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# The part-time poverty gap across Europe: How institutions affect the way part-time and full-time workers avoid poverty differently

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## **ABSTRACT**

Drawing on EU-SILC 2012 data, this paper investigates the variation in the degree to which part-time and full-time workers avoid poverty differently by various income components in Europe. We look at three consecutive steps in the income package: individual earnings, market incomes of other household members, and government transfers. The results indicate that on average across Europe full-timers are more likely than part-timers to escape poverty with each step. On the other hand, much variation across countries is discovered. More stringent wage institutions, short working hour cultures and a strong support for working mothers are related with lower differences in earnings poverty between part-time and full-time workers. These institutional characteristics also reduce the difference in the degree to which part-time and full-time workers avoid poverty by other market incomes in the household. The difference in poverty reduction by government transfers between part-timers and full-timers was found to vary little across countries, but the degree to which part-time earnings are combined with benefits tends to be related to a larger difference pre-distribution poverty.

**Keywords:** part-time employment, in-work poverty, social policy, working time, labour market institutions

**JEL:** I32, I38, J08, J21, J22, J31

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## 1 Introduction

Having a job is seen as the best protection against poverty by many, in particular by policymakers. However, it is well documented that not all jobs provide sufficient income and that the working poor are a non-negligible phenomenon across Europe (Andress & Lohmann, 2008; Fraser, Gutiérrez, & Peña-Casas, 2011). Part-time workers are one group that faces especially high - and in recent years increasing - poverty rates (Horemans, Marx, & Nolan, 2016). As part-time work drives overall employment rates, the increased poverty risk seriously questions the assumed relationship between employment growth and poverty reduction. On average across Europe part-timers are twice as likely to be poor compared to full-timers, but their poverty risk varies considerably across Europe, far more so than for the working poor in general (Horemans & Marx, 2013a; OECD, 2010). Therefore, this paper systematically examines the variation in the poverty risk of part-time vis-à-vis full-time workers across Europe to unravel under which institutional and policy settings part-time employment is to be seen as problematic from a poverty perspective.

Because part-timers work fewer working hours, greater job instability and lower hourly wages (OECD, 2010), it comes perhaps as no surprise that part-timers have lower annual earnings compared to full-time workers and therefore face a higher in-work poverty risk as commonly measured in Europe. On the other hand, we know that low earnings are not a sufficient condition for in-work poverty and that the relationship between both is rather weak as we need to take into account the overall household income package to understand in-work poverty (Maitre, Nolan, & Whelan, 2012; Marx & Nolan, 2014). Indeed, previous single country studies show that part-time employment is particularly problematic for single earner households, while for dual earner household the difference in the poverty risk between full-time and part-time workers is reduced substantially (Debels, 2008; Rodgers, 2003; Shaefer, 2009). Other income sources, including benefits that compensate the inability to work full-time, complement the household income of part-time workers in particular as well (Horemans & Marx, 2013a; Horemans et al., 2016). Hence, the variation in the part-time poverty gap should not solely be understood as a difference in wages - and in extension earnings - between part-timers and full-timers across countries. In addition, we need to take into account the variation in the degree to which other income sources, from other workers in the household or from government transfers, help part-timers and full-timers to avoid poverty.

Following the approach of Gardiner and Millar (2006), we divide the household income into separate components, then add these up step by step, and examine whether the income is enough to lift a worker (and

his/her family) over the poverty line. In this paper, we look at three income steps in particular: individual earnings, market incomes of other household members, and transfers. Because the variation in how part-time and full-time workers differently avoid poverty by the three steps of the household income package, a variety of institutions characteristics potentially explain this variation. Drawing on previous research, we may expect labour market regulations to be especially related to the distribution of pre-transfer incomes only, whereas the set-up of the social security system is expected to affect poverty reduction by transfers of workers in general (Lohmann, 2009). However, the results indicate that social policy indicators are already related with the variation in the degree to which full-time workers are more likely to avoid poverty by their own earnings and the labour market incomes of other household members.

This paper is structured as followed. The next section portraits the variation in the part-time poverty risk and discusses the two approaches adopted in the literature to understand why some workers have a higher poverty risk and how they avoid poverty. The third section presents an overview of institutional factors that can explain the variation in how part-time workers avoid poverty differently across countries. Next, we discuss the empirical data and the fixed-effect logistic regression method that was adopted to examine how country-level characteristics are associated with a higher part-time poverty gap. The fifth section shows the results and the last section concludes.

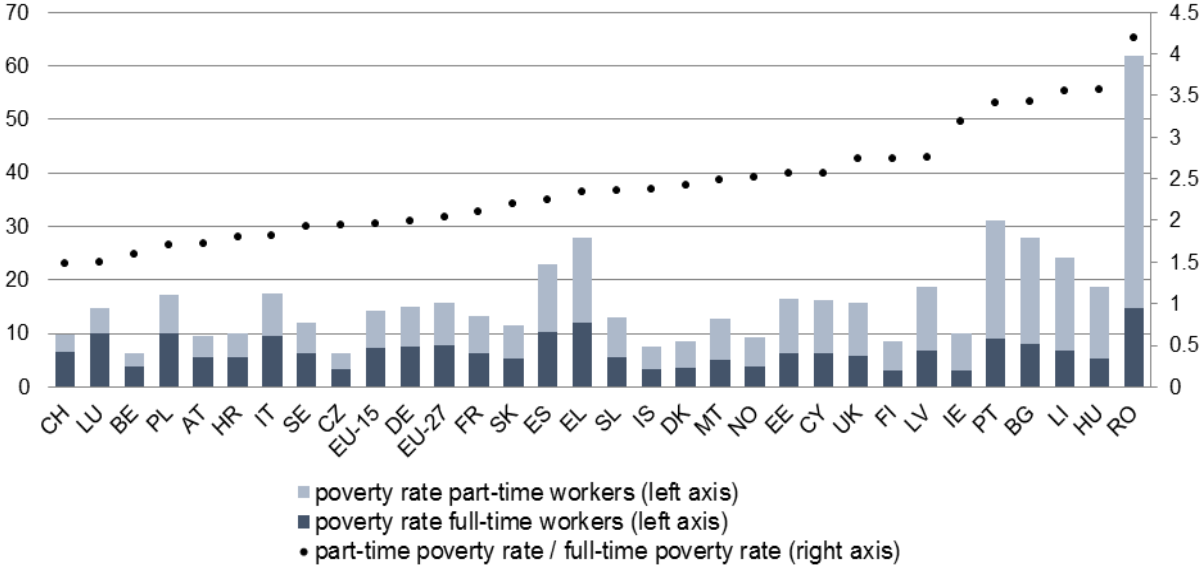
## **2 Poor part-time workers: a distinct 'risk group' or an 'accounting problem'?**

Setting the scene, this sections starts with presenting the poverty risk of part-time vis-à-vis full-time workers empirically across Europe. Subsequently I present two approaches that clarify the oxymoron of working poverty, a 'risk-group approach' and an 'accounting approach', and highlight previous findings regarding the higher poverty risk of part-timers compared to full-timers.

Figure 1 shows the poverty rate of part-time and full-time workers across Europe as can be found on the Eurostat website. The figures are drawn from the European Union Statistics on Income and Living Conditions (EU-SILC), a survey that is used for monitoring the poverty and social inclusion in the European Union. Overall figure 1 confirms previous OECD (2010) findings that part-timers face an important "part-time poverty penalty" as they are on average twice as likely to be poor<sup>i</sup>. At the same time, however, figure 1 shows considerable variation in the poverty risk of part-timers, much more than for full-timers, resulting in a strong variation across Europe in the difference in the poverty risk between both groups. While in the Netherlands, Switzerland and Luxembourg part-timers have

less than 1.5 times the poverty risk of full-timers, in Ireland, Portugal, Bulgaria, Lithuania, Hungary and Romania it is more than 3 times higher. Consequently, the question that arises is which institutional characteristics contribute to this variation. Yet, in order to answer that question, we first we need to know why workers in general and part-timers in particular are not always able to avoid poverty in the first place. This can be done by two approaches.

*Figure 1 Poverty rate of part-time and full-time workers across Europe in 2014*



Source: EU-SILC 2014 (retrieved from on-line Eurostat statistics).

**2.1. The 'risk-group approach' to in-work poverty**

A first modus operandi, the 'risk-group approach', describes how individual endowments, job characteristics and living arrangements are related to higher in-work poverty risks (Airio, 2008). Following poverty research in general, Lohmann (2009) summarises these features in terms of 'needs', 'resources', and 'restrictions to participate'. Resources include characteristics like age, education, or occupation that represent the earnings potential of workers and hence lower the poverty risk of workers. Needs refer to the presence of dependent household members who increase the income needs and thus are associated with a higher poverty risk. In addition, children, dependent elderly, or other dependent household members reduce the possibilities for all household members to participate fully in the labour market and thus increase the poverty risk. Alternatively, one may group working poor as workers who are "less competitive in the labour market" and/or have "a disproportionate ratio of dependents to earners" (Brady, Fullerton, & Cross, 2010). Crettaz (2013) as well as Marx and Nolan (2014) distinguish between inadequate earnings, low (household) work-intensity, a high number of dependents

relative to earners, and inadequate income replacement as not mutually exclusive mechanisms that lead to a higher in-work poverty risks for particular groups of workers. These fundamental mechanisms can be evoked to understand why particular individual endowments, job characteristics and living arrangements are associated with a higher poverty risk.

Research that applied the risk group approach mention that holding a part-time job is one of the many risk factors, but do not discusses the underlying mechanisms in detail (Andress & Lohmann, 2008; Fraser et al., 2011). Research with an explicit focus on part-timers shows that their higher poverty risk can be attributed to multiple underlying mechanisms. Part-timers have a lower wage, they have by definition a lower work-intensity, often work in less stable jobs, and are on average more likely to have children (Airio, Kuivalainen, & Niemeä, 2008; Horemans & Marx, 2013a, 2013b; Snel, de Boom, & Engbersen, 2008). Furthermore, part-timers are less likely to meet eligibility criteria for receiving full replacement income for periods out of work (Buschoff & Protsch, 2008; Leschke, 2007; OECD, 2010). In reality, however, part-timers are more likely to combine earnings with benefits, precisely because of their part-time status and unstable labour market attachment (Horemans & Marx, 2013a; Rodgers, 2003). Working fewer hours in itself is not necessarily to be seen as problematic from a poverty perspective as the poverty rate of part-timers is especially high for a single earner families, while for dual earner families little differences exist in the poverty risk between part-time and full-time workers (Debels, 2008; Rodgers, 2003; Shaefer, 2009). In other words, despite their lower earnings, part-timers can avoid poverty by the presence of other earners.

## ***2.2. The 'accounting approach' to in-work poverty***

A second type of studies adopts an 'accounting approach' that examines more in detail how workers avoid poverty (Millar et al., 1997; Strengmann-Kuhn, 2003). In this approach the household income package is divided in individual earnings, market incomes of other household members, and state transfers. Subsequently, the income components are added in a particular sequence. The specific order as well as the amount of detail of income components varies across studies<sup>ii</sup>. The results consistently indicate that the earnings of other household members provide the most effective way to avoid poverty, especially for low paid workers who are less likely to avoid poverty relying solely on their own earnings (Gardiner & Millar, 2006). The poverty reduction by government transfers for not working household members is considered a key element to understand the cross-country differences in in-work poverty (Lohmann, 2009). On the other hand, as in-work poverty is partially a problem of un- or underemployment (Halleröd, Ekbrand, & Bengtsson, 2015), individual

wage replacement benefits also have a substantial poverty reducing capacity for workers in some countries (Allègre, 2013). Moreover, especially for single (parent) families, government transfers are the only way out of poverty when earnings are insufficient.

In-work poverty research that adopted the accounting approach and looked at part-time work is very diverse regarding the income components studied. For Europe as a whole, Lohmann (2009) shows that the pre-transfer poverty rate in 2004 was substantially higher for part-timers compared to full-timers and indicates that an additional worker decreases the odds of pre-transfer poverty more strongly when (s)he works full-time instead of part-time. He does not find that poverty reduction by transfers differs on average significantly between full-time and part-time workers in Europe, but transfers do appear to help workers with an additional part-timer more than workers with an additional full-timer in the household (Lohmann, 2009). Looking at different elements of the income package, Debels (2008) constructs a counterfactual 'poverty pay' for Belgium, indicating whether employees would be poor in the hypothetical situation that they are single and rely solely on their own earnings. She shows that part-timers are twice as likely as full-timers to have a poverty pay, but respectively 89 and 85 percent avoid poverty when taking into account household composition and all other income sources. Conversely, among the non-poor workers, respectively 31 and 15 percent of the part-timers and full-timers have poverty pay, suggesting that part-time employment is more common in a household context where other income sources help to reduce the poverty risk associated with the lower earnings (Debels, 2008). Remarkably, Rodgers (2003) looks for Australia how the poverty risk of part-timers would look like when investment income is excluded, but as expected he finds little consequences as the opportunities for wealth accumulation are scarce for people at the bottom of the income distribution. On the other hand, his results do suggest that government transfers help part-timers to avoid poverty, especially when they are single earners (Rodgers, 2003).

Country cases or comparisons allow a detailed description of the institutional context in which in-work poverty risks need to be interpreted (Giesselmann, 2015), but lack a more systematic comparison of the variation across countries (Lohmann, 2009). Adopting the accounting approach in a comparative setting allows us to examine under which conditions working part-time is a feasible option without falling in poverty. Yet, the variation in how part-time and full-time workers are able to avoid poverty by their own earnings, by incomes of other household members, or by government transfers remains largely a blind spot. A-priori, we can expect it to differ substantially across countries as previous research indicates a strong variation in the how the part-time wage penalty contributes to the part-time poverty gap as well as a strong variation in the degree to which differences in the work-intensity compensate the

lower earnings of part-time workers across countries (Horemans, 2016 forthcoming). Therefore, the next section explores which institutional factors are potentially associated with the variability in the part-time earnings gap, and, which institutional factors make it more likely that income from other workers or government transfers allow part-time workers to avoid poverty more easily.

### **3 Cross-national differences in how part-time workers avoid poverty**

This section provides an overview of the theoretical expectations regarding the relationship between the variation in institutions, policies, and the composition of the labour force on the one hand and the variation in the poverty gap between part-time and full-time workers on the other. We look at country-level characteristics that are related to three steps of the accounting approach: (1) the variation in the earnings difference between part-time and full-time workers, (2) the variation in the degree to which other working family members and (3) government transfers help part-time and full-time workers to avoid poverty differently. Because the choice to work part-time is done in a particular household and institutional context, it is important to note that both country-level and household characteristics associated with a part-time poverty gap should not be seen as exogenous (Debels, 2008; Lohmann, 2008). Hence, we cannot make causal inference about changes in policies or other institutional characteristics on changes in the poverty difference between part-time and full-time workers.

As regard the institutional characteristics associated with the cross-country variation in how part-timers and full-timers avoid poverty differently, we draw on the previous research discussing the variation in in-work poverty in general (Brady et al., 2010; Lohmann, 2009). Given the multifaceted nature of in-work poverty this means that we need to take into account the research that looks at the variation in non-standard employment (Hipp, Bernhardt, & Allmendinger, 2015), the relation between labour market institutions and earnings inequality (for a recent overview, see: Salverda & Checchi, 2015), and the link between gender culture, family policies and the employment of parents (Boeckman, Misra, & Budig, 2014; Stieber & Haas, 2012).

#### ***3.1. Part-time - full-time earnings differences across countries***

A first facet of the variation in the part-time poverty gap has to be sought in the underlying variation in the part-time earnings gap. The latter is associated with particular labour market institutions that affect the overall earnings dispersion, including both wages and working hours as well as



the institutions that are related with occupational segmentation of part-time jobs.

The impact of changing labour market institutions, like de-unionisation and decreasing minimum wages (DiNardo, Fortin, & Lemieux, 1996), on rising wage inequalities inspired previous research on the cross-country variation in in-work poverty. For example, Brady et al. (2010) refer to the unified theory of Blau and Kahn (2002) to claim that more egalitarian labour markets have stronger institutions that remove the least productive, resulting in a fairly decent wage for all workers. Referring to similar theoretical underpinnings, Lohmann (2009) indicates for Europe that low skilled workers are less likely to be poor in countries with centralised bargaining systems that compress the wage structure. Industrial relation indicators, however, may point out a stronger support for more generous welfare systems that explains the variation in (in-work) poverty more consistently (Brady et al., 2010; Plasman & Rycx, 2001). Yet, for the US Brady, Baker, and Finnigan (2013) argue that unions are related with lower in-work poverty, independent of their effect on social policies. We expect similar mechanisms to be at work regarding the part-time wage gap because they typically face an hourly pay penalty as they are concentrated in lower level occupations (Bardasi & Gornick, 2008; Manning & Petrongolo, 2005; O'Dorchai, Plasman, & Rycx, 2007). In other words, because part-time workers are more likely to be concentrated at the bottom of the earnings distribution, *the degree to which full-timers are more likely than part-timers to avoid poverty with their own earnings is expected to be lower in countries where institutions support a more condense wage distribution (Hypothesis 1a).*

The literature on the relationship between institutions and earnings inequality provides little guidelines as to which institutions should primarily be looked at. Salverda and Checchi (2015) conclude in their recent overview that *"the institutional approach faces an abundance of institutions for which it lacks a clear criterion of choice"*. Potential candidates include wage setting institutions like union membership, bargaining coverage and centralisation. Other institutions that are regularly studied consist of the presence and level of minimum wages, working time regulations, or the strictness of employment protection legislation that affect employers hiring practices. Lastly, more recent studies also look at the generosity of income replacement schemes, labour market activation policies as well as work-family reconciliation policies that influence employees reservation wage and employment decisions (Salverda & Checchi, 2015)

While labour market institutions that compress the wage structure are expected to reduce the wage difference between part-timers and full-timers on average, they can at the same time make part-time jobs more problematic in terms of annual earnings. Similar to overall earnings inequality, we have to look at both wages and hours worked. Restrictive

labour market institutions can result in low hour and unstable part-time jobs when employers look for alternative, more flexible staffing arrangements to overcome minimum wage floors (Bhorat, Kanbur, & Mayet, 2013; Hsing, 2000; Neumark, Schweitzer, & Wascher, 2004; Ressler, Watson, & Mixon, 1996) or strict employment protection legislation (Buddelmeyer, Mourre, & Ward, 2008). Salverda and Checchi (2015) indicate that in highly regulated labour markets, identified by strict employment protections and active union presence, the negative correlation between working hours and wages is stronger. On the other hand, employers' staffing strategies are limited by strong unions and inclusive labour regulations that follow from unions' egalitarian normative discourse (Western & Rosenfeld, 2011). Hence, the relationship between labour market institutions and the part-time earnings penalty can go both ways as strong institution, like high minimum wages and high union presence, are expected to reduce overall wage inequality, at the same time they may increase the precarious nature of part-time work in terms of hours and employment stability.

Through their effect on the labour supply of parents, work-family reconciliation policies also influence the overall earnings distribution (Misra, Budig, & Boeckman, 2011). Feminist welfare state research indicates that in traditional breadwinner societies mothers reduce (and fathers slightly increase) their employment around childbirth, whereas in a dual-earner dual-carer society, family policies are expected to support mothers to remain in the labour market and fathers to also partially reduce their working hours to engage in caring activities (Crompton, 1999; Lewis, 1992; Sainsbury, 1999). Indeed, externalising childcare tends to increase women's relative contribution to the household income (Stier & Mandel, 2009), while fathers appear to work slightly less compared to childless men in countries that offer alternative income in terms of well paid leave for fathers, short parental leave for mothers and generous family allowances (Bünning & Pollmann-Schult, 2015). Consequently, we can expect that in countries where support for working parents is higher, the overall wage distribution is likely to be more compressed when mothers are able to work a substantial number of hours, and full-time working fathers do not have to work long hours in high paid jobs to support their family, resulting in a lower part-time earnings penalty as well.

Besides the overall earnings distribution, a second element that potentially affects the earnings difference between full-time and part-time workers is the degree of occupational segmentation, which indicates the extent to which part-time jobs are concentrated in particular types of jobs. The occupational structure has been shown to be the most important driver behind the pay penalty associated with working part-time (Matteazzi, Pailhé, & Solaz, 2012). Long working hours cultures restrict part-time jobs to low paid occupation and specific sectors because working part-time hinders further career progress or part-time work is simply not possible in

some managerial or professional occupations (Bardasi & Gornick, 2008; Matteazzi et al., 2012). If long working hour cultures prevail, part-time workers are more likely to be stigmatised for working less hours (Webber & Williams, 2008) and the perception of low employee commitment by employers reinforces the low remuneration (Messenger & Ray, 2015). Countries without working time regulations allow little opportunities for reconciling work and family life in demanding full-time jobs (Gornick & Heron, 2006), resulting in a stronger difference in terms of the types of jobs that are available for part-timers. In addition, occupational segmentation of part-timers varies across countries regarding the degree to which policies allow mothers in particular to reduce working hours around childbirth without having to change to a lower paid part-time job (Dupuy & Fernández-Kranz, 2011; Manning & Petrongolo, 2008). In sum, working time regulations are expected to be associated with a reduced part-time earnings penalty as they reduce occupational segregation and allows part-time workers (mothers) to keep a link with the higher level paid jobs around childbirth. Consequently, *the degree to which full-timers are more likely than part-timers to avoid poverty with their own earnings is expected to be lower in countries where institutions limit occupational segregation (Hypothesis 1b).*

### **3.2. Variation in part-time poverty reduction by earnings of other household members**

While earnings are a first step to understand the variation in the part-time poverty gap, we also know that low wage earners avoid poverty by the presence of other working household members (Gardiner & Millar, 2006; Marx & Nolan, 2014). These additional earnings are of vital importance, perhaps even more so for part-timers as they have a substantially higher poverty risk when relying solely on their own earnings (Debels, 2008; OECD, 2010; Rodgers, 2003). On the other hand, the required additional income to be lifted above the poverty line is smaller for full-timers. An additional part-time or low wage job may do the trick for full-timers. Conversely, part-timers additional income needs are substantially higher, especially in countries with stronger differences in earnings between part-time and full-time workers. Thus, *on average we expect it to be more difficult for part-timers, compared to full-timers, to avoid poverty by accumulating their own earnings with other market incomes in the household (hypothesis 2a),* but the degree to which this happens is again not necessarily similar across countries.

First, the required additional income to be lifted above the poverty line is expected to be especially higher for part-time workers in countries where they face the highest earnings penalty in the first place. In addition, couples are affected by similar labour market institutions that allow a high degree of earnings inequality, partners are equally likely to have lower earnings, that is, under the assumption of homogamy and a high

correlation in earnings between spouses. In other words, we *expect the difference in the degree to which other market incomes reduce the poverty risk between part-timers and full-timers to be lower in countries which institutions reduce the earnings differences in the first place (hypothesis 2b)*.

Second, the variation in household employment patterns across countries is strongly associated with the variation in the employment of mothers (Misra et al., 2011) and availability of high quality childcare services typically found to help mothers to maintain a link with the labour market (Stieber & Haas, 2012; Van Lancker & Ghysels, 2010)<sup>iii</sup>. In countries with a well-developed (publicly supported) care system, mothers are able to work, often in part-time jobs of substantial hours and considerable earnings levels. Furthermore their partners are also expected to have higher earnings as previous studies indicate a selective uptake of family policies, with a stronger relation to the employment rates of high-skilled women (Cantillon et al., 2001; Cipollone, Patacchini, & Vallanti, 2014; Van Lancker & Ghysels, 2012). Thus we *expect the difference in the way full-timers and part-timers avoid poverty by other market incomes to be lower in countries where (partially) externalising care is less constrained (hypothesis 2c)*.

Third, we have to take into account a composition effect. Single parents have a harder choice between spending time at home versus providing sufficient income. Hence, when their additional income and care needs are not addressed by other household members, they are more likely to end up in a part-time job, that is, when entering the labour market at all. *Consequently, in countries where part-time jobs are more concentrated among single (parents), part-timers are in general expected to be less likely to avoid poverty through the income of other market incomes in het household (hypothesis 2d)*.

### ***3.3. Variation in part-time poverty reduction by government transfers***

Besides the earnings of other household members, welfare state generosity plays an important poverty alleviating role, also for workers (Allègre, 2013; Brady et al., 2010; Lohmann, 2009). A last step to understand the variation in the poverty penalty of part-time workers is thus to examine the degree to which financial government support helps to avoid poverty and how this differs between part-time and full-time workers. Broadly speaking, earnings can be combined with three types of benefits at the household level: (1) benefits that can be combined with (part-time) earnings, such as partial unemployment or short-time work schemes, or country specific benefits related to invalidity, sickness, work-life balance compensations, or pension; (2) income replacement benefits provided to non-working household members, or to workers who are out

of the labour market for short periods; (3) household income supplements, usually to compensate for the cost of children or housing.

Income replacement schemes for non-working household members are strongly related to variation in poverty reduction as they compensate for non-working household members (Lohmann, 2009). Hours and/or earnings thresholds may restrict secondary (part-time) earners to meet the eligibility criteria for full income replacement schemes (Buschoff & Protsch, 2008; Leschke, 2007; OECD, 2010). Yet, if a secondary earner loses his/her job, limited income replacement benefits may be insufficient even for the remaining primary full-time earner to escape poverty, whereas when part-time workers who become primary earners need a substantial replacement rate for non-working adults as their own earnings are lower. Hence, overall, *we expect that government transfers are more likely to lift full-timers above the poverty threshold (Hypothesis 3a).*

With respect to benefits that are combined with earnings, it is important to note that part-time workers are entitled to benefits specifically provided to them because of their part-time status (Horemans & Marx, 2013b). This additional income may exactly be the reason why they work part-time in the first place. While much variation exists across countries, several benefits allow a (voluntary) reduction in working hours with moderated income consequences, for example, to combine work with study, phased pensioning or other work-life balance reasons. Furthermore, household income supplements associated with the presence of children are concentrated among part-timers as well. *Hence, we expect that part-timers are more likely to avoid poverty in countries that support their part-time status with some additional benefit (hypothesis 3b) or when part-timer work is strongly associated with having children (hypothesis 3c).*

In sum, the relationship between institutional characteristics and the variation of the magnitude of a part-time poverty penalty comes down to factors that affect the variation in the earnings difference between part-timers and full-timers, the variation in poverty reduction by other workers, and the variation in poverty reduction by government transfers. Table 7.1 provides an overview of the expectations regarding the different steps in the accounting approach.

*Table 7.1 Overview of hypothesis in the difference steps of the analysis.*

	Step 1: Poverty earnings: higher for part-timers	Step 2: Poverty reduction by other market incomes: lower for part-timers	Step 3: Poverty reduction by government transfers: lower for part-timers
Expected sign of working part- time compared to full-time (main coefficient)	+	-	-
Expected sign of interaction between country-level characteristics and working part-time	-	+	+
	Reason 1: Institutions reducing the overall earnings distribution Reason 2: Institutions that reduce occupational segmentation between part- timers and full- timers	Reason 1: Institutions reducing the part-time earnings gap Reason 2: Institutions that support dual earnship among Reason 3: The concentration of part-time jobs among couples	Reason 1: Institutions reducing the part-time earnings gap Reason 2: Social transfers that are beneficial for part-timers in particular Reason 3: The concentration of part-time jobs among families with children

#### **4 Data and methodology**

For the micro-level data this paper draws on the EU-SILC survey for the year 2012, referring to incomes of the year 2011. The analysis includes respondents aged 18 to 64 years, who worked at least 6 months of the income reference period of a year and worked part-time or full-time as an employee at the time of the interview. Country-level variables are collected from various sources and include institutional characteristics, policy and cultural indicators regarding working time and parenting, as well as aggregated profile characteristics of part-timers (see more detailed discussion below and appendix 7.1). In order to examine the variation in the part-time poverty gap, I apply three basic steps of the accounting approach and examine how both individual and country-level characteristics relate to each step (see table 7.1).

Three dichotomous dependent variables were constructed: 'poverty earnings', 'poverty reduction by other market incomes', and 'poverty reduction by government transfers'. The poverty line for all three concepts is the same and calculated as 60 percent of the national median disposable equivalent household income. The concept of 'poverty earnings' indicates whether workers are able to avoid poverty for their family when relying only on their own gross equivalised earnings under a *ceteris paribus* condition. It can be seen as a proxy of the latent poverty risk of workers in the case of separation, but as with all accounting approaches behavioural consequences are not included and tax-benefits eligibility effects are ignored. 'Poverty reduction by other market incomes' refers to workers with poverty earnings that are lifted above the poverty line when looking at the equivalent pre-transfer income. Earnings of other workers are the key addition, but this income variable, as provided by Eurostat, also includes incomes from self-employment, capital income, and regular inter-household cash transfers. Lastly, 'poverty reduction by government transfers' refers to workers who are poor in a pre-transfer situation, but not in a post-transfer situation. The models also control for several other individual (sex, age, education), household (presence of children, family type, work-intensity of other household members) and job related (stable full-year jobs, occupation) features (see appendix 7.2). Appendix 7.3 provides an overview of the poverty risks of workers when relying only on their own earnings, in a pre-transfers situation, and in a post-transfer situation.

For each dependent variable a series of country fixed-effect logistic regressions were computed. As in this paper we are not interested in the direct effect of country level factors, but in the cross-level interaction effects between country-level characteristics and part-time work, a fixed-effects analysis has been applied by including dummies into the model. A fixed-effects model controls for the country-level heterogeneity and avoids making the assumption that the country-level error terms are normally distributed and independent from the other variables, which is needed in commonly used multi-level models (Möhring, 2012).

Analysing the relationship between country-level characteristics on the variation in the higher poverty risk of part-timers, two approaches can be followed. Welfare state regimes can be applied as an heuristic tool, or particular country-level policy or institutional indicators can be adopted. As an analytical tool to understand varieties in the profile of the working poor across countries, the explanatory power of welfare states proved be rather limited (Halleröd et al., 2015; Lohmann & Marx, 2008; Van Lancker, 2013). Furthermore, the gendered nature of part-time employment does not fit nicely with the typical welfare regime approach (O'Reilly & Fagan, 1998). Hence, similar to much of the debates on comparative research on female employment, we look at specific 'explanatory' value institutional indicators separately, while being aware

that these are proxies of a complex and interrelated (endogenous) institutional framework (Boeckman et al., 2014). Various country-level features that are expected to explain the variation in the difference in the poverty risk between part-time and full-time workers are grouped as wage setting institutions, social policies, working hour culture and institutions, employment support and family policies, and labour force composition (see appendix 7.1). In a robustness check indicators belonging to a specific group are included simultaneously in the model and the models are also controlled for the interaction between economic performance and working part-time (see appendix 7.6).

## 5 Results

Table 7.2 shows the results of the fixed-effect models for in-work poverty with country-level dummies (results for the dummies not shown). Part-time workers are clearly more likely to face poverty earnings, but are on average, as expected, less likely to avoid poverty by other market incomes or government transfers. As caution is needed when comparing logistic models, because the unobserved heterogeneity is likely to vary across models (Mood, 2010), appendix 7.4 shows the average marginal effects. Controlling for other relevant characteristics, on averages part-timers' probability of being earnings poor is almost 30 percentage points higher than it is for full-timers (see: appendix 7.4, model 1b). On the other hand, the probability of part-timers to avoid poverty by other market incomes in the household and subsequently government transfers is respectively 4 and 1.5 percentage points lower (see: appendix 7.4, model 2b and 3b). In other words, the results indicate that part-timers are less likely to avoid poverty first with their own earnings, and also when adding other household market incomes and governments transfers in consecutive steps.

Turning to the variation in the relation between working hours and poverty earnings across countries, table 7.3 models 1c to 1z show the main effect of working part-time and the interaction between part-time work and several country level variables which were added separately. The results confirm that stringent wage setting institutions - a higher union density and a higher minimum wage - are associated with a lower difference in poverty earnings between part-timers and full-timers. The poverty earnings gap of part-timers is also cushioned in countries with a higher replacement rate of unemployment benefits. The same appears true in countries where family benefits make out a substantial part of workers household income, but the coefficient is not significant. Other social policy indicators, however, tend to be associated with a widening of the poverty earnings difference between part-time and full-time workers. In countries that spend relatively more of their GDP on passive labour market policies we see that the relative degree to which part-timers are able to avoid poverty by their own earnings tends to be lower. The same is true for the share of full-year workers that receive a benefit, and the



average share benefits have in workers' individual income (= earnings + benefits). In other words, countries that allow (part-time) earnings to be combined with a replacement benefits or earnings supplement appear to widen the earnings difference between part-time and full-time workers as they probably (partially) compensate the lower earnings as they probably support workers to accept low paid part-time jobs in the first place. Overall, working hours and institutions follow the expected sign as well. When part-time jobs consist of substantial hours on average and when working time can be arranged more flexible for family reasons, the part-time poverty earnings gap tends to be lower. The same is true for countries where formal childcare use is more common. Yet, other indicators of employment support, informal care use and active labour market spending are associated with a higher difference in poverty earnings between part-time and full-time workers. Lastly, the degree to which part-time work is concentrated among couples and families with children also matters. In countries where part-time more concentrated these 'traditional' circumstances, part-time earnings appear less problematic from a poverty perspective.

Models 2c-z show the results for how the difference in poverty reduction by other market incomes between part-time and full-time workers is associated with country-level characteristics. Again, results are largely in line with the expectations. Full-timers are on average more likely to avoid poverty by other market incomes in the household (see also table 2), but the degree to which they do so varies by country-level characteristics (table 3). First, stronger wage setting institutions, which decrease the part-time earnings gap in the first place, also limit the degree to which full-timers are more likely to avoid poverty by other market incomes. The only exception is the level of the minimum wage. Higher minimum wages appear to reinforce the beneficial position of full-time workers. Which is not necessarily surprising as full-timers are lifted above the poverty line more easily when receiving a high minimum wage, while for part-timers eligibility criteria and the number of hours worked are key, even with a high pro-rata minimum wage. Indeed, as table 3 indicates, working hours culture and institutions cushion the difference in poverty avoidance between part-time and full-time workers. As a way to support dual earnership among parents with flexible work arrangements as well as working hour limitations for full-time workers, or more substantial part-time jobs help part-timers to avoid poverty more easily by other market incomes. Formal childcare use is also related with a reduced difference in the degree to which full-timers are more likely to be lifted above the poverty line by other market incomes, while in countries where parents have to rely on informal care more strongly, the opposite is true. As expected, the composition of the part-time labour force matters as well. The higher the concentration of part-time workers among singles, the higher the gap between full-timers and part-timers in the degree to which other market incomes help in avoiding poverty because singles do not receive much other market incomes by definition.

Contrasting the results of Lohmann (2009) that draw on EU-SILC 2005 data for twenty European countries, table 2 suggests a small, but significant difference between full-time and part-time workers regarding the poverty reduction of government transfers for both groups. Full-time workers are, as expected under the assumption that additional income needs are lower, more likely than part-timers to avoid poverty by government transfers. Overall, however, little variation exist across countries regarding the difference in poverty reduction by government transfers between full-time part-time workers (see appendix 5). Contrary to the expectations, countries where benefits and earnings are combined among part-timers in particular do not make part-timers more likely to avoid poverty by government transfers compared to full-time workers. While the results are not significant, the sign of the coefficients even suggests that countries where benefits are more likely to be combined with earnings, the difference in poverty reduction government transfers among full-timers is even more likely than among part-timers. One reason could be that because these benefits increase the earnings gap between part-timers and full-timers and thus the additional income to be lifted above the poverty line for part-time workers is also larger in these countries, making it in fact less likely for them to be lifted above the poverty line. On the other hand, we do find indications that the concentration of part-time work among families with children, and policies that support parents in combining work and family, is associated with a more equal poverty reduction by government transfers for both part-time and full-time workers.

*Table 2 Fixed-effect logistic regression coefficients (log-odds) on earnings poverty (Models 1a and 1b), poverty reduction by other market incomes (Models 2a and 2b), and poverty reduction by government transfers (Models 3a and 3b)*

	<b>Model 1a</b>	<b>Model 1b</b>	<b>Model 2a</b>	<b>Model 2b</b>	<b>Model 3a</b>	<b>Model 3b</b>
part-time (ref.: full-time)	2.12 ***	2.15 ***	-0.16 ***	-0.38 ***	-0.14 ***	-0.08 *
women (ref.: men)		0.98 ***		0.10 ***		0.23 ***
age (ref.: 18_29)						
30_49		-0.99 ***		-0.06 *		0.22 ***
50_64		-1.17 ***		0.10 **		0.41 ***
education (ref.: low)						
middle		-0.48 ***		0.35 ***		0.25 ***
high		-1.09 ***		0.49 ***		0.23 ***
Child (ref.: no)		0.82 ***		-0.45 ***		-0.10 ***
family type (ref.: single)						
couple		-1.06 ***		0.40 ***		-0.98 ***
other		1.57 ***		0.68 ***		0.68 ***
WI other HHmembers		0.10 ***		4.81 ***		-0.32 ***
full-year (ref.: no)		-1.77 ***		0.56 ***		0.21 ***
Occupation (ref.: ISCO 1+2)						
ISCO		0.48 ***		0.06		0.06
ISCO		0.96 ***		0.02		0.02
ISCO		1.75 ***		-0.36 ***		-0.25 ***
ISCO		1.52 ***		-0.41 ***		-0.19 **
ISCO		2.27 ***		-0.73 ***		-0.47 ***
N	174913	174913	65120	65120	25988	25988
R <sup>2</sup>	0.105	0.359	0.021	0.414	0.034	0.090
LL	-103400	-740589	-39458	-23617	-16317	-15378

Source: EU-SILC 2012

Note: all model also controls for fixed effect of 27 countries

**Table 3** *Main effects of part-time work and cross-level interaction effects (log-odds) of fixed-effect logistic regressions on earnings poverty (Models 1c-z) , poverty reduction by other market incomes (Models 2c-z), and poverty reduction by government transfers (Models 3c-z).*

	Models 1c-z				Models 2c-z				Models 3c-z			
	part-time		interaction		part-time		interaction		part-time		interaction	
<b>wage setting institutions</b>												
union density	2.40	***	-0.01	***	-0.51	***	0.00	*	-0.09		0.00	
bargaining coverage	2.07	***	0.00		-0.59	***	0.00	**	-0.10		0.00	
bargaining centralisation	2.12	***	0.06		-0.65	***	0.70	***	-0.04		-0.09	
minimum wage	2.40	***	-1.13	***	-0.29	***	-0.38	*	-0.04		-0.15	
<b>social policies</b>												
replacement rate unemployment benefits	2.25	***	-0.00	*	-0.54	***	0.00	**	-0.02		0.00	
passive labour market spending (% gdp)	2.05	***	0.10	**	-0.42	***	0.04		-0.11	(*)	0.03	
share of benefit in individual income (all full-year)	2.11	***	0.29		-0.36	***	-0.17		0.00		-0.57	(*)
share of benefit in individual income (all full-year part-time)	2.06	***	4.65	**	-0.35	***	-1.69		-0.01		-3.37	
share of full-year workers that receive a benefit	2.02	***	2.19	***	-0.22	***	-2.34	**	-0.01		-0.96	
share of full-year part-time workers that receive a benefit	2.09	***	0.29	*	-0.30	***	-0.34	(*)	0.01		-0.38	
ratio family benefits and pre-transfer income	2.18	***	-0.23		-0.48	***	0.66	*	-0.13		0.38	
<b>working hour culture and institutions</b>												
average actual working hours in main job (FT employees)	0.93		0.03	*	-1.31		0.02		-1.53		0.04	
average collectively agreed working hours	2.20	**	0.00		3.52	***	-0.10	***	0.68		-0.02	
average usual working hours in main job (PT employees)	5.18	***	-0.13	***	-1.86	***	0.06	***	-0.03		0.00	
average usual working hours part-time / full-time	4.39	***	-3.80	***	-1.31	***	1.60	**	0.25		-0.57	
able to take day off for family reasons	2.31	***	-0.36	**	-0.73	***	0.80	***	-0.25	**	0.42	*
able to adapt working hours for family reasons	2.46	***	-0.53	***	-0.85	***	0.86	***	-0.28	**	0.41	*
<b>employment support and family policies</b>												
formal childcare use in FTE	2.84	***	-2.05	***	-0.50	***	0.36	(*)	-0.09		0.06	
informal childcare use in FTE	2.09	***	0.52	*	-0.19	***	-1.55	***	-0.02		-0.47	
total childcare use in FTE	3.01	***	-1.97	***	-0.35	***	-0.08		-0.05		-0.05	
active labour market spending (% gdp)	2.01	***	0.21	***	-0.47	***	0.16	*	-0.14	*	0.11	
<b>labour force composition</b>												
part-time rate single / part-time rate couple	1.88	***	0.30	***	-0.14	*	-0.25	***	0.01		-0.09	
part-time rate other / part-time rate couple	1.67	***	0.45	***	-0.08		-0.28	**	0.01		-0.08	
part-time rate child / part-time rate no child	2.75	***	-0.47	***	-0.92	***	0.43	***	-0.48	***	0.32	***
<b>Economic prosperity</b>												
GDP per capita in PPS in 2011	2.93	***	-0.01	***	-0.66	***	0.00	***	-0.37	***	0.00	***

*Source: EU-SILC 2012. Note: interactions are added separately and all model control for the variables in models 1b, 2b and 3b, and country dummies.*

## **6 Conclusion and discussion**

Motivated by the importance of part-time jobs in contemporary labour markets and the strong variation in the degree to which part-time jobs are associated with a 'poverty penalty' (OECD, 2010), this paper examined under which settings part-time work is most likely to be associated with a higher poverty risk. We distinguished between two approaches that may answer this question, a 'risk-group approach' and 'accounting approach'. This paper adopted the latter approach because it allows a more detailed assessment of how part-time and full-time workers avoid poverty differently by their own earnings, by other market incomes in the household, and by government transfers. These three elements are the fundamentals of the overall income package. Yet, the degree to which particular institutions, policies and labour market structures are related to the difference in poverty avoidance between part-time and full-time workers regarding these income components is not necessarily similar across countries. While the results of the analysis in this paper should not be interpreted as causal mechanisms, several interesting findings do arise that provide new insights regarding the association between country-level characteristics and the higher poverty risk of part-time workers in particular.

The empirical findings presented in this paper suggest that the variation in the part-time earnings penalty is a crucial starting point to understand the variation in the higher poverty risk of part-timers. Because part-timers work fewer hours and typically face an hourly pay penalty, they are less likely to provide enough income to keep a family out of poverty. However, in countries with high minimum wages and strong unions, institutions that also compress the overall earnings distribution, the situation is less problematic. This chapter also indicates that support for working mothers, in terms of working hour policies and working hour cultures as well as the availability of formal care provisions, is associated with a reduced difference in poverty earnings between part-time and full-time workers. This largely confirms our expectations as the latter institutions reduce the occupational segregation of part-time work in specific types of lower paid jobs as they allow for career progression even when working part-time, and do not constrain mothers to switch to lower paid occupations when working part-time. The consequences of labour market institutions in the longer run, however, are not necessarily consistent with the correlations found in this paper. Precisely when employers face strong wage setting constraints, they may look for opportunities to overcome stringent regulations, especially in times of crisis, resulting in a secondary segment of low hour part-time jobs as the recent proliferation of zero-hours contracts, mini-jobs, and marginal part-time employment illustrate (Lang, Schömann, & Clauwaert, 2013; Messenger & Wallot, 2015).

Because historically the main function of a standard full-time employment relationship has been to provide for the income needs of an entire family (Bosch, 2006), the notion of earnings poverty has still a heuristic value to examine the degree to which individual workers can provide for their family. However, in contemporary dual earner societies, work intensity at the household level has become more important to understand people's income position and hence poverty risk (Airio, 2008; Horemans, 2016). Consequently, the notion of poverty earnings is not able to draw the full picture in the variation in the part-time poverty gap across countries. We also need to take into account the degree to which poverty is reduced by other market incomes in the household, as well as by government transfers. On average we found that full-time workers are more likely to avoid poverty by other market incomes and government transfers as well.

Country-level features do not only affect the initial earnings penalty of part-time workers, but are also associated with the degree to which other market incomes are able to reduce their poverty earnings. Three mechanisms are potential responsible for this. First, when the earnings difference between full-timers and part-timers are lower on average, the additional income needed to be lifted above the poverty line differs less as well between them. Second, support for dual earners with children, or perhaps better one-and-a-half earners with children, is typically used by already more privileged families (Cantillon et al., 2001; Ghysels & Van Lancker, 2011). In other words, in countries that support the employment of mothers in particular, part-timers working mothers are also more likely to have high earnings partners. Third, in countries where part-time work is more concentrated among singles, market incomes from other household members are less relevant for part-timers.

Lastly, little difference was found between part-time and full-time workers regarding the poverty reduction by government transfers across countries. Yet, we did find some indications that family benefits in particular tend to reduce the poverty gap between part-time and full-time workers. On the other hand, in countries where part-timers are more likely to combine earnings with benefits on average, the results show that the part-time earnings poverty gap is higher in the first place and part-timers are relative less likely to avoid poverty by other market incomes in the household. Future research would benefit from a more fine-grained theoretical and empirical understanding of how work and benefits can go hand in hand, especially for those unable or highly constrained to work full-time as these, admittedly rather rudimentary analysis, suggests that the compensation for the reduced working hours is far from adequate and in potentially allows a higher part-time earnings gap in the first place.

## Appendix 1: Overview country-level variables

	# countries	mean	Std. Dev.	Min.	Max.	Source
<b>wage setting institutions</b>						
union density	27	32.72	19.82	0.69	74.40	Salverda and Checchi (2015)
bargaining coverage	27	61.39	25.54	12.16	98.91	Salverda and Checchi (2015)
bargaining centralisation	27	0.38	0.15	0.11	0.90	Salverda and Checchi (2015)
minimum wage (Kaitz index)	27	0.23	0.18	0.00	0.47	Salverda and Checchi (2015)
<b>social policies</b>						
replacement rate unemployment benefits	27	35.13	16.12	6.14	61.64	Salverda and Checchi (2015)
passive labour market spending (% gdp)	27	0.87	0.63	0.23	2.23	Salverda and Checchi (2015)
share of benefit in individual income (all full-year)	27	0.02	0.01	0.00	0.05	EU-SILC 2012 aggregate, own calculation
share of benefit in individual income (all full-year part-time)	27	0.08	0.05	0.01	0.19	EU-SILC 2012 aggregate, own calculation
share of full-year workers that receive a benefit	27	0.14	0.12	0.00	0.35	EU-SILC 2012 aggregate, own calculation
share of full-year part-time workers that receive a benefit	27	0.25	0.16	0.02	0.53	EU-SILC 2012 aggregate, own calculation
ratio family benefits and pre-transfer income	27	0.15	0.13	0.01	0.65	EU-SILC 2012 aggregate, own calculation
<b>working hour culture and institutions</b>						
average actual working hours in main job (full-time employees)	27	39.60	0.97	37.80	41.30	Eurofound (2010)
average collectively agreed working hours	27	38.61	1.26	35.60	40.00	Eurofound (2010)
average usual working hours in main job (part-time employees)	27	23.28	2.35	18.96	29.38	EU-SILC 2012 aggregate, own calculation
average usual working hours part-time / full-time	27	0.57	0.06	0.48	0.74	EU-SILC 2012 aggregate, own calculation
able to take day off for family reasons <sup>(a)</sup>	27	0.37	0.21	0.04	0.76	Eurostat (2016a)
able to adapt working hours for family reasons <sup>(a)</sup>	26	0.49	0.23	0.08	0.86	Eurostat (2016a)
<b>employment support and family policies</b>						
formal childcare use in FTE <sup>(b)</sup>	27	0.30	0.16	0.06	0.67	EU-SILC 2012 aggregate, own calculation
informal childcare use in FTE <sup>(b)</sup>	27	0.14	0.12	0.00	0.45	EU-SILC 2012 aggregate, own calculation
total childcare use in FTE <sup>(b)</sup>	27	0.42	0.16	0.16	0.69	EU-SILC 2012 aggregate, own calculation
active labour market spending (% gdp)	27	0.54	0.42	0.04	1.72	Salverda and Checchi (2015)
<b>labour force composition</b>						
part-time rate single / part-time rate couple	27	1.42	2.01	0.36	11.25	EU-SILC 2012 aggregate, own calculation
part-time rate other / part-time rate couple	27	1.39	1.47	0.72	8.63	EU-SILC 2012 aggregate, own calculation
part-time rate child / part-time rate no child	27	1.09	0.38	0.53	2.10	EU-SILC 2012 aggregate, own calculation
<b>economic prosperity</b>						
GDP per capita in PPS in 2011	27	102.44	45.23	45.00	263.00	Eurostat (2016b)

Note: <sup>(a)</sup> Average share of respondents that agrees that this is 'generally possible', other possible answers include 'rarely possible' and 'not possible'; <sup>(b)</sup> FTE = proportion of children below the age of 3 in formal childcare x average number of hours per week (as a percentage of 30 hours per week), see OECD Family Database.

## Appendix 2: Overview individual-level variables

	Poverty earnings	Poverty reduction: other market incomes	Poverty reduction: government transfers
<b>working time</b>			
full-time	85.9	74.4	76.1
part-time	14.1	25.6	23.9
<b>sex</b>			
male	50.8	40.0	48.8
female	49.2	60.0	51.2
<b>age</b>			
18_29	14.9	22.1	16.7
30_49	55.3	55.1	56.7
50_64	29.8	22.8	26.6
<b>education</b>			
low	14.5	21.2	27.7
middle	51.1	60.4	57.3
high	34.4	18.4	15.1
<b>children</b>			
0	47.3	37.0	42.0
1	24.4	26.9	22.5
2	21.6	25.5	22.3
>2	6.74	10.5	13.2
<b>family type</b>			
single	11.9	4.4	13.9
couple	55.2	44.9	43.6
other	32.9	50.7	42.5
<b>full-year working</b>			
no	4.5	8.6	9.8
yes	95.5	91.5	90.2
<b>occupation</b>			
managers and intellectuals (ISCO 1 + 2)	26.8	11.3	9.4
technicians (ISCO 3)	16.8	11.8	9.3
Clerical support (ISCO 4)	10.5	10.8	8.6
Service and sales (ISCO 5)	15.1	23.7	21.9
Agricultural, Crafts and machines (ISCO 6 + 7 + 8)	22.4	26.8	31.0
Elementary occupations (ISCO 9)	8.4	15.7	19.8
<b>work-intensity other household members</b>			
	$\mu = 61.2$ $\sigma = 42.9$	$\mu = 66.2$ $\sigma = 39.3$	$\mu = 24.0$ $\sigma = 36.3$
<b>n-value</b>	174913	65120	25988

Source: EU-SILC 2012



### Appendix 3: Poverty incidence by working time and income concepts.

	Earnings poverty		Pre-transfer poverty		Post-transfer poverty	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
AT	32.4	75.6	14.9	20.9	6.1	9.3
BE	12.8	48.5	7.4	17.3	1.9	6.2
BG	53.2	82.6	14.8	40.7	6.4	24.7
CY	48.6	90.0	14.0	27.5	6.8	15.7
CZ	38.9	85.4	11.0	33.3	3.0	11.2
DE	17.2	68.3	10.4	24.3	5.0	11.0
DK	9.3	30.2	7.5	15.8	3.2	4.3
EE	31.0	68.6	12.7	30.4	5.7	19.4
EL	15.4	75.3	12.3	44.3	6.2	24.8
ES	22.9	79.5	11.6	32.2	6.2	18.1
FI	17.8	62.3	7.9	24.9	1.4	6.6
FR	31.9	77.3	13.0	31.8	4.8	12.7
HU	44.1	85.9	18.8	41.2	4.3	14.0
IE	17.1	79.1	9.6	44.7	1.7	8.7
IT	26.7	77.1	14.4	28.5	7.4	17.0
LT	40.6	82.8	14.3	40.9	5.3	20.8
LU	35.7	69.7	19.9	31.4	8.4	12.6
LV	35.4	84.4	15.2	41.4	6.7	25.7
NL	9.6	46.5	6.3	11.0	2.5	3.6
NO	26.7	75.3	11.7	31.4	3.2	6.5
PL	38.8	73.1	14.8	30.0	5.8	11.6
PT	38.9	86.4	13.9	41.7	5.3	19.3
RO	30.9	67.5	13.4	39.5	5.3	33.1
SE	23.5	64.9	13.1	30.2	3.8	9.5
SI	38.4	73.9	15.7	38.9	3.5	8.8
SK	55.6	91.0	11.2	38.7	3.7	18.1
UK	28.6	82.0	11.5	32.9	4.4	13.5

Source: EU-SILC 2012

**Appendix 4: Average Marginal Effects (AME) of part-time work on poverty earnings, poverty reduction by other market incomes and poverty reduction by government transfers**

	AME of part-time work	std. err.
<b>poverty earnings</b>		
Model 1a	0.430	0.003
Model 1b	0.294	0.003
<b>poverty reduction by other market incomes</b>		
Model 2a	-0.033	0.005
Model 2b	-0.043	0.004
<b>poverty reduction by government transfers</b>		
Model 3a	-0.030	0.007
Model 3b	-0.015	0.007

Source: EU-SILC

## Appendix 5: Country specific coefficients of working part-time

Figure A.5.A Variation in the in log-odds of working part-time on earnings poverty

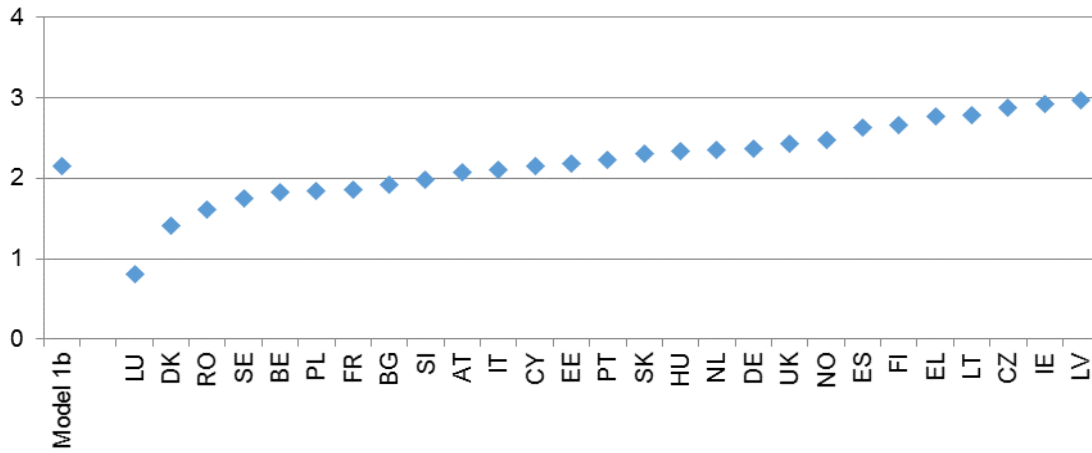


Figure A.5.2 Variation in the in log-odds of working part-time on poverty reduction by other market incomes

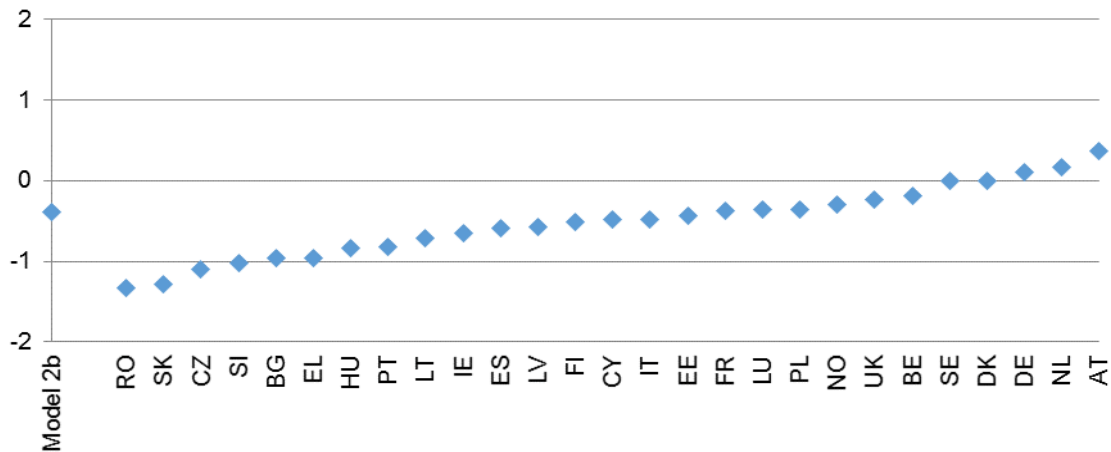
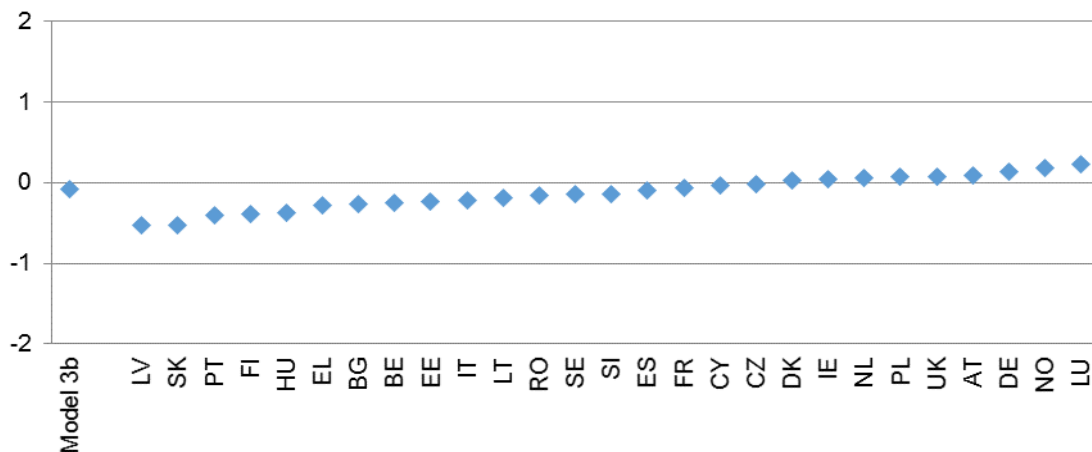


Figure A.5.3 Variation in the in odds of working part-time on poverty reduction by government transfers



## Appendix 6: Robustness checks cross-level interactions

Table A6.1 Robustness check interaction coefficients (log-odds) of wage setting institutions

<b>earnings poverty</b>												
part-time (main effect)	3.00	***	2.82	***	2.92	***	3.15	***	2.81	***	3.60	***
union density	-0.00	**							-0.00	(*)	0.00	*
bargaining coverage			0.00	*					0.00		0.00	
bargaining centralisation					0.03				-0.75	***	-0.96	***
minimum wage							-1.09	***	-1.35	***	-1.67	***
GDP per capita in PPS in 2011	-0.01	***	-0.01	***	-0.01	***	-0.01	***			-0.01	***
<b>poverty reduction by other market incomes</b>												
part-time (main effect)	-0.69	***	-0.85	***	-0.97	***	-0.57	***	-0.70	***	-0.92	***
union density	0.00								0.00	*	0.00	
bargaining coverage			0.00	**					0.00		0.00	
bargaining centralisation					0.76	***			0.53	*	0.59	**
minimum wage							-0.46	**	-0.27		-0.24	
GDP per capita in PPS in 2011	0.00	**	0.00	***	0.00	***	0.00	***			0.00	**
<b>poverty reduction by government transfers</b>												
part-time (main effect)	-0.33	***	-0.37	**	-0.34	**	-0.33	**	0.04		-0.22	
union density	0.00								0.00		-0.00	
bargaining coverage			0.00						0.00		0.00	
bargaining centralisation					-0.07				-0.26		-0.20	
minimum wage							-0.21		-0.29		-0.24	
GDP per capita in PPS in 2011	0.00	***	0.00	***	0.00	***	0.00	***			0.00	***

Source: EU-SILC 2012

Table A6.2 Robustness check interaction coefficients (log-odds) of social policy indicators

<b>earnings poverty</b>														
part-time (main effect)	3.14	***	2.86	***	2.86	***	2.85	***	2.92	***	2.91	***	2.92	***
replacement rate unemployment benefits	-0.00	***												
passive labour market spending (% gdp)			0.06	(*)										
share of benefit in individual income (all full-year)					3.23	(*)								
share of benefit in individual income (all full-year part-time)							0.98	(*)						
share of full-year workers that receive a benefit									0.08					
share of full-year part-time workers that receive a benefit										0.10				
ratio family benefits and pre-transfer income													0.09	
GDP per capita in PPS in 2011	0.01	***	0.01	***	-0.01	***	-0.01	***	-0.01	***	-0.01	***	-0.01	***
<b>poverty reduction by other market incomes</b>														
part-time (main effect)	-0.91	***	-0.74	***	-0.64	***	-0.49	***	-0.66	***	-0.60	***	-0.72	***
replacement rate unemployment benefits	0.01	**												
passive labour market spending (% gdp)			0.07											
share of benefit in individual income (all full-year)					-0.90									
share of benefit in individual income (all full-year part-time)							-1.75	*						
share of full-year workers that receive a benefit									-0.03					
share of full-year part-time workers that receive a benefit										-0.23				
ratio family benefits and pre-transfer income													0.51	(*)
GDP per capita in PPS in 2011	0.00	***	0.00	***	0.00	***	0.00	**	0.00	***	0.00	***	0.00	***
<b>poverty reduction by government transfers</b>														
part-time (main effect)	-0.34	**	-0.42	***	-0.32	**	-0.36	**	-0.30	**	-0.31	**	-0.40	***
replacement rate unemployment benefits	0.00													
passive labour market spending (% gdp)			0.05											
share of benefit in individual income (all full-year)					-1.96									
share of benefit in individual income (all full-year part-time)							-0.06							
share of full-year workers that receive a benefit									-0.39					
share of full-year part-time workers that receive a benefit										-0.22				
ratio family benefits and pre-transfer income													0.25	
GDP per capita in PPS in 2011	0.00	***	0.00	***	0.00	**	0.00	**	0.00	**	0.00	**	0.00	**

Source: EU-SILC 2012

Table A6.3 Robustness check interaction coefficients (log-odds) of social policy indicators (cont.)

<b>earnings poverty</b>																
part-time (main effect)	2.06	***	2.93	***	1.97	***	2.96	***	2.15	***	3.00	***	2.11	***	3.01	***
replacement rate unemployment benefits	-0.00	**	-0.01	***	-0.00		-0.00	**	-0.01	***	-0.01	***	-0.00	**	-0.00	***
passive labour market spending (% gdp)	0.17	***	0.11	**	0.16	***	0.09	**	0.17	***	0.11	**	0.15	***	0.09	**
share of benefit in individual income (all full-year)	9.54	***	5.81	**												
share of benefit in individual income (all full-year part-time)					3.34	***	0.92									
share of full-year workers that receive a benefit								1.11	***	0.58	*					
share of full-year part-time workers that receive a benefit													0.58	***	0.19	
ratio family benefits and pre-transfer income	-0.62	**	-0.22		-0.77	**	-0.14		-0.69	**	-0.22		-0.57	*	-0.09	
GDP per capita in PPS in 2011			-0.01	***			-0.01	***			-0.01	***			-0.01	***
<b>poverty reduction by other market incomes</b>																
part-time (main effect)	-0.60	***	-0.97	***	-0.44	***	-0.77	***	-0.62	***	-0.97	***	-0.56	***	-0.91	***
replacement rate unemployment benefits	0.00	(*)	0.01	**	0.00	(*)	0.00	*	0.01	**	0.01	**	0.00	*	0.01	**
passive labour market spending (% gdp)	0.01		0.05		0.00		0.03		0.01		0.42		0.01		0.04	
share of benefit in individual income (all full-year)	-3.37		-1.83													
share of benefit in individual income (all full-year part-time)					-2.98	***	-2.05	*								
share of full-year workers that receive a benefit								-0.62	(*)	-0.40						
share of full-year part-time workers that receive a benefit													-0.55	**	-0.36	(*)
ratio family benefits and pre-transfer income	0.75	*	0.56	(*)	1.08	**	0.84	**	0.88	**	0.65	*	0.93	**	0.70	*
GDP per capita in PPS in 2011			0.00	***			0.00	**			0.00	***			0.00	***
<b>poverty reduction by government transfers</b>																
part-time (main effect)	-0.04		-0.39	*	-0.00		-0.39	*	-0.06		-0.37	*	-0.03		-0.35	*
replacement rate unemployment benefits	-0.00		-0.00		-0.00		-0.00		-0.00		-0.00		-0.0		-0.00	
passive labour market spending (% gdp)	0.02		0.05		0.03		0.06		0.01		0.04		0.02		0.05	
share of benefit in individual income (all full-year)	-3.54		-1.36													
share of benefit in individual income (all full-year part-time)					-1.54	(*)	-0.24									
share of full-year workers that receive a benefit								-0.75	(*)	-0.46						
share of full-year part-time workers that receive a benefit													-0.51	(*)	-0.28	
ratio family benefits and pre-transfer income	0.47		0.31		0.62	(*)	0.32		0.61	(*)	0.42		0.62	(*)	0.41	
GDP per capita in PPS in 2011			0.00	**			0.00	**			0.00	**			0.00	**

Source: EU-SILC 2012

Table A6.4 Robustness check interaction coefficients (log-odds) of working hour culture and institutions

<b>earnings poverty</b>												
part-time (main effect)	2.20	*	2.63	***	5.59	***	4.94	***	2.88	***	2.88	***
average actual working hours in main job (FT employees)	0.02											
average collectively agreed working hours			0.01									
average usual working hours in main job (PT employees)					-0.11	***						
average usual working hours part-time / full-time							-3.49	***				
able to take day off for family reasons									0.16			
able to adapt working hours for family reasons											0.11	
GDP per capita in PPS in 2011	-0.01	***	-0.01	***	-0.01	***	-0.01	***	-0.01	***	-0.01	***
<b>poverty reduction by other market incomes</b>												
part-time (main effect)	-2.75	*	3.28	***	-1.90	***	-1.44	***	-0.82	***	-0.89	***
average actual working hours in main job (FT employees)	0.05											
average collectively agreed working hours			-0.10	***								
average usual working hours in main job (PT employees)					0.05	***						
average usual working hours part-time / full-time							1.38	**				
able to take day off for family reasons									0.66	***		
able to adapt working hours for family reasons											0.74	***
GDP per capita in PPS in 2011	0.00	***	0.00	***	0.00	**	0.00	***	0.00	*	0.00	
<b>Poverty reduction government transfers</b>												
part-time (main effect)	-3.11	*	-0.30		-0.06		0.10		-0.41	***	-0.37	**
average actual working hours in main job (FT employees)	0.07	(*)										
average collectively agreed working hours			-0.02									
average usual working hours in main job (PT employees)					-0.01							
average usual working hours part-time / full-time							-0.83					
able to take day off for family reasons									0.18			
able to adapt working hours for family reasons											0.14	
GDP per capita in PPS in 2011	0.00	***	0.00	***	0.00	***	0.00	***	0.00	**	0.00	*

source: EU-SILC 2012

Table A6.4 Robustness check interaction coefficients (log-odds) of working hour culture and institutions (cont.)

<b>earnings poverty</b>																
part-time (main effect)	5.59	***	5.88	***	2.48	***	2.88	***	5.54	***	5.88	***				
average actual working hours in main job (FT employees)																
average collectively agreed working hours																
average usual working hours in main job (PT employees)	-3.33	***	-0.28	***					-0.34	***	-0.25	***				
average usual working hours part-time / full-time	7.67	***	6.03	***					8.20	***	4.49	**				
able to take day off for family reasons					0.61	*	0.32		0.34		-0.07					
able to adapt working hours for family reasons					-1.04	***	-0.17		-0.50	(*)	0.60	*				
GDP per capita in PPS in 2011			-0.01	***			-0.01	***			-0.01	***				
<b>poverty reduction by other market incomes</b>																
part-time (main effect)	-2.16	***	-2.16	***	-0.85	***	-0.88	***	-2.15	***	-2.15	***	1.83	2.27	(*)	
average actual working hours in main job (FT employees)																
average collectively agreed working hours													-0.09	**	-0.08	**
average usual working hours in main job (PT employees)	0.31	***	0.28	***					0.29	***	0.28	***	0.27	***		
average usual working hours part-time / full-time	-9.56	***	-8.58	***					-9.21	***	-9.04	***	-9.24	***		
able to take day off for family reasons					0.07		0.18		0.27		0.30				0.28	
able to adapt working hours for family reasons					0.80	(*)	0.56		0.44		0.37				0.08	
GDP per capita in PPS in 2011			0.00	*			0.00				0.00		0.00	*	0.00	*
<b>Poverty reduction government transfers</b>																
part-time (main effect)	-0.32		-0.27		-0.28	*	-0.36	**	-0.09		-0.12		0.26		-4.17	*
average actual working hours in main job (FT employees)													-0.01		0.09	*
average collectively agreed working hours																
average usual working hours in main job (PT employees)	0.18	**	0.12	*					0.14	*	0.12	(*)	0.34			
average usual working hours part-time / full-time	-6.84	**	-5.13	*					-6.20	**	-5.17	*	-5.65			
able to take day off for family reasons					-0.00		0.26		-0.12		0.08				0.21	
able to adapt working hours for family reasons					0.21		-0.12		0.56		0.17				0.07	
GDP per capita in PPS in 2011			0.00	**			0.00	***			0.00	(*)	0.00	**	0.00	*

Source: EU-SILC 2012



Table A6.5 Robustness check interaction coefficients (log-odds) of employment support and family policies

<b>earnings poverty</b>																
part-time (main effect)	3.21	***	2.98	***	3.42	***	2.80	***	2.88	***	3.34	***	2.95	***	3.34	***
formal childcare use in FTE	-1.55	***							-2.12	***	-1.67	***				
informal childcare use in FTE			-0.30	***					-0.59	*	-0.92	**				
total childcare use in FTE					-1.54	***							-1.91	***	-1.45	***
active labour market spending (% gdp)							0.19	***	0.08	(*)	0.07		0.05		0.07	
GDP per capita in PPS in 2011	-0.00	***	-0.01	***	-0.00	***	-0.01	***			-0.00	***			-0.01	***
<b>poverty reduction by other market incomes</b>																
part-time (main effect)	-0.65	***	-0.43	***	-0.53	***	-0.77	***	-0.31	*	-0.48	***	-0.50	***	-0.66	***
formal childcare use in FTE	-0.06								0.14		-0.16					
informal childcare use in FTE			-1.29	***					-1.38	***	-1.19	**				
total childcare use in FTE					-0.45	(*)							0.06		-0.31	
active labour market spending (% gdp)							0.17	*	0.09		0.10		0.16	*	0.15	*
GDP per capita in PPS in 2011	0.00	***	0.00	**	0.00	***	0.00	***			0.00	**			0.00	***
<b>Poverty reduction government transfers</b>																
part-time (main effect)	-0.30	**	-0.35	**	-0.24	*	-0.44	***	-0.11		-0.36	*	-0.17		-0.33	*
formal childcare use in FTE	-0.46	(*)							0.05		-0.41					
informal childcare use in FTE			-0.11						-0.29		-0.04					
total childcare use in FTE					-0.43								0.06		-0.33	
active labour market spending (% gdp)							0.12		0.10		0.10		0.12		0.09	
GDP per capita in PPS in 2011	0.00	***	0.00	**	0.00	***	0.00	***			0.00	***			0.00	***

Source: EU-SILC 2012

Table A6.6 Robustness check interaction coefficients (log-odds) of labour force composition

<b>earnings poverty</b>														
part-time (main effect)	2.98	***	2.64	***	3.03	***	2.65	***	3.13	***	2.47	***	2.74	***
part-time rate single / part-time rate couple	-0.03						0.07		-0.07					
part-time rate other / part-time rate couple			0.24	**							0.20	*	0.20	*
part-time rate child / part-time rate no child					-0.13	(*)	-0.44	***	-0.15	*	-0.41	***	-0.08	
GDP per capita in PPS in 2011	-0.01	***	-0.01	***	-0.01	***			-0.01	***			-0.01	***
<b>poverty reduction by other market incomes</b>														
part-time (main effect)	-0.40	**	-0.38	**	-0.92	***	-0.71	***	-0.71	***	-0.71	***	-0.71	***
part-time rate single / part-time rate couple	-0.18	**					-0.13	*	-0.13	(*)				
part-time rate other / part-time rate couple			-0.22	**							-0.15	(*)	-0.15	(*)
part-time rate child / part-time rate no child					0.41	***	0.37	***	0.37	***	0.39	***	0.37	***
GDP per capita in PPS in 2011	0.00	*	0.00	**	0.00				-0.00				0.00	
<b>Poverty reduction government transfers</b>														
part-time (main effect)	-0.37	**	-0.35	*	-0.50	***	-0.50	**	-0.55	**	-0.52	**	-0.53	**
part-time rate single / part-time rate couple	0.00						0.01		0.03					
part-time rate other / part-time rate couple			-0.02								0.03		0.02	
part-time rate child / part-time rate no child					0.21	(*)	0.33	***	0.22	(*)	0.33	***	0.22	(*)
GDP per capita in PPS in 2011	0.00	**	0.00	**	0.00				0.00				0.00	

Source: EU-SILC 2012

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<sup>i</sup> This concept should not be confused with the idea that the poor pay more (Caplovitz, 1967)

<sup>ii</sup> For example, Gardiner and Millar (2006) distinguish between market income of a partner in a second step and only take into account the market income of other household members as a sixth step, after including non-means-tested benefits, tax credits, and means-tested benefits. Others look at one aspect in particular which may include different specific steps, like the difference between a poverty wage rate and the actual poverty rate (Debels, 2008) or, the poverty reduction through social transfers in general (Lohmann, 2009). at one point economies of scale and household needs are taken into account by adopting an equivalence scale. This involves making strong assumptions. Taking the household context into account makes the results highly sensitive to the assumption of equal income sharing within the household (Gardiner & Millar, 2006). Furthermore, from a comparative perspective, it implies that the cost of children is the same in all countries (Crettaz, 2013). The degree of detail for adopting equivalence scales is not fixed. For example, Allègre (2013) differentiates between the conjugal situation and the presence of children.

<sup>iii</sup> The potential effect of single policy measures, however, should not be overstated as multiple paths to high female employment exist, including cultural acceptance of working mothers (Kenworthy, 2008; Orloff, 2002; Pfau-Effinger, 2004).