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Measuring (in)security in the event of unenployment: are we forgetting someone?

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Measuring (in)security in the event of unemployment: are we forgetting someone?

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Abstract

In this paper we argue that the consequences of the unemployment risk may be quite different according to the number of persons who depend on the income of the active members, and propose new measures for the economic (in)security related to employment risk, that take into account the household composition of the unemployed: a *per-earner* actuarially-fair insurance premium corresponding to the aggregate *equivalent* expected loss, and the *inactive-unemployed dependency rate (IUDR)*, i.e. the average number of persons that each unemployed individual has to provide for (beyond herself). Both have a simple interpretation but the latter has an advantage in terms of data-requirement. Adding the IUDR in the measure of employment security used by Osberg and Sharpe, the relative position of various countries change, suggesting that the overall level of insecurity associated to similar unemployment and replacement rates may be quite different if we consider all the individuals in the households that are potentially affected by this risk.

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1. Introduction

"Economic insecurity arises from the exposure of individuals, communities and countries to adverse events, and from their inability to cope with and recover from the costly consequences of those events" (UNDESA, 2008). Some authors do not distinguish between different types of misfortunes and model an individual's sentiment of insecurity as a function of his/her wealth (Bossert, D'Ambrosio, 2009). The human-rights perspective, instead, identifies four key objective economic risks: unemployment, sickness, widowhood and old age. We follow this approach and propose a new measure for the economic (in)security related to employment risk.

The Osberg/Sharpe IEWB measure of the risk imposed by unemployment is a weighted sum (or product) of the unemployment rate (which captures the probability of not having a job), and the financial protection rate (the average percentage of lost earnings replaced by unemployment benefits). In Osberg (2010) a higher weight has been given to the former because it has been found to have a larger negative impact on self reported happiness for the working population. On the assumption that changes in the subjective level of anxiety about a lack of employment security are proportionate to changes in objective risk, this index captures the anxiety imposed by employment risk on individuals who participate in the labour market.

However, these individuals do not live in isolation. This means that not only "a middle aged worker with … dependent children and no other source of family income is likely to feel far more anxiety than an older worker with … grown up children … and an employed spouse" Osberg (1998), but also that these children and spouses are themselves exposed to the same anxiety. The importance of considering unemployment from a household perspective is highlighted by the recent stream of literature which is based on analysis of jobless household rates (Gregg and Wadsworth, 2008; Mocetti et al. 2010). In research on social exclusion, the share of individuals living in jobless household started to be considered.

The recognition that we should not restrict our attention only to active individuals when evaluating security in the event of unemployment, is supported also by an argument directly related to the specific concern of the economic insecurity literature. In comparing the latter with the literature on vulnerability, Osberg (2010) underlines that "the main substantive difference appear to be that vulnerability discourse focuses on the risk of poverty and destitution, while the insecurity perspective concerns the hazards faced by all citizens". Therefore, we argue that we should consider the hazard faced by all the members of the household, and not only by the individual who participates in the labour market.

In this paper we explore two different ways in which one can take into account the number of individuals who are affected by the risk of unemployment, corresponding to the two approaches used in the construction of the relevant component in the IEWB: the insurance approach and the weighted sum approach. The first index we proposed is based on an insurance perspective, and it assigns to each member of households at risk an equivalent expected loss (due to the possibility of unemployment of the working individuals in the household), and then it computes a *per-earner* actuarially-fair

premium that corresponds to the aggregate expected loss. In this way one recognizes that the same financial loss has different welfare effects for households with different composition, and that an increase in the proportion of individuals in households with higher expected losses implies an increase in the overall level of insecurity. If instead we follow the weighted sum approach, we propose to add a new dimension in the measure of risk imposed by unemployment: the inactive-unemployed dependency rate. The latter captures the average number of "dependent" individuals for each unemployed person in the country, assigning to each inactive person a weight equal to the ratio between unemployed and active individuals in the household, and dividing the sum of them by the total number of unemployed. As will be illustrated in the following section, in this way we account for all persons who are exposed to the event of unemployment, and simultaneously recognize that the effect of this event may be different if there are other employed individuals in the household.

The paper is organized as follows. In section 1 we discuss the methodological foundations of the two approaches and the data used. In section 2 we present the results based on the insurance approach, and in section 3 those related to the inactive-unemployed dependency rate approach. Section 4 concludes.

2. Methodology and data.

2.1 The insurance approach.

The original probabilistic approach used for measuring the unemployment-related insecurity dimension of the IEWB was based on the expected value of individual financial loss. When moving from the individual to the household perspective, ideally one would like to compare the household well-being under uncertainty both across households and over time. One possibility to do this would be to consider the ex-ante compensating variation, i.e. the amount that should be given to a certain household so that its certainty equivalent would be equal to that of a reference household (see e.g. Anderson, 1979). This approach can be used also for intertemporal comparisons, by expressing lotteries in real terms and comparing the compensating variation of the reference household at different points in time (net of the effect of changes in demographic characteristics). An increase in economic insecurity in this case would be captured by an increase of the compensating variation. The main advantage of this approach is its clear welfare foundation, whereas the drawbacks are the need of ad-hoc estimation of the compensating variations for each country and each year and the departure from the framework used by Osberg (2010) in the construction of the insecurity dimension of the IEWB.

Alternatively, one can follow the original probabilistic approach used for the IEWB, which is based on the expected value of financial loss, and adjust it in order to capture the presence of different individuals in the household. Let Δy_i^h be the amount of lost earnings of individual i in household h in the event of unemployment, which corresponds to the difference between his potential earnings ($y_{p,i}^h$) and his unemployment benefits: $\Delta y_i^h = y_{p,i}^h - UB_i^h$. For a household with m active members (i.e.

individuals who participate in the labour market), under the simplifying assumption of no correlation between the unemployment probabilities of the different members, the expected income loss for household *h* due to the risk of unemployment is:

$$EL^h = \prod_{i=1}^{m} p_i^h \left(\sum_{i=1}^{m} \Delta y_i^h \right) + (1 - p_m^h) \prod_{i=1}^{m-1} p_i^h \left(\sum_{i=1}^{m-1} \Delta y_i^h \right) + \ldots + \prod_{i=1}^{m-1} (1 - p_i^h) p_m^h (\Delta y_m^h) \qquad (1)$$

where p_i^h is the probability of unemployment for individual *i* in household *h*.

Similarly to the approach followed for the measurement of poverty and inequality, we recognize that resources are shared within the household, but that the welfare unit is the person (see e.g. Boeri and Brandolini, 2005). Therefore, we transform the above-specified total expected loss into an adult-equivalent expected loss by using the equivalence scale for household *h* (s_h). In other words, a given financial loss for household *h*, say Δy_i^h, corresponds to an adult equivalent loss of $\Delta y_i^h / s_h$. Given the linearity of the expected value operator, the adult-equivalent expected loss for household *h* is simply:

$$EL_e^h = \frac{EL^h}{s_h} \qquad (2)$$

We can then assign this adult equivalent expected loss to each individual in the household and compute an aggregate expected loss for a given country "*c*":

$$EL^c = \sum_{h=1}^{H} n_{ih} EL_e^h \qquad (3)$$

where *H* is the total number of households in country *c*, and n_{ih} represents the number of individuals in household *h*.

The *per-earner* actuarially fair premium for this loss is the ratio between the latter and the total number of earners in households at risk in country *c*:

$$\pi_e^c = \frac{EL^c}{\sum_{h=1}^{H} n_{eh}} \qquad (4)$$

where n_{eh} represents the number of earners in household *h*. Note that in (1) we do not include the loss already experienced by individuals who are actually unemployed because in this case their earnings are equal to the unemployment benefits and therefore there is no "expected" earning loss[2].

[2] Actually, in this case we should add the expected gain by re-entering employment. However, since the information of the probability of reentering employment conditional on unemployment is not so easily

In order to simplify the computation of the aggregate expected loss and to facilitate international comparisons, we distinguish the six types of households considered in the OECD tax-benefit model (a single person with no children, a one-earner couple with no children, a two-earner couple with no children, and the same types of households but with two children). The per-capita actuarially fair premium for the aggregate expected loss then becomes:

$$\pi_e = \frac{\sum_{k=1}^{6} n_{i,k} \cdot n_k EL_e^k}{\sum_{k=1}^{6} n_{e,k} \cdot n_k}$$

where k represents the type of household, $n_{i,k}$ and $n_{e,k}$ are respectively the number of individuals and earners living in type-k households, n_k is the total number of households of type-k.

Potential earnings and unemployment benefits are taken from the OECD tax-benefit model. In particular, potential earnings are set equal to the average wage for the first-earner in the household, and to 67% of the average wage for the second-earner[3]. The only case for which we cannot obtain unemployment benefits from the tax-benefit model is the one in which both earners in the household are unemployed. For this household type we compute the unemployment benefit for both a single individual and a one-earner household with potential earnings equal to 167% of the average wage (with or without children). These two measures are different only for Germany and the UK; the one-earner benefit in each year is 20% higher than the single one in Germany and 57% in the UK. Since the latter is more in line with the actual composition of the household (and more favorable), we used it in computing the expected loss for two-earner households. We deflated wages and unemployment benefits using the country-specific harmonized consumer price index, expressing all variables in terms of 2005 euros. For the UK, we first deflated the variables and then used the 2005 euro-pound exchange rate.

The probability of unemployment is equal for all individuals and proxied by the unemployment rate; the equivalence scale is the OECD-modified scale (which assigns a value of 1 to the household head, of 0.5 to each additional adult member and of 0.3 to each child), and the number of the different types of household in the country is taken from Eurostat (LFS dataset). In the latter, data are available only for the years 2005-2010, and therefore we restrict our attention only to this time-period. The countries we consider are those for which the IEWB had already been calculated and, among these, those with complete information about household types: Belgium, Finland, France, Germany, Italy, the Netherlands, Spain and the United Kingdom.

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available for all countries as the unemployment rate (and one minus the unemployment rate is not an appropriate proxy for this) we preferred not to consider this expected gain.

[3] Earnings are calculated for industry sectors C to K of the International Standard Classification of all Economic Activities (including both manual and non-manual workers); data relate to the average earnings for the country as a whole. The worker is an adult (male or female) worker in the covered industry sector, he/she is assumed to be fully employed during the year.

In considering only households with at least one earner, we exclude first of all households composed solely of students or inactive individuals aged 65 and over, which account for about 20% of the total number of households[4]. Among the remaining, the proportion of households with all adults not working (either unemployed or inactive) varies from 23% (Belgium) to 14% (Spain)[5]. A further restriction is that we take into account only single and couples, thus excluding all households in which there are two adults who are not a couple, or more than two adults (mainly households where young adults cohabit with parents). The incidence of the latter varies significantly across countries (see table A1 in the appendix). Countries with a weak welfare system, a late transition to adulthood, and strong family ties (like Spain and Italy), show a relatively high proportion of households with more than two adults (an average of 40% for Spain and 32% for Italy). This incidence is significantly lower in other countries (on average 19% of UK, 16% for Germany, 10% for Finland).

2.2 The inactive-unemployed dependency rate.

As underlined in the introduction, the Osberg/Sharpe IEWB measure of the risk imposed by unemployment is a weighted sum of the unemployment rate, and the financial protection rate, with a higher weight assigned to the first component because it has been found to have a larger negative impact on self reported happiness for the working population. Our second approach is to add to this sum a measure that takes into account the number of inactive individuals that "depend" on the unemployed ones, i.e. all the people actually exposed to the consequences of the event of unemployment. Clearly these consequences may be very different, both in economic and psychological terms, if there are other employed people in the household. For this reason we assign to each inactive member a weight that is equal to the ratio between the number of unemployed and active individuals in the household.

The "inactive-unemployed dependency rate" (IUDR) is defined as follows:

$$IUDR_c = \frac{\sum_{h=1}^{H_c} n_i^h \frac{n_u^h}{n_a^h}}{\sum_{h=1}^{H_c} n_u^h} \qquad \text{for } n_a^h > 0$$

where n_i^h, n_u^h, n_a^h, are respectively the number of inactive, unemployed and active individuals in household h, and H_c is the total number of households in country c.

[4] Italy and Germany exhibit a higher incidence of these inactive households (24.2% and 24% on average respectively, with an increasing trend over time), while Spain has the lowest proportion (about 17%, stable between 2005 and 2010).

[5] The proportion of "non working" households is about 18% in Italy and UK, 17.5% in Germany and Finland, 19.5% in France and 15.5% in Netherlands. For almost all countries we observe an increase in this proportion in 2009 due to the economic crisis, with the highest rise in Spain (from 12% in 2005 to 18% in 2010).

Note first that this index considers only members of households where there is at least one unemployed individual; indeed if all active individuals in a household are employed, $\frac{n_u^h}{n_a^h} = 0$, i.e. the inactive members of these households are not counted in the IUDR. On the contrary, for households with unemployed members and no employed individuals, we have that $\frac{n_u^h}{n_a^h} = 1$, and therefore all inactive persons in these households are fully counted in the numerator of the IUDR. For households where there are both employed and unemployed members, each inactive individual counts for the fraction $\frac{n_u^h}{n_a^h}$, i.e. for the relative "importance" of unemployment in the household.

Secondly, this index captures both the larger number of people affected by the unemployment risk and also part of the psychological burden for the unemployed, because worries for the consequences of losing the job on other family members are a large component of it. For this reason we propose to include this index as a specific element of the measure of risk related to unemployment in the IEWB. There are actually two ways in which we can do this: either additively or multiplicatively. Indeed we could adjust the unemployment rate, by multiplying it by (1+IUDR), so that each percentage point increase in the IUDR would mean an increase in this "adjusted unemployment rate" of 1/(1+IUDR) percent[6]. Note that the AUR could also be interpreted as a dependency ratio between all the (weighted) members in households with at least one unemployed and all active individuals. Indeed, we have:

$$AUR_c = \left(\frac{\sum_{h=1}^{H_c} n_u^h}{\sum_{h=1}^{H_c} n_a^h} \right) \cdot \left(1 + \frac{\sum_{h=1}^{H_c} n_i^h \frac{n_u^h}{n_a^h}}{\sum_{h=1}^{H_c} n_u^h} \right) = \frac{\sum_{h=1}^{H_c} n_T^h \frac{n_u^h}{n_a^h}}{\sum_{h=1}^{H_c} n_a^h} \qquad \text{for } n_a^h > 0$$

where n_T^h is the total number of individuals in household *h*.

One possibility to account for the IUDR would be to substitute the unemployment rate with the adjusted one in the measure of risk related to unemployment in the IEWB. Alternatively we could follow the additive approach used by Osberg (2010), and construct a weighted sum of the various dimensions. Since the IUDR captures a part of the psychological burden of unemployment, it seems plausible to redistribute the weight given to the unemployment rate (0.8) to both the latter and the IUDR. We prefer this second approach because it is simpler and more transparent. We assign a weight equal to 0.6 to the unemployment rate and 0.2 to the IUDR, because we think that an increase of "dependent" people in the household can have the same importance as a reduction in

[6] For example, for an unemployment rate equal to 8% and a IUDR equal to 25%, the adjusted unemployment rate (AUR) would be 10%. An increase of the IUDR from 25 to 26% would imply an increase in the AUR of 8%, i.e. from 10% to 10.08%.

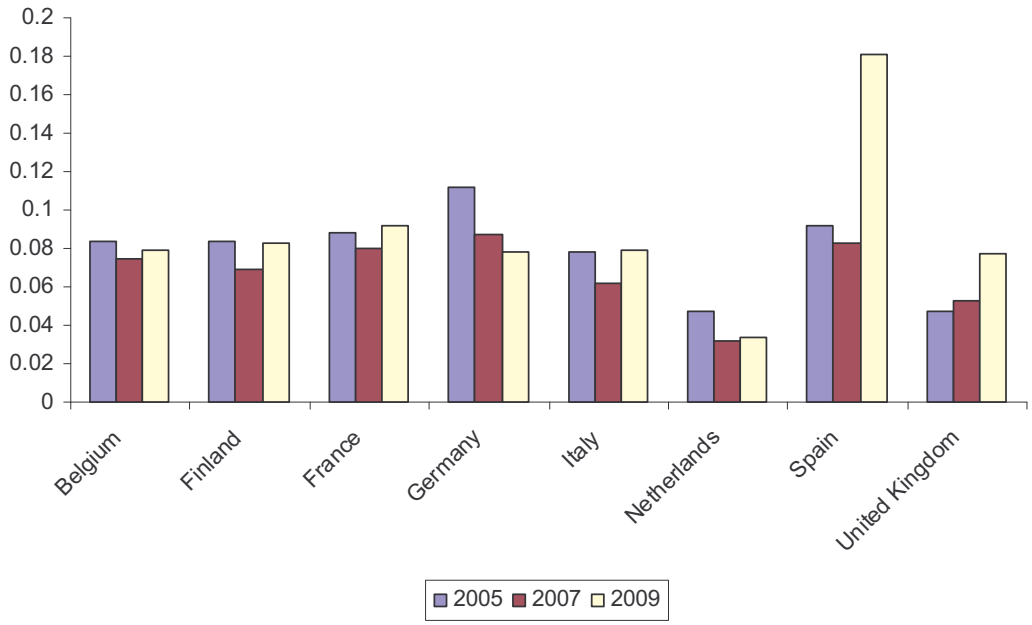
the replacement rate. As before, in order to facilitate international comparisons, we use data from the Eurostat LFS database[7], and consider only the years and the countries for which they are available, i.e. Belgium, Finland, France, Germany, Italy, the Netherlands, Spain and the United Kingdom, 2005-2010.

3. Results based on the insurance approach.

In order to understand the differences across countries (and over time) of the actuarially fair premium, we present first the main components of the expected income loss, i.e. the unemployment rate and the amount of income not replaced by the unemployment benefit.

As can be seen in fig. 1, the level and the evolution of the unemployment rate (OECD data) is fairly similar for Belgium, Finland, France, and Italy. In Germany it was higher in 2005, but then declined reaching the average level of the previous group; in Spain the opposite occurred: the unemployment rate was fairly similar to the mentioned group of countries in 1005 and 2007, but the effect of the crisis was much more pronounced. The Netherlands and the United Kingdom have lower unemployment rates, with a declining trend for the former and an increasing one for the latter.

Figure 1. Unemployment rate, various countries, various years



Source: OECD.

[7] Even though in order to distinguish between unemployed and inactive individuals one needs to present a specific request to Eurostat.

If we look at the percentage of gross earnings that are lost in the event of unemployment[8] (table 1 and 2), while there are almost no changes over time, differences between countries are very marked both in terms of levels and in terms of household composition effects. In Belgium, France, Italy and the Netherlands, the percentage lost is independent on household composition and it goes from 25-30% in the Netherlands to about 70% in the case of Italy. The UK presents the highest loss, with a small effect of a dependent spouse but no effects of children. Finland and Spain account for the presence of children (with a more pronounced effect in the case of Spain), whereas Germany accounts for both the dependent spouse and the presence of children, but the proportional loss is higher than in Finland, Spain and France. When households have two earners (and therefore higher total income), the proportional loss when both are unemployed is higher in all countries except France[9].

Table 1: Percentage of (gross) income loss due to unemployment for single and one earner households.

	2005	2006	2007	2008	2009
Belgium	66%	67%	67%	67%	61%
France	43%	43%	43%	43%	43%
Italy	71%	72%	72%	69%	69%
Netherlands	30%	30%	25%	25%	25%
UK					
s	95%	95%	95%	95%	95%
1 e	92%	93%	93%	93%	92%
Finland					
0 ch.	53%	53%	54%	55%	54%
2 ch.	48%	48%	49%	50%	49%
Spain					
0 ch.	44%	45%	44%	46%	47%
2 ch.	30%	30%	30%	30%	31%
Germany					
s, 0 ch.	65%	65%	65%	65%	65%
s, 2 ch.	61%	61%	61%	61%	61%
1e, 0 ch.	59%	60%	60%	60%	59%
1e, 2 ch.	55%	55%	55%	56%	55%

Source: Computation based on the OECD tax-benefit model; earnings are equal to the average wage for each country.

Notes: For countries in which there is no distinction according to the type of household, the percentage of income loss is the same for all types. Other specifications are: s= single, 1e = one earner households; 0ch = no children, 2 ch = two children.

[8] We consider one year of unemployment. For countries in which unemployment benefits are paid for less than a year (Italy and UK), we used the actual amount paid (i.e. 6 months for the UK and 7 months for Italy in the period 2005-2007, and 8 months in the period 2008-2009).

[9] We reported in table A2 in the Appendix the percentage of income loss when only the first or the second earner is unemployed.

Table 2: Percentage of (gross) income loss due to unemployment for two-earner households when both earners are unemployed.

	2005	2006	2007	2008	2009
Belgium	80%	80%	80%	80%	77%
France	43%	43%	43%	43%	43%
Italy	83%	83%	83%	82%	82%
Netherlands	53%	55%	51%	52%	52%
UK	95%	96%	96%	96%	95%
Finland					
0 ch.	64%	64%	65%	65%	65%
2 ch.	61%	61%	62%	63%	62%
Spain					
0 ch.	67%	67%	67%	67%	68%
2 ch.	57%	57%	57%	58%	59%
Germany					
0 ch.	64%	64%	64%	64%	64%
2 ch.	60%	60%	60%	60%	59%

Source: Computation based on the OECD tax-benefit model; earnings are equal to the average wage for the first earner and to 67% of the average wage for the second earner.
Notes: See the notes to table 1.

Clearly, losing 60% of income has very different meaning for a single individual with no children and for a one-earner household with two children. For this reason we transformed these data into an "adult equivalent loss", by dividing the expected loss of household income by the OECD equivalence scale, and then computed for each type of family the "family equivalent expected loss" by multiplying the adult-equivalent expected loss for the number of household components. Table 3 reports this expected loss as a percentage of the household income in order to allow comparisons between countries.

The expected loss is much lower than the actual one because it is multiplied by the unemployment rate, and for the same reason also differences across countries are lower. The effect of the unemployment rate on the evolution of the expected loss over time is quite strong: for single and one-earners, for example, if the income loss is constant, the rate of growth in the expected loss is the same as the growth rate of the unemployment rate[10]. For this reason, differences in the expected loss across countries in some cases have the opposite sign than those in the actual one (see e.g. the difference for single between Germany and the UK in table 1 and 3). Table 3 illustrates quite clearly that the incidence of the expected loss is generally much higher (almost double) for households with children, and is higher for one-earner households than for single. One-earner and two-earner households have similar expected losses, but the incidence *per earner* is much lower for the latter.

[10] Note that, if the latter is initially around 5-6%, an increase of two percentage points means a growth of about 33-40%.

Table 3: Family equivalent expected income loss as percentage of household income.

	0ch					2ch				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
single										
Belgium	5.6%	5.5%	5.0%	4.7%	4.8%	10.5%	10.3%	9.4%	8.8%	9.1%
Finland	4.4%	4.1%	3.7%	3.5%	4.5%	7.5%	6.9%	6.4%	6.0%	7.6%
France	3.7%	3.7%	3.4%	3.2%	3.9%	7.0%	7.0%	6.4%	5.9%	7.3%
Germany	7.3%	6.7%	5.7%	5.0%	5.1%	12.8%	11.7%	10.0%	8.8%	8.9%
Italy	5.5%	4.9%	4.5%	4.7%	5.5%	10.4%	9.3%	8.4%	8.8%	10.2%
Netherlands	1.4%	1.2%	0.8%	0.7%	0.9%	2.6%	2.2%	1.5%	1.3%	1.6%
Spain	4.1%	3.8%	3.7%	5.2%	8.4%	5.2%	4.8%	4.7%	6.4%	10.6%
UK	4.5%	5.1%	5.1%	5.1%	7.3%	8.4%	9.6%	9.5%	9.5%	13.7%
1 earner										
Belgium	7.4%	7.3%	6.7%	6.2%	6.5%	10.6%	10.4%	9.5%	8.9%	9.2%
Finland	5.9%	5.4%	5.0%	4.7%	6.0%	7.6%	7.0%	6.5%	6.1%	7.7%
France	5.0%	5.0%	4.5%	4.2%	5.2%	7.1%	7.1%	6.5%	6.0%	7.5%
Germany	8.9%	8.2%	7.0%	6.1%	6.2%	11.7%	10.7%	9.2%	8.0%	8.1%
Italy	7.4%	6.6%	5.9%	6.3%	7.3%	10.6%	9.4%	8.5%	9.0%	10.4%
Netherlands	1.9%	1.6%	1.1%	0.9%	1.1%	2.7%	2.2%	1.5%	1.3%	1.6%
Spain	5.4%	5.0%	4.9%	6.9%	11.2%	5.3%	4.9%	4.7%	6.5%	10.8%
UK	5.8%	6.7%	6.6%	6.5%	9.5%	8.3%	9.5%	9.4%	9.3%	13.5%
2 earners										
Belgium	7.0%	6.9%	6.3%	5.8%	5.6%	10.1%	9.9%	9.0%	8.2%	8.1%
Finland	5.5%	5.1%	4.6%	4.3%	5.5%	6.9%	6.4%	5.9%	5.5%	7.0%
France	4.9%	5.0%	4.5%	4.2%	5.2%	7.0%	7.1%	6.4%	5.9%	7.4%
Germany	9.5%	8.8%	7.5%	6.5%	6.7%	12.7%	11.7%	10.0%	8.8%	8.9%
Italy	7.4%	6.6%	5.9%	6.0%	7.0%	10.5%	9.4%	8.4%	8.6%	10.0%
Netherlands	1.9%	1.6%	1.1%	0.9%	1.1%	2.7%	2.2%	1.5%	1.3%	1.6%
Spain	4.7%	4.4%	4.3%	6.0%	9.6%	5.3%	4.9%	4.7%	6.5%	10.6%
UK	5.9%	6.8%	6.7%	6.7%	9.7%	8.4%	9.7%	9.5%	9.5%	13.8%

Source: Computation based on the OECD tax-benefit model and on OECD data on unemployment rates.

These results suggest that even if there are no changes in the unemployment rate or in the replacement rate, economic insecurity in one country can increase if the number of one-earner households or of households with children increases relatively to other types of households. Given the difficulty in recovering data on unemployment benefits for households different from single and couples, we illustrate an application of the approach based on the actuarially fair premium using only the latter types of households. As already mentioned, in this way we exclude a significant fraction of households, especially for Italy and Spain, and one should keep this in mind in interpreting our results.

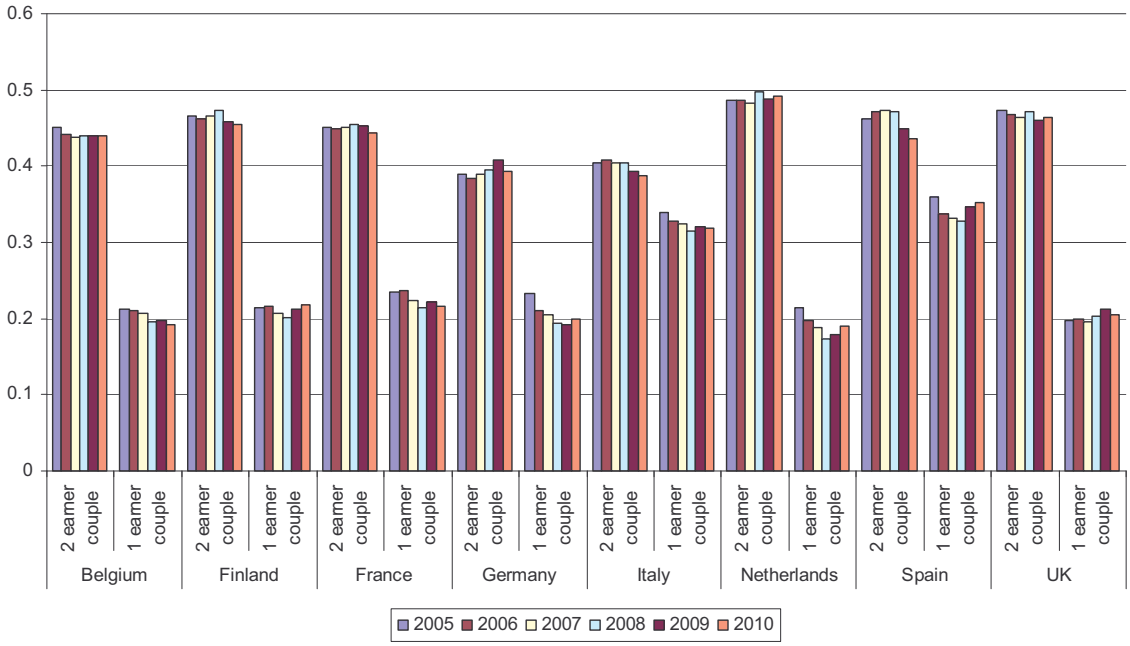
Fig.2 illustrates the incidence of one and two-earner couples on the total number of single and couples with at least one-earner (the remaining proportion is represented by single persons), and in table 4 the proportion over the same group of households with children. The incidence of one-earner couples is around 20% for all countries except Italy and Spain, for which this proportion is higher than 30%. As a consequence, for similar unemployment rate and replacement rate, the overall expected loss in these

countries will be higher. The proportion of one-earner couples is slightly decreasing for almost all countries, but with a small offsetting effect of the 2008 crisis for five countries out of eight. Giving the stable or slightly decreasing fraction of two-earner households, the category of households whose importance has increased over time among the "working" ones is that of single individuals, which should lead to a reduction in the overall expected loss.

As regards households with children, their proportion is very different in the different countries, and this would imply a different expected loss between them, higher for Spain, Italy, France and Belgium. Again, if we look at the evolution over time, the incidence of this type of households follows a declining trend in all countries except the UK, suggesting once again an offsetting effect on the overall expected loss (when restricting attention to single and couples).

If we consider all these dimensions together, we can have an idea of the evolution of the insurance premium over time. For Germany and the Netherlands we have a positive effect of the reduction in the unemployment rate, which is reinforced by a decrease in one-earner couples and in households with children, and by an increase in the replacement rate for the latter (the replacement rate for Germany remains unchanged over time). Therefore, for these two countries the insurance premium should decline over time.

Fig. 2: Incidence of one- and two-earner couples on the total number of single and couples with at least one-earner.



Source: Computation based on the data from Eurostat LFS dataset.

Table 4: Incidence of households with children on the total number of single and couples with at least one-earner.

	2005	2006	2007	2008	2009	2010
Belgium	52.8%	52.3%	51.5%	50.5%	50.5%	50.5%
Finland	37.5%	37.9%	36.5%	36.0%	36.0%	35.3%
France	50.0%	49.9%	49.3%	48.8%	48.9%	47.8%
Germany	37.7%	36.6%	36.0%	34.6%	35.6%	34.4%
Italy	58.1%	57.9%	57.4%	56.4%	55.9%	55.3%
Netherlands	43.3%	42.2%	41.8%	41.8%	41.3%	41.7%
Spain	63.0%	62.7%	60.9%	60.3%	60.0%	61.0%
UK	42.9%	42.1%	42.6%	42.7%	43.1%	43.6%

Source: Computation based on the data from Eurostat LFS dataset.

For Spain and the UK we have an opposite result: they both have a marked increase of the unemployment rate, which is accompanied by a reduction in the replacement rate for Spain (unchanged for the UK), and a slight increase in households with children and no reduction in one-earner households for the UK (a slight reduction in the former and a U-shape pattern in the latter for Spain). In the remaining four countries we have a U-shape pattern for the unemployment rate and a decreasing importance of households with children and with one-earner, which should mitigate the increase in the unemployment rate in the more recent years. For Belgium and Italy there is also a positive effect of the reduction in the replacement rate, whereas for Finland and France this is not so.

Indeed, the evolution of the insurance premium for the different countries reported in fig.3 (actual values are reported in tables A3 and A4 in the appendix), follows the trends outlined above: declining for Germany and the Netherlands (strongly for the former and slightly for the latter given the low initial level); increasing for Spain and the UK; with a U-shape for Italy, France and Finland. Note that it has a declining trend also for Belgium, meaning that for this country the positive effects of the increase in the replacement rate and of household composition offset the negative effect of the increase in the unemployment rate in the last years.

As an illustration of the consequences of using this measure in the IEWB, we computed the scaled index of the premium (as percentage of the average wage) and compared it with the index of economic security related to unemployment in the IEWB. In order to account for the fact that the scaling of our measure is based on a smaller number of years and countries, we rescaled the IEWB measure considering only the same group of countries over the same years. Results are reported in table 5 (recall that an increase in the indices means an increase in economic *security)*. Unfortunately, the scaling rule applied with such a small number of countries and years implies huge changes in the indices over time for the countries to which the scale is anchored (see e.g. the pattern of our measure for the UK and of the IEWB for Spain). For this reason we do not compare the pattern of the two measures, but simply the order of countries in the initial and the final year, that we report in table 6. While there is no difference in the least secure and the most secure according to the two measures, intermediate positions are different: the insurance premium classifies Belgium, Italy and the UK much less secure than the IEWB and Spain much more secure in 2005. In 2009, again Belgium and Italy appear

much less secure according to our measure, whereas Germany and France much more secure.

Fig.3: Insurance premium as a percentage of the average wage.

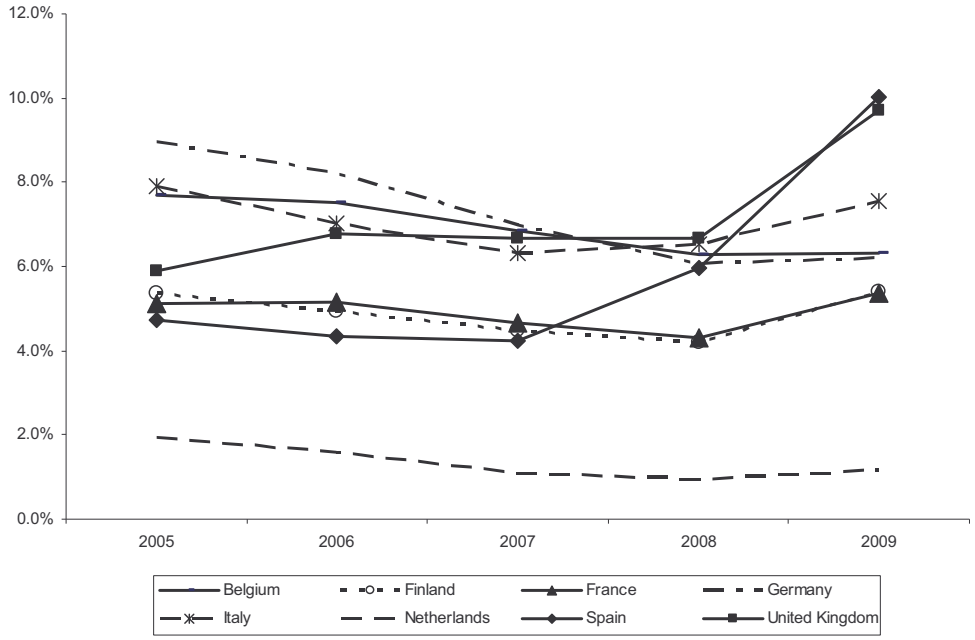


Table 5: Index of (scaled) per earner insurance premium (as a percentage of the average wage), and the rescaled index of employment security of the IEWB.

	2005	2006	2007	2008	2009
Index of employment security based on insurance premium					
Belgium	0.298	0.313	0.376	0.428	0.423
Finland	0.512	0.551	0.592	0.619	0.509
France	0.533	0.531	0.576	0.609	0.512
Germany	0.181	0.250	0.361	0.446	0.434
Italy	0.278	0.360	0.425	0.405	0.310
Netherlands	0.825	0.857	0.904	0.917	0.898
Spain	0.570	0.604	0.615	0.457	0.083
UK	0.461	0.382	0.390	0.391	0.114
Rescaled index of employment security in IEWB					
Belgium	0.669	0.675	0.707	0.728	0.688
Finland	0.637	0.664	0.698	0.719	0.637
France	0.641	0.644	0.679	0.702	0.626
Germany	0.450	0.488	0.557	0.607	0.598
Italy	0.648	0.687	0.715	0.687	0.641
Netherlands	0.799	0.830	0.857	0.876	0.847
Spain	0.608	0.636	0.647	0.513	0.221
UK	0.666	0.642	0.656	0.656	0.550

Table 6: Ranking of countries from less to more secure according to different measures of employment security, 2005-2009

2005		2009	
IEWB	Insurance premium	IEWB	Insurance premium
Germany	Germany	Spain	Spain
Spain	Italy	UK	UK
Finland	Belgium	Germany	Italy
France	UK	France	Belgium
Italy	Finland	Finland	Germany
UK	France	Italy	Finland
Belgium	Spain	Belgium	France
Netherlands	Netherlands	Netherlands	Netherlands

Clearly these results may be strongly affected by the exclusion of a significant proportion of households in the construction of the insurance premium. However, the sign of this effect is not so clear because, for example, in 2005 it goes in opposite directions for Italy and Spain, the two countries where the exclusion restrictions are more relevant.

Summarizing, the insurance approach has a direct and simple interpretation: the percentage of the average wage that would be required from each earner in order to insure the aggregate expected loss of the country, after expressing each household income in terms of adult-equivalent. For similar unemployment and replacement rates, the higher the proportion of households with children or of one-earner households, the higher this premium. Our results suggest that the level of economic insecurity measured through this index may be quite different from the one measured by the index of economic security in the event of unemployment used in the IEWB. However, the specific differences between the two approaches illustrated in this section should be taken with caution because the universe of households considered is quite different especially for some countries

4. Evidence on the IUDR

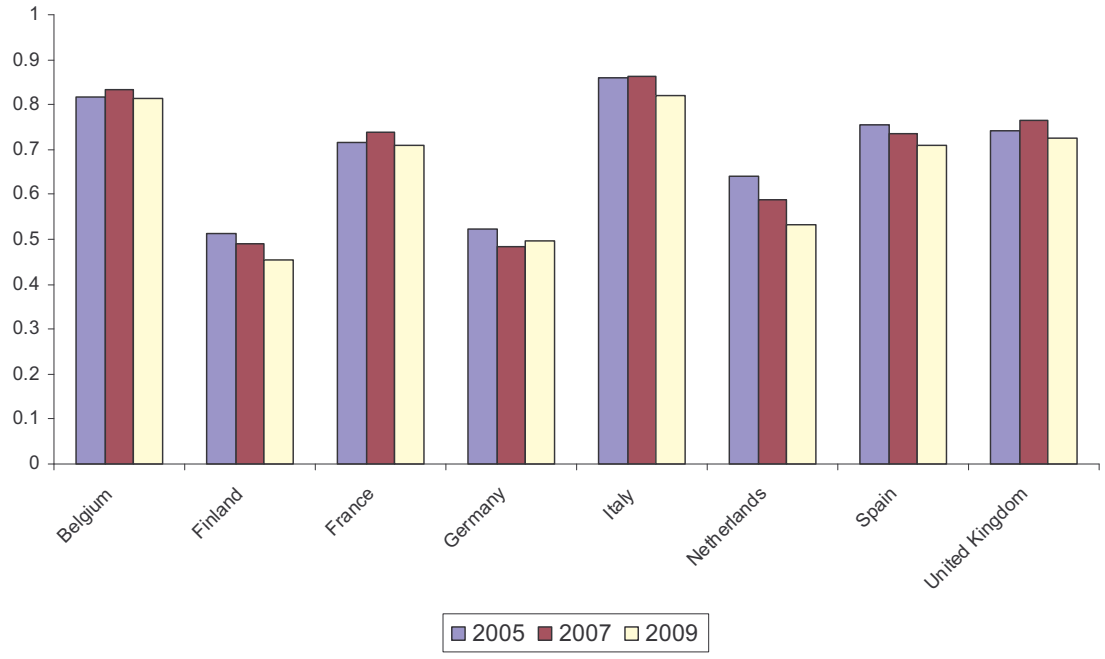
The dataset we use for calculating the IUDR is an extraction of the Eurostat database (LFS) and reports the number of households in each country according to the combination of the number of employed, unemployed and inactive individuals, and the number of children. Since each of these variables is top-coded at 3, we first check whether this may represent a relevant problem, by calculating the unemployment rate with our data and comparing it with the OECD one. As can be observed in table A5 in the appendix, differences between the two measures are negligible (between 0 and 0.008 percentage points).

The level and evolution of the IUDR for the various countries is illustrated in fig.4 (actual values are reported in table A6 the appendix). Note first the differences in the

levels of this index for the various countries. Italy and Belgium have an IUDR higher than 0.8. On the contrary, this ratio is below 0.5 in Finland and Germany. The trend is decreasing in five countries out of eight (particularly in the Netherlands), and fairly stable in Belgium, France and the UK.

These results suggest that the unemployment risk affects quite a different number of persons in the various countries, with the consequence that the overall level of insecurity associated to similar unemployment and replacement rates may be quite different. The implications of this for the index of economic security related to unemployment in the IEWB are illustrated in table 7 and 8, where we report respectively the index with the IUDR, and the differences with the corresponding index without the IUDR.

Fig. 4: Inactive-Unemployed Dependency Rate, various years.



Source: Calculation based on Eurostat database (LFS)

Economic security (related to employment security) increased in the first three years considered for all countries except the UK. The inversion of the trend was anticipated in Italy and Spain compared with the other countries (in 2008 instead of 2009), with a final level of security lower than the initial one in the case of France, Spain and the UK. The effect of introducing the IUDR is negative and quite large in all years for Italy, Belgium, and the UK, and it is also negative but smaller for France and the Netherlands. For Finland and Germany we have a positive effect in all years, particularly large for Germany, whereas for Spain the effect changes its sign from negative to positive in the

last year (when the decrease in the IUDR mitigates the huge increase in the unemployment rate).

Table 7. Index of employment security including the IUDR

	2005	2006	2007	2008	2009
Belgium	0.585	0.576	0.605	0.631	0.599
Finland	0.675	0.707	0.729	0.752	0.697
France	0.602	0.606	0.621	0.643	0.593
Germany	0.515	0.556	0.610	0.638	0.635
Italy	0.539	0.567	0.587	0.564	0.548
Netherlands	0.745	0.773	0.808	0.828	0.823
Spain	0.556	0.592	0.593	0.507	0.285
UK	0.571	0.556	0.558	0.561	0.495

Sources: calculation based on Eurostat database (LFS)
Notes: weights 0.6 to unemployment rate, 0.2 to replacement rate and 0.2 to inactive-unemployed dependency rate

Table 8. Differences in the index of employment security with and without the IUDR

	2005	2006	2007	2008	2009
Belgium	-0.085	-0.100	-0.103	-0.097	-0.089
Finland	0.038	0.043	0.031	0.032	0.060
France	-0.040	-0.039	-0.058	-0.059	-0.033
Germany	0.065	0.068	0.053	0.030	0.038
Italy	-0.109	-0.120	-0.128	-0.123	-0.092
Netherlands	-0.053	-0.057	-0.049	-0.049	-0.025
Spain	-0.052	-0.045	-0.054	-0.006	0.064
UK	-0.095	-0.087	-0.098	-0.095	-0.055

Sources: calculation based on Eurostat database (LFS)
Notes. Index with IUDR: weights 0.6 to unemployment rate, 0.2 to replacement rate and 0.2 to inactive-unemployed dependency rate. Index without IUDR: weights 0.8 to unemployment rate, 0.2 to replacement rate.

If we compare the order of countries in terms of employment security (from the less to the more secure) reported in table 9, we can see that taking into account the inactive-unemployed dependency rate Belgium and Italy become relatively less secure in both 2005 and 2009 (Italy moves from the 5th to the 2nd position in 2005 and from the 6th to the 3rd in 2009), whereas Finland becomes more secure. In 2005 UK is less secure, whereas France and Spain are more secure; in 2009 Germany becomes more secure.

These results suggest that our evaluation of the overall risk related to the possibility of losing one's job, and also international comparisons, are quite different if we consider all the individuals in the households that are potentially affected by this risk or solely those who participate in the labour market.

Table 9: Ranking of countries from less to more secure according to the index of employment security with and without the IUDR, 2005-2009

2005		2009	
without IUDR	with IUDR	without IUDR	with IUDR
Germany	Germany	Spain	Spain
Spain	Italy	UK	UK
Finland	Spain	Germany	Italy
France	UK	France	France
Italy	Belgium	Finland	Belgium
UK	France	Italy	Germany
Belgium	Finland	Belgium	Finland
Netherlands	Netherlands	Netherlands	Netherlands

5. Conclusions

In this paper we propose two new measures for the economic (in)security related to employment risk, that take into account the household composition of the unemployed. Usually the degree of risk related to the possibility of unemployment is evaluated considering only the unemployment rate and the replacement rate, i.e. restricting the attention to individuals who participate in the labor market. However, the consequences of this risk for the active members, as well as for the whole society, may be quite different according to the number of persons who depend on their income. In this paper we investigated two ways in which one can take into account the consequences of unemployment for this people: by computing a *per-earner* actuarially-fair insurance premium to cover the aggregate *equivalent* expected loss (i.e. the sum over all individuals living in households at risk of the corresponding adult-equivalent expected loss); and by considering the *inactive-unemployed dependency rate*, i.e. the (weighted) average of inactive individuals for each unemployed person in the country.

The interpretation of the measure based on the insurance approach is quite simple: the percentage of the average wage that would be required from each earner in order to insure the aggregate adult-equivalent expected loss of the country. For similar unemployment and replacement rates, the higher the proportion of households with children or of one-earner households, the higher the premium. The main disadvantage of this approach is that it requires data on unemployment benefits for various types of household and number of employed individuals in the household. The OECD tax benefit model provides data only for single and couples (with 0 or 2 children), and restricting attention to these types of households may cause significant problems for countries where the proportion of multiple-adult households is relevant (like, for example, Italy and Spain). In any case we provide an illustration of this approach using data on single and couples. Our results suggest that the level of economic insecurity measured through this index may be quite different from the one measured by the index of employment security used in the IEWB. However, the specific differences between the two approaches may not be robust because the universe of households considered is quite different especially for some countries.

Also the interpretation of the inactive-unemployed dependency rate (IUDR) is quite simple: the average number of persons that each unemployed individual has to provide for (beyond herself). Furthermore, this approach has the advantage of requiring only data on the number of households according to the number of unemployed, employed, and inactive individuals. Differences across countries in the level and evolution of the IUDR are quite marked: in Italy and Belgium each unemployed individual has on average 0.8 persons that depend on his/her income, whereas in Finland, Germany, and the Netherlands only about a half. The trend is decreasing in five countries out of eight (particularly in the Netherlands), and fairly stable in Belgium, France and the UK. When we add the IUDR in the measure of employment security, the relative position of various countries change, suggesting that the overall level of insecurity associated to similar unemployment and replacement rates may be quite different if we consider all the individuals in the households that are potentially affected by this risk or solely those who participate in the labour market.

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Appendix

Table A1. Percentage of households other than single and couples over total number of households (excluding students and inactive aged 64 or more)

	2005	2006	2007	2008	2009
Belgium	23.8%	24.0%	25.1%	24.6%	24.3%
Finland	10.0%	9.9%	9.9%	9.6%	9.8%
France	14.4%	14.6%	14.1%	13.9%	13.6%
Germany	16.7%	16.4%	16.6%	16.2%	15.7%
Italy	33.8%	33.3%	32.7%	31.9%	31.2%
Netherlands	11.8%	10.4%	10.0%	10.6%	10.0%
Spain	42.2%	41.5%	40.6%	39.1%	36.8%
UK	19.1%	19.0%	18.8%	19.3%	19.0%

Source: calculation based on Eurostat, LFS

Table A2. Percentage of income loss due to unemployment, two earners, only one unemployed

		2005	2006	2007	2008	2009
Belgium	I e	41%	42%	42%	41%	37%
	II e	22%	22%	22%	21%	17%
France	I e	26%	26%	26%	26%	26%
	II e	16%	17%	17%	17%	17%
Italy	I e	43%	43%	43%	42%	41%
	II e	28%	28%	28%	25%	25%
Netherlands	I e	18%	18%	15%	15%	15%
	II e	12%	12%	10%	10%	10%
UK	I e	57%	57%	57%	57%	57%
	II e	37%	37%	37%	37%	37%
Spain	I e, 0ch	26%	27%	27%	27%	28%
	I e, 2ch	18%	18%	18%	18%	19%
	II e	12%	12%	12%	12%	12%
Finland	I e, 0ch	31%	32%	32%	33%	32%
	II e, 0ch	18%	18%	18%	18%	18%
	I e, 2ch	28%	29%	29%	30%	29%
	II e, 2ch	15%	15%	15%	15%	15%
Germany	I e, 0ch	38%	38%	39%	39%	38%
	II e, 0ch	26%	26%	26%	26%	26%
	I e, 2ch	36%	36%	36%	36%	36%
	II e, 2ch	24%	24%	24%	24%	24%

Source: Computation based on the OECD tax-benefit model; earnings are equal to the average wage for the first earner and to 67% of the average wage for the second earner.
Notes: I e = first earner (i.e. the one with earnings equal to the average wage) unemployed, II e = second earner (i.e. the one with earnings equal to 67% of the average wage) unemployed; 0ch = no children, 2 ch = two children.

Table A3. Per-earner insurance premium

	2005	2006	2007	2008	2009
Belgium	2817.3	2769.6	2536.6	2342.1	2384.8
Finland	1755.0	1631.9	1550.7	1465.5	1883.0
France	1549.9	1566.6	1426.9	1309.5	1649.6
Germany	3469.0	3156.9	2708.5	2350.7	2367.9
Italy	1886.7	1691.7	1523.4	1625.9	1917.5
Netherlands	753.6	643.0	445.1	392.7	482.4
Spain	974.2	889.9	874.4	1249.1	2189.7
UK	2619.9	3043.0	3098.5	3000.5	4336.9

Source: calculation based on the OECD tax-benefit model and Eurostat, LFS. See the text for details.

Table A4. Per-earner insurance premium as a percentage of the average wage

	2005	2006	2007	2008	2009
Belgium	7.7%	7.5%	6.8%	6.3%	6.3%
Finland	5.4%	4.9%	4.5%	4.2%	5.4%
France	5.1%	5.2%	4.7%	4.3%	5.4%
Germany	9.0%	8.2%	7.0%	6.1%	6.2%
Italy	7.9%	7.0%	6.3%	6.5%	7.6%
Netherlands	2.0%	1.6%	1.1%	1.0%	1.2%
Spain	4.7%	4.4%	4.2%	6.0%	10.0%
UK	5.9%	6.8%	6.7%	6.7%	9.7%

Source: calculation based on the OECD tax-benefit model and Eurostat, LFS. See the text for details.

Table A5. Differences between the OECD unemployment rate and the one calculated using the Eurostat database.

	2005	2006	2007	2008	2009
Belgium	0.003	0.002	0.003	0.003	0.004
Finland	-0.028	-0.026	-0.018	-0.012	0.006
France	-0.003	0.004	-0.002	-0.039	-0.088
Germany	0.035	0.032	0.026	0.020	0.003
Italy	-0.011	-0.020	-0.018	-0.006	-0.014
Netherlands	-0.029	-0.028	-0.028	-0.038	-0.043
Spain	0.048	0.045	0.053	0.088	0.148
UK	0.002	0.001	0.001	-0.001	0.004

Source: calculation based on Eurostat, LFS. See the text for details.

Table A6. The inactive-unemployed dependency rate.

	2005	2006	2007	2008	2009
Belgium	0.817	0.848	0.834	0.808	0.813
Finland	0.514	0.482	0.490	0.472	0.455
France	0.716	0.712	0.738	0.727	0.709
Germany	0.522	0.490	0.484	0.509	0.497
Italy	0.859	0.861	0.863	0.866	0.820
Netherlands	0.639	0.628	0.588	0.575	0.534
Spain	0.756	0.720	0.736	0.701	0.708
UK	0.741	0.741	0.765	0.757	0.724

Source: calculation based on Eurostat, LFS. See the text for details.

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