The Working Poor: Too Low Wage Or Too Many Kids?

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Abstract

In 2003, the European Union adopted a new social indicator, the "in-work at-risk-of-poverty rate". According to the European definition, the working poor are all workers who live in a household with an equivalised household disposable income below the poverty threshold. This indicator is often used as a kind of immutable object regardless of the fact that it is based on a series of assumptions that are rarely questioned although they have particularly strong consequences for the calculation of the in-work poverty risk and for the design of policies to combat it. The purpose of this paper is to show the volatility in the measured proportions of working poor according to different methodological choices in terms of the unit of analysis, the measure of income and the population of workers. By showing this volatility, we aim at tackling some of these generally unquestioned assumptions. We also carry out an in-depth country-specific econometric analysis of the characteristics of the working poor. We concentrate on the differential impact of individual characteristics, the household structure and employment-related factors on the in-work poverty risk according to whether individual or equivalised household income is used to measure this risk. Our analysis covers 8 European Union countries (Austria, Belgium, Spain, France, Ireland, Luxembourg, Poland, the United Kingdom) and is based on the 2007 wave of the European Statistics on Income and Living Conditions (EU-SILC).

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Theme: Welfare, Income Distribution, Poverty, Gender Inequality

Introduction

Since the introduction of the European Employment Strategy in 1997 and the launch of the Lisbon strategy in 2000, working poverty has gained a more prominent place in the European debate. Indeed, in the framework of the European process towards social inclusion and social protection and the European Employment Strategy, the European Union adopted a new social indicator in 2003, the "in-work at-risk-of-poverty rate". According to the European Commission's definition, the working poor are all full-time or part-time employees/self-employed workers aged 15-64 who live in a household with an equivalised household disposable income below 60% of the median of this income in the country.

This indicator has been amply analysed and criticized ever since (Lelièvre, Marlier and Pétour 2004; Ponthieux 2007; Cazenave 2006).

First of all, the European approach neglects that the working poor are at the heart of a conceptual problem as employment is an individual state whereas poverty is commonly (indulgently) defined at the level of the household.

Second, the European "at-risk-of-poverty rate" implies the clear assumption that the incomes of members of a household are pooled and shared in full. However, an equal division of income within the household seems an abstract notion rather than a real-life fact.

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Finally, the income pooling and sharing assumption particularly hinders the correct assessment of women's poverty situation. Women often live with men whose income lifts them up above the poverty threshold, while men often live with women who are less economically active (Ponthieux 2009). This is the reason why women are underrepresented among the working poor in EU studies (e.g. Eurofound 2010).

An alternative approach is upheld in our research and by few others (e.g. Ponthieux 2009; Smock 1994). This approach allows overcoming the three main difficulties that are raised by the European Commission's definition of the working poor. Using an individual measure of income to determine the poverty status avoids the conceptual problem that employment is an individual state whereas the poverty risk is commonly determined through a household approach. It further allows going without an income pooling assumption and as such contributes to a more correct identification and understanding of the working poor, especially of its female population. In order to correctly design policies to reduce in-work poverty, a precise identification of the working poor is essential.

In the present analysis, we have compared the in-work at-risk-of-poverty rate and the characteristics of the population at risk applying different methodological assumptions concerning the unit of analysis (individual versus household), the definition of income (earned income, market income, total income) and the population of workers (actual workers or potential workers). We assess and compare the size and characteristics of the working poor population in 8 European Union countries (Austria, Belgium, Spain, France, Ireland, Luxembourg, Poland, the United Kingdom) according to the European definition and the individualised one using the 2007 wave of the European Statistics on Income and Living Conditions (EU-SILC).

1. Overview of the literature

The existing literature on working poverty is extremely heterogeneous in methodological terms. The computed rate of working poor is very sensitive to some basic assumptions made at the outset of any analysis: the definition of a worker, the definition of the poor, the reference population, the type of income considered and the unit of analysis. Although all researchers agree that the working poor are persons who are working but who are poor, the statistical implementation of the notion tends to alter a lot.

"*The sensitivity of the extent of poverty, and particularly of poverty of women, to how it is measured, is an area ripe for research. But no matter how it is measured, poverty rates are higher among women than among men. Intra-household distribution is difficult to measure, but when it is ignored, poverty measures probably underestimate women's poverty.*" (Albelda 1999:725)

Regarding the definition of poverty, a great part of European research defines poverty on the basis of a relative poverty threshold: one is poor if one lives in a household with an equalised household income under 50% or 60% of the national median income. The equivalence scale that is most often applied to household income is the so-called "OECD-modified equivalence scale" which assigns a value of 1 to the household head, a value of 0.5 to each additional adult member of the household and a value of 0.3 to each child. This method tables on assumptions about economies of scale in consumption as well as on judgments about the needs of each individual in the household, particularly in the case of children or elderly household members (OECD 2008). Although this equivalence scale has been applied since decades, it is generally not questioned by researchers who tend to use it as a kind of immutable object. The consequences of applying such a scale are thus in need of discussion and analysis. This approach is based on the major assumption that income is equally pooled by household members. "*Because well-being is rarely an individual phenomenon, the family is the usual unit for measuring poverty. But because of persistent gender differences in human capital investment, productive capabilities, access to resources, and decision making power within the family it would be a serious mistake to ignore that the well-being of men and women within families is not the same.*" (Albelda 1999:723-724) "*Several authors have shown that the equal sharing assumption (i) has no theoretical foundation, (ii) does not a priori descend from the unitary model itself and (iii) has been rejected by statistical evidence (for a review, see Behrman, 2003).*" (Orsini and Spadaro 2005:1). Two generations of studies have tested this assumption. The first studies testing the income pooling assumption were hindered by the endogenous nature of the intra-household income distribution. The most obvious example is that of earned income, the level and distribution of which depend on all household members' labour supply.

These studies have nevertheless generally rejected the assumption of income pooling within households (Thomas 1990; Schultz 1990; Phipps and Burton 1998; Bourguignon et al. 1993). More recently, studies have evaluated the degree of income pooling within households through an analysis of the quasi-experimental variation in the distribution of income within households as a result of changes in the policy context

(Attanasio and Lechene 2002; Bradbury 2004; Moehling 2003; Thomas, Contreras, and Frankenberg 2002; Quisumbing and Maluccio 2003; Duflo 2003; Bargain et al. 2006; Lundberg, Pollak, and Wales 1997; Ward-Batts 2008). All but Bradbury (2004) reject the income pooling assumption. Sen (1983 and 1990) also drew a disproof conclusion by introducing the notion of "perceived contribution response" which suggests that women and girls receive less from household resources because their contributions to household income are valued less than those of men and boys. As a result, many poor women live in households that are not considered poor. Their poverty is hidden. Bonke and Browning (2009) show that who brings in income matters for the distribution of welfare within the household. The wife's share of household income impacts negatively on the reported satisfaction of the husband. The reported satisfaction of wives is first decreasing and then increasing in her income share. The crucial issue is to derive the strategic weight of each household member, and hence its power in the resource sharing game. These power differentials depend on how tax-benefit systems are designed across different countries.

In the US literature on working poverty, a different notion of poverty is accepted. The American Bureau of Labour Statistics (BLS) has set an absolute poverty threshold expressed in dollars. This threshold varies by family size. This is reflected in US research such as in the studies by Klein and Rones (1989) and Gardner and Herz (1992). Australian researchers like Robson and Rodgers (2008) use a European-style relative poverty threshold but set to 50% of the national median income level instead of to 60%, the threshold that is withheld by Eurostat.

The definition of a worker shows much more diversity, even in Europe only. Ponthieux (2009) lists the differences in the definitions of workers across EU countries. The European approach – underlying the in-work poverty risk indicator – defines a worker as a person who was actually working at the time of the survey and who spent at least 7 months in employment during the previous year. Eurostat uses the EU-SILC database that contains calendar information on people's main activity status during the year. The French INSEE defines a worker as a person who has spent at least 6 months in the labour market in the reference year with a minimum of 1 month of employment. Ponthieux (2009) also discusses the American Bureau of Labour Statistics' definition of a worker, notably a person who has spent at least 27 weeks during the year of reference in the labour market either working or looking for a job. There is thus great variation across countries and researchers as to how to define a worker.

As for the reference population, there are also slight differences in the literature but the pros and cons of either one choice are rarely discussed. The reference population can be the total population, the working age population, the poor population or the working population. The most recent publication by Eurofound (2010) uses the working age population as the reference group and sets the age limit at 18 years and over. Ponthieux (2009) has tested two reference populations, the poor population and the working age population (16-64 years excluding those whose main activity during the reference year was education or retirement).

The next issue to consider is the type of income on which to base the analysis. In the literature, there is again much variety in the kinds of income researchers use to determine working poverty. As already mentioned, most of the papers use equivalised household disposable income. This approach cumulates all income sources received by all individual household members (i.e. it sums wages and salaries, social transfers, capital receipts and other items, net of any taxes or social security contributions paid on these sources of income). This is also the approach used by Eurofound (2010). However, as far as the analysis focuses on the working poor, income is sometimes limited to earned income only, studies focusing on the working poor in a broader sense including also the unemployed and those on sickness leave tend to limit income to market income, still others sum up household income before or after taxation, with or without social welfare allowances, etc.

A different approach to income measurement argues that when equalised household income is used, poverty or the risk of poverty is not correctly evaluated. Some household members are above the poverty threshold because they can rely on their partner sharing his/her income. In a society marked by a drastic increase in divorce rates, assessing the poverty risk based on an assumption of intra-household sharing of resources is not appropriate. Indeed, in Europe, divorce rates have increased phenomenally since the 1960s. In 1960, there were 2 to 3 divorces per 1,000 married couples. By 2002, this rate had more than tripled, with over 7 annual divorces per 1,000 married couples (González and Viitanen 2006). This has generated a great deal of attention from researchers and policy-makers. Many worry about the negative economic consequences of divorce for women and children. Instead of equivalised household income, individual income should underlie the analysis of the in-work poverty risk.

Ponthieux (2009) introduced the concept of "poverty in earned income" or "economic poverty" based on individual income. She argued in favour of market income to measure working poverty. Market income is calculated by adding wages and salaries, self-employed incomes, unemployment and sickness benefits. Her analysis of working poverty is based on the market income of the working age population using 2006 SILC data for 10 EU member states. This study showed that, contrary to what Eurofound found in its study based on equivalised household income (Eurofound 2010), women are much more exposed to economic poverty than men.

Meulders et al. (2009) developed a methodology in order to analyse poverty based on the resources of each individual, whatever the characteristics of the household in which he/she lives[3]. This involved measuring inequalities between men's and women's individual incomes. A statistical and econometric study of these income disparities was carried out in order to propose indicators for monitoring purposes. The present paper is based on this methodology to revisit the issue of the working poor.

2. Data and methodology

In the present analysis, the working poor population is analysed in 8 EU countries (Austria, Belgium, Spain, France, Ireland, Luxembourg, Poland, the United Kingdom) using the 2007 wave of the EU-SILC. In a first step (section 3), we carry out four types of simulations.

First, emphasis is on the choice of the unit of analysis. We show the impact on the in-work at-risk-of-poverty rate of changing the unit of analysis from the household to the individual comparing the proportions of working poor between the European definition of working poverty and a fully individualised definition. According to the European definition, the working poor are all full-time or part-time employees/self-employed workers aged 15-64 who live in a household with an equivalised household disposable income below 60% of the median of this income in the country whereas according to the fully individualised definition, the working poor are all full-time or part-time employees/self-employed workers aged 15-64 with an individual net income below 60% of the median of this income in the country.

Although the assumption that no income sharing at all takes place between partners within households can be justified in a context of increasing marital instability, it should be acknowledged that in all circumstances parents share income with their children. Not only income is affected by partnership dissolution but also the cost of living, especially in the presence of children. To account for this we have computed not just in-work at-risk-of-poverty rates based on purely individual income but also based on equivalised individual income. Equivalised individual income was obtained by applying an equivalence scale to adjust individual income for the number of children a person has in charge. The income of an adult was divided by $1 + 0.3$ for each child of whom he or she is in charge alone and by $1 + 0.15$ for each child for whom he or she shares responsibility (with another adult).

Second, we challenged the measure of income. As far as we are analysing in-work poverty, we limited the measure of income to earned income only. When the in-work poverty risk is computed on the basis of income earned from work, we get a more precise idea of the protective role played by employment. In this case, the protection offered by employment is not blurred by the perception of other income sources. We compare the proportion of working poor when total individual net income is used with the proportion of working poor when only earned income is considered.

Third, we changed the population of workers. We extended the analysis of in-work poverty to all potential workers. An analysis of working poverty including all labour market participants, i.e. employed workers, the self-employed but also the unemployed and workers on sickness leave, is far less restrictive and considers the category of the working poor in its broadest sense. We compare the proportions of poor labour market participants with those of poor workers using total individual net income to measure the poverty risk in both cases.

Fourth, we adapted the measure of income to this change in the definition of workers. When the analysis of working poverty is extended to all potential workers, the risk of poverty can be measured on the basis of the more restricted category of market income.

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[3] The BGIA project "Genre et revenu: analyse et développement d'indicateurs - Belgian Gender and Income Analysis (BGIA)" was a joint project on the part of Belgium's Politique scientifique fédérale, the Institut pour l'égalité des femmes et des hommes, the Direction générale des Statistiques et de l'Information Economique and the Département d'Economie Appliquée de l'Université Libre de Bruxelles (DULBEA) that has carried out this research.

This is a subcategory of total net individual income that includes wages, the income derived from self-employment, unemployment benefits and sickness benefits. Again we compare the proportion of poor potential workers when the poverty risk is measured on the basis of total individual net income with the proportion of poor potential workers when the poverty risk is computed based on market income only.

The last part of this paper (section 4) presents an in-depth country-specific analysis using bivariate probit regressions of the characteristics of the working poor in two configurations: a configuration where in-work poverty is defined based on an individual income measure and a configuration where in-work poverty is defined with respect to equivalised household disposable income. In this part of our study, we insist on the impact of individualising the unit of analysis. We do not test the assumptions related to the definition of workers or the measure of income. We concentrate on the differential impact of individual characteristics, the household structure and employment-related factors on the risk of in-work poverty according to whether individual income or equivalised household income is used to measure this risk.

There are thus two dependent variables for each country. These are dichotomous, equalling 1 if a worker's individual income, respectively equivalised household income, is below 60% of the median of individual income, respectively equivalised household disposable income, and 0 in the opposite case.

The independent variables include sex (2 categories: women and men), age (5 categories : <25 years, 25-34 years, 35-44 years, 45-54 years and 55-64 years of age), marital status (4 categories: married, never married, separated/divorced and widowed), education (3 categories: lower secondary at most, upper secondary, and higher education), number of adults in the household (4 categories: 0, 1, 2, 3+), number of children in the household (4 categories: 0, 1, 2, 3+), working hours (2 categories: part-time versus full-time), labour market experience as the number of years spent in paid work (3 categories: <5 years, 5-20 years, 20+ years), type of employment contract (2 categories: temporary versus permanent), an indicator of the household's work intensity[4] (4 categories: workless, low work intensity, high work intensity and maximum intensity), firm size or number of persons working at the local unit (3 categories: <10 employees, 10-100 employees, >100 employees), sector of economic activity as NACE 1-digit (12 categories), and finally, occupational category as ISCO88 1-digit (9 categories).

These variables are traditionally used in the analysis of poverty and social exclusion (cfr. Jenkins and Rigg 2001; Piachaud 2002; Bardone and Guio 2005). The reference case is a prime-age (35-44 years) full-time working married man with a medium level of education living in a 2-adult household without dependent children but with maximum level of work intensity, with more than 20 years of labour market experience, working as a professional in a medium-sized firm in "Manufacturing; Electricity, gas, steam and air conditioning supply; Water supply; sewerage; waste management and remediation activities", under a permanent employment contract.

The estimated coefficients of this model report the marginal effects of each independent variable separately on the likelihood of working poverty holding all other characteristics constant. Table 5 presents the marginal effects of all independent variables in comparison with the reference case. We will discuss these results in section 4 after having discussed the consequences of changing the unit of analysis on the proportions of working poor.

3. The importance of concepts and definitions

Simulation 1: From equivalent household income to individual income

By analysing the link between work and the risk of poverty at the individual level, we distinguish (as Rowntree 2000 and Ponthieux 2010) between poverty due to low earnings and poverty due to having a large family as a way of separating labour market factors from household factors. The EU household-based definition of the in-work poverty risk actually measures the proportion of workers who are poor because they have too many dependents. On the contrary, when the in-work poverty risk is computed on the basis of individual income, what is measured is the proportion of workers who, because of their employment conditions, earn a wage that is insufficient to stay out of poverty or receive social transfers that offer a too weak protection against the poverty risk.

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[4] The work intensity of a household is the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period. A working-age person is a person aged 18-59 years, with the exclusion of students in the age group between 18 and 24 years. Households composed only of children, of students aged less than 25 and/or of people aged 60 or more are completely excluded from the indicator calculation. Low work intensity is defined as a level of work intensity below a threshold set at 0.50; intensity is high when it is above this threshold.

Table 1 shows the impact on the proportion of working poor of changing the unit of analysis from the household to the individual. It compares the proportions of working poor between the European definition of in-work poverty and our individual definition. The difference between the two measures illustrates the impact of household structure.

Table 1: Proportions of working poor by sex using individual or equivalised household income to measure the poverty risk

| | European definition | | | individual definition | | | | | |
| | | | | purely individual income | | | equivalised individual income (accounting for children) | | |
	men	*women*	*ratio W/M*	*men*	*women*	*ratio W/M*	*men*	*women*	*ratio W/M*
Austria	7,37	6,43	0,9	6,92	19,94	2,9	7,13	21,65	3,0
Belgium	4,37	4,4	1,0	3,7	10,49	2,8	4,02	11,9	3,0
Spain	10,51	7,92	0,8	6,74	14,86	2,2	6,85	15,77	2,3
France	7,83	7,04	0,9	4,72	14,04	3,0	4,75	15,84	3,3
Ireland	5,31	5,12	1,0	5,2	10,6	2,0	5,1	13,03	2,6
Luxembourg	8,17	7,97	1,0	3,36	16,25	4,8	2,67	17,73	6,6
Poland	11,95	10,02	0,8	8,99	14,37	1,6	9,49	16,11	1,7
United Kingdom	8,68	8,06	0,9	8,09	22,82	2,8	7,99	24,39	3,1

Source: EU-SILC 2007

A first finding is that with the European definition, the proportion of poor male workers exceeds that of poor female workers in all countries but Belgium. When individual income is used to evaluate the poverty risk, the inverse holds true, the proportion of poor female workers largely exceeds that of poor male workers in all countries. This illustrates the impact of women's overrepresentation in part-time low-paid jobs, a fact that is hidden by the assumption of intra-household income pooling and sharing as it is upheld in the EC definition of the in-work at-risk-of-poverty rate.

A second finding is that the move from the European household-based definition to the individual definition reduces the proportions of male working poor but it substantially increases those of female working poor. The decrease in the proportions of male working poor results from the fact that in most households men are still the primary earners. When these men no longer need to share their income with other dependent members in their household, their income appears to be more sufficient to protect them against the risk of poverty. On the contrary, the European definition appears to severely understate female workers' at-risk-of-poverty rate. As long as female workers can bow on supplements from their household's income, they manage much better to stay out of poverty than when they have to cope on their personal income only.

A third finding results from the previous two: the relative share of women with respect to men in the category of working poor increases enormously when the European definition is traded in for an individual measure of the poverty risk. Accounting for the number of children by computing in-work at-risk-of-poverty rates on the basis of equivalised individual income increases the gender gap in all countries. This finding underscores the specific vulnerability of lone mothers with respect to poverty.

Simulation 2: Earned income instead of total net individual income
The variability of in-work at-risk-of-poverty rates according to the type of income measured is also very challenging for researchers. An indication of the extent to which state transfers and other sources of income not earned through work protect workers against the risk of poverty is obtained through a second change in the standard definition of the in-work at-risk-of-poverty rate. When equivalent household disposable income is replaced not just by individual net income but by one of its components, notably the income earned from work, we get a more precise idea of the protective role played by employment against the risk of poverty. In this case, the protection offered by employment is not blurred by the perception of other income sources (e.g. a part-time worker who owns two houses).

Table 2 compares two definitions of the working poor. Columns 2-4 refer to the working poor as all full-time or part-time employees/self-employed workers aged 15-64 with an individual net income below 60% of the median of this income in the country.

Columns 5-7 refer to the working poor as all full-time or part-time employees/self-employed workers aged 15-64 with an individual net earned income below 60% of the median of this income in the country. From Table 2 we see that the rates of working poor are roughly doubled between both definitions, for men and for women. Between one fourth and over one third of all female workers earn a wage that is below 60% of the median of all income earned by male and female part-time or full-time workers or self-employed aged 15-64. For male workers, between 9 and 19% earn less than 60% of the median earned income. The increase in the in-work at-risk-of-poverty rate is largest in Ireland for both men and women when we restrict the income measure to earned income. It thus seems that social transfers are most effective in Ireland. This finding corroborates that of Wolff (2010) who computed the reduction in the poverty risk before and after social transfers and who found Ireland to rank sixth, after Hungary, the Nordic countries and the Czech Republic, in the ranking of the 27 EU member states in terms of the size of this reduction. Except for France and Luxembourg, the gender ratio remains roughly unaffected.

Table 2: Proportions of working poor by sex using total individual income versus earned income to measure the poverty risk

	total individual net income			earned income		
	men	*women*	*Ratio W/M*	*men*	*women*	*Ratio W/M*
Austria	6,92	19,94	2,9	13,88	35,61	2,6
Belgium	3,7	10,49	2,8	8,77	26,24	3,0
Spain	6,74	14,86	2,2	13,8	30,08	2,2
France	4,72	14,04	3,0	11,12	26,15	2,4
Ireland	5,2	10,6	2,0	19,06	37,15	1,9
Luxembourg	3,36	16,25	4,8	9,12	31,66	3,5
Poland	8,99	14,37	1,6	17,46	27,31	1,6
United Kingdom	8,09	22,82	2,8	14,68	37,05	2,5

Source: EU-SILC 2007

Simulation 3: From workers to potential labour supply

In the literature on working poverty, the working poor are sometimes defined as poor workers or as poor active persons. An analysis of working poverty including all labour market participants, i.e. employed workers, the self-employed but also the unemployed and workers on sickness leave, is far less restrictive and considers the category of the working poor in its broadest sense. In line with Ponthieux (2010), we compute the rates of working poor based on an understanding of "workers" as all potential workers, that is people of working age (15-64) who are not studying nor retired from the labour market. This less restrictive definition obviously boosts the rates of working poor which are doubled or tripled even (Table 3). The rates of female working poor reach phenomenally high levels. In Luxembourg and Spain, over 40% of all female labour market participants have an income below 60% of the median individual net income in the country. In Spain, the gender ratio increases noticeably pointing towards a gender bias in the unemployment and sickness benefit systems.

Table 3: Proportions of working poor by sex in two population categories: workers and potential workers

	total individual net income of workers			total individual net income of working age population		
	men	*women*	*Ratio W/M*	*men*	*women*	*Ratio W/M*
Austria	6,92	19,94	2,9	12,94	39,61	3,1
Belgium	3,70	10,49	2,8	14,73	35,61	2,4
Spain	6,74	14,86	2,2	13,11	44,04	3,4
France	4,72	14,04	3,0	12,82	32,58	2,5
Ireland	5,20	10,6	2,0	14,11	33,63	2,4
Luxembourg	3,36	16,25	4,8	8,43	42,06	5,0
Poland	8,99	14,37	1,6	21,54	36,89	1,7
United Kingdom	8,09	22,82	2,8	14,10	32,08	2,3

Source: EU-SILC 2007

Simulation 4: From total to market income

The evaluation of the risk of poverty faced by potential workers can also be done on the basis of the more restricted category of market income. This is a subcategory of total net individual income that includes wages, the income derived from self-employment, unemployment benefits and sickness benefits.

In this set-up, the rates of working poor once again attain peak levels (Table 4). For male labour market participants, the proportions with a market income below 60% of the median of market income in the country range between 8% in Luxembourg and 29% in Poland. The share of poor female labour market participants in this configuration varies between 39% in France and 50% in Spain. Note that these results shed further light on the effectiveness of social transfers in Ireland to reduce the poverty risk as it was put forward in our first simulation. As the in-work at-risk-of-poverty rates computed on the basis of the market income received by the larger working-age population are above those of the subcategory of actual workers based on their earned income, it seems that the effectiveness of Irish social transfers operates through social assistance rather than through generous unemployment and sickness benefits.

A comparison of the gender ratio of in-work at-risk-of-poverty rates in the working-age population based on their market income with the ratio in the population of workers based on their earned income shows that the gender ratio is much higher in the former category in Luxembourg and to a lesser extent in Spain. As mentioned before, this could point towards a gender bias in the unemployment and sickness benefit systems in these countries although this finding should also be interpreted in light of the absolute level of female (un)employment in these countries.

Table 4: Proportions of poor potential workers by sex using total individual income versus market income to measure the poverty risk

	total individual net income of potential workers			market income of potential workers		
	men	*women*	*Ratio W/M*	*men*	*women*	*Ratio W/M*
Austria	12,94	39,61	3,1	17,58	46,75	2,7
Belgium	14,73	35,61	2,4	21,57	44,04	2,0
Spain	13,11	44,04	3,4	17,41	49,64	2,9
France	12,82	32,58	2,5	17,27	39,01	2,3
Ireland	14,11	33,63	2,4	24,28	48,72	2,0
Luxembourg	8,43	42,06	5,0	7,98	44,74	5,6
Poland	21,54	36,89	1,7	28,56	43,33	1,5
United Kingdom	14,10	32,08	2,3	23,16	45,33	2,0

Source: EU-SILC 2007

To conclude on this section, the rates of working poor are extremely sensitive to a series of methodological choices made at the outset. What is actually measured by the European in-work at-risk-of-poverty indicator has little to do with poverty due to low earnings. The indicator rather yields the proportions of workers who are poor because they have many dependent household members. This is illustrated by the fact that with the European definition, the proportion of poor male workers exceeds that of poor female workers whereas with the individual definition, the inverse holds true. Moreover, when the European definition is traded in for an individual income measure, the proportions of male working poor are reduced but those of female working poor substantially increase. State transfers play a protective role in all countries as the rates of working poor are roughly doubled when the in-work poverty risk is computed based on earned income rather than on total individual net income. The rates of working poor, especially those of female working poor, reach phenomenally high levels when we relax the definition of workers to include all potential workers. Finally, an analysis of potential workers' poverty risk based not on their total individual income but on their market income also increases the rates of working poor to very high levels. The latter two findings reflect the lower female employment rate (as compared with men's employment rate) and the fact that some social transfers are still not fully individualised in all countries (e.g. unemployment benefits in Belgium).

4.   A changing profile of the working poor according to the income measure used

The results from our Probit estimations put forth interesting differences between the models predicting the probability of working poverty using an individual measure or an equivalised household measure of income.

4.1. Individual characteristics

As far as sex is concerned, being a woman has a positive impact on the probability of being at risk of in-work poverty in the individual case whereas it has a negative effect when the European in-work at-risk-of-poverty indicator is used as the dependent variable.

This finding underscores the "protective" role played by the intra-household income sharing assumption. Whereas sex is a highly significant determinant of working poverty in the individual sense in all of the countries, it comes out as significant in just 3 countries when the European definition of working poverty figures as the dependent variable. According to the individual model, a woman's risk of working poverty is 1% (Belgium, Ireland, and Poland) to 6% (Austria) higher than a man's. Age does not come out of our estimations as a major determinant of working poverty. The low-educated see their in-work poverty risk increase by between 1% and 3% compared with people who have finished upper secondary education in all countries but Belgium. However, significance is attained only with the European definition. In the individual case, having a low level of education is significant only in Austria and Poland. In turn, holding a degree of higher (non-)tertiary education reduces the risk of working poverty by up to 2% in all countries but France. There are no clear differences between the two models.

4.2. Household structure

Our regressions include three variables that inform on household structure: marital status, the number of adults in the household and the number of dependent children in the household. It is obvious that these household structure variables will have a very different effect on our two dependent variables given the way these latter are constructed (the in-work poverty risk based on individual income versus the same risk based on equivalised household income).

The effect of household structure on the in-work at-risk-of-poverty rate in the individual model is mainly indirect as individual income has not been subject to an equivalence scale. The indirect effect of household structure thus passes through its impact on labour supply. In this sense, additional adults in the household, or more precisely additional earners, or the presence of children could have a negative impact on working hours and as such on individual income resulting in an increased risk of in-work poverty. Although the effect of household structure is thus mainly indirect in the individual case, we should note that a limited direct effect on the individual in-work poverty risk may be expected because of the fact that most countries offer child- or family-related social transfers or have tax systems that account for household structure. For example, the presence of children opens the right to family allowances which in some countries increase with the number of children. The presence of children thus has a direct and negative impact on the individual in-work poverty risk (reducing it). The effect of other family-related social transfers is more ambiguous as it depends on the degree to which the tax and transfer system of a country is individualised.

On top of these direct and indirect effects of household structure on the individual in-work poverty risk, there is a direct effect of household structure on the in-work poverty risk measured on the basis of equivalised household income. This effect derives directly from the unit of analysis that underlies this risk as it is measured as the proportion of workers with an equivalised (using the OECD-modified equivalence scale) household disposable income below the poverty threshold. It is thus assumed that resources are fully shared within the household. As a result, household structure is bound to have a huge impact on this measure of the in-work poverty risk.

As far as marital status is concerned, compared with the reference category of married persons, the individual model predicts that people who were never married run a smaller risk of working poverty in Austria, Spain, Luxembourg and the UK. These countries are probably the most conservative ones in our sample when it comes to women's employment and gender equality. It is again interesting to observe the contrasting signs of the coefficients that were estimated for separated or divorced persons between the individual and the household-based model. Whereas separation or divorce reduces the risk of working poverty in the individual model between 1% and 3% in Austria, France, Luxembourg and Poland, it increases the risk in the household-based model by 2%-3% in Spain, France and the UK. The impact of being a widow on the in-work poverty risk as compared with a married person is negative in both the individual and the household model. It is statistically significant in all countries but Belgium and Austria and ranges between 1% and 3%.

Regarding the number of adults present in the household, compared with the reference case of a 2-adult household, someone who is the only adult in the household faces a smaller risk with respect to working poverty in the individual case whereas, logically, in the household-based model, his/her risk of working poverty is increased. The negative effect of being the sole adult in the household as it is predicted in the individual model is much smaller than the positive impact set forth by the household-based model. Whereas the decrease in the individual case ranges between 1% and 4%, the increase associated with this household configuration as it comes out of the European model varies between 2% and 25%.

Indeed, in Luxembourg, according to the European definition, singles have a 25% higher risk of working poverty than people living in 2-adult households. The same dichotomy between both models is observed for people in households where there are at least three adults. In the individual case, such people run a 1%-2% higher risk of working poverty than the reference case in Austria, Belgium and France but results are far less significant than in the European model. In this latter model, people in households with three or more adults have a risk of working poverty that is between 1% and 4% lower than that of people in 2-adult households in all countries but Belgium.

Just as important as the number of adults in a household is the number of children in a household, at least when the in-work poverty risk is measured on the basis of equivalised household income. Compared with a childless household, the presence of one child in the household decreases the risk of working poverty in the individual model whereas it increases this risk in the European household-based model. In absolute terms, the effect of one child is rather small. It will increase with the number of children. The decrease in the individual case is smaller than 2% and is statistically significant in Austria, Spain, France, Ireland and Poland. The increase as it is predicted by the household model is comprised between 2% and 4% and is significant in all countries except for Belgium, Ireland and the UK.

The same pattern is observed for the presence of two children in the household and the estimated coefficients are somewhat larger, at least in the European model as in the individual case there is no mentionable difference between 1 and 2 children. In the European household-based model, the increase in the risk of in-work poverty that is associated with having two dependent children in the household varies between 3% in Austria, Belgium and the UK and 10% in Luxembourg. Finally, the presence of three or more dependent children in the household marginally affects the size of the negative effect compared with the situation where there were one or two dependent children in the individual case but it further increases the positive effect associated with the number of children in the household as it is predicted by the European household-based model. Indeed, living in a household with three or more dependent children increases the risk of in-work poverty according to the European definition by between 2% in Ireland and 24% in Spain.

4.3. Employment-related characteristics

Besides individual determinants and indicators of household structure, we also tested the effect of employment-related characteristics on the probability of being at risk of in-work poverty. Part-time employment is a systematically statistically significant and important determinant of the in-work at-risk-of-poverty rate. The coefficients estimated through both models share the same positive sign indicating that part-timers as compared with full-time workers run an increased risk of in-work poverty. What is more interesting is that the size of the coefficients associated with part-time work is much larger in the individual model than in the household-based model. This illustrates that the individual model is a better performer when it comes to capturing poverty due to low earnings or bad employment conditions whereas the European definition really captures poverty that is due to having a large family. The increase in the risk of working poverty that is associated with part-time work ranges between 1% and 4% according to the household-based model whereas it ranges between 6% and 20% in the individual model. In Austria, part-timers face a 20% higher risk of working poverty than full-timers. In the UK, their risk is 19% larger and in Spain 17%.

The other labour market variables also come out more strongly in the individual than in the household-based model. Labour market experience measured as the number of years spent in paid work is negatively associated with the in-work poverty risk whereas holding a temporary employment contract increases the risk of working poverty as compared with workers under a permanent contract.

The size of the local unit one works in is another important determinant of the risk of working poverty. Workers in very small/large units (with less than 10 employees/with more than 100 employees) have a larger risk of working poverty than their colleagues in units that employ between 10 and 100 employees. Overall, the statistical correlation between sector of economic activity and the risk of working poverty is weak and wherever the estimated coefficients turn out significant they remain small in size. Occupational affiliation appears to be much stronger associated with the risk of in-work poverty.

Compared with the reference category of professionals, especially the category of "elementary occupations" faces a much larger risk of in-work poverty. In the individual case, these workers are between 3% (Belgium) and 21% (the UK) more exposed to the in-work poverty risk than professional workers. In the household model, their risk is between 3% and 22% higher.

Besides elementary occupations, other categories are characterised by a higher degree of vulnerability with respect to working poverty than professionals: service workers, shop and market sales workers face an in-work poverty risk that is 2%-18% higher than that of professionals, plant and machine operators and assemblers run a risk that is between 3% and 16% higher, the risk of craft and related trades workers is 2% to 16% higher, and that of clerks is between 2% and 10% higher. Finally, note that agricultural workers also face a higher risk in Spain, France, Luxembourg and Poland. In the individual case, they are 46% more likely to be working poor than professionals in Luxembourg but this particularly high figure must be due to the small size of the sample of agricultural workers in this country.

Finally, compared with people in households with maximum work intensity, those in low- and high-work intensity households systematically have a higher in-work poverty risk in all countries.

4.4. Conclusion

To conclude on these results, it appears that the main fact that is put forth is the dichotomy between the two models that were estimated for each country. What we called the individual model identified the determinants of the in-work poverty risk when in-work poverty is defined as those full-time or part-time employees or self-employed workers aged between 15 and 64 years of age whose total individual net disposable income is below 60% of the median total individual net disposable income in the country of residence. On the contrary, what we called the household or European model identified the determinants of in-work poverty defined as all full-time or part-time employees/self-employed workers aged 15-64 who live in a household with an equivalised household disposable income below 60% of the median of this income in the country. The regression results clearly show that only the individual definition allows studying in-work poverty. The European definition rather analyses poverty that is due to having a large family. Indeed, whereas the variables relative to the number of adults and children in the household came out more strongly significant in the household models, those related to employment characteristics had a stronger effect in the individual case. With regard to the number of adults and children, the contrasting signs of the estimated coefficients between the two models clarify the consequences of the income sharing assumption in a crystal clear way. Whereas singles face an increased risk of working poverty using the European definition, they are less at risk than people in 2-adult households when the individual definition is used.

Similarly, people in households where there are three or more adults are estimated to be more at risk by the individual model and less at risk by the household model. The same was found in terms of the number of children in the household. Only in the European model did we see a systematic increase in the risk of in-work poverty with the number of children in the household. The individual model yielded negative, smaller and far less statistically significant effects for the number of children. On the contrary, employment characteristics, in particular the fact that one works part-time but also experience and holding a temporary rather than a permanent contract, were set forth as major determinants of working poverty, especially by the individual model.

Moreover, our results also confirm that, because of the assumption that income is fully shared within the household, the European definition severely understates women's poverty. Recall that the estimated coefficient for sex was negative even in the European model whereas it came out strongly significant and positive in the individual model.

Table 5: Marginal effects of the country-specific probit estimations of the risk of working poverty based on an individual definition and the EC definition

	Austria		Belgium		Spain		France		Ireland		Luxembourg		Poland		United Kingdom	
	ind_AT	eur_AT	ind_BE	eur_BE	ind_ES	eur_ES	ind_FR	eur_FR	ind_IE	eur_IE	ind_LU	eur_LU	ind_PL	eur_PL	ind_UK	eur_UK
being a woman (d)	0.06***	-0.02**	0.01***	-0.00	0.02***	-0.01*	0.02***	-0.01	0.01***	-0.01*	0.03***	-0.01	0.01***	0.00	0.04***	0.00
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
25-34 years of age (d)	-0.01	0.01	0.01	0.00	-0.00	0.00	-0.00	-0.00	-0.00	-0.01***	-0.00	-0.01	-0.00*	-0.01***	0.01	0.01
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
45-54 years of age (d)	0.01	0.02**	0.00	-0.00	-0.00	0.00	-0.00	0.01**	-0.00	0.00	-0.01	0.00	-0.00	0.01	-0.01**	0.01
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
55-64 years of age (d)	0.01	0.01	-0.00	-0.00	-0.01	0.01	0.00	0.01	0.00	0.00	-0.01	0.01	-0.01***	-0.02***	-0.02***	0.01
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
never married (d)	-0.02*	0.00	0.01**	0.00	-0.01**	0.01	-0.01	0.00	0.00	0.00	-0.01**	-0.01	-0.00	0.01	-0.01***	0.01*
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
separated/divorced (d)	-0.03***	0.02	0.00	0.00	-0.00	0.03***	-0.01**	0.02**	0.00	0.01	-0.01**	-0.02***	0.01***	-0.01	-0.00	0.02**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
widowed (d)	-0.03	0.01			-0.02***	-0.00	-0.02***	0.01	-0.01***	-0.01***	-0.02***	-0.03***	-0.01	-0.02***	-0.02**	-0.00
	(0.02)	(0.03)			(0.00)	(0.01)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
lower secondary education at most (d)	0.03***	0.01	0.00	0.00	0.00	0.01*	0.01	0.01*	-0.00	0.01**	0.01	0.03***	0.01***	0.03***	0.01	0.01*
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
higher (non-)tertiary education (d)	-0.02**	-0.01	-0.01**	-0.00*	-0.01**	-0.01*	-0.01	-0.01	-0.00	-0.00*	-0.02***	-0.02**	0.00	-0.02***	-0.01	-0.01**
	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
1 adult in household (d)	-0.03***	0.08***	-0.01***	0.06***	-0.01***	0.04***	-0.02***	0.06***	-0.01***	0.02**	-0.00	0.25***	-0.01***	0.09***	-0.04***	0.04***
	(0.01)	(0.02)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.00)	(0.02)	(0.00)	(0.01)
3+ adults in household (d)	0.01*	-0.03***	0.01**	-0.00	0.00	-0.03***	0.02***	-0.02***	0.00	-0.01***	-0.00	-0.03***	0.00	-0.04***	0.01	-0.02***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
1 child in household (d)	-0.02**	0.01	0.00	0.02***	-0.01**	0.03***	-0.01***	0.02***	-0.01***	0.01	-0.00	0.04***	-0.00*	0.02***	0.00	0.00
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)

Table 5 (continued)

	Austria		Belgium		Spain		France		Ireland		Luxembourg		Poland		United Kingdom	
	ind_AT	eur_AT	ind_BE	eur_BE	ind_ES	eur_ES	ind_FR	eur_FR	ind_IE	eur_IE	ind_LU	eur_LU	ind_PL	eur_PL	ind_UK	eur_UK
Transporting and storage (d)	-0.02*	-0.01	0.04	0.08**	0.02*	0.03**	-0.01	0.02	0.01	0.00	0.03	0.11***	-0.01*	-0.01	0.01	0.03*
	(0.01)	(0.01)	(0.03)	(0.04)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.02)	(0.04)	(0.00)	(0.01)	(0.01)	(0.02)
Accommodation and food service activities (d)	0.00	-0.01	-0.00	-0.01***	-0.00	0.02	-0.00	0.01	-0.01*	-0.00	-0.01**	-0.02***	-0.01*	0.00	0.00	-0.01
	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Information and communication (d)	-0.02	-0.02**	-0.01**	0.01	0.01	-0.02***	-0.01	0.03	-0.00		0.00	-0.01	-0.01**	-0.02**	-0.00	0.00
	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)		(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Financial and insurance activities (d)	-0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.02	-0.00	-0.00*	0.06***	0.01	-0.01*	-0.01	0.02*	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Real estate activities (d)	-0.03***	-0.02**	-0.00	0.00	-0.01	-0.00	-0.01	-0.00	0.00	-0.00	-0.02***	-0.03***	0.01	-0.01	-0.02**	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Professional, scientific and technical activities (d)	-0.04***	-0.02**	0.00	0.01	0.01	0.01	0.01	-0.00	0.00	0.00	-0.01	-0.03***	-0.00	-0.00	0.03*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Administrative and support service activities (d)	-0.02**	-0.01	-0.01	0.00	-0.00	0.01	-0.01	-0.00	-0.00	0.00	-0.01	0.01	0.00	0.01	0.01	0.01
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Public administration and defence; compulsory social security; Education; Human health and social work activities (d)	0.01	0.00	0.01	0.00	0.02**	0.03***	0.04***	0.03***	0.00	-0.00	0.01	0.01	-0.00	-0.00	0.03*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)
Legislators, senior officials and managers (d)	-0.01	-0.02	0.01	-0.00	-0.01	-0.01	0.01	-0.01**	0.01	0.00	0.00	-0.00	0.01	-0.01	0.03*	0.01
	(0.03)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)

Table 5 (end)

	Austria		Belgium		Spain		France		Ireland		Luxembourg		Poland		United Kingdom	
	ind_AT	eur_AT	ind_BE	eur_BE	ind_ES	eur_ES	ind_FR	eur_FR	ind_IE	eur_IE	ind_LU	eur_LU	ind_PL	eur_PL	ind_UK	eur_UK
Technicians and associate professionals (d)	0.01	0.01	0.00	0.00	0.01	0.03**	-0.00	-0.00	0.02	0.00	0.01	0.01	0.01	0.02	0.04**	0.00
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)
Clerks (d)	-0.01	0.01	0.00	0.00	0.01	0.04**	0.02	0.01	0.01	0.01	0.03	0.05	0.02**	0.05**	0.10***	0.05***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)
Service workers, shop and market sales workers (d)	0.02	0.03*	0.00	0.01	0.02**	0.03**	0.05***	0.02	0.03**	0.01	0.09**	0.09*	0.02**	0.07***	0.18***	0.07***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.04)	(0.04)	(0.01)	(0.02)	(0.03)	(0.02)
Skilled agricultural and fishery workers (d)	0.06	0.06	0.00	0.05	0.06*	0.06*	0.02	0.10**	0.08	0.06	0.46**	0.32**	0.03	0.15**	0.01	0.07
	(0.06)	(0.06)	(0.02)	(0.05)	(0.04)	(0.03)	(0.02)	(0.04)	(0.07)	(0.06)	(0.18)	(0.15)	(0.03)	(0.06)	(0.04)	(0.05)
Craft and related trades workers (d)	0.01	0.03	0.00	0.02*	0.01	0.04**	0.02	0.04***	0.01	-0.00	0.05*	0.16***	0.02**	0.07***	0.07**	0.05**
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.03)	(0.05)	(0.01)	(0.02)	(0.03)	(0.02)
Plant and machine operators and assemblers (d)	0.02	0.05*	0.00	0.00	0.02	0.05***	0.01	0.03**	0.03	0.01	0.09**	0.14**	0.03**	0.08***	0.16***	0.11***
	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.04)	(0.06)	(0.01)	(0.02)	(0.04)	(0.03)
Elementary occupations (d)	0.07***	0.06**	0.03**	0.03**	0.04***	0.07***	0.05***	0.05***	0.05***	0.02	0.11***	0.22***	0.04***	0.12***	0.21***	0.10***
	(0.03)	(0.03)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.04)	(0.07)	(0.02)	(0.03)	(0.04)	(0.03)
Low work intensity household (d)	0.01	0.23***	0.00	0.16***	0.02*	0.28***	0.01	0.41***	0.00	0.13***	0.01	0.49***	0.00	0.31***	-0.02***	0.41***
	(0.02)	(0.04)	(0.01)	(0.04)	(0.01)	(0.03)	(0.01)	(0.05)	(0.01)	(0.05)	(0.01)	(0.07)	(0.00)	(0.03)	(0.01)	(0.09)
high work intensity household (d)	0.01*	0.04***	0.00	0.04***	0.00	0.07***	0.00	0.06***	0.01***	0.02***	0.02***	0.11***	0.01***	0.07***	-0.02***	0.09***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)
Workless household (d)		0.38								0.16		0.72***		0.39		0.02
		(0.35)								(0.24)		(0.13)		(0.24)		(0.04)
constant																
Pseudo R-squared	0.26	0.15	0.29	0.25	0.30	0.22	0.34	0.22	0.37	0.32	0.43	0.40	0.30	0.25	0.40	0.23
chi2	834.11	346.78	348.83	274.96	1259.85	841.64	1000.85	493.67	428.02	206.89	687.33	708.25	811.58	995.27	1154.30	540.53
N	6110	6113	4904	4904	11116	11116	8408	8408	3827	3629	3969	3971	10036	10040	7242	7250

Notes: (d) for discrete change of dummy variable from 0 to 1; * p<.1, ** p<.05, *** p<.01

5. *Conclusion and Policy Recommendations*

In 2003, the European Union adopted a new social indicator, the "in-work at-risk-of-poverty rate". According to the European definition, the working poor are all full-time or part-time employees/self-employed workers aged 15-64 who live in a household with an equivalised household disposable income below 60% of the median of this income in the country.

This indicator is often accepted and used as a kind of immutable object regardless of the fact that it is based on a series of assumptions that are only rarely discussed and questioned although they have particularly strong consequences for the calculation of the in-work poverty risk and for the design of policies to combat in-work poverty.

The purpose of this paper was to show the volatility in the measure of the proportions of working poor with respect to different methodological choices in terms of the unit of analysis, the measure of income and the population of workers. By showing this volatility, we aimed at tackling some of these generally unquestioned assumptions.

Using an individual measure of income to determine the poverty risk avoids the conceptual problem that employment is an individual state whereas the poverty risk is commonly determined through a household approach. It further allows going without an income pooling assumption and as such contributes to a more correct identification and understanding of the working poor, especially of its female population.

Based on an individual definition that defines the working poor as those full-time or part-time employees or self-employed workers aged between 15 and 64 years of age whose total individual net disposable income is below 60% of the median total individual net disposable income in the country of residence, we assessed the size and characteristics of the working poor population in 8 European Union countries (Austria, Belgium, Spain, France, Ireland, Luxembourg, Poland, the United Kingdom) and systematically compared them with the European definition using the 2007 wave of the European Statistics on Income and Living Conditions (EU-SILC).

In a first stage, emphasis was on the impact on the rate of working poor of changing the unit of analysis from the household to the individual comparing the proportions of working poor between the European definition of in-work poverty and a fully individualised definition. By analysing the link between work and the risk of poverty at the individual level, we distinguish (as Rowntree 2000 and Ponthieux 2010) between poverty due to low earnings and poverty due to having a large family as a way of separating labour market factors from household factors. The European household-based definition of the poverty risk actually measures the proportions of workers who are poor because they have too many dependents. On the contrary, when the poverty risk is computed on the basis of individual income, what is measured is the proportion of workers who, because of their employment conditions, earn a wage that is insufficient to stay out of poverty or receive social transfers that are too low to protect against the poverty risk. The difference between the two measures illustrates the impact of household structure.

A first finding is that with the European definition, the proportion of poor male workers exceeds that of poor female workers in all countries but Belgium. When individual income is used to evaluate the poverty risk, the inverse holds true. This illustrates the impact of women's overrepresentation in part-time low-paid jobs, a fact that is hidden by the assumption of intra-household income pooling and sharing as it is upheld in the European definition of the in-work at-risk-of-poverty rate.

A second finding is that the move from the European household-based definition to the individual definition reduces the proportions of male working poor but it substantially increases those of female working poor. The decrease in the proportion of male working poor results from the fact that in most households men remain the primary earners. When they no longer need to share their income with other dependent members in their household, their income appears to be more sufficient to protect them against the risk of poverty. On the contrary, the European definition appears to severely understate female workers' at-risk-of-poverty rate. As long as female workers can bow on supplements from their household's income, they manage much better to stay out of poverty than when they have to cope on their personal income only.

When equivalent household disposable income is replaced not just by individual net income but by one of its components, notably the income earned from work, we get a more precise idea of the protective role played by employment against the risk of poverty. We found that the rates of working poor were roughly doubled between the definitions based on total individual income and on earned income only. Between one fourth and over one third of all female workers earn a wage that is below 60% of the median of all income earned by male and female part-time or full-time workers or self-employed aged 15-64. For male workers, between 9 and 19% earn less than 60% of the median earned income.

An analysis of working poverty in its broadest sense including all labour market participants, i.e. employed workers, the self-employed but also the unemployed and workers on sickness leave, also boosted the rates of working poor. In Luxembourg and Spain, over 40% of all female labour market participants have an income below 60% of the median individual net income in the country.

Finally, the risk of poverty faced by potential workers was computed on the basis of the more restricted category of market income. This is a subcategory of total net individual income that includes wages, the income derived from self-employment, unemployment benefits and sickness benefits. In this set-up, the proportions of male labour market participants with a market income below 60% of the median of market income in the country ranged between 8% in Luxembourg and 29% in Poland. The share of poor female labour market participants in this configuration varied between 39% in France and 50% in Spain.

From this first analysis, it is important to remember the huge consequences of making what appear to be incremental changes to either the unit of analysis, the measure of income or the definition of workers in terms of the computed rates of working poor.

In a second stage we have estimated bivariate probit models for each of the eight countries in our sample to estimate the effect of various observable individual characteristics, indicators of household structure and employment-related factors on the probability of being working poor. This probability was measured either on the basis of individual income or of equivalised household disposable income.

The most important finding that is put forth is the dichotomy between the two models that were estimated for each country. What we called the individual model identified the determinants of the in-work poverty risk when in-work poverty is defined as those full-time or part-time employees or self-employed workers aged between 15 and 64 years of age whose total individual net disposable income is below 60% of the median total individual net disposable income in the country of residence.

On the contrary, what we called the household or European model identified the determinants of working poverty defined as all full-time or part-time employees/self-employed workers aged 15-64 who live in a household with an equivalised household disposable income below 60% of the median of this income in the country. The regression results clearly showed that only the individual definition allows studying working poverty. The European definition rather analyses poverty that is due to having a large family. Indeed, whereas the variables relative to the number of adults and children in the household came out more strongly significant in the household model, those related to employment characteristics had a stronger effect in the individual case. With regard to the number of adults and children, the contrasting signs of the estimated coefficients between the two models clarified the consequences of the income sharing assumption in a crystal clear way. Whereas singles face an increased risk of working poverty using the European definition, they are less at risk than people in 2-adult households when the individual definition is used. Similarly, people in households where there are three or more adults are estimated to be more at risk by the individual model and less at risk by the household model. The same was found in terms of the number of children in the household. Only in the European model did we see a systematic increase in the risk of working poverty with the number of children in the household. The individual model yielded negative, smaller and far less statistically significant effects for the number of children. On the contrary, employment characteristics, in particular the fact that one works part-time but also experience and holding a temporary rather than a permanent contract, were set forth as major determinants of working poverty, especially by the individual model.

Moreover, our results also confirm that, because of the assumption that income is fully shared within the household, the European definition severely understates women's poverty. The estimated coefficient for sex was negative even in the European model whereas it came out strongly significant and positive in the individual model.

This dichotomy between both models has crucial policy implications. Given that the European definition measures poverty due to having a large family rather than poverty due to low earnings and bad employment conditions, it is impossible to formulate any recommendations in terms of employment policies on the basis of this definition. The only policy implications that can be drawn from studies of the working poor that employ the European definition of working poverty relate to birth-control policies or changes in family-related allowances. More precisely, to decrease the in-work at-risk-of-poverty rate as it is computed by Eurostat, it could be suggested to increase family allowances to better protect families with dependent children or to grant a universal allowance to housewives to better protect low work intensity households or even to implement a paternalist Chinese-style policy to control the number of births. Employment-related policy recommendations can only be drawn from the results of studies of the working poor that use an individual measure of income to determine the in-work at-risk-of-poverty rate. Only when individual income is used do we actually measure working poverty in the sense of poverty because of low income (earned income and social transfers) or poor employment conditions.

References

Albelda, R. (1999) "Women and poverty: Beyond earnings and welfare", *The Quarterly Review of Economics and Finance*, 39, 723-742.

Attanasio, O. & Lechene, V. (2002). Tests of Income Pooling in Household Decisions. *Review of Economic Dynamics*, 5(4), 720-748.

Bardone, L. & Guio, A.-C. (2005). Pauvreté des travailleurs - nouveaux indicateurs définis conjointement au niveau européen. Eurostat, Population et Conditions sociales, *Statistiques en bref*, 5.

Bargain, O., Beblo, M., Beninger, D., Blundell, R., Carrasco, R., Chiuri, M.-C., Laisney, F., Lechene, V., Moreau, N., Myck, M., Ruiz-Castillo, J. & Vermeulen, F. (2006). Does the representation of household behavior matter for welfare analysis of tax-benefit policies? An introduction. *Review of Economics of the Household*, 4(2), 99-111.

Bonke, J. & Browning, M. (2009). The distribution of financial well-being and income within the household. *Review of Economics of the Household*, 7(1), 31-42.

Bourguignon, F., Browning, M., Chiappori, P.-A. & Lechene, V. (1993). Intra household allocation of consumption: a model and some evidence from French data. *Annales d'Economie et de Statistique*, 29, 137-156.

Bradbury, B. (2004). The price, cost, consumption and value of children. *SPRC Discussion Paper*, 132, June.

Cazenave, M.-C. (2006). Les travailleurs pauvres dans les pays développés : acquis et controverses. Paris, Matisse, *Les Travaux de l'Observatoire 2005-2006*, 199-225.

Coudouel, A., Hentschel, J. & Wodon, Q. (2002). *Poverty Measurement and Analysis*. Washington D.C., World Bank, PRSP Sourcebook (http://mpra.ub.uni-muenchen.de/10490/1/MPRA_paper_10490.pdf).

Duflo, E. (2003). Grandmothers and Granddaughters: Old-Age Pensions and Intrahousehold Allocation in South Africa. *The World Bank Economic Review*, 17(1), 1-25.

Eurofound (2010). *Working poor in Europe*. Dublin, European Foundation for the Improvement of Living and Working Conditions.

Gardner, J.M. & Hertz, D. E. (1992). Working and poor in 1990. *Monthly Labor Review*, 115(12), 3-13.

González, L. & Viitanen, T. (2009). The effect of divorce laws on divorce rates in Europe. *European Economic Review*, 53(2), 127-138.

Jenkins, S. P. & Rigg, J. A. (2001). The dynamics of poverty in Britain. Department for Work and Pensions, *DWP Research Report*, 157.

Klein, B. W. & Rones, P. L. (1989). A profile of the working poor. *Monthly Labor Review*, 112(10), 3-11.

Lelièvre, M., Marlier, E. & Pétour, P. (2004). Un nouvel indicateur européen : les travailleurs pauvres. in : *Les indicateurs dans l'Union européenne: avancement et perspectives*, dossiers Solidarité et Santé de la DREES, 2, avril-juin.

Lundberg, S., Pollak, R. A. & Wales, T. J. (1997). Do Husbands and Wives Pool their resources? Evidence from the U.K. Child Benefit. *Journal of Human Resources*, 22, 463-480.

Meulders, D., O'Dorchai, S., Plasman, R. & Rycx, F. (2009). Genre et revenu: analyse et développement d'indicateurs. Final report of the research project « Belgian Gender and Income Analysis (BGIA) », 472p.

Moehling, C. (2003). The Incentives to Work: Working Children and Household Decision-Making. *mimeo*.

OECD (2008). *Growing Unequal? Income Distribution and Poverty in OECD Countries*. Directorate for Employment, Labour and Social Affairs, October, 310p.

Orsini, K. & A. Spadaro (2005) "Sharing resources within the household: a multi-country microsimulation analysis of the determinants of intrahousehold "strategic weight" differentials and their distributional outcomes", *Paris-Jourdan Sciences Economiques Working Paper* N° 2005 – 04, 32p.

Phipps, S. A. & Burton, P. S. (1998). What's mine is yours? The influence of male and female incomes on patterns of household expenditure. *Economica*, 65, 599-613.

Piachaud, D. (2002). Capital and the determinants of poverty and social exclusion. Centre for Analysis of Social Exclusion, *CASE paper*, 60.

Ponthieux, S. (2007). The working poor – Limits of the EU indicator « in-work poverty risk », limits of the statistical category « working poor », and exploration of a notion of « poverty in earned income ». Paris, Insee, *ECINEQ*, June, 15p.

Ponthieux, S. (2009). The working poor as a statistical category – Methodological difficulties and exploration of a notion of poverty in earned income. Paris, INSEE.

Ponthieux, S. (2010). *In-work poverty in the EU*. Eurostat Methodologies and Working Papers. (http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-10-015/EN/KS-RA-10-015-EN.PDF).

Quisumbing, A. R. & Maluccio, J. A. (2003). Resources at Marriage and Intrahousehold Allocation: Evidence from Bangladesh, Ethiopia, Indonesia, and South Africa. *Oxford Bulletin of Economics and Statistics*, 65(3), 283-328.

Robson, D. & Rodgers, J. R. (2008). Travail to No Avail? Working Poverty in Australia. University of Wollongong, Department of Economics, *Working Paper* 08-08.

Rowntree, B.S. (2000). *Poverty: A study of town life*. Bristol, The Policy Press.

Schultz, T. P. (1990). Testing the Neoclassical Model of Family Labor Supply and Fertility. *Journal of Human Resources*, 25, 599-634.

Sen, A. K. (1983). Economics and the Family. *Asian Development Review*, 1(2), 14-26.

Sen, A. K. (1990). Gender and Cooperative Conflicts. in: Tinker, I. (ed.) *Persistent Inequalities: Women and World Development*. New York, Oxford University Press.

Smock, P. (1994). Gender and the short-run economic consequences of marital disruption. *Social Forces*, 73(1), 243-262.

Thomas, D. (1990). Intra-household resource allocation: an inferential approach. *Journal of Human Resources*, 25(4), 635-664.

Thomas, D., Contreras, D. & Frankenberg, E. (2002). Distribution of power within the household and child health. *mimeo*.

Ward-Batts, J. (2008). Out of the Wallet and into the Purse: Using Micro Data to Test Income Pooling. *Journal of Human Resources*, 43(2), 325-351.