0.49	0.87	0.91	0.92	0.77
HH size	1.88	2.73	3.03	3.26	2.87	2.33	3.05	3.14	3.07	2.85
Mean labour income	21150	20777	22972	28727	24173	14525	15091	18534	23295	17257
Unemployed						0.35	0.25	0.18	0.15	0.25
Individuals	524	771	930	1096	3321	283	232	197	222	823
Episodes						1014	650	398	111	2268
Person years	4825	7712	9885	11578	34000	2861	2640	2272	1359	9132

Note: Mean labour income refers to employed individuals only
Sources: *CNEF-GSOEP data, author's calculation*

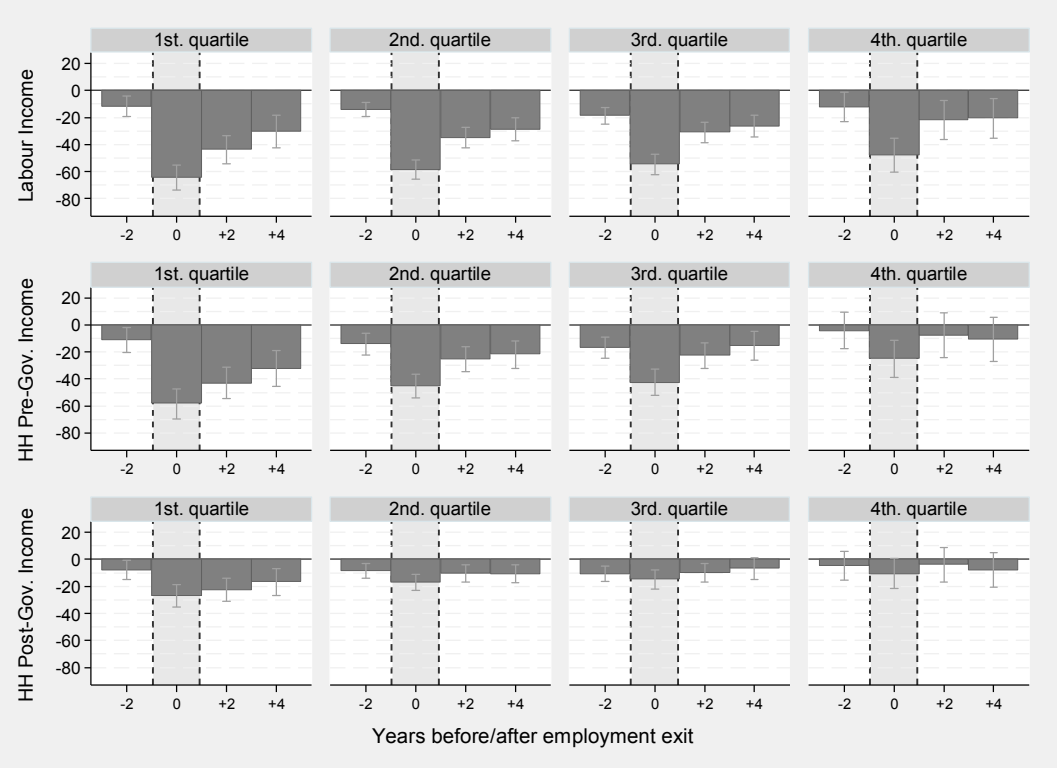
Table A4.2 *Individual characteristics comparing those always employed and those that have experienced at least an episode of non-employment, United States*

	Men									
	Always employed					With non-employment experience				
	1st.	2nd.	3rd.	4th.	Total	1st.	2nd.	3rd.	4th.	Total
Age	36.73	37.36	37.89	40.00	38.60	36.01	37.59	38.44	40.53	37.92
Race										
White	0.45	0.60	0.73	0.83	0.73	0.39	0.53	0.67	0.79	0.58
Black	0.52	0.34	0.23	0.13	0.23	0.56	0.40	0.29	0.15	0.37
Other	0.02	0.07	0.04	0.04	0.04	0.05	0.08	0.04	0.06	0.05
Education										
Less than H.S.	0.28	0.20	0.08	0.03	0.09	0.29	0.19	0.08	0.02	0.16
High School	0.48	0.48	0.45	0.22	0.36	0.48	0.48	0.38	0.24	0.41
More than H.S.	0.23	0.32	0.47	0.75	0.54	0.23	0.33	0.54	0.73	0.43
With partner	0.53	0.80	0.89	0.93	0.87	0.47	0.76	0.85	0.90	0.73
HH size	2.61	3.32	3.41	3.51	3.38	2.50	3.28	3.28	3.37	3.07
Mean labour income	25110	38499	52497	90053	63914	21596	34363	47472	77149	43454
Unemployed						0.24	0.14	0.12	0.10	0.16
Individuals	300	785	1257	1514	3856	347	270	236	185	1038
Episodes						827	430	339	239	1835
Person years	2772	7746	13778	17664	41960	3436	3003	2928	2317	11684

	Women									
	Always employed					With non-employment experience				
	1st.	2nd.	3rd.	4th.	Total	1st.	2nd.	3rd.	4th.	Total
Age	38.09	38.03	38.02	39.59	38.61	37.57	36.98	38.09	39.32	37.88
Race										
White	0.39	0.53	0.67	0.81	0.66	0.26	0.45	0.60	0.77	0.48
Black	0.58	0.44	0.28	0.14	0.30	0.71	0.53	0.34	0.18	0.48
Other	0.03	0.03	0.04	0.05	0.04	0.03	0.02	0.06	0.05	0.04
Education										
Less than H.S.	0.17	0.10	0.06	0.02	0.07	0.21	0.10	0.04	0.01	0.11
High School	0.49	0.46	0.40	0.28	0.38	0.51	0.41	0.40	0.29	0.42
More than H.S.	0.34	0.44	0.54	0.70	0.55	0.28	0.49	0.55	0.70	0.47
With partner	0.29	0.53	0.81	0.92	0.73	0.21	0.50	0.81	0.90	0.55
HH size	2.65	3.03	3.30	3.37	3.20	2.80	2.95	3.47	3.44	3.11
Mean labour income	21095	29801	33981	47832	36723	17883	26462	29634	42662	27707
Unemployed						0.21	0.14	0.11	0.12	0.15
Individuals	426	848	1074	1258	3606	342	228	204	165	939
Episodes						726	337	262	229	726
Person years	3989	8283	11096	13511	36879	3510	2475	2299	1973	10257

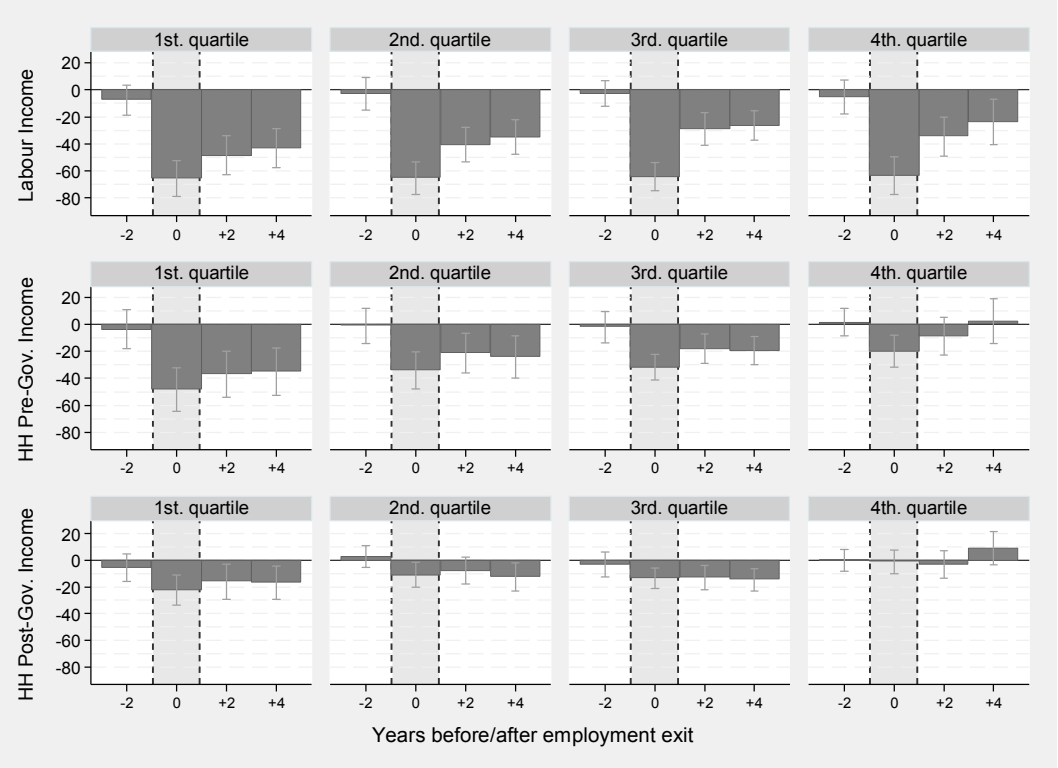
Note: Mean labour income refers to employed individuals only
Sources: *CNEF-PSID data, author's calculation*

Figure A4.1 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, men. Selected sample, only those who are observed at least 10 years, 3 random years*



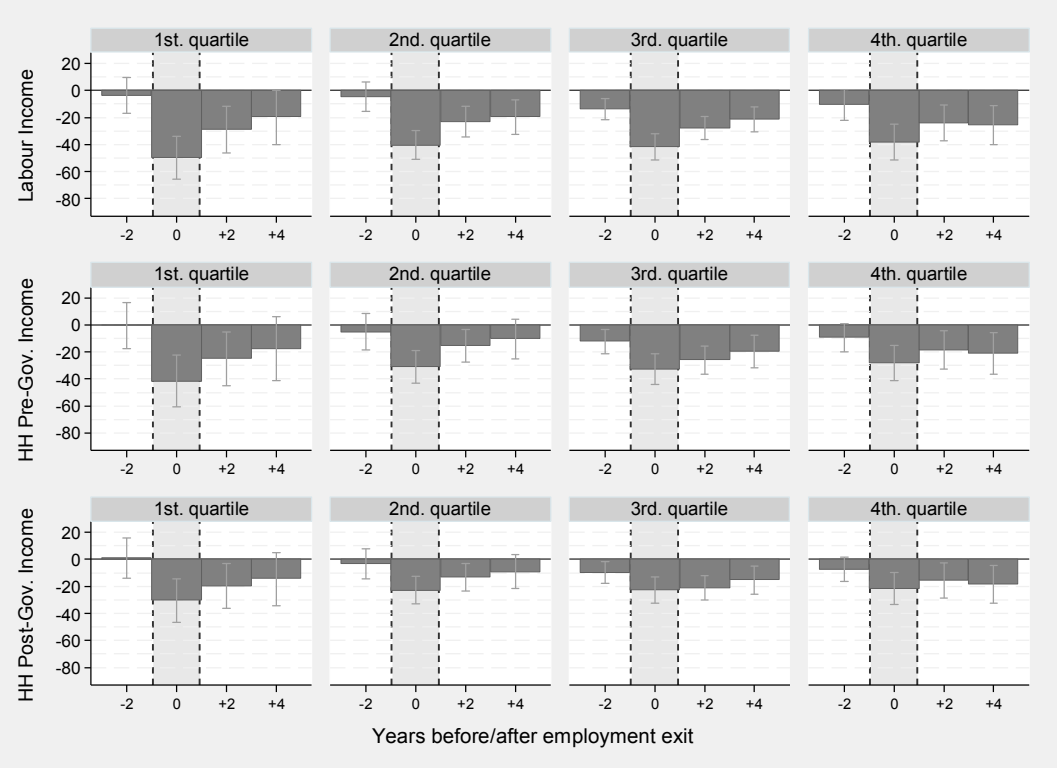
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Figure A4.2 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, women. Selected sample, only those who are observed at least 10 years, 3 random years*



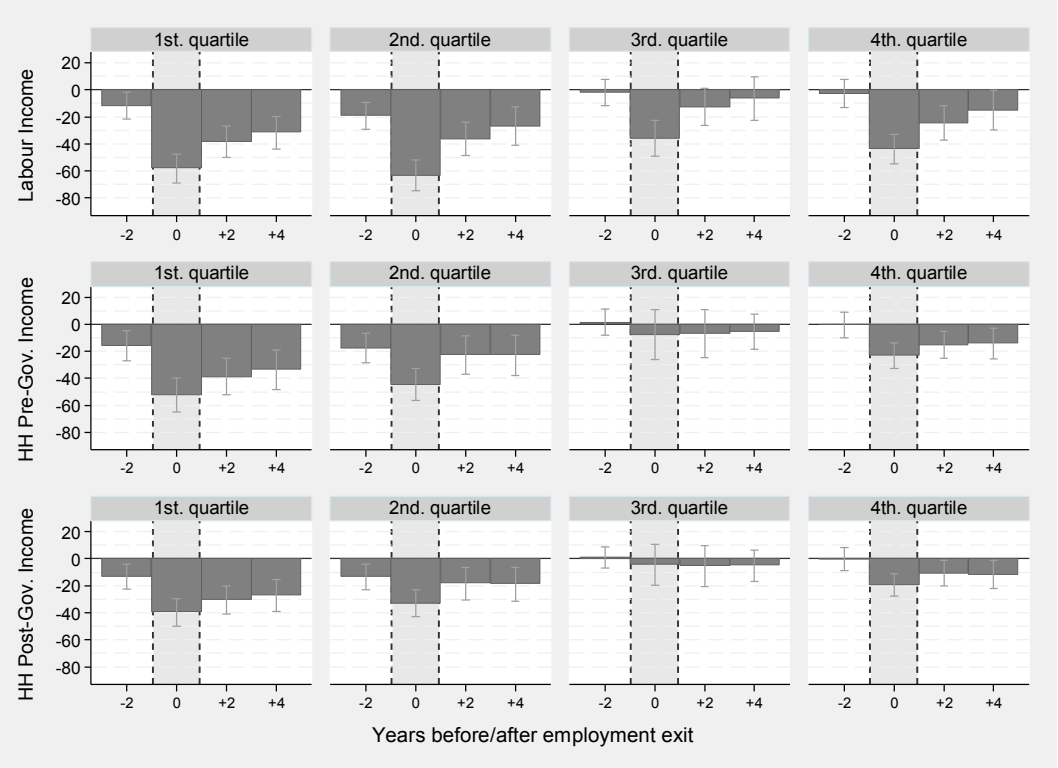
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Figure A4.3 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, men. Selected sample, only those who are observed at least 10 years, 3 random years*



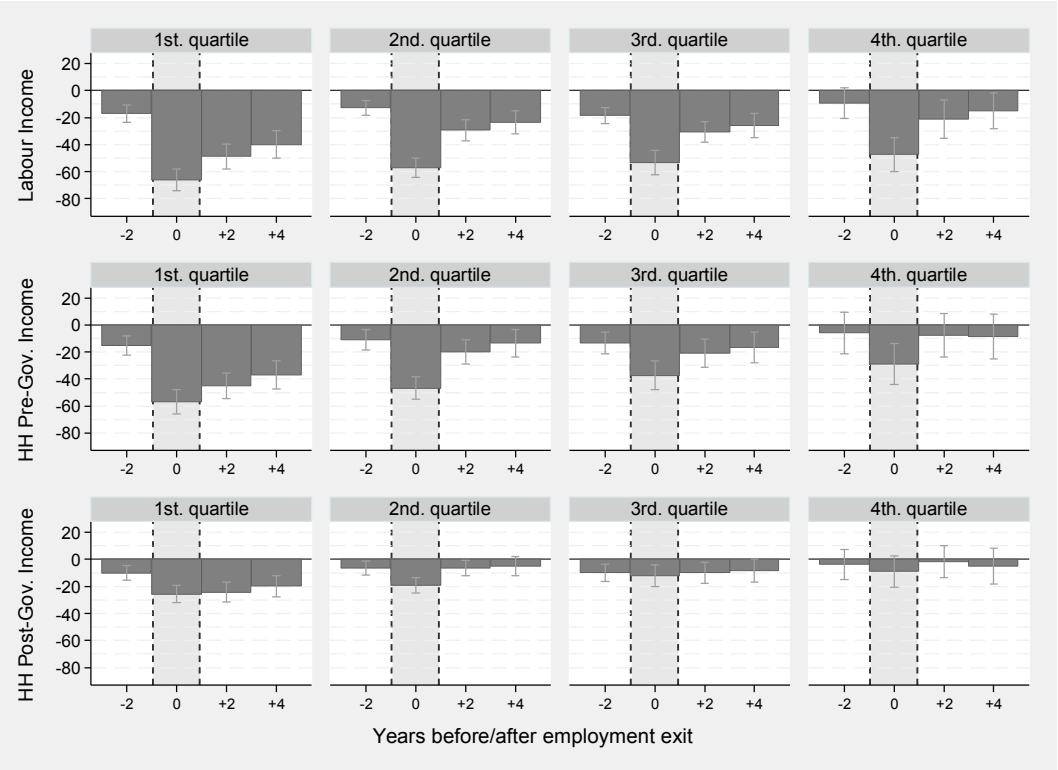
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.4 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, women. Selected sample, only those who are observed at least 10 years, 3 random years*



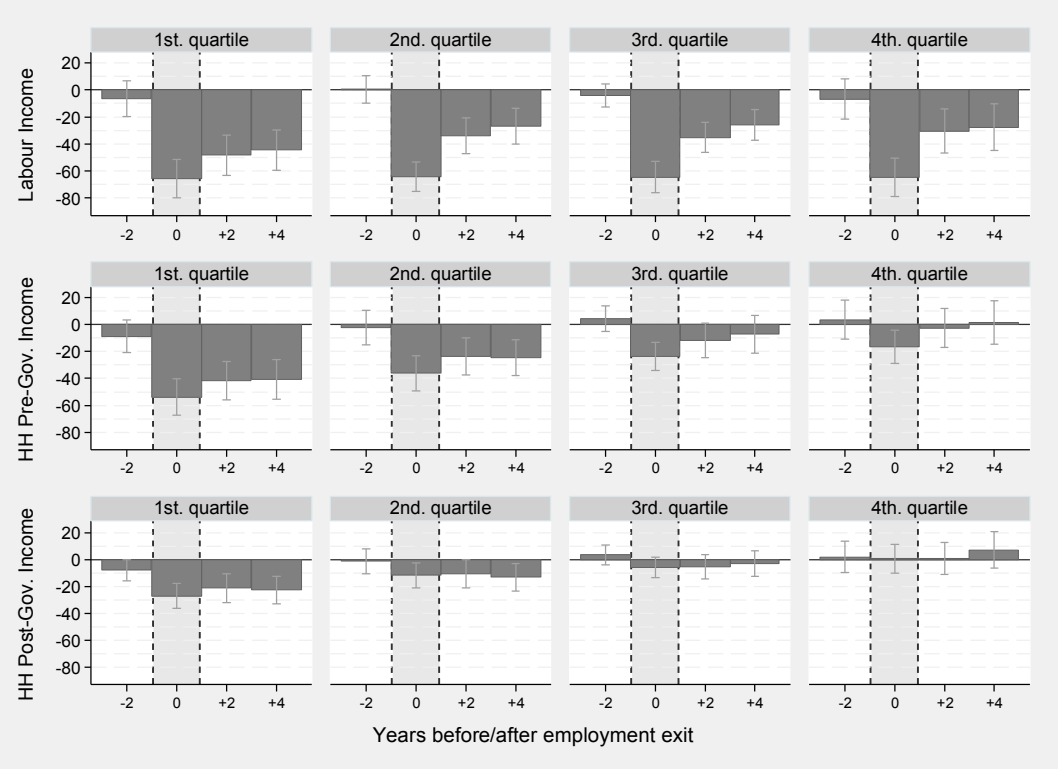
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.5 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, men. Selected sample, only those who are observed at least 10 years, 5 random years*



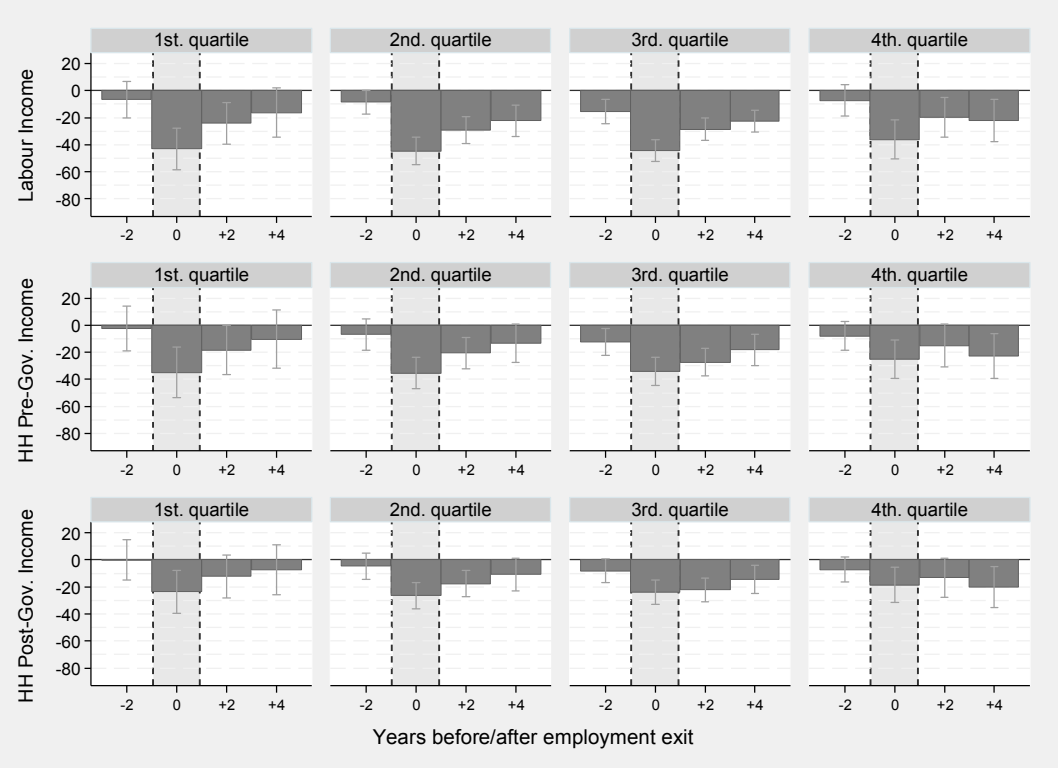
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.6 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, women. Selected sample, only those who are observed at least 10 years, 5 random years*



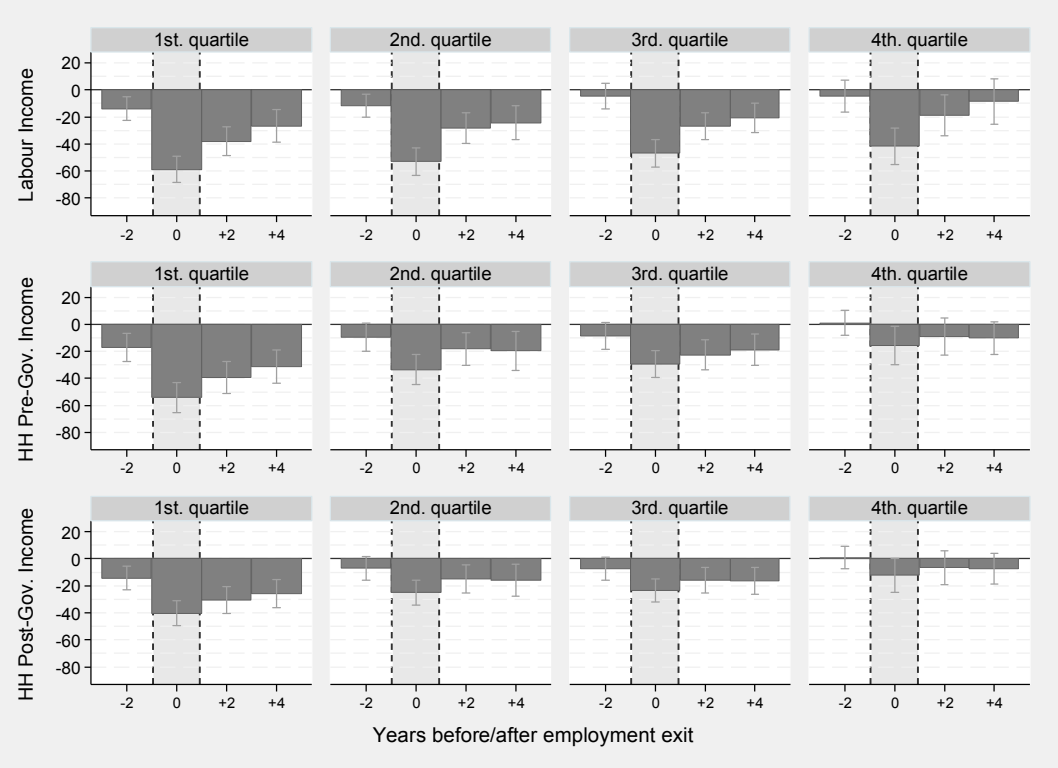
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.7 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, men. Selected sample, only those who are observed at least 10 years, 5 random years*



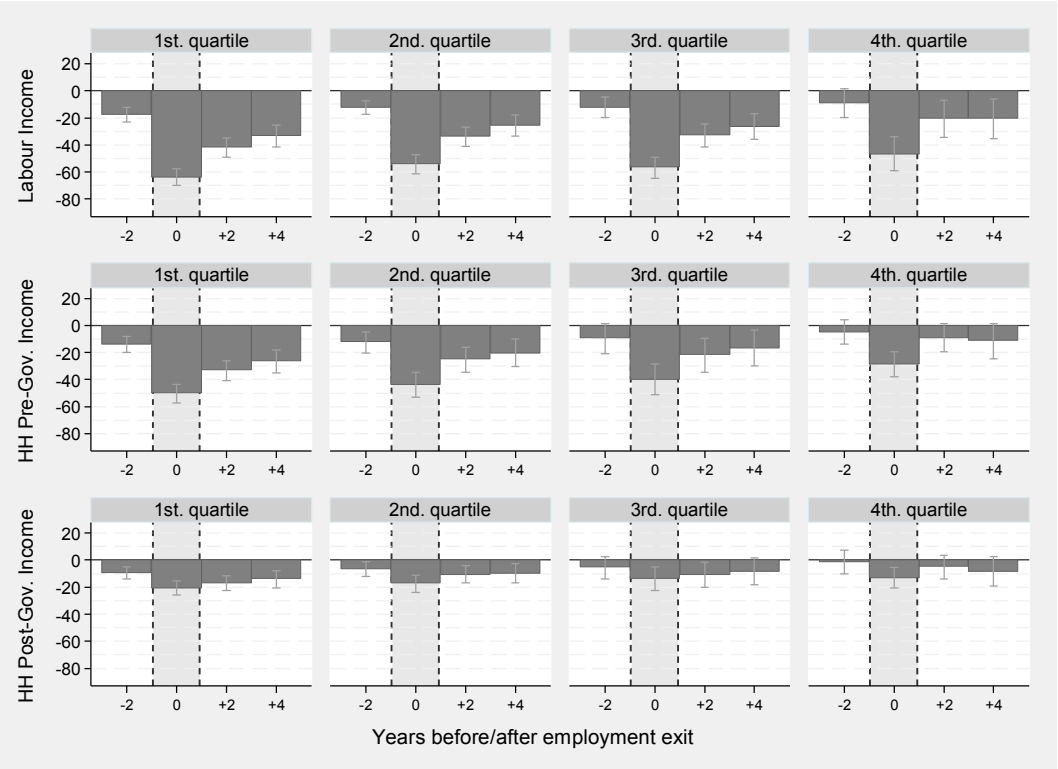
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.8 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, women. Selected sample, only those who are observed at least 10 years, 5 random years*



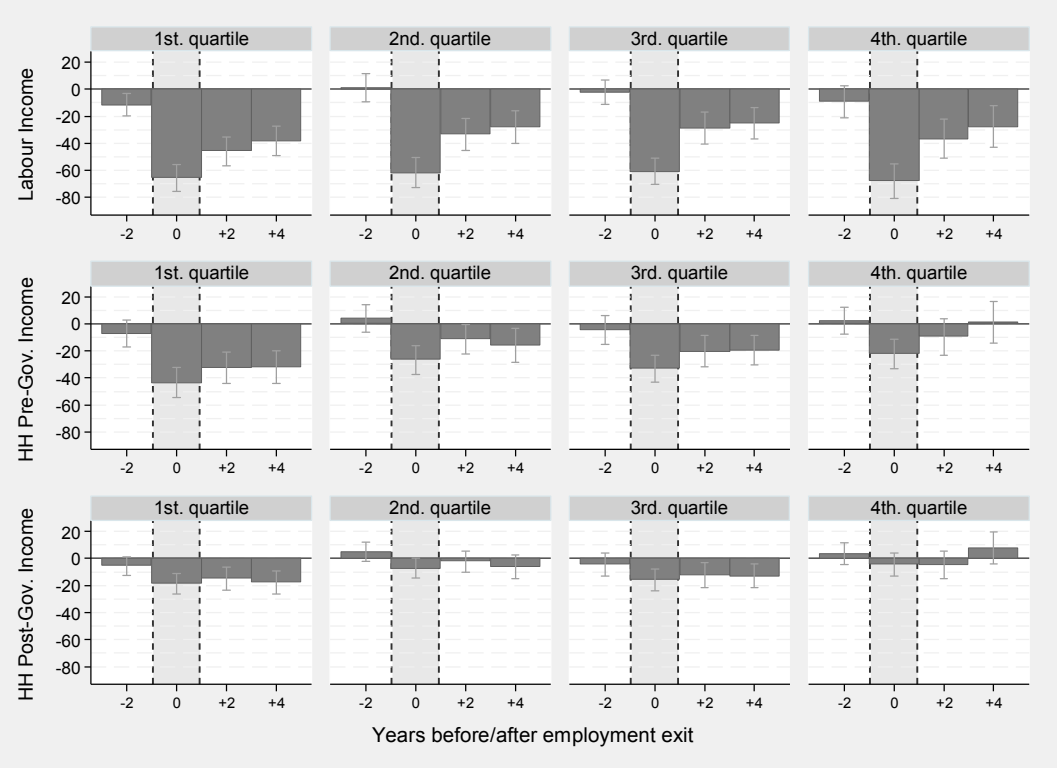
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.9 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, men. Social stratification based on years of employment only*



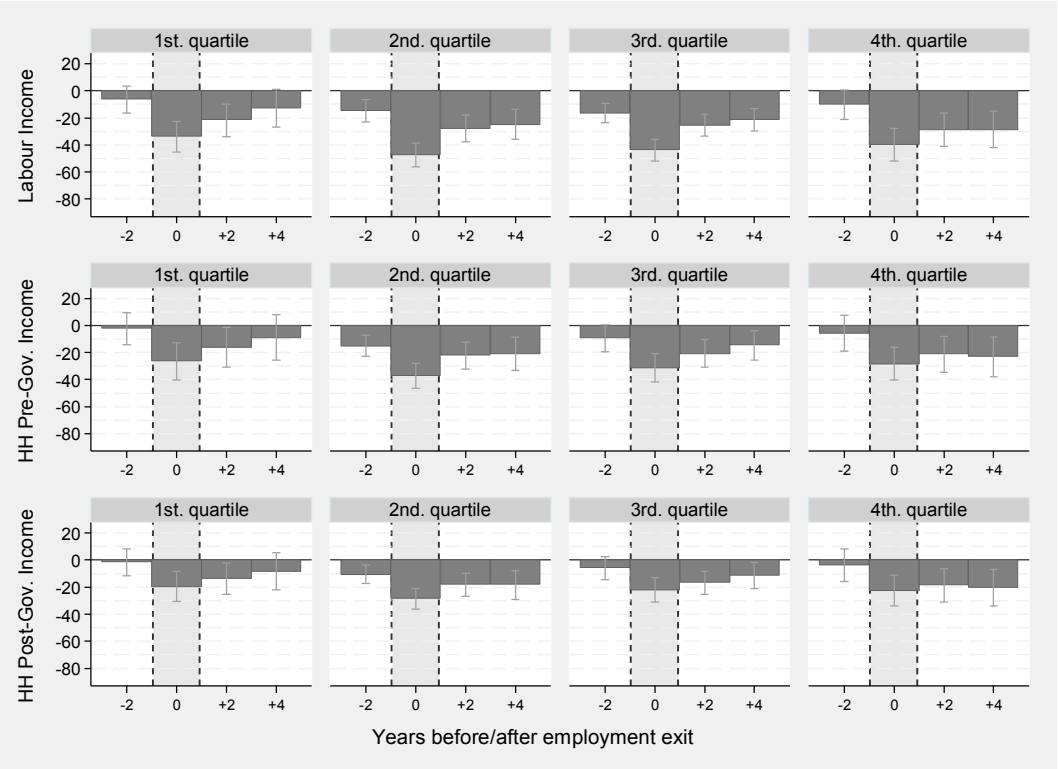
Sources: *estimates based on CNEF- GSOEP data, author's calculation*

Figure A4.10 *Estimated income trajectories for different income concepts at different points in time, by social strata. Germany, women. Social stratification based on years of employment only*



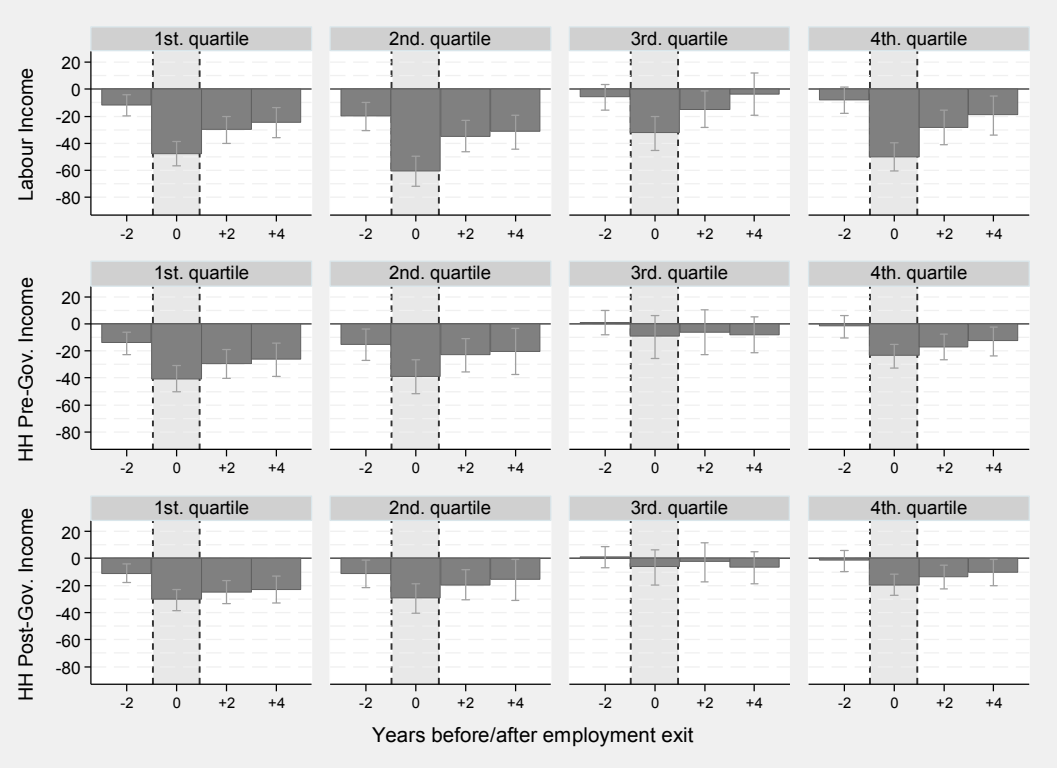
Sources: *estimates based on CNEF- GSOEP data, author's calculation*

Figure A4.11 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, men. Social stratification based on years of employment only*



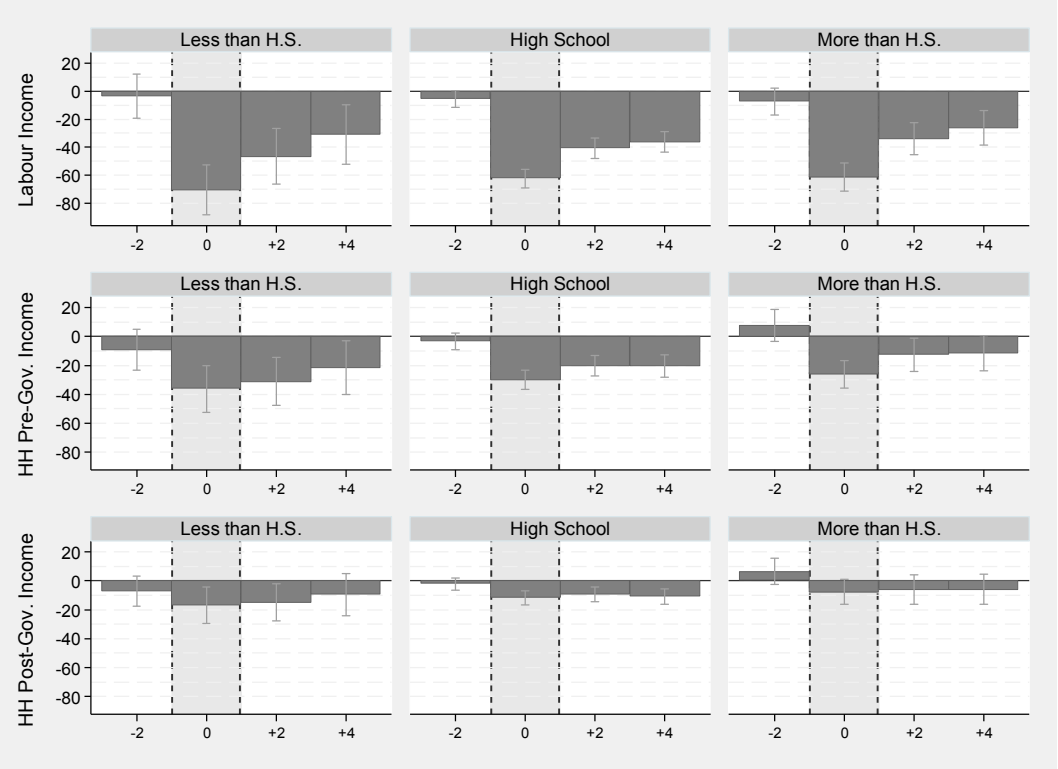
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.12 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, men. Social stratification based on years of employment only*



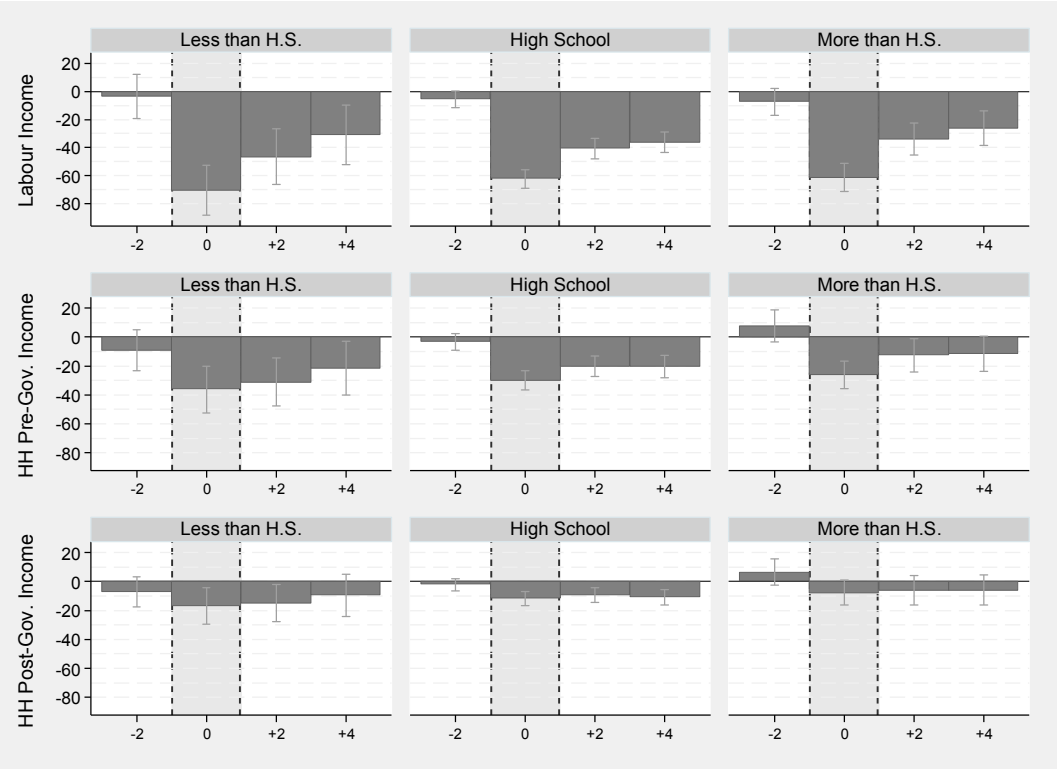
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.13 *Estimated income trajectories for different income concepts at different points in time, by education. Germany, men.*



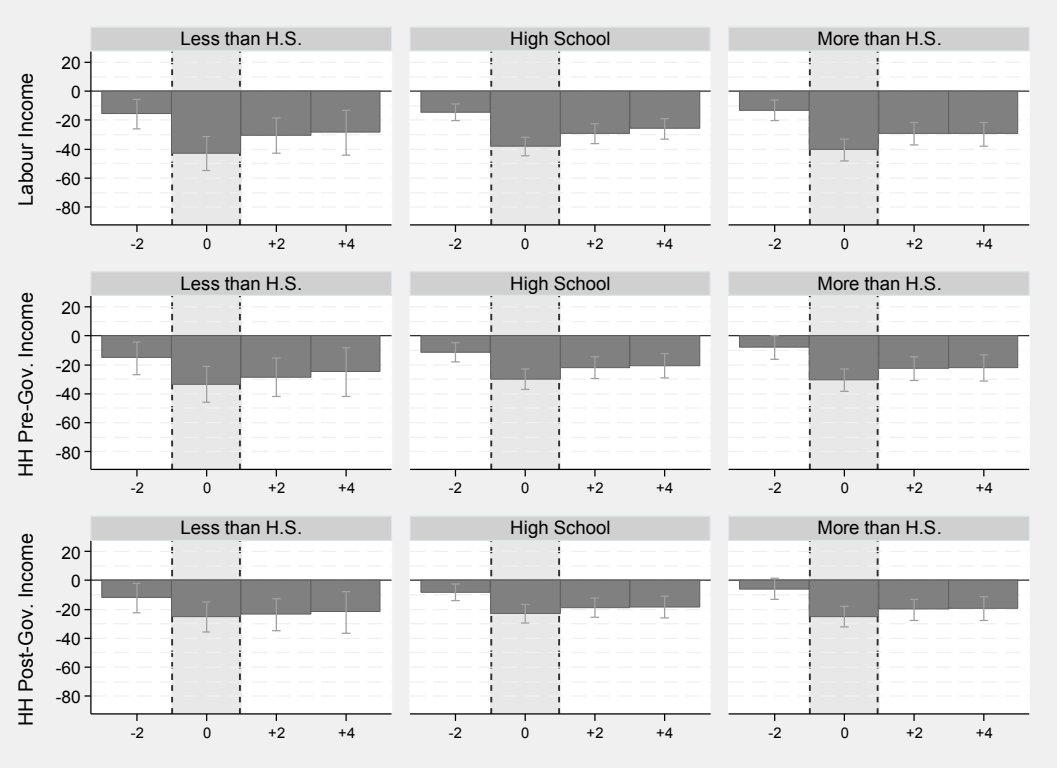
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Figure A4.14 *Estimated income trajectories for different income concepts at different points in time, by education. Germany, women.*



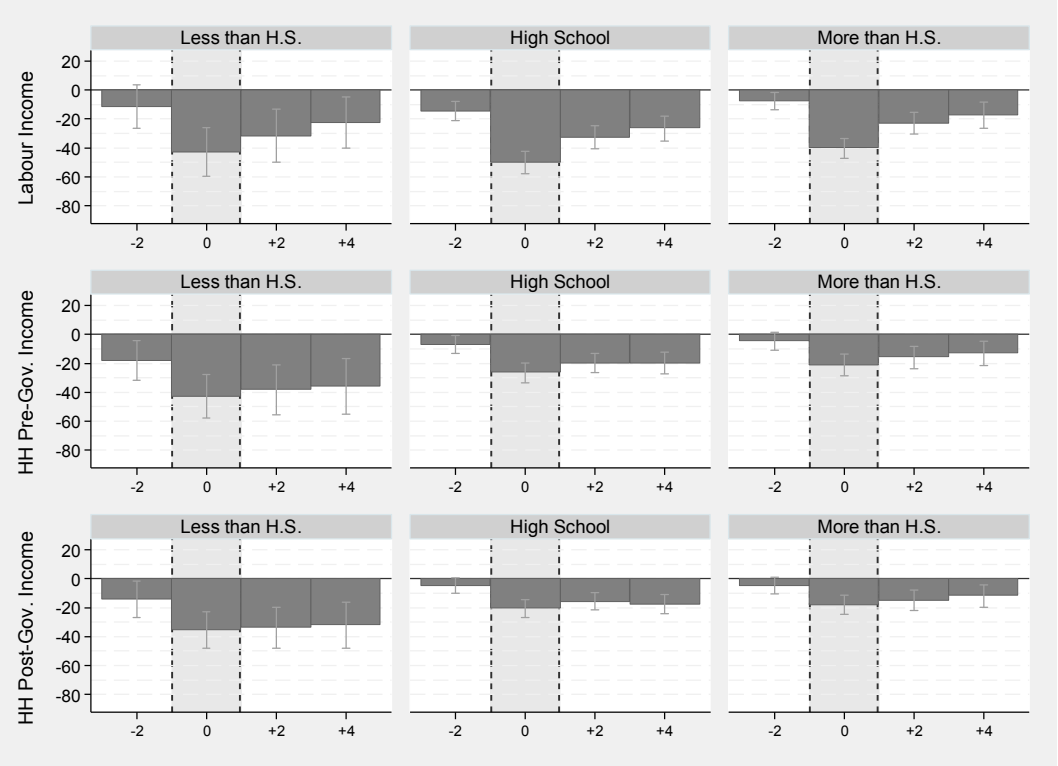
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Figure A4.15 *Estimated income trajectories for different income concepts at different points in time, by education. United States, men.*



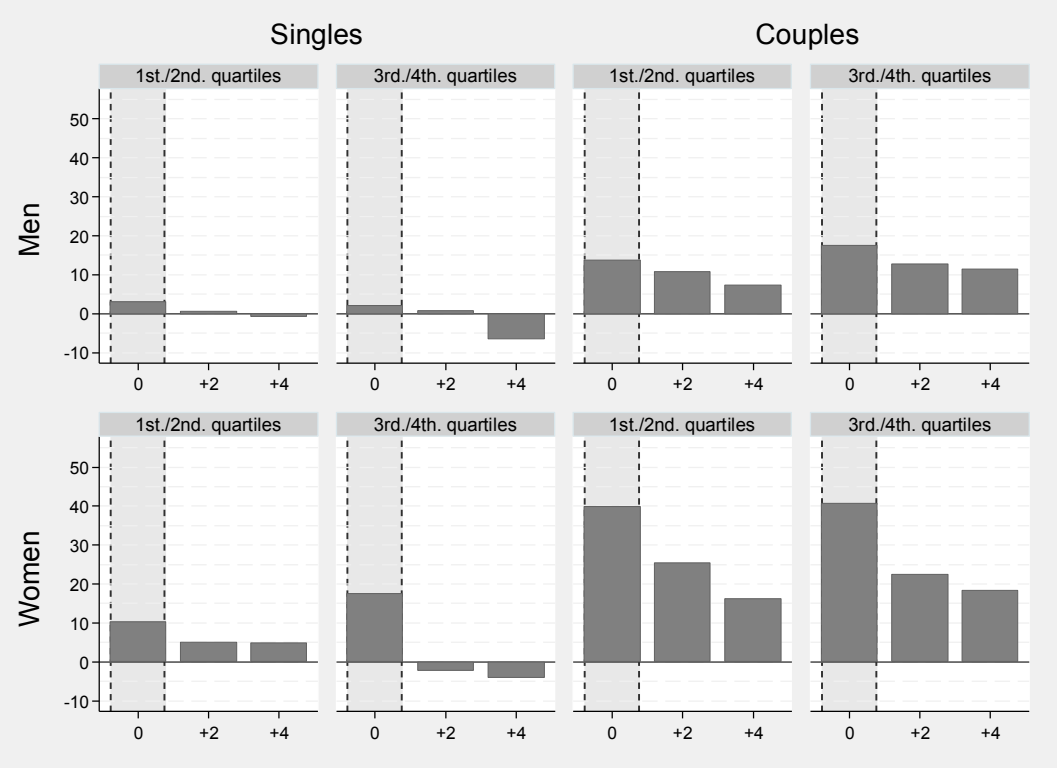
Sources: *estimates based on CNEF- PSID data, author's calculation*

Figure A4.16 *Estimated income trajectories for different income concepts at different points in time, by education. United States, women.*



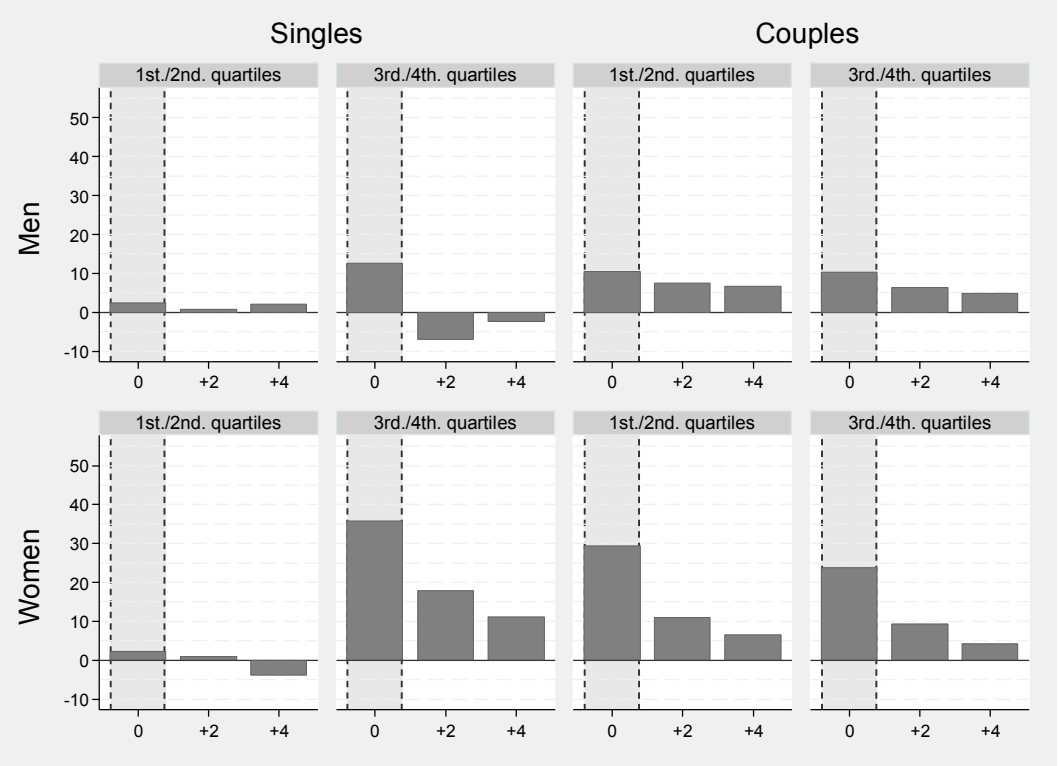
Sources: *estimates based on CNEF-PSID data, author's calculation*

Figure A4.17 *Household buffer at different points in time, by social strata and living arrangement. Germany, men and women*



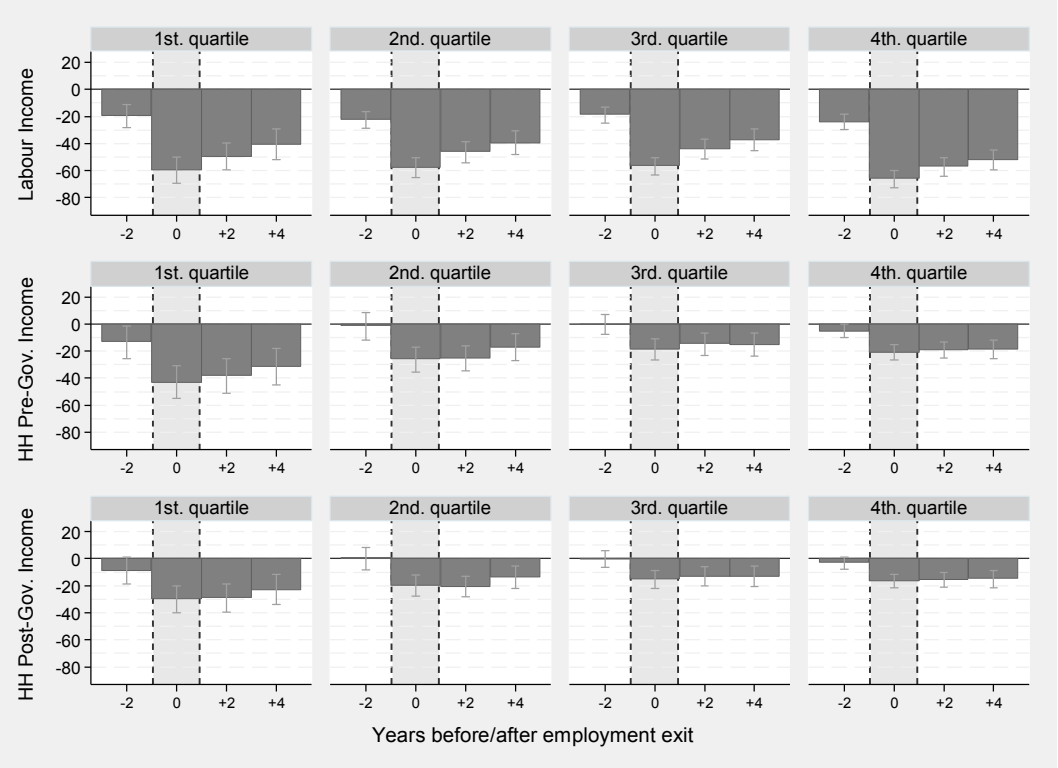
Sources: *estimates based on CNEF-GSOEP data, author's calculation*

Figure A4.18 *Household and Welfare State buffer at different points in time, by social strata and living arrangement. United States, men and women*



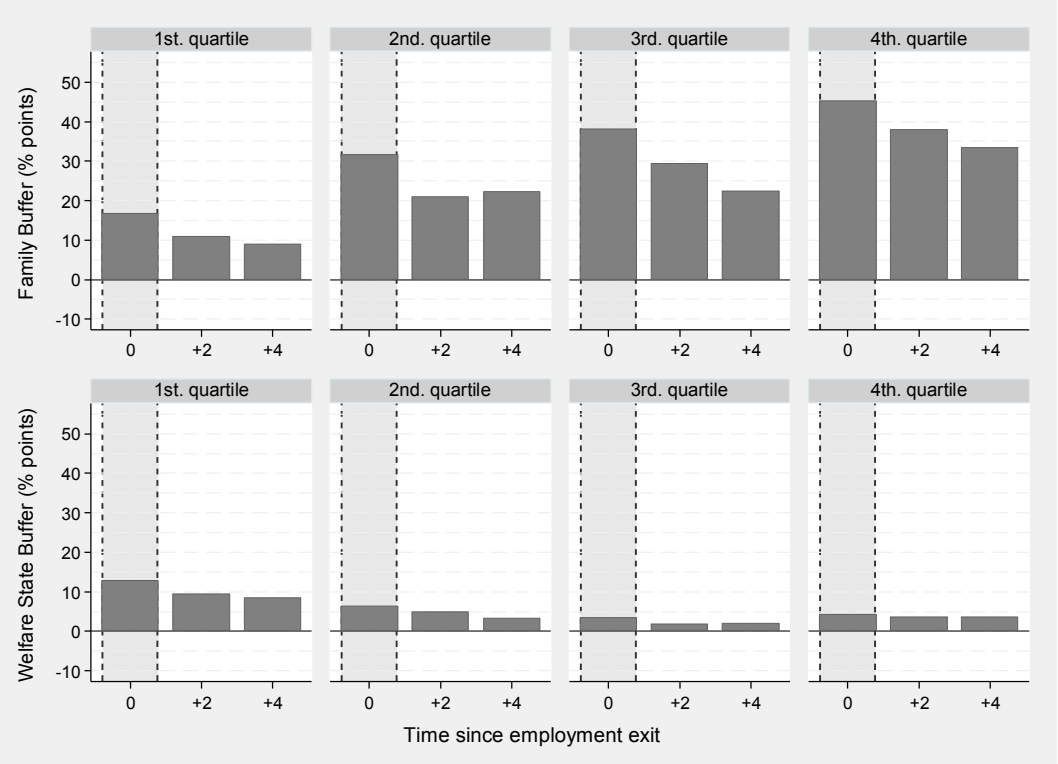
Sources: *estimates based on CNEF-PSID data, author's calculation*

Figure A4.19 *Estimated income trajectories for different income concepts at different points in time, by social strata. United States, employment exit, women*



Sources: *estimates based on CNEF-PSID data, author's calculation*

Figure A4.20 *Household and Welfare State buffer at different points in time, by social strata. United States, employment exit, women*



Sources: *estimates based on CNEF-PSID data, author's calculation*

Table A4.3 *Probability to experience an unemployment event. Dynamic random effects probit model*

	Germany		United States	
	Men	Women	Men	Women
$Employment_{t0}$	0.801***	0.651***	0.470***	0.426***
$Employment_{t-1}$	0.996***	1.047***	0.564***	0.637***
Social strata (ref. 1st. Q.)				
2nd. Q.	-0.628***	-0.518***	-0.578***	-0.470***
3rd. Q.	-0.893***	-0.754***	-0.858***	-0.588***
4th. Q.	-1.327***	-1.020***	-1.035***	-0.660***
With partner	0.022	-0.069	-0.134*	-0.168**
Age	-0.046	-0.051	-0.012	0.006
Age square	0.073*	0.076*	0.011	-0.009
Education (ref. Low)				
Medium	-0.290***	-0.240**	-0.002	-0.103
High	-0.540***	-0.486***	-0.023	-0.144*
N. of children younger than 14 (ref. No child)				
1	-0.097*	0.112	0.042	0.102*
2+	-0.113	0.172*	0.063	0.118*
Nonwhite			0.155***	0.190***
Period (ref. 1984-1989)				
1990-1994	-0.332***	0.071	0.111*	0.175**
1995-1999	-0.139	0.013	-0.074	0.016
2000-2004	-0.07	-0.06	0.201	0.041
2005-2007/10	-0.172	-0.154	0.023	0.077
Constant	-1.321**	-0.623	-1.029*	-1.348**
lnsig2u				
Constant	-0.626***	-0.497***	-1.202***	-1.318***
Statistics				
N obs.	55146	39431	48694	42805
N groups	5366	4137	4830	4509
Log-Likelihood	-7.00E+03	-6.00E+03	-6.50E+03	-5.90E+03

Legend: * p<.05; ** p<.01; *** p<.001

Note: models also control for averages and t_0 of time-varying covariates (Partner, Age, Child, Period), and Lander for Germany. Robust Standard Errors

Source: *CNEF-GSOEP/PSID data, author's calculation*

Table A4.4 *Distributed fixed-effects estimates. Labour income by social strata. Germany, Men*

	Labour income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-1526	-2019**	-2410*	-72
-3	-2377*	-3102***	-3564**	-1889
-2	-3098***	-4236***	-6654***	-5010
-1	-7958***	-9583***	-11067***	-10719**
Event	-16316***	-18933***	-21744***	-29996***
1	-13334***	-14337***	-14266***	-23123***
2	-11255***	-11612***	-12914***	-14074***
3	-10340***	-9741***	-10689***	-15445***
4	-8262***	-9040***	-10631***	-12921**
5+	-6956***	-8854***	-10653***	-12146**
With partner	818	621	2001**	2843*
N. of children younger than 14 (ref. No child)				
1	-244	619	612	1643**
2+	747	1434***	1440***	2168**
Age	1413***	1758***	2666***	6377***
Age square	-16***	-17***	-25***	-60***
Constant	-6860	-12840**	-31743***	-108046***
N obs.	8960	15647	18162	17488
N groups	878	1411	1527	1563
R^2 Within	0.16	0.14	0.18	0.23

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.5 *Distributed fixed-effects estimates. Household Pre Government income by social strata. Germany, Men*

	Household Pre Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-764	-2384**	-1656	1540
-3	-2304*	-2808***	-2789*	-1931
-2	-2815**	-3227***	-4212***	-1211
-1	-6121***	-5635***	-6816***	-3841
Event	-12559***	-10971***	-12113***	-13009***
1	-10273***	-8340***	-7621***	-7526*
2	-9144***	-6321***	-6802***	-4399
3	-8778***	-5435***	-5233**	-5874
4	-7260***	-5341***	-5000***	-5258
5+	-6006***	-5561***	-4133**	-3435
With partner	-3040***	-5400***	-6531***	-13071***
N. of children younger than 14 (ref. No child)				
1	-3492***	-4363***	-5102***	-4475***
2+	-4781***	-5985***	-6271***	-6388***
Age	1130**	608*	228	1963***
Age square	-12**	-4.5	1.1	-13**
Constant	-812	14151**	26096***	-4269
N obs.	8960	15647	18162	17488
N groups	878	1411	1527	1563
R^2 Within	0.13	0.13	0.15	0.18

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.6 *Distributed fixed-effects estimates. Household Post Government income by social strata. Germany, Men*

	Household Post Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	72	-904*	-573	587
-3	-938	-1273**	-1195	-1455
-2	-1371*	-1277**	-1913***	-379
-1	-1451*	-1188*	-1927**	-1118
Event	-3999***	-2926***	-3050***	-4048**
1	-3585***	-2717***	-2339***	-2658
2	-3393***	-2003***	-2255**	-1804
3	-3366***	-1643**	-1551	-3023
4	-2747***	-1868**	-1656*	-2468
5+	-2512**	-1903*	-1318	-1803
With partner	-1697***	-2781***	-3896***	-6826***
N. of children younger than 14 (ref. No child)				
1	-1523***	-2080***	-2385***	-1812***
2+	-2290***	-2860***	-2848***	-2548***
Age	665**	357**	97	1287***
Age square	-6.8*	-2.3	1.5	-8.2**
Constant	2155	10662***	18757***	-4228
N obs.	8960	15647	18162	17488
N groups	878	1411	1527	1563
R^2 Within	0.08	0.10	0.13	0.19

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.7 *Distributed fixed-effects estimates. Labour income by social strata. Germany, Women*

	Labour income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-877	885	966	-1104
-3	-1292	-294	284	-2395
-2	-2587*	-536	-587	-2474
-1	-6482***	-5289***	-5986***	-8589***
Event	-13724***	-13509***	-14804***	-18794***
1	-10849***	-10290***	-9261***	-11577***
2	-9958***	-8407***	-7517***	-10112***
3	-9439***	-7518***	-6964***	-7120**
4	-8578***	-7189***	-6271***	-7300**
5+	-7648***	-6161***	-4989***	-6160*
With partner	134	-1200**	-1474*	-1273
N. of children younger than 14 (ref. No child)				
1	-242	-1113**	-1908***	-2376***
2+	-219	-2361***	-2638***	-2742***
Age	1862***	1391***	1380***	1965***
Age square	-17***	-13***	-12***	-17***
Constant	-27211***	-13557**	-11138*	-22791***
N obs.	7686	10352	12157	12937
N groups	807	1003	1127	1207
R^2 Within	0.16	0.15	0.14	0.13

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.8 *Distributed fixed-effects estimates. Household Pre Government income by social strata. Germany, Women*

	Household Pre Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-462	89	-735	-626
-3	-461	-1421	-905	1679
-2	-1398	-759	-1018	1498
-1	-5084***	-3843**	-4190**	-895
Event	-10207***	-8724***	-9410***	-8553***
1	-8347***	-6382***	-5727***	-4158
2	-7885***	-5481***	-5438***	-3518
3	-7589***	-5435***	-5008***	-972
4	-7516***	-5948***	-5887***	466
5+	-5973**	-5941***	-3905*	1837
With partner	2824***	1150	1964	3376*
N. of children younger than 14 (ref. No child)				
1	-268	-1209*	-1625***	-1877**
2+	-350	-2057**	-1295*	-1403
Age	1813***	738*	1030***	1429**
Age square	-16***	-5.1	-6.2	-6.5
Constant	-26060***	3424	-4413	-9961
N obs.	7686	10352	12157	12937
N groups	807	1003	1127	1207
R^2 Within	0.09	0.05	0.08	0.10

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.9 *Distributed fixed-effects estimates. Household Post Government income by social strata. Germany, Women*

	Household Post Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-197	271	-625	-876
-3	-261	-334	-828	863
-2	-806	159	-836	1026
-1	-1249	-359	-1061	1661
Event	-3136***	-2097**	-2954***	-876
1	-2529**	-1623*	-2081**	-412
2	-2239*	-1532	-2419**	-1054
3	-2120*	-1615*	-2369**	349
4	-2552**	-2091*	-2949***	1885
5+	-1830	-2125*	-2045*	2624
With partner	1259***	246	995	2168*
N. of children younger than 14 (ref. No child)				
1	301	-18	-299	-112
2+	88	-206	214	783
Age	1429**	944***	324*	215
Age square	-6.5	-7.9***	-0.65	2.2
Constant	-9961	-9630*	6381	6774*
N obs.	12937	7686	10352	12157
N groups	1207	807	1003	1127
R^2 Within	0.10	0.05	0.05	0.10

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-GSOEP data, author's calculation*

Table A4.10 *Distributed fixed-effects estimates. Labour income by social strata. United States, Men*

	Labour income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	1367	-1102	-1990	-3497
-3	-1981	-2633	-3318	-2017
-2	-1969	-5597**	-9093***	-9015
-1	-6916***	-7842***	-12213***	-14371**
Event	-11797***	-16730***	-23923***	-37129***
1	-9308***	-12360***	-20222***	-26608***
2	-7700***	-9008***	-15159***	-25869***
3	-7678***	-8205***	-11324***	-25840***
4	-5195*	-9019***	-12158***	-24799***
5+	-4704	-7177**	-8782**	-24338***
With partner	1280	965	-33	5725*
N. of children younger than 14 (ref. No child)				
1	156	246	546	4246***
2+	1836	1121	1203	5139**
Age	683	6743*	646	11489**
Age square	-13	-45***	-52***	-105***
Constant	13969	-122450	67523	-195338
N obs.	6208	10749	16706	19981
N groups	647	1055	1493	1699
R^2 Within	0.06	0.06	0.10	0.15

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

Table A4.11 *Distributed fixed-effects estimates. Household Pre Government income by social strata. United States, Men*

	Household Pre Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	1151	-1584	-2196	-3198
-3	-836	-1149	-2993*	1040
-2	-1250	-3627*	-5081**	-3669
-1	-4348**	-4602**	-6659**	-11376**
Event	-9020***	-9777***	-13565***	-17408***
1	-7337***	-7261***	-13585***	-16284***
2	-6088***	-4219*	-10470***	-13230**
3	-5772**	-4092*	-7301**	-14165***
4	-4432*	-4057	-8772***	-13127**
5+	-3994	-3400	-5626*	-12670**
With partner	-2258*	-5220***	-9182***	-12883***
N. of children younger than 14 (ref. No child)				
1	-3587***	-4926***	-6091***	-6837***
2+	-4246***	-7478***	-8134***	-11038***
Age	-346	4909*	183	2612
Age square	-12	-24***	-12*	-22**
Constant	41742	-85464	51861	11289
N obs.	6208	10749	16706	19981
N groups	647	1055	1493	1699
R^2 Within	0.07	0.08	0.12	0.13

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

Table A4.12 *Distributed fixed-effects estimates. Household Post Government income by social strata. United States, Men*

	Household Post Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	908	-952	-1230	-1343
-3	-309	-558	-1786	955
-2	-643	-2129	-2698*	-1595
-1	-2615*	-2699*	-3363*	-6480**
Event	-5786***	-5996***	-7289***	-9374***
1	-5055***	-4567***	-8640***	-10045***
2	-4262***	-2737*	-6665***	-8020**
3	-3937**	-3039*	-4264*	-8428**
4	-3032*	-2950*	-5499***	-8138*
5+	-2626	-2571	-3812*	-7797**
With partner	-2027**	-4084***	-6633***	-9398***
N. of children younger than 14 (ref. No child)				
1	-2246***	-3252***	-4075***	-4085***
2+	-2681***	-5137***	-5416***	-6757***
Age	-672	2892	-220	1046
Age square	-9	-15***	-6	-10
Constant	44207	-43083	46767	25977
N obs.	6208	10749	16706	19981
N groups	647	1055	1493	1699
R^2 Within	0.07	0.09	0.13	0.16

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

Table A4.13 *Distributed fixed-effects estimates. Labour income by social strata. United States, Women*

	Labour income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-1759	-458	157	2628
-3	-1083	-2455*	270	1041
-2	-2643**	-6494***	-2162	-2780
-1	-5142***	-6637***	-2554	-9431***
Event	-11622***	-18402***	-10926***	-22950***
1	-7839***	-11397***	-7372***	-11358***
2	-7786***	-11213***	-4399*	-12875***
3	-6860***	-7351***	-3183	-6429*
4	-6786***	-7562***	-2924	-8484*
5+	-4975***	-8075***	-2911	-2629
With partner	-672	-1715**	-3033***	-913
N. of children younger than 14 (ref. No child)				
1	-102	-474	-1672***	-3232***
2+	-1195	-716	-1456*	-5926***
Age	2596*	2619	1481	4286
Age square	-17***	-20***	-20***	-45***
Constant	-42909	-34521	2297	-51901
N obs.	7499	10758	13395	15484
N groups	768	1076	1278	1423
R^2 Within	0.12	0.15	0.1	0.16

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

Table A4.14 *Distributed fixed-effects estimates. Household Pre Government income by social strata. United States, Women*

	Household Pre Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-2546**	932	-119	851
-3	-880	-1648	1325	1906
-2	-3577***	-4021*	425	-2078
-1	-6084***	-4486*	582	-8387**
Event	-10273***	-11860***	-2463	-14928***
1	-7774***	-6195**	-3570	-12006***
2	-8364***	-7373***	-1972	-10804***
3	-7981***	-2759	-2668	-9077*
4	-7481***	-6545**	-630	-10430**
5+	-7020***	-6758**	-1805	-8162
With partner	3335***	3662***	1833	6566***
N. of children younger than 14 (ref. No child)				
1	-1739**	-2633***	-3206***	-4731***
2+	-2300***	-3295***	-3525***	-6967***
Age	1975	2593	-63	-698
Age square	-10*	-11*	6	5
Constant	-33128	-40288	32614	66357
N obs.	7499	10758	13395	15484
N groups	768	1076	1278	1423
R^2 Within	0.09	0.07	0.06	0.11

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

Table A4.15 *Distributed fixed-effects estimates. Household Post Government income by social strata. United States, Women*

	Household Post Government income			
	1st. Q.	2nd. Q.	3rd. Q.	4rt. Q.
T (ref. -5+)				
-4	-2066**	1006	-64	933
-3	-895	-1293	719	1632
-2	-2446***	-2511	420	-1261
-1	-4105***	-2644*	647	-4507*
Event	-7088***	-7200***	-1028	-8679***
1	-5428***	-3923**	-1998	-7433***
2	-6204***	-4990***	-1046	-5655**
3	-5754***	-1331	-1723	-5817*
4	-5613***	-4457**	-450	-5934*
5+	-5192***	-4337**	-1261	-5081
With partner	1629**	1612**	617	2755*
N. of children younger than 14 (ref. No child)				
1	-789	-1429**	-1952***	-2697***
2+	-1124*	-1972***	-2138***	-4039***
Age	1159	2032	-9	-1011
Age square	-7*	-7*	7*	9
Constant	-13713	-31665	22395	58361
N obs.	7499	10758	13395	15484
N groups	768	1076	1278	1423
R^2 Within	0.08	0.08	0.08	0.14

Legend: * p<.05; ** p<.01; *** p<.001
Note: year fixed-effects included. Robust Standard Errors
Source: *CNEF-PSID data, author's calculation*

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Xtpdyn: estimating Wooldridge's initial condition and dynamic random probit models. Disentangling the role of state dependence and unobserved heterogeneity in accounting for the persistence of positive dichotomous outcomes.

INTRODUCTION

Dynamic random effects models are increasingly employed in the literature concerned with persistence of dichotomous outcomes. The general aim of dynamic specification of probit and logit models is to allow for the identification of state-dependence processes, modelled as a *t*-1 lag in the outcome and representing the amount of inertia in previous statuses of a binary response variable. Nonetheless, the identification of state dependence by a simple inclusion of lags in the dependent variable rests on the assumption of no unobserved heterogeneity correlated with the response variable. Nonetheless, if solely *t*-1 lag of response variable is included among independent variables, it is not possible disentangling true state dependence effects and, if any, the role played by unobserved factors associated with the outcome.
A first contribution of the .ado file proposed in this article is to provide a flexible and user-friendly implementation of Wooldridge approach for initial condition problem (Wooldridge 2005)

$$y_{it}^{*} = \mathrm{Z}_{it}\beta + \gamma y_{i,t-1} + \alpha_1 y_{i0} + \alpha_2 \overline{\mathrm{w}}_i + \alpha_3 w_{i0} + v_i + \varepsilon_{it}$$

in which the latent outcome variable y_{it}^{*} expresses the chances of experiencing a particular status (low wage in the provided example) at time *t* conditional on its lagged value at *t*−1 (here capturing genuine state-dependence effect).
In line with Rabe-Hesketh and Skrondal (2013) the model is estimated as a standard RE probit regression comprising a set of explanatory variables Z_{it}; the initial condition is given by $\alpha_3 w_{i0}$ and y_{i0}, indicating the values of, respectively, individual time varying variables and outcome at the start of the observational window.
In order to relax the assumption of no correlation between the regressors and v_i , unobserved heterogeneity is assumed to be captured by the initial condition variables and by unit level averages for time-varying variables ($\overline{\mathrm{w}}_i$) computed for all t>1. Under this assumption, the *t*-1 lagged value of response variable can be interpreted as genuine state dependence.

Moreover, making use of both the value of initial condition and the averages of time-varying variables, v_i can be predicted for each unit and $(\bar{v}_i)$ and $sd\ (v_i)$ can be computed over the sample.
Notably, once fixed the value of $(\bar{v}_i)$ to be used for estimating predicted probabilities, $sd\ (v_i)$ can be used to calculate upper / bottom bounds of predicted probabilities in presence of unobserved heterogeneity positively $[p_i + (\bar{v}_i) + sd\ (v_i)]$ / negatively $[p_i + (\bar{v}_i) - sd\ (v_i)]$ correlated with the outcome. This procedure allows to estimate the relative weight of unobserved factors for any given individual profile.
Since predicted probabilities are calculated accordingly to specific profiles of covariates, it is possible to estimate a range of variation in the prediction assuming positive/negative correlation of $(v_i)$and the response variable. This range of predictions can be computed independently from the t-1 status of the response variable (i.e. independently on state dependence issues).

In what follows we present

a) **xtpdyn**, a command fitting random-effects probit model implementing Wooldridge method (2005) and Rabe-Hesketh and Skrondal correction (2013) to solve the initial conditions problem

b) **probat**, a post estimator command computing predicted probabilities for $Y_{(t-1)}$=0 and $Y_{(t-1)}$=1 and for specific profiles given by the values specified for relevant covariates. A range of possible variation is then provided mirroring different assumptions on the prevalence of negative and positive unobserved heterogeneity

Additionally, under the assumption of a steady state *Zit = Zi* for all *t* (and stable entry *Pr(1|0))* and exit rates *(Pr(0|1),* **probat** postestimator displays for each given profile the probability of y=1 in any given wave of the panel (or, equivalently, the expected proportion of time in which the unit *i* displays a positive outcome, computed as *[(Pr(1|0))/(Pr(1|0)) + (Pr(0|1))]*.
Analogously, the expected mean duration of the event *1/(Pr(0|1)* is reported as an ancillary descriptive.

Such estimates provide an indication of possible accumulation over time of short-run effects for any given profile. This makes possible to try extending the comparisons between groups/profiles moving toward a "long-run" perspective.

EXAMPLE

See xtpdyn_example.do

In the provided example, **xtpdyn** is used to model low wage (lopay) individual risks as function of age (age), age squared (agesq), sex (female), having/not having a tertiary degree (degree), workplace tenure (jobten), trade union membership (tucov), temporary (temp) and part time (pt) contract on the job, and a period variable accounting for a -fictive- pre-post reform on minimum wage in national labour market (postref).
The **xtpdyn** command fits a probit dynamic random effects model, in which both t_0 and *t-1* values of dependent variable are automatically included as regressors.
For time varying variables specified in avg_i(), the command includes as additional regressors individual averages (computed within unit for any t >1) and starting values of the same variables at the first available individual observation. Neither average nor initial condition variables are here meant to be interpreted substantially, but their statistical significance indicates their association with unobserved characteristics correlated with the outcome.
The coefficient of lagged dependent variable represents here the net contribution in terms of state dependence.

```
. xtpdyn lopay age agesq female degree jobten tucov temp pt postref, ///
> avg_i(age degree jobten tucov temp pt)

Random-effects probit regression                Number of obs      =     42564
Group variable: pid                             Number of groups   =      6658

Random effects u_i ~ Gaussian                   Obs per group: min =         1
                                                               avg =       6.4
                                                               max =        13

Integration method: mvaghermite                 Integration points =        12

                                                Wald chi2(23)      =   5247.25
Log likelihood  = -13674.066                    Prob > chi2        =    0.0000
```

lopay	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lopay__0	1.165924	.0415752	28.04	0.000	1.084439	1.24741
l__lopay	.6741632	.0276075	24.42	0.000	.6200536	.7282729
age	-.0611903	.0125216	-4.89	0.000	-.0857323	-.0366484
agesq	.0575125	.0138483	4.15	0.000	.0303703	.0846547
female	.1017713	.0366247	2.78	0.005	.0299881	.1735544
degree	-.2962814	.1629401	-1.82	0.069	-.6156381	.0230753
jobten	-.013955	.0028846	-4.84	0.000	-.0196088	-.0083012
tucov	-.3335821	.0343512	-9.71	0.000	-.4009093	-.266255
temp	.3518706	.0709164	4.96	0.000	.2128771	.4908642
pt	.0832034	.0391022	2.13	0.033	.0065646	.1598423
postref	.3326245	.0310337	10.72	0.000	.2717996	.3934494
age__0	.0136767	.007688	1.78	0.075	-.0013915	.0287448
degree__0	-.007135	.1727256	-0.04	0.967	-.3456709	.331401
jobten__0	.0102381	.0041526	2.47	0.014	.0020991	.0183771
tucov__0	.0565992	.0438127	1.29	0.196	-.0292721	.1424706
temp__0	-.0109149	.0719174	-0.15	0.879	-.1518705	.1300407
pt__0	.2442519	.0489388	4.99	0.000	.1483337	.3401702
m__age	.0074564	.0089995	0.83	0.407	-.0101823	.025095
m__degree	-.2753157	.234402	-1.17	0.240	-.7347352	.1841039
m__jobten	.0064946	.0052511	1.24	0.216	-.0037973	.0167865
m__tucov	-.1207152	.061203	-1.97	0.049	-.2406708	-.0007596
m__temp	.2772479	.1774849	1.56	0.118	-.0706161	.625112
m__pt	.5802005	.0700601	8.28	0.000	.4428852	.7175158
_cons	-1.063225	.2399542	-4.43	0.000	-1.533526	-.5929232
/lnsig2u	-.5124394	.0566322			-.6234365	-.4014424
sigma_u	.7739719	.0219159			.7321878	.8181405
rho	.3746218	.0132678			.3490003	.4009658

```
Likelihood-ratio test of rho=0: chibar2(01) =  1192.32 Prob >= chibar2 = 0.000
```

As shown in the output *l__lopay* coefficient is statistically significant net both of the correlation between the individual effects and individual averages, individual starting values

of time varying variables, and the coefficients measuring initial condition, i.e. *lopay__0*. That is, being exposed to low pay in the previous year, increases *in itself* the low pay risks in the subsequent time point.

The **probat** post estimation command provides additional statistics concerning entry and exit rates, steady state probabilities and expected durations according to specific profiles of independent variables.

In what follows, maintaining fixed a unit profile in terms of age, age squared[54], sex, education, trade union membership, tenure, contractual arrangement, these expected probabilities and additional statistics are contrasted using different values (0-1) for the period (or reform) variable.

```
. probat, at(age=25, agesq=6.25,  female=1, degree=0, tucov=0, jobten=1, temp=1, postref=0) plot
Probability for the profile chosen
```

Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.10031	0.03124	0.03909	0.16153
Pr(1|0)_med	0.28971	0.06076	0.17062	0.40880
Pr(1|0)_hig	0.56802	0.06981	0.43119	0.70485
Y(t-1)=1				
Pr(1|1)_low	0.27238	0.05979	0.15518	0.38957
Pr(1|1)_med	0.54773	0.07131	0.40796	0.68751
Pr(1|1)_hig	0.80108	0.05024	0.70261	0.89956

Additional statistics	
Entry probability P(1|0)	0.28971
Exit probability P(0|1)	0.45227
Proportion of T in y=1/Steady state Pr.	0.39046
Mean duration	2.21108

```
. probat, at(age=25, agesq=6.25,  female=1, degree=0, tucov=0, jobten=1, temp=1, postref=1)plot
Probability for the profile chosen
```

Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.17178	0.04055	0.09231	0.25124
Pr(1|0)_med	0.41231	0.06196	0.29087	0.53375
Pr(1|0)_hig	0.69286	0.05593	0.58324	0.80247
Y(t-1)=1				
Pr(1|1)_low	0.39242	0.06218	0.27055	0.51430
Pr(1|1)_med	0.67457	0.05826	0.56038	0.78875
Pr(1|1)_hig	0.88063	0.03224	0.81743	0.94382

Additional statistics	
Entry probability P(1|0)	0.41231
Exit probability P(0|1)	0.32543
Proportion of T in y=1/Steady state Pr.	0.55888
Mean duration	3.07282

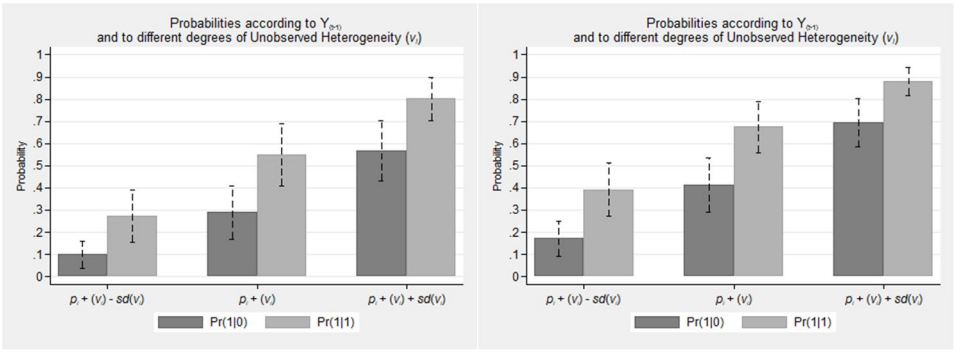
The comparisons can be seen as an extension of marginal effect of a given variable (here postref is used to capture a discontinuity in the panel -a period effect-) to a wider set of estimates, including state dependence measure.

Profile-specific state dependence effect can be calculated contrasting predictions for Pr(1|0) and Pr(1|1). The state dependence is simply represented by differences in predicted probabilities of those experiencing / not experiencing previous spells of low pay at *t-1*. As mentioned, this difference can be evaluated at different levels of unobserved

[54] Age squared enters in the model age the square of the age divided by 100.

heterogeneity (UH).
First, one can compare low pay inertia according to unit profiles, assuming no role for UH: the marginal effect of inertia in response variable is .26 for both the profiles (.55-.29 if postref=0 and .67-.41 if postref=1). Second, low pay inertia can be looked comparing predicted probabilities assuming unobserved heterogeneity to play a role: the prediction will be around .17 (.27-.10) assuming negative UH if postref=0 and around .22 (.39-.17) maintaining same observed and unobserved profile if postref=1).
The same holds for comparisons made within a single profile, thus looking at the weight of unobserved heterogeneity in shaping inertia of the dependent variable: for example, in the second profile Pr(1|1)-Pr(1|0) ranges between .19 (.88-.69) and .26 (.67-.41) percent of increase assuming different role of UH.

For convenience, these result can be evaluated graphically by means of **plot** option after **probat** command. Please notice that the net contribution of state dependence is not necessarily increasing moving from $[p_i + (\bar{v}_i) \ -sd\ (v_i)\ ]$ to $[p_i + (\bar{v}_i) \ +sd\ (v_i)\ ]$.



The box containing additional statistics provides instead a set of estimates concerning expected patterns of dependent variable over time, with unit trajectories in and out the spells of low pay and with the expected spell duration and ("long term") steady state probability.
Once again, being these ancillary statistics computed for any profile specified in the **probat** profile, is possible to look at variations in expected entry and exit rates, steady state probability and duration according to one or more changes applied to the profile under analysis. Here the only change in postref value modifies the entry rates (.29 vs .41), the exit rates (.45 vs .33), the steady state probability (.39 vs .56), and the mean duration of the spells (2.2 vs 3.1).
For the sake of clarity, and in order to check for substantial variation in the absolute effect of a given variable, similar comparisons can be made evaluating profiles characterised by modest low wage risks. We look at change in these statistics for two additional profiles differentiated solely for the value of period effects dummy variable.

```
. probat, at(age=35, agesq=12.25,  female=0, degree=0, tucov=1, jobten=10, temp=0, postref=0) plot
Probability for the profile chosen
```

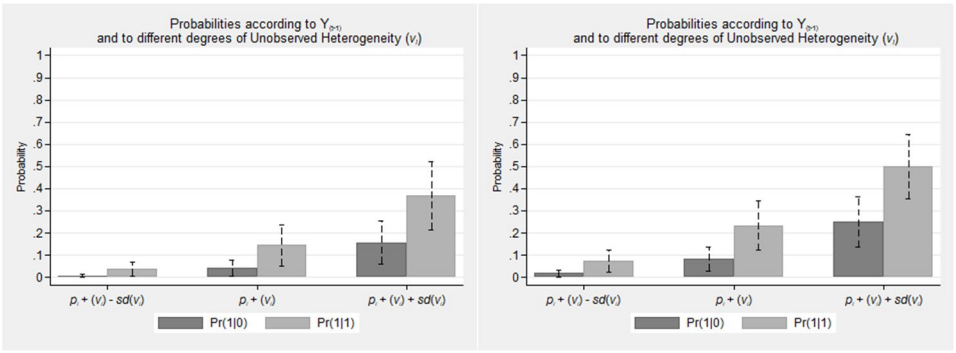
Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.00696	0.00400	-0.00087	0.01479
Pr(1|0)_med	0.04147	0.01829	0.00562	0.07732
Pr(1|0)_hig	0.15665	0.04946	0.05971	0.25360
Y(t-1)=1				
Pr(1|1)_low	0.03711	0.01695	0.00389	0.07033
Pr(1|1)_med	0.14464	0.04757	0.05139	0.23788
Pr(1|1)_hig	0.36913	0.07888	0.21452	0.52375

Additional statistics	
Entry probability P(1|0)	0.04147
Exit probability P(0|1)	0.85536
Proportion of T in y=1/Steady state Pr.	0.04624
Mean duration	1.16909

```
. probat, at(age=35, agesq=12.25,  female=0, degree=0, tucov=1, jobten=10, temp=0, postref=1)plot
Probability for the profile chosen
```

Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.01672	0.00766	0.00170	0.03173
Pr(1|0)_med	0.08057	0.02755	0.02657	0.13457
Pr(1|0)_hig	0.24962	0.05853	0.13490	0.36434
Y(t-1)=1				
Pr(1|1)_low	0.07316	0.02605	0.02211	0.12421
Pr(1|1)_med	0.23359	0.05744	0.12101	0.34616
Pr(1|1)_hig	0.49939	0.07482	0.35275	0.64603

Additional statistics	
Entry probability P(1|0)	0.08057
Exit probability P(0|1)	0.76641
Proportion of T in y=1/Steady state Pr.	0.09512
Mean duration	1.30478



Looking at profiles with lower overall risks of low pay (in terms of age, sex, trade union membership and contractual arrangement) it clearly emerges that for different values of postref variable the modifications of both the predicted probabilities and the additional statistics are much narrower, thus indicating a smaller marginal effects of the period dummy for this second group of individuals. Here the only change in postref value implies smaller modifications: the entry rates (.04 vs .08), the exit rates (.86 vs .77), the steady state probability (.05 vs .10), and the mean duration of the spells (1.2 vs 1.3).

Obviously, the same analyses carried out concerning the period effect can be applied for each significant variable in the model.

In the following, we present the results concerning at the effect of trade union membership.

```
. probat, at(age=25, agesq=6.25,  female=1, degree=0, tucov=1, jobten=1, temp=1, postref=1) plot
Probability for the profile chosen
```

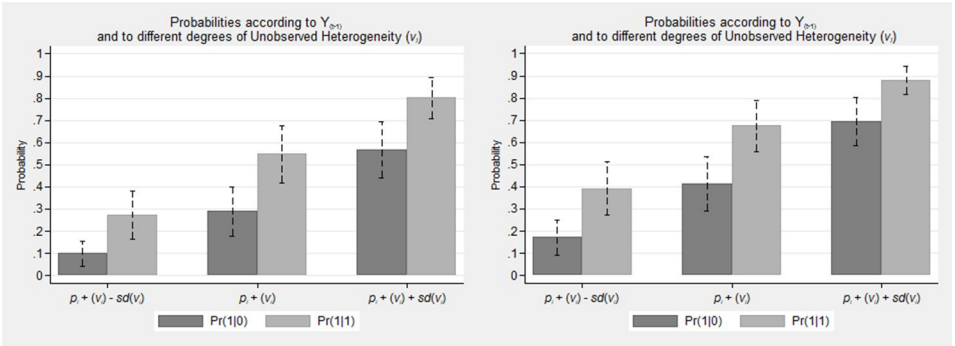
Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.10014	0.02875	0.04378	0.15650
Pr(1|0)_med	0.28938	0.05597	0.17968	0.39908
Pr(1|0)_hig	0.56764	0.06435	0.44151	0.69378
Y(t-1)=1				
Pr(1|1)_low	0.27206	0.05525	0.16376	0.38036
Pr(1|1)_med	0.54735	0.06595	0.41810	0.67661
Pr(1|1)_hig	0.80082	0.04649	0.70969	0.89194

Additional statistics	
Entry probability P(1|0)	0.28938
Exit probability P(0|1)	0.45265
Proportion of T in y=1/Steady state Pr.	0.38999
Mean duration	2.20922

```
. probat, at(age=25, agesq=6.25,  female=1, degree=0, tucov=0, jobten=1, temp=1, postref=1) plot
Probability for the profile chosen
```

Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.17178	0.04055	0.09231	0.25124
Pr(1|0)_med	0.41231	0.06196	0.29087	0.53375
Pr(1|0)_hig	0.69286	0.05593	0.58324	0.80247
Y(t-1)=1				
Pr(1|1)_low	0.39242	0.06218	0.27055	0.51430
Pr(1|1)_med	0.67457	0.05826	0.56038	0.78875
Pr(1|1)_hig	0.88063	0.03224	0.81743	0.94382

Additional statistics	
Entry probability P(1|0)	0.41231
Exit probability P(0|1)	0.32543
Proportion of T in y=1/Steady state Pr.	0.55888
Mean duration	3.07282



More generally, even without relying on explicitly interaction effects, **probat** allows for profile specific computation of changes or differences in predicted state dependence, weight of HU, entry rates, exit rates, ("long term") steady state probabilities and mean expected duration of spells.

```
. probat, at(age=35, agesq=12.25,  female=0, degree=1, tucov=1, jobten=10, temp=0, postref=1) plot
Probability for the profile chosen
```

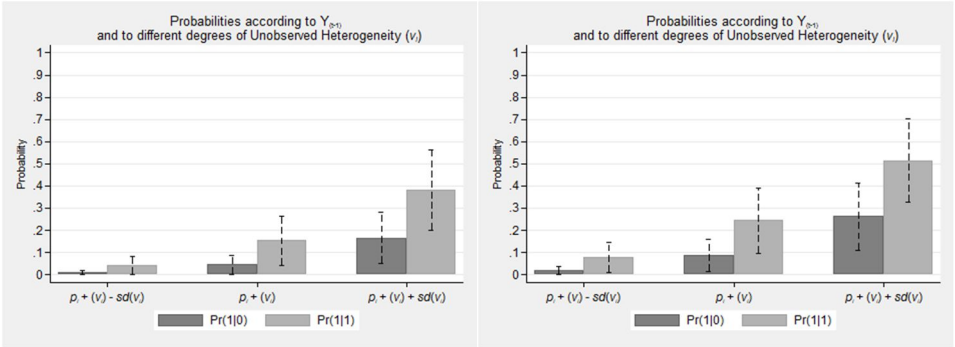
Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.00769	0.00506	-0.00223	0.01762
Pr(1|0)_med	0.04480	0.02257	0.00055	0.08904
Pr(1|0)_hig	0.16553	0.05945	0.04900	0.28206
Y(t-1)=1				
Pr(1|1)_low	0.04015	0.02090	-0.00082	0.08112
Pr(1|1)_med	0.15307	0.05714	0.04106	0.26507
Pr(1|1)_hig	0.38293	0.09229	0.20205	0.56381

Additional statistics	
Entry probability P(1|0)	0.04480
Exit probability P(0|1)	0.84693
Proportion of T in y=1/Steady state Pr.	0.05024
Mean duration	1.18073

```
. probat, at(age=35, agesq=12.25,  female=0, degree=1, tucov=0, jobten=10, temp=0, postref=1) plot
Probability for the profile chosen
```

Probability	Coeff.	Std. Err.	Low 95% CI	Up 95% CI
Y(t-1)=0				
Pr(1|0)_low	0.01833	0.01064	-0.00252	0.03918
Pr(1|0)_med	0.08629	0.03724	0.01330	0.15929
Pr(1|0)_hig	0.26161	0.07701	0.11068	0.41254
Y(t-1)=1				
Pr(1|1)_low	0.07848	0.03506	0.00976	0.14721
Pr(1|1)_med	0.24516	0.07526	0.09766	0.39266
Pr(1|1)_hig	0.51427	0.09541	0.32727	0.70127

Additional statistics	
Entry probability P(1|0)	0.08629
Exit probability P(0|1)	0.75484
Proportion of T in y=1/Steady state Pr.	0.10259
Mean duration	1.32479



Looking at profiles with lower overall risks of low pay (in terms of age, sex, education, trade union membership and contractual arrangement) it clearly emerges that being / not being trade union member does make a stronger differences in reducing low wage risks of variable the modifications of both the predicted probabilities and the additional statistics are much narrower, thus indicating a smaller marginal effects of the trade union membership for this second group of individuals.

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