CSB
WORKING PAPER

centreforsocialpolicy.eu June 2012 No 12 / 06

Individual Employment, Household Employment and Risk of Poverty in the EU. A Decomposition Analysis.

Vincent Corluy & Frank Vandenbroucke

University of Antwerp
Herman Deleeck Centre for Social Policy
Sint-Jacobstraat 2
BE – 2000 Antwerp
fax +32 (0)3 265 57 98

Individual Employment, Household Employment and Risk of Poverty in the EU. A Decomposition Analysis[1]

Vincent Corluy (UA) and Frank Vandenbroucke (KU Leuven & UA)[2]

Working Paper No. 12 / 06

June 2012

ABSTRACT

In this paper we explore missing links between employment policy success (or failure) and inclusion policy success (or failure), relying on the EU Labour Force Survey (EU LFS) and the EU Survey on Income and Living Conditions (EU SILC). At the inclusion side of the equation, our focus is on the share of individuals at risk of poverty in the 20-to-59 age cohort.
The analysis proceeds in two steps. The first step considers the distribution of individual jobs over households, thus establishing a link between individual employment rates and household employment rates. Following the work by Gregg, Scutella and Wadsworth a 'polarization index' is defined in terms of the difference between, on the one hand, the hypothetical share of individuals living in jobless households assuming that individual employment is distributed randomly across households, and, on the other, the actual share of individuals living in jobless households. Actual changes in household joblessness are decomposed in (i) changes due to changes in polarization and (ii) changes due to changing individual employment rates and changing household structures.
The second step in the analysis decomposes changes in the at-risk-of-poverty rates on the basis of (i) changes in the poverty risks of jobless households, and (ii) changes in the poverty risks of other (non-jobless) households; (iii) changes in household joblessness due to changes in individual employment rates and changing household structures (changes one would expect if no changes in polarization would occur) and (iv) changes in polarization. The proposed technique does yield interesting insights into the trajectories that EU welfare states have followed over the past ten years.

Keywords: jobless and work-poor households, polarization of employment, at-risk-of-poverty rate, convergence across EU

---

[1] Funding for the research was provided by Net – SILC2, the Second Network for the Analysis of EU-SILC (http://www.essnet-portal.eu/net-silc2).

[2] We thank Paul De Beer, Bea Cantillon and colleagues at the Herman Deleeck Centre for Social Policy, Brian Nolan and the participants at a seminar at the KU Leuven and the UvA for precious comments. The usual disclaimers apply. Correspondence to vincent.corluy@ua.ac.be.

Introduction

Is employment the best recipe against poverty of people in working age? At the level of individual citizens and the households in which they live, participation in the labour market significantly diminishes the risk of financial poverty. However, what seems evident at the level of individuals and households is less evident at the country level.

Prior to the financial crisis, the Lisbon strategy could be regarded as a qualified success in the field of employment, at least if one assumes there to have been causal relationships between the Lisbon agenda and growing employment rates across Europe. On the other hand, though, the Lisbon strategy largely failed to deliver on its ambitious promise concerning poverty. Notwithstanding generally higher employment rates, as well as declining poverty in some Member States, other Member States saw poverty increase. In many Member States there was a standstill in the poverty record. Rather than a general conversion of employment policy success in anti-poverty success, the overall picture seems one of convergence of national at-risk-of poverty rates: poverty rates increased in some Member States where they were traditionally low, and decreased in other Member States where they were traditionally high. Hence, it is important to understand the *missing links* between employment policy success (or failure) and inclusion policy success (or failure). We explore those missing links, relying on the statistical apparatus of the EU Labour Force Survey (EU LFS) and the EU Survey on Income and Living Conditions (EU SILC).

At the poverty side of the equation, our focus is on the share of individuals at risk of poverty in the 20-to-59 age cohort. Since the poverty risk of an individual is determined on the basis of the income of the household to which that individual belongs, the relation between at-risk-of-poverty rates and employment rates must, first of all, be analyzed at the household level; hence, we will establish measures of *household employment*. As we will explain in Section 1, at that side of the equation we face a difficult choice between different conceptions of household employment rates. Our time frame for the analysis of poverty risks is determined by the use of EU SILC 2005 and EU SILC 2008. Since EU SILC 2005 refers to observations in 2004 and 2005 and EU SILC refers to observations in 2007 and 2008, we will label the time frame of these poverty analyses as '2004/5-2007/8'.[3] This short time frame is linked to data limitations, but is also interesting per se, as we want to study the

[3] Since the income data in SILC refer to the year prior to the survey, the basis of our poverty data spans the years 2004 and 2007 (except in Ireland and the United Kingdom). The ILO-based definition of jobless households refers to realities in 2005 and 2008 observed immediately before the survey, whilst the definition of 'work-poor' households (see Section 4) refers to the 12-month period as the income data. To summarize this complex construal we label the time frame as '2004/5-2007/8'.

trajectory of (24)[4] EU welfare states during the 'good economic years' 2004/5-2007/8. The longer term labour market analysis which we will present concerns two time frames: 1995-2008 (on the basis of LFS 1995 en LFS 2008) for 11 countries and 2000-2008 (on the basis of LFS 2000 and LFS 2008) for 23 countries. Our inquiry thus should enable us to verify empirically one of the explanations for the disappointing poverty trends during the 'good economic years' of the Lisbon era, put forward in Vandenbroucke and Vleminckx (2011) and Cantillon (2011), to wit, that this outcome is partly attributable to a failure to reduce the number of individuals living in jobless or work-poor households, despite increasing individual employment rates.

The analysis of the evolution between 2004/5 and 2007/8 then proceeds in two steps. The first step, in Section 2, considers the distribution of individual jobs over households, thus establishing a link between individual employment rates and the configuration of household employment. Following the work by Gregg, Scutella and Wadsworth (2008, 2010), a 'polarization index' is defined in terms of the difference between, on the one hand, the hypothetical share of individuals living in jobless households assuming that individual employment is distributed *randomly* across households, and, on the other, the actual share of individuals living in jobless households. Actual changes in household joblessness are decomposed in (i) changes due to changes in polarization and (ii) changes due to changing individual employment rates and changing household structures. Changes in polarization can be further decomposed, as will be shown. As we explain below, the benchmark of 'random distribution of jobs', applied in this analysis, does not carry a normative meaning. The message should be read as follows, in our understanding: to the extent that positive polarization is avoidable, it signals an avoidable suboptimal situation for a welfare state.

The second step in the analysis, in Section 3, decomposes changes in the at-risk-of-poverty rates on the basis of (i) changes in the poverty risks of jobless households, and (ii) changes in the poverty risks of other (non-jobless) households; (iii) changes in household joblessness due to changes in individual employment rates and changing household structures (changes one would expect if no changes in polarization would occur) and (iv) changes in polarization. Thus, we integrate the two missing links we explore (the link between individual employment rates and the configuration of household employment; the link between the configuration of household employment and poverty) into one single analysis. In principle, this would allow to assess the impact on at-risk-of-poverty rates of changes in individual employment rates, *ceteris paribus*, and the impact on at-risk-of poverty rates of changes in polarization, *ceteris paribus*. In practice, data limitations make such an integrated analysis hard, and the conclusions we will draw can only be tentative.

[4] Bulgaria, Romania and Malta are not yet available in EU-SILC 2005 survey.

Although important *caveats* warn against simplistic interpretation of the decomposition pursued, the proposed technique does yield interesting insights into the trajectories that EU welfare states have followed over the past ten years. The analysis uncovers a puzzling combination of convergence and disparity within the EU. Convergence is observed in terms of fundamental trends in labour markets since at least 1995, and, albeit less unequivocally, in relation to overall poverty outcomes (in the age cohort 20 to 59) during the Lisbon era. Convergence in national poverty rates during the boom years 2004/5-2007/8 was presumably the upshot of economic growth and intergenerational shifts in the new Member States, decreasing poverty rates in Anglo-Saxon Europe and increasing poverty rates in some Scandinavian countries. At the same time, the evidence suggests a disparity in social policy trajectories during those years.

Polarization levels and household sizes constitute important structural background features for EU welfare states; together with differences in social spending, they help explain differences in their performance with regard to poverty risks and poverty risk reduction. Our analysis of the longer term changes in labour markets suggests that cumulative, incremental changes in polarization and household size structure also play a role in changes in pre-transfer poverty risks and welfare state performances over time. *A priori*, it seems plausible to assume that in a number of countries those factors contributed to disappointing trends in at-risk-of poverty rates in an era of significant employment growth. However, we lack the data to test that hypothesis; our analysis of short term changes in poverty risks during the boom years 2004/5-2007/8 shows that changes in polarization or household size structures did not play a noteworthy role in the evolution of poverty risks in that short time span, except for some countries. But that does not diminish the importance of national and EU policy-makers should attach to the presence of high numbers of jobless households and polarization, as possibly problematic conditions for welfare states.

In Section 4 we explore a decomposition of changes in poverty risks based on the more subtle distinction between 'work-poor' and 'work-rich' households. This allows to enrich our conclusions and to set out an agenda for further research.

1. Household Employment: Alternative Definitions and Social Stratification

1.1. Alternative Definitions of Household Employment

In Sections 2 and 3 of this paper we will focus on household joblessness, using an ILO concept of employment. According to this ILO concept of employment, an individual is in work if employed for at least one hour in the week before the survey. The household is jobless if no member in the age bracket 20-59 is in employment, so defined. As a short cut, we will use 'jobless household rate' or 'household joblessness' to refer to the share of individuals in the age bracket 20-59 living in jobless households.[5] In Section 4, we will focus on a different conception of household employment rates, distinguishing 'work-poor' from 'work-rich' households. Applying a measurement for work intensity as defined by Eurostat in the framework of Europe 2020, we consider a household to be 'work-poor', if it's work intensity is less than 50%. We will refer to the latter concept with the notation $wp^{0.5}$ and refer to the former concept (joblessness) with the notation wp^{0}. The population reference group is exactly the same for wp^{0} and $wp^{0.5}$: 'adults' are defined as those belonging to the 20-59 age bracket excluding full-time students (that is, household members aged 20-24 with ILO status inactive). Similarly, the employment status is checked of household members aged 20-59, excluding full-time students aged 20-24.[6] The underlying employment concept is radically different though. According to the ILO concept of employment, which is used for wp^{0} , an individual is in work if employed for at least one hour in the week before the survey; the household is jobless if no member belonging to the working-age focus group is in employment, so defined. For the calculation of wp^{0} use can be made of LFS and SILC, differences in the LFS and SILC samples alas leading to divergent results.[7] In contrast, in order to calculate $wp^{0.5}$, work intensity is defined as the ratio of the total number of months that working age household members (excluding students) worked to the total number of months that could, in theory, have been worked by them. For persons who reported having worked part-time, an estimate of the number of months in terms of full-time-equivalent was computed on the basis of the number of usually worked hours at the time of the interview. The indicator $wp^{0.5}$ can only be calculated on the basis of SILC.

The distinction between wp^{0} and $wp^{0.5}$ is a matter not only of degree (no economic activity whatsoever versus limited economic activity) but also of

---

5 We exclude full time students both when we count the members of the household who are in employment (to classify the household as 'jobless' or 'not jobless'), and when we define the population for which we calculate the jobless household rate. In LFS and SILC individuals are considered 'full time students' when they are between 18 and 24 and their status is 'inactive'.

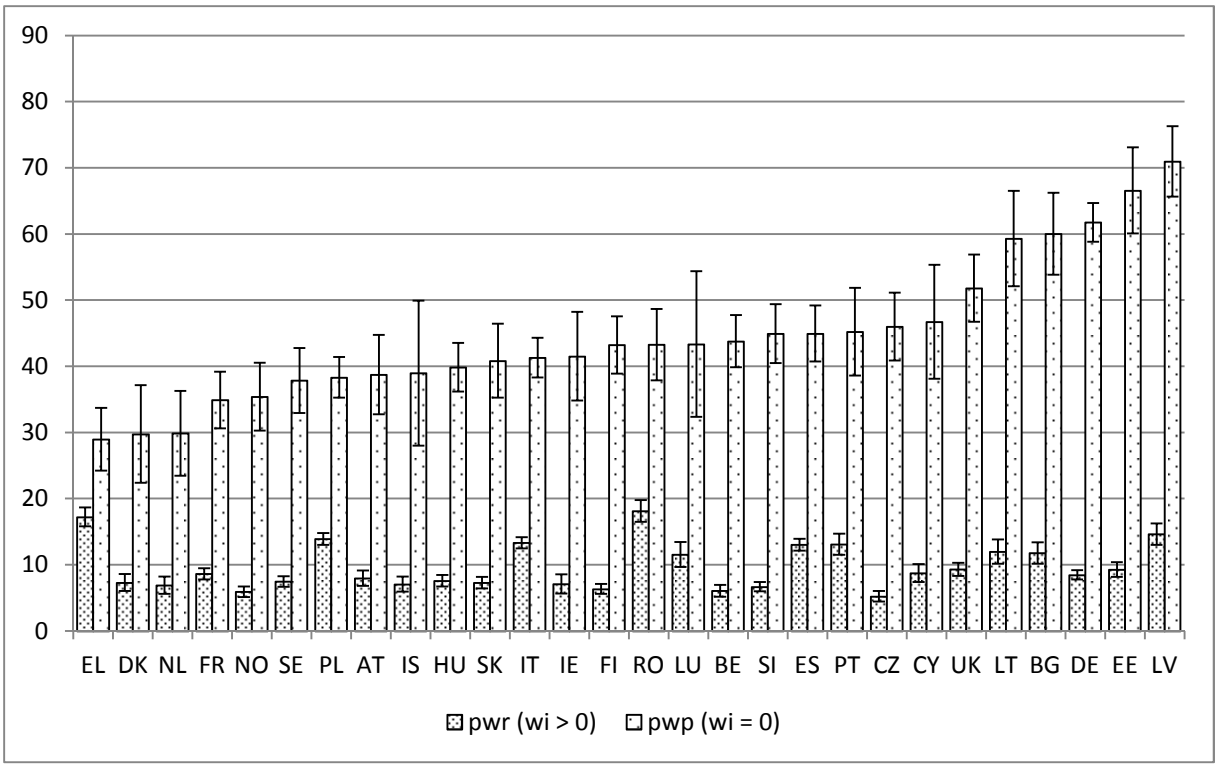
6 Hence, whether or not a household, comprised of two 22-year-old students and a non-student adult of the same age, is a jobless household depends on the employment status of the non-student only.

7 This problem is discussed in Nolan and De Graaf (2011) and in appendix 1 of this paper.

the timeframe applied: wp^0 is based on the week before the survey, whereas $wp^{0.5}$ is based on the year prior to the survey (income reference period). Thus, the households identified as jobless may be households where the week prior to the survey no-one happened to be in employment, even though household members experienced irregular spells in and out of the labour market in the months before; with the work intensity metric, these households would not be identified as jobless but as work-poor. Unsurprisingly, the average value of $wp^{0.5}$ across the countries under review is higher than the average value of wp^0: 9.5% of the population aged 20-59 was living in a jobless household and 15.7% of the population was living in a work-poor household, i.e. a household with work intensity of less than 50%. Rather more surprisingly, the poverty risk of the jobless households (pwp^0), while typically higher than the poverty risk for the work-poor ($pwp^{0.5}$), is lower in Denmark, Greece, Norway, France and Estonia. Two factors may explain this. First, the ILO-based measure for wp^0 is not comparable to the work intensity measure used by Eurostat, hence one should not *a priori* expect an ILO-based calculation of pwp^0 to be higher than a work intensity based calculation for $pwp^{0.5}$. Second, even when using the work intensity metric to calculate pwp^0 (i.e. looking back twelve months, and taking into account both months and hours worked – which we did not do here) the relation between work intensity and financial poverty risks is non-linear in most countries: households with work intensity equal to zero experience lower poverty risks than households with work intensity close to zero but non-zero (European Commission, 2011, p. 157, Chart 21). *Prima facie,* this may be due to the fact that the group of zero work intensity households includes a substantial number of households living on pensions or pre-pensions, even below the age of 59; early-exit schemes may yield a better income than the unemployment or social assistance benefits on offer to those who have irregular spells in and out of the labour market.[8]

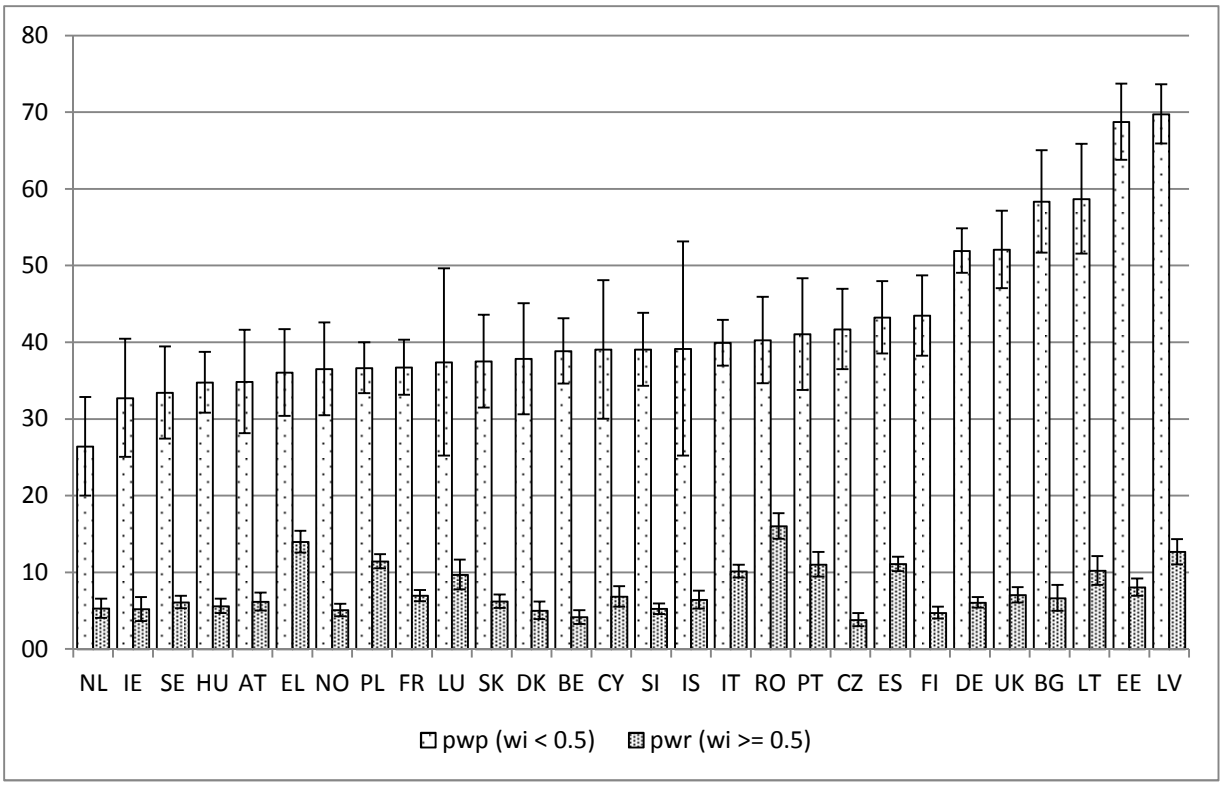
[8] The impact of work intensity on poverty risks appears to be influenced significantly by the age bracket studied; preliminary results, not shown here, suggest that the at-risk-of-poverty rate for the work-poor groups is considerably higher in a number of countries if the 'early-exit generation', i.e. the 55-59 age bracket, is excluded from the analysis.

Figure 1: At-risk-of-poverty rate for individuals in jobless and non-jobless households, 2007/8, (ILO definition, EU SILC 2008).



One of the reasons why we have chosen a 50% benchmark for work intensity, instead of the 20% benchmark the Europe 2020 strategy focusses on, is that using 50% yields a substantial subgroup of the population despite the strictness of the underlying concept of work intensity which takes into account both the frequency and the normal hours of work during one year. We wanted a population subgroup that would be sufficiently large, to safeguard statistical significance when analysing further subdivisions of this group. The European Commission shows that the risk of poverty begins to drop significantly when household work intensity increases beyond 20%, which explains their choice of this benchmark. Simultaneously, the Commission shows that the poverty risk (for adults) only comes down to the same level as the total at-risk-of poverty rate for adults when work intensity exceeds 50% (European Commission, ibidem).

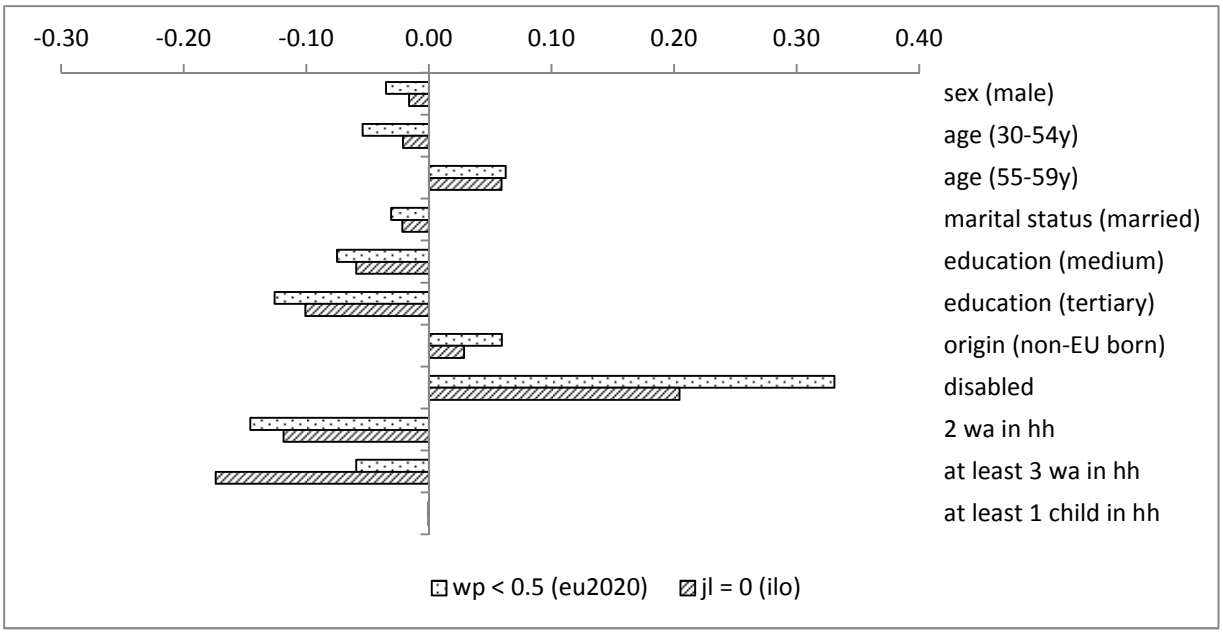
Figure 2: At-risk-of-poverty rate for individuals in work-poor and work-rich households, 2007/8, (EU2020 definition of work intensity, EU SILC 2008).



1.2. The Social Stratification of Individuals in Jobless and Work-poor Households

Who are the individuals confronted with a high risk of living in a jobless household (ILO-concept) or a work-poor household with less than 50% work intensity? A probit analysis on the level of EU-15 and EU-10 reveals strong social stratification, as can be seen in Figure 3 and Figure 4. We distinguish the old and new Member States, because *a priori* one might expect a sociological difference in the stratification of the post-communist societies of the EU-10. However, the social stratification of jobless and work-poor households in today's 'old' and 'new' Europe is quite similar; apart from the risk associated with being single, this social stratification to a large extent reflects some deep-rooted social disadvantages with which individuals are born or have come to live with rather early in their lives. This underscores the challenges activation strategies face if they want to reach out successfully at jobless or work-poor households.

Figure 3: Marginal effects on the probability of living in jobless (ILO) or work-poor (wi < 0.5) households, SILC 2008, for EU-15



First of all and unsurprisingly, individuals with high risks of living in a jobless household or a work-poor household are individuals living in single households. This result is in part attributable to the mere 'mathematical' effect of the absence of unemployment risk pooling in single households. Our probit analysis does not reveal whether or not singles run a higher risk of joblessness or work poverty as a 'household' than their peers in larger households (peers in terms of gender, education, and the other factors studied in the probit analysis) *beyond* the higher risk they incur because of the lack of risk pooling.[9] Rather surprisingly, at the level of these pooled EU data, having children does not influence the risk of living in a jobless or work-poor household: this is the result of small positive and negative impact of having children in different Member States, cancelling each other out at the EU-15 and EU-10 level.[10] Whatever the household size, we see that disabled individuals[11] and individuals whose educational attainment is lower than secondary education run a higher risk of living in a jobless or work-poor household. With regard to the risk of living in a jobless household, our age-result follows intuition. Compared with individuals aged 20-29, individuals between 30-54 have a lower risk and individuals between 55-59 have a significantly higher risk of living in a jobless household. This result for the latter group is in line with what one would expect given early exit from labour markets. The marginal effects

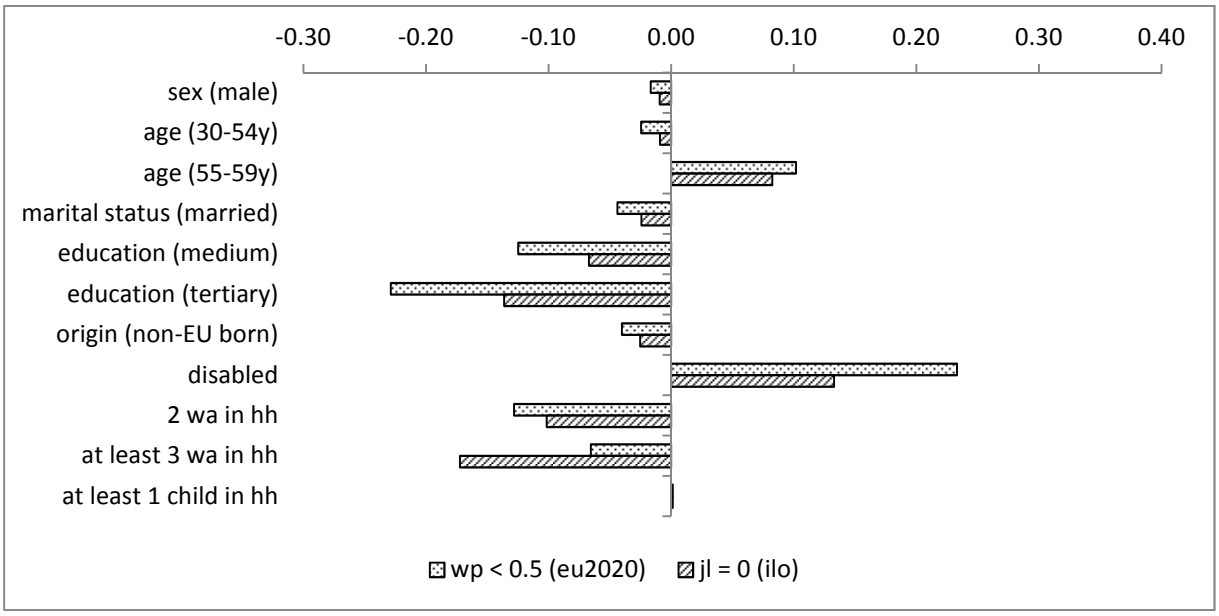
[9] In appendix 4 and 5 of this paper we refine the decomposition of polarization 'within' and 'between' households on a conditional basis, which can in principle shed some light on this question.

[10] That does not exclude that the impact of having children might be important when analysing specific subgroups of the population, for instance singles.

[11] The variable captures the person's own perception of their main activity at present. The respondent indicates to be permanently disabled or/and unfit to work.

are very similar for both the fine-grained definition on the basis of work intensity and the ILO definition.

Figure 4: Marginal effects on the probability of living in jobless (ILO) or work-poor (wi < 0.5) households, SILC 2008, for EU 10.



There are subtle differences between the risk profiles of the two population subgroups (jobless households, work-poor household) we distinguish here. The risks associated with disability and education are similar for joblessness and work poverty, yet the marginal effects of those individual features are more important for work poverty than for joblessness. Also the impact of gender is more outspoken with regard to work poverty than with regard to joblessness. The impact of household size is also different: a larger household size reduces the risk of joblessness and work poverty (compared to the risks of singles), yet the reduction is relatively more important for the two-adult household when looking at work poverty and relatively more important for the three-plus household when looking at joblessness. A low level of education has a larger impact in the EU-10 than in the EU-15 whilst disability has a smaller impact in the EU-10. The only difference in direction of the effects between the EU-15 and the EU-10 relates to non-EU born residents. Their risk of living in a jobless household, compared to the risk of an EU-born resident, is higher in the EU-15, yet lower in the EU-10.

We conclude from this analysis that both changes in household 'joblessness' (wp^0) and in household 'work poverty' ($wp^{0.5}$, work intensity less than 50%) may be interesting to understand the dynamics of poverty risks over time.

1.3. Some preliminary observations on the relationship between national at-risk-of-poverty rates and individual and household employment rates

On a cross-country level, national rates of household 'joblessness' and household 'work poverty' calculated on the basis of EU SILC correlate in a different way with national poverty risks for individuals in the age cohort 20 to 59. Table 1 shows this.

Table 1: Cross-sectional correlations of post- and pre-transfer poverty and different concepts of employment.

Correlations of *post*-transfer at-risk-of-poverty rates and …	**… employment (*) (ǂ)**				
	2005	2006	2007	2008	Δ 2005 - 08
… individual employment rates	-0.58	-0.51	-0.48	-0.40	-0.34
… share of individuals in non-jobless housheolds (ILO)	-0.09	0.00	0.04	0.04	-0.35
… share of individuals in work-rich households (wi >= 50%)	-0.42	-0.32	-0.31	-0.16	-0.42
Correlations of pre-transfer at-risk-of-poverty rates and …	**… employment (*) (ǂ)**				
	2005	2006	2007	2008	Δ 2005 - 08
… individual employment rates	-0.36	-0.27	-0.37	-0.53	-0.78
… share of individuals in non-jobless housheolds (ILO)	-0.73	-0.62	-0.69	-0.76	-0.80
… share of individuals in work-rich households (wi >= 50%)	-0.49	-0.54	-0.42	-0.67	-0.79

NOTE: These correlations do not imply causality, nor significance; they merely serve to structure our data.

(ǂ) Correlations with joblessness or work-poverty obviously have the opposite sign

(*) EU SILC, 24 countries

Given our earlier assertion that one should study the link between employment and poverty through *household* employment, it may be rather surprising that, *levels* of *individual* employment rates correlate negatively with post-transfer poverty rates, whilst *household* joblessness rates show no correlation whatsoever with post-transfer poverty rates for the years, at least for the years covered in EU SILC 2005, 2006, 2007 and 2008. Different factors explain this *prima facie* counterintuitive result. First, household joblessness correlates positively with pre-transfer poverty, but the impact of household joblessness on post-transfer poverty is mitigated by social spending. Second, national pre-transfer and post-transfer poverty rates are also influenced by the poverty rates prevailing in 'non-jobless' households, which carry a large weight in the overall poverty record of many countries. Third, in a cross-country comparison higher individual employment rates are associated with lower levels of pre-transfer poverty among the 'non-jobless' households. Hence, higher individual employment rates reduce pre-transfer poverty rates both because of their impact on household joblessness (individual and

household employment correlate with each other) and because of their impact on pre-transfer poverty among the 'non-jobless' segment. Finally, higher individual employment rates are associated with higher levels of spending on working age cash benefits; and higher levels of spending are associated with a larger extent of poverty reduction through social transfers, both within the jobless and the non-jobless segment of the population. Together, all these elements explain why in a cross-country comparison post-transfer poverty correlates with individual joblessness but not with household joblessness. We do not pursue this analysis here. Table 1 only illustrates that both household joblessness and individual joblessness correlate positively with *pre*-transfer poverty rates, whilst only individual joblessness correlates positively with post-transfer poverty.

Contrary to household *joblessness* rates, in those SILC surveys the share of individuals living in *work-poor* households does correlate positively with post-transfer poverty rates; household work poverty also correlates with pre-transfer poverty, but less so than household joblessness.

With regard to *changes* in at-risk of poverty rates between EU SILC 2005 and EU SILC 2008, both individual joblessness, household joblessness and household work poverty correlate positively but weakly with changes in poverty rates, as can be inferred from Table 1 (a correlation coefficient of 0.34 for changes in individual joblessness, 0.35 for changes in household joblessness Δwp^0, and 0.42 for changes in household work poverty $\Delta wp^{0.5}$). The decomposition analysis in Sections 3 and 4 focuses on these changes over time.

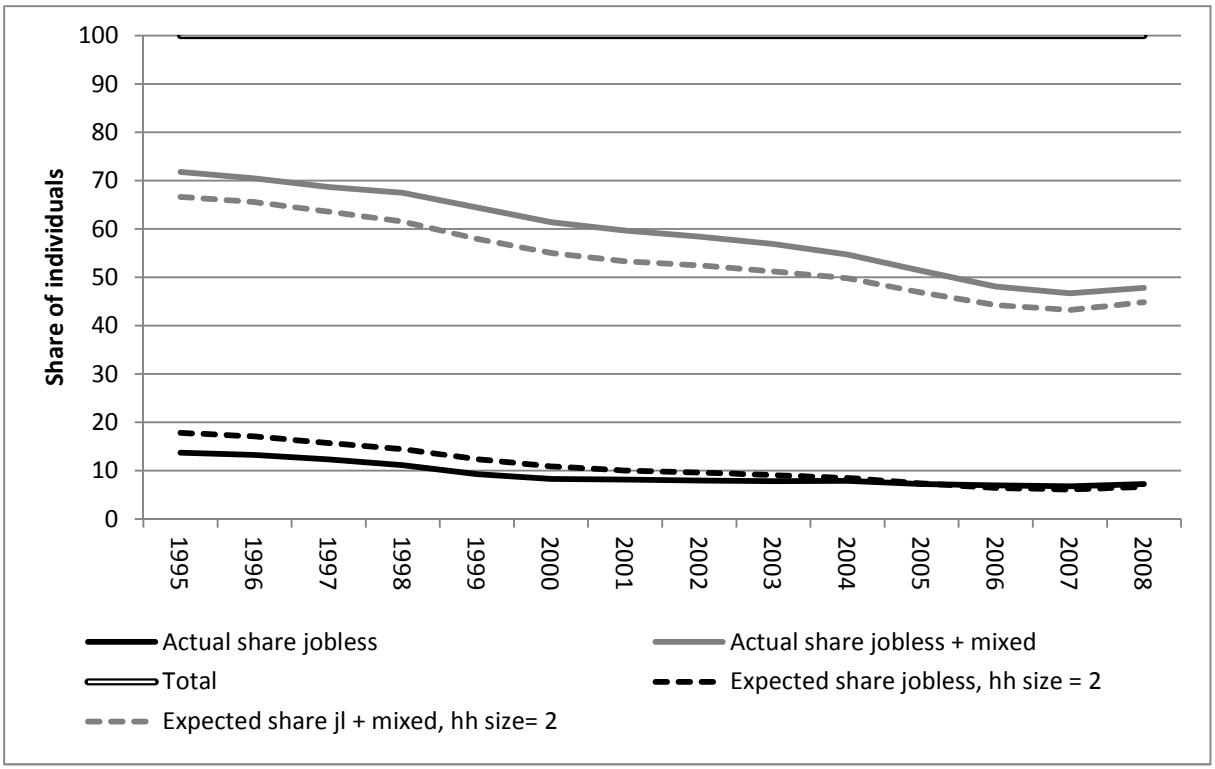
2. Trends in the distribution of jobs over households

We first focus on trends in individual and household joblessness, referring to the ILO employment concept, in 11 EU Member States (excluding the Scandinavian countries and Germany) for which LFS data are available from 1995 to 2008. In all countries, individual joblessness diminished substantially over the sample period, with an average decline of 8.4 percentage points, and improvements of, for example, 16.5 and 12.2 percentage points in Spain and Ireland respectively. However, the share of individuals living in jobless households decreased much less in percentage points.[12] Simultaneously, the percentage point increase of the share of individuals living in 'full employment households' (i.e. households where everyone is in work) was larger than the increase in the individual employment rate. As a result, the share of individuals living in 'mixed households', where some though not all members are in work, declined. Those trends are in part explainable by a pure 'mathematical' effect,

[12] The picture is different when we calculate the growth rates of those shares. As most of our understanding of the dynamics of welfare states is based on shifts in percentage points of population shares, we stress here the result in percentage points [to be elaborated]

reflecting the pooling of individual risks in households, but not completely so. We illustrate this in Figure 5 with the Spanish case. Figure 5 shows the distribution of Spanish individuals in the age cohort 20-59 (excluding students) over jobless households, 'full employment households' and 'mixed households'. The actual share of individuals living in jobless households decreased with 6.5 percentage points and the actual share of individual living in 'mixed' households decreased with 17.5 percentage points, while the actual share of individuals living in 'full employment households' increased with 24 percentage points. The dotted lines in Figure 5 show how the household distribution would have been, if all Spanish households would have consisted of 2 working-age adults and jobs would have been distributed randomly over households: given the rise in individual employment rates, the decrease in household joblessness would have been 11.2 percentage points, the decrease in the 'mixed household' share would have been 10.6 percentage points, and the increase in the 'full employment households' share would have been 21.8 percentage points. The spectacular increase in the share of individuals in 'full employment households', from somewhat more than a quarter of the population to more than half of the population (thus making 'household full employment' the *median social situation*) is in essence the mathematical corollary of the substantial rise in individual employment rates in Spain. However, the relatively small decrease in household joblessness (measured in percentage points) is only in part explainable as 'expected' given the pooling of unemployment risks in households. The gap between the actual decline of household joblessness (6.5 percentage points) and the decline that would have been expected if jobs were distributed randomly over 2-adult households (11.2 percentage points) calls for substantial, additional explanations. Household size structure and 'polarization' provide such explanations. The fact that the actual share of Spanish individuals living in jobless households was, for most of the period under examination, lower than what one would expect if jobs would be distributed randomly over (2-working age) households, is rather exceptional in the EU. Specific individual joblessness rate can be consistent with a range of different household joblessness rates, depending on how employment is distributed; in this respect, diversity prevails.

Figure 5: Distribution of the population over jobless, mixed and full employment households in Spain, 1995-2008, LFS



Gregg and Wadsworth (2008) propose a counterfactual to evaluate polarization in the distribution of household employment. Like the benchmark used in the Lorenz curve, the counterfactual or predicted household joblessness rate is the one that would occur if jobs were randomly distributed in the population, given the specific household size structure in the country under examination. *Polarization* can be defined as the difference between the actual and the predicted household joblessness rate. So it measures the extent to which there are more (or fewer) jobless households than predicted in the case of a random distribution of employment across individuals, given the national household size structure. Formally (using *wp* instead of *wp^0*", to simplify the notification),

(1) $P_{it} = wp_{it} - wp_{it}^{e}$

with:

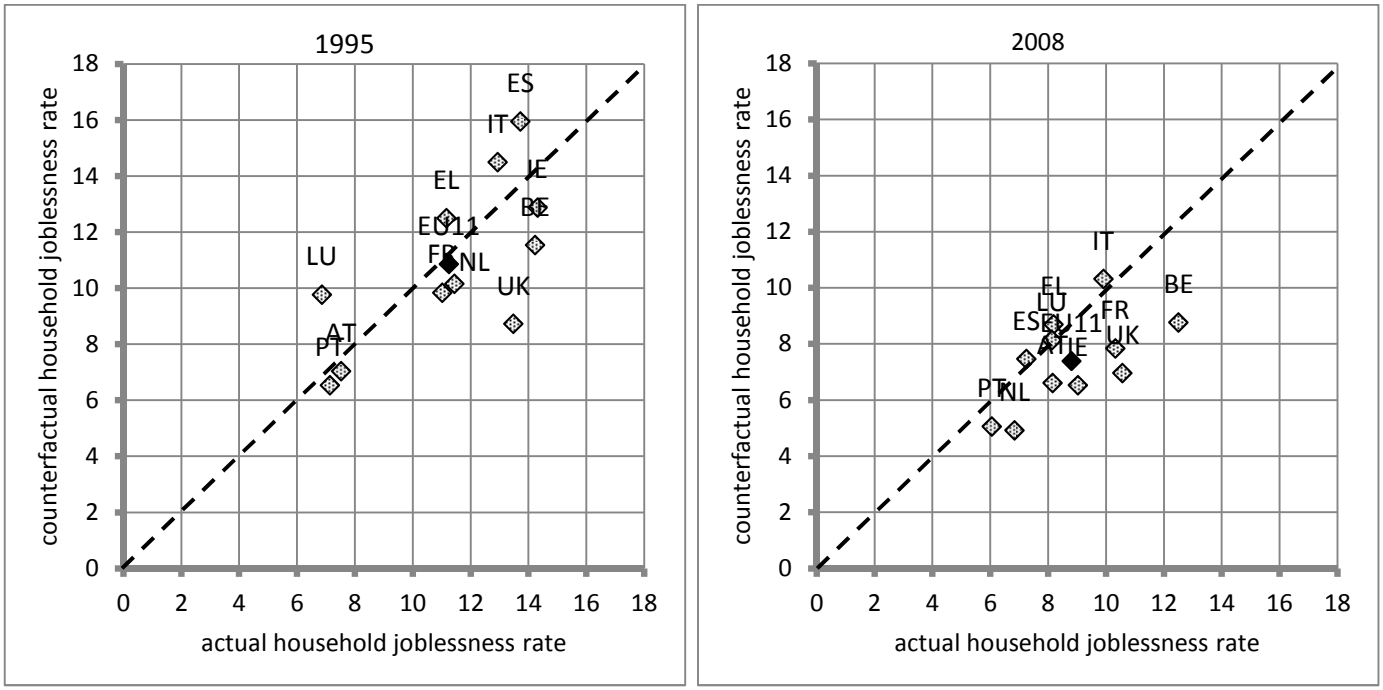
$P_{it} = the\ polarization\ of\ household\ joblessness\ in\ country\ i\ in\ year\ t$
$wp_{it} = the\ actual\ share\ of\ individuals\ living\ in\ jobless\ households$
$(no\ member\ of\ working\ age\ is\ employed) in\ country\ i\ in\ year\ t$
$wp_{it}^{e} = the\ expected\ share\ of\ individuals\ living\ in\ jobless\ households$
$in\ country\ i\ in\ year\ t, in\ the\ counterfactual\ hypothesis\ that\ jobs$
$are\ distributed\ at\ random\ over\ households\ given\ the\ national$
$household\ structure$

Obviously, if the share of smaller households increases, a given rate of individual joblessness may be expected to lead to higher household joblessness, as, all other things being equal, the probability of having no-one in work is higher in a smaller household than in a larger one. *Ceteris paribus* the risk of household joblessness decreases with household size. In what follows, households are distinguished on the basis of size only. Hence, in this analysis, the 'predicted rate' of household joblessness is a function of (i) the rate of individual joblessness and (ii) the structure of households in terms of size.

In Figure 6, actual (X) and predicted (Y) household joblessness rates are presented. If employment is randomly distributed, then the predicted and actual household joblessness rates are identical, so that the polarization rate is zero and the country estimates appear on the diagonal. Countries above the diagonal encounter negative polarization and those under the diagonal positive polarization. The distance to the diagonal reflects the magnitude of the cardinal measure of polarization.

At the start of the sample period, all Southern European countries (most saliently Spain) as well as Luxembourg had negative polarization rates. Negative polarization of work is consistent with theories of the gender division of non-work (Danziger and Katz, 1996) and added worker theories (Cullen and Gruber, 2000). All other old Member States exhibited limited positive polarization, with only the UK displaying strong positive polarization. Polarization in Spain, Italy and Greece remained negative throughout the entire period, but approached zero in 2008. In the other countries, polarization became more positive over time, meaning that the distribution of employment grew more unequal. The UK, Ireland and Belgium display the highest polarization rates, with household joblessness respectively 3.6, 2.5 and 3,7 points higher than would be the case if work were evenly distributed across households.

Figure 6: Actual and counterfactual household joblessness, 1995 & 2008, LFS



We should emphasize that the expression 'polarization' does not carry a normative meaning for us, that is, we do not consider the benchmark used to define the concept – a random distribution of jobs over households, given the household size structure – as a normative ideal. In a context of limited job opportunities 'positive polarization' might be seen as a kind of 'Matthew effect': a concentration of additional advantage (say, a second job for the partner of someone who is already employed) for those who already have some advantage (compared with a household where both partners are jobless); 'negative polarization' might be appreciated as a form of solidarity, i.e. a fair distribution of scarce employment opportunities. However, we do not suggest that either maximally 'negative polarization', or the benchmark of 'randomly distributed jobs' serve a normative ideal. The message rather is that 'positive polarization' comes with a social cost: jobless households of working age people need to be supported by social transfers. If that cost is to some extent avoidable, the welfare state is in a sense in a suboptimal equilibrium.

In the same vein, when we underscore the fact that 'mathematically' one should expect the percentage point reduction in household joblessness to be smaller than the percentage point reduction in individual joblessness, when individual employment rates increase, that does not mean that this mathematical fact carries no societal meaning. It means that in a modernizing society, with increasing individual employment rates, the mitigating impact of risk pooling in households (risk with regard to non-employment) becomes progressively less important in terms of the (percentage point) reduction of household joblessness that corresponds

(in a 'probabilistic', expected sense) to a reduction in individual joblessness.[13]

In the 11 countries examined (i.e. the Southern, Anglo-Saxon and Continental members of the EU15, excluding Germany) one observes an *upward convergence* of the levels of polarization. The pattern is one of both beta-convergence, a catch-up process, and sigma-convergence, a reduction in the dispersion of values. In 1995, the average value of the polarization index was 0.39, with a particularly large positive value in the UK and negative values in Luxembourg, Spain, Italy and Greece. By 2008 the average value of the polarization index increased to 1.42.[14] In the UK, positive polarization diminished, while in Luxembourg, Spain, Italy and Greece the negative polarization characterizing the beginning of the period was reduced to close to zero. Belgium is an exception in this respect, moving from a rather high level of positive polarization in 1995 to an even higher level (the highest of the group) by 2008.[15]

Why should changes occur in the polarization index? At any point in time, the observed household joblessness rate diverges from the predicted rate if, within certain household subgroups (defined by size), the rate of household joblessness is higher or lower than what one would expect on the basis of a random distribution. Over time, these divergences can decrease or increase in one or more subgroups of the households; this type of change is referred to as 'within-household polarization'. There may also be a structural shift towards household subgroups where polarization is relatively higher, without change in the subgroup degree of polarization itself; this is referred to as 'between-household polarization'.

Combining this insight with earlier assertions about the determinants of 'predicted household employment rates', the observed changes in the actual household joblessness rate can be decomposed into four terms: (i) changes in the individual non-employment rate that affect the predicted rate; (ii) changes in the household size structure that affect the predicted

---

[13] The argument can best be illustrated in the simple hypothesis that the whole population consists of households with only 2 working-age adults. For a given individual jobless rate *n*, a random distribution of jobs implies a household jobless rate $wp = n^2$. Hence, the ratio of 'household joblessness' on 'individual joblessness' *wp/n* is equal to *n*, and thus diminishes with increasing individual employment rates. The marginal impact of changes in *n* on *wp* also diminishes with increasing employment rates ($dwp/dn = 2n$). The argument should be interpreted in terms of changes *in percentage points* (i.e. percentage points changes in population shares); the elasticity calculated for marginal changes ($\frac{dwp/wp}{dn/n}$) is in this case always equal to 2. Our reasoning about poverty rates, employment rates, social spending, etc. is typically in terms of changes in percentage points.

[14] Beta-convergence is identified by a negative correlation of -0.81 between the initial values in 1995 and the changes over the period 1995-2008; sigma-convergence is identified by the standard deviation decreasing from 2.16 to 1.50.The sigma-convergence is quite sensitive to outliers, unlike the beta-convergence. Omission of the UK reduces the decline of standard deviation from -0.66 to -0.35; it also reduces the negative correlation from -0.81 to -0.66.

[15] Appendix 4 shows that the combined impact of region, origin and education is an important explanatory factor for the level of polarization in Belgium.

rate; (iii) between-household polarization, i.e. changes in the household structure that impact upon the degree of polarization, given subgroup degrees of polarization; and (iv) within-household polarization, i.e. changes in the degree of polarization in subgroups. Such a shift-share analysis is presented in Table 2 and Figure 7. Formally, the decomposition has the following form (from Gregg and Wadsworth, 2008):

(2) Observed change in household joblessness $\Delta\, wp =$
$\sum_{k=1}^{K} \Delta n^k \left[0.5\pi_{k,t} + 0.5\pi_{k,t+1}\right] +$
(contribution by changes in the individual non-employment rate n)

$\sum_{k=1}^{K} \Delta\, \pi_k \left[0.5\, n_t^k + 0.5\, n_{t+1}^k\right] +$
(contribution by changes in the household structure)

$\sum_{k=1}^{K} \Delta\pi_k [0.5(wp_k - n^k)_t + 0.5(wp_k - n^k)_{t+1}] +$
(contribution by 'between household polarization')

$\sum_{k=1}^{K} \Delta(wp_k - n^k)\left[0.5\pi_{k,t} + 0.5\pi_{k,t+1}\right]$
(contribution by 'within household polarization')

with

n = individual non-employment rate in the population
k = the size of households (the number of working-age adults)
K = the maximal size of households in the population
π_k = *the share of the population living in households with size k*
wp_k = *the actually observed rate of jobless individuals in households with size k*

The first and the second term in the decomposition add up to the 'predicted' rate of household joblessness wp^e in equation (1).

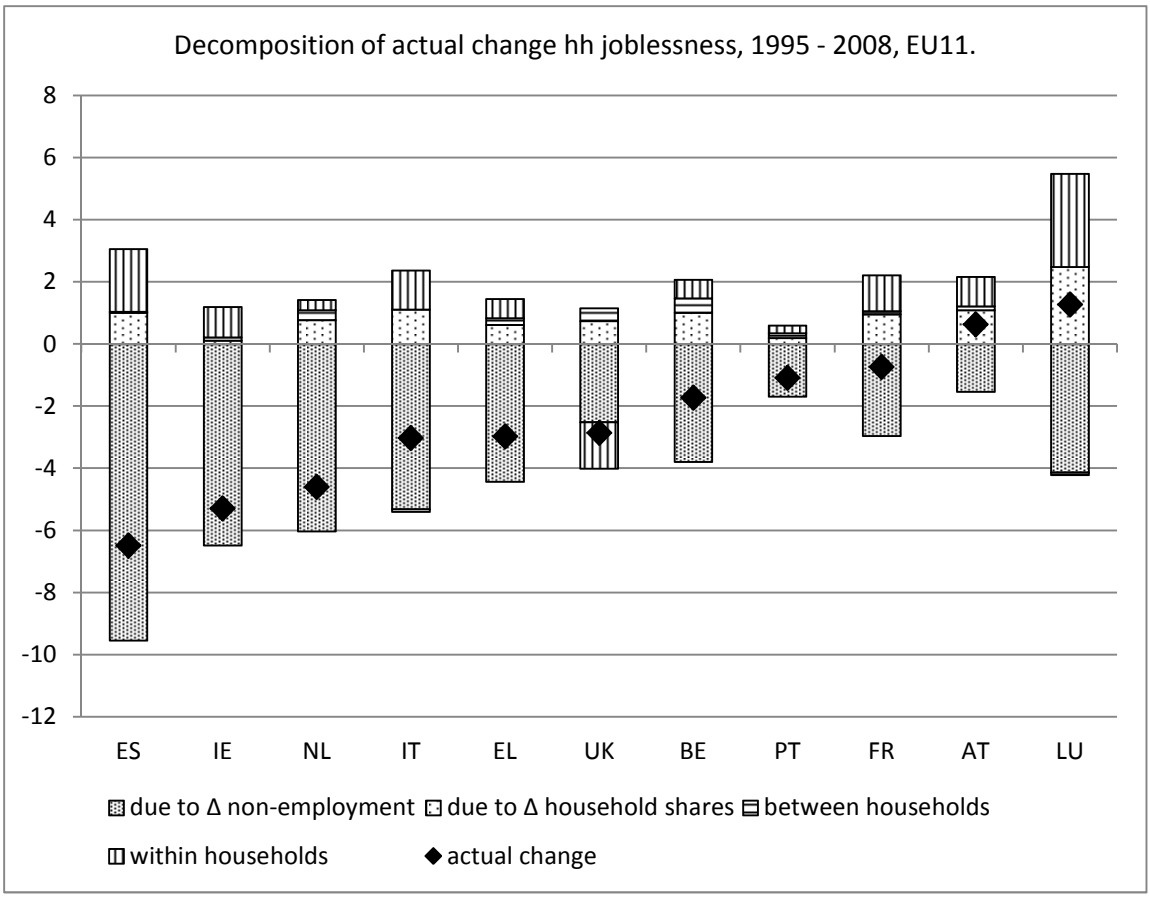
Table 2: Decomposition of changes in jobless household rates, 1995-2008, 11 EU Member States, LFS

	actual change	total predicted change	of which: predicted change (unconditional)		total polarization change	of which: polarization	
			due to Δ non-employment	*due to Δ household shares*		*between households*	*within households*
ES	-6.48	-8.53	-9.54	1.01	2.05	0.04	2.01
IE	-5.29	-6.37	-6.48	0.12	1.08	0.11	0.97
NL	-4.60	-5.25	-6.03	0.78	0.65	0.32	0.33
IT	-3.02	-4.20	-5.31	1.11	1.18	-0.09	1.26
EL	-2.97	-3.81	-4.43	0.62	0.84	0.21	0.62
UK	-2.85	-1.76	-2.51	0.75	-1.09	0.41	-1.50
BE	-1.72	-2.78	-3.79	1.01	1.06	0.46	0.60
PT	-1.09	-1.49	-1.68	0.20	0.40	0.15	0.25
FR	-0.74	-2.00	-2.95	0.96	1.26	0.11	1.15
AT	0.64	-0.44	-1.53	1.09	1.07	0.12	0.95
LU	1.27	-1.64	-4.13	2.49	2.91	-0.08	2.99

NOTE: Actual change = total predicted change + total polarization change (column 1 = column 2 + column 5); *Total predicted change* = change due to changes in non-employment rate + change due to changes in household shares (column 2 = column 3 + column 4); *Total polarization change* = between-household polarization + within-household polarization (column 5 = column 6 + column 7)

Over the period 1995 – 2008, household joblessness should have fallen in all countries, given the rising individual employment rates in each country (Table 2, column 3). Changes in household structures exert upward pressure on household joblessness rates (Table 2, column 4). However, the impact of changing household structures on the predicted household joblessness is much smaller than the influence of strongly declining individual joblessness. In most countries, the contribution of polarization to the change in the workless household rate is larger than the household structure component. Most of the divergence between household and individual joblessness stems from an increasingly skewed distribution of employment across households. Moreover, most polarization is within household types. Only in the UK are changes in polarization negative over time, due to more equally distributed employment within households and notwithstanding the growing share of household types already suffering high polarization. *A priori* it seems plausible to assume that policy in the UK, for instance with regard to the activation of lone mothers and the reduction of inactivity traps in tax- and benefit systems, contributed to this result.

Figure 7: Decomposition of changes in jobless household rates, 1995-2008, 11 EU Member States, LFS



If one restricts the period under consideration to 2000-2008, the number of countries can be increased to 23 (the EU-27 minus Sweden, Finland, Denmark and Malta). Between 2000 and 2008, one again observes beta and (albeit less robustly) sigma-convergence, both for the group of 23 EU Member States and for the eleven for which data availability stretches back to 1995.[16] There is no real *upward* convergence in the levels of polarization across the 23 EU Members: the average value of the polarization index for the group under review increased from 1.68 in 2000 (with a standard deviation of 1.75) to 1.78 (with a standard deviation of 1.25). In the smaller group of 11 countries for which data are available from 1995 onwards, the *upward* movement is more outspoken: in 2000 the average value of the polarization index for these Member States was 0.73 (standard deviation 1.88) increasing to 1.42 (standard deviation 1.50) by 2008. This trend seems to have been driven mainly by the declining size of households and the rising female participation in labour markets in Spain, Italy, France and Greece (cf. the explanatory power of

[16] The beta-convergence is more robust than the sigma-convergence when eliminating outliers. The negative correlation between starting values for P, signalling beta-convergence, is -0.71 for the EU-23 and -0.70 for the EU-11. In appendix 2 we elaborate on the impact of elimination of outliers on the sustainability of convergence.

gender, below). The ten new Member States under examination were characterized by high levels of polarization in 2000 (with an average polarization index of 2.72); in this respect their starting position in the beginning of the Lisbon era was very different from that of Spain, Italy and Greece, which were still characterized by negative polarization in 2000 with extended families still pooling unemployment risks.

Table 3 and Figure 8 provide an overview of the results of the decomposition for that shorter period. Between 2000 and 2008 individual non-employment decreased in all countries (except Romania), and substantially in some of the new Member States (Bulgaria, Estonia, Poland, Slovakia) as well as in Italy, Greece and Spain. However, in all countries except Latvia, Slovenia and Romania, demographic change reduced the impact of the decreasing non-employment rates on household jobless rates, as average household size diminished. Polarization of jobs over households had a divergent impact: negative change in polarization boosted the impact of decreasing individual joblessness on household joblessness in the United Kingdom and most of the new Member States (except Romania and Cyprus); but positive change in polarization reduced it in Italy, Spain, France, Germany, Ireland and Luxembourg, and, to a lesser extent, in Greece, Cyprus, the Netherlands, Austria and Belgium. Thus, for the period 2000-2008, five clusters of countries emerge, as shown in Table 3 and Figure 8.

Figure 8: Decomposition of changes in household jobless rates, 2000 – 2008, EU-23, LFS

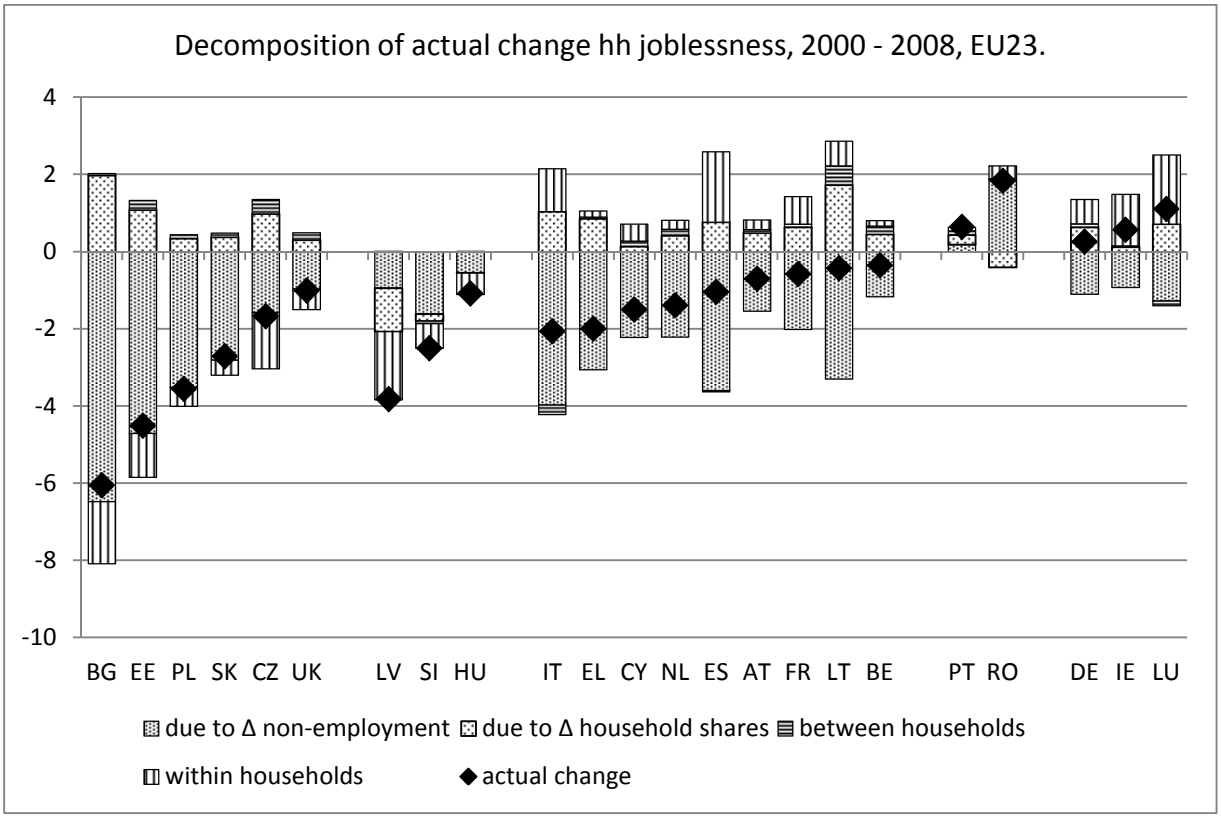


Table 3: Decomposition of changes in household joblessness rate, 2000 – 2008, EU27 (exc. SE, FI, DK, MT), LFS.

	actual change	of which: predicted change (unconditional)			of which: polarization		
		total predicted change	*due to Δ non-employment*	*due to Δ household shares*	total polarization change	*between households*	*within households*
BG	-6.05	-4.50	-6.48	1.98	-1.55	0.05	-1.60
EE	-4.51	-3.62	-4.70	1.09	-0.89	0.24	-1.14
PL	-3.56	-3.17	-3.51	0.34	-0.39	0.10	-0.49
SK	-2.71	-2.43	-2.80	0.38	-0.29	0.11	-0.39
CZ	-1.67	-0.58	-1.57	0.99	-1.09	0.37	-1.46
UK	-1.01	-0.66	-0.96	0.31	-0.35	0.19	-0.54
LV	-3.82	-2.07	-0.94	-1.12	-1.76	0.01	-1.77
SI	-2.50	-1.80	-1.61	-0.19	-0.70	-0.06	-0.64
HU	-1.09	-0.55	-0.54	0.00	-0.54	0.01	-0.56
IT	-2.07	-2.93	-3.97	1.04	0.86	-0.25	1.11
EL	-2.00	-2.20	-3.06	0.86	0.20	0.04	0.16
CY	-1.50	-2.08	-2.22	0.13	0.58	0.14	0.44
NL	-1.39	-1.79	-2.21	0.42	0.40	0.16	0.24
ES	-1.04	-2.83	-3.60	0.77	1.79	-0.03	1.82
AT	-0.71	-1.06	-1.54	0.48	0.35	0.10	0.25
FR	-0.58	-1.37	-2.01	0.64	0.80	0.08	0.72
LT	-0.43	-1.57	-3.29	1.73	1.14	0.50	0.64
BE	-0.35	-0.71	-1.17	0.45	0.36	0.22	0.14
PT	0.64	0.43	0.19	0.24	0.20	0.11	0.10
RO	1.83	1.46	1.86	-0.40	0.38	0.04	0.34
DE	0.25	-0.46	-1.10	0.63	0.72	0.09	0.63
IE	0.57	-0.80	-0.92	0.12	1.37	0.03	1.34
LU	1.10	-0.55	-1.27	0.72	1.66	-0.13	1.79

The choice of the first year of this shorter period, 2000, is dictated primarily by data availability. However, it appears that 2000 is a useful cut-off in describing the evolution of polarization for some countries. For instance, in Spain and Ireland, the increase in polarization accelerated after 2000; in Belgium, and to a lesser extent France, the year 2000 marked the beginning of a deceleration or even a standstill in polarization. Hence, if one takes account of the timing, there appears to be no uniform pattern of evolutions across the EU, apart from the general trend of upward convergence. The difference in pace at which women entered the labour market offers part of the explanation (see below).

2.1. Feminization of Labour Markets and Polarization

In appendix 4 of this paper we explore the explanatory power of gender, education and age (and for Belgium, region and origin) in relation to the polarization observed. It appears that, of these three factors, gender carries the greatest explanatory power, both for the observed levels of polarization and the change in polarization.

A first approach to gaining an understanding of the underlying societal trends consists in the construction of 'conditional counterfactuals', i.e. a variety of counterfactual household employment rates conditional on gender, age, and educational level of household members, to which may be added region of residence and origin. One can then compare the 'unconditional polarization' index (the counterfactual being based on household size only) with various 'conditional polarization' indices (see Gregg et al., 2010). Subsequently one can calculate the *share* (as a percentage) *of the absolute level* and the *share of the change* (again, as a percentage) *of the unconditional polarization index* that is *explained* by gender, age, education, etc., or by combinations of those factors. Applying this approach shows that the level of polarization is predominantly explained by gender.[17]

A second approach applies regression techniques. A simple regression for the EU-11 over 1995-2008 shows that the changes in the ratio of female and male employment rates have a significant and substantial impact on changes in the unconditional polarization index, while changes in the structure of educational attainment of the population seem to have no significant impact.

These results reflect fundamental societal trends in Europe, some of which follow a clear pattern of convergence, whereas others – surprisingly – show no *prima facie* convergence at all. The ratio of female and male employment rates displays very strong beta and sigma-convergence in the EU-11 over these years. However, there is neither beta-convergence nor sigma-convergence with regard to the proportion of the population with post-secondary education (ISCED levels 5-6) in the EU-11 over this period (the correlation between starting values and change is actually positive, and the dispersion increases); with regard to the proportion of the population with lower than secondary education (ISCED levels 0-2), the

[17] The level of polarization is explained by gender for more than 50% in Spain (for every single year in 1995-2008, with a minimum of 73% explained), in Greece (for every single year in 1995-2008, with a minimum of 109% explained), in Italy (for every single year in 1995-2008, with a minimum of 97%) and in Luxembourg (for most years in 1995-2008). The change in the level of polarization is explained for more than 50% by gender in the following cases: Austria (2000-2008, change explained for 61%), Belgium (1995-2008, 62%; and 2000-2008, 67%), Cyprus (2000-2008, 146%), Spain (1995-2008, 57%; and 2000-2008, 64%), Greece (1995-2008, 128%; and 2000-2008, 223%), Ireland (1995-2008, 82%), Italy (1995-2008, 70%), Luxembourg (1995-2008, 59%), the Netherlands (2000-2008, 104%; and 1995-2008, 106%), and Portugal (2000-2008, 51%).

correlation between starting values and change is mildly negative, but the dispersion is not reduced.

Other results show that 'increased homogamy' (increased matching of couples on the basis of education attainment of the partners) is not an explanatory factor for increasing polarization since 1995, that is, there is no increasing gap between the degree of homogamy one sees in reality in couples and the degree of homogamy one would expect if couples are formed at random (not presented here, available on request).

3. Integrated Decomposition of Changes in Labour Markets and Poverty Risks

In the preceding section we described an 'upward convergence in polarization' with regard to the distribution of jobs over households. Did this 'upward convergence' have a substantial impact on the evolution of household joblessness? Certainly in relative terms, i.e. in comparison with the predicted evolution of household joblessness without change in polarization, over the years 2000-2008 changes in polarization may have been a relatively important factor in the UK (where a negative change in polarization boosted the household employment rate) and in Spain, Italy, France, Belgium and Luxembourg (where a positive change in polarization reduced the improvement in household employment). The question then is whether or not polarization is an important factor in the analysis of poverty trends.

We examine this question by decomposing changes in the at-risk-of-poverty rates on the basis of (i) changes in the poverty risks of jobless households, and (ii) changes in the poverty risks of other (non-jobless) households; (iii) changes in household joblessness due to changes in individual employment rates and changing household structures (changes one would expect if no changes in polarization would occur) and (iv) changes in polarization. Thus, we integrate the two missing links we explore in this paper (the link between individual employment rates and the configuration of household employment; the link between the configuration of household employment and poverty) into one single analysis. In principle, this would allow to assess the impact on at-risk-of-poverty rates of changes in individual employment rates, *ceteris paribus*, and the impact on at-risk-of poverty rates of changes in polarization, *ceteris paribus*. In practice, data limitations make such an integrated analysis hard, and the conclusions we will draw can only be tentative.

Formally, the second step in our analysis proceeds as follows. The at-risk-of-poverty rate can be written as a weighted average of the at-risk-of-poverty rate of individuals in jobless households and the at-risk-of-poverty rate of individuals in the other households. Figure 1 in Section 1 illustrates that the poverty risk of individuals in jobless households (*pwp*, dropping

the superscript *0* to simplify the notification) is much higher than the poverty risk in the other households (*pwr*) in all EU Member States. Labelling these other households as the 'work-rich' (the share of individuals in work-rich households *wr = 1 - wp*), we can write:

$$(3)\ pov_{it} = wp_{it}.pwp_{it} + wr_{it}.pwr_{it}$$

where:

$pwp_{it} = at\ risk\ of\ poverty\ rate\ for\ individuals\ in\ work\ poor\ (jobless) households$
$pwr_{it} = at\ risk\ of\ poverty\ rate\ for\ individuals\ in\ work\ rich\ (non-jobless)\ households$

Changes over time can be decomposed as:

$$(4)\ \Delta pov_i = \overline{wr_i}.\Delta pwr_i + \overline{wp_i}.\Delta pwp_i + (\overline{pwp_i} - \overline{pwr_i}).\Delta wp_i$$

where, for a change from *t=0* to *t=1,*

$\Delta pov_i = pov_{i1} - pov_{i0}$
$\overline{wr_i} = 0.5wr_{i0} + 0.5wr_{i1}$ *, etcetera.*

In this way, the change in the overall poverty risk is decomposed into three subcomponents or contributory factors:

i. a contribution by the change in the at-risk-of-poverty rate of the work-rich;
ii. a contribution by the change in the at-risk-of-poverty rate of the work-poor;
iii. a contribution by the change in the share of the population living in work-poor households.

De Beer (2007), who applied this technique to long-term evolutions between 1980 and 2000, rightly stresses that a decomposition as such is not a causal analysis. It simply calculates by how much a decomposable variable (the at-risk-of-poverty rate for the population aged 20-59) changes if one of the factors informing the decomposition changes, *all the other factors being equal*. Such a mechanical approach should be interpreted with due caution: it is an accounting device, that does not imply causality. Moreover, changes in one subcomponent may be intrinsically linked to changes in other subcomponents of the decomposition. For instance, reducing the share of people living in work-poor households may be achieved by means of a deliberate policy of increasing the poverty risk of people in work-poor households through stricter conditionality and less generosity in unemployment benefits. Or increasing employment may push up the median income, to the effect that a decreasing share of work-poor households and higher poverty rates go hand in hand. Conversely, work-poor households may become work-rich because their members accept jobs that are at the lower end of the pay scale, thus marginally increasing the average risk of poverty of the work-rich group… Diverging evolutions in household size structure between the work-poor and the work-rich, implying changes in the poverty gap between the two categories, may also be at play… These

examples do not invalidate the decomposition as such, but rather illustrate a general *caveat* concerning its interpretation.
Using equations (1), (2), (3) and (4), it is possible to integrate the decomposition of changes in household employment and changes in poverty on the basis of following equation:

$$(5)\ \Delta pov_i = \overline{wr_i}.\Delta pwr_i + \overline{wp_i}.\Delta pwp_i + (\overline{pwp_i} - \overline{pwr_i}).(\Delta wp_i^e + \Delta P_i)$$

However, this requires that the data used to decompose changes in individual and household employment and changes in poverty are consistent. Since we must rely on SILC to establish a link between employment and income, it is only possible to pursue this integrated decomposition from 2004 onwards. For some countries, there are considerable differences between individual and household employment data obtained through LFS and SILC, as discussed in de Graaf-Zijl and Nolan (2011) and appendix 1 of this working paper. Hence, circumspection is called for when connecting the analysis based on SILC 2005-2008 with the employment analyses for 1995-2008 and 2000-2008 based on LFS, as presented in Sections 2 and 3 above. In order to allow some comparison on a conceptual level the ILO definition of joblessness is applied, even though SILC makes it possible to define joblessness on a retrospective basis for the twelve months prior to the survey (setting work intensity, as defined by Eurostat, to zero).

Figure 9 summarizes the integrated decomposition of changes in household joblessness and poverty risks in the 20-to-59 age bracket on the basis of SILC. The underlying figures are presented in Table 4 and Table 5 (the statistical significance of the estimated changes in at-risk-of-poverty rates is provided in Table 5)

Table 4: Poverty risks and household employment, 2004/5-2007/8: key figures (analysis applied to ILO-based *wp*, SILC 2005-2008)

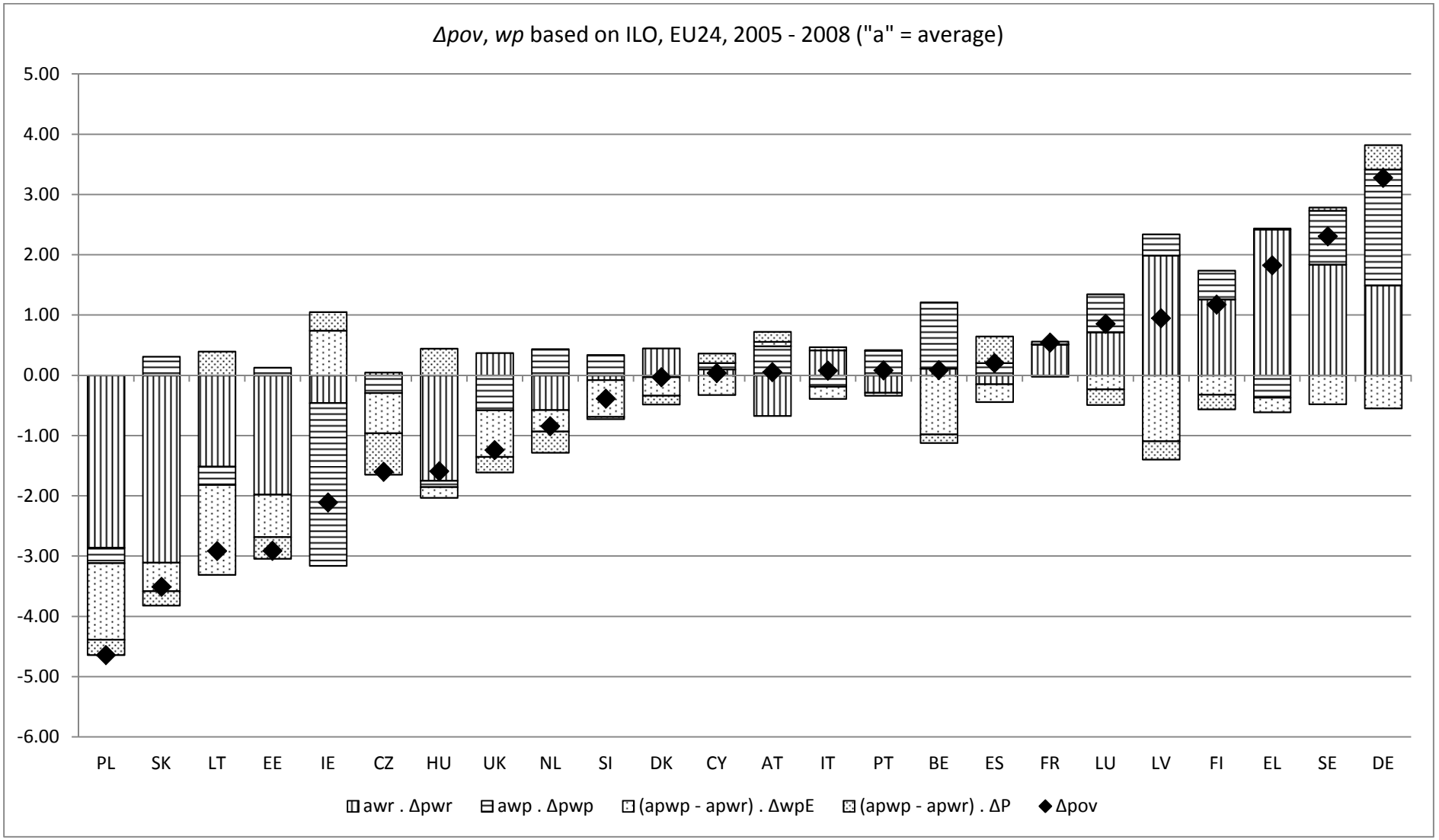
	Δpov	wp_{2005}	pwp_{2005}	Δwp	Δ *pwp*	Δ *(pwp - pwr)*	*Δpov(60+)*
AT	0.1	8.4	33.3	0.9	5.5	6.2	0.6
BE	0.1	16.9	36.6	-3.3	7.2	7.1	0.1
CY	0.0	5.3	44.6	-0.5	2.1	2.0	-2.6
CZ	-1.6	10.6	49.2	-3.2	-3.2	-3.3	2.0
DE	3.3	11.6	45.0	-0.3	16.8	15.1	1.8
DK	0.0	10.6	30.1	-2.0	-0.3	-0.8	0.6
EE	-2.9	9.4	65.0	-1.9	1.5	3.7	16.2
EL	1.8	9.0	33.4	-1.5	-4.5	-7.1	-3.8
ES	0.2	7.7	42.4	0.5	2.6	2.7	-1.5
FI	1.2	12.3	39.1	-1.6	4.1	2.7	3.4
FR	0.5	10.6	34.9	0.1	0.0	-0.5	-5.1
HU	-1.6	13.2	40.6	0.8	-0.8	1.3	-2.0
IE	-2.1	12.2	61.7	2.4	-20.2	-19.7	-9.7
IT	0.1	10.6	43.1	-0.5	-1.8	-2.3	-1.6
LT	-2.9	10.3	62.6	-2.3	-3.3	-1.6	11.6
LU	0.9	7.3	33.5	-1.8	9.8	9.1	-1.5
LV	0.9	9.5	66.7	-2.5	4.3	2.1	26.6
NL	-0.8	11.0	25.1	-3.5	4.7	5.4	3.3
PL	-4.6	15.3	40.4	-6.4	-2.1	1.2	3.6
PT	0.1	7.5	39.7	-0.1	5.5	5.9	-4.2
SE	2.3	9.7	27.7	-1.6	10.1	8.1	4.2
SI	-0.4	10.3	41.3	-1.8	3.6	3.7	-0.9
SK	-3.5	8.4	36.5	-2.4	4.3	7.7	2.6
UK	-1.2	12.5	56.9	-2.3	-5.1	-5.5	2.9
avg	-0.4	10.4	42.9	-1.4	1.7	1.8	1.9
st dev	1.8	2.5	11.6	1.8	6.8	6.6	7.2

Table 5: Decomposition of changes in poverty risks, 2004/5 – 2007/8; analysis on ILO-based *wp*, SILC 2005-2008.

	$\overline{wr}.\Delta pwr$	$\overline{wp}.\Delta pwp$	$(\overline{pwp} - \overline{pwr})\Delta wp^e$	$(\overline{pwp} - \overline{pwr})\Delta P$	*Δpov*
AT	-0.67	0.48	0.07	0.17	0.05
BE	0.11	1.10 ***	-0.98 ***	-0.14	0.09
CY	0.10	0.11	-0.32	0.15	0.04
CZ	0.05	-0.29	-0.67 ***	-0.69	-1.60 **
DE	1.49 ***	1.92 ***	-0.55	0.41	3.28 ***
DK	0.45	-0.03	-0.31 ***	-0.15	-0.03
EE	-1.98 ***	0.13	-0.70 ***	-0.36	-2.91 ***
EL	2.42 ***	-0.37	-0.24 ***	0.02	1.83 **
ES	-0.15	0.20	-0.29	0.44	0.20
FI	1.26 ***	0.48 *	-0.32 ***	-0.25	1.17 ***
FR	0.51	0.00	0.05	-0.02	0.54
HU	-1.75 ***	-0.10	-0.18	0.44	-1.59 ***
IE	-0.46	-2.70 ***	0.74 ***	0.31	-2.11 ***
IT	0.42	-0.19	-0.20	0.05	0.08
LT	-1.51	-0.30	-1.49 ***	0.39	-2.92 ***
LU	0.71	0.63	-0.23 ***	-0.26	0.86
LV	1.99 **	0.35	-1.09 ***	-0.30	0.95
NL	-0.57	0.44	-0.36 ***	-0.35	-0.84
PL	-2.86 ***	-0.26	-1.27 ***	-0.26	-4.64 ***
PT	-0.29	0.41	-0.05	0.01	0.08
SE	1.84 ***	0.90 ***	-0.48 ***	0.05	2.31 ***
SI	-0.08	0.34	-0.61 ***	-0.04	-0.39
SK	-3.11 ***	0.31	-0.47 ***	-0.24	-3.51 ***
UK	0.37	-0.58 **	-0.77 ***	-0.26	-1.24 **

Δpov, *Δpwp* and *Δpwr*, and (actually observed) *Δwp* significantly different from 0 at 95% (***), at 90% (**), at 85% (*).

Figure 9: Decomposition of changes in poverty risks, 2004/5-2007/8; analysis performed on ILO-based wp, SILC 2005-2008.



3.1. Conclusions of the Integrated Decomposition

We can draw two sets of tentative conclusions from this exercise:
First, the poverty record of EU Member States during the economic upswing 2004/5-2007/8 is decomposable in quite different trajectories, which seem in part linked to different *policy* trajectories:

- Belgium: despite a success in the reduction of household joblessness *wp*, there was no significant change in the at-risk-of-poverty rate of the population in the 20-to-59 age cohort, given a significant increase in the at-risk-of-poverty rate of jobless households.
- Germany (based on SILC, *caveat*[18]): household joblessness did not decrease, as increasing polarization neutralised the progress in employment; but the at-risk-of-poverty rates of both jobless households and other households increased significantly; the overall result being a significant increase in at-risk-of-poverty of the population in the 20-to-59 age cohort.
- Finland and Sweden follow a trajectory comparable to the German (SILC-)trajectory: here, a small decrease in household joblessness, was more than offset by increasing poverty risks for both the work-rich and the jobless households; as a result the poverty risk for the population between age 20 and 59 increased significantly.
- Ireland presents an opposite case: despite an increase in household joblessness, the increasing generosity of social protection diminished the poverty risks of both the jobless households and the other households, to the effect that the overall poverty risk in the 20-to-59 age cohort decreased significantly.
- UK: both the reduction of household joblessness (helped by the reversal in the British polarization trend in the labour market) and the reduction of poverty in jobless households, contributed to a significant decrease of the overall poverty risk for the population in the 20-to-59 age cohort .
- In most of the new Member States (notably Poland, Slovakia, Estonia, Lithuania, and the Czech Republic) economic growth led to substantial increases in individual employment rates and decreases in household joblessness (helped by decreasing polarization, except in Lithuania). This contributed to significant improvements in overall poverty risks in the 20-to-59 age cohort, reinforced by significantly decreasing poverty risks in the work-rich households in Slovakia, Poland, and Estonia. Importantly, however, the last column in Table 4 shows that poverty risks for the elderly increased in those countries, sometimes very substantially. So, their trajectory is not only employment- and growth-based, but also shows an intergenerational shift.[19]
- In France, Greece and Portugal there was a generational shift in poverty risks in favour of the elderly.

[18] We entertain serious doubts concerning the validity of the German EU SILC data (Frick & Krell, 2010). They yield a picture which is very different from the German SOEP data, for crucial components of this analysis.

[19] Hungary and Latvia present diverging trajectories in the group of new Member States.

Second, on the basis of this analysis, we can begin to verify one of the hypotheses put forward in Vandenbroucke and Vleminckx (2011) and Cantillon (2011) to explain the disappointing poverty trends in the EU during the Lisbon era, to wit, that this outcome is partly attributable to a failure to reduce the number of individuals living in jobless or work-poor households, despite increasing individual employment rates. The fact that household joblessness decreased less (in percentage points) than individual joblessness, is in part a purely mathematical corollary of the pooling of unemployment risks in families, as we explained in Sections 2 and 3. It would be wrong to describe this mathematical truism as a 'policy failure' (although its existence may have been neglected in policy discussions and evaluations). Policy may however play a role in changes in polarization of jobs over households. How important were changes in polarization of jobs over households?

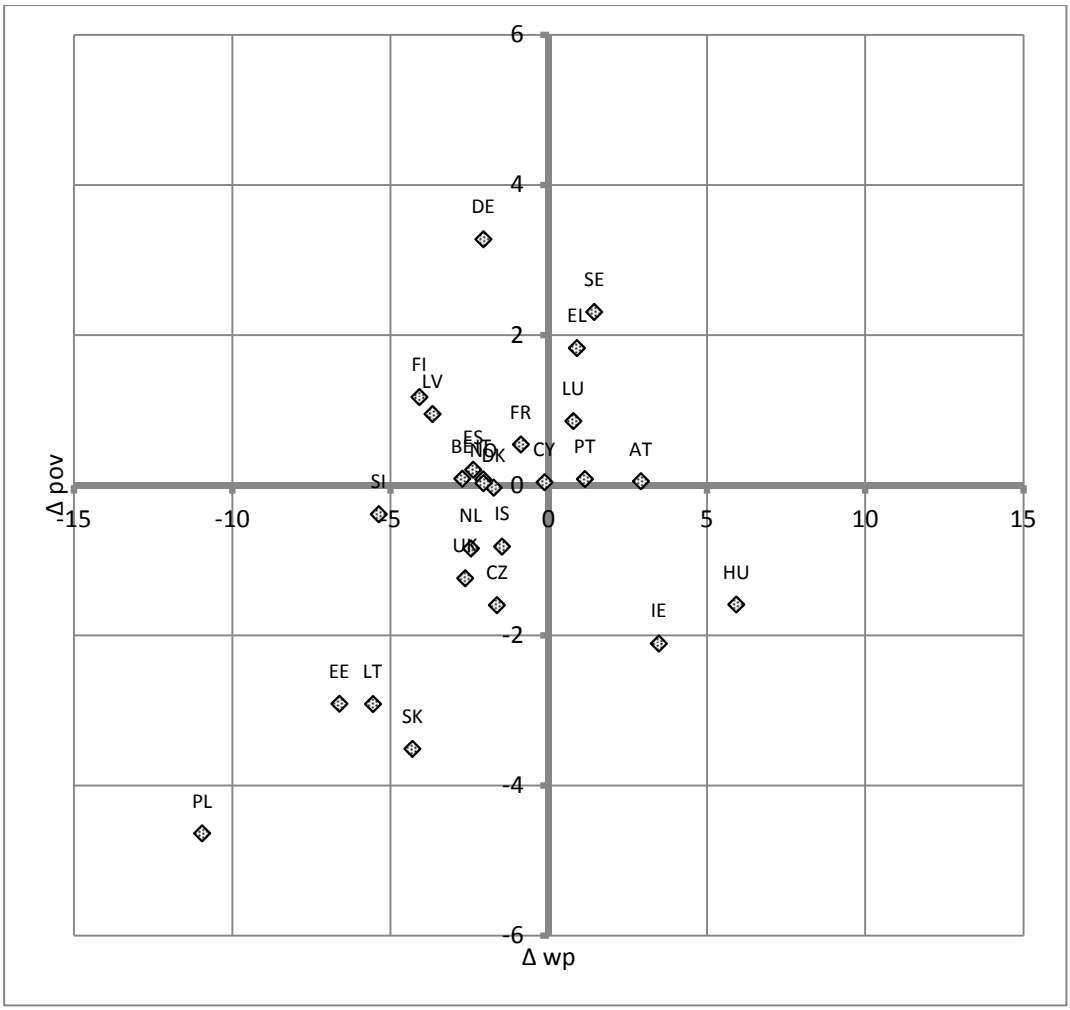
Differences among EU Member States in levels of polarization and household size do play a role in explaining the diversity of configurations of individual employment, household employment and at-risk-of-poverty rates. How important were *changes* in employment polarization in explaining changes in poverty rates? The shaded bars in Figure 9 and column 4 of Table 5 show the poverty impact of employment polarization across households *as such*. One may conclude that, in the short time span of 2004/5-2007/8, this impact was rather limited and disparate: in some countries it added slightly to the decline in poverty realised over the given period (the Czech Republic, the UK, Estonia, the Netherlands and Slovakia); in others, most notably Spain, polarization appears to have had the effect of checking any decline in poverty that might have occurred without further polarization. In Germany, on the contrary, polarization apparently added to growing poverty (but, important doubts exist concerning the German SILC figures).

Obviously, polarization is a long-term trend, rather than a short-term event. Given the fact that the gap between the poverty risk of jobless households and the poverty risk of non-jobless households is, on average and across countries, about 33 percentage points, one might say that a one-percentage-point increase in polarization – which is more or less the average increase for the 11 countries studied between 1995 and 2008 – structurally adds 0.33 percentage points to the proportion of people experiencing poverty in the 20-to-59 age cohort. This may seem little, but it is certainly not insignificant. However, polarization does not emerge as 'structural', that is, our analysis does not show that it is an unavoidable process in modernizing societies. Policies do play a role (for evidence on the impact of policies about patterns of household (non-)participation in labour markets, see for instance Ellwood, 2000; Meyer and Rosenbaum, 2001; Grogger, 2003).

4. Decomposition of Changes in At-risk-of-poverty Rates on the basis of Work Poverty

In Section 1 we pointed out that the correlation between changes in the share of individuals living in work-poor households and changes in poverty rates is positive but rather weak (Table 1). This is illustrated in Figure 10, which is constructed with four quadrants, depending on whether the values for Δpov and $\Delta wp^{0.5}$ are positive or negative when comparing EU SILC 2005 and EU SILC 2008.

Figure 10: Overall poverty risks and the share of individuals in work-poor household: the diversity of EU trajectories (EU 2020 definition of work intensity, EU SILC 2005-2008)



In each of the quadrants one can identify specific trajectories, such as the Finnish trajectory with a decreasing share of persons in work-poor households, but an increasing overall at-risk-of-poverty rate;[20] in stark

[20] It is tempting to use Germany as an example of a trajectory where the overall poverty rate increases, despite a decreasing share of work-poor households. As already indicated in footnote 17, doubts exist about EU SILC for Germany. Hence, one should refrain from drawing conclusions on the basis of the former data.

contrast, the Irish trajectory, with an increasing share of persons in work-poor households but decreasing poverty risks; the Polish trajectory, with a substantially decreasing share of persons in work-poor households and strongly decreasing poverty risks; and finally the Swedish trajectory, with a slightly increasing share of persons in work-poor households and an increasing overall at-risk-of-poverty rate.

4.1. Decomposition of Changes in Poverty on the Basis of Work Poverty ($wp^{0.5}$)

As explained in Section 3, we can decompose changes in at-risk-of-poverty rates by distinguishing work-poor households and work-rich households. We now apply this technique, formalized in equation (4) in Section 3, using 50% work intensity as dividing line between work-poor and work-rich.

The change in the overall poverty risk is decomposed into three contributory factors:

i. a contribution by the change in the at-risk-of-poverty rate of the work-rich;
ii. a contribution by the change in the at-risk-of-poverty rate of the work-poor;
iii. a contribution by the change in the share of the population living in work-poor households.

Table 6 provides the basic data with regard to changes in poverty risks and population shares. Table 7 displays the components of the decomposition, for all EU Member States as well as Norway and Iceland, for the period 2004/5-2007/8. Figure 11 provides a graphical summary of the decomposition in Table 7.

Table 6: Poverty risks and household employment, 2004/5-2007/8: key figures (analysis based on $wp^{0.5}$, Europe 2020 definition of work intensity, SILC 2005-2008)

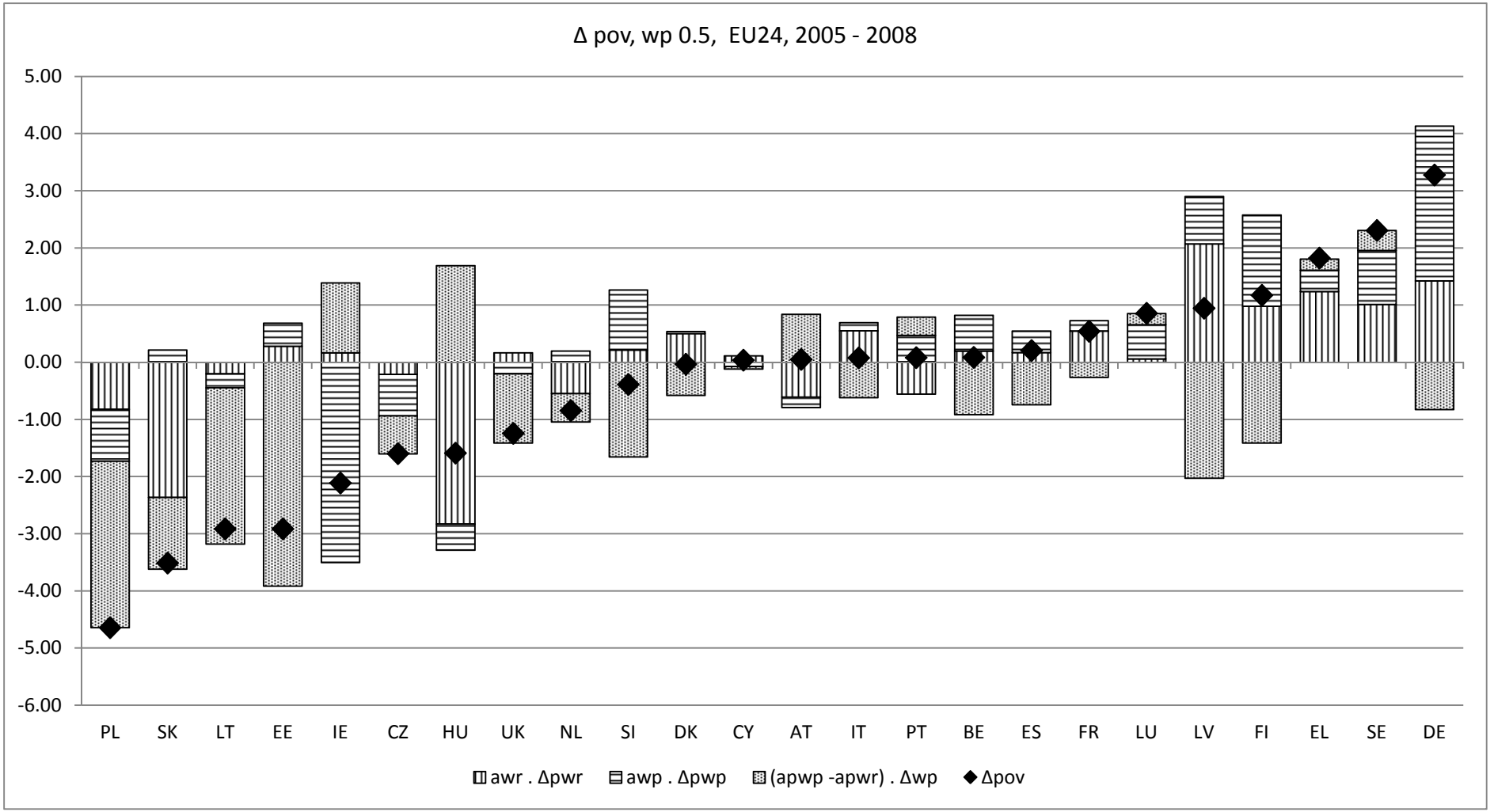
	Δpov	Wp_{2005}	pwp_{2005}	Δwp	Δ *pwp*	Δ *(pwp - pwr)*	*Δpov(60+)*
AT	0.1	13.2	36.1	2.9	-1.3	-0.5	0.6
BE	0.1	23.0	36.0	-2.7	2.9	2.6	0.1
CY	0.0	11.7	39.7	-0.1	-0.6	-0.7	-2.6
CZ	-1.6	13.3	47.5	-1.6	-5.8	-5.6	2.0
DE	3.3	20.6	38.1	-2.1	13.8	12.1	1.8
DK	0.0	14.6	37.6	-1.7	0.3	-0.3	0.6
EE	-2.9	15.6	65.5	-6.6	3.3	3.0	16.2
EL	1.8	18.0	34.1	0.9	2.0	0.5	-3.8
ES	0.2	16.5	40.8	-2.4	2.5	2.3	-1.5
FI	1.2	18.4	33.7	-4.1	9.8	8.6	3.4
FR	0.5	15.9	35.6	-0.9	1.2	0.5	-5.1
HU	-1.6	16.3	37.1	5.9	-2.4	1.1	-2.0
IE	-2.1	21.5	47.8	3.5	-15.0	-15.3	-9.7
IT	0.1	22.2	39.3	-2.1	0.7	0.0	-1.6
LT	-2.9	17.0	60.4	-5.6	-1.7	-1.5	11.6
LU	0.9	12.2	32.7	0.8	4.7	4.7	-1.5
LV	0.9	14.8	63.4	-3.7	6.4	4.0	26.6
NL	-0.8	18.1	25.3	-2.5	1.2	1.8	3.3
PL	-4.6	29.3	40.5	-10.9	-3.8	-2.7	3.6
PT	0.1	14.0	37.8	1.1	3.2	3.9	-4.2
SE	2.3	12.5	26.3	1.4	7.1	6.0	4.2
SI	-0.4	19.2	32.7	-5.4	6.3	6.1	-0.9
SK	-3.5	14.6	35.8	-4.3	1.7	4.4	2.6
UK	-1.2	17.4	53.4	-2.6	-1.3	-1.5	2.9
avg	-0.4	17.1	40.7	-1.8	1.5	1.4	1.9
st dev	1.8	4.0	10.4	3.5	5.5	5.1	7.2

Table 7: Decomposition of changes in poverty risks, 2004/5 – 2007/8; analysis on $wp^{0.5}$ (EU 2020 definition of work intensity, EU SILC 2005-2008).

	$\overline{wr}^{0.5}.\Delta pwr^{0.5}$	$\overline{wp}^{0.5}.\Delta pwp^{0.5}$	$(\overline{pwp}^{0.5} - \overline{pwr}^{0.5})\Delta wp^{0.5}$	*Δpov*
AT	-0.61	-0.18	0.84 ***	0.05
BE	0.20	0.62	-0.91 ***	0.09
CY	0.11	-0.07	-0.04	0.04
CZ	-0.21	-0.73	-0.67 **	-1.60 **
DE	1.42 ***	2.71 ***	-0.82 ***	3.28 ***
DK	0.50	0.04	-0.57 **	-0.03
EE	0.28	0.41	-3.92 ***	-2.91 ***
EL	1.24 *	0.37	0.19	1.83 **
ES	0.17	0.38	-0.74 ***	0.20
FI	0.98 ***	1.60 ***	-1.41 ***	1.17 ***
FR	0.55	0.18	-0.26	0.54
HU	-2.83 ***	-0.46	1.69 ***	-1.59 ***
IE	0.17	-3.50 ***	1.22 ***	-2.11 ***
IT	0.55	0.14	-0.62 ***	0.08
LT	-0.20	-0.24	-2.73 ***	-2.92 ***
LU	0.06	0.60	0.20	0.86
LV	2.07 ***	0.83 *	-2.02 ***	0.95
NL	-0.54	0.20	-0.50 ***	-0.84
PL	-0.82 **	-0.91 ***	-2.91 ***	-4.64 ***
PT	-0.55	0.47	0.32	0.08
SE	1.01 ***	0.94 ***	0.35 ***	2.31 ***
SI	0.22	1.05 ***	-1.65 ***	-0.39
SK	-2.36 ***	0.22	-1.25 ***	-3.51 ***
UK	0.17	-0.20	-1.21 ***	-1.24 **

NOTE: *Δpov*, *Δpwp* and *Δpwr*, and (actually observed) $\Delta wp^{0.5}$ significantly different from 0 at 95% (***), at 90% (**), at 85% (*).

Figure 11: Decomposition of changes in poverty, 2004/5-2007/8; analysis based on $wp^{0.5}$ (EU 2020 definition of work intensity, EU SILC 2005-2008)



The difference in percentage points between the average values of the at-risk-of-poverty rates for respectively work-poor and work-rich households varies between 20.2 (for the Netherlands) and 59.2 (for Estonia), with an average of 33.5 percentage points. Correspondingly, the impact of a decrease in the share of individuals living in work-poor households ($wp^{0.5}$) by 1 percentage point on the at-risk-of-poverty rate for the whole population aged 20-59 ranges from -0.2 to -0.6 percentage points, and is, on average, around -0.3 percentage points.[21] Obviously, given the additional diversity of $\Delta wp^{0.5}$ ($\Delta wp^{0.5}$ ranges from -10.9 in Poland to +5.9 in Hungary), the actual contribution to the poverty rate of the change in the share of people living in work-poor households is very diverse, ranging from -3.9 percentage points in Estonia to +1.7 percentage points in Hungary (see column 3 in Table 7).

The observation that the overall cross-sectional correlation between Δpov and $\Delta wp^{0.5}$ is rather weak (cf. supra) is explained by the highly diversified impact of the *other* factors at work in the decomposition, driven by $\Delta pwp^{0.5}$ and $\Delta pwr^{0.5}$. It would be incorrect to assert that the modest decline in the share of work-poor households was the 'main culprit' in explaining disappointing poverty trends across the board in EU Member States. The picture is both more complicated and more diversified. Moreover, to contextualize the decomposition of poverty in the 20-59 age bracket, one must also consider the evolution of poverty in other segments of the population, notably the elderly. For this reason, Table 6 also incorporates the evolution of the poverty risk of people aged 60+ (hereafter 'the elderly').

A first set of observations relates to the overall pattern of change between 2004/5 and 2007/8, a period of economic growth, particularly in the new Member States. Not surprisingly, with regard to the poverty risk of both the population aged 20 to 59 and individuals living in work-poor households, one observes catching-up or beta-convergence (albeit weakened somewhat if one disregards Poland); as regards the poverty risk of the working-age population, there is also evidence of a sigma-convergence (i.e. less dispersion, but this effect is weakened quite substantially if Poland is disregarded). However, simultaneously, the evolution of the gap between the poverty risk of persons in work-poor households and those in work-rich households is quite diverse: it increased by 12.1 percentage points in Germany (but see footnote 17), 8.6 percentage points in Finland, 10.6 percentage points in Iceland, 6.1 percentage points in Slovenia, and 6 percentage points in Sweden; in that same period of just three years, it decreased by 15.3 percentage points in Ireland and 5.6 percentage points in the Czech Republic. In Germany, Finland and Iceland, persons in work-poor households lost out in comparison with, not only the work-rich, but also the elderly. In the Czech

[21] A regression of Δpov on $\Delta wp^{0.5}$, $\Delta pwp^{0.5}$ and $\Delta pwr^{0.5}$ yields a coefficient of 0.32 for $\Delta wp^{0.5}$, 0.17 for $\Delta pwp^{0.5}$ and 0.81 for $\Delta pwr^{0.5}$.

Republic and Ireland, persons in work-poor households gained ground on both the work-rich and the elderly, although the reduction in poverty risk among the elderly was quite substantial in Ireland. In yet other countries, such as Poland, Estonia, Lithuania and Latvia, the gap between the work-rich and the work-poor did not change very much, but the total population aged 20-59 (i.e. both work-poor and work-rich) gained ground on the elderly, whose poverty risk increased substantially between 2005 and 2008. In other words, Poland, Estonia, Lithuania and Latvia witnessed an intergenerational shift; the same holds, albeit to a lesser extent, for the United Kingdom. In France and Greece, too, the gap between the poverty risk of the work-poor and the work-rich changed hardly at all, though here the elderly gained ground significantly, vis-à-vis both the work-poor and the work-rich in the population aged 20-59.

We now focus on cases that are in a certain sense exceptional or remarkable. For each of the three subcomponents in the decomposition, values can be identified in Table 7 that may be regarded as 'outliers' when compared to the average value and standard deviation of those subcomponents for the twenty-six European countries under review.

Finland is an outlier with regard to the value of component 2, the contribution of changes in the poverty risk of work-poor households, which adds 1.6 percentage points to the overall poverty risk. The decrease in household work poverty, which was also rather substantial, was not sufficient to offset that impact. Given the fact that the poverty risk of work-rich households also increased, the overall poverty risk in Finland increased.

The data for Ireland paint exactly the opposite picture: the reduction of poverty among work-poor households greatly dwarfed the impact of the increasing share of individuals living in work-poor households over the years 2005-2008. This confirms the intuition on the basis of figure 7b that, in so far as the 1990s and the 2000s were concerned, Ireland represented a striking exception.

Poland is exceptional on two counts: the contribution of the declining share of individuals living in work-poor households (an impact of -2.9 percentage points on the overall poverty rate) and the contribution of the decreasing poverty risk of work-poor households (an impact of -0.9 percentage points); together with a rather large reduction in the poverty risk of the work-rich, this resulted in a substantial overall reduction in poverty risks. The downside is that the poverty risk of the elderly increased considerably. So one could say that in Poland the decomposition reveals trends (of $pwp^{0.5}$ and $pwr^{0.5}$) that are driven by an intergenerational shift, i.e. the relative improvement of the position of the cohort aged 20-59 vis-à-vis the elderly.
Sweden recorded an exceptional increase in poverty over the years considered. This was the result of the positive impact of all three

subcomponents (none were statistical outliers, though all three were rather high up in the distribution of the value of the subcomponents across the EU). In Sweden, the poverty risk of the work rich, the work-poor and the elderly increased, and the share of persons in work-poor households also grew.

Although in Greece the overall poverty risk of the population aged 20-59 increased slightly (though only significantly at 90%), this was mainly due to the increasing poverty risk of persons in work-rich households, which was not offset by any other factor at play within that age cohort; the elderly gained the most ground.

In the United Kingdom, the positive poverty record in the population aged 20-59 (as opposed to the poverty increase among the elderly) was due mainly to the declining share of people living in work-poor households. This suggests that activation policies were successful in reaching out to work-poor households and moving them to the work-rich group.

4.2. Comparison of the two Poverty Risk Decompositions

We can now compare our poverty risk decompositions on the basis of $wp^{0.5}$ and wp^{0}. The comparison should proceed with due caution, though, as the underlying employment concept is very different. Yet the figures do tell – or at least suggest – some interesting stories. A visual comparison of Figures 6 and 11 shows that the poverty decomposition on the basis of wp^{0} is quite different from the decomposition on the basis of $wp^{0.5}$. The differences are relatively important for Estonia, Finland, Greece, Hungary, Lithuania, Poland and Slovenia. Some are readily attributable, as in the case of Poland, where the decomposition on the basis of $wp^{0.5}$ gives greater weight to the decline in the share of individuals living in work poverty (as the decrease in $wp^{0.5}$ is much more substantial than the decrease in joblessness wp^{0}) and lower weight to the diminishing poverty risk of the work-rich (since the poverty risk of the households that hold *any* job, however little it implies in terms of work intensity, decreases more than the poverty risk of households with work intensity >= 50%). Despite those differences, the overall picture that emerges with regard to the diversity of trajectories followed by EU welfare states in the years 2004/5-2007/8 is confirmed by both decompositions.

4.3. General conclusions

The configuration of individual employment rates and household employment rates on which we focussed in this paper proves relevant for differentiating EU welfare states. We used two concepts to structure data on household employment: 'household joblessness', based on an ILO definition of employment, and 'household work poverty', based on work

intensity. Although the ILO employment definition is less fine-grained than the work intensity measure, it has the advantage that it can be decomposed on the basis of evolutions in individual joblessness, household size structure, and polarization between and within households.

The shape of this configuration of individual and household employment is driven by forces of modernization that affect all European welfare states in the same direction such as declining household size, feminization of labour markets…, but the configuration is nevertheless different from country to country. At the start of the Lisbon era the individual/household employment configuration was rather different in Spain, Greece and Italy from most other EU Member States, including most new Member States. The level of polarization was negative in Spain, Greece and Italy – a corollary of the pooling of non-employment risks in extended families – and became gradually less negative: these southern welfare states were in a trajectory of modernization in which gains in individual employment did not lead to important declines in the shares of jobless households, i.e. in welfare state dependency. Their welfare states were still in a process of taking over from familial solidarity. The pattern in the new Member States after 2000 was very different: gains in individual employment rates were enhanced by decreasing polarization of jobs over households, i.e. by a more even distribution of jobs over households, thus additionally decreasing welfare state dependency. Experience in the UK (and the US) suggests that the prevalence of jobless households, and thus the extent of 'positive' polarization, can be influenced by policy.

However, changes in the share of jobless households cannot explain very much of the diversity in the changes in national at-risk-of-poverty rates during the economic upswing 2004/5-2007/8. Or, to put it in other ways, it would be incorrect to attribute disappointing poverty trends during the employment boom years solely to the modest conversion of individual employment successes in household employment successes, or more specifically to ongoing polarization of jobs over households. But that does not diminish the importance of national and EU policy-makers should attach to the presence of high numbers of jobless households and polarization, as possibly problematic conditions for welfare states. The multidimensional Europe 2020 target on social exclusion and poverty, which includes the reduction of people living in low work-intensity households, may find a justification here.

The disappointing overall 'stand still' in national at-risk-of poverty rates during the economic upswing coincides with a convergence of national at-risk-of-poverty rates in the 20-to-59 age cohort in the EU during those years. We pursued a decomposition of changes in poverty risks both on the basis of 'household joblessness' and 'household work poverty'. Both suggest that the convergence is the combined result of four evolutions:

first, an overall poverty standstill in a number of countries, with both relatively low and relatively high poverty rates;

second, a clearly inegalitarian trajectory in some countries with historically low poverty rates, such as Sweden and Finland (and Germany, at least if we base our assessment on EU SILC);

third, a successful effort to reduce poverty in the Anglo-Saxon Member States where poverty rates were higher, yet with a different policy emphasis in the UK (successful activation) and Ireland (much enhanced social protection generosity);

fourth, the strong economic and employment growth and an intergenerational shift in poverty risks in the new Member States.[22]

Economic and socio-demographic convergence was a dominant background condition in this short time span, but the policy trajectories with regard to public social spending on working age benefits (including child benefits) were quite different.

These conclusions point simultaneously to the need to refuel economic convergence in the EU, to allow the new Member States to reconnect on a sound basis with the 'good years' 2004/5-2007/8 in terms of growth and employment creation, *and* to the necessary complementarity of employment creation and poverty reduction through social transfers and inclusive labour market policies.

5. References

Brandolini, A. & Viviano, E. (August, 2010). *Extensive vs. intensive margin: Changing Perspective on the Employment Rate.* Paper presented at the 31st General Conference of The International Association for Research in Income and Wealth, St. - Gallen, Switzerland.

Cantillon, B. (2011). The paradox of the social investment state: growth, employment and poverty in the Lisbon era, *Journal of European Social Policy*, 21(5), 432–449.

Cullen, J.B. & Gruber, J. (2000). Does unemployment insurance crowd out spousal labor supply? *Journal of Labor Economics*, 18(3), 546–572.

Danzinger, L. & Katz, E. (1996). A theory of sex discrimination. *Journal of Economic Behavior and Organization*, 31, 57–66.

Dawkins, P., Gregg, P. & Sctella, R. (2002). *The Growth of Jobless Households in Australia*, The Australian Economic Review, 35 (2), 133–154.

[22] There was also an intergenerational shift in some of the old Member States.

de Graaf-Zijl, M. & Nolan, B. (2011). Household joblessness and its impact on poverty and deprivation in Europe, *Journal of European Social Policy*, 21, 413-431.

Ellwood, D.T. (2000). The Impact of Earned Income Tax, Credit and Social Policy Reforms on Work, Marriage, and Living Arrangements, *National Tax Journal*. 53(4), 1063–1106.

European Commission (2011). *Employment and Social Developments in Europe*. Brussels: European Commission.

European Commission (2011). *Joint Employment Report 2011.* Brussels: European Commission.

Frick, J.R. & Krell, K. (2010). *Measuring Income in Household Panel Surveys for Germany: A Comparison of EU-SILC and SOEP*, SOEPpapers on Multidisciplinary Panel Data Research, n° 265, Berlin: DIW.

Gregg, P. & Wadsworth, J. (2008). Two sides to every story: measuring polarization and inequality in the distribution of work. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 171, 857-875.

Gregg, P., Scutella, R. & Wadsworth, J. (2010). Reconciling workless measures at the individual and household level. Theory and evidence from the United States, Britain, Germany, Spain and Australia. *Journal of Population Economics*, 23 (1), 139-167.

Grogger, J. (2003). The effects of time limits, the EITC, and other policy changes on welfare use, work, and income among female-headed families, *The Review of Economics and Statistics*. 85(2): 394–408.

Meyer, B.D. & Rosenbaum, B.T. (2001). Welfare, the earned income tax credit, and the labor supply of single mothers*, The Quarterly Journal of Economics*. 1063–1115.

OECD (2009). Is work the best antidote to poverty? In: *Employment Outlook*. Paris: OECD.

Sala-i-Martin (1996), Regional Cohesion: Evidence and Theories of Regional Growth and Convergence, *European Economic Review*, 40, 1325–1352.

The Social Protection Committee (2009). *Growth, Jobs and Social Progress in the EU. A contribution to the evaluation of the social dimension of the Lisbon Strategy.* Brussels: European Commission.

Vandenbroucke, F. & Vleminckx, K. (2011). Disappointing poverty trends: is the social investment state to blame? Journal of European Social Policy, 21(5), 450–471.

Appendix 1: Indicators of work poverty at the household level

In this appendix we discuss the existing definitions of household joblessness. We compare the different demarcations of the relevant populations, the definition of employment and the impact of their combination on the ranking of countries by their population in household joblessness.

Currently, different indicators for wp^a, the share of individuals living in households which we consider 'work-poor' because their work intensity is less than a chosen benchmark value *a,* are used. In this appendix we list six indicators, referring to different definitions of household joblessness and/or household work intensity, which one finds in Eurostat publications and the literature on household employment. Those indicators are based on three surveys, the EU Labour Force Survey (LFS), the European Community Household Panel (ECHP), and the EU Survey on Income and Living Conditions (SILC). All these indicators have the same structure. They are characterized by a *population reference* group, a *working age focus* group, and a *definition of employment*. The reference group is the population subset which we partition according to the work intensity of households (or, in the limiting case, the subset which we take into account when calculating the share of individuals in jobless households and the share not living in jobless households). The working age focus group consists of the household members on which we focus to determine the work intensity of a household (or, less frequently, whether or not their household is jobless). In other words, the reference group consists of the potential "beneficiaries" of economic activity whom we consider relevant for the calculation of the indicator; the focus group consist of those household members whose potential contribution to economic activity we consider relevant. The reference group and the focus group may overlap to a large extent, but not necessarily completely. We examine these indicators in detail in Table A. 1 to Table A. 4 and illustrate that seemingly minor differences in definitions may translate into differences in analytical and policy emphasis and entail significant changes in country ranking.

In this paper we have used two indicators for the share of individuals living in work-poor households. Those measures only differ in the underlying concept of 'employment': wp^0 refers to the share of adults living in jobless households, using an ILO-concept of employment; $wp^{0.5}$ refers to the share of adults living in households that have a work intensity lower than 0.5, using a measurement for work intensity. The *population reference group* and the *working age focus group* are exactly the same. However, in recent scientific literature and policy debates different definitions of the share of individuals living in work-poor or jobless households have been used simultaneously. In Table A. 1 we compare (a) the population reference group, (b) the working age focus group, (c) the definition of employment and (d) the data sources of the currently available definitions.

Definition I and *definition II* are both 'older' Eurostat definitions, but are still available online[23]. D*efinition I* determines the share of individuals living in jobless households as (a) the share of individuals aged 18 – 59 who are living in a household where (b) no adult between 15 and 75 is working. Students aged 18 – 24 who live in households composed solely of students of the same age group are not included in the calculation. The (c) employment concept is the ILO definition of employment. Someone is employed when he/she was in paid or self-employment for at least one hour during the reference week. The household is jobless when no member belonging to the working age focus group is employed, so defined. Computation of the indicator is based on (d) LFS.

The indicator in *definition II* is based on the same employment definition (ILO) and survey data (LFS) as in *definition I*, but the population reference group and the working age focus group differ. In *definition II* the indicator is calculated as (a) the share of all persons aged 16 – 64 who are living in a household where (b) no-one between 16 – 64 (excluding dependent children and retired persons) is employed. Additionally, depending on the number of working age adults in the household, an ordinal measurement of work intensity is introduced.

Definition III is derived from Gregg, Scutella and Wadsworth's work (2008, 2010) on the relation between individual and household employment. The indicator is calculated as (a) the share of the total working age population (20 – 59), excluding full-time students (20 – 24) and all households with a (nominated) head above retirement age (60 and over), who are living in a household where (b) no-one of this age group is working. The definition of employment is the ILO concept.

Definition IV captures the 'new' household work intensity variable as developed in 2010 in the framework of the Europe 2020 strategy. For the (d) definition of employment this indicator introduces a work intensity measure of the total work potential during the past year. Work intensity is defined as the ratio of the number of all months that household members belonging to the working age focus group worked to the total number of months that could, in theory, have been worked by all the members of the same household who belong to the working age focus group. For persons who declared having worked part-time, an estimate of the number of months in terms of the full-time-equivalent is computed on the basis of the number of usually worked hours at the time of the interview. The

[23] For *definition I* see: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsisc090
For definition II see: http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=DSP_GLOSSARY_NOM_DTL_VIEW&StrNom=CODED2&StrLanguageCode=EN&IntKey=16624585&RdoSearch=CONTAIN&TxtSearch=work%20intensity&CboTheme=&IntCurrentPage=1

indicator is calculated as (a) the share of individuals of 0-59 living in a household where (b) no-one between 18 – 59 (with the exclusion of students in the age group between 18 and 24) is employed using the full-time equivalent retrospective definition of employment. In this definition persons are characterized as living in a household with low work intensity when the household work intensity is below a threshold set at 0.20. The estimates are based on SILC.

Definition V refers to the (ordinal) measure of work intensity as adopted in 2004 by the Indicators' Sub-Group (ISG) of the Social Protection Committee (SPC). It has been used in the breakdown of the social inclusion secondary indicator 'at risk of poverty rate by work intensity'. It was calculated (c) as a ratio of the sum of all months actually worked in the past year (without any distinction between full-time or part-time) by (b) adults (aged 16-64, excluding dependent inactive youth aged 16-24) to the sum of workable months in the household. The (a) population reference group is demarcated as the population aged 16-64 excluding dependent inactive youth aged 16-24. The estimates are based on SILC.

Definition VI uses the same delineations for the working age focus group, the population reference group, the employment definition and the source data as definition IV, with the sole difference that an ordinal measurement of work intensity replaces the binary concept of a threshold.

Table A. 2 shows the estimates of these different definitions. Looking at individuals living in a jobless household (work intensity zero), definition VI is clearly the most flexible one. In all countries, the share of individuals living in a jobless household is the lowest. Comparison of the LFS data estimates learns that definition II is the most stringent, offering the highest rates of household joblessness. The broader working age focus group (including individuals aged 60 – 64) can be a relevant explanation. The higher propensity of household joblessness in definition V as compared to definition VI (both SILC measures) can be explained by the retrospective question of employment. Not controlling for a full-time equivalent employment of part-time employees reveals higher rates of household joblessness. Table A. 3 ranks the available countries (dependent of the data source) by the share of individuals living in a jobless household (work intensity is zero for ordinal measures of work intensity). Minor differences in definitions translate in significant changes in country rankings.

The discussion of the different definitions of household joblessness shows that available measures do differ in a number of ways. Besides the data source used, we described differences in population covered, the definition of employment definitions and the time frame of evaluated work. Given the fact that these indicators differ in all these respects, it is not surprising that they produce different outcomes. However, to understand the impact of the data source and to know which of the underlying differences do

account for a divergent measurement of the share of individuals living in household joblessness, we re-calculate definition I in SILC, progressively adapting the different concepts in the indicator of definition IV (the current EU2020 threshold for individuals living in a work-poor household). This analysis is shown in Table A. 4 (see also table 3 in de Graaf-Zijl and Nolan, 2011) .

Column (1) and column (3) show the point estimates available at the Eurostat website. Column (2) and column (4) show the same estimates that we have produced ourselves from LFS and SILC data. These estimates are very similar, indicating that we use the correct definitions and concepts.

In column (5) we retain the concepts of definition IV, but we shift from a work-poor (work intensity < 0.2) perspective to a joblessness one (work intensity of the household equals zero). For all countries, the share of individuals living in a jobless household is lower than the share of individuals living in a work-poor household. The differences, however, are limited indicating that very small jobs are rather exceptional. Bulgaria, Hungary and Ireland are exceptions with substantial differences between the work-poor and joblessness approach. In column (6), we alter the population reference group to that of definition I (from individuals aged 0 - 59 to individuals aged 18 – 59). The differences between column (5) and (6) are limited. In most countries, excluding children from the population reference group (hardly) increases the share of individuals living in jobless households. In Belgium, the Netherland, Denmark and Finland, the increase is more obvious, potentially indicating that most children do not grow up in joblessness. On the contrary, in the United Kingdom and Ireland the narrowing of the population reference group to the working age population decreases the share of individuals living in household joblessness. Subsequently, in column (7) the working age focus group is adapted. Changing the subset of household members whose potential contribution to economic activity we consider relevant (in this case from adults aged 18-59y to those aged 15-75y, both excluding students) decreases the share of individuals living in household joblessness in comparison to column (6). This decline is limited, but most notable in Southern European countries. Finally, column (7) changes the definition of employment. We switch from a retrospective work-intensity approach as recently developed in the framework of the new headline targets of the Europe 2020 strategy to one based on current labour force status during the reference week (ILO). This adjustment causes the most substantial change in the share of individuals living in jobless households. Temporary employment, not captured through the ILO definition, is most prominent in the United Kingdom and Poland, and to a smaller extent in Spain, Finland, Hungary and Ireland. Any remaining differences between estimates in column (2) and column (8) are solely attributable to reasons related to data sources. For some countries these differences are quite substantial. We find more than 2 percentage points higher estimates in

SILC in Ireland, Poland and Latvia and we observe 2 per cent point lower estimates in SILC for Luxemburg and Slovakia. Although both survey samples might have different purposes, with LFS primarily dedicated to the measurement of employment at the individual level and with SILC mainly constructed for poverty and income measurement at the household level, these differences are cause for concern for Eurostat and researchers interested in the relation between individual employment and household poverty.

In Figure A. 1 to Figure A. 4 we look more closely at the (a) distribution of the population aged 0–59 living in a jobless household and (b) the distribution of the poor population by work intensity, both defined by the ISG definition of work intensity (definition V) and the more recent EU2020 definition of work intensity (definition VI).

The main difference between both definitions is the concept of employment. Although both definitions use a retrospective approach of employment during the year prior to the survey, definition V controls for the number of months an individual has been employed while definition VI additionally controls for the number of hours a part-time employed individual has been working. Thus, in definition V work intensity is defined as the ratio of the number of all months that household members belonging to the working age focus group worked to the total number of months that could in theory have been worked by all the members of the same household who belong to the working age focus group. Additionally, in definition VI, for persons who declared having worked part-time, an estimate of the number of months in terms of full-time equivalent is computed on the basis of the number of usually worked hours at the time of the interview.

To improve comparability between both definitions, the population reference group is set at individuals aged 0–59 years of age for both definitions. The working age focus group is already the same.

Figure A. 1 and Figure A. 2 show the distribution of the population aged 0–59 by household work intensity in 2009. The following findings arise. First, in all countries, the share of individuals living in a jobless household (work intensity equals zero) is smaller when one applies definition VI. Controlling for part-time employment decreases the propensity of living in a jobless household. Second, the share of individuals living in a full employment household is much more confined when one calculates the estimates with the new EU 2020 definition of work intensity. These differences are most prevalent in the Netherlands and the United Kingdom with differences of more than 40 percentage points between both definitions of retrospective work intensity. But also in Austria, Belgium, Germany, Luxembourg and Sweden the differences between both indicators exceed 20 percentage points. Those differences are mainly translated in a trade-off between household full-employment (wi = 1) and

work rich household employment (0.5 <= wi < 1). Thirdly, in the new EU Member States observed differences in the share of individuals living in full-employment households are rather limited, not exceeding 10 percentage points in any of these countries.

Consequently, the composition of the population at risk of poverty also differs by household work intensity, depending of the definition applied. Because of a more rudimentary approach of household work intensity in definition V, the more detailed subgroups of individuals living in work-poor and work rich households are underrepresented among the poor (at risk of poverty) population in all countries in comparison with a similar distribution based on definition VI (see Figure A. 3 and Figure A. 4). Complementary, the share of individuals living in jobless and full-employment households are overrepresented among the poor (at risk of poverty) population when one applies definition V to demarcate work intensity. The overrepresentation of individuals living in jobless households among the poor is the strongest in Finland, the Netherlands and Poland. The overrepresentation of individuals living in full-employment households among the poor population is most outspoken in Luxembourg, the Netherlands, Romania, Sweden and the United Kingdom.

Table A. 1: Different definitions of work intensity on the household level.

	definition I	**definition II**	**definition III**	**defintion IV**	**definition V**	**definition VI**
definition of employment	ILO (current position in reference week)	ILO (current position in reference week)	ILO (current position in reference week)	retrospective (nbr of months and hours worked during income reference year)	retrospective (nbr of months worked during income reference year)	retrospective (nbr of months and hours worked during income reference year)
measure	binary	continuous WI=0; 0<WI<0.5; 0.5<=WI<1; WI=1	continuous WI=0; 0<WI<0.5; 0.5<=WI<1; WI=1	binary (with threshold) WI<0.2	continuous WI=0; 0<WI<0.5; 0.5≤WI<1; WI=1	continuous WI=0; 0<WI<0.5; 0.5≤WI<1; WI=1
working age focus group	no adult (age 15-75y) in work	no adult (16-64y) in work; exclusion of full-time students and retired persons	no adult (20-59) in work	potential full-time full-year in work for the sum of adults (18-59y) in hh; exclusion of students (18 – 24y)	potential full-year in work for the sum of adults (16 - 64y) in the hh; excluding dependent inactive youth (16 - 24y)	potential full-time full-year in work for the sum of adults (18-59y) in hh; exclusion of students (18 – 24y)
population reference group	share of persons 18-59y; hh with only students not counted	share of persons 16-64y	population of working age ; exclusion of hh with no individuals at active age or with hh head retired	share of persons 0-59y; exclusion of hh composed only of children, students or people aged 60+	share of persons 0-65y; exclusion of hh composed only of children, students or people aged 65+	share of persons 0-59y; exclusion of hh composed only of children, students or people aged 60+
source	ELFS	ELFS, ECHP	ELFS	EU-SILC	EU-SILC	EU-SILC

Table A. 2: Different definitions of work intensity at the household level, 2008.

country	Labour Force Survey									Survey on Income and Living Conditions								
	def I	definition II				definition III				def IV	definition V				definition VI			
	0	*0*	*0 - 0.5*	*0.5 - 1*	*1*	*0*	*0 - 0.5*	*0.5 - 1*	*1*	*0*	*0*	*0 - 0.5*	*0.5 - 1*	*1*	*0*	*0 - 0.5*	*0.5 - 1*	*1*
AT	7.8	11.4	3.0	24.7	61.0	8.0	1.3	23.1	67.6	7.8	12.2	6.9	37.2	43.7	6.8	8.9	54.6	29.7
BE	12.3	17.2	2.9	22.4	57.4	12.6	1.9	20.6	64.9	11.6	17.3	6.1	27.1	49.5	10.0	9.0	47.4	33.7
BG	8.6	12.9	3.7	27.1	56.2	9.4	2.5	22.6	65.5	8.1	10.5	12.4	40.8	36.4	5.8	14.8	39.4	40.0
CY	4.5	6.6	3.4	32.6	57.4	4.9	1.3	27.9	66.0	4.1	5.9	7.7	43.6	42.7	3.4	7.9	46.7	42.0
CZ	6.0	11.0	2.0	26.5	60.5	6.7	0.7	24.8	67.7	7.2	11.7	5.1	38.2	45.0	6.4	5.0	40.4	48.1
DE	10.8	13.8	1.8	20.7	63.7	11.6	0.8	21.2	66.4	11.7	15.9	3.7	27.7	52.7	10.4	7.4	53.2	29.0
DK										8.5	14.7	1.9	18.2	65.2	8.0	3.4	29.9	58.7
EE	5.9	9.0	1.0	20.8	69.1	7.7	0.7	18.8	72.8	5.3	7.9	3.3	33.4	55.4	4.4	4.5	39.8	51.4
EL	7.5	11.1	5.1	36.7	47.2	7.4	2.5	35.3	54.7	7.5	9.8	11.2	42.5	36.5	6.3	10.5	45.8	37.4
ES	6.5	8.6	7.0	38.8	45.6	7.7	3.9	35.5	52.9	6.1	8.5	7.7	42.2	41.6	4.6	9.0	50.0	36.5
FI										7.4	11.5	4.9	35.2	48.4	5.6	7.6	42.2	44.6
FR	10.2	15.1	1.5	22.8	60.6	10.2	0.7	21.4	67.6									
HU	12.4	16.7	5.6	32.5	45.2	13.1	3.4	32.0	51.5	12.9	20.2	9.7	36.3	33.8	9.9	11.9	40.7	37.5
IE	8.7	10.0	2.8	30.6	56.6	10.4	1.6	29.3	58.7	13.7	13.8	8.7	38.3	39.3	11.0	14.5	50.1	24.5
IT	9.3	13.1	7.6	35.7	43.6	9.7	4.1	35.9	50.3	9.7	13.7	11.1	38.0	37.2	8.4	10.7	48.1	32.8
LT	9.1	11.6	2.6	22.8	63.0	9.6	1.8	19.7	69.0	5.1	8.3	5.3	32.4	54.1	4.5	6.2	35.0	54.2
LU	7.6	11.8	4.1	28.2	55.9	7.7	2.1	29.6	60.6	4.6	8.4	7.8	37.4	46.4	3.5	8.3	58.3	29.8
LV										5.0	7.4	6.0	37.2	49.3	4.2	7.0	40.0	48.8
MT																		
NL	6.3	10.1	1.2	20.0	68.8	7.1	0.5	17.2	75.2	8.2	13.6	3.6	32.8	50.0	6.7	8.1	70.0	15.1
PL	10.3	13.1	7.7	33.7	45.5	10.3	4.9	31.2	53.6	7.9	13.8	9.4	40.3	36.5	6.1	10.9	47.6	35.4
PT	5.4	7.9	4.6	31.0	56.5	5.9	2.9	26.9	64.2	6.3	8.2	8.4	38.8	44.6	5.2	9.4	40.9	44.5
RO	10.1	12.3	6.4	32.7	48.7	10.7	4.1	30.9	54.3	8.4	12.0	9.0	37.6	41.4	7.4	10.2	40.2	42.2
SE										5.5	7.7	3.1	24.4	64.7	4.3	9.3	42.8	43.6
SI	6.7	10.1	5.1	25.7	59.1	6.3	2.3	22.3	69.1	6.7	11.7	8.2	35.6	44.5	5.9	5.9	34.1	54.1
SK	8.2	11.4	5.2	33.5	49.8	8.9	3.1	29.9	58.1	5.0	9.4	6.0	35.7	48.8	4.6	5.0	35.4	55.0
UK	14.3	12.9	1.5	20.3	65.3	12.6	0.8	18.2	68.3	10.3	13.1	1.7	19.8	65.4	8.8	7.6	48.4	35.1

Table A. 3: Performance rankings of countries using different definitions of work intensity, ranked on wi = 0, 2008 data.

	definition											
	LFS						***SILC***					
ranking	*I*		*II*		*III*		*IV*		*V*		*VI*	
1	CY	4.5	CY	6.6	CY	4.9	CY	4.1	CY	5.9	CY	3.4
2	PT	5.4	PT	7.9	PT	5.9	LU	4.6	LV	7.4	LU	3.5
3	EE	5.9	ES	8.6	SI	6.3	LV	5.0	SE	7.7	LV	4.2
4	CZ	6.0	EE	9.0	CZ	6.7	SK	5.0	EE	7.9	SE	4.3
5	NL	6.3	IE	10.0	NL	7.1	LT	5.1	PT	8.2	EE	4.4
6	ES	6.5	NL	10.1	EL	7.4	EE	5.3	LT	8.3	LT	4.5
7	SI	6.7	SI	10.1	ES	7.7	SE	5.5	LU	8.4	ES	4.6
8	EL	7.5	CZ	11.0	EE	7.7	ES	6.1	ES	8.5	SK	4.6
9	LU	7.6	EL	11.1	LU	7.7	PT	6.3	SK	9.4	PT	5.2
10	AT	7.8	AT	11.4	AT	8.0	SI	6.7	EL	9.8	FI	5.6
11	SK	8.2	SK	11.4	SK	8.9	CZ	7.2	BG	10.5	BG	5.8
12	BG	8.6	LT	11.6	BG	9.4	FI	7.4	FI	11.5	SI	5.9
13	IE	8.7	LU	11.8	LT	9.6	EL	7.5	SI	11.7	PL	6.1
14	LT	9.1	RO	12.3	IT	9.7	AT	7.8	CZ	11.7	EL	6.3
15	IT	9.3	UK	12.9	FR	10.2	PL	7.9	RO	12.0	CZ	6.4
16	RO	10.1	BG	12.9	PL	10.3	BG	8.1	AT	12.2	NL	6.7
17	FR	10.2	PL	13.1	IE	10.4	NL	8.2	UK	13.1	AT	6.8
18	PL	10.3	IT	13.1	RO	10.7	RO	8.4	NL	13.6	RO	7.4
19	DE	10.8	DE	13.8	DE	11.6	DK	8.5	IT	13.7	DK	8.0
20	BE	12.3	FR	15.1	UK	12.6	IT	9.7	IE	13.8	IT	8.4
21	HU	12.4	HU	16.7	BE	12.6	UK	10.3	PL	13.8	UK	8.8
22	UK	14.3	BE	17.2	HU	13.1	BE	11.6	DK	14.7	HU	9.9
23							DE	11.7	DE	15.9	BE	10.0
24							HU	12.9	BE	17.3	DE	10.4
25							IE	13.7	HU	20.2	IE	11.0
# countries	22		22		22		25		25		25	

Table A. 4: Comparison of household joblessness indicators in LFS and SILC, 2008 data.

	1	2	3	4	5	6	7	8
	hhner (wi=0) - LFS		wp (wi < 0.2) - SILC		hhner (wi = 0) - SILC			
	Eurostat	own estimate	Eurostat	own estimate	own estimate			
AT	7.0	7.8	7.8	7.8	6.8	7.5	7.1	9.4
BE	12.0	12.3	11.7	11.6	10.0	11.2	10.8	13.1
BG	9.0	8.6	8.1	8.1	5.8	5.8	5.2	8.0
CY	4.9	4.5	4.1	4.1	3.4	3.8	2.9	4.1
CZ	6.0	6.0	7.2	7.2	6.4	6.5	6.2	7.5
DE	9.0	10.8	11.6	11.7	10.4	11.2	10.7	12.0
DK			8.3	8.5	8.0	9.6	9.3	10.0
EE	6.2	5.9	5.3	5.3	4.4	4.9	4.5	7.1
EL	7.5	7.5	7.4	7.5	6.3	7.2	6.3	7.7
ES	7.4	6.5	6.2	6.1	4.6	5.2	4.5	7.9
FI			7.3	7.4	5.6	6.7	6.4	10.3
FR	9.8	10.2	8.8					
HU	12.5	12.4	12	12.9	9.9	10.5	10.4	14.1
IE	9.0	8.7	13.6	13.7	11.0	10.5	9.7	13.6
IT	9.6	9.3	9.8	9.7	8.4	9.4	8.7	10.0
LT	9.0	9.1	5.1	5.1	4.5	5.3	5.0	8.2
LU	7.9	7.6	4.7	4.6	3.5	3.9	3.8	5.5
LV	6.4		5.1	5.0	4.2	4.8	4.4	7.1
MT			8.2					
NL	5.9	6.3	8.1	8.2	6.7	7.8	7.4	7.0
PL	10.1	10.3	7.9	7.9	6.1	7.0	6.7	13.6
PT	5.5	5.4	6.3	6.3	5.2	5.6	4.9	6.8
RO	10.5	10.1	8.2	8.4	7.4	8.0	7.7	8.9
SE			5.4	5.5	4.3	4.8	4.2	7.2
SI	6.4	6.7	6.7	6.7	5.9	7.0	6.8	8.3
SK	7.5	8.2	5.2	5.0	4.6	5.1	4.9	5.6
UK	10.7	14.3	10.4	10.3	8.8	7.4	7.0	13.7

Figure A. 1: Definition VI (EU2020), Distribution of population (0-59) by household work intensity, 2009, SILC.

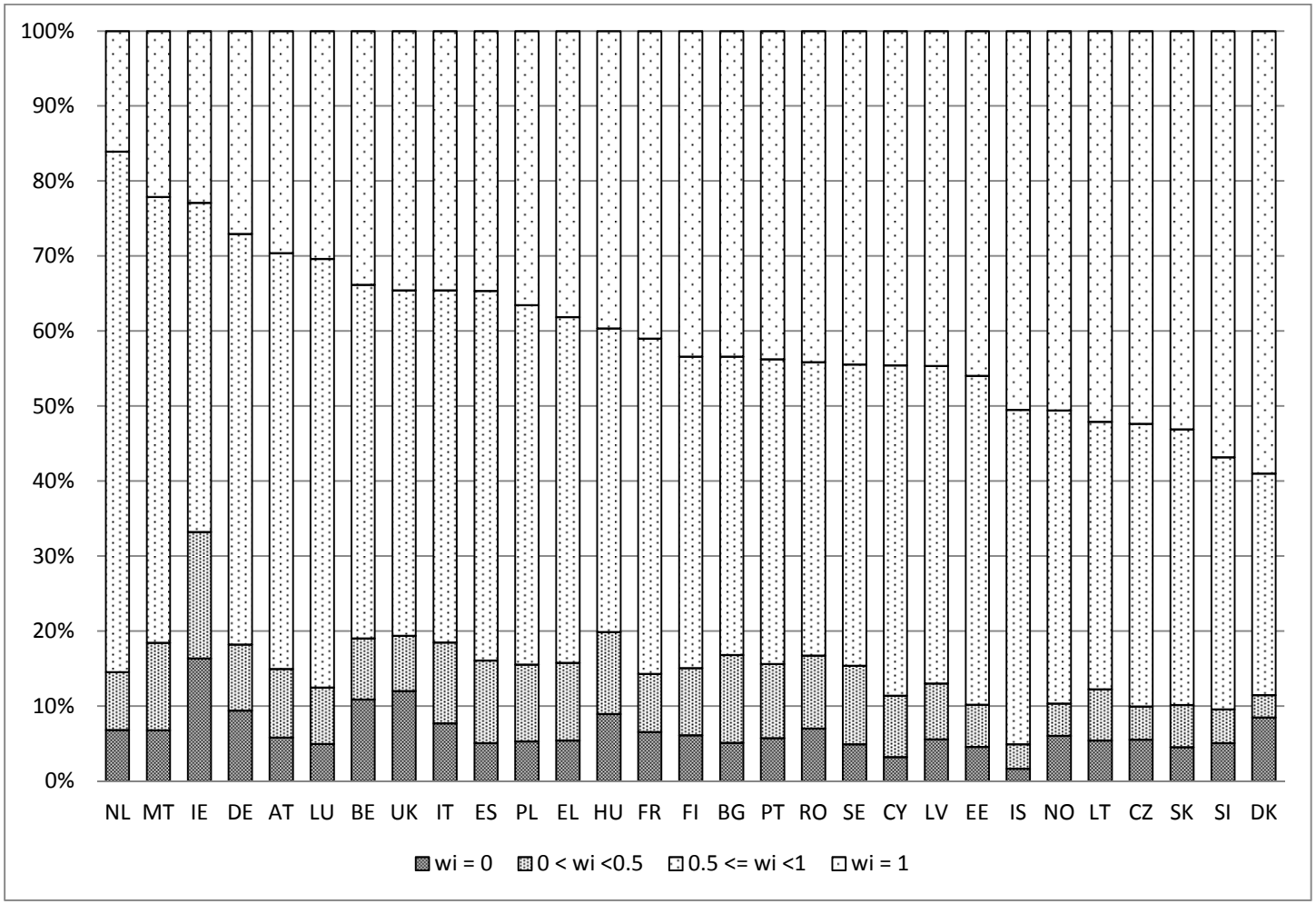
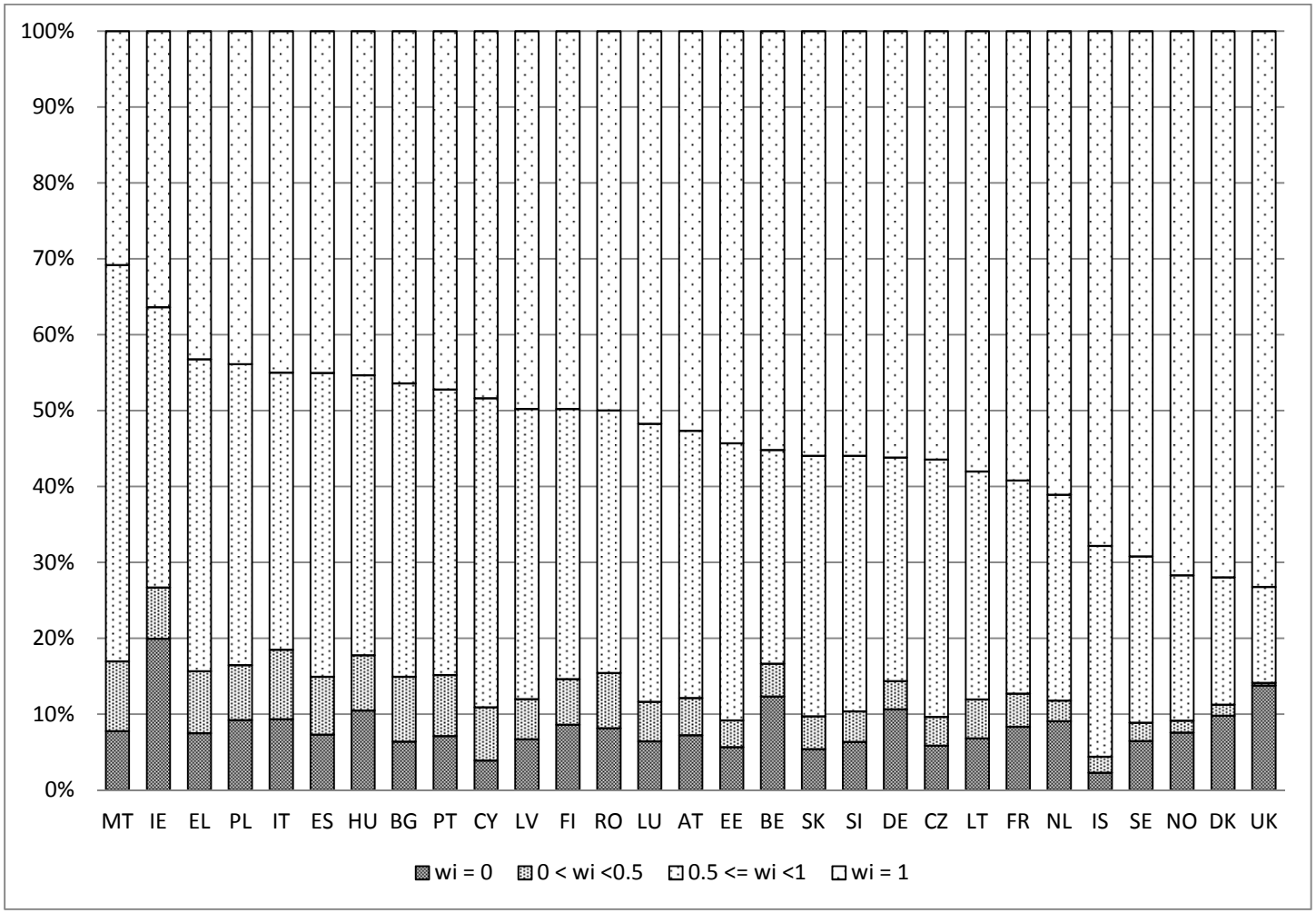


Figure A. 2: Definition V (ISG, 2004), Distribution of population (0 – 59)[24] by household work intensity, 2009, SILC.



[24] To improve comparability, age brackets for the population reference group are adapted to those of definition 6 (EU2020) .

Figure A. 3: Definition VI (EU2020), Distribution of household work intensity among poor individuals (0 – 59), 2009, SILC.

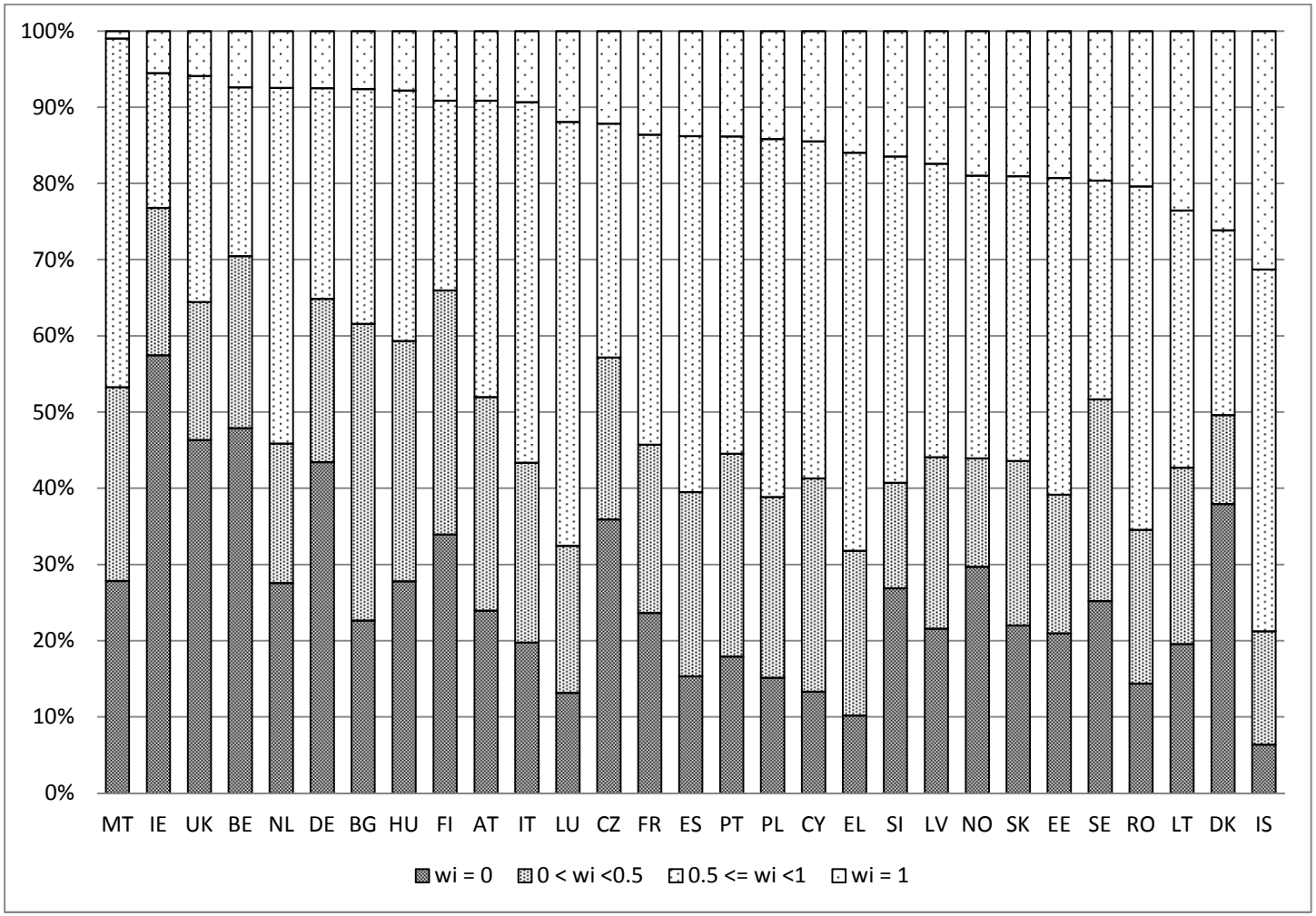
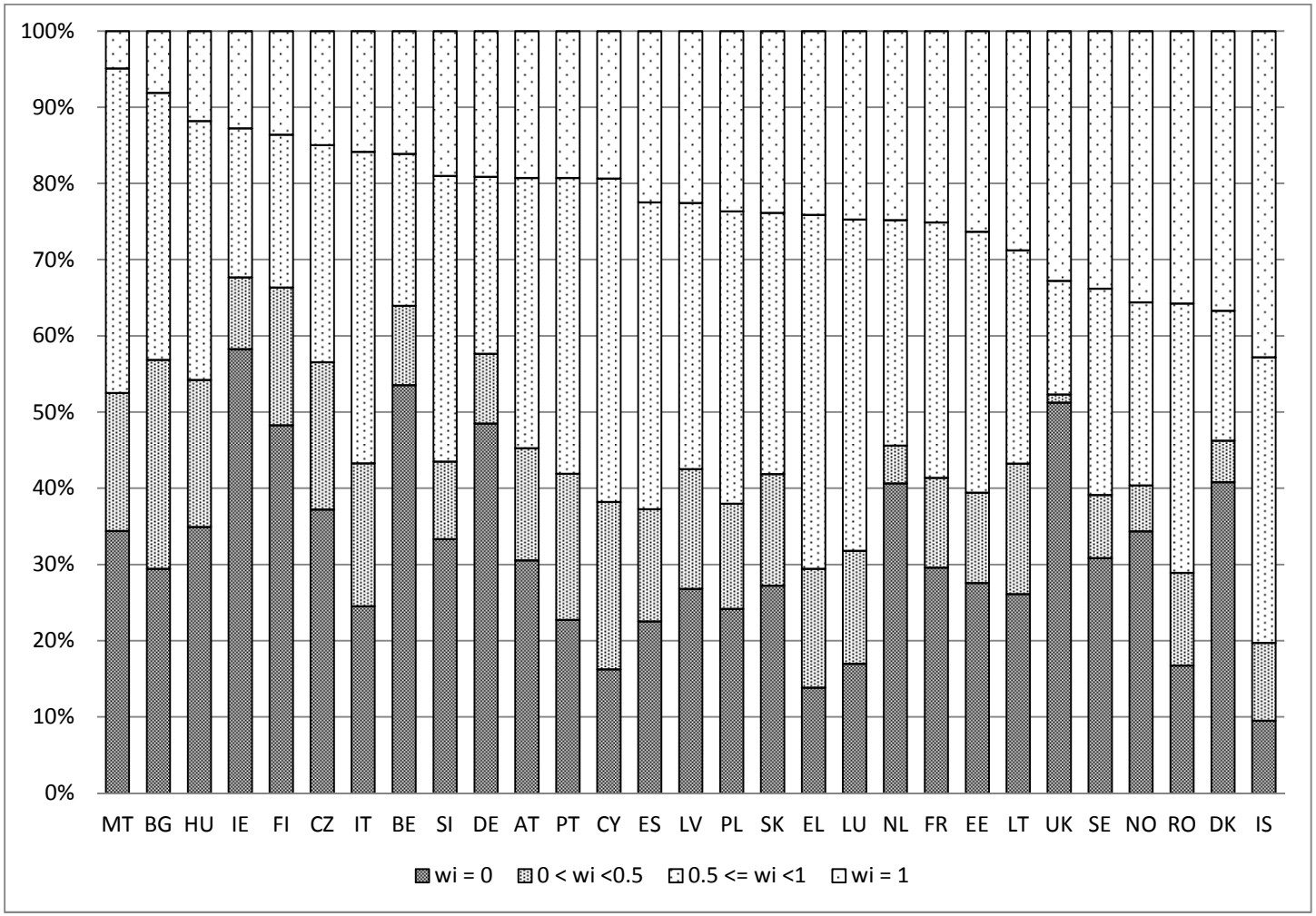


Figure A. 4: Definition V (ISG, 2004), Distribution of household work intensity among poor individuals (0 – 59), 2009, SILC.



Appendix 2: Convergence in EU?

The decomposition analysis uncovers a puzzling combination of convergence and disparity within the EU. Convergence is observed in terms of fundamental trends in labour markets since at least 1995, and, albeit less unequivocally, in relation to overall poverty outcomes (in the age cohort 20 to 59) during the Lisbon era. Convergence in national poverty rates during the boom years 2004/5-2007/8 was presumably the upshot of economic growth and intergenerational shifts in the new Member States, decreasing poverty rates in Anglo-Saxon Europe and increasing poverty rates in some Scandinavian countries. At the same time, evidence suggests a disparity in social policy trajectories during those years (and, so it seems, a persistent disparity in educational attainment).

Sala-i-Martin (1996) draws a useful distinction between two types of convergence in growth analysis: sigma-convergence and beta-convergence. When the dispersion of poverty rates or polarization across a group of countries falls over time (the standard deviation drops), there is sigma-convergence. When the partial correlation between growth in poverty rates or polarization over time and its initial level is negative, there is beta-convergence. This means that those countries with an initially lower starting position evolve relatively faster.

Table A. 5 (upper section) shows that in the eleven countries examined (i.e. the Southern, Anglo-Saxon and Continental members of EU15, excluding Germany), one observes an upward convergence of the levels of polarization. The pattern is one of both beta-convergence (a catch-up process) and sigma-convergence (a reduction in the dispersion of values). In 1995, the average value of the polarization index was 0.39, with a particularly large positive value in the UK and negative values in Luxembourg, Spain, Italy and Greece. In 2008, the average value of the polarization index increased to 1.42. In the UK, positive polarization diminished, while in Luxembourg, Spain, Italy and Greece the negative polarization characterizing the beginning of the period was reduced to close to zero. Belgium is an exception in this respect, moving from a rather high level of positive polarization in 1995 to an even higher level (the highest of the group) by 2008. Beta-convergence is identified by a negative correlation of -0.81 between the initial values in 1995 and the changes over the period 1995-2008. Sigma-convergence is identified by the standard deviation decreasing from 2.16 to 1.50. Unlike the beta-convergence, the sigma-convergence is quite sensitive to outliers. Omission of the UK and Spain (two countries with substantial, but opposite trends in polarization) reduces the decline of standard deviation from -0.66 to -0.29; it also reduces the negative correlation from -0.81 to -0.60.

If one restricts the period under consideration to 2000-2008 (see Table A. 5 -lower section-), the number of countries can be increased to twenty-three (the EU-27 minus Sweden, Finland, Denmark and Malta). Between 2000 and 2008, one again observes beta and (albeit less robustly) sigma-convergence. This holds both for the eleven countries for which data availability stretches back to 1995 and for the group of twenty-three EU Member States. Again, the beta-convergence is more robust than the sigma-convergence when eliminating outliers. The negative correlation between starting values and deltas for polarization, signalling beta-convergence, is -0.72 for EU-23 and -0.70 for EU-11. Excluding UK and Spain drops this partial correlation to -0.41 and -0.42 respectively for EU-23 and EU-11. The decline in standard deviation for EU-23 decreases from -0.46 to -0.12 when excluding outliers Spain and UK from the estimates. For EU-11 countries this decline in standard deviation evolves from -0.38 to -0.13.

However, there is no real *upward* convergence in the levels of polarization across the twenty-three EU Members: the average value of the polarization index for the group under review increased from 1.61 in 2000 (with a standard deviation of 1.73) to 1.75 (with a standard deviation of 1.27). In the smaller group of eleven countries for which data are available from 1995 onwards, the *upward* movement is more outspoken: in 2000 the average value of the polarization index for these Member States was 0.73 (standard deviation 1.88) increasing to 1.42 (standard deviation 1.50) by 2008. This trend seems to have been driven mainly by the modernization of household structure and participation in labour markets in Spain, Italy, France and Greece. The ten new Member States under examination were characterized by high levels of polarization in 2000 (with an average polarization index of 2.50 and standard deviation 1.02); in this respect their starting position in the beginning of the Lisbon era was very different from that of Spain, Italy and Greece, which were still characterized by negative polarization in 2000.

With regard to poverty risks, we are restricted to periods of change between 2004/5 and 2007/8, a period of economic growth, particularly in the new Member States. Not surprisingly, when we look at the poverty risk of the population aged 20 to 59, we observe catching-up or beta-convergence with a negative correlation of -0.45 between the initial estimates in 2004/5 and the changes over the period 2004/5 and 2007/8 (see Table A. 6). This beta-convergence is weakened if one disregards Poland (negative correlation of -0.33) or if one drops those countries with the most outspoken trends in poverty risks (i.e. Germany, Ireland, Poland and Sweden) (with a negative correlation of only -0.18). This beta-convergence also holds for individuals living in work-poor or jobless households. As regards the poverty risk of the working-age population, there is also evidence of a sigma-convergence (i.e. less dispersion, but this effect is weakened quite substantially if Poland is disregarded) (see Table A. 7).

Table A. 5: BETA & SIGMA-convergence of polarization for different periods (1995 – 2000 – 2008) and different country combinations , SILC.

		EU11 (=EU 15, excluding DK, FI, SE & DE)	EU9 (=EU 11, excluding UK & ES)	EU23 (= EU27, excluding DK, FI, SE & MT)	EU12 (= EU15, excluding DK, FI & SE)	EU11 (= EU12 NMS, excluding MT)	EU21 (= EU23, excluding ES & UK)
avg. polarization index	1995	0.39	0.20				
	2008	1.42	1.36				
std. dev.	1995	2.16	1.68				
	2008	1.50	1.38				
sigma convergence '95 - '08		-0.66	-0.29				
beta-convergence '95 - '08		-0.81	-0.60				
avg. polarization index	2000	0.73	0.67	1.61	0.79	2.50	1.67
	2008	1.42	1.36	1.75	1.48	2.03	1.75
std. dev.	2000	1.88	1.52	1.73	1.81	1.02	1.46
	2008	1.50	1.38	1.27	1.45	0.88	1.34
sigma convergence '00 - '08		-0.38	-0.13	-0.46	-0.36	-0.13	-0.12
beta-convergence '00 - '08		-0.70	-0.42	-0.72	-0.69	-0.52	-0.41

Table A. 6: BETA-convergence of AROP, share of individuals in working poor households, AROP among working poor and AROP among working rich for 2 definitions of work intensity and different country combination, 2005 – 2008, SILC.

		EU26 (all countries in survey) (=EEU)	EU24 (= EU26, excluding IS & NO)	EU 23 (= EU24, excluding DE)	EU23 (= EU24, excluding IE)	EU23 (= EU24, excluding PL)	EU23 (= EU24, excluding SE)	EU20 (= EU24, excluding DE, IE, PL, SE)	EU15	EU9 (= EU12, excluding BG, RO & MT)
wi = 0	corr (pov t0 - Δ pov)	-0.45	-0.48	-0.48	-0.48	-0.33	-0.42	-0.18	-0.28	-0.47
	corr (wp t0 - Δ wp)	-0.43	-0.41	-0.47	-0.45	-0.28	-0.41	-0.42	-0.47	-0.57
	corr (pwp t0 - Δ pwp)	-0.29	-0.23	-0.25	-0.04	-0.24	-0.15	0.06	-0.64	0.62
	corr (pwr t0 - Δ pwr)	-0.33	-0.32	-0.28	-0.32	-0.15	-0.27	0.01	-0.12	-0.31
wi = 0.5	corr (pov t0 - Δ pov)	-0.45	-0.48	-0.48	-0.48	-0.33	-0.42	-0.18	-0.28	-0.47
	corr (wp t0 - Δ wp)	-0.42	-0.47	-0.47	-0.59	-0.19	-0.44	-0.31	-0.38	-0.62
	corr (pwp t0 - Δ pwp)	-0.27	-0.23	-0.24	-0.19	-0.24	-0.18	-0.13	-0.49	0.18
	corr (pwr t0 - Δ pwr)	-0.23	-0.21	-0.15	-0.21	-0.15	-0.18	-0.05	-0.20	-0.13

Table A. 7: SIGMA-convergence of AROP, share of individuals in work-poor households, AROP among working poor and AROP among working rich for 2 definitions of work intensity and different country combinations, 2005 – 2008, SILC.

		EU26 (all countries in survey) (=EEU)	EU24 (= EU26, excluding IS & NO)	EU 23 (= EU24, excluding DE)	EU23 (= EU24, excluding IE)	EU23 (= EU24, excluding PL)	EU23 (= EU24, excluding SE)	EU20 (= EU24, excluding DE, IE, PL, SE)	EU15	EU9 (= EU12, excluding BG, RO & MT)
wi = 0	pov	-0.36	-0.40	-0.41	-0.40	-0.09	-0.26	0.08	-0.05	-0.45
	wp	-0.20	-0.12	-0.22	-0.20	0.03	-0.11	-0.14	-0.29	-0.20
	pwp	0.08	0.59	0.27	1.14	0.45	1.08	1.20	-1.68	3.47
	pwr	-0.17	-0.16	-0.10	-0.16	0.09	-0.09	0.26	0.02	-0.11
wi = 0.5	pov	-0.36	-0.40	-0.41	-0.40	-0.09	-0.26	0.08	-0.05	-0.45
	wp	-0.11	-0.11	-0.10	-0.58	0.77	0.00	0.54	-0.14	-0.81
	pwp	-0.02	0.16	-0.02	0.08	0.10	0.46	0.12	-0.27	1.37
	pwr	-0.01	0.01	0.08	0.02	0.10	0.05	0.23	-0.05	0.29

Appendix 3: Probability of joblessness on the individual level

In this section we further explore the socio-demographic characteristics of individuals who are confronted with a high risk of living in a jobless household (ILO-concept) or a work-poor household with less than 50% work intensity.

We estimate a probit model with a range of dependent socio-demographic covariates that may affect the individual probability of living in a jobless (or work-poor) household. The probit model specifies a cumulative distribution function of the standard normal distribution. The coefficients are estimated by maximum likelihood. In a nonlinear model (as is the case with a binary dependent variable of household joblessness), marginal effects are more informative than the coefficients. Therefore we provide estimates of the marginal effect at a benchmark case.

In Table A. 8 and Table A. 9 we look at individual probabilities of household work intensity for the population of six country clusters, for household joblessness (work intensity equals zero) and work-poor households (work intensity is strictly lower than 0.5) respectively. In column 4 and 5 we compare old and new EU Member States (EU15 versus EU10). In columns 6 to 9 the EU15 population is subdivided in four welfare state type clusters. We provide both the estimated probability of household joblessness and the marginal effects of the different covariates at the benchmark case of a 20-29 year old, unmarried low educated woman , born in an EU country, who is not disabled and lives in a single adult household without children.

We find quite similar individual risks of living in a jobless or work-poor household for the reference individuals in old and new EU member states. For the average working age adult (with the characteristics of the reference individual - see column 3) the risk of household joblessness is 42.2 % and 47.1 %, for EU15 and EU10 respectively. The EU15 average conceals the lower household joblessness rate in Scandinavian countries and the relatively high rate in Southern European countries.

But also the magnitude and sign of the marginal effects of the different socio-demographic characteristics for both country clusters are largely similar. This social stratification reflects to a large extent some deep-rooted social disadvantages with which individuals are born or have come to live with rather early on in their lives. First of all and unsurprisingly, individuals with a high risk of living in a jobless household or a work-poor household are individuals living in single households. This result is in part attributable to the mere 'mathematical' effect of the absence of unemployment risk pooling in single households. With regard to the risk of living in a jobless household, our age-result follows intuition. Compared with individuals aged 20-29, individuals between 30-54 face a lower risk and individuals between 55-59 face a significantly higher risk of living in a

jobless household. The result for the latter group is in line with what one would expect given early exit from the labour market. Again, we find substantial differences by welfare state cluster. In Scandinavian countries there is no significant difference in the probability of household joblessness for older and younger individuals. In Southern countries, the youngest age group is at the highest risk. Rather surprisingly, having children does not influence the risk of living in a jobless or work-poor household. Whatever the household size, we see that disabled individuals run a higher risk of living in a jobless or work-poor household. Here the effect is stronger in older European Member States countries, with a percentage point difference of 7.1. Moreover, the impact of individual educational outcomes follows standard sociological relations; the lower the educational profile, the higher the probability of living in a jobless household. Again, differences between EU15 and EU10 are limited, with the cluster of Scandinavian countries displaying a divergent pattern with a limited positive effect of tertiary education on household joblessness. Finally, the only socio-demographic characteristics for which the sign of the marginal effect is opposite for different country clusters is origin (defined as country of birth). Being born in a non-European country strongly increases the risk of living in a jobless household in Scandinavian and to a lesser extent in Conservative European countries, but it decreases household joblessness in EU10 and liberal European countries.

Using a more fine grained definition of household work intensity (see Table A. 9) slightly increases the risk of household joblessness for the reference population. However, this effect is stronger in EU15 than in EU10, which makes the gap in probabilities for both country clusters smaller. On the one hand, in Conservative and Scandinavian countries the EU2020 estimation of living in a household with poor work intensity (with a benchmark at 0.5) strongly increases the individual risk in comparison with the ILO definition (around 13 percentage points), while in Southern and liberal EU this change of definition increases the risk only slightly.

Considering the marginal effects, there are only subtle differences between the risk profiles of the two population subgroups (jobless households, work-poor household) we distinguish here. The risks associated with age, education and disability are similar for joblessness and work poverty, yet the marginal effects of these individual features are more important for work poverty than for joblessness (with some opposite effect within the welfare state clusters). Also the impact of gender is more outspoken in the case of work poverty than in the case of joblessness. A larger household size reduces the risk of joblessness and work poverty (compared to the risks of singles), yet the reduction is relatively more important for a two-adult household when looking at work poverty and relatively more important for a three-plus household when looking at joblessness.

Table A. 10 and Table A. 11 make a similar exercise, but expand the EU2020 definitions of work-poor households with a peculiar focus on Belgium. In the covariates region is also added. The benchmark case is now a 30-54 year old, unmarried, low educated woman, born in an EU country, who is not disabled and lives in a single adult household without children in the Flemish region.

The first row of Table A. 10 shows the predicted probability for a working age adult (with the characteristics of the reference case) of living in a jobless/ work-poor household. For the retrospective definition of full-time employment in the reference year (EU2020) we use several benchmarks to define the household's work poverty (work intensity = 0; < 0.2; < 0.5; < 0.8). As already discussed in Appendix 1, the ILO definition of household joblessness is less strict than the EU2020 definition. This explains why the probability of joblessness is higher when the ILO definition is used. For the different benchmarks of work-poor households the risk of living in such a household gradually increases from 35.4 per cent to 52.0 per cent in 2005. In 2008 those estimates are slightly higher for all subgroups.

The magnitude of the marginal effects does gradually increase/decrease across the work-poor benchmarks. For example, the negative impact of tertiary education on household joblessness decreases from -14.8 percentage points to -25.6 percentage points. The same pattern can be found for gender, age and (very progressively) for origin and disability. For the number of working age adults in the household the sign of the marginal effect turns opposite for work rich households (benchmark between 0.5 and 0.8). At least one individual within the household is not working full-time over the past year, which can be explained by risk pooling and time management within the household. The effect of region and the impact of the presence of children in the household do not gradually change with the narrowing of the definition of work-poorness. Living in Brussels increases the risk for an individual of living in a work-poor household with around 8 percentage point in 2005, independent of the applied benchmark for work intensity.

Table A. 11 estimates the probability of living in a jobless/work-poor household for individuals with specific combinations of socio-demographic characteristics of gender, age and education and the number of working age adults in the household. It is clear that for single adult households, the individual probability of living in a work-poor household across different benchmarks does not differ as substantially as for the other household composition types. For example, the estimated risk for a low educated, 55 – 59 year old single man differs from 0.78 of complete joblessness to 0.87 for work intensity lower than 0.8. For a man living in a household with two working age adults this risk increases from 0.33 of complete joblessness to 0.88 for household work intensity 0 to 0.8. Within households with at least 2 working age adults, the gap in the individual

risk is most outspoken between work-poorness defined as smaller than 0.2 and smaller than 0.5. We conclude from this analysis that both changes in household 'joblessness' (wp^0) and in household 'work poverty' ($wp^{0.5}$, work intensity less than 50%) may be interesting to understand the dynamics of poverty risks over time.

Table A. 8: Probability of living in jobless household (wi = 0) for reference group and marginal effect of covariates for different country clusters, ILO definition of employment, 2008, SILC.

			EU15	EU10	Conservative EU	Scandinavian EU	Southern EU	Liberal EU
probability of living in a jobless hh for reference individual			0.422	0.471	0.402	0.250	0.520	0.419
variable group	*observed coefficient*	*reference group*						
gender	male	female	-0.016	-0.009	-0.001	-0.003	-0.014	-0.027
age	30 - 54y	20 - 29y	-0.021	-0.009	0.003	-0.025	-0.056	-0.025
	55 - 59y	20 - 29y	0.059	0.082	0.089	0.001	-0.013	0.073
marital status	married	not married	-0.022	-0.024	-0.018	-0.015	-0.010	-0.027
educational level	medium	low	-0.059	-0.067	-0.068	-0.026	-0.079	-0.059
	tertiary	low	-0.101	-0.136	-0.123	-0.032	-0.121	-0.088
origin	non-EU born	EU-born	0.029	-0.025	0.049	0.081	0.049	-0.013
disabled	disabled	not disabled	0.204	0.133	0.200	0.215	0.229	0.174
nbr of wa adults in HH	2	1	-0.119	-0.101	-0.140	-0.114	-0.113	-0.100
	at least 3	1	-0.174	-0.172	-0.224	-0.132	-0.166	-0.154
minor children in HH	at least 1	0	0.000	0.001	0.003	0.005	0.030	-0.012

Table A. 9: Probability of living in work-poor household (wi = 0.5) for reference group and marginal effect of covariates for different country clusters, ILO definition of employment, 2008, SILC.

			EU15	EU10	Conservative EU	Scandinavian EU	Southern EU	Liberal EU
probability of living in a jobless hh for reference individual			0.480	0.519	0.534	0.386	0.533	0.432
variable group	*observed coefficient*	*reference group*						
gender	male	female	-0.035	-0.017	-0.015	-0.022	-0.045	-0.041
age	30 - 54y	20 - 29y	-0.054	-0.025	-0.055	-0.065	-0.042	-0.070
	55 - 59y	20 - 29y	0.063	0.102	0.077	-0.011	0.089	0.003
marital status	married	not married	-0.031	-0.044	-0.028	-0.023	-0.042	-0.013
educational level	medium	low	-0.075	-0.125	-0.088	-0.034	-0.076	-0.103
	tertiary	low	-0.126	-0.229	-0.153	-0.037	-0.115	-0.160
origin	non-EU born	EU-born	0.059	-0.040	0.075	0.121	-0.001	0.117
disabled	disabled	not disabled	0.331	0.233	0.335	0.299	0.304	0.329
nbr of wa adults in HH	2	1	-0.146	-0.128	-0.163	-0.136	-0.115	-0.139
	at least 3	1	-0.059	-0.066	-0.112	-0.091	0.000	-0.094
minor children in HH	at least 1	0	0.000	0.001	0.006	0.002	-0.019	0.049

Table A. 10: Probability of living in jobless/ work-poor household for reference group and marginal effect of covariates for different definitions of work intensity (ILO, EU2020 with gradual benchmark), Belgium, 2005 & 2008, SILC.

			2005					2008				
			ilo	eu2020				ilo	eu2020			
			jl	jl	wi < 0.2	wi < 0.5	wi < 0.8	jl	jl	wi < 0.2	wi < 0.5	wi < 0.8
Probability of living in jobless/work-poor hh for reference individual			0.399	0.354	0.371	0.430	0.520	0.469	0.394	0.428	0.483	0.557
variable	*observed effect*	*reference group*										
gender	male	female	-0.038	-0.035	-0.044	-0.050	-0.069	-0.025	-0.020	-0.025	-0.042	-0.049
age	20 - 29y	30 - 54y	0.024	0.021	0.034	0.048	0.045	0.009	0.007	0.014	0.013	0.021
	55 - 59y	30 - 54y	0.173	0.142	0.154	0.202	0.275	0.125	0.101	0.118	0.156	0.262
marital status	married	not married	-0.011	-0.022	-0.024	-0.028	0.033	-0.007	0.008	-0.007	-0.024	0.055
educational level	medium	low	-0.076	-0.070	-0.076	-0.096	-0.147	-0.101	-0.077	-0.089	-0.124	-0.165
	tertiary	low	-0.150	-0.148	-0.157	-0.180	-0.256	-0.172	-0.142	-0.162	-0.215	-0.298
region	Brussels region	Flemish region	0.077	0.069	0.078	0.088	0.071	0.034	0.034	0.039	0.063	0.042
	Walloon region	Flemish region	0.061	0.072	0.077	0.059	0.072	0.053	0.053	0.052	0.062	0.064
origin	non-EU born	EU-born	0.095	0.075	0.084	0.149	0.188	0.114	0.094	0.115	0.168	0.223
disabled	disabled	not disabled	0.234	0.206	0.223	0.303	0.669	0.158	0.144	0.167	0.244	0.421
nbr of wa adults in HH	2	1	-0.139	-0.121	-0.126	-0.146	0.062	-0.156	-0.155	-0.153	-0.139	0.013
	at least 3	1	-0.225	-0.207	-0.193	-0.035	0.312	-0.212	-0.197	-0.183	-0.058	0.188
minor children in HH	at least 1	0	-0.021	-0.013	-0.011	-0.027	-0.020	-0.021	-0.020	-0.019	-0.047	-0.025

Table A. 11: Estimated probabilities for types of individuals to live in a jobless / work-poor household, Belgium, 2008, SILC.

			1 WA adult in HH					2 WA adults in HH					at least 3 WA adults inHH				
			ilo	eu2020				ilo	eu2020				ilo	eu2020			
Gender	age	education	jl	jl	wi < 0.2	wi < 0.5	wi < 0.8	jl	jl	wi < 0.2	wi < 0.5	wi < 0.8	jl	jl	wi < 0.2	wi < 0.5	wi < 0.8
Female	20-29y	low	0.55	0.48	0.51	0.52	0.59	0.24	0.09	0.14	0.25	0.59	0.17	0.04	0.08	0.34	0.74
Female	20-29y	medium	0.37	0.22	0.24	0.27	0.37	0.10	0.02	0.04	0.09	0.38	0.04	0.01	0.02	0.16	0.55
Female	20-29y	tertiary	0.20	0.11	0.13	0.18	0.25	0.05	0.01	0.01	0.04	0.24	0.01	0.00	0.00	0.08	0.39
Female	30-54y	low	0.53	0.44	0.46	0.49	0.56	0.20	0.09	0.12	0.21	0.60	0.12	0.06	0.09	0.33	0.77
Female	30-54y	medium	0.32	0.22	0.23	0.27	0.37	0.08	0.02	0.03	0.07	0.38	0.03	0.01	0.02	0.14	0.59
Female	30-54y	tertiary	0.18	0.10	0.11	0.15	0.23	0.03	0.00	0.01	0.03	0.24	0.01	0.00	0.00	0.07	0.44
Female	55-59y	low	0.82	0.76	0.78	0.77	0.84	0.54	0.29	0.34	0.46	0.85	0.45	0.19	0.26	0.60	0.94
Female	55-59y	medium	0.67	0.47	0.48	0.49	0.65	0.36	0.11	0.14	0.24	0.70	0.18	0.06	0.09	0.34	0.84
Female	55-59y	tertiary	0.56	0.35	0.37	0.41	0.55	0.22	0.04	0.05	0.13	0.54	0.10	0.03	0.05	0.24	0.75
Male	20-29y	low	0.51	0.55	0.59	0.59	0.66	0.18	0.17	0.24	0.36	0.71	0.09	0.08	0.15	0.46	0.82
Male	20-29y	medium	0.29	0.32	0.35	0.37	0.47	0.07	0.04	0.06	0.14	0.46	0.03	0.01	0.03	0.22	0.62
Male	20-29y	tertiary	0.16	0.13	0.15	0.20	0.28	0.03	0.01	0.02	0.06	0.30	0.01	0.00	0.01	0.13	0.48
Male	30-54y	low	0.48	0.49	0.50	0.53	0.62	0.14	0.11	0.15	0.26	0.65	0.07	0.07	0.12	0.40	0.82
Male	30-54y	medium	0.27	0.25	0.26	0.31	0.41	0.05	0.03	0.04	0.10	0.44	0.02	0.01	0.03	0.18	0.65
Male	30-54y	tertiary	0.14	0.11	0.13	0.18	0.26	0.02	0.01	0.01	0.04	0.29	0.01	0.00	0.01	0.10	0.50
Male	55-59y	low	0.77	0.78	0.79	0.78	0.87	0.49	0.33	0.39	0.53	0.88	0.31	0.28	0.37	0.70	0.96
Male	55-59y	medium	0.64	0.54	0.55	0.56	0.72	0.31	0.15	0.19	0.32	0.75	0.13	0.11	0.16	0.46	0.89
Male	55-59y	tertiary	0.49	0.33	0.34	0.39	0.56	0.13	0.06	0.08	0.18	0.60	0.07	0.03	0.05	0.29	0.77

Appendix 4: 'Conditional' polarization

The index of polarization measures the deviation of the actual number of jobless households from a random distribution of employment across all adults aged 20 – 59. The counterfactual household joblessness rate is determined by individual employment levels and the evolving structure of households. Positive polarization occurs when there are more jobless households than would be the case with a random distribution of work.

One methodological approach to gain an understanding of the underlying societal conditions in polarization trends consists in the construction of 'conditional counterfactuals' (Dawkins et al., 2002; Gregg et al., 2008), i.e. a range of counterfactual household employment rates varying by gender, age and educational level of household members. Relaxing the random distribution of the employment assumption and allowing for varying employment rates across the key subgroups of the population for which employment is known to vary, make it possible to explain the concentration of joblessness within certain households. Assortive mating, where members of the household share common individual characteristics, has an impact on the polarization measure. If household members have similar characteristics, inequalities in labour market outcomes related to these characteristics will result in a within-household polarization, especially in the case of randomly distributed employment across all working age adults. This societal process tends to make joblessness concentrated in particular households if joblessness occurs more in certain sections of the labour market. The effect of assortive mating will be stronger if employment opportunities have worsened for certain groups in the population while having improved for others and the disadvantaged groups live in the same household. For example, demand for low-educated labour may have fallen simultaneously with an increase in demand for tertiary educated individuals. When low educated individuals are more likely to live in a household of other low-educated adults and tertiary educated adults tend to choose for a tertiary educated partner, this can have an effect on employment polarization.

Subsequently, one can compare the 'unconditional polarization' index (the counterfactual being based on household size only) with several 'conditional polarization' indices (see Gregg & Scutella, 2008). The estimation of this 'conditional' counterfactual household joblessness rate allows us to explore whether changes in employment patterns across age, gender or education (and region or origin) over the last fifteen years lie behind the observed polarization of work.

We focus on characteristics for which employment rates vary strongly across the population. The characteristics we use to differentiate between varying employment rates are gender, age (20 – 29 years, 30 – 54 years, 55 – 59 years) and education (at most lower secondary education: ISCED 1-2, upper secondary education: ISCED 3-4, tertiary education: ISCED 5-6). For Belgium we allow additional variation of individual employment by

region (Flemish, Brussels or Walloon region). We use a combination of these individual characteristics to calculate a conditional counterfactual household joblessness rate. In Figure A. 5 and Figure A. 7 we present the actual household joblessness rate (dotted line) over the period between 1995 and 2009 alongside the counterfactual household joblessness rate. Initially we assume that employment is distributed randomly (full line). Then we allow employment to vary across different individual characteristics (striped and striped-dotted lines).

In Spain, the observed share of individuals living in a jobless household is only marginally higher than predicted by a benchmark of randomly distributed work in 2008. Today then, there is little observed polarization on this measure. In previous years, the predicted household joblessness rate was higher than the actual share of household joblessness. This indicates negative polarization. There is negative polarization in countries where there are fewer jobless households than predicted by a random distribution of individual joblessness. In the relevant time frame, this occurs mainly in Southern European countries where a more traditional organisation of the family is still prevalent. One adult works in paid employment while another adult, usually the woman, remains inactive on the labour market and produces within the home.

In Belgium, the counterfactual household joblessness rate has decreased over time (from 11.6 % in 1995 to 8.8 % in 2008). However, the observed household joblessness rate has broadly remained flat. Therefore polarization of work across households has increased over time.

Subsequently one can calculate the share (as a percentage) of the absolute level of the unconditional polarization index that is explained by gender, age, education, etc., or by combinations of those factors. In Figure A. 6 and Figure A. 8 we estimate unconditional polarization as the difference between the actual household joblessness and the unconditional counterfactual household joblessness (striped line). The figures show which share of polarization can be explained when allowing employment to vary across the combined set of characteristics. What remains is called unexplained (or conditional) polarization.

For Spain, the figures show that allowing employment to vary by gender, age and education decreases the counterfactual household joblessness rate. This drop is entirely driven by gender related changes. After all, allowing for gender variations can only fully explain (negative) polarization in Spain. Before 2005, female employment rates were much lower than those of men. Allowing for gender differences in the counterfactual employment rate brings on lower predicted household joblessness. Over time the gap in female and male employment rates has fallen, and by now this effect has entirely disappeared.

For Belgium, variation of individual employment by gender, age and education increases the estimated counterfactual household joblessness

rate, but this effect is very limited. Yet, Figure A. 7 shows that the effect of differences in individual employment rates by region, origin and education is stronger to explain levels of polarization in Belgium. Because Brussels (and the Walloon region) and non-EU born immigrants are confronted with low employment rates and adults with those characteristics reside in the same household, individuals living in those households are likely to have a higher propensity of household joblessness. In combination these employment changes raise the counterfactual household joblessness by a little more than 1 percentage point, so even after conditioning around 70 % of the polarization remains (see Figure A. 8).

Figure A. 5: Actual and (conditional) counterfactual household joblessness rates, Spain, 1994 – 2009.

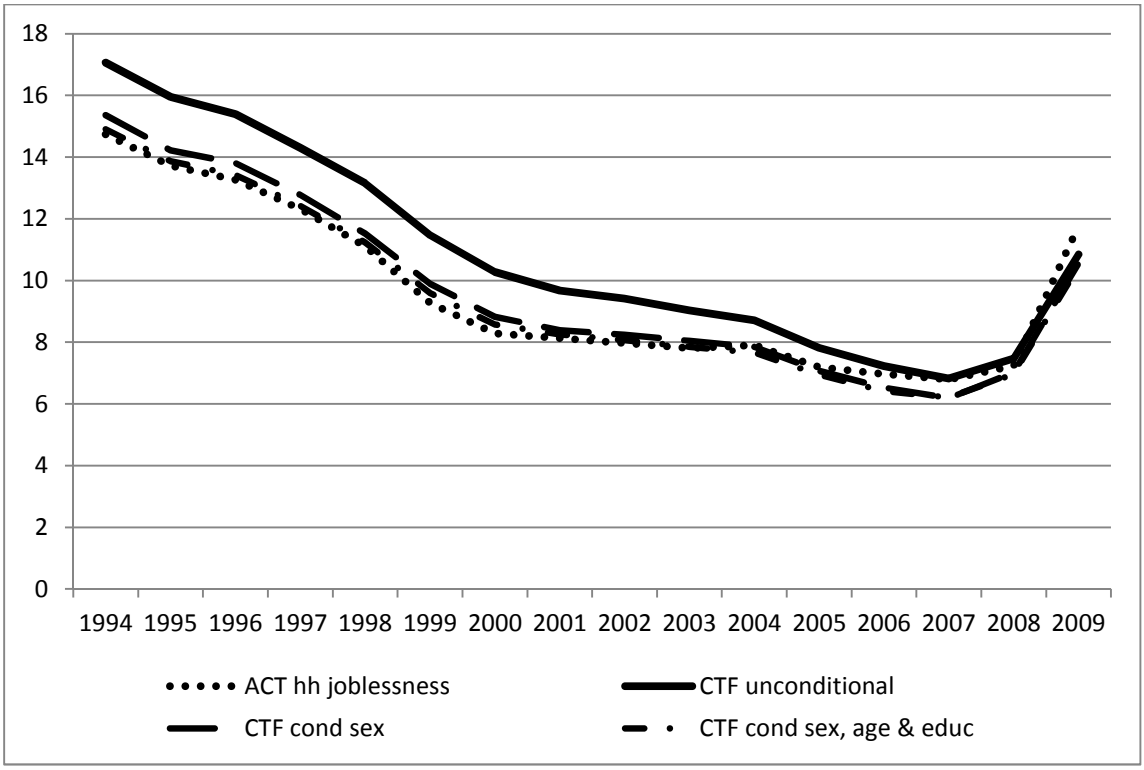


Figure A. 6: Explained part of polarization by gender, age and education, Spain, 1994 – 2009, LFS.

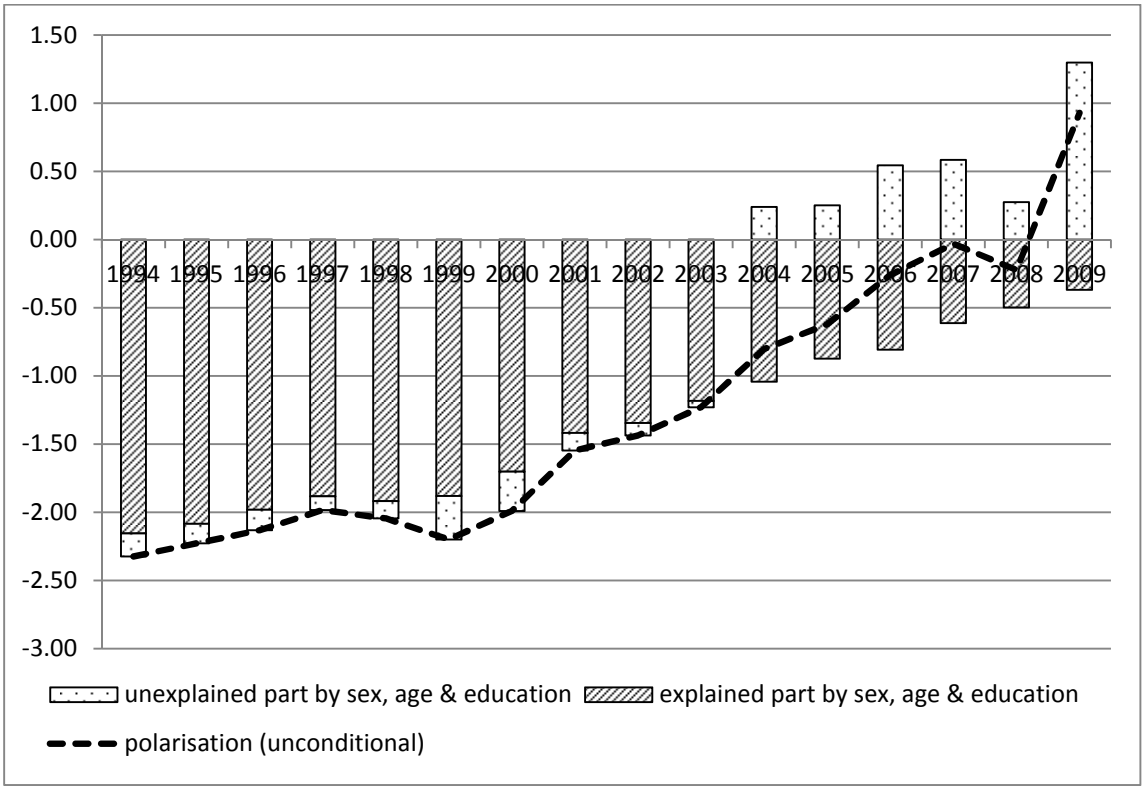


Figure A. 7: Actual and (conditional) counterfactual household joblessness rates, Belgium, 1995 – 2009.

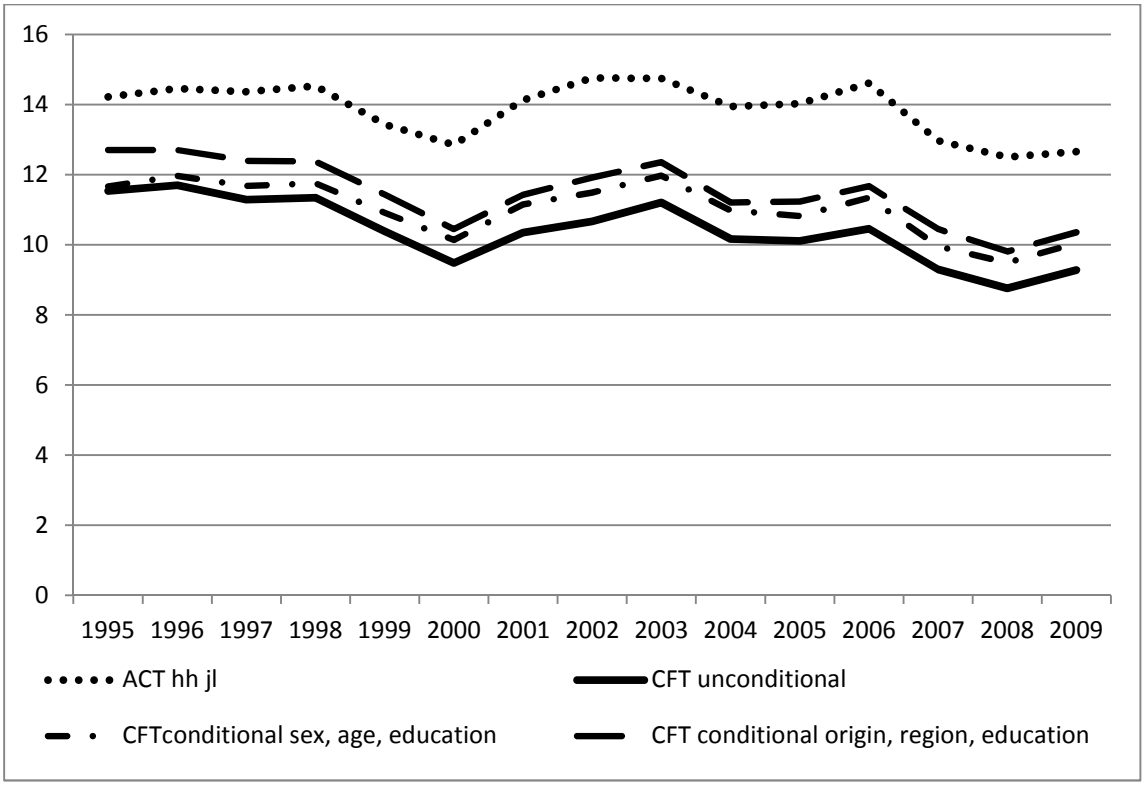
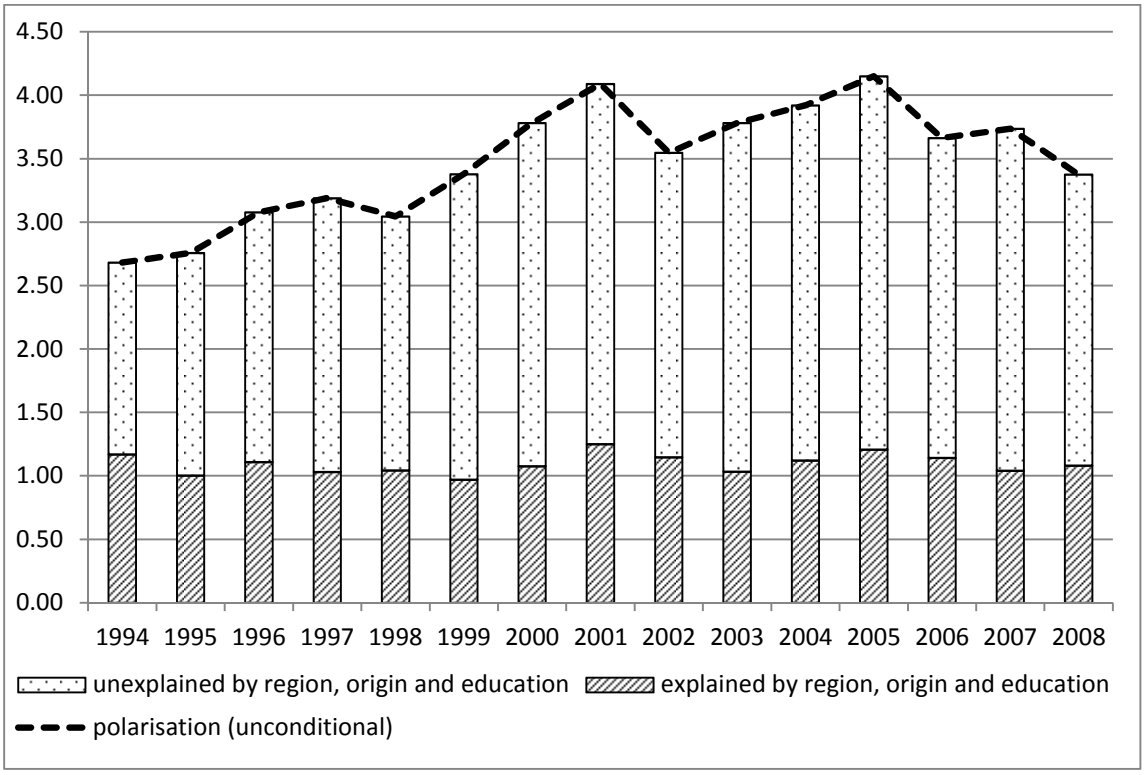


Figure A. 8: Explained part of polarization by region, origin and education, Belgium, 1995 – 2009, LFS.



Appendix 5: Regional aspects of polarization in Belgium

The previous exercise of conditional polarization (in appendix 4) already showed the importance of regional diversity in employment rates to understand degrees of polarization in Belgium. In this section we will briefly elaborate on this issue. We use a basic shift-share analysis to decompose the counterfactual (predicted) household joblessness rate and the measure of polarization in order to separate different underlying effects. This exercise is repeated with (a) a national employment rate and (b) a regional employment rate. This enables us to control for divergent economic conditions between regions in the explanation of polarization.

Figure A. 9 shows the regional diversity in individual non-employment rates and the national weighted average. The decrease of the Belgian individual non-employment rate with 6.8 percentage points over the past 15 years is caused by an improvement at the Flemish level. We observe an increase in the individual employment rate in the Flemish region with more than 8 percentage points, while the improvement in Brussels and the Walloon region remains around 4 percentage points. Nevertheless, the decrease of the share of individuals living in a jobless household is most outspoken in Brussels, even surpassing the absolute change in individual employment rates. The limited drop in household joblessness rates at the federal level is due to limited improvements in the Flemish region and a virtual stand-still in the Walloon region.

In Figure A. 10 we present the actual and predicted household joblessness rates for the three regions. We define a 'between region' and a 'within region' polarization measure. The significantly better individual employment rate in the Flemish region (up to an almost 15 percentage points difference between the Flemish region and Brussels in 2008) strongly influences the counterfactual household joblessness rate in the other regions (and consequently also the levels of polarization) when applying a national individual employment rate in the estimation of polarization levels (= 'between region' polarization). Therefore we opt for a complementary analysis of 'within region' polarization in an attempt to understand independent regional trends of polarization. The 'between region' analysis results in very high levels of polarization of 6.9 and 8.4, for Brussels and the Walloon region respectively, and limited levels of polarization of less than 1 for the Flemish region. On the contrary, controlling for regional diversity and shifting the focus towards a 'within region' distribution of individual employment rates over households leads to more comparable levels of polarization for each region. Polarization of employment remains most problematic in the Walloon region (4.2). The distribution in Brussels seems more equal (1.7) while in the Flemish region the distribution becomes more unequal (3.7).

Table A. 12 and Figure A. 11 give an insight into the underlying factors that determine global changes in the household joblessness rate. In this

analysis we apply a national individual non-employment rate to estimate counterfactual household joblessness.

The actual change of household joblessness is the strongest in the Brussels region. In Brussels substantial changes in the predicted household joblessness rate and low levels of polarization are combined. The Flemish region is characterized by fewer predicted changes in household joblessness and limited levels of polarization changes. The Walloon region combines lower levels of predicted changes in household joblessness rates and a strong increase in polarization levels.

The total predicted change can be decomposed in changes related to trends in individual non-employment rates and changes related to changing household composition types. Although we use a nationally based individual non-employment rate to estimate the counterfactual household joblessness rate the deltas due to non-employment differ slightly because of a different household type distribution over the region, with a high rate of single adult households in Brussels. Looking at the changes in the household composition over the period, we observe clear shifts in the pattern of household composition with an 8 percentage points increase in the share of households containing only one adult in the Walloon region, and corresponding declines in the share of both two and three plus adult households. In the Brussels and the Flemish region, we do not observe such substantial changes in household composition types. This explains the increase of the total predicted household joblessness rate in the Walloon region.

The changes in levels of polarization in Brussels and the Flemish region are limited for the period between 1996 and 2008. Nothing has really changed in the distribution of employment over households. In the Walloon region however, there is a trend towards a more unequal distribution within all types of households and a trend, of approximately the same size, towards more precarious household types. Thus, the apparent stability in the observed household joblessness rate in the Walloon region is actually the result of offsetting developments. On the one hand, rising employment between 1996 and 2008 would, ceteris paribus, reduce the number of individuals living in jobless households. On the other hand, an underlying trend in household structure toward more single-adult households and the increasing unequal distribution of jobs over and between households have the opposite effect.

In Table A. 13 and Figure A. 12 we allow variation in individual non-employment rates across the different regions. This enables us to interpret a conditional polarization rate, as it is independent of regional diversity in economic performance.

Concerning the changes in the predicted household joblessness rate, shifting towards regional variety in individual employment rates does not change the importance or sign of the underlying effects. Although the

purely mathematical change due to changes in individual employment rates is now lower in Brussels and the Walloon region because of more limited changes in the individual employment rate over time, the net effect of household composition changes remains the same. We can say that the predicted baseline of expected household joblessness is less positive in Brussels and the Walloon region in comparison with the previous definition of counterfactual household joblessness.

However, allowing for regional variation in individual employment rates makes the interpretation of an overrepresentation of joblessness within certain households more tentative. Brussels is confronted with the lowest individual employment rates, but it converts into a substantial decline of actual household joblessness. This actual change is even stronger than the predicted change due to a decrease of polarization over time. Within all household composition types the level of polarization has decreased in this region. Conversely, the Flemish and Walloon region are confronted with increasing levels of polarization. While this effect in the Walloon region is reflected in an evolution towards more precarious household composition types, the polarization change in the Flemish region is driven by a trend towards a more unequal distribution of employment over all household types.

Figure A. 9: Individual non-employment rates, Belgium and its regions, 1996 – 2009, LFS.

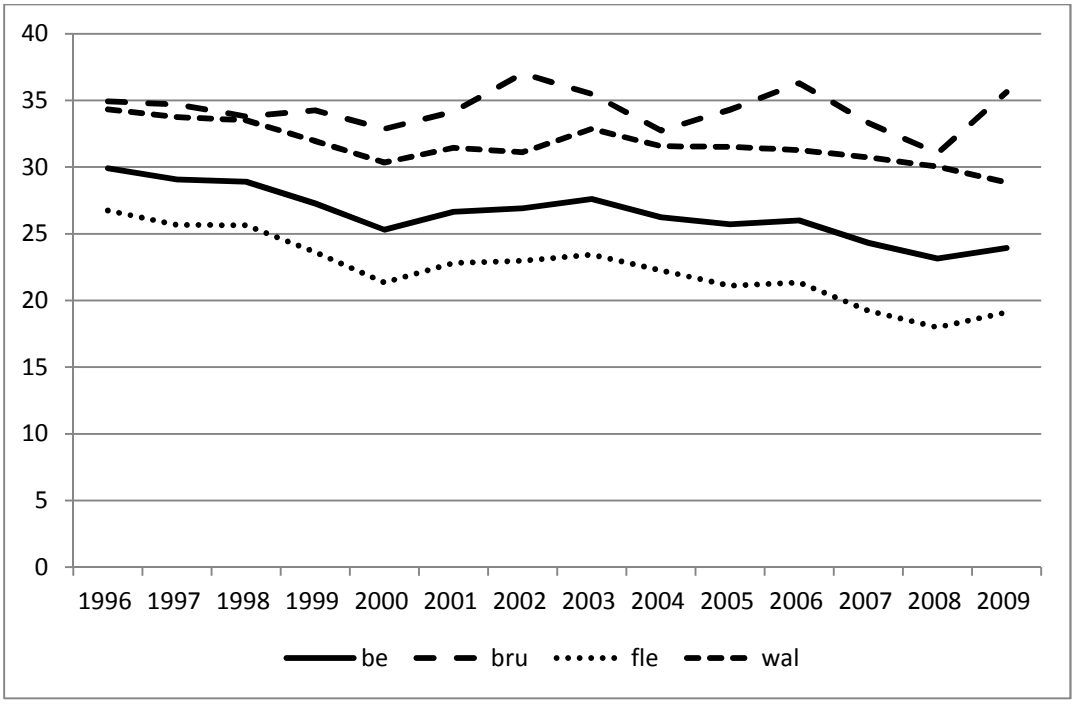


Figure A. 10: Actual and 'within region' and 'between region' counterfactual household non-employment rates, Belgium and its regions, 1996 – 2008, LFS.

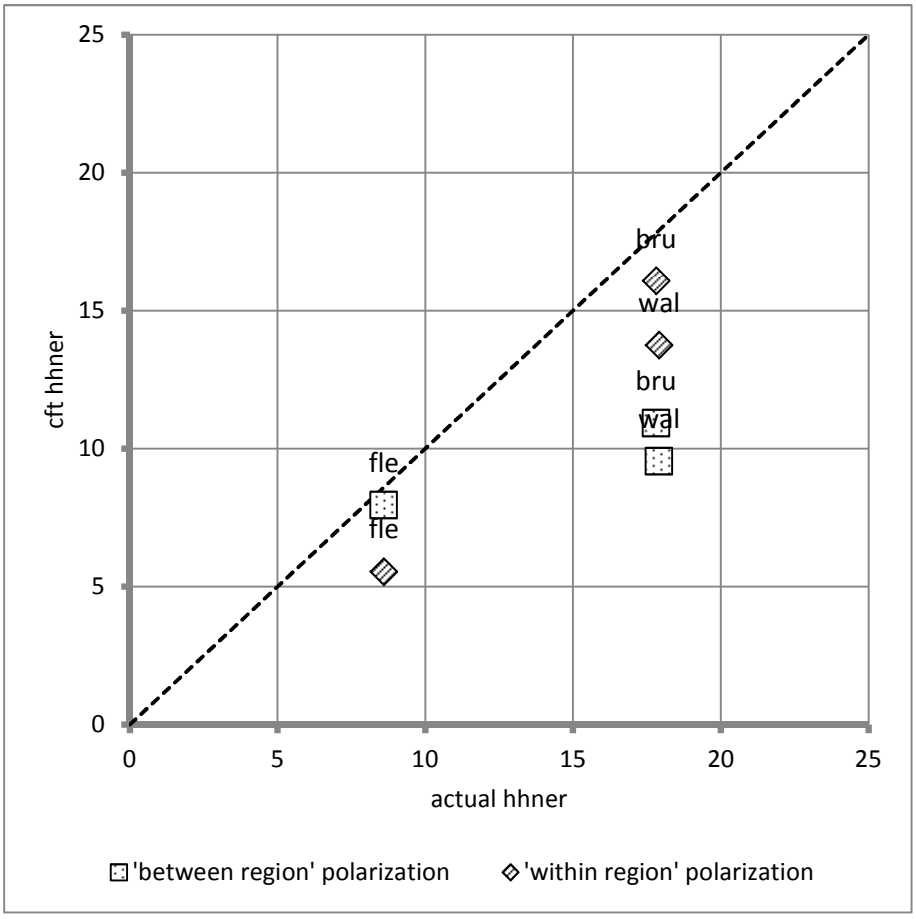


Table A. 12: Decomposition of changes in household joblessness rates using 'between region' polarization, Belgium and its regions, 1996 – 2008, LFS.

	actual change	total predicted change	of which: predicted change (unconditional)		total polarization change	of which: polarization	
			due to Δ non-employment	*due to Δ household shares*		*between households*	*within households*
brux	-4.45	-4.83	-4.41	-0.42	0.39	-0.01	0.40
fle	-2.46	-2.88	-3.69	0.81	0.42	0.31	0.11
wal	-0.61	-2.62	-3.98	1.36	2.01	0.87	1.14

Figure A. 11: Decomposition of changes in household joblessness rates using 'between region' polarization, Belgium and its regions, 1996 – 2008, LFS.

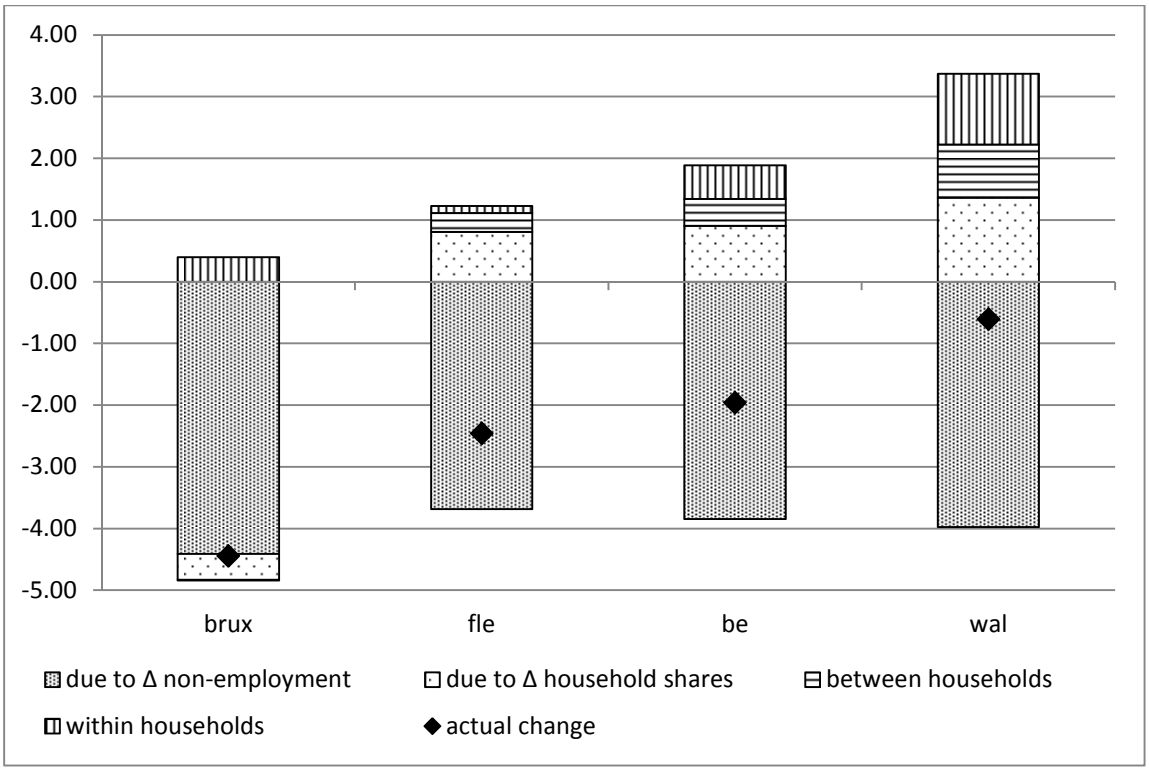


Table A. 13: Decomposition of changes in household joblessness rates using 'within region' polarization, Belgium and its regions, 1996 – 2008, LFS.

	actual change	total predicted change	of which: predicted change (unconditional)		total polarization change	of which: polarization	
			due to Δ non-employment	*due to Δ household shares*		*between households*	*within households*
brux	-4.45	-3.35	-2.84	-0.51	-1.10	0.08	-1.18
fle	-2.46	-3.51	-4.22	0.71	1.05	0.40	0.65
wal	-0.61	-1.31	-2.87	1.56	0.70	0.67	0.03

Figure A. 12: Decomposition of changes in household joblessness rates using 'within region' polarization, Belgium and its regions, 1996 – 2008, LFS.