Taxes on Social Benefits in the EU. A distribution analysis using EUROMOD*

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Nederlandse samenvatting

Recent adviseerde de OESO in haar "Economic Survey 2005" van België om de uitkeringen van oudere werklozen en bruggepensioneerden op dezelfde wijze te belasten als inkomen uit arbeid. Hoe hoog zijn nu echter de belastingen op werkloosheidsuitkeringen en pensioenen in België in vergelijking met andere EU-landen? Hoe groot is het verschil tussen bruto en netto in vergelijking met lonen in de EU-15? In dit bericht proberen we deze vragen te beantwoorden met behulp van het Europese microsimulatiemodel EUROMOD. Met dit model kunnen we empirisch de verdelingseffecten nagaan van belastingen op uitkeringen.

We kunnen onze vaststellingen en besluiten als volgt samenvatten:

1) De meest opvallende vaststelling is dat de gemiddelde pensioenen in België aan de onderkant van de inkomensverdeling vrij laag zijn in vergelijking met andere landen, en dit ondanks het feit dat de belastingdruk op pensioenen daar zeer gering is.

2) De belastingdruk op uitkeringen is in België duidelijk lager dan in de Scandinavische landen en Nederland, maar hoger dan in onze andere buurlanden. Gemiddeld worden pensioenen en werkloosheidsuitkeringen minder zwaar belast dan lonen in alle 15 EU-landen. Hiervoor zijn drie redenen. Ten eerste zijn de bruto inkomens van ouderen en werklozen over het algemeen lager dan de inkomens van werkenden. Doordat de personenbelasting progressief is, leidt dit tot een zwaardere last voor werkenden. Ten tweede hebben een aantal landen speciale voorzieningen opgenomen in hun personenbelasting voor ouderen, voor pensioenen en werkloosheidsuitkeringen. Ten derde betalen gepensioneerden en werklozen veel minder (in sommige landen geen) sociale bijdragen.

3) De gemiddelde belastingvoet op pensioenen aan de onderzijde van de inkomensverdeling is zeer laag in België, Frankrijk, Groot-Brittannië, Ierland, Italië, Portugal en Spanje. Dit komt enerzijds door de belastingvoordelen (een belastingvermindering voor ouderen in Groot-Brittannië en Ierland; een belastingkrediet voor pensioenen in België; een belastingaftrek voor pensioenen in Portugal), en anderzijds door het feit dat de laagste pensioenen geen of nauwelijks sociale bijdragen betalen. De belastingdruk voor lage pensioenen is het hoogst in Nederland, Zweden en vooral Denemarken; in de twee Scandinavische landen is dit hoofdzakelijk te wijten aan de personenbelasting, terwijl het in Nederland om vrij hoge sociale bijdragen gaat. Voor de hoge inkomensgroepen blijkt de belastingdruk op pensioenen veel dichter in de buurt te komen van die op lonen.

4) In de meeste landen is het verschil tussen bruto en netto werkloosheidsuitkeringen zeer klein of nul, zeker aan de onderkant van de inkomensverdeling. De uitzonderingen zijn alweer Nederland en de Scandinavische landen, door resp. de sociale bijdragen en de belastingen.

5) Wat betreft de netto bedragen is er vooral een grote variatie tussen landen aan de onderkant van de inkomensverdeling. Ondanks het feit dat de Belgische pensioenen in het onderste inkomensdeciel nauwelijks belastingen of bijdragen betalen is het netto pensioen

vrij laag in vergelijking met andere landen. Dit geldt ook voor de laagste lonen. Naarmate we echter opklimmen in de inkomensverdeling komen de gemiddelde netto uitkeringen en lonen voor de verschillende landen dichter bij mekaar te liggen.

6) De manier waarop belastingen worden geheven op pensioenen zorgt in de meeste landen voor een vermindering van de inkomensongelijkheid tussen loontrekkenden en ouderen. Dit is te verklaren door het feit dat de personenbelasting op pensioenen in alle landen merkelijk veel progressiever is dan die op lonen, o.m. door de reeds genoemde belastingvoordelen die vooral de lage pensioenen ten goede blijken te komen. Dit is vooral in Duitsland zeer sterk het geval; het gaat veel minder op in Denemarken en Griekenland. Een gelijkaardige conclusie geldt voor de werkloosheidsuitkeringen, omdat deze in de meeste landen niet of nauwelijks belast worden.

1. Introduction

In this paper we investigate the different ways of levying taxes on replacement incomes, and how this affects the distribution of gross and net social benefits? We investigate this empirically for the 15 countries that formed the European Union before 1st May 2004 (henceforth called the EU-15). We limit ourselves in this article to the tax treatment of replacement incomes, and more specifically old age pensions and unemployment benefits. In section 2 we describe the various links between taxes and social policy. We use the European microsimulation model EUROMOD, which is briefly presented in section 3. There we also describe the methodology used to measure inequality and progressivity of taxes on replacement incomes. In section 4 we present our empirical results. Section 5 summarises our main findings and conclusions.

2. Taxes and social policy

2.1 'Fiscal welfare'

The tax system and the social security system each have their own logic and objectives. Taxes raise revenue and have to be levied according to the principles of horizontal (i.e. equal treatment of equals) and vertical equity (i.e. taxation according to economic strength) (Musgrave, 1959). The basic goals of social security are 1) guaranteeing a minimum level of resources for everyone, and 2) maintaining (unto a certain extent) the acquired standard of living (see a.o. Atkinson, 1987). This means that social security is based on both the solidarity and the insurance principle. However, the weight attached to one of these principles differs according to the type of welfare state: the so-called Bismarckian systems are grounded on the insurance principle, whereas the Beveridgean model is said to be based on the principle of solidarity. The emphasis on one of these principles can also vary for the different social security schemes, and can evolve over time. Within the framework of the 'Active Welfare State' these two principles have been supplemented with the goal of activation (i.e. (re-)integration of individuals in the working process); in some countries this aim is put into practice through the tax system (e.g. the Working Tax Credit in the UK).

Up until now researchers have paid little attention to the role that the tax system plays as a social policy instrument. An exception is the field of family policy, where e.g. the joint effect of child benefits and tax concessions for children has been studied (e.g. Bradshaw and Finch, 2002; O'Donoghue and Sutherland, 1999). But also in the other sectors of social security there are many interactions between the tax and the benefit system. Both social security benefits and personal income taxes affect disposable income of households, as well as the distribution of these incomes. Both play a prominent role in the redistribution process. Moreover, there is an increasing overlap between taxpayers and benefit recipients. Both systems are also technically linked: apart from the so-called 'social-fiscal' measures (cf. infra) there are links through the fact that both social contributions and social benefits can be part of taxable income.

As early as the 1950s Titmuss emphasised that the Welfare State is not only shaped by social services and benefits, but also by the tax system. The total of social services and benefits was labelled by him as '*social welfare*', while the tax revenue lost in meeting needs or objectives similar to public welfare received the term '*fiscal welfare*': "Allowances and reliefs from income tax, though providing similar benefits and expressing a similar social purpose in the recognition of dependencies, are not, however, treated as social service expenditures. While one is 'a cash transaction', the other is 'an accounting convenience'. Despite this difference in administrative method, the tax saving that accrues to the individual is, in effect, a transfer" (Titmuss, 1969). Titmuss wanted to make clear that in many countries the tax system can to some extent serve as an alternative for the social security system. This was translated by Adema et al. (1996) into the concept of "social-fiscal measures", which are defined as "those reductions, exemptions, deductions or postponements of taxes, which (a) perform the same policy function as cash transfers which, were they to exist, would be classified as social expenditures; or (b) are aimed at stimulating private provisions of benefits". This also corresponds to what Kvist and Sinfield (1997) call 'tax benefits', analogous to social benefits.

Such a social-fiscal measure can be applied in different forms. The OECD (1984, 1996a) distinguishes the following categories of tax reliefs:

1) *tax allowance*: in this case a tax unit can deduct a fixed amount of its taxable income. As most tax systems are progressive, the amount of the advantage increases with income, and as such it favours the higher income groups;
2) *income-related tax deduction*: when an amount is subtracted from taxable income that is not fixed but that depends on the level of the income, this is called an income-related tax deduction;
3) *tax credit*: this is a (fixed) amount that is subtracted from the tax liability. If the tax credit exceeds tax liability, two possibilities arise: either the amount of the excess of the tax credit over the tax liability is paid to the taxpayer, in which case it is a 'non-wastable tax credit', or this does not happen, and then the tax credit is 'wastable', providing no or a minor advantage to the lowest income groups;
4) *tax exemption*: part of income or specific sources of income are tax exempt. If exemptions are applied at the bottom of the tax scale, then the effect is analogous to that of a tax credit. If a certain source of income is not included in taxable income, then the effect is similar to that of a tax allowance;
5) *preferential tax rate*: some incomes or sources of income are taxed at a lower rate than others are. This can be done a.o. by dividing taxable income in different parts, such that each part is taxed at a lower marginal rate. This technique is often used when treating married couples.

Research has shown that the tax treatment of replacement incomes differs widely among countries. Consequently, the ranking of countries by aggregate expenditure level is different for gross and net social expenditures (Adema et al., 1996; Adema, 1999). On a micro level this is translated into a difference between gross and net benefits, which can vary widely among countries.

2.2 The tax treatment of the elderly and unemployed in the EU-15

Social-fiscal measures are also used to lower the tax burden on old age income or on unemployment allowances. Consequently, their tax treatment is quite often distinct from that of income from work. Table 1 presents an overview of the special provisions in the personal income tax system for old age and unemployment benefits in the EU-15.

Table 1. Special provisions in the personal income tax system for old age/pensions and unemployment in the EU-15, EUROMOD, 1998.

	Concessions for old age or for pensions	Concessions for unemployment benefits
Austria	Tax credit for pensioners	Unemployment benefits are tax exempt
Belgium	**Tax credit for pension incomes** **Guaranteed minimum income for old persons is tax exempt**	**Tax credit for unemployment benefits**
Denmark	-	-
Finland	Deduction for pensions	-
France	Minimum pension and social benefit for dependent elderly are tax exempt Deduction for pensions	-
Germany	Deduction for old age, for pensions	Unemployment benefits are tax exempt
Greece	-	-
Ireland	Tax allowance for old age	Unemployment benefits are tax exempt
Italy	Social pension is tax exempt Tax credit for pensioners	-
Luxembourg	Deduction for pensioners	-
Netherlands	Tax allowance for old age	
Portugal	Deduction for pension income	Unemployment benefits are tax exempt
Spain	Tax credit for elderly inactive	
Sweden	Part of pensions are deducted from taxable income, and thus tax exempt	
UK	Tax allowance for old age and for married old age couples	

Source: Country notes of EUROMOD.

Pensions are in almost all countries part of taxable income, though often provisions for old age or for pension income have been made (see also Fenge and Werding, 2004; Keenay and Whitehouse, 2003a and 2003b). Part of pension income is tax exempt in Belgium, Finland, France, Germany, Italy, Luxembourg, Portugal and Sweden. In Belgium, France and Italy pensions that can be characterised as a guaranteed social minimum are not taxable. In Finland, Sweden and Luxembourg older people are entitled to a special deduction that depends on the level of pension income. Germany has made the most extensive favourable tax treatment for pension income: the share of public pensions that is taxable depends on age (e.g. 38% of public pensions are taxable when the individual is aged 55, 27% is taxable at age 65 and 21% at age 70). Ireland, the Netherlands and the UK have a tax allowance for old age, which means that for individuals older than 65 a fixed amount can be deducted from taxable income. A tax credit is granted in Austria, Belgium and Spain; in Austria and Belgium the tax credit depends on the level of pension income, whereas in Spain the tax advantage is granted to inactive persons older than 65.

Unemployment benefits are partly or entirely tax exempt in Austria, Germany, Ireland and Portugal. Belgium provides a tax credit for unemployment benefits, which is designed in such a way that the households whose income consists only of these benefits do not pay taxes.

2.3 Social contributions on replacement incomes in the EU-15

The tax burden on replacement incomes can also consist of social insurance contributions. As is shown in table 2, also in this field replacement incomes are not treated in the same way as income from work. In all countries mandatory social insurance contributions are levied on income from work. In four countries no SIC are levied on either pensions or unemployment allowances (Ireland, Italy, Portugal and UK). In all other countries recipients of either pensions or unemployment allowances also pay contributions, though in most cases the rate is lower than on income from work (see also Verbist, 2004).

Table 2. Basis for levying social insurance contributions in the EU-15, EUROMOD, 1998.

SIC on	Income from work	Pensions	Unemployment benefits
Austria	x	x	
Belgium	**x**	**x**	
Denmark	x		x
Finland	x	x	x
France	x	x	x
Germany	x	x	
Greece	x	x	
Ireland	x		
Italy	x		
Luxembourg	x	x	x
Netherlands	x	x	x
Portugal	x		
Spain	x		x
Sweden	x		x
UK	x		

Source: Country notes of EUROMOD.

3. EUROMOD and the calculation of taxes on replacement incomes

3.1 EUROMOD

EUROMOD is a tax-benefit model for the EU-15 countries (for more information, see Immervoll et al., 1999; Sutherland, 2001)[1]. EUROMOD is a static empirical microsimulation model, which covers a major part of the national personal income tax and social benefits systems of the EU-15. It calculates taxes and benefits for a representative set of micro-data. These national datasets are collected at various points in time between 1993 and 1998, but have all been adjusted to 1998 prices and incomes. Policy measures in the model used here also refer to 1998.

Gross income components are taken directly from the dataset or, where necessary, are imputed from net income (see Immervoll and O'Donoghue, 2001; see Verbist (2004) for the composition of gross income in each country). To arrive at disposable or net income we subtract personal income taxes and social insurance contributions from gross income. Social insurance contributions do not include employer contributions, following customary practice of most distribution studies.

3.2 Defining the elderly, unemployed and workers and their income

We compare the income position of old age and unemployed individuals with that of workers. *Workers* are either employees or civil servants and have a strictly positive value for income from employment and who have no replacement income (i.e. unemployment benefits, pensions, invalidity allowances). The self-employed have been excluded. There is also an age limit: only individuals who are 18 and older and who have not yet reached the age of 60 are classified here as workers. *Old age individuals* are all individuals older than 65. The age of 65 is the most common state pension age in EU countries; recent increases in pension age indicate a convergence on this level in the future (Disney and Whitehouse, 1999). The samples used in EUROMOD all refer to private households; this means that the elderly living

[1] EUROMOD relies on micro-data from 15 different sources for fifteen countries. These are the European Community Household Panel (ECHP) User Data Base made available by Eurostat (Wave 2 – 1995 for Denmark and Greece; W3 – 1996 for Portugal and Spain); the Austrian version of the ECHP (W5, 1999) made available by the Interdisciplinary Centre for Comparative Research in Social Sciences; the Panel Survey on Belgian Households (PSBH, W6, 1999) made available by the University of Liège and the University of Antwerp; the Income Distribution Survey made available by Statistics Finland (1998); the Enquête sur les Budgets Familiaux (EBF, 1994/5) made available by INSEE; the public use version of the German Socio Economic Panel Study (GSOEP, W15, 1998) made available by the German Institute for Economic Research (DIW), Berlin; the Living in Ireland Survey (W1, 1994) made available by the Economic and Social Research Institute; the Survey of Household Income and Wealth (SHIW95, 1996) made available by the Bank of Italy; the Socio-Economic Panel for Luxembourg (PSELL-2, W5, 1999) made available by CEPS/INSTEAD; the Socio-Economic Panel Survey (SEP, W3, 1996) made available by Statistics Netherlands through the mediation of the Netherlands Organisation for Scientific Research - Scientific Statistical Agency; the Income Distribution Survey (1997) made available by Statistics Sweden; and the Family Expenditure Survey (FES, 1995/6) made available by the UK Office for National Statistics (ONS) through the Data Archive. Material from the FES is Crown Copy right and is used by permission. Neither the ONS nor the Data Archive bear any responsibility for the analysis or interpretation of the data reported here. An equivalent disclaimer applies for all other data sources and their respective providers cited in this acknowledgement.

in an institution are not represented in the study. The proportion of old age individuals in institutional households varies widely among countries (for figures see e.g. OECD, 1996b). *Unemployed* are those individuals which either have a strictly positive value for unemployment benefits or have 'Unemployed' as their employment status. The same age limits apply as for workers. For Luxembourg the absolute number of unemployed in the sample is too small to have a reliable analysis; therefore the results for this country are not included for this part of the analysis.

For these three categories of individuals we will investigate the impact of taxes on the income components that are specific for their category, namely income from work for workers, pension income for the elderly and unemployment benefits for the unemployed. *Income from work* (or earnings) equals gross income from employment and includes also 13^{th} / 14^{th} monthly salaries, as well as other employment incomes, such as bonuses, extra holiday pay, occasional pay etc. *Pensions* include both public and private pensions, as we are interested in the effects of taxes on income that is old age specific. *Unemployment benefits* are those benefits that are aimed specifically at the unemployed and include both insurance-related and social assistance allowances.

3.3 Measuring taxes on replacement incomes

It is not obvious how to calculate the exact amount of taxes on replacement incomes as personal income taxes are often levied on the total of taxable income. Some assumptions are required to allocate taxes to the different income sources. There are two possible methods: the *marginal* and the *proportional method* (Verbist, 2002; Eklind et al., 2003). With the marginal method one compares the present system with one in which replacement incomes are tax exempt; the difference between both systems is a measure of the tax burden on benefits. This method is the most appropriate for calculating the cost of changes in a specific income component. However, it overestimates taxes paid on each income component, so that the total of taxes on the income components is larger than taxes calculated on total income. With the proportional method we attribute taxes to income components according to their respective shares in taxable income before application of allowances and deductions (for the specification of allowances and deductions, see Verbist, 2004). We use here the proportional method. This means that we have to specify for each country: a) taxable replacement incomes (RY); b) taxable income before applications of tax deductions and tax allowances (Y); c) taxes to be apportioned (T). Taxes on replacement income (T_{RY}) are then: $T_{RY} = T * RY / Y$.

When replacement incomes are part of income liable for social insurance contributions, the same procedure is applied for these contributions.

3.4 Measures of inequality and progressivity of taxes on replacement incomes

Our unit of analysis is the individual. Income (components) are corrected for differences in household size and composition with the modified OECD-scale. According to this equivalence scale the first adult has a value 1, every other adult counts for 0.5 and each child

for 0.3. We assume that household income is equally shared among all household members. Thus, we analyse inequality of equivalent household income weighted for the number of individuals. We use two tools for inequality measurement. In the first place we present the results per income decile. Secondly, we use the Gini and Kakwani coefficients as summary measures of inequality and progressivity respectively. The Kakwani index Π_T^K measures progressivity as the deviation of taxes from proportionality (Kakwani, 1977 and 1984). A tax system is called *progressive* when the proportion of income that is taken in tax increases with income, i.e. the average tax rate increases with income. It is represented by $\Pi_T^K > 0$ (see a.o. Lambert, 2001). The tax system is *proportional* when the average tax rate is constant (Kakwani index around zero), and it is said to be *regressive* when the average tax rate decreases with rising income (negative Kakwani index). Kakwani indices are calculated here with respect to the respective income components. This means that progressivity of taxes on income from work (T_W on Y_W) is measured as the difference between the Gini coefficient G of Y_W minus the concentration coefficient C of T_W:

$$\Pi_{T_W}^K = G_{Yw} - C_{Tw}$$

Similarly, the progressivity of taxes on pensions P is measured as:

$$\Pi_{T_P}^K = G_{Yp} - C_{Tp}$$

and on unemployment benefits U:

$$\Pi_{T_U}^K = G_{Yu} - C_{Tu}$$

4. Empirical results

4.1 Relative income position of old age individuals and unemployed

Before we apply these inequality indicators, we give an overview of the relative income position of old age and unemployed individuals in the EU-15. We measure this by expressing their average income as a percentage of average income of workers. These ratios can be considered as replacement rates[2]. A replacement rate of 100% or more indicates that the elderly or unemployed are on average better off than the group of workers.

What is immediately striking from table 3 is that in all countries the net replacement rate is higher than the gross replacement rate. The difference between gross and net rates is biggest in Germany (for old age individuals around 20%; for the unemployed around 14%). The difference is much smaller for old age individuals in Greece, Spain and Luxembourg, and for the unemployed in Denmark, Italy, the Netherlands and Spain. This difference between gross and net replacement rates is an indicator of the positive influence of the tax system on the relative welfare position of the elderly and the unemployed.

[2] This use of replacement rates differs from the more conventional approach of individual replacement rates, which measure the pensioners income against his pre-retirement income or average earnings (Whitehouse, 2000).

Table 3. Average income of old age individuals and unemployed as a % of average income of workers.

Country	old age individuals			unemployed		
	gross	net	difference gross - net	gross	net	difference gross - net
Austria	55.6	65.8	10.3	53.7	63.9	10.2
Belgium	**43.3**	**54.7**	**11.4**	**45.4**	**55.9**	**10.6**
Denmark	40.7	50.6	9.9	70.4	74.7	4.4
Finland	44.7	52.6	7.9	45.2	52.9	7.7
France	58.1	66.6	8.6	40.3	46.5	6.2
Germany	46.2	66.5	20.4	42.0	56.3	14.3
Greece	35.3	40.3	5.1	27.7	31.6	3.9
Ireland	31.2	38.9	7.7	29.7	37.6	7.9
Italy	59.5	68.8	9.3	11.3	13.1	1.8
Luxembourg	58.8	64.9	6.1	-	-	-
Netherlands	55.2	66.0	10.8	36.8	39.9	3.0
Portugal	44.5	54.5	10.0	32.8	39.9	7.1
Spain	35.1	40.5	5.3	24.3	27.2	2.9
Sweden	55.1	65.3	10.2	60.2	66.6	6.4
UK	46.6	55.4	8.7	27.6	34.5	6.9

Source: EUROMOD.

The average replacement rate is in all countries and for the two categories of individuals below 100% (both in gross and in net terms). For the elderly, gross replacement rates vary between 31% (Greece) and 60% (Italy), whereas net replacements range from 40% (Greece and Spain) to 69% (Italy). The difference between gross and net replacement rates for unemployed is considerably smaller than for old age individuals.

Table 4. Earnings, pensions and unemployment benefits of workers, old age individuals and unemployed as a % of their total gross individual income.

	Workers Gross earnings	Old age individuals Gross pension	Unemployed Gross unemployment benefits
Austria	96.5	91.3	23.1
Belgium	**93.7**	**84.4**	**38.4**
Denmark	96.4	65.7	39.6
Finland	92.8	83.7	26.1
France	93.1	79.1	29.5
Germany	96.4	88.7	33.2
Greece	96.4	74.5	4.0
Ireland	96.9	66.6	62.9
Italy	92.9	67.4	21.2
Luxembourg	93.8	80.5	
Netherlands	95.6	90.9	27.9
Portugal	97.3	71.3	51.4
Spain	98.9	85.2	31.6
Sweden	91.0	78.7	34.0
UK	95.8	69.1	6.5

Source: EUROMOD.

It is important to note that the weight of the category-specific income component is not the same for the various categories, nor in all the countries (see table 4). Income from work for workers makes up almost their entire gross income (more than 90%), and this applies for all

the EU-15 countries. This is not the case for the elderly and unemployed. On average gross pensions make up between 66% and 91% of gross income of old age individuals (the highest proportions are found in Austria and the Netherlands, which have also the highest proportion of private supplementary pension provisions). This variation is a.o. due to differences in

- level and coverage of the public pension system
- what old age individuals can and cannot earn as income from work,
- regulations of possible combinations with other benefits.

The variety is even bigger for the unemployed (between 4% in Greece and 63% in Ireland). This is also mainly due to variations in regulation of the benefits (level and coverage of the benefits, possible combinations with other income sources etc.).

4.2 Taxes paid on earnings, pensions and unemployment benefits

We isolate taxes on the income source that is typical for each category, i.e. taxes paid on income from work by workers, on pension income for the elderly and on unemployment benefits for the unemployed (see section 3.3). In table 5 we present personal taxes (PT) and social contributions (SIC) on earnings, pensions and unemployment benefits as a percentage of gross earnings, gross pensions and gross unemployment benefits, respectively.

We first compare income from work with pensions. There is quite some variation among countries both for earnings and for pensions. The difference between gross and net earnings varies between 20% (Spain) and 38% (Sweden); for pensions we find a wider range i.e. from 3% in Portugal to 26% in Sweden. In all countries earnings are taxed more heavily than pensions. There are three reasons for this. Firstly, gross income of pensioners is on average lower in all countries. As most personal income tax systems are progressive, this will lead to a higher tax burden for workers. A second reason is that some countries have special provisions in their personal income tax system for old age or for pension incomes (cf. section 2.2). This also becomes apparent in a large difference for personal taxes in Belgium, Finland, Germany, Ireland, Portugal and the UK. A third reason is that pensioners pay less in social contributions than workers, and in some countries none at all. This is so because for certain risks pensioners do not have to pay any more insurance contributions (e.g. for unemployment) (see also Disney and Whitehouse, 2003; Keenay and Whitehouse, 2003a and 2003b). This also becomes apparent if we compare average SIC paid by pensioners and workers: here the gap between pensioners and workers is the widest. Moreover, for almost all countries average social insurance contributions paid by the elderly are smaller than their average personal income tax liability (France and Germany are the only exceptions).

Taxes on earnings are mainly personal taxes, except for France, Greece and the Netherlands, where SIC have the biggest weight. Also for pensions income taxes are the most important component for all countries but France and Germany. As we have seen in section 2.3, in almost half of the countries no social insurance contributions are payable on pension income; in the other countries the level of SIC on pensions is rather small due to the fact that it is levied at a reduced rate.

Table 5. PT and SIC on earnings as a % of gross earnings (only earners), PT and SIC on pensions as a % of gross pensions (only pensioners), PT and SIC on unemployment benefits (UB) as a % of gross unemployment benefits (only unemployed), EU, 1998.

	Earnings			Pensions			UB		
	PT	SIC	Net earnings	PT	SIC	Net pension	PT	SIC	Net UB
Austria	15.0	13.8	71.2	13.7	3.7	82.7	0.0	0.0	100.0
Belgium	**20.9**	**11.6**	**67.5**	**9.7**	**2.5**	**87.7**	**5.8**	**0.0**	**94.2**
Denmark	31.3	10.5	58.2	25.3	0.0	74.7	28.8	2.5	68.7
Finland	27.9	7.6	64.5	18.8	3.0	78.2	20.1	1.4	78.5
France	4.5	19.7	75.9	3.6	5.2	91.3	0.9	1.5	97.6
Germany	18.8	17.7	63.5	1.7	6.4	91.9	0.0	0.0	100.0
Greece	9.8	11.5	78.7	3.6	4.0	92.4	4.9	0.0	95.1
Ireland	20.5	4.0	75.6	3.3	0.0	96.7	0.0	0.0	100.0
Italy	19.0	8.9	72.1	14.4	0.0	85.6	10.3	0.0	89.7
Luxembourg	13.9	10.0	76.1	9.8	2.6	87.7			
Netherlands	11.2	19.4	69.5	9.0	8.2	82.8	7.0	20.3	72.7
Portugal	13.0	11.0	76.0	2.6	0.0	97.4	0.0	0.0	100.0
Spain	16.7	3.7	79.6	6.9	0.0	93.1	3.1	2.5	94.4
Sweden	31.3	6.2	62.5	25.9	0.0	74.1	26.0	6.9	67.0
UK	16.0	6.7	77.3	6.3	0.0	93.7	-0.7	0.0	100.7

Source: EUROMOD.

For most workers total income is made up of earnings (see table 4). This is not the case for the unemployed: gross unemployment benefits in almost all countries make up less than half of gross income. Similar to the elderly, unemployed individuals pay on average less taxes than earners (though the average tax rate for the unemployed is still relatively high in Denmark, the Netherlands and Sweden). The difference between earners and the unemployed is most pronounced in the case of social insurance contributions. But also for personal taxes the difference is quite big in Austria, Belgium, Germany, Ireland, Portugal, Spain and the UK. In most of these countries, unemployment benefits are tax exempt or can benefit from a special tax relief.

The difference between gross and net earnings varies between 42% (in Denmark) and 20% (Spain). The range of variation is wider for unemployment benefits: between 33% (Sweden) and -0.7% (UK). Personal taxes are much lower on unemployment benefits than on earnings, except in Finland, Italy and Sweden. Social contributions on unemployment benefits are negligible, except in the Netherlands and Sweden.

4.3 Decile distributions

For our distribution analysis we first present the proportion of the gross income component that is taken away in taxes in the 1st, 5th and 10th decile thereby distinguishing between personal taxes (PT) and social contributions (SIC). For the same deciles we also present the average gross and net income component for the three categories of individuals, expressed in Euro purchasing power parities (PPP).

Figure 1. **Taxes paid by pensioners, workers and unemployed as a % of their individual gross pensions, earnings, and unemployment benefits respectively, 1st decile, EUROMOD 1998.**

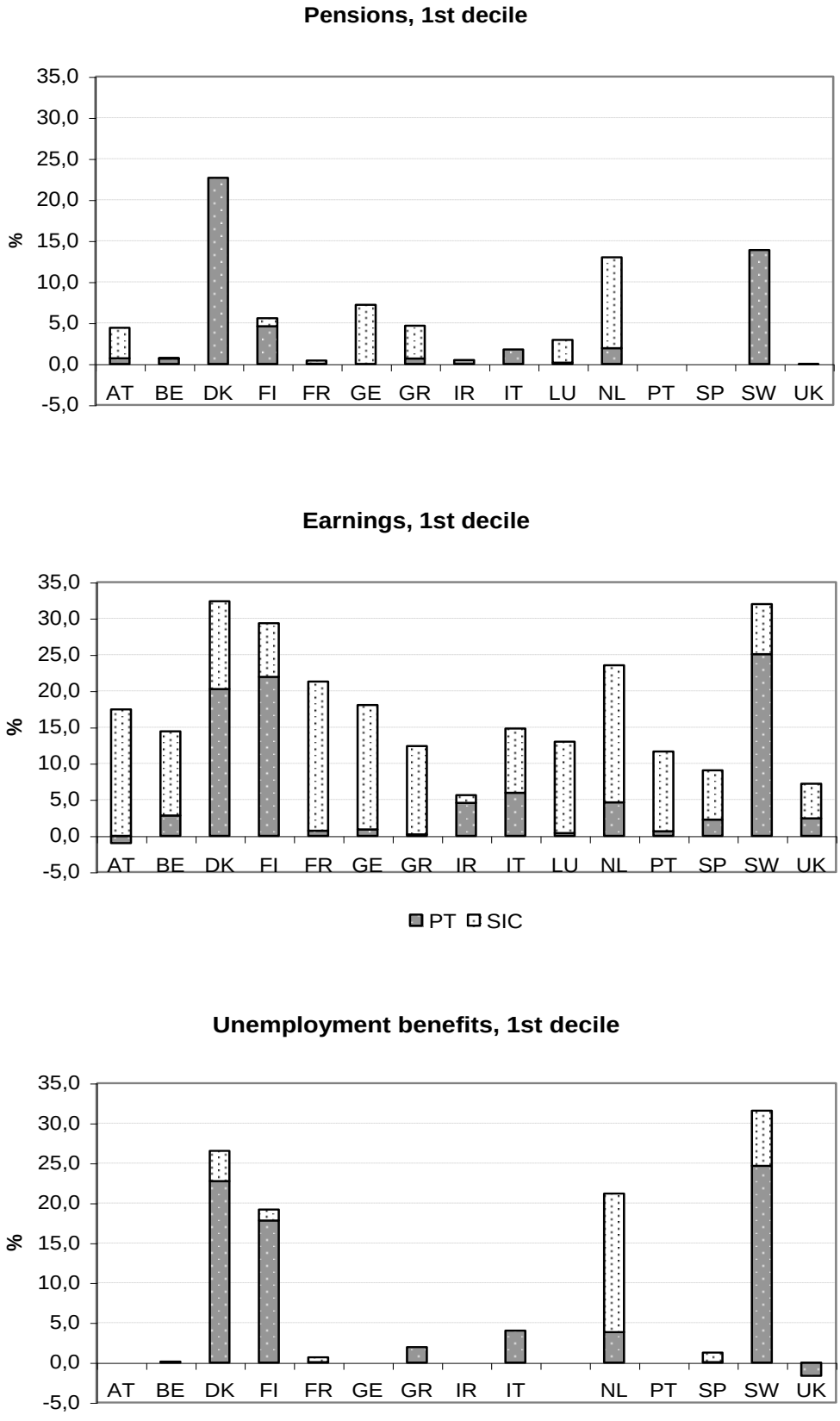


Figure 2. **Taxes paid by pensioners, workers and unemployed as a % of their individual gross pensions, earnings, and unemployment benefits respectively, 5th decile, EUROMOD 1998.**

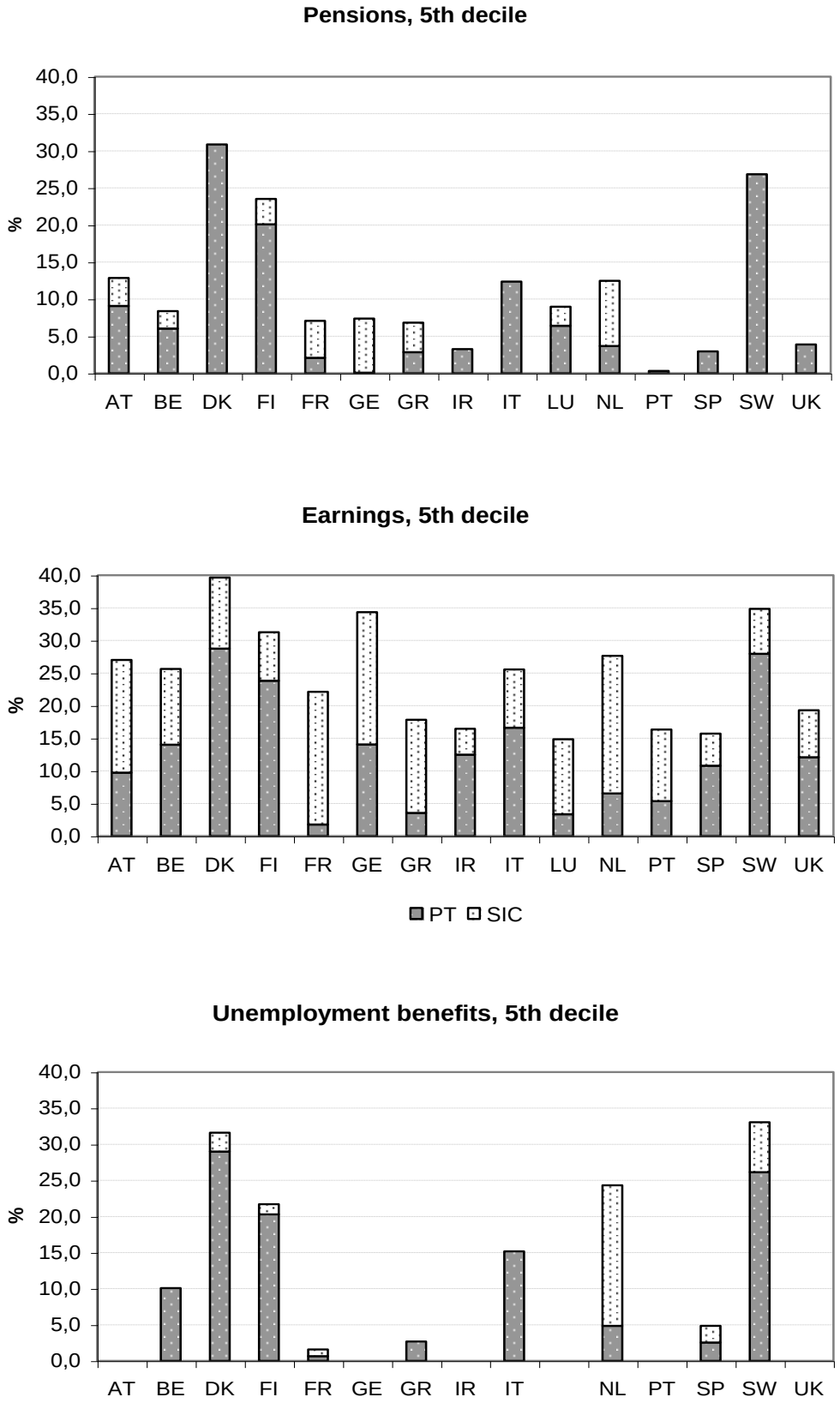


Figure 3. **Taxes paid by pensioners, workers and unemployed as a % of their individual gross pensions and earnings respectively, 10th decile, EUROMOD 1998.**

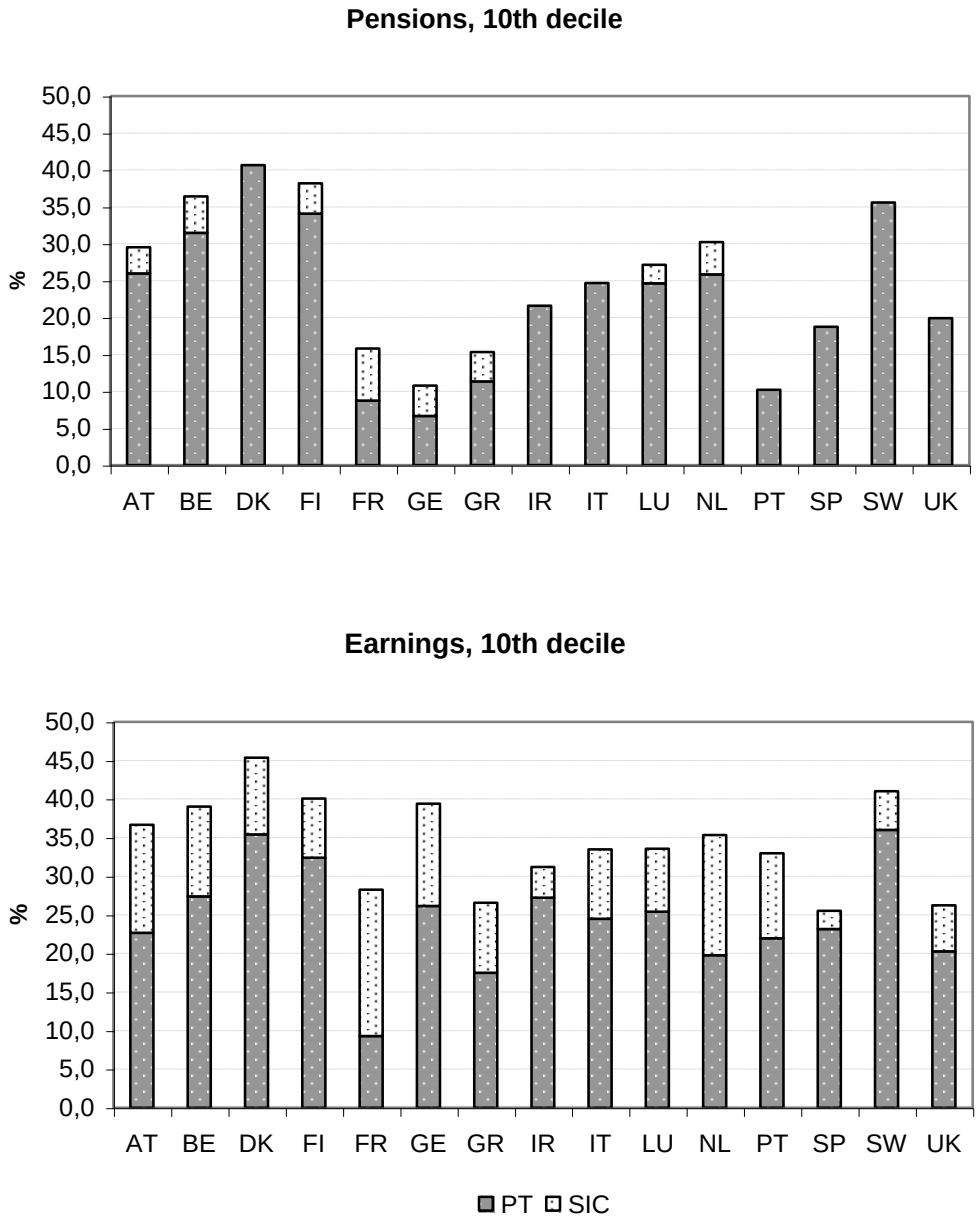


Figure 4. Gross and net pensions, earnings and unemployment benefits in the 1st decile, Euro PPP, EUROMOD 1998.

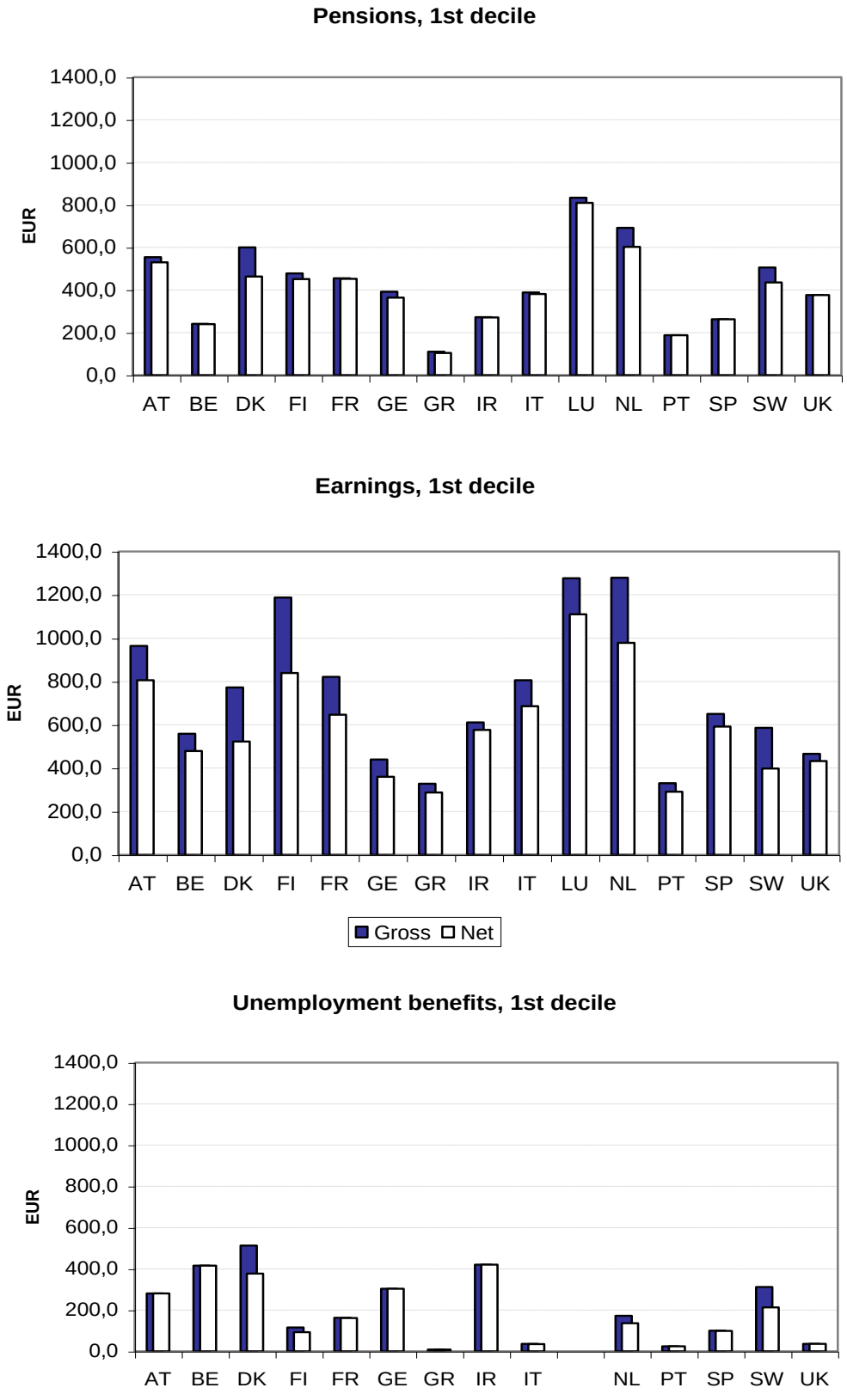


Figure 5. Gross and net pensions, earnings and unemployment benefits in the 5th decile, Euro PPP, EUROMOD 1998.

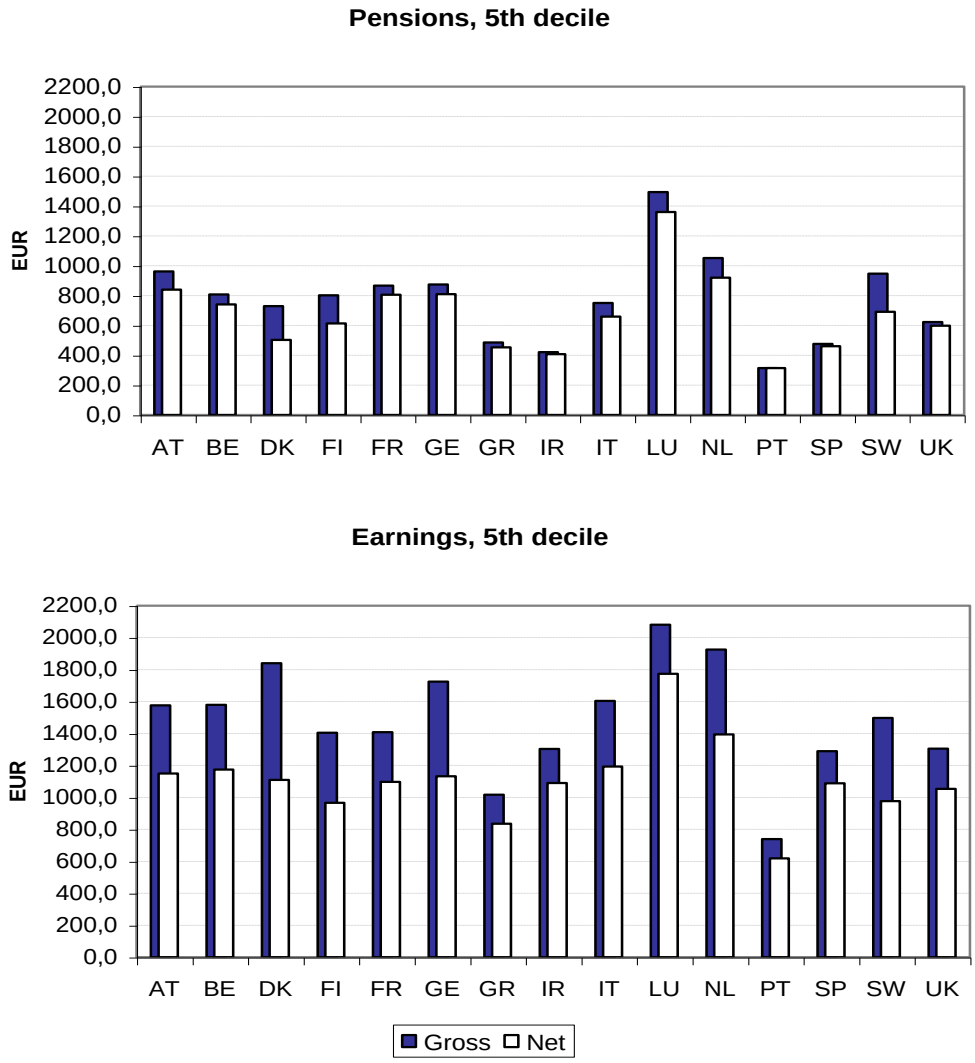
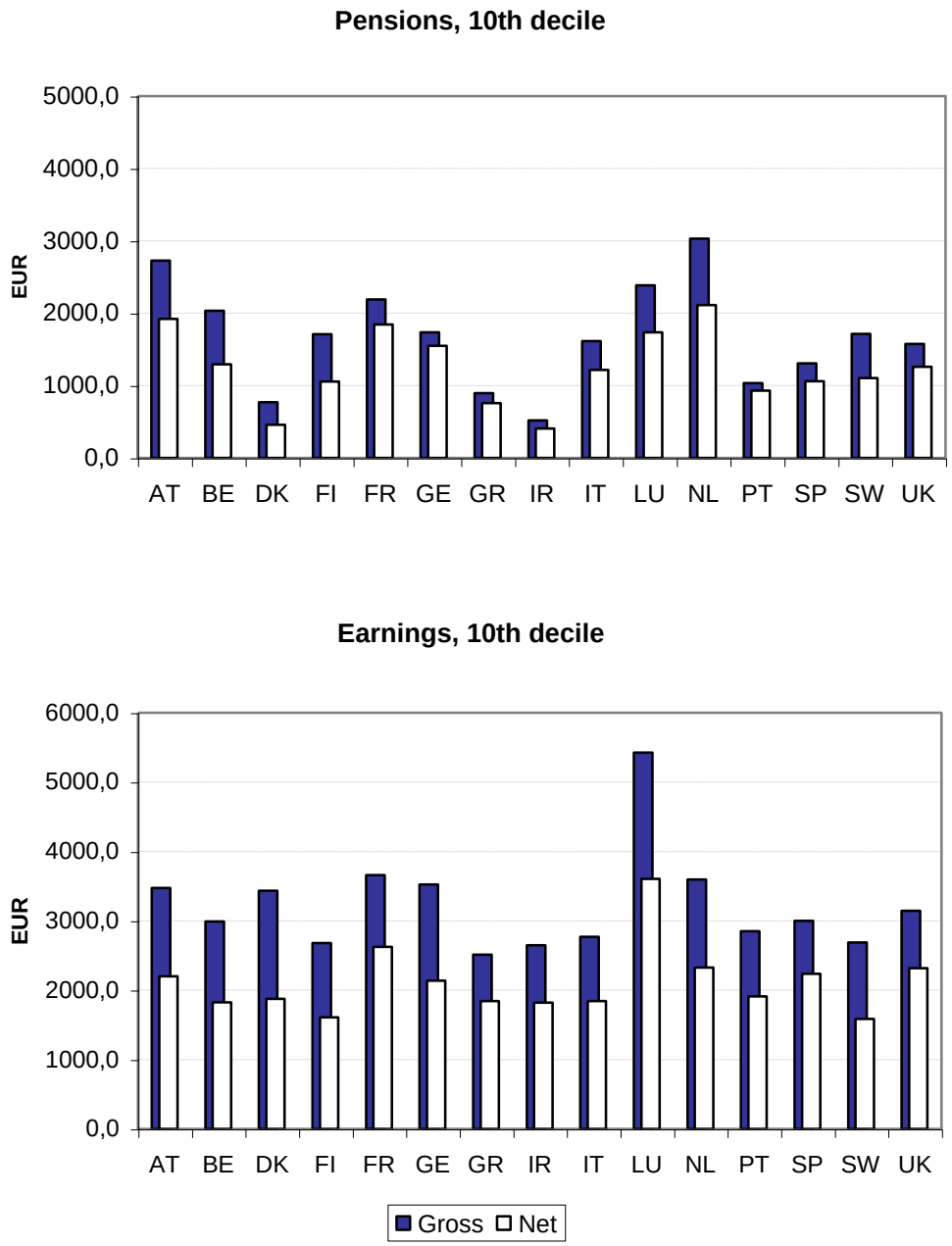


Figure 6. Gross and net pensions and earnings in the 10th decile, Euro PPP, EUROMOD 1998.



A general observation is that in the lowest decile, taxes paid by low income pensioners are considerably lower than taxes paid by low income workers (see figure 1). This is mainly due to the fact that pension incomes are in general lower than incomes from work (see figure 4). For the rest, there is quite some diversity among countries in the distribution of taxes paid on pensions and earnings. The average tax rate for pensioners at the bottom of the income distribution is very low in Belgium, France, Ireland, Italy, Portugal, Spain and the UK. An important factor here is that in the latter five countries no SIC have to paid on pensions, while in Belgium social security contributions are only liable from a certain threshold onwards. In Belgium, low income pensioners hardly pay personal taxes due to the tax credit for pension

incomes. In Ireland and the UK low income pensioners hardly pay any taxes due to the tax allowances, of which the allowance for old age is an important component. In Italy and Spain the low average tax rate for pensioners is mainly due to the fact that no SIC are due on pension income, other special provisions for older people are too small to make a difference. In Portugal the tax deduction for pension income is especially important for the lowest incomes. The average tax rate is somewhat higher for the lowest income pensioners in Austria, Finland, Germany, Greece and Luxembourg, mainly due to the fact that in these countries SIC have to be paid on pensions, also on the lower pensions. The SIC-rate, however, is considerably lower than on income from work, because pensioners only contribute for specific sectors in social security. The tax burden for low income pensioners is highest in the Netherlands, Sweden and especially Denmark. In the two Scandinavian countries this follows mainly from taxes (especially local taxes), whereas for the Netherlands social contributions are far more important. It is also in these countries that the gap between average gross and net pensions for low incomes is highest (figure 4).

The situation is quite different for higher incomes. The average tax rates of pensioners in the 10th decile are much closer to those of workers for most countries (figures 3 and 6). Social insurance contributions paid by pensioners are still remarkably lower than those paid by workers, but for personal taxes this does not apply any more. In some countries high income pensioners pay on average even relatively more in personal taxes than workers (Austria, Belgium, Denmark, Finland, France, Luxembourg and the Netherlands). This is mainly due to the fact that any special provisions for old age or pensions are outweighed by the tax advantages granted to (high) earnings (e.g. deduction for professional expenses, see also Verbist, 2004). The most notable exception is Germany: the tax burden of high income pensioners is still remarkably lower than that of workers, due to its considerable tax deduction for pensioners.

For the unemployed we only present here the results for the 1st and 5th decile, as the number of unemployed is rather small in the highest decile. The highest tax burden for unemployed with a low or middle income is found in Scandinavia and the Netherlands (see figures 1 and 2). These are also the countries with the largest difference between gross and net unemployment benefits. In all other countries, gross and net unemployment benefits are (almost) the same (with an exception for Belgium in the 5th decile).

4.4 Progressivity of taxes on pensions and earnings

In this section we compare inequality of earnings with inequality from pension income and unemployment benefits by calculating the Gini coefficient of these income categories. We calculate the Kakwani indices to look at progressivity of taxes on these incomes.

Inequality of gross income among workers is higher than income inequality among pensioners in Denmark, Germany and Luxembourg (table 6). In all other countries the income distribution of workers is more compressed than that of pensioners. In all countries, except Ireland, inequality is bigger for unemployment benefits than it is for earnings.

Table 6. Gini of gross earnings, pensions and unemployment benefits, and Kakwani index of personal taxes (PT) and social contributions (SIC) on earnings (W), pensions (P) and unemployment benefits (UB), EU-15, 1998.

	Gini-coefficient			Kakwani index for W		Kakwani index for P		Kakwani index for UB	
	Earnings	Pensions	UB	PT on W	SIC on W	PT on P	SIC on P	PT on UB	SIC on UB
Austria	0.301	0.378	0.563	0.215	-0.058	0.313	-0.006	-	-
Belgium	**0.282**	**0.324**	**0.491**	**0.150**	**-0.001**	**0.437**	**0.335**	**-0.122**	**-**
Denmark	0.258	0.209	0.407	0.053	-0.043	0.051	-	0.009	-0.071
Finland	0.244	0.292	0.583	0.071	0.006	0.288	0.223	0.012	0.018
France	0.282	0.330	0.601	0.344	-0.030	0.408	0.208	0.160	0.236
Germany	0.295	0.272	0.487	0.127	-0.043	0.562	-0.069	-	
Greece	0.355	0.451	0.852	0.296	-0.072	0.254	0.000	0.083	-
Ireland	0.324	0.337	0.223	0.153	-0.032	0.465	-	-	-
Italy	0.310	0.349	0.905	0.102	-0.070	0.260	-	0.017	-
Luxembourg	0.333	0.257		0.301	-0.064	0.319	-0.005		
Netherlands	0.263	0.279	0.780	0.261	-0.048	0.433	-0.144	0.060	0.009
Portugal	0.399	0.428	0.641	0.272	0.000	0.437	-	-	-
Spain	0.357	0.370	0.644	0.187	-0.167	0.402	-	0.036	0.079
Sweden	0.241	0.278	0.479	0.064	-0.067	0.144	-	0.011	0.003
UK	0.315	0.323	0.894	0.111	-0.042	0.450	-	0.032	-

Source: EUROMOD.

Personal taxes on earnings are most progressive in France (Kakwani of 0.344) and least progressive, rather proportional in Denmark (Kakwani of 0.053). This conforms to the general progressivity indices calculated for all individuals (see Verbist, 2004). Social insurance contributions on earnings are more or less proportional in all countries. Only Spain has a more pronounced regressive effect, mainly due to its upper bound for SIC liability. Personal taxes on pensions are most progressive in Germany, and they are far more progressive than taxes on work, mainly because of the extensive tax relief granted to pensioners. Also for old age individuals, taxes are the least progressive, even proportional, in Denmark. Social insurance contributions on pensions are progressive in Belgium, Finland and France, whereas in the Netherlands they are regressive.

In most countries where taxes are levied on unemployment benefits, these taxes are proportional. Only in France there is a stronger inclination towards progressivity and in Belgium towards regressivity. As France has a highly progressive personal income tax system it is not surprising that taxes on unemployment benefits also exhibit a more progressive pattern. The negative sign of the Kakwani index of taxes on UB in Belgium is somewhat surprising, as there is a tax credit for low unemployment benefits. This tax credit, however, decreases when the benefit is combined with earnings. As the lowest unemployment benefits are often combined with income from work, the tax credit does not or hardly applies for these groups, thus probably explaining the more regressive pattern of personal taxes. In most countries no SIC on unemployment benefits are levied. In those countries where they are, the distribution is proportional. Only in France, these contributions are progressive, and even much more than SIC on earnings, due to the progressive rate structure of the "Cotisation Sociale Généralisée" on unemployment benefits.

5. Summary and conclusions

Summarising, we can draw the following observations and conclusions on the basis of our research on the relationship between taxes and replacement incomes in the EU-15.

1. On average old age pensions and unemployment benefits are taxed at a lower rate than income from work in all the EU-15 countries. There are three reasons for this. Firstly, gross income of old age and unemployed individuals is on average lower, and as personal income tax systems are progressive this will lead to a higher tax burden for workers. Secondly, some countries have special provisions in their personal income tax system for old age and for pension and unemployment income. Thirdly, pensioners and unemployed persons pay less in social insurance contributions than workers.

2. The average tax rate on pensions at the lower end of the income distribution is very low in Belgium, France, Ireland, Italy, Portugal, Spain and the UK. This is due to special income tax provisions (tax allowance for old age in Ireland and the UK; tax credit for pensions in Belgium; tax deduction for pension income in Portugal) and to the fact that (almost) no social insurance contributions have to be paid on the lowest pensions. The tax burden for low pensions is highest in the Netherlands, Sweden and especially Denmark; in the Scandinavian countries this is mainly due to local taxes, whereas in the Netherlands social contributions are most important. For higher income groups the tax burden on pensions is much closer to that on earnings.

3. In general, the tax burden at the lower end of the income distribution is much lower on unemployment benefits than for workers. The highest tax burden for unemployed with a low income is found in Scandinavia (local personal taxes) and the Netherlands (social contributions), where we also find the largest difference between gross and net unemployment benefits. In all other countries gross and net unemployment benefits are (almost) the same.

4. In most countries (except Denmark, Germany and Luxembourg) inequality of pre-tax income is higher for pensions than for earnings. Also progressivity of taxes on pensions is higher than that of taxes on earnings in most countries (the exceptions are Denmark and Greece). Personal taxes on pensions are most progressive in Germany and least (almost proportional) in Denmark. In the countries where taxes are levied on unemployment benefits, these tend to be proportional. Also social contributions on replacement incomes tend to be close to proportional (with the exception of SIC on pensions in Belgium, Finland, France and the Netherlands).

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