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Taxing Working Families

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Foreword

This publication provides an analysis of the distributional impact of income taxes paid by workers and employees' social security contributions in OECD countries. It draws heavily on the information and methodology contained in the annual OECD Taxing Wages *publication and represents a novel use of them in an area of considerable public interest. The study concentrates on the effects of these taxes on the distribution of income between different types of working households, looking at three dimensions of inequality: vertical inequality between households at different income levels, horizontal inequality between households with different numbers of children and the tax treatment of one-earner* versus *two-earner households.*

While tax policymakers must take account of many factors in designing tax systems, their distributional effect is always an important consideration. At the same time, this study's concentration on distributional issues means it cannot be interpreted as judging the overall merits of the structure of income tax and social security contributions in OECD countries.

The study was prepared by Angela Tiraferri, who was the Alessandro Di Battista Fellow in the OECD's Centre for Tax Policy and Administration in 2002-3. This Fellowship was generously established by the Italian government in memory of Alessandro Di Battista, an economist who died tragically young while working at the OECD. The study has benefited from comments provided by delegates to the Working Party No. 2 on Tax Policy Analysis and Tax Statistics of the Committee on Fiscal Affairs but they have not endorsed it. The analysis, opinions and conclusions presented in the study are those of the author.

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Executive Summary

1. Introduction

Governments collect taxes primarily to finance the greater part of their expenditures. Apart from their revenue-raising capacity, taxes are often regarded as effective instruments to achieve a wide variety of public policy goals. For example, policy makers may wish to use the tax system to influence consumer and producer choices, or to modify the distribution of personal incomes and wealth. Even in cases where – in setting tax policy – governments abstain from pursuing explicit distributional goals, tax burdens are seldom distributed in a way in that leaves the shape of the pre-tax distribution of personal incomes unchanged.

The present study seeks to analyse the distributional impact of personal income tax and employees' social security contributions – labour taxes for short. Certain generally available cash benefits for families – regarded as negative taxes – are also taken into account. The focus on taxes directly related to income from employment implies that distributional impacts of other taxes, notably consumption taxes and capital (income) taxes, are excluded from the analysis, the main reason being that the necessary data on who pays these taxes is not available for a significant number of OECD countries. A further limitation of the present study is that the focus is on households earning annual wages within a specified income range, *i.e.* between 67 and 167 per cent of the earnings of an average production worker.

The study concentrates on the effects of these taxes on the distribution of income between different types of working households, looking at three dimensions of inequality: vertical inequality between households at different income levels, horizontal inequality between households with different numbers of children and the tax treatment of one-earner *versus* two-earner households.

2. Methodology

The effects of taxes on household incomes is calculated by using the methodology of the annual OECD *Taxing Wages* publication, based on the use of a limited number of household types to trace the statutory impact of the taxes. The distributional effect of the taxes is then measured by the extent to which they reduce the "income gap" between specific pairs of households. This is a simple intuitive measure, but can also be shown to be a special case of the Reynolds-Smolensky index that is widely used in studies of income inequality.

3. Results

While detailed results vary between countries, reflecting wide differences in both tax provisions and cash benefits, some general patterns do emerge. Labour taxes and cash benefits (where available) reduce the vertical inequality of the personal income distribution in (nearly) all OECD countries, both for single workers and families. As one might expect, it is generally the countries with higher tax-to-GDP ratios that achieve most

redistribution, although there are important exceptions. In almost all countries the horizontal inequality of personal incomes between those with and without children is also reduced, with tax-benefit systems particularly favouring single parents earning low wages, with countries varying widely in the size of the reduction and in the relative role of tax provisions and cash benefits. On average, tax-benefit systems compress income inequality between single earners with and without dependent children by about 20 percentage points, and income inequality between households with and without children by some 7 points. Finally, most tax-benefit systems favour households (at a given total income level) where both spouses contribute to household income, with the premium for two-earner households varying from one country to another and depending on the place of households in the over-all income distribution. Generally speaking, the "two-earner premium" tends to be of greater value at higher income levels.

PART I

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PART I

Chapter 1

Analytical Report

1. Introduction

Governments collect taxes primarily to finance the greater part of their expenditures. Apart from their revenue-raising capacity, taxes are often regarded as effective instruments to achieve a wide variety of public policy goals. For example, policy makers may wish to use the tax system to influence consumer and producer choices, or to modify the distribution of personal incomes and wealth. Even in cases where – in setting tax policy – governments abstain from pursuing explicit distributional goals, tax burdens are seldom distributed in a neutral way in that they leave the shape of the pre-tax distribution of personal incomes unchanged.

The pre-tax distribution of labour and capital income is highly uneven. In modern welfare states the distribution of net disposable household incomes is less skewed, as a consequence of the combined impact of the tax system and a wide range of public transfer programmes. Recent empirical evidence shows that during the 1990s inequality increased significantly in a number of OECD countries.[1] This trend has renewed interest in issues related to income distribution and redistributive government policies. At the same time, it is recognised that redistributive policies may reduce work incentives and diminish total output of the economy. Governments are thus faced with a trade-off between equity and efficiency goals. In this respect, OECD member countries have made different policy choices, reflecting both differences in the state of their economies and in views as to what should be the appropriate role of the State in shaping the distribution of net disposable household incomes.

Since the 1970s, a considerable number of theoretical as well as empirical studies have addressed income redistribution issues.[2] Part of this work has established to what degree income taxes redistribute household incomes. An analysis of personal income tax systems in OECD countries shows that their structure is generally progressive: as the tax base increases, tax liability increases more than proportionally. Thus, under progressive taxes, post-tax incomes are distributed more evenly than are pre-tax incomes. Two features can explain tax progressivity: the tax base and tax rates. For the purpose of most taxes, taxpayers may claim various reliefs – exemptions, deductions and credits against tax. These reliefs erode the tax *base* and may disproportionately benefit lower income groups, increasing the progressivity of the income tax, for example child benefit provided in the form of a lump-sum tax credit against personal income tax due. The personal income tax also illustrates the basic model of progressive *rates*: income is sliced into brackets which are taxed at increasing marginal rates. As a consequence, the average tax rate is below the marginal tax rate over the whole income range.

The present study seeks to analyse the distributional impact of a number of taxes, using the particular methodology set out below in greater detail. The focus is on the taxation of working families, using data contained in the OECD's annual *Taxing Wages* report. Taxes covered include personal income tax and employees' social security contributions – labour taxes for short. Certain generally available cash benefits for

families – regarded as negative taxes – are also taken into account. The focus on taxes directly related to income from employment implies that distributional impacts of other taxes, notably consumption taxes and capital (income) taxes, are excluded from the analysis, the main reason being that the necessary data on who pays these taxes is not available for a significant number of OECD countries.

A further limitation of the present study is that the focus is on households earning annual wages within a specified income range, *i.e.* between 67 and 167 per cent of the earnings of an average production worker (APW); for further details, see Table I.1.1. It follows that the impact of taxes on labour income for households at the two extremes of the personal income distribution (outside the 67-167 per cent range of average wages) is not reflected in the results presented here.

The approach adopted in this report to analyse the redistributive potential of tax systems uses income as the relevant variable. Generally speaking, income is a good proxy to indicate the welfare of households. It also has the advantage of being easy to measure, and it allows the application of broadly used indices to summarise the inequality of distributions. Results presented in this report compare the inequality of pre-tax and post-tax income distributions. Pre-tax income is usually referred to as earned or market income.

- *Pre-tax* income is equal to the sum of wages and salaries, income from self-employment, capital income, private pensions and so on. This study focuses on gross wage earnings received by dependent workers.
- *Post-tax* income can be derived from pre-tax income by subtracting taxes paid and adding in generally available cash transfers for families. Post-tax income is often referred to as net (disposable) income or take-home pay.

To assess the distributive impact of taxes on labour, the present study compares distributions of pre-tax and post-tax income of well-defined household types in each OECD country. The household types considered differ by family composition and wage level. The impact of labour taxes on relative income positions of households is analysed in three distinct ways.

First, positions of taxpayers at different income levels are compared (*vertical inequality*). The family composition of these households is assumed to be identical, so they qualify for the same set of tax reliefs and public benefits in so far as these depend on marital status, and the number and age of children in the household. The position of households at the lower end of the income range considered is discussed in terms of the "low-wage income gap" (or: low-wage vertical inequality). Households at the middle and higher end of the income range considered are discussed in terms of the "higher-wage income gap" (or: higher-wage vertical inequality).

Second, the report compares the tax impact on households of varying family composition at the same level of income (*horizontal inequality*). Data reported in *Taxing Wages* allow the differentiation of families according to marital status and the number and age of children in the household. Although all household types considered have by assumption the same money income, it is clear that – at the same wage level – a family with two young children is less well off than a single person. Money income can be made "equivalent" for various household types, taking into account their composition. For this purpose the OECD modified equivalence scale has been selected, and the equivalent income of families has been derived by dividing their money income by the corresponding equivalence index.

Third, the report examines the tax treatment of *one-earner versus two-earner households*. Here, households included in the comparison have the same wage earnings and identical family composition. Tax policies in place may distort the decision to supply work or can introduce disparities between spouses in terms of job opportunities and economic conditions. Empirical studies[3] provide evidence that the decision of the second earner to enter or leave the labour market often depends on tax considerations. Some countries use the tax system to encourage both spouses to work by providing them standard and non-standard reliefs in relation to extra work-related expenses (*e.g.* baby-sitting expenses). On the other hand, several OECD countries take into account the sacrifices faced by families when the secondary spouse chooses to stay home to take care of children, by providing the principal earner with extra tax relief on behalf of the dependent spouse. Labour supply can also be influenced by the choice of the relevant tax unit: the family or the individual.

The remainder of the Chapter remarks briefly on the theoretical framework; introduces the data used for this study and some of its limitations; and summarises the methodology. Annex I.1.A1 lays out some key results on the measurement of inequality and tax progressivity. Chapter 2 then discusses and measures the tax impact on vertical inequality, horizontal inequality and the tax position of one-earner *versus* two-earner households. Part II describes main features of each country's personal income tax(es), employees' social security contributions and generally available cash benefits, and discusses their redistributive effects.

2. Theoretical framework

To estimate the redistributive impact of labour taxes, this report quantifies the gap between post-tax and pre-tax income for well-defined household types. Results presented are the product of a static analysis of the impact of personal income tax and employees' social security contributions on the net income of workers, assuming no tax-induced changes of labour supply. The report traces the *statutory incidence* of the taxes covered. The results do not reflect the final incidence of these taxes. To evaluate the *economic incidence* of taxes, the calculations for the report should also have taken into account behavioural changes of employees and employers in response to the taxes covered. This evaluation would have required data on the elasticities of labour demand and supply that is not available for many OECD countries. Also, the paper concentrates on the redistributive effects of taxes, while disregarding the trade-off between equity and efficiency effects of taxes.

The analysis assumes that employers' social security contributions and payroll taxes do not affect the personal distribution of income. Any other assumption would complicate the analysis substantially and would be unlikely to have much effect on the results, as employers' contributions are typically almost (or exactly) proportional to wages.

3. Data and their limitations

Measuring the distributive impact of given taxes may appear to be an ambitious project, given the complexity of tax laws, the interplay of tax and benefit programmes and the widely different distribution of pre-tax wage across countries. Also, data available to policy makers and researchers are sometimes imprecise and poor. To overcome these challenges, comparative analyses generally require a serious degree of simplification. Therefore, this section addresses briefly a few of such practical difficulties and discusses the associated limitations of the study. These limitations imply that considerable care should be taken in interpreting the results presented below.

Box I.1.1. **The *Taxing Wages* approach**

To determine the tax liability of a particular household type, the simulation models used to produce the comparative tables included in the *Taxing Wages* report take into account relevant standard tax allowances applicable to employee taxpayers; tax amounts calculated are reduced by any relevant tax credit. The calculation of net income includes family benefits paid by general governments as cash transfers. All standard tax reliefs and tax credits are included in the calculations, while non-standard reliefs are excluded. *Standard tax reliefs* are unrelated to actual expenditures incurred and are automatically available to all taxpayers satisfying the eligibility rules specified in the legislation. To allow better comparability of the standard reliefs designed and employed by different OECD governments, the *Taxing Wages* report classifies them in five main categories:

1. Basic reliefs which are available to all taxpayers irrespective of their family status.
2. Reliefs for work-related expenses.
3. Marital status reliefs targeted at married taxpayers.
4. Deduction for social security contributions and other income taxes.
5. Standard child reliefs granted to families with two children between five and twelve years of age.

Non-standard tax reliefs are wholly determined by reference to actual expenses incurred by taxpayers. The micro simulation models used in preparing the *Taxing Wages* report also take into account family cash transfers universally paid in respect of dependent children between five and twelve years of age attending school. If tax reliefs or cash transfers vary within this age range, the most generous provisions are taken. Table I.1.1 introduces the eight family types. The family is assumed to have no income other than from employment and – depending on family size – cash benefits.

Table I.1.2 provides figures on the wage of the APW in OECD countries in 2002, expressed in US dollars with equal purchasing power. Average earnings of an APW in the OECD-area were equal to about USD 25 000, but substantial differences can be observed. In countries like Hungary, Mexico or the Slovak Republic an APW earns less than USD 10 000 per year, while in one-third of the OECD countries (Australia, Belgium, Canada, Germany, Luxembourg, the Netherlands, Norway, Switzerland, United States) the APW wage level exceeds USD 30 000.

The third column of Table I.1.2 details the average tax rate for central plus local income taxes: Denmark shows the highest tax rate (31.7 per cent), followed by Finland (25.4 per cent) and Sweden (23.4 per cent). On the other hand, Greece, Korea and Mexico impose on average production workers an effective tax burden of less than two per cent, Japan, Poland, Portugal and the Slovak Republic have average tax rates of between five and six per cent.

Column 4 provides data on employees' social security contributions: most contribution systems in OECD countries have a proportional or a slightly regressive rate structure, the only exemption being the Netherlands, where employees' social security contributions are characterised by a complex and slightly progressive structure. Contributions are often deductible from taxable income so that they redistribute welfare also in an indirect way. Australia and New Zealand charge no employee contributions. On the other hand, in Austria, Germany, Greece, Japan, Korea, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic and Switzerland the contributions' rate exceeds the income tax rate, rising to over 20 per cent in the cases of Germany, the Netherlands and Poland. The other OECD countries employ contribution rates ranging between 0.2 per cent (Ireland) and 15 per cent (Turkey). Large differences are also observed in the tax wedges among OECD countries (column 5 of Table I.1.2). The last column shows marginal tax rates imposed on individuals at the APW wage level, ranging from 17.2 per cent in Korea to over 60 per cent in Belgium and Germany. Marginal tax rates tend to be high when reliefs (tax credits or transfers) are means-tested and phased out as income increases.

The OECD's *Taxing Wages* report presents calculations of the amount of personal income tax, social security contributions and family cash benefits for eight household-types, differing by income level and family composition.[4] The report derives both average and marginal effective tax rates, treating generally available cash family benefits as negative taxes. *Taxing Wages* focuses on employees, assuming their annual income from employment to be equal to a certain percentage of the gross wage earnings of an average production worker (APW).[5] Further details are given in Box I.1.1.

Ideally, when tracing the redistributive impact of tax systems, researchers would have at their disposal a set of micro data on households: income and its components, expenditures and the various demographic and socio-economic background variables. A data-set meeting these requirements would allow researchers to calculate poverty and inequality indices and to implement various sophisticated analyses.

Instead, the *Taxing Wages* approach focuses on a limited number of "typical" households, their sole source of income being wage earnings, located at some fixed points in the pre-tax wage distribution. This approach permits a comparison of the pre-tax and post-tax income position of the selected household-types.

The cross-country comparison of tax systems is facilitated because the *Taxing Wages* report focuses on "typical" wage earners. On the other hand, the methodology for the report does not consider the considerable cross-country differences in the dispersion of pre-tax wage incomes. It follows, for example, that if for two countries the same tax-induced reduction of the income gap between single taxpayers earning 100 and 167 per cent of the APW wage is found, this does not imply that taxes have the same impact on the over-all distribution of wage incomes in those two countries.

The simulations for the *Taxing Wages* report do not take into account non-standard tax reliefs. The size of such reliefs is determined by the actual expenses incurred by taxpayers for specific purposes, such as health care, tertiary education expenses, premiums for private pensions. As a result of non-standard tax reliefs, in practice effective tax rates are (somewhat) lower than those simulated in the *Taxing Wages* report. In addition, subsidised public provision of goods and services is not taken into account.[6]

The income redistributive impact of taxes is affected by real world macroeconomic phenomena, such as the unemployment level and inflation rates. Such external factors affect tax burdens and thus the redistribution achieved through the tax and transfer system. However, these factors cannot be captured in the analysis presented here, because

Table I.1.1. **Household types distinguished in *Taxing Wages***

Marital status	Children	Principal wage-earner	Secondary wage-earner
Single individual	No children	67% APW	–
Single individual	No children	100% APW	–
Single individual	No children	167% APW	–
Single individual	2 children	67% APW	–
Married couple	2 children	100% APW	–
Married couple	2 children	100% APW	33% APW
Married couple	2 children	100% APW	67% APW
Married couple	No children	100% APW	33% APW

Source: OECD (2003), *Taxing Wages 2002-2003*, OECD, Paris.

Table I.1.2. **Average production worker – wage level, taxes paid, effective tax rates, 2002**[1]

	Average rates				Marginal rates
	Value of APW (US dollars with equal purchasing power)	Income tax	Employees' social security contributions	Tax wedge (income tax + employees' and employers' contributions – cash benefits)	Income tax + employees' and employers' contributions – cash benefits
Australia	35 867	24.0	0.0	28.3	35.4
Austria	25 824	10.5	18.1	44.7	55.6
Belgium	34 053	27.2	13.9	55.1	66.4
Canada	32 488	17.9	6.5	35.8	43.2
Czech Republic	14 534	11.2	12.5	43.5	48.1
Denmark	36 142	31.7	10.6	42.7	48.8
Finland	27 988	25.4	6.1	45.2	56.6
France	23 771	13.6	13.3	48.2	52.7
Germany	34 260	20.4	20.7	51.1	64.4
Greece	15 107	0.4	15.9	34.6	44.1
Hungary	9 087	16.9	12.5	49.0	55.4
Iceland	27 453	24.8	0.2	28.8	40.1
Ireland	24 791	11.4	5.0	24.5	33.2
Italy	26 242	18.9	9.2	46.0	54.2
Japan	29 235	5.6	13.6	29.8	32.0
Korea	31 108	2.2	4.5	14.1	17.2
Luxembourg	31 696	8.3	13.8	31.3	44.4
Mexico	9 075	2.1	1.6	16.1	25.8
Netherlands	32 747	9.2	23.8	42.5	50.9
New Zealand	27 361	20.1	0.0	20.1	33.0
Norway	32 412	21.0	7.8	36.9	43.1
Poland	13 976	6.1	25.0	42.8	45.3
Portugal	11 987	5.5	11.0	32.6	39.4
Slovak Republic	8 740	5.9	12.8	41.1	43.1
Spain	20 946	13.0	6.4	38.2	45.8
Sweden	24 259	23.4	7.0	47.6	48.6
Switzerland	33 702	9.9	11.6	29.6	37.5
Turkey	15 438	15.0	15.0	42.4	44.5
United Kingdom	29 701	15.6	7.6	29.5	39.2
United States	32 360	16.6	7.7	29.7	34.3

1. Single worker, no children.

Source: OECD (2002), *Taxing Wages*, tax/benefit models, OECD, Paris.

the APW survey contains only income data and does not model unemployment, inflation and related macroeconomic variables. As capital income is not included in the simulation, financial market trends are also neglected.

4. Methodology

The impact of taxes on vertical inequity, on horizontal inequity and on the tax treatment of one-earner *versus* two-earner households is traced using *income* as the relevant variable. We measure the tax impact by comparing after-tax and pre-tax income gaps. The *income gap* is a basic index of inequality, showing the gap between the incomes of the taxpayers with the highest and lowest income considered, divided by the mean of their incomes. Annex I.1.A1 shows that the income gap can be interpreted as a special case of a continuous index of tax redistribution, known as the Reynolds-Smolensky index (RS), at least for the analysis of vertical inequality.[7] The RS-index is frequently used in literature

on the global redistributive impact of taxes. It is particularly interesting as it enables a clarification of the factors that contribute to the redistributive power of a given tax. In fact, the over-all redistributive impact of a tax on income depends positively on two elements: the "global incidence" (average tax rate) and the degree of progressivity. At a fixed average tax rate (*g*), the redistributive impact of the tax will increase after raising its progressivity. Conversely, the redistributive impact increases by simply raising the average tax rate, even in the case where the degree of progressivity remains unchanged.

Box I.1.2 exhibits the formulas used in this report to calculate relevant income gaps and the associated tax impacts.

To establish the impact of labour taxes on vertical inequality, we calculate:

- the low-wage income gap, comparing income positions of single workers (no children) earning respectively 67 and 100 per cent of the wage of an average production worker.
- the high-wage income gap, comparing income positions of single workers (no children) earning respectively 100 and 167 per cent of the wage of an average production worker.

Then shifting the focus to multi-member households, we compare income positions of a one-earner couple with two young children earning respectively 133 and 167 per cent of the wage of an average production worker.

To assess the degree to which OECD tax systems change in relation to income positions of households at the same income level but with differing family status, it is necessary to first choose the most relevant determinants of family status. This report considers the number and age of household members to be the most appropriate and

Box I.1.2. **Assessing the redistributive impact of taxes**

VERTICAL INEQUALITY (BETWEEN DIFFERENT INCOME LEVELS):

- Gross income gap = (gross income high – gross income low)/((gross income high + gross income low)/2)
- Net income gap = (net income high – net income low)/((net income high + net income low)/2)
- Inequality reduction = gross income gap – net income gap

HORIZONTAL INEQUALITY (BETWEEN DIFFERENT HOUSEHOLD TYPES):

- Gross income gap= (gross income 0 child/scale 0) – (gross income 2 child/scale 2) /((gross income 2 child/scale 2) + (gross income 0 child/scale 0))/2)
- Net income gap = (net income 0 child/scale 0) – (net income 2 child/scale 2)/((net income 2 child/scale 2) + (net income 0 child/scale 0))/2)
- Inequality reduction = gross income gap – net income gap

TAX TREATMENT OF ONE-EARNER VERSUS TWO-EARNER HOUSEHOLDS

- Gross gap = (gross income 1 earner – gross income 2 earners)/((gross income 1 earner + gross income 2 earners)/2)
- Net gap = (net income 1 earner – net income 2 earners)/((net income 1 earner + net income 2 earners)/2)
- Tax impact = gross gap – net gap

Note: "scale 2" indicates the value of the equivalence scale for a household with two children.
"scale 0" indicates the value of the equivalence scale for a household with no children.

straightforward indicators. The next step is to select an equivalence scale, which is used to transform the money income of households of different family status into equivalent incomes. Equivalent income is derived by dividing money income by an equivalence index. The choice of the equivalence scale is important: alternative scales tend to give different emphasis to family size or to the age of household members, and produce different results (see Box I.1.3). For this report, the so-called modified OECD equivalence scale has been selected. This scale is frequently used in cross-country empirical studies.

Box I.1.3. **Equivalent income according to different equivalence scales.**

Equivalence scales are used to determine equivalent pre-tax and after-tax incomes of taxpayers living in households of varying composition. Given pre-tax money earnings, it is possible to derive the equivalent pre-tax income by dividing the earnings by the equivalent number of household members. This is done applying an equivalence scale. The choice of a particular equivalence scale involves a subjective judgment: some scales confer the same weight to all household members, some others confer a lower weight to dependent children, yet others stress economies of scale for household members sharing costs of living. The equivalence scale eventually selected has implications for the rearrangement of taxpayers along the income axis. Four such scales are reviewed here:

a) Per-capita income. The most straightforward methodology to infer household equivalent income is to calculate per-capita income, by dividing money income by the number of household members. This method does not take account of the fact that children in the household obviously consume less than adults. The method also neglects savings produced by sharing goods and services in the household. For these reasons it is not commonly used for empirical studies.

b) OECD equivalence scale. The OECD equivalence scale is one of the best-known and most used equivalence scales: it was designed in 1982 and awards the value of 1 to the principal adult household member, the value of 0.7 to any further adult member and of 0.5 to any child under 14 years old.

c) Modified OECD equivalence scale. This scale was established in 1994; it gives the value 1 to the principal adult household member, the value of 0.5 to any further adult member and of 0.3 to any child under 14 years old. This equivalence scale is less benevolent to large families than the original OECD scale since it puts more weight on economies of scale.

d) Parametric scales. The equivalence scale is estimated by elevating the number of family members by a chosen parameter θ, with $0 < \theta < 1$. The parameter θ represents the elasticity of the equivalence scale in respect to household size, and it is established on the basis of econometric analysis. An example of a parametric scale is the square root equivalence scale. It consists in dividing the gross or net income of taxpayers by the square root of the number of household members, without making any distinction between adults and children.

Table I.2.2 compares the effects of different scales to equalise pre-tax money earnings of a single parent with two children, earning 67 per cent of APW wage level. Applying the OECD equivalence scale, her equivalent income corresponds to 50 per cent of money income (money income divided by $1.0 + [2 \times 0.5]$). Applying the modified OECD equivalence scale, her equivalent income corresponds to 62.5 per cent of money income (money income divided by $1.0 + [2 \times 0.3]$). Applying the square root of the number of family members produces an equivalent income of 57.7 per cent of money income; using the econometric parameter ($\theta = 0.65$) results in an equivalent income of 49 per cent of money income.

To establish the impact of labour taxes on horizontal inequality, we calculate:

- Income gaps for a single parent (two children) and a single individual (no children), each earning 67 per cent of the wage of an average production worker.
- Income gaps for two-earner households (two children) and two earner households (no children), each earning 133 per cent of the wage of an average production worker.[8]

To establish the impact of labour taxes on the relative income positions of one-earner and two-earner households, we first created three household types not represented in the *Taxing Wages* report. This allows the calculation of:

- Income gaps for households earning 100 per cent of the wage of an average production worker, in the two-earner household the shares of the partners being 67/100 and 33/100 respectively.
- Income gaps for households earning 133 per cent of the wage of an average production worker, in the two-earner household the shares of the partners being 100/133 and 33/133 respectively.
- Income gaps for households earning 167 per cent of the wage of an average production worker, in the two-earner household the shares of the partners being 100/167 and 67/167 respectively.[9]

Notes

1. See, for example Gottschalk P., Smeeding T.M. (2000), "Empirical evidence on income inequality in industrialized countries" in *Handbook of Income Distribution*, North-Holland, Amsterdam.
2. See, for example Aronson, J.R., Jonson P., Lambert P.J. (1994) "Redistributive Effect and Unequal Income Tax Treatment" *Economic Journal*, Vol. 104, 262-270 and Kakwani, N.C. (1977) "Measurement of tax progressivity: an international comparison", *Economic Journal*, Vol. 87, 71-80.
3. See OECD (1995), *Taxes, benefits, employment and unemployment*, OECD, Paris.
4. Family cash benefits include transfers universally paid in respect of dependent children between five and twelve years of age who attend school. They include both benefits provided to families irrespective of their income and means-tested benefits. If the amount of benefits varies within the age range (5-12) chosen for the calculation, the most generous provisions are taken into account.
5. The APW represents an adult, full-time production worker in the manufacturing sector of each OECD economy. The manufacturing sector chosen as the basis for the APW simulations is defined in Division D of the International Standard Industrial Classification of All Economic Activities (ISIC Revision 3, United Nations, New York 1989).
6. For example, according to our analysis Denmark discriminates against two-earner couples at the low end of the wage scale. However, local governments in Denmark typically pay 70 per cent of the cost of day care for children below school age. Presumably, this is one reason why Denmark has one of the world's highest female labour force participation rates, despite the tax discrimination against female labour supply suggested by our results.
7. The redistribution index evaluated in this study corresponds to four times the Reynolds-Smolensky index. For a more extensive discussion of the RS-index and the Kakwani index, see Annex I.1.A1.
8. Example: to determine the effectiveness of the overall income tax system in reducing the income gap between two individuals earning 67 per cent of the APW wage, without children and with two children, the calculation runs:
   1. Gross income of the single individual without children (g067).
   2. Gross earning of the single parent with two children (g267).
   3. Net income of the single individual without children (n067).
   4. Net income of the single parent with two children (n267).
   5. The OECD modified equivalence scale (scale 0 and scale 2) applied to adjust the gross and net incomes according to household composition.

The gross income gap (gI67) is equal to the percentage difference between the equivalent gross incomes of the taxpayers gI67 = ((g067/scale0) – (g267/scale2))/(((g267/scale2) + (g067/scale0))/2). The corresponding net income gap (nI67) will be equal to the percentage difference between their equivalent net incomes nI67 = ((n067/scale0) – (n267/scale2))/(((n267/scale2) + (n067/scale0))/2). The reduction of inequality can be evaluated as the difference between the gross and net income gaps I67= (gI67-nI67).

9. To determine the impact of the different tax treatment of two families earning 100 per cent of the APW wage, with the share of each spouse 100/0 (one-earner household) and 67/33 (two-earner household), the calculation runs:
   1. Gross income of the one-earner family ($g1^{100}$).
   2. Gross income of the two-earner family ($g2^{100}$).
   3. Net income of the one-earner family ($n1^{100}$).
   4. Net income of the two-earner family ($n2^{100}$).

   The gross difference (gD^{100}) is always equal to zero. The corresponding net difference (nD^{100}) will be equal to the proportioned difference between the net income of the taxpayer chosen as benchmark and the net income of the other taxpayer $nD^{100} = ((n1^{100} – n2^{100})/((n1^{100} + n2^{100})/2))$. The result is the difference between the gross and net difference $D^{100} = (gD^{100} – nD^{100})$, or exactly the negative of net difference.

ANNEX I.1.A1

The Index of Tax Redistribution

Introduction

The Reynolds-Smolensky index (RS)[1] is a continuous index that evaluates the global redistributive power of taxes. It is able to appraise the redistributive effect of a tax on the entire distribution of income. A special case of RS has been used in the analysis of the redistributive effects of income tax systems in the OECD countries. This brief annex provides a framework of the theory on inequality and progressivity indices and explains the methodology that is used in the analysis to evaluate a simplified version of RS.

RS is based on the framework of the *Lorenz curve*, a continuous function that ranks the gross income of the population from the poorest to the richest: using the *Lorenz curve* it is possible to estimate the concentration indices of gross incomes (the so-called *Gini coefficient*), net incomes and taxes.

The Lorenz curve and the redistributive effects of taxes

Let's consider a generic distribution of incomes Y = {y_1, y_2, ...y_i, ..., y_n} and a tax function T(y);

1) The sum of gross income is: $Y = (\sum_{n=1}^{N} y_n)$

2) The yield of taxation is: $T = (\sum_{n=1}^{N} T(y_n)$

3) The average tax rate is: $t_a = T / Y = (\sum_{n=1}^{N} T(y_n))/(\sum_{n=1}^{N} y_n)$

4) The marginal tax rate is $0 < t_m < 1$, which means that there is no re-ranking of incomes.

Then, the Lorenz curve of gross incomes (L_y) is:

$$L_y(i) = (\sum_{n=1}^{i} y_n)/(\sum_{n=1}^{N} y_n) = (\sum_{n=1}^{i} (y_n))/Y \quad (1)$$

The concentration curve of tax (L_T) is:

$$L_T(i) = (\sum_{n=1}^{i} T(y_n))/(\sum_{n=1}^{N} T(y_n)) = (\sum_{n=1}^{i} T(y_n))/T \quad (2)$$

The concentration curve of net incomes ($L_{(Y-T)}$) is:

$$L_{(Y-T)}(i) = \left[\sum_{n=1}^{i} (y_n - T(y_n))\right] / \left[\sum_{n=1}^{N} (y_n - T(y_n))\right] = \left[\sum_{n=1}^{i} (y_n - T(y_n))\right] / (Y - T) \quad (3)$$

The following manipulations demonstrate that there exists a relationship between the Lorenz curve of gross incomes, the concentration curve of net incomes and the concentration curve of tax:

$$L_{(Y-T)}(i) = \left[\sum_{n=1}^{i} (y_n - T(y_n))\right] / (Y - T)$$

$$(Y - T) * L_{(Y-T)}(i) = \left[(\sum_{n=1}^{i} y_n) - (\sum_{n=1}^{i} T(y_n))\right]$$

$$\left[(Y - T)/Y\right] * L_{(Y-T)}(i) = \left[(\sum_{n=1}^{i} y_n)/Y\right] - \left[(\sum_{n=1}^{i} T(y_n))/Y\right]$$

$$\left[1 - (T/Y)\right] * L_{(Y-T)}(i) = \left[L_y(i)\right] - \left[(\sum_{n=1}^{i} T(y_n))/Y\right]$$

But $t_a = T/Y$, which implies that $Y = T/t_a$:

$$\left[(1 - t_a)\right] * L_{(Y-T)}(i) = L_y(i)\left[(\sum_{n=1}^{i} T(y_n))/(T/t_a)\right]$$

$$[(1 - t_a)] * L_{(Y-T)}(i) = L_y(i) - t_a * [L_T(i)]$$

Then:

$$L_y(i) = [(1 - t_a)] * L_{(Y-T)}(i) + t_a * L_T(i) \quad (4)$$

The Lorenz curve of gross incomes is equal to the weighted average between the concentration curve of net income and the concentration curve of tax, when the weight is the average tax rate.

Using the relationship (4), it is possible to demonstrate that the tax is able to reduce inequality if, and only if, the concentration of the tax system is bigger than the concentration of gross incomes.

$$L_{(Y-T)}(i) > L_{(y)}(i) \Leftrightarrow L_{(y)}(i) > L_{(T)}(i)$$

Re-arranging the terms of (4) we obtain:

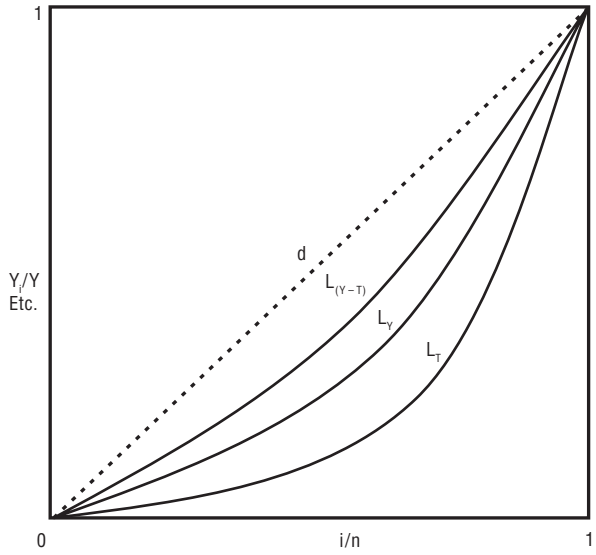
$$L_{(Y-T)}(i) - L_y(i) = [t_a/(1 - t_a)] * [L_y(i) - L_T(i)] \quad (5)$$

The term on the left hand side, $(L_{(Y-T)} - L_y)$, represents the global reduction of inequality achieved implementing the tax system, and is called the global redistributive effect. The first term on the right hand side, $(t_a/(1 - t_a))$, shows the average tax burden. The second term on the right hand side, $(L_Y - L_T)$, characterizes the degree of tax progressivity.

Thus, the global redistributive effect of taxes can be decomposed into two factors: the incidence (burden) of taxes and tax progressivity. Keeping the average tax rate fixed, the tax redistributive effect can be increased by raising the level of progressivity. At the same time, the global redistributive effect of a tax can rise simply by increasing the average tax rate, even when the degree of tax progressivity remains unchanged.

Figure I.A1.1 shows the framework of the Lorenz curve and the concentration curves when the tax system is progressive.

Figure I.A1.1.



Inequality indices and global progressivity indices

Using the framework of the Lorenz curve, it is possible to evaluate the degree of inequality, associated with the distribution of gross incomes, using a synthetic index, called the *Gini coefficient*: the *Gini coefficient* $G_{(Y)}$ is the area between the Lorenz curve and the diagonal line, divided by the total area below the diagonal line. It can also be evaluated using this formula:

$$C_{(Y)} = 1 - 2 * \int_0^1 L_Y(p)\, dp \tag{6}$$

At the same time, we can compute:

1. The degree of inequality associated with the concentration curve of net incomes by the *concentration index of net incomes* $C_{(Y\ -\ T)}$: it corresponds to the area between the concentration curve of net incomes and the diagonal line, divided by the total area behind the diagonal line.

$$C_{(Y-T)} = 1 - 2 * \int_0^1 L_{(Y-T)}(p)\, dp \tag{7}$$

2. The degree of inequality associated with the concentration curve of tax by the *concentration index of tax* $C_{(T)}$: it corresponds to the area between the concentration curve of tax and the diagonal line, divided by the total area behind the diagonal line.

$$C_{(T)} = 1 - 2 * \int_0^1 L_T(p)\, dp \tag{8}$$

Using the relationship (5), equations (6)-(8) imply:

$$[1 - 2*\int_0^1 L_{(Y-T)}(p)\, dp] - [1 - 2*\int_0^1 L_Y(p)\, dp] = [t_a / (1 - t_a)]* [[1 - 2*\int_0^1 L_Y(p)\, dp] - [1 - 2*\int_0^1 L_T(p)\, dp]]$$

$$2 * \int_0^1 (L_{(Y-T)}(p) - L_Y(p))\, d\,p = \left[t_a/(1-t_a)\right] * 2 * \int_0^1 (L_Y(p)\ (L_T(p))\, dp$$

$$C_{(Y-T)} - G_{(Y)} = \left[t_a/(1-t_a)\right] * \left[G_{(Y)} - C_{(T)}\right] \tag{9}$$

The term on the left end side of equation (9) represents the reduction of inequality achieved by implementing the tax system, and is known as the Reynolds-Smolensky index (*RS*). The RS index is equal to the difference between the *Gini coefficient* of gross incomes and the *concentration indexof net incomes*. The first term on the right end side of (9) shows the tax incidence. The second term on the right end side of (9) characterizes the degree of tax progressivity, and is called the *Kakwani index*.[2] The *Kakwani index* (K). K is calculated as the difference between the *concentration index of tax* and the *Gini coefficient* of gross incomes. Thus, equation (9) can be written as:

$$RS = (t_a / (1 - t_a)) * K \quad (10)$$

Where:

$$RS = (C_{(Y-T)} - G_{(Y)}) \quad (11)$$

$$K = (G_{(Y)} - C_{(T)}) \quad (12)$$

RS is particularly interesting as it can be used to explain the elements that contribute to raise the redistributive power of a certain tax. In fact, RS (which corresponds to the global redistributive effect of income taxes) can be decomposed into two factors: the incidence of taxes and the tax progressivity, estimated by the use of the *Kakwani index* (K).

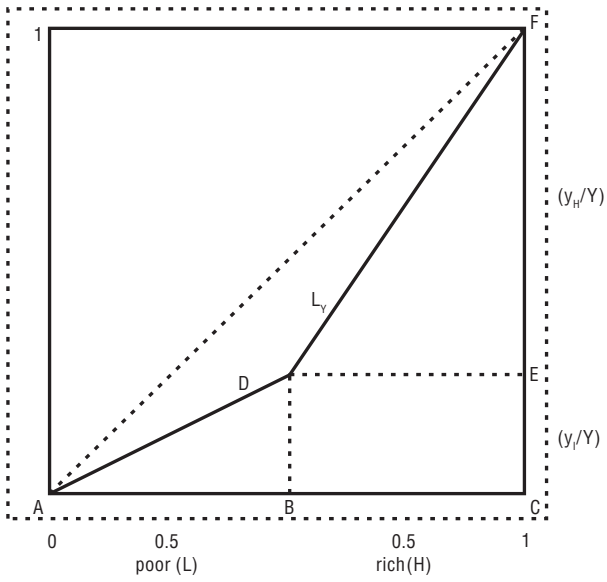
An application

Using the framework described above, it is possible to implement a special case of RS that can be used for the analysis employed in the main part of this work.

Consider a society composed of two individuals (n = 2): the poor person has a low gross income (y_L) and the rich person has a high gross income (y_H). The total income is $Y = y_L + y_H$. A progressive tax system is imposed on the gross incomes of the two individuals, with an increasing marginal tax rate. The net incomes of individuals are, respectively, Ny_L and Ny_H.

Using these figures it is possible to represent a discrete Lorenz curve and evaluate the *Gini coefficient* of the gross incomes (Figure I.A1.2).

Figure I.A1.2.



The *Gini coefficient* can be evaluated as follow:

$G_{(Y)} = 1 - 2 * \int_0^1 L_Y(p)\,dp$ = 1– 2 * (Area ABD +Area BCED +Area DEF)

$G_{(Y)} = 1 - 2 * [((0.5 * y_L/Y)/2) + (0.5 * y_L/Y) + ((0.5 * y_H/Y)/2)]$

$G_{(Y)} = 1 - 2 * [0.25 * y_L/Y + 0.5 * y_L/Y + 0.25 * y_H/Y]$

$G_{(Y)} = 1 - 0.5 * y_L/Y - y_L/Y - 0.5 * y_H/Y$

$G_{(Y)} = 1 - 1.5 * y_L/Y - 0.5 * y_H/Y$

$G_{(Y)} = (Y - 3/2 * y_L - 1/2 * y_H)/(y_L + y_H)$

$G_{(Y)} = (y_L + y_H - 3/2 * y_L - 1/2 * y_H)/(y_L + y_H)$

$G_{(Y)} = (1/2 * y_H - 1/2 * y_L)/(y_L + y_H)$

$G_{(Y)} = 1/2 * [(y_H - y_L)/(y_L + y_H)]$ (13)

If the same procedure is repeated for the *concentration index of net incomes* and the *concentration index of tax*, it emerges:

$C_{(Y\text{-}T)} = 1/2 * [(Ny_H - Ny_L)/(Ny_L + Ny_H)]$ (14)

$C_{(T)} = 1/2 * [(T_H - T_L)/(T_L + T_H)]$ (15)

Substituting equations (13), (14) into (11) and equations (14), (15) into (12), it is possible to obtain:

$RS = 1/2 * [(Ny_H - Ny_L)/(Ny_L + Ny_H)] - 1/2 * [(y_H - y_L)/(y_L + y_H)]$ (16)

$K = 1/2 * [(y_H - y_L)/(y_L + y_H)] - 1/2 * [(T_H - T_L)/(T_L + T_H)]$ (17)

These last two relationships (16) and (17) have been used in the paper to estimate the redistributive effects of taxes and the degree of tax progressivity in the OECD countries.

Notes

1. Reynolds, M. and E. Smolensky (1977), Public Expenditure, Taxes and the Distribution of Income: The United States, 1951, 1961, 1970, *Academic Press*, New York.
2. Kakwani, N.C., (1977), "Measurement of Tax Progressivity: An International Comparison", *Economic Journal*, Vol. 87, pp. 71-80, Royal Economic Society, Great Britain.

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PART I

Chapter 2

Inequality in Three Dimensions

1. Inequality in Three Dimensions

1.1. Analysing the tax impact on vertical inequality

An enquiry into the impact of labour taxes on vertical inequality compares the pre-tax and post-tax income position of taxpayers at various levels of income. To be fair, the comparison requires that households in similar positions be considered, for example households with the same number of children in the same age group, so as to ensure that they qualify for comparable tax reliefs and public transfer payments.

OECD countries aim to promote vertical equity goals through the progressive rate schedule of the personal income tax and a combination of universal and targeted reliefs.

As far as *rates of the personal income tax* are concerned, the degree of progressivity depends on the length of tax brackets and the steepness of the increase of the marginal rate applied to income in each bracket on the one hand, and on the tax threshold – the level of earnings at which income tax is first paid – on the other hand. In 1996, the income tax rates of about one-third of the OECD countries included six or more brackets, while the rest of the OECD countries had simpler income tax schedules.[1] During the past seven years most countries have undertaken reforms, with a general trend of flattening the rate structure by reducing the number of brackets, *e.g.* Hungary reduced the number of brackets from six to three, Italy from seven to five.

Reliefs employed to attain vertical equity goals comprise two distinct categories of provisions: tax allowances and tax credits. Most OECD tax systems employ at least one of these reliefs. Tax *allowances* are subtracted from income subject to tax and can be a fixed amount or related to gross income subject to tax (*e.g.* in France, Mexico, Portugal and Sweden). Tax *credits* are deducted from the tax due. For example, the Icelandic tax system provides a basic tax credit to all individuals over 16 years of age, irrespective of their family or professional status. In the case of Iceland, the value of the tax credit is reduced once income exceeds a certain threshold. Reliefs differ in terms of their impact on equity. The value of tax allowances is a function of the marginal tax rate; under progressive tax schedules, allowances are thus worth more to high than to low income taxpayers. In contrast, the value of tax credits is unaffected by the marginal tax rates of taxpayers.

Using data contained in the *Taxing Wages* report, it is possible to analyse the impact of labour taxes both for singles (with no children) and households (with children). In the case of single workers with no children, we can compare the isolated effect of the tax system, because no family benefits in the form of tax reliefs apply. In particular:

- To determine the low-wage income gap reduction, we compare pre-tax and after-tax income of single workers (no children) earning 67 per cent and 100 per cent of the APW gross wage level.
- To determine the higher-wage income gap reduction, we compare pre-tax and after-tax income of single workers (no children) earning 100 per cent and 167 per cent of the APW gross wage level.

Focusing on households with children (where family benefits frequently apply), we compare pre-tax and after-tax incomes of two-earner couples (two children) earning 133 per cent and 167 per cent of the APW gross wage level.

The analysis allows an evaluation of the effective capacity of the tax system to redistribute income between households at fixed points on the income scale. Of course, the results obtained are significant only over this particular income range; therefore, the figures must be read with caution.

1.2. Analysing the tax impact on horizontal inequality

An enquiry into the impact of labour taxes on horizontal inequality of personal incomes compares the position of taxpayers with various household characteristics, such as the presence of children. To be fair, the comparison requires that households at the same level of income be considered, for example households with wage earnings at the level of the average production worker. In determining tax liabilities, several OECD countries take account of the number and age of family members: they recognise that households play an important role in the redistribution of general welfare through the sharing of income and services between their members.[2] Moreover, some countries try to encourage couples to have children through the tax system. Partly to this end, a number of OECD countries provide tax relief for dependent children or the dependent spouse in the form of tax credits or tax allowances, (see Box I.2.1). In most cases, the relief for the dependent spouse is phased out once she/he participates in the labour market and her/his wage earnings exceed a certain threshold amount. On the other hand, tax relief or the amount of direct transfer payments for dependent children usually depends on the number and age of children, and in certain cases these reliefs are increased in the presence of a handicapped child or a single parent.

Box I.2.1. **Tax treatment of families in OECD countries**

Table I.2.1 summarises reliefs for workers, related to family status, provided under tax and social security legislation of OECD countries in 2002. About two-thirds of the countries have set up reliefs associated with the presence of a dependent spouse or a spouse with a low income of her/his own. The presence of dependent children qualifies households for supplementary reliefs in about two-thirds of OECD countries. In Austria, Belgium, Canada, Greece, Italy, Luxembourg, the Netherlands, Portugal, the United Kingdom and the United States these reliefs take the form of tax credits, while in the Czech Republic, France, Japan, Korea, the Slovak Republic, Spain and Switzerland they operate as tax allowances. Germany, Hungary and Ireland employ both relief categories. In most countries – except in Hungary, Italy, the Netherlands, the United Kingdom and the Unites States – child relief is not income-tested, hence families may claim relief independent of their level of income.

Some other countries (*e.g.* Mexico) tend to emphasise other components of the redistribution system. In particular, they focus on vertical inequity and have opted to use the tax system to encourage labour supply.

1.3. Analysing the tax treatment of one-earner versus *two-earner couples*

The third leg of the analysis evaluates the impact of labour taxes on pre-tax and after-tax income positions of one-earner *versus* two-earner households. To isolate the effect of the number of earners, the comparison concerns households at the same level of income and with

Table I.2.1. **Standard tax reliefs related to marital status and dependent children, 2002**

	Marital Status	Dependent Children
Australia	A standard tax credit is available when a taxpayer contributes to the maintenance of a dependent spouse (legal or *de facto*). The amount for a dependent spouse without children is fixed, and is reduced at a certain rate when the spouse's separate net income exceeds a specific amount. The rebate for a dependent spouse with a dependent child has been replaced by the Family Tax Benefit Part B (FTB(B)). As a contribution towards the cost of basic medical and hospital care, a medical levy is imposed on resident payers' taxable income. Certain thresholds are applied before the levy is imposed: the thresholds vary according to the family status of the taxpayer.	From 1 July 2000, the "new family benefit" (FTB) has replaced several forms of tax relief and cash transfers. The FTB can be claimed either through the taxation system or as a cash transfer: in this work it is treated as a cash transfer. From 1 July 2001 a refundable tax offset, called "baby bonus", was introduced to recognise that one of the hardest times for families financially is the birth of their first child, when one partner gives up or reduces their paid employment. This tax relief cannot be considered in the calculations, as *Taxing Wages* considers only children between 5 and 12 years old.
Austria	Sole earner's (if married) and single parent's tax credit: the sole earner's credit is not given when a spouse's income exceeds a certain amount, and is different if there are dependent children.	Children's tax credit for each child. As this tax credit is paid together with children allowances and not connected with income tax assessment, it is treated as a transfer.
Belgium	The amount of basic credit depends on the marital status of the taxpayer. Deduction related to particular family status, as for example dependent persons other than children, spouse without income or with handicap, single parents.	Deduction related to the number of dependent children: its amount is doubled for children with a handicap.
Canada	A taxpayer with a dependent spouse or partner receives a tax credit, reduced by 16 per cent of the dependant's income above a threshold. The same amount is available to heads of single-parent families eligible dependants.	A credit is provided for eligible dependants, including children under 18. The amount is reduced by 16 per cent rate of the dependant's net income above a threshold. The non-wastable Goods and Services Tax credit provides an additional amount for each qualified dependant under 19. A credit is allowed for dependants aged 18 and over and physically or mentally infirm. If the latter has a positive net income, the credit is reduced by this/her net income above a fixed threshold at a 16 per cent rate.
Czech Republic	Marital status relief: an allowance is given for a spouse living in a common household if the spouse's income is under a certain amount.	One spouse may claim an allowance for each dependent child who is: 1. aged under 18; 2. or aged under 26 and in full-time education; 3. aged under 26 and physically or mentally disable, provided that they are not in receipt of a state disability payment. The allowances are given irrespective of the child's own income.
Denmark	Each person is granted a personal allowance, which is converted to a wastable tax credit by applying the marginal tax rate of the first bracket of the income tax schedule. If a married person cannot utilise the personal allowance, the unutilised part is transferred to the spouse.	None
Finland	None	None
France	The "prime pour l'emploi", is a tax credit for low-wage employees: the basic threshold to obtain it changes according to the family status. It also has a supplement for a non-working spouse and a single parent.	The system of "quotient familial" provides tax reliefs to taxpayers with children. If the taxpayer has dependent children, the amount of "prime pour l'emploi" increases.
Germany	In the case of joint assessment, specific allowances are doubled. Income tax according to the schedule is computed by the income splitting method. An allowance is provided for single parents.	A tax credit is provided for children: its amount depends on the number of children.
Greece	None	Tax credit for dependent children: its amount depends on the number of children.
Hungary	None	Tax can be reduced by child tax credit, which is different for the 1st and 2nd child, and in the case of three or more dependent children. This tax deduction can be applied by a pregnant woman (or her husband) from the 91st day after conception.

Table I.2.1. **Standard tax reliefs related to marital status and dependent children, 2002** *(cont.)*

	Marital Status	Dependent Children
Iceland	Married couples may utilise up to 95 per cent of each spouse's unutilised portion of his/her basic tax credit (a fixed tax credit is granted to all individuals aged 16 and over, regardless of their marital status; unutilised tax credits or portions thereof are wastable).	None
Ireland	Married taxpayers are allowed an additional tax credit equal to the basic tax credit. An allowance is provided to single parent families; its amount is equivalent to that of the basic tax credit. Exemptions from income tax are available to individuals with small income; the exemption limit varies according to marital status.	The exemption limit increases by a fixed amount per child for the first two qualifying children and by a higher amount for the third and subsequent children.
Italy	Dependent spouse tax credit is provided if the spouse's income does not exceed a certain amount; its amount is calculated according to income brackets.	Children tax credit: the amount is related to the number of children. Other members of the family: a tax credit is granted for other dependants, provided the dependant's income does not exceed a certain amount. A dependant is deemed to be any person entitled to maintenance allowances (*e.g.* parents, parents-in-law) under civil law.
Japan	Allowance for spouse. A further special allowance is provided to a resident taxpayer depending on the income of the spouse, and certain requirements.	An allowance is given for each child. The amount of the allowance depends on the age of the child.
Korea	A taxpayer can deduct a certain amount from his/her income if his/her spouse's taxable income is below a specific threshold amount. There is a special allowance for single income earners with a dependant (spouse, child).	A taxpayer can deduct a certain amount per person from his/her income if his/her children aged 20 or under have a taxable income below a specific threshold. An additional allowance is provided when the dependants fall into certain categories (*e.g.* child under 6 years, or single parent).
Luxembourg	An extra deduction is designed for a spouse who receives a positive wage.	A tax credit is available for each dependent child. The amount is fixed. An additional tax credit is provided to single parents.
Mexico	None	None
Netherlands	All taxpayers are entitled to (at least) a general tax credit, which is wastable. If, however, a spouse/partner with insufficient income to fully exploit his/her tax credit has a partner with a surplus of tax and premiums payable over his/her own tax credit, the tax credit of the first-mentioned taxpayer is increased by (at most) the surplus of tax and premiums payable by his/ her fiscal partner. As a consequence, the tax credit of the first-mentioned taxpayer will exceed his/her tax and premiums payable, resulting in a pay-out of the residual tax credit to the taxpayer by the tax authority.	Child credit. A single person with children below 16 receives a credit if his or her income does not exceed a certain amount. A taxpayer with a partner is only entitled to the child credit if his or her income exceeds the income of the partner and the joint income does not exceed a fixed threshold. Additional child credit. If a person receives the ordinary child credit and the joint income does not exceed a specified threshold, he or she is also entitled to the additional child credit. Combination credit. A taxpayer with children below the age of 12 years is entitled to a combination credit, if his/ her income from work exceeds a certain amount. Single parent credit. A single parent is under certain conditions entitled to the single parent credit. Additional single parent credit. A single parent who is entitled to the single parent credit receives an additional credit of 4.3 per cent of his or her income from work, to a specified threshold.
New Zealand	None	None
Norway	None	A Parent allowance applies to the spouse who has the highest income. Unused parent allowance may be transferred to the other spouse. The allowance is also applicable to single parents. It is not evaluated in the APW model as it depends on documented expenses for child care.
Poland	None	None
Portugal	The amount of the basic tax credit provided to taxpayers depends on the family status.	A tax credit is available for each dependent child. If there is a child with handicap, this tax credit is increased by 50 per cent.

Table I.2.1. **Standard tax reliefs related to marital status and dependent children, 2002** *(cont.)*

	Marital Status	Dependent Children
Slovak Republic	An allowance is given in respect of a spouse living in a common household if that spouse earns under a certain income.	One spouse may claim an allowance per child for children of the household who satisfy one of the following criteria: 1. Aged below 18. 2. Aged below 26 and in full-time education. 3. Aged below 26 and physically or mentally disable provided that the child is not in receipt of a state disability payment. The allowances are given irrespective of the child's own income.
Spain	An allowance is provided to married taxpayers (twice the basic allowance) if one spouse has no income. An allowance is provided to single-parent families.	An allowance per child is provided for the first two dependent children under 25. This allowance is increased for subsequent children (3rd and 4th). A supplementary allowance is provided for each child between 3 and 16 years of age to cover part of the costs of education.
Sweden	None	None
Switzerland	An allowance is provided if the taxpayer's partner receives a positive salary.	An allowance is provided for each child below 18, or for older dependent children in full-time education.
Turkey	None	None
United Kingdom	None	Children Tax Credit: The Children's Tax Credit is a wastable tax credit designed to help families who have at least one child under 16 living with them. The CTC is expressed as an additional allowance given at the flat rate of 10 per cent. For higher rate taxpayers, the credit is reduced at the rate of GBP 1 for every GBP 15 of income in the higher rate band. There is an additional GBP 520 of Children's Tax Credit for families with a baby born on or after 6 April 2002 in the tax year of their child's birth. Working Families' Tax Credit (WFTC): A non-wastable tax credit available to low- and middle-income families where one earner works at least 16 hours a week and who have at least one child under 16 (or 19 if still in full time non-advanced education). The amount depends on the hours worked, the number and ages of the children. This credit is reduced by 55 pence for each GBP1 of net income above a weekly threshold.
United States	Married couples generally benefit from a more favourable schedule of tax rates for joint returns. There are no other general tax reliefs for marriage. A personal exemption is given every taxpayer, including both husband and wife filing a joint return. Exemptions differ depending on family status.	For each child and other person claimed as a dependant on a taxpayer's return, the taxpayer is entitled to a dependency exemption. Low-income workers with dependent children are allowed a non-wastable earned income credit, which is phased down when income exceeds a certain amount. Taxpayers are permitted a tax credit for each qualifying child under the age of 17. The maximum credit is reduced for taxpayers with income in excess of certain threshold amounts. A taxpayer with three or more qualifying children may be allowed a supplemental refundable (non-wastable) child credit, subject to certain restrictions. The refundable amount is equal to the amount by which the child credit exceeds the taxpayer's tax liability, but cannot exceed the taxpayer's social security taxes less the earned income credit received.

the same characteristics, *e.g.* the number of children. This tax effect can be expected to influence the decisions of households as to the allocation of labour supply between their members.

The so-called "secondary worker" is the spouse who earns the lower income or would earn a low income if she/he accepted paid employment. In most cases, the secondary worker is the female spouse. Her decision to enter the labour market often depends on the outcome of simple arithmetic: the increase of after-tax household income on the one hand, against the opportunity costs of lost leisure time plus costs that come with the job on the other hand. Provisions in the personal income tax impact on this choice, *e.g.* the decision to take paid work, can be discouraged in the presence of dependent children when no deduction for costs of child-care services is allowed.

Several countries encourage both spouses to enter the labour market, by making both standard and non-standard reliefs available to them. Often such reliefs take the form of allowances for work-related expenses, or for costs of transport and child-care. The simulations for *Taxing Wages* regard the allowances for general work-related expenses and basic travel costs as standard reliefs, thus including these items in the calculation of taxes due. On the other hand, deductions for child-care or for certain travelling expenses are considered as non-standard reliefs, thus they are not captured in the tax simulations.

In contrast, a number of OECD countries take into account the sacrifices made by families when the secondary worker chooses to stay home to take care of the children and renounces the prospect of extra income. Usually, the instrument chosen is to provide the principal earner with a tax allowance or tax credit.

The decision of the secondary worker to enter the labour market will also be influenced by the tax unit: the family or the individual. With the family being the tax unit, the income of both partners is added before tax liability is assessed. It can be argued that this best reflects ability to pay but, in the presence of a progressive rate schedule, this implies that gross income earned by the secondary worker is taxed at the (high) marginal rate that applies to the last dollar, yen or euro earned by the principal earner. Moreover, joint income will often be so high that the families concerned no longer qualify for income-tested benefit programmes. In these ways, family taxation can create disincentives for one of the spouses (generally the woman) to enter the labour market.

In contrast, countries opting for individual taxation under the personal income tax can encourage non-working spouses to enter the labour market, as her/his income will be taxed separately, starting at low marginal rates.

Currently, most OECD countries practice individual taxation, while a number of countries (Canada, France, Germany, Ireland, Korea, Luxembourg, Portugal, Switzerland and the United States) have opted for the family as the basis of income taxation.[3] Table I.2.3 provides an overview of the tax unit in OECD countries and the techniques used to reduce the "marriage penalty" associated with the choice of families as the tax unit.[4] France and Luxembourg apply a "quotient familial", which takes into account the marital status of the taxpayer and the number of dependent children. The system of the "quotient familial" divides family income by the number of parts (*e.g.* in France: one part for the husband, one part for the wife, one half part for each child and other dependent persons, and so on). The resulting amount of tax related to each component is multiplied by the total number of parts to obtain the total amount of tax due. Countries such as Ireland, Switzerland and the United States provide broader tax brackets for married taxpayers or families with dependent children. Germany and Portugal have opted

Table I.2.2. **Equivalent income under different equivalence scales**

	Annual gross wage (US Dollars) 2002					
	Gross wage level[1]		Equivalent income			
	Single individual without children APW	Single parent with two children 67% APW	OECD equivalence scale	Modified OECD equivalence scale	$\sqrt{N}$	N^{θ}
Australia	35 867	23 911	11 956	14 944	13 805	11 708
Austria	25 824	17 216	8 608	10 760	9 940	8 430
Belgium	34 053	22 702	11 351	14 189	13 107	11 116
Canada	32 488	21 658	10 829	13 536	12 504	10 605
Czech Republic	14 534	9 690	4 845	6 056	5 595	4 745
Denmark	36 142	24 094	12 047	15 059	13 911	11 797
Finland	27 988	18 659	9 330	11 662	10 773	9 136
France	23 771	15 848	7 924	9 905	9 150	7 760
Germany	34 260	22 840	11 420	14 275	13 187	11 183
Greece[2]	15 107	11 078	5 539	6 924	6 396	5 424
Hungary	9 087	6 058	3 029	3 786	3 498	2 966
Iceland	27 453	18 302	9 151	11 439	10 567	8 961
Ireland	24 791	16 527	8 264	10 329	9 542	8 092
Italy	26 242	17 495	8 748	10 934	10 101	8 566
Japan	29 235	19 490	9 745	12 181	11 253	9 543
Korea	31 108	20 738	10 369	12 961	11 973	10 154
Luxembourg	31 696	21 130	10 565	13 206	12 199	10 346
Mexico	9 075	6 050	3 025	3 781	3 493	2 962
Netherlands	32 747	21 831	10 916	13 644	12 604	10 689
New Zealand	27 361	18 241	9 121	11 401	10 532	8 931
Norway	32 412	21 608	10 804	13 505	12 475	10 580
Poland	13 976	9 318	4 659	5 824	5 380	4 562
Portugal	11 987	7 991	3 996	4 994	4 614	3 913
Slovak Republic	8 740	5 827	2 913	3 642	3 364	2 853
Spain	20 946	13 964	6 982	8 728	8 062	6 837
Sweden	24 259	16 173	8 087	10 108	9 338	7 919
Switzerland	33 702	22 468	11 234	14 043	12 972	11 001
Turkey	15 438	10 292	5 146	6 433	5 942	5 039
United Kingdom	29 701	19 800	9 900	12 375	11 432	9 695
United States	32 360	21 573	10 787	13 483	12 455	10 563
Percentage of APW	100%	66.7%	33.3%	41.7%	38.51%	32.6%
Percentage of 67% APW	150%	100%	50%	62.5%	57.7%	49.0%

1. OECD (2003), *Taxing Wages 2002-2003*, tax benefit models, OECD, Paris.
2. Figures for Greece are slightly different, owing to the fact that employees are granted cash transfers by their employers, under the relevant collective labour agreement. As a result of this cash transfer, the actual gross wage of a single parent with two children is equal to about 73 per cent of the APW (the other results are, respectively: income based on the OECD equivalent scale is equal to 36.7% of APW, income evaluated on the basis of the modified OECD equivalent scale is equal to 45.8% of APW, income based on the squared root of family members is equal to 42.3% of APW, and income based on the econometric parameter ($\theta = 0.65$) is equal to 35.9% of APW).

for the so-called "splitting method", whereby the taxable income of the household is split into two halves. Each half is taxed at ordinary rates, and the tax assessment includes twice the amount of the tax imposed on each half. These constructs reduce the tax burden of one-earner families, but they often do not eliminate all disincentives for secondary workers, as the effective marginal tax rate applied to the secondary workers' income can still be higher than it would be if they were single.

Table I.2.3. **Tax unit, 2002**

	Tax unit 2002
Australia	**Individual**
Austria	**Individual**
Belgium	**Family.** However couples who both receive earned income are taxed separately on that income. If one spouse has no earned income, the couple can benefit from a "quotient conjugal" system: a fraction of taxpayer earned income can be attributed to the other spouse, and the two incomes are taxed separately according to the tax schedule.
Canada	**Individual.** However, in cases where the income of a spouse is below a certain amount, this income is declared on the return of the other spouse.
Czech Republic	**Individual**
Denmark	**Individual**
Finland	**Individual**
France	**Family.** The "quotient familial" takes into account the marital status of the taxpayer and the dependent children. The system divides the income by the number of parts (1 for the husband, 1 for the wife, ½ for each child and other dependent persons, 1 for the 3rd child, a supplementary ½ for handicapped household members). The total amount of tax due is equal to the amount of tax for one part multiplied by the total number of parts.
Germany	**Family.** Income tax is computed by the income splitting method. Spouses can, however, opt to be assessed separately. The income of dependent children is not assessable with that of the parents.
Greece	**Individual**
Hungary	**Individual**
Iceland	**Individual,** except for unearned income of married couples, which is taxed jointly.
Ireland	**Family.** Either spouse may opt for assessment as a single person, in which case both are treated as separate units.
Italy	**Individual**
Japan	**Individual**
Korea	**Individual** In most cases, but in the case of a married couple receiving rental income from real estate property or interest and dividend income (in excess of a threshold amount), the income of both spouses is combined to determine their taxable income.
Luxembourg	**Family.** Non-salary income of children under 18 is combined with that of the parents in the calculation of taxable income.
Mexico	**Individual**
Netherlands	**Individual**
New Zealand	**Individual**
Norway	**Individual** in most cases (tax class 1), but in some cases, when the spouse has no income or low income, optional taxation as a couple is more favourable (tax class 2). Single parents will be taxed under the class 2 schedule. Children under 17 are generally taxed with their parents, but may be taxed individually. All other income earners are taxed individually (tax class 1).
Poland	**Individual,** but couples married during the whole calendar year can opt to be taxed on their joint income. In the latter case, the "splitting" system applies: the tax bill for the couple is twice the income tax due on half of the joint income, provided the joint income does not include capital income.
Portugal	**Family.** The total taxable income is calculated using the "splitting system".
Slovak Republic	**Individual**
Spain	**Choice.** Individual as a general rule, but families have the option of being taxed: As married couples filing jointly on the combined income of both spouses and dependants; As heads of households (only unmarried or separated individuals with dependants).
Sweden	**Individual.** Spouses are taxed separately.
Switzerland	**Family.** The incomes of married couples are combined. There is a more favourable tax schedule for spouses living together, widowed, separated, divorced or unmarried taxpayers living with their own children than for persons living alone. The earned income of children is taxed separately.
Turkey	**Individual.** From 1999, spouses are taxed separately on earned income. (In previous years, if each of the spouses worked separately for more than one employer and if each of them individually earned more than a fixed amount in gross income annually, they were taxed jointly).
United Kingdom	**Individual**
United States	**Choice.** Families are generally taxed in one of three ways: As married couples filing jointly on the combined income of both spouses. As married individuals filing separately and declaring actual income of each spouse. As heads of household (only unmarried or separated individuals with dependants). All others, including dependent children with sufficient income, file as single individuals.

2. Results

Readers of the report are reminded once again that results presented in this section should be interpreted with caution, bearing in mind the limitations of the *Taxing Wages* data and those inherent to the methodology used.

2.1. Vertical inequality

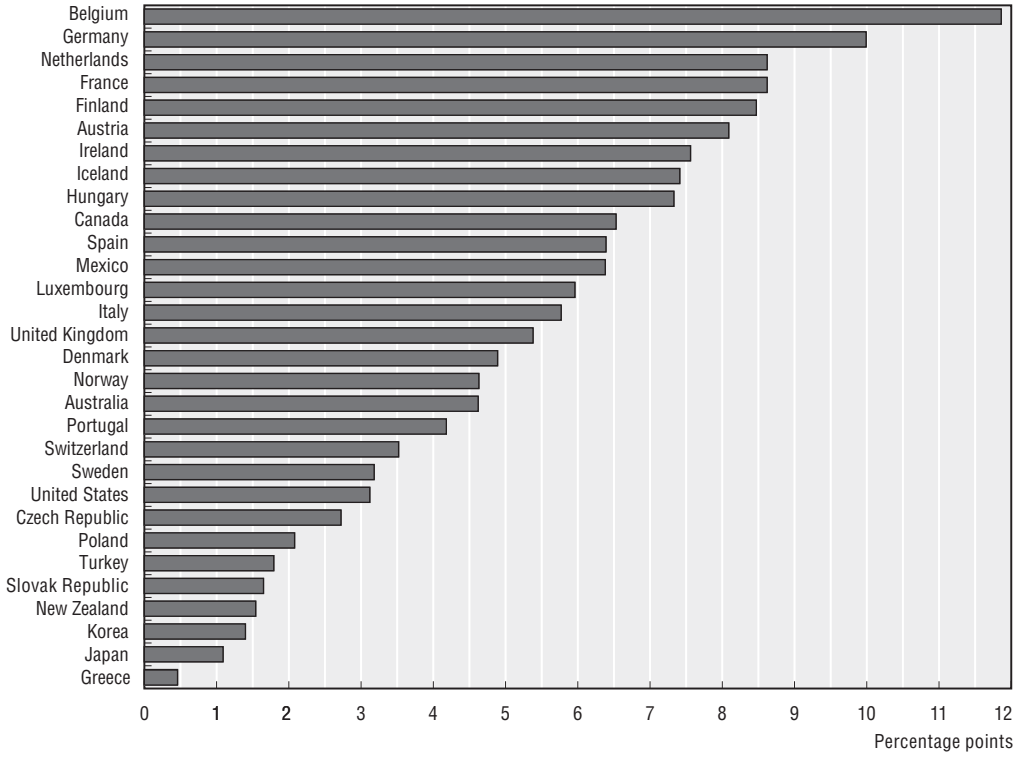
Table I.2.4 and Figure I.2.1 through 2.3 show that labour taxes in OECD countries reduce vertical income inequality, although to a varying degree. In Figure I.2.1 the focus is on the position of single workers at low wages. To illustrate, we consider the case of Australia. The gross income gap between workers earning 67 and 100 per cent of the APW wage is 40 percentage points: $[(100 - 66.66)/((100 + 66.66)/2)] \times 100$.[5] The net income gap in this case turns out to be 35.4 points. Applying the formula specified in footnote 18 we find

Table I.2.4. **Vertical tax progressivity by household type, 2002**

	Single taxpayers		Married couples
	Low-wage income gap reduction (%)[1] APW-67% APW	High-wage income gap reduction (%)[2] 167% APW-APW	Income gap reduction 167% APW-133% APW (%)
Australia	4.62	11.80	2.90
Austria	8.09	9.46	3.68
Belgium	11.86	12.16	6.78
Canada	6.53	3.85	3.56
Czech Republic	2.72	4.01	6.08
Denmark	4.89	13.77	4.17
Finland	8.47	11.74	3.00
France	8.62	5.23	2.41
Germany	9.99	11.51	7.30
Greece	0.46	8.17	0.15
Hungary	7.33	16.36	4.30
Iceland	7.41	16.34	7.22
Ireland	7.56	13.49	4.26
Italy	5.77	7.17	3.30
Japan	1.09	3.39	0.98
Korea	1.40	7.53	0.01
Luxembourg	5.96	11.84	3.30
Mexico	6.38	7.80	2.10
Netherlands	8.62	2.57	3.33
New Zealand	1.54	7.04	0.42
Norway	4.63	10.47	3.14
Poland	2.08	1.66	1.28
Portugal	4.18	8.07	3.31
Slovak Republic	1.65	5.03	6.33
Spain	6.39	5.95	0.35
Sweden	3.18	8.01	2.30
Switzerland	3.52	5.88	3.93
Turkey	1.79	3.18	0.40
United Kingdom	5.38	3.65	4.67
United States	3.12	7.90	3.00

1. Low-wage income gap results from a comparison of the gross and net income of a worker earning the APW wage with a worker earning 67 per cent of the APW wage level.
2. High-wage income gap results from a comparison of the gross and net income of a worker earning 167 per cent of the APW with a worker earning the APW wage.

Figure I.2.1. **Low-wage income gap reduction**



that in the case of Australia the tax system reduces the income gap by 4.6 points (40-35.4). The system of labour taxes in a number of European countries, including Austria, Belgium, Finland, France, Germany, Hungary, Iceland, Ireland and the Netherlands reduces the low-wage income inequality by more than seven points. In the remaining OECD countries the reduction varies between 0.5 points (Greece) and 6.5 points (Canada).

Figure I.2.2, focusing on single workers at higher wages, shows that labour taxes in one-third of the OECD countries reduce the gross-net income gap by over 10 percentage points, with a maximum of 16.4 points in Hungary, followed by 16.3 points in Iceland and 13.8 points in Denmark. The lowest scores are found for Poland (1.7 points) and the Netherlands (2.6 points). The average reduction of vertical inequality is 8.2 percentage points for the higher-wage income gap as against 5.2 points for the low-wage income gap.[6] These results are dictated by the interplay of rate schedules, threshold levels and standard reliefs.

The last column of Table I.2.4 offers results on the income gap reduction for (married) couples with two children (see also Figure I.2.3). On average, vertical inequality is reduced by around 3 percentage points, but substantial differences are observed among countries: three countries (Belgium, Germany and Iceland) post a reduction of 6.7 percentage points or more, two-thirds of OECD tax systems effectuate a decline of vertical inequality ranging between 2 and 4 points, while the remainder of OECD countries (Greece, Japan, Korea, New Zealand, Spain and Turkey) display minor differences between pre-tax and after-tax income gaps. These results are in line with the general picture of cross-country differences found for single taxpayers. On the other hand, the redistributive impact of the tax system operates more strongly in the case of single taxpayers than it does for households with

Figure I.2.2. **Higher-wage income gap reduction**

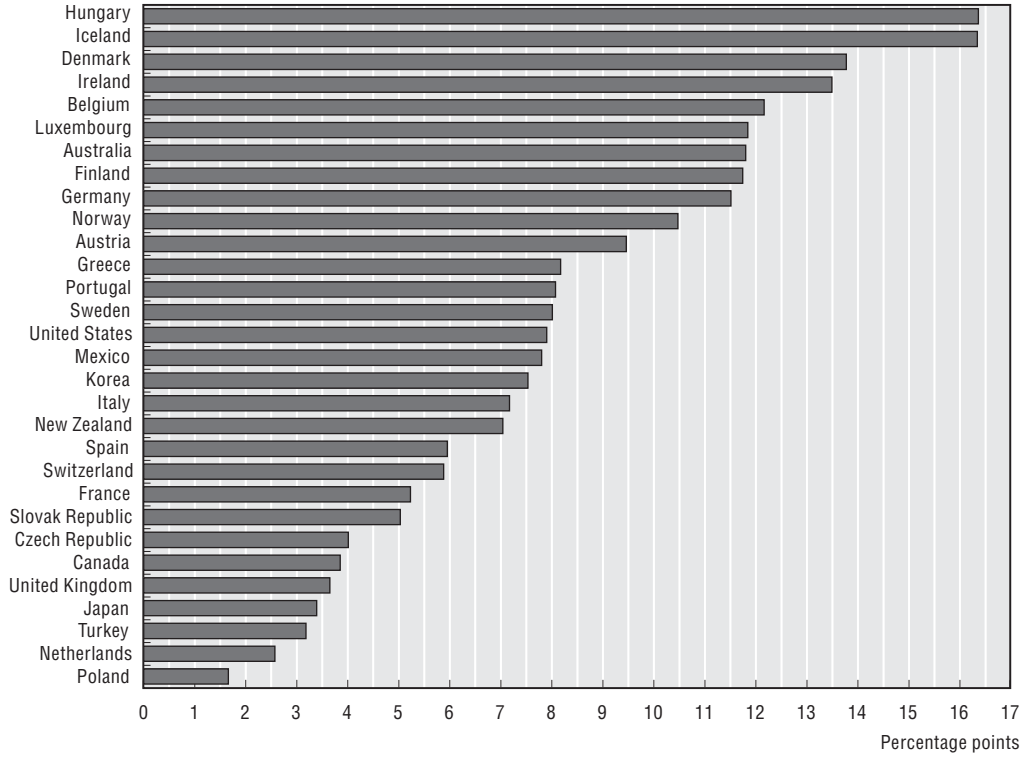
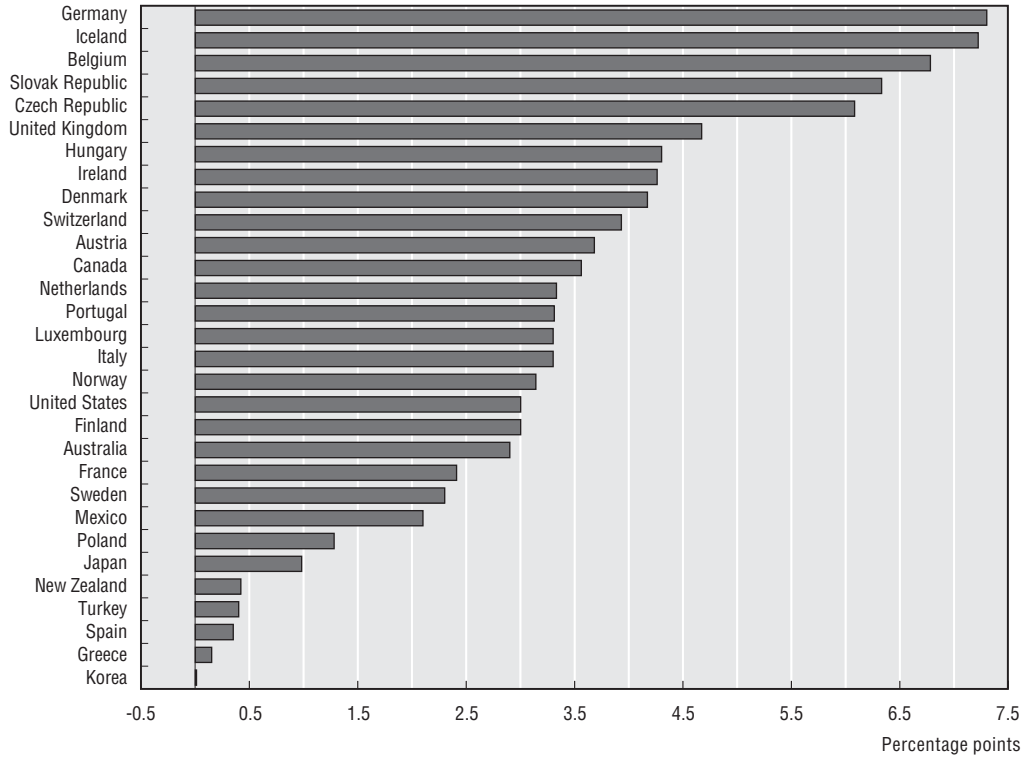


Figure I.2.3. **Income gap reduction for households**



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children. In fact, these findings also reflect that the income levels selected for households with children are higher than the income levels selected for single workers. In other words, in most OECD countries labour taxes have a greater redistributive impact for taxpayers with relatively low incomes. The only exceptions to this "rule" are the Czech Republic and the Slovak Republic.

The capability of a tax to redistribute income depends significantly on its share in GDP and in the tax mix (Box I.2.2). Even though results regarding the reduction of income gaps for employees at various wage levels refer to the situation in year 2002 (Table I.2.4) and the macro data in Tables I.2.5 and I.2.6 refer to years 1998-2000, it may be useful to compare them to interpret the results obtained in a broader context. Generally, countries with high income tax-to-GDP ratios show the greatest redistributive impacts. For example, Finland

Box I.2.2. **Personal income tax and social security contributions in OECD economies**

Tables I.2.5 and I.2.6 provide some data on the weight of personal income tax and social security contributions in both the economy and the tax mix of OECD countries during the years 1998-2000. These data may help readers in gauging the significance of taxes on labour income and their potential contribution to the overall redistribution of resources among households.

As shown in Table I.2.5, in 1998 revenues from *personal income taxes* amounted to less than 10 per cent of gross domestic product (GDP) in about half of all OECD countries, with a minimum of 4.3 per cent in Korea. The Nordic countries had the highest personal income tax-to-GDP ratios: Denmark (25.9 per cent), followed by Sweden (18.1 per cent) and Finland (14.9 per cent). Revenues from the personal income tax as a share of GDP remained stable over the period. The last three columns of Table I.2.5 show the share of the personal income tax (PIT) in the tax mix. In 1998, PIT accounted for about 26 per cent of all tax receipts, but large differences can be observed among OECD countries. Over 50 per cent of Denmark's tax revenues were generated by personal income taxes, while in Australia, New Zealand and the United States the share of income taxes exceeded 40 per cent. On the other hand, in one-third of the OECD countries the share of PIT was below 20 per cent. Trends in the period 1998-2000 differ slightly: Denmark, France, Hungary, Italy, Japan, New Zealand, Poland, the UK and the United States saw the share of personal income taxes in total tax revenues increase. Australia, the Czech Republic, Finland, Iceland, Korea, Luxembourg, the Netherlands, Norway, the Slovak Republic and Spain witnessed a somewhat declining share of PIT, while Greece and Turkey experienced a quite sharp decline.

Table I.2.6 provides some figures on the weight of *employees' social security contributions* in the economy and the tax mix of OECD countries. In 1998, these taxes represented less than 4 per cent of GDP in about two-thirds of OECD countries, while in Austria, Belgium, France, Germany, Greece, Luxembourg and the Netherlands the share of employees' contributions ranged between 4 and 7.7 per cent. Australia and New Zealand impose no contributions on employees. Basically, this pattern did not change in 1999 and 2000. In 2000, the Netherlands remained the country with the highest ratio of employees' social security contributions to GDP (8.1 per cent), followed by Germany (6.5 per cent) and Greece (6.2 per cent). In the OECD area as a whole, employees' contributions make up about 8 per cent of aggregate tax revenues, but the picture varies widely for individual countries. In about one-third of the OECD countries the share of employees' contributions exceeds 10 per cent, while the other OECD countries post lower shares.

Table I.2.5. **Personal income taxes as percentage of GDP and total tax revenues, 1998-2000**

	Taxes on personal income as percentage of GDP			Taxes on personal income as percentage of total taxation		
	1998	1999	2000	1998	1999	2000
Australia	11.7	11.8	12.6	42.6	43.3	36.7
Austria	10.0	10.1	9.6	22.5	22.9	22.1
Belgium	14.1	13.9	14.1	30.8	30.7	31.0
Canada	13.7	13.7	13.2	37.5	38.3	36.8
Czech Republic	5.2	5.0	5.0	13.6	12.9	12.7
Denmark	25.9	26.0	25.7	51.6	50.7	52.6
Finland	14.9	14.9	14.4	32.2	31.8	30.8
France	7.7	8.0	8.2	17.2	17.4	18.0
Germany	9.3	9.5	9.6	25.0	25.1	25.3
Greece	4.9	5.2	5.1	23.9	14.2	13.5
Hungary	6.5	6.8	7.3	16.8	17.5	18.6
Iceland	12.1	12.9	12.8	35.2	34.9	34.4
Ireland	9.8	9.5	9.6	30.9	30.4	30.8
Italy	10.6	11.4	10.8	25.0	26.4	25.7
Japan	5.2	4.8	5.6	19.2	18.5	20.6
Korea	4.3	3.7	3.8	18.8	15.6	14.6
Luxembourg	7.6	7.7	7.6	19.0	18.8	18.3
Mexico	NA	NA	NA	NA	NA	NA
Netherlands	6.2	6.3	6.2	15.4	15.3	14.9
New Zealand	14.5	14.6	15.0	41.8	41.8	42.8
Norway	11.8	11.7	10.3	27.2	28.2	25.6
Poland	8.3	8.1	7.9	22.0	23.1	23.2
Portugal	5.7	5.8	6.0	17.1	16.9	17.5
Slovak Republic	4.6	4.4	3.6	12.5	12.6	10.0
Spain	7.0	6.8	6.6	20.7	19.5	18.7
Sweden	18.1	18.5	19.3	35.0	35.6	35.6
Switzerland	10.9	10.0	10.9	31.4	29.0	30.6
Turkey	7.7	7.4	7.2	27.3	23.8	21.5
United Kingdom	10.1	10.4	10.9	27.3	28.7	29.2
United States	11.7	11.8	12.6	40.5	40.7	42.4

Source: OECD (2002), *Revenue Statistics 1965-2001*, OECD, Paris.

and Belgium post an income tax-to-GDP ratio exceeding 14 per cent and at the same time these countries reduce the vertical inequality among single workers (no children) substantially. Denmark, which has the highest income tax-to-GDP ratio, redistributes income from workers at the higher end of the wage range, scoring average results for low-wage workers and households. There are, however, also some notable exceptions: for example in Germany the tax system has a relatively large equalising effect for both single workers and households, even though the income tax-to-GDP ratio is below 10 per cent.

The analysis of the tax impact on the (vertical) inequality of the personal income distribution presented here uses a special case of the Reynolds-Smolensky (RS) index. It is possible to decompose the RS-index into two factors: the average rate of the personal income tax plus employees' social security contributions (g), and tax progressivity as measured by the Kakwani index (K). Table I.2.7 shows results of the decomposition of the RS-index: the first three columns refer to low-wage vertical inequality (single workers without children earning 67 and 100 per cent of average wages); the last three columns

Table I.2.6. **Employees' social security contributions as percentage of GDP and total tax revenues, 1998-2000**

	Employees' social security contributions as percentage of GDP			Employees' social security contributions as percentage of total taxation		
	1998	1999	2000	1998	1999	2000
Australia	–	–	–	–	–	–
Austria	6.2	6.2	6.1	13.9	14.0	14.0
Belgium	4.4	4.4	4.4	9.6	9.6	9.7
Canada	2.0	1.9	2.0	5.4	5.4	5.7
Czech Republic	3.8	3.8	3.9	10.1	9.8	10.0
Denmark	1.2	1.8	1.9	2.4	3.5	3.9
Finland	2.0	2.0	2.2	4.3	4.3	4.7
France	4.0	4.0	4.0	8.8	8.8	8.9
Germany	6.6	6.5	6.5	17.9	17.3	17.2
Greece	6.0	6.2	6.2	16.8	16.9	16.4
Hungary	2.1	2.2	2.1	5.4	5.6	5.4
Iceland	0.1	0.1	0.1	0.3	0.2	0.2
Ireland	1.1	1.3	1.3	3.6	4.0	4.2
Italy	2.7	2.4	2.2	6.3	5.5	5.4
Japan	3.8	3.8	3.8	14.2	14.4	14.2
Korea	1.7	2.0	2.4	7.6	8.4	9.3
Luxembourg	4.2	4.5	4.7	10.5	11.1	11.3
Mexico	NA	NA	NA	NA	NA	NA
Netherlands	7.7	8.1	8.1	19.2	19.6	19.5
New Zealand	–	–	–	–	–	–
Norway	3.5	3.5	3.1	8.0	8.3	7.7
Poland	–	NA	NA	–	NA	NA
Portugal	3.1	3.2	3.3	9.4	9.4	9.5
Slovak Republic	3.0	2.8	2.8	8.1	7.9	7.7
Spain	1.9	1.9	1.9	5.5	5.5	5.5
Sweden	3.0	3.0	3.0	5.8	5.8	5.5
Switzerland	3.9	4.0	3.9	11.4	11.5	11.0
Turkey	1.6	2.2	2.2	5.7	6.9	6.5
United Kingdom	2.7	2.6	2.5	7.2	7.2	6.7
United States	2.9	3.0	3.0	10.2	10.5	10.2

Source: OECD (2002), *Revenue Statistics 1965-2001*, OECD, Paris.

refer to higher-wage vertical inequality (single workers without children earning 100 and 167 per cent of average wages). Decomposition of the RS-index is not possible for households, as in this case the tax burden depends on the combined tax liability of both partners, increasing the complexity of the decomposition procedure.

Some countries with strong redistribution among *low-wage earners* reveal a high degree of tax progressivity; in these cases taxes are effective redistributors, even though the tax burden is relatively low, *e.g.* in Iceland and Ireland. In other countries the redistributive power of labour taxes depends largely on the level of the average tax rate, *e.g.* in Belgium and Germany. Certain OECD countries show significant progressivity in combination with a low tax burden (*e.g.* Mexico). On the other hand, there are countries where modest results in terms of redistribution are mainly explained by the low degree of tax progressivity (*e.g.* Turkey).

Similar observations can be made looking at the results for *higher-wage earners*. Tax systems with a high Kakwani index are generally effective in redistributing income, even

Table I.2.7. **Decomposition of the RD-index by progressivity (Kakwani index) and average tax rate, 2002 (%)**

	Total redistributive (4 times *Reynolds-Smolensky*) index (%)	Progressivity (*Kakwani*) index (%)	Tax burden *g* (%)	Total redistributive (4 times *Reynolds-Smolensky*) index (%)	Progressivity (*Kakwani*) index (%)	Tax burden *g* (%)
	Vertical inequality, single individuals APW-67% APW			Vertical inequality, single individuals 167% APW-APW		
Australia	4.6	15.9	22.6	11.8	28.8	28.5
Austria	8.1	22.9	26.1	9.5	19.4	32.8
Belgium	11.9	19.2	38.1	12.2	14.5	45.6
Canada	6.5	16.8	28.0	3.9	10.2	26.3
Czech Republic	2.7	9.2	22.8	4.0	11.6	25.7
Denmark	4.9	7.0	41.1	13.8	15.4	47.2
Finland	8.5	20.8	29.0	11.7	19.2	36.1
France	8.6	27.1	24.1	5.2	12.6	29.3
Germany	10.0	16.0	38.5	11.5	13.9	45.2
Greece	0.5	2.4	16.1	8.2	31.4	20.6
Hungary	7.3	19.7	27.1	16.4	28.7	36.3
Iceland	7.4	25.3	22.7	16.3	34.1	32.4
Ireland	7.6	47.7	13.7	13.5	44.4	23.3
Italy	5.8	16.2	26.3	7.2	15.7	31.4
Japan	1.1	4.7	18.9	3.4	12.7	21.0
Korea	1.4	21.2	6.2	7.5	59.7	11.2
Luxembourg	6.0	23.7	20.1	11.8	30.8	27.8
Mexico	6.4	600.6[1]	1.1	7.8	84.6	8.4
Netherlands	8.6	19.6	30.6	2.6	4.9	34.2
New Zealand	1.5	6.3	19.6	7.0	22.6	23.7
Norway	4.6	12.3	27.4	10.5	20.8	33.4
Poland	2.1	4.7	30.5	1.7	3.5	31.9
Portugal	4.2	23.6	15.1	8.1	30.7	20.8)
Slovak Republic	1.7	7.5	18.1	5.0	18.6	21.3
Spain	6.4	30.9	17.1	6.0	20.6	22.4
Sweden	3.2	7.6	29.4	8.0	15.6	33.9
Switzerland	3.5	13.8	20.3	5.9	18.2	24.4
Turkey	1.8	4.3	29.4	3.2	6.9	31.4
United Kingdom	5.4	19.7	21.4	3.7	10.9	25.0
United States	3.1	10.3	23.3	7.9	20.3	28.1

1. This peculiar value of the Kakwani index in Mexico results from the fact that single individuals earning 67% of APW show a negative tax liability.

in the presence of very low tax burdens (*e.g.* Ireland, Mexico, Portugal), while countries with the highest degree of redistribution (*e.g.* Belgium, Denmark, Hungary) combine high average tax rates with moderate progressivity of their tax structure.

A comparison of inequality indices based on micro-data (Box I.2.3) and results presented in this report provides some additional insights. Generally, countries with a low score on the Gini index, such as Finland, find themselves in the middle range or at the top end of the redistribution league (Table I.2.4). Conversely, some countries with a high score on the Gini index, such as Turkey, lag behind in the redistribution league. One exception is Mexico, with a high score on the Gini index though its labour taxes are found to strongly reduce vertical income inequality. In contrast, while Japan scores low on the Gini index, its tax system seems to have little redistributive impact.

Box I.2.3. **Income inequality in OECD countries**

Several yardsticks are available to measure vertical income inequality. The simplest measurement is to arrange individuals or families in rank order, from poorest to richest, then divide the hierarchy into quintiles (20 per cent groups) or deciles (10 per cent groups) and compute either the average income by quintiles or deciles or the share that each grouping has in society's total income. Then, shares in total income or average incomes of the rich and the poor can be compared. Traditionally, researchers tend to prefer the Gini coefficient to evaluate vertical inequality in international comparative studies.* The Gini coefficient measures the extent to which the distribution of income among individuals or households within a country deviates from a perfectly equal distribution. The so-called Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini coefficient measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. In an egalitarian society the Gini coefficient would be 0; the higher the value of the Gini coefficient, the more unequal is the distribution of income. In a perfectly unequal society, in which one person has all the income, the Gini coefficient is equal to 1. Calculation of the Gini requires the availability of a detailed survey covering the whole income scale within a country; given the nature of the simulation results for *Taxing Wages* the Gini coefficient cannot be used to summarise results reported here. To put results reported in this paper in a broader perspective, this box summarises some figures on income inequality published by the OECD and the World Bank.

Table I.2.8 shows trends in Gini coefficients between the mid 1980s and the mid 1990s for about two-thirds of the OECD countries. In the mid 1980s some European counties (Denmark, Finland, the Netherlands, Norway and Sweden) showed the lowest levels of inequality, ranging from 20.7 to 23.4 per cent. These countries are among the most developed, economically both in terms of per capita income and life standards. They have also high tax-to-GDP ratios. On the other hand, countries like Australia, Greece, Ireland, Italy, Mexico, Turkey and the United States show much higher values of the Gini coefficient (above 30 per cent). From the mid 1980s to the mid 1990s there is a tendency for the Gini coefficient to increase slightly (by 1-2 percentage points) in most countries. For Italy and Turkey the increase is even four percentage points and more. In five OECD countries – Australia, Canada, Denmark, Hungary and Ireland – the Gini coefficient fell slightly.

Table I.2.9 provides some figures using an alternative index (the ratio of the income or consumption share of the richest group to that of the poorest group). Data have been collected by the World Bank, and they refer to a year in the period between 1994 and 2000. The first column shows the ratio of the income or consumption of the richest 10 per cent to that of the poorest 10 per cent. In about one-third of the OECD countries the value of this ratio exceeds 12, while the remainder of countries post figures ranging from 4.5 (Japan) to 11 (Ireland). Figures in the second column generally confirm those contained in column 1. On average, the richest 20 per cent of the population receives 5.9 times the income of the poorest 20 per cent. Mexico shows the highest ratio, followed by the United States.

* The Gini index can be derived from the formula $G = (1/2*n^2*\hat{y})\ [\sum_{i=1}^{n} \sum_{j=1}^{n} (|y_i - y_j|)]$ where n is the number of individuals in the sample, y_i is the income of individual i, $i \in (1, 2, ..., n)$, and $\hat{y} = (1/n)\ \Sigma y_i$, the arithmetic meaning income.

Table I.2.8. **Trends in Gini coefficient between the mid 1980s and the mid 1990s**

	Gini coefficient (%) mid 80s[1]	Gini coefficient (%) mid 90s
Australia	31.2	30.5
Austria	25.3	26.1
Belgium	25.9	27.2
Canada	29.0	28.5
Czech Republic	..	..
Denmark	22.9	21.7
Finland	20.7	22.8
France	27.6	27.8
Germany	26.5	28.2
Greece	33.6	33.6
Hungary	29.2	28.3
Iceland	..	..
Ireland	33.1	32.4
Italy	30.6	34.5
Japan	25.2	26.0
Korea	..	..
Luxembourg	..	..
Mexico	50.2	52.6
Netherlands	23.4	25.5
New Zealand	..	..
Norway	23.4	25.6
Poland	..	..
Portugal	..	..
Slovak Republic	..	..
Spain	..	..
Sweden	21.6	23.0
Switzerland	..	26.9
Turkey	43.5	49.1
United Kingdom	29.4	32.4
United States	34.0	34.4

1. The Gini index measures inequality over the entire distribution of income.

Source: Förster, M. (2000), *Trends and driving factors in income distribution and poverty in the OECD area*, Labour Market and Social Policy Occasional Paper, No. 42, OECD, Paris.

The interpretation of our results (in Table I.2.4) and the identification of tax instruments which play a major role in achieving given equity goals is facilitated by an analysis of the redistributive potential of certain reliefs provided to taxpayers under OECD tax systems. To assess the impact of basic reliefs on gross-net income gaps, we look at the loss in redistributive potential that would result from removing each relief provision from the system of labour taxes. The same procedure can be followed to trace the redistributive impact of other (standard) reliefs, such as the deduction for work-related expenses and reliefs which depend on family status.

Basic reliefs benefit all taxpayers, irrespective of family status and professional occupation. They come in three distinct categories: 1) basic allowances, 2) a zero-rate band, and 3) basic tax credits. All these reliefs reduce tax burdens of taxpayers and may serve to reduce the inequality of the distribution of pre-tax incomes. Table I.2.10 shows the contribution of each of these three basic reliefs in reducing the vertical income gap. Results refer to single taxpayers (without children) and evaluate both the low-wage and higher-wage income gap reduction.

Table I.2.9. **Alternative inequality indexes**

	Survey year	Richest 10% to poorest 10%[1]	Richest 20% to poorest 20%[1]
Australia	1994[2]	12.5	7.0
Austria	1995[2]	9.8	5.5
Belgium	1996[2]	7.8	4.5
Canada	1997[2]	9.0	5.4
Czech Republic	1996[2]	5.2	3.5
Denmark	1997[2]	8.1	4.3
Finland	1995[2]	5.1	3.5
France	1995[2]	9.1	5.6
Germany	1998[2]	14.2	7.9
Greece	1998[2]	10.0	6.2
Hungary	1998[3]	5.0	3.5
Iceland	..	..	..
Ireland	1987[2]	11.0	6.4
Italy	1998[2]	14.5	7.1
Japan	1993[2]	4.5	3.4
Korea	1998[2]	7.8	4.7
Luxembourg	1998[2]	7.7	4.9
Mexico	1998[2]	34.6	17.0
Netherlands	1994[2]	9.0	5.5
New Zealand	1997[2]	12.5	6.8
Norway	1995[2]	5.3	3.7
Poland	1998[3]	7.8	5.1
Portugal	1997[2]	15.0	8.0
Slovak Republic	1996[2]	6.7	4.0
Spain	1990[2]	9.0	5.4
Sweden	1995[2]	5.9	3.8
Switzerland	1992[2]	9.9	5.8
Turkey	2000[3]	13.3	7.7
United Kingdom	1995[2]	13.4	7.1
United States	1997[2]	16.6	9.0

1. Data show the ratio of the share of income or consumption of the richest group to that of the poorest.
2. Survey based on income.
3. Survey based on consumption.

Source: World Bank (2003), *Inequality in Income or Consumption* 2003, World Bank, Washington.

Comparing Tables I.2.10 and I.2.4 (showing the vertical income gap reduction produced by labour taxes over-all), we can trace the importance of each relief type. In reducing the *low-wage* income gap, basic reliefs seem to play an important equalising role in Austria, Iceland, Mexico and Norway where they contribute to reduce low-wage inequality by over four percentage points. Basic reliefs make a slightly smaller contribution (around three points) in Denmark, Finland, Hungary, the Netherlands, Sweden and the United Kingdom. In contrast, in Korea and the Slovak Republic basic reliefs have a slightly regressive effect. In reducing the *higher-wage* income gap, basic reliefs are especially effective in Hungary (7.9 points) and Sweden (9.5 points), followed by Greece (5.5 points) and Iceland (5.2 points). In Japan, the impact of basic reliefs is slightly regressive, whereas in the remainder of OECD countries their impact is slightly progressive (generally less than four points).

The various basic reliefs are equivalent in terms of their equity effects. A number of countries employ two different general reliefs, while Austria and Sweden combine the zero rate band with a general tax allowance and a general tax credit. In these cases, it is not

Table I.2.10. **Low-wage and higher-wage vertical inequality – the impact of basic reliefs, 2002**

	Basic reliefs in the tax system			Income gap reduction through basic reliefs	
	Zero rate band	Basic allowances	Basic tax credits	Low-wage income gap change (%)	High-wage income gap change (%)
Australia	y			1.2	0.9
Austria	y	y	y	4.0	3.4
Belgium			y	0.1	0
Canada			y	1.7	1.5
Czech Republic		y		1.0	1.0
Denmark			y	3.4	2.4
Finland	y			3.2	2.7
France	y	y		0.7	2.3
Germany				–	–
Greece	y			0.5	5.5
Hungary			y	3.3	7.9
Iceland			y	7.6	5.2
Ireland			y	2.9	2.3
Italy			y	1.8	1.9
Japan		y	y	0.3	–0.7
Korea		y	y	–0.5	2.5
Luxembourg	y	y		1.2	1.1
Mexico		y	y	4.5	3.9
Netherlands			y	3.2	3.1
New Zealand			y	0.8	0
Norway		y		4.6	3.4
Poland			y	1.3	1.0
Portugal		y	y	1.7	3.8
Slovak Republic		y		–1.0	0.9
Spain		y		2.5	1.5
Sweden	y	y	y	3.3	9.5
Switzerland	y			0.1	0.1
Turkey		y		0.5	0.2
United Kingdom		y		3.0	0.7
United States		y		0	1.4

possible to isolate the separate impact of each relief, so their combined effect on vertical income inequality is considered here. Moreover, their collective redistributive impact cannot be inferred by a simple adding procedure; sometimes the value of reliefs is mutually dependent and their value can change if other tax elements are removed or modified.

We analyse the impact of one other standard relief, *i.e.* the allowance for certain expenses associated with having paid work (*e.g.* transport costs, trade union membership dues, unemployment insurance premiums), which reduce the tax liability of employees. In general, reliefs for work-related expenses do not play a key redistributive role. Yet in some cases they do reduce the vertical income gap. Table I.2.11 shows the potential of work-related reliefs to reduce low-wage and higher-wage vertical inequality. Compared with the impact of basic reliefs, the influence of work-related reliefs is insignificant, and in some cases these seem to increase inequality (*e.g.* in Japan work-related allowances seem to increase low-wage inequality by one percentage point and the higher-wage income gap by 2.4 points). The reason for their limited impact could be that reliefs for work-related expenses usually rise in proportion to gross wage earnings.

Table I.2.11. **Low-wage and higher-wage vertical inequality – the impact of reliefs for work-related expenses, 2002**

	Reliefs for work related expenses	Form taken by allowances for work related expenses	Reduction of effective average tax rates (income tax + employees' SSC – cash benefits) (%)	Low-wage income gap reduction, vertical inequality (%)	High-wage income gap reduction, vertical inequality (%)
Australia	–	–	–	–	–
Austria	Y	Fixed	0.1	0	0
Belgium	Y	Percentage of earning	3.4	0.9	0.2
Canada	–	–	–	–	–
Czech Republic	–	–	–	–	–
Denmark	Y	Fixed	0.8	0.6	0.5
Finland	Y	Percentage of earning	0.7	0.2	0.2
France	Y	Percentage of earning	1.4	0.6	–1.4
Germany	Y	Fixed	1.2	0.2	0.2
Greece	–	–	–	–	–
Hungary	–	–	–	–	–
Iceland	–	–	–	–	–
Ireland	Y	Fixed	2.6	1.2	0.9
Italy	–	–	–	–	–
Japan	Y	Percentage of earning	5.3	–1.0	–2.4
Korea	Y	Percentage of earning	8.2	–3.3	1.2
Luxembourg	Y	Fixed	0.8	–0.2	0.1
Mexico	–	–	–	–	–
Netherlands	Y	Percentage of earning	3.1	1.8	1.7
New Zealand	–	–	–	–	–
Norway	–	–	–	–	–
Poland	Y	Fixed	1.0	0.7	0.6
Portugal	–	–	–	–	–
Slovak Republic	–	–	–	–	–
Spain	Y	Percentage of earning	3.3	2.6	1.0
Sweden	–	–	–	–	–
Switzerland	Y	Percentage of earning	0.6	0	–0.2
Turkey	–	–	–	–	–
United Kingdom	–	–	–	–	–
United States	–	–	–	–	–

(–) = No reliefs are provided to households.

2.2. Horizontal inequality

Table I.2.12 and Figures I.2.4 and I.2.5 show to what degree labour taxes in OECD countries reduce horizontal inequality between households of different composition and at the same level of money wages. In Figure I.2.4 the focus is on the position of single workers earning low wages (67 per cent of the wage of an average production worker); one worker has no children, the other has two young children. The gross income gap is 46.2 percentage points, reflecting the application of the equivalence scale. In the case of Italy, the corresponding net income gap is 22.3 points. Applying the formula set out in footnote 19, the redistributive impact of Italian labour taxes is found to be (46.2 – 22.3) = 23.9 percentage points. Tax systems can be a powerful instrument to reduce the equivalised income gap of households. In twelve OECD countries the income gap is reduced by over 26 points (see also Figure I.2.4). Only Greece, Mexico and Turkey leave the gross income gap

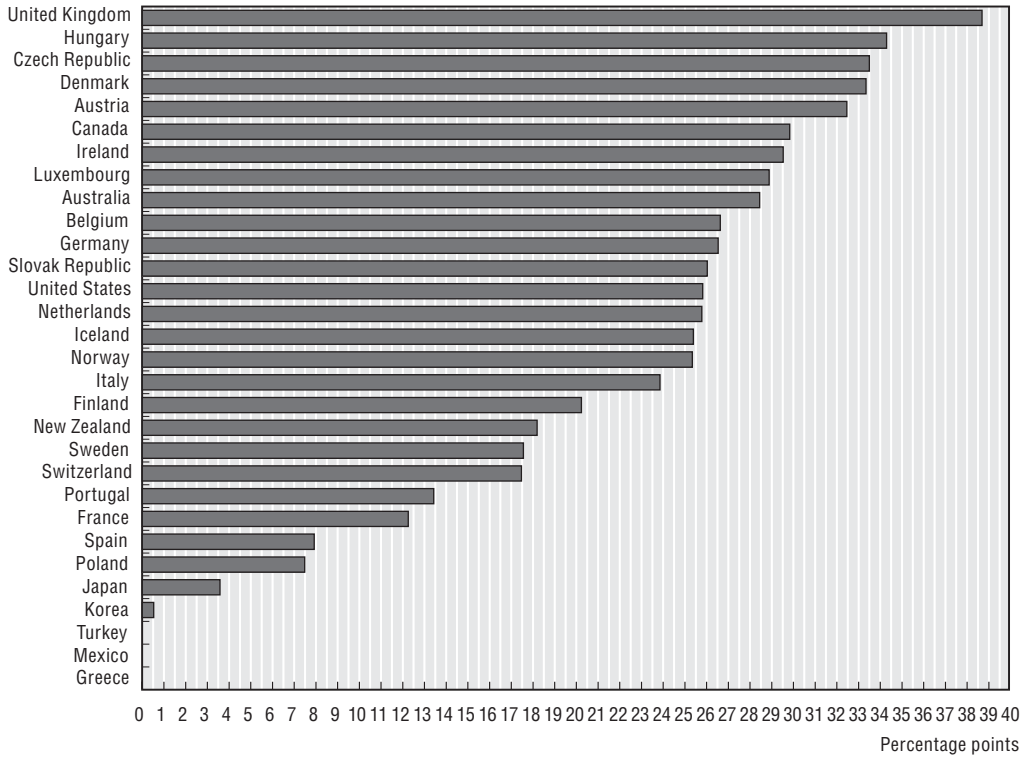
Table I.2.12. **Horizontal redistribution between household types, 2002**

	Single taxpayers 67% APW	Married couples 133% APW
	Income gap reduction (%)	Income gap reduction (%)
Australia	28.44	3.96
Austria	32.46	16.55
Belgium	26.63	13.46
Canada	29.83	3.89
Czech Republic	33.50	10.94
Denmark	33.34	7.70
Finland	20.23	8.48
France	12.25	8.06
Germany	26.53	12.41
Greece	0	0.54
Hungary	34.29	19.05
Iceland	25.39	7.12
Ireland	29.53	6.43
Italy	23.85	5.14
Japan	3.58	1.85
Korea	0.53	0.24
Luxembourg	28.88	15.68
Mexico	0	0
Netherlands	25.78	6.79
New Zealand	18.19	0
Norway	25.34	7.62
Poland	7.48	0
Portugal	13.43	7.48
Slovak Republic	26.03	14.05
Spain	7.92	1.71
Sweden	17.56	9.46
Switzerland	17.47	8.75
Turkey	0	0
United Kingdom	38.69	8.46
United States	25.82	6.72

untouched. On average, at this point of the earnings distribution (67 per cent of the APW wage) tax systems of OECD countries reduce the gross-net gap of equalised incomes by about 20 percentage points.

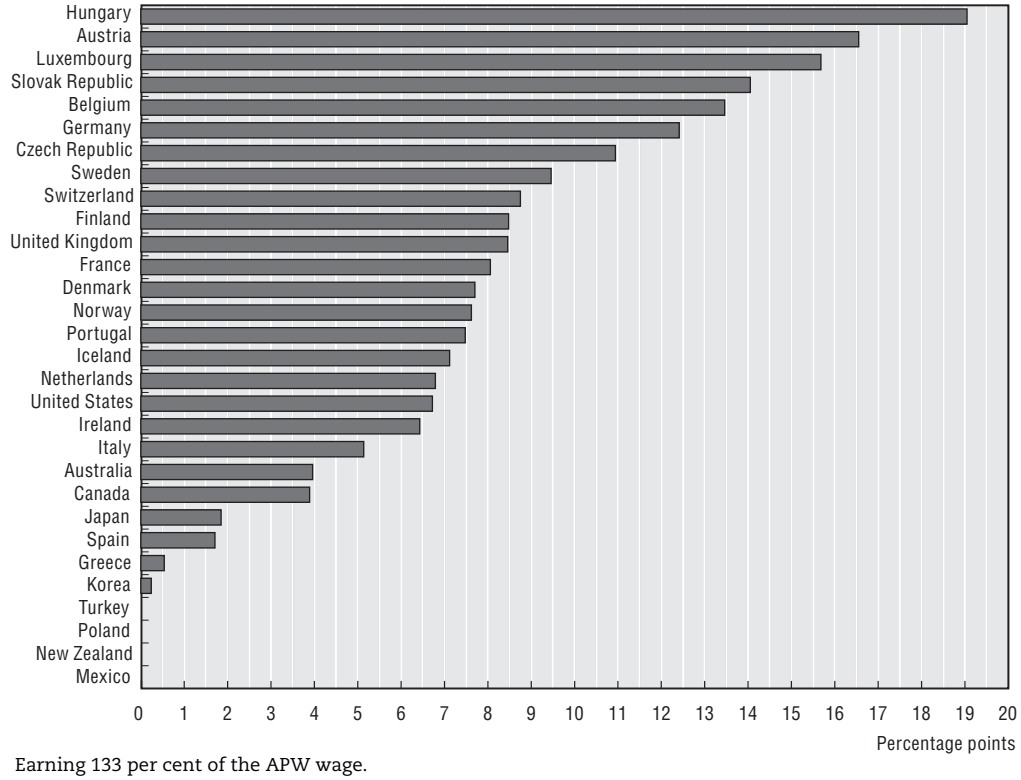
The last column of Table I.2.12 and Figure I.2.5 show the reduction of gross-net income gaps for two-earner couples where partners together earn an income equal to 133 per cent of the wage of an average production worker; one couple has no children, the other couple has two young children. In this case, the application of the equivalence scale produces a gross income gap of 33.3 percentage points. On average, at this point of the earnings distribution, tax systems of OECD countries close the income gap by about seven percentage points. Only four countries – Mexico, New Zealand, Poland and Turkey – leave the gross income gap untouched. On the other hand, six countries reduce the gross-net gap by more than 12 points (Austria, Belgium, Germany, Hungary, Luxembourg and the Slovak Republic). Our results strongly suggest that tax and benefit systems of OECD countries do more to bridge the gross-net gap for single parents (at low wages) than they aim to close it for married couples with children (at high medium wages).

Figure I.2.4. **Income gap reduction individuals with/without children**[1]



1. Earning 67 per cent of the APW wage.

Figure I.2.5. **Income gap reduction couples with/without children**[1]



1. Earning 133 per cent of the APW wage.

The RS redistribution index cannot be decomposed into its two components (the progressivity index and the average tax rate) because the analysis uses equivalence scales and compares hypothetical equivalent incomes.

Nevertheless, it may be concluded that tax progressivity will depend mainly on the presence of reliefs tied to family status and cash benefits for dependent children, as the household types compared here will normally be subject to the same marginal tax rates since they earn the same money wages. But they do differ in the various reliefs they can claim. Reliefs tied to family status are targeted at taxpayers with a dependent spouse or dependent children. Such reliefs are designed to compensate wage-earners who share their income with other dependent household members. Normally, relief for *dependent children* will vary with the number and age of the children in the household. Relief for *dependent spouses* is usually tested against the spouse's own income and will gradually be reduced as the spouse's earnings rise. Table I.2.13 provides an overview of to what degree family status reliefs cover the gross-net income gap. As before in this section, we shall first

Table I.2.13. **Percentage change in gross-net income gaps due to family status reliefs, 2002**

	Single individual *versus* single parent with two children at 67% of APW wage level	Two-earner couple without children *versus* two-earner couple with two children at 133% of APW wage level
Australia	0	0
Austria	3.2	0
Belgium	7.7	2.9
Canada	7.4	0
Czech Republic	4.7	2.8
Denmark	0	–0.2
Finland	–	–
France	0.7	0
Germany	26.5	12.4
Greece	0	1.4
Hungary	10.9	7.7
Iceland	0	0
Ireland	2.4	–0.3
Italy	7.8	3.1
Japan	3.6	1.9
Korea	0.5	0.2
Luxembourg	0	1.8
Mexico	–	–
Netherlands	15.7	1.3
New Zealand	0	0
Norway	–	–
Poland	–	–
Portugal	1.8	2.7
Slovak Republic	3.4	1.9
Spain	7.9	1.7
Sweden	–	–
Switzerland	3.2	3.0
Turkey	–	–
United Kingdom	26.2	2.3
United States	24.7	6.7

(–) = No reliefs are provided to households.

analyse the case of single workers earning 67 per cent of the APW wage, without children and with two young children respectively. Next, we turn to the case of two-earner households at gross earnings equal to 133 per cent of the wage of an average production worker, without children and with two young children respectively.

For single workers with and without children we find no reduction of the income gap in the cases of Australia, Denmark, Greece, Iceland, Luxembourg and New Zealand, even though these countries have a set of reliefs related to the family status of taxpayers. This outcome is probably explained by the fact that in these countries relief provided is proportional to earnings. On the other hand Germany, the Netherlands, the United Kingdom and the United States show a reduction of the income gap by more than 15 percentage points. Comparing these results with those in Table I.2.12 (reduction of inequality by labour taxes over-all), it becomes clear that in Germany, Japan, Korea and Spain the reduction of the income gap is fully explained by various reliefs which depend on family status. In other OECD countries the gap is reduced by a combination of family status related reliefs and other tax/benefit instruments.

Moving to the column with results for couples, we find no reduction of the income gap in the cases of Australia, Austria, Canada, France, Iceland and New Zealand. The largest reduction is observed in the case of Germany (by 12.4 percentage points). The impact of various reliefs is smaller for couples than it is for single workers. The very small increase of the income gap observed for Denmark and Ireland is probably associated with the combination of family status reliefs and other elements in the tax system. Comparing the results reported in Tables I.2.13 and I.2.12, we find that in Japan, Korea, Spain and the United States family status reliefs play a key role in reducing the income gap between families of different composition.

Table I.2.14 provides more information on the family cash benefits included in the simulation models that form the basis for the data in *Taxing Wages*. These cash transfers are associated with the presence of dependent children in the household. Generally, low-wage taxpayers receive higher amounts when cash benefits are income-tested. Moreover, some countries have in place supplementary transfers for single parents (*e.g.* Finland and the United Kingdom). Table I.2.15 shows to what degree family cash transfers reduce inequality between families of different composition. First, the analysis compares workers earning 67 per cent of the wage of an average production worker, without children and with two young children respectively. Next, the analysis compares gross and net incomes of two-earner households without and with two young children, earning 133 per cent of the APW wage. The reduction of the income gap is generally larger for single workers than it is for couples. Reductions shown vary between 7.7 percentage points in Poland and 34.3 points in Denmark. Four countries providing cash benefits to households with children show a reduction of the income gap by 27 points and more: Australia, Austria, the Czech Republic and Denmark.

Comparing the results in Tables I.2.15 and I.2.12 we find that cash benefits play a central role in closing part of the income gap in most OECD countries.

2.3. Tax treatment of one-earner versus *two-earner households*

This section compares the tax treatment of one-earner *versus* two-earner households. Results are reported in Table I.2.16 and Figures I.2.6 through 8. The following example serves to illustrate how results have been derived. Consider two couples living in Italy,

Table I.2.14. **Universal cash transfers for dependent children, 2002**

	Transfers for dependent children
Australia	FTB has 2 parts: families may be entitled to one or both parts depending on their circumstances. Part A: eligibility is based on the combined taxable income of the parents. There is an income ceiling, over which the transfer is reduced by 30 per cent, and the amount increases with the number of children. Part B: targeted at single income families, eligibility contingent upon the spouse meeting a separate income test and the existence of at least 1 dependent child under the age of 16 (or under the age of 18 if a full-time student). FTB(B) is payable at a higher rate if the child is aged under 5. There is no income ceiling, but there is a spouse income threshold above which the amount is reduced by 30 per cent. Parenting Payment (at single and partnered rates) is a taxable payment available for low-income sole parent and couple families with a qualifying child aged under 16. The payments are subject to income and asset tests. Pharmaceutical Allowance is a standard non-taxable supplement to Parenting Payment (Single). Parents with entitlements to these payments receive the maximum amount of FTB(A).
Austria	A family allowance is given for each child: the monthly payment depends on the number of children. This allowance is increased for children above 10 years of age and for students.
Belgium	The annual amount of the cash transfer for children depends on the number of children (up to the 3rd child) and their age.
Canada	The Canada Child Tax Benefit (CCTB) provides a benefit for each child under age 18, with additional amounts for a third and subsequent child. An additional amount is provided for each child under 7 where no child care expenses are deducted. The CCTB consists of a base benefit for low- and middle-income families and a supplement (called the National Child Benefit supplement) for low-income families. Benefits are reduced when family income exceeds a threshold.
Czech Republic	A cash transfer is provided for each dependent child, if the family income does not exceed three times the relevant minimum living standard (MLS). An additional allowance is paid to low-income families. A family is also entitled to a social allowance if there is at least one child and the net monthly income is below 1.6 MLS.
Denmark	Cash transfers for dependent children, independent of the parents' income. The amount of the transfer is related to the age of the children. Special amounts for single parents and a state transfer per year for each dependent child when an "absent parent" does not contribute to the family.
Finland	The government provides an allowance for dependent children. The amount depends on the number of children and is increased for single parents.
France	Cash transfers for dependent children: the amount depends on the number of children. There is also an allowance for children under 3 years old.
Germany	None
Greece	None
Hungary	The amount of cash transfers for dependent children varies according to the number of children, and is increased for single earner families and disabled children. For the first time in July 2002, families receive an extra one-month benefit.
Iceland	A cash transfer is provided for dependent children: the amount is related to the number of children.
Ireland	Cash transfers are available for children under the age of 16 (or under 19 if the child is in full-time education or incapacitated). These payments do not depend on any insurance or on the means of the claimant. Transfers for low-income families: payable where either the principal earner and/or the spouse are in full-time employment. The level of this cash transfer is dependent on the amount of family income and the number of children; there is a fixed ceiling. One Parent Family Payment: This non-taxable payment is available for men and women who for a variety of reasons are bringing up a child or children without the support of a partner. The payment is means-tested. Because of the complex means-testing system, this type of person is excluded from the APW examples.
Italy	Cash transfers for dependent children take into account both family income and the number of dependent persons; transfers are reduced when family income increases.
Japan	Cash transfers are provided for children under 6 years old; the amount is related to the number of children.
Korea	None
Luxembourg	Cash transfers are provided for dependent children; the amount is related to the number of children and is increased when children are 6 years old or over.
Mexico	None
Netherlands	Families with children receive a tax-free benefit, depending on the number and age of the children.
New Zealand	The "Parental Tax Credit" provides a cash transfer per week for the first eight weeks of each child's life. The "Family Support Tax Credit" is available for each dependant, while the "Child Tax Credit" is an additional transfer per dependant, available to families not receiving any of the main social welfare benefits. The total of these three credits is abated against the combined income of the parents.
Norway	Cash transfers are available for each dependent child; the amount is related to the number of children. For children who are 1-2 years old there is an additional child support. Families living in the northernmost part of Norway receive an extra child support for each child until the age of 18. Single parents receive transfers for one more child than the actual number.
Poland	A non-taxable family benefit per child is paid to employees whose annual income per each household member, in a calendar year preceding a period of collecting benefit, does not exceed a certain threshold; this threshold is increased in the case of a single parent. Benefit is granted for a period of 12 months; the right to benefit is tested once a year.

Table I.2.14. **Universal cash transfers for dependent children, 2002** *(cont.)*

	Transfers for dependent children
Portugal	A cash transfer is provided for each dependent child. The amount of this transfer is related to family income, age of the children and their number. A special cash transfer is available for children with a handicap.
Slovak Republic	The government pays an allowance for each dependent child based on the family income level, if this does not exceed two times the relevant minimum living standard. The amount of this transfer is related to the age of the children. An additional allowance is paid to low-income families. The transferred amount varies according to the type of allowance and income of the family.
Spain	A cash transfer is provided for each dependent child to taxpayers with annual gross earnings below a fixed amount. This transfer is not taken into account in the tax system evaluation, because the APW (and even 67 per cent of the APW wage level) is always higher than the threshold.
Sweden	A cash transfer is available for each dependent child; the amount depends on the number of children.
Switzerland	None
Turkey	None
United Kingdom	Child benefit is paid in respect of each child in the family up to age 16 (or 19 if still in full-time non-advanced education). The amount of this benefit is related to the number of children. For eligible one-parent families there is a higher rate of child benefit in respect of the first child. None of these payments is subject to tax.
United States	None

Table I.2.15. **Impact of general cash benefits on gross-net income gaps, 2002 (%)**

	Single individual *versus* single parent with two children at 67% of APW wage level	Two-earner couple without children *versus* two-earner couple with two children at 133% of APW wage level
Australia	28.3	4.0
Austria	28.4	16.6
Belgium	17.6	10.3
Canada	20.8	3.9
Czech Republic	27.5	7.1
Denmark	34.3	7.7
Finland	20.2	8.5
France	9.6	5.2
Germany	–	–
Greece	–	–
Hungary	21.0	10.5
Iceland	25.4	7.1
Ireland	22.2	6.4
Italy	15.0	2.0
Japan	–	–
Korea	–	–
Luxembourg	25.0	13.4
Mexico	–	–
Netherlands	8.8	5.4
New Zealand	18.2	0
Norway	20.0	7.6
Poland	7.7	0
Portugal	11.4	4.7
Slovak Republic	21.9	11.9
Spain	–	–
Sweden	17.6	9.5
Switzerland	11.5	5.7
Turkey	–	–
United Kingdom	9.8	6.0
United States	–	–

(–) = No universal cash transfers are provided to households.

where in both cases household income is equal to the wage of an average production worker. In the two-earner case, both spouses earn part of the household income, while in the second case only the principal earner is gainfully employed. Although in both cases gross household income is the same, after-tax income of the two-earner household is 5.2 percentage points higher than after-tax income of the one-earner household (see also the formula in footnote of Box I.2.3). The analysis shows that tax systems tend to favour households where both spouses are gainfully employed, although there are differences between countries and the tax advantage varies with income levels. In general, the tax advantage for two-earner households tends to increase with earnings levels. For low-wage families (Figure I.2.6), five countries (Austria, Finland, Hungary, Mexico and the Netherlands) offer a tax advantage of six percentage points or more to households where both spouses work, whereas Denmark and Japan seem to discriminate slightly in favour of one-earner couples.[7] The United States offers the same tax treatment to families, irrespective of the number of workers in the household. Observing households at the medium-wage level (Figure I.2.7), only the Japanese and the Dutch tax systems modestly favour one-earner households. The tax system of most other OECD countries provides incentives for non-working partners to enter the labour market. A maximum premium for

Table I.2.16. **Tax treatment of one-earner *versus* two-earner households, 2002**

	100% APW two-earners/one-earner married couple with two children	133% APW two-earners/one-earner married couple with two children	167% APW two-earners/one-earner married couple with two children
Australia	3.18	6.59	10.25
Austria	6.98	6.00	10.85
Belgium	2.88	2.35	3.87
Canada	4.77	2.21	2.96
Czech Republic	0.94	1.19	2.41
Denmark	–2.50	2.75	6.83
Finland	10.91	10.33	13.78
France	3.01	0.94	0.30
Germany	0.94	0.18	–2.35
Greece	1.07	5.82	11.13
Hungary	7.93	12.24	16.94
Iceland	0.41	0.34	0.29
Ireland	2.84	1.24	4.14
Italy	5.16	5.49	7.68
Japan	–0.36	–0.08	0.62
Korea	1.36	4.66	7.60
Luxembourg	0.12	0.10	2.74
Mexico	10.55	9.02	10.92
Netherlands	6.58	–0.09	1.98
New Zealand	2.44	5.17	8.08
Norway	3.65	5.04	8.75
Poland	1.46	1.12	0.90
Portugal	0.28	3.27	3.36
Slovak Republic	1.95	1.54	2.57
Spain	1.00	0.58	3.72
Sweden	4.06	4.33	9.02
Switzerland	1.65	1.75	1.46
Turkey	2.76	2.86	4.13
United Kingdom	5.64	7.71	5.70
United States	0	0	0

Figure I.2.6. **Tax treatment of one-earner and two-earner couples (100% APW)**

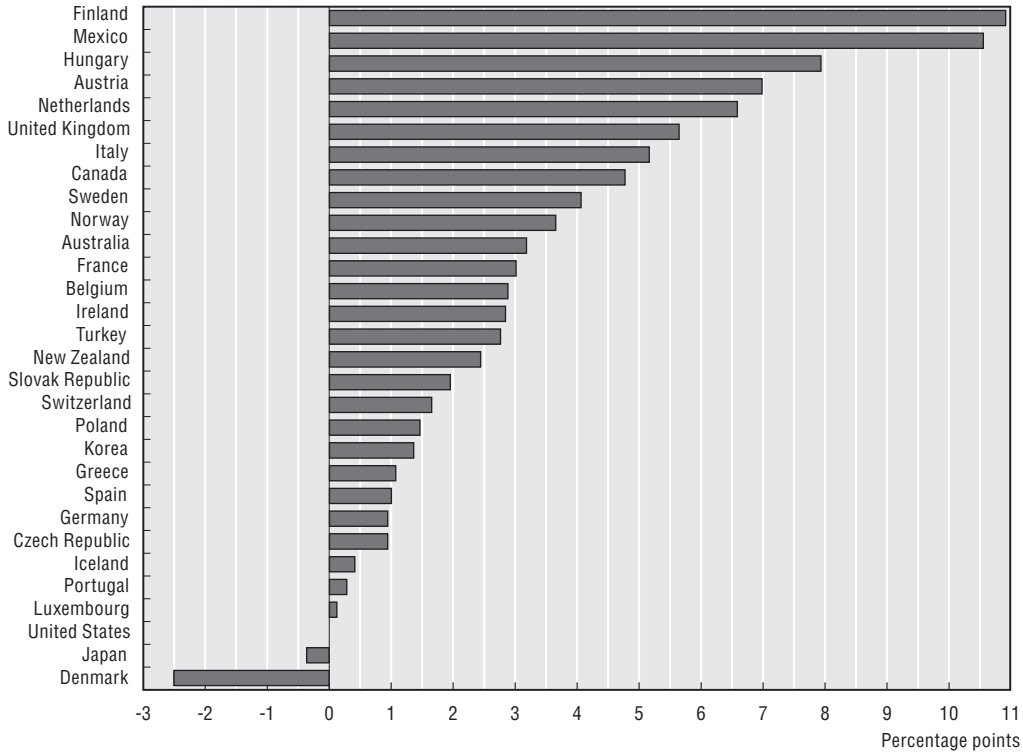


Figure I.2.7. **Tax treatment of one-earner and two-earner couples (133% APW)**

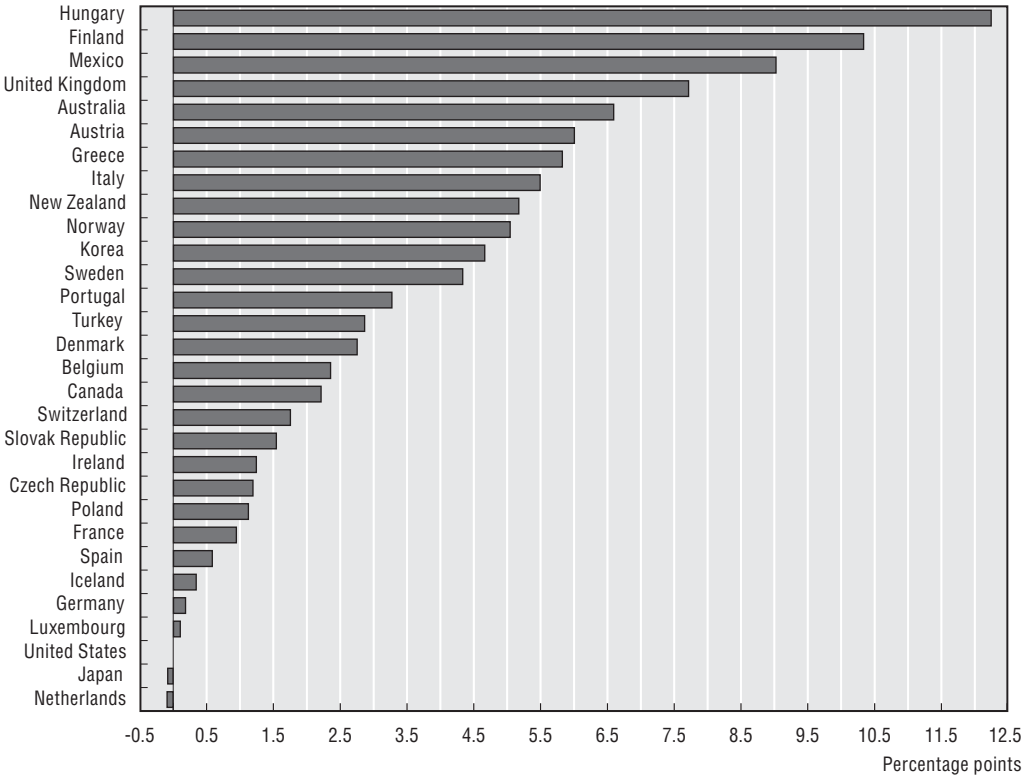
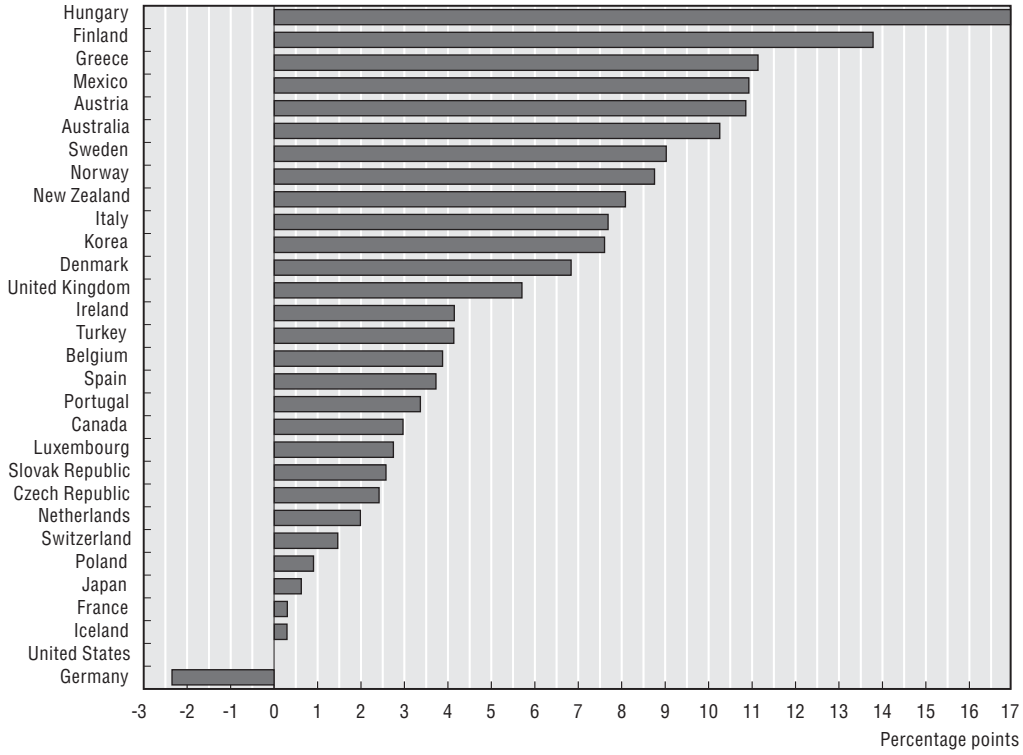


Figure I.2.8. **Tax treatment of one-earner and two-earner couples (167% APW)**



entering the labour market of 12.2 percentage points is observed in the case of Hungary. Finally, for higher-wage households (Figure I.2.8) we find the largest impact on gross-net income gaps: Germany clearly offers financial assistance to one-earner couples through its "income splitting" system. In contrast, one-fifth of all OECD countries give preferential treatment to two-earner couples of more than ten percentage points.

Earlier in this Chapter it was pointed out that the tax treatment of households with a different number of wage earners is influenced by a number of complex and interrelated factors. For example, work-related deductions are often designed to create an incentive to supply work, while at the same time family status reliefs can reduce (potential) labour supply of the second earner. Moreover, the choice of the tax unit can influence the decision to enter the labour market. The static and partial results in the present report can shed no light on the effects of specific reliefs or deductions on the dynamics of labour supply.

3. Conclusion

OECD countries differ in the level of government engagement in the redistribution of personal incomes through taxes and transfer payments. This report seeks to analyse the redistributive impact of personal income taxes, employee social security contributions and general cash benefits that are available to families with a dependent spouse and/or young children. Data derived from the OECD *Taxing Wages* report on labour taxes due by and benefits available to workers in all OECD countries (in year 2002) are used to determine the impact of tax-benefit systems on the relative income position of selected household types. We compare the gap between pre-tax (gross) income and post-tax (net) income of each

household type to trace the redistributive impact of the public programmes concerned. In particular, the present report details:

- Gross-net income gaps for households (of identical composition) at different income levels to measure the impact of the selected public programmes on *vertical* equity.
- Gross-net income gaps for households (at the same income level) of different composition to measure the impact of the selected public programmes on *horizontal* equity; the equivalent income of household types considered was derived using the OECD modified equivalence scale.
- Gross-net income gaps of one-earner *versus* two-earner households (at the same income level).

The analysis is limited to workers earning wages at certain points in the range between 67 and 167 per cent of the annual gross wage earnings of an average production worker (in each OECD country). It is assumed workers have no income from other sources. Furthermore, taxes due are calculated assuming that households claim only standard deductions (available to all workers, regardless of actual expenses incurred). The focus is on the statutory impact of taxes and benefits, in other words behavioural responses are not taken into account. These limitations indicate that results reported here should be interpreted with due caution.

The results suggest that labour taxes and cash benefits (where available) reduce the vertical inequality of the personal income distribution in (nearly) all OECD countries, both for single workers and families (over the selected income ranges). In almost all countries the horizontal inequality of personal incomes is also reduced (between selected household types at fixed earnings levels), with tax-benefit systems particularly favouring single parents earning low wages. On average, tax-benefit systems compress income inequality between single earners with and without dependent children by about 20 percentage points, and income inequality between households with and without children by some seven points. Finally, (at the same level of household earnings) most tax-benefit systems favour households where both spouses contribute to household income, with the premium for two-earner households varying from one country to another and depending on the place of households in the over-all income distribution. Our results underline that, generally speaking, the "two-earner premium" tends to be of greater value at higher income levels.

Results presented in this report suggest that *Taxing Wages* data are useful as inputs for research into the redistributive impact of tax and benefit systems of OECD countries. This line of research opens new perspectives for policy analysis, provided that analysts are fully aware of its inherent limitations.

Notes

1. Luxembourg employed even 17 different tax rates, ranging from 10 to 50 per cent plus a first band subject to a zero tax rate, Spain had also 17 brackets, ranging from 20 to 56 per cent plus a first exempted bracket, and Switzerland employed 11 brackets for individual taxpayers and 15 brackets for married couples (tax rates from 0.77 per cent to 11.5 per cent). Belgium, Greece, Finland, France, Hungary, Italy, Mexico and Turkey had five to eight brackets, with a large variety in rates.
2. For a more comprehensive review of the tax treatment of families, see OECD (2003), *Taxing Wages 2001-2002*, OECD, Paris.
3. Belgium combines a joint assessment with separate taxation of earned income (including pensions and social transfers) for two-earner married couples, a splitting system for one-earner married couples and family taxation for one-earner couples and two-earners couples if one spouse

earns less than 30 per cent of joint earned income of both spouses. In fact such a system is a mix of family taxation and individual taxation, but it seems more realistic to consider it as individual taxation in the context of *Taxing Wages*.

4. Family joint taxation is not neutral with respect to marriage (legal or *de-facto*). A marriage "penalty" occurs when a couple filing joint returns experiences a greater tax liability than would occur if each were to file as a single individual.

5. Low wage is defined as ⅔ of the APW wage level, rounded in the main text as 67 per cent of the APW wage.

6. In absolute terms, tax systems appear to be more efficient in reducing high-wage rather than low-wage income inequality. However, our results are explained by the fact that the gap in pre-tax income between the APW and the single worker earning 167 per cent of the APW wage is twice as large (67 points) as the pre-tax income gap between the low wage individual (67 per cent of the APW) and the APW (33 points).

7. It should be noted that Denmark provides heavily subsidised childcare to working parents, a policy which probably explains why Denmark has a high labour force participation rate for married women despite this characteristic of the tax system.

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PART II

Country Summaries

1. Australia

The Australian tax structure is progressive mainly through the use of a bracket scheme, but a system of allowances and tax credits also contributes to the redistribution of income. The tax unit is the individual. From 1996 to 1999, the tax schedule was composed of four income brackets, plus a first bracket with a zero tax rate. The APW income belonged in the third bracket during 1996-1997, and to the fourth bracket in 1998-1999. Following the reform of personal income tax rates during 1999-2000 tax years, a lower tax rate-schedule is now available to all taxpayers, and the brackets have increased slightly. This reform follows the tendency of lower tax rates and a move to a smoother tax framework as in most OECD countries; on the other hand, the reform has left the maximum tax rate unchanged at 47 per cent, benefiting mainly taxpayers at the bottom of the income scale. With the new tax schedule, the APW income belongs in the third bracket.

No social security contributions are collected from employers or employees in the Australian tax system. There is, however, a Medicare levy based on taxable income; it has a nearly proportional structure, equivalent to about 1.5 per cent. Also, in the Australian tax system there are no local or state taxes on income.

Compared with the other OECD countries, the Australian tax system shows a relatively ordinary tax schedule, with a maximum statutory tax rate of 47 per cent, above the average OECD level (in 2002 the maximum statutory rate was on average 38.7 per cent). On the other hand, the analysis of the tax rates calculated in the model, which takes tax reliefs and universal cash transfers into account, confirms that policy makers employ a number of effective fiscal means other than a simply progressive tax schedule to reduce inequality.

First of all, the Australian tax system provides a series of allowances and tax credits that serve to guarantee a more equal income distribution. To assess the redistributive power of these fiscal means in 2002, we will compare the effective tax rates available in the *Taxing Wages* model with the tax rates that we would obtain if the tax system did not provide these reliefs or credits. It will also be possible to measure the capacity of the different reliefs to reduce inequality between taxpayers.

Basic reliefs. A basic relief is available to all resident taxpayers, making income earned up to a certain amount subject to a zero tax rate. This amount was adjusted in 2000 as part of the tax reform.[1] The allowance in part affects the tax system's progressiveness and improves the position of taxpayers at the bottom of the income distribution scale. On account of the gradual natural increase of the APW on the one hand, and the reform with the subsequent reduction of the statutory tax rates on the other hand, the redistributive strength of the basic relief has decreased progressively. The basic relief was able, in 2002, to reduce the low-wage vertical income gap by only 1.2 percentage points and high-wage inequality by 0.9 percentage point.

Reliefs for low income earners. During the last seven years, a tax credit has been available to taxpayers whose taxable income is under a certain ceiling; its amount is phased out when income exceeds a fixed threshold. The amount of the tax credit remained

unchanged during the period 1996-2002, while the income threshold was subject to some marginal changes. Given that the threshold for eligibility (= AUD 20 700) was under 50 per cent of the APW during this period, the redistributive power of this relief seems to be important only at the very bottom of the income distribution scale. In fact, in our tax model only the spouses of the sixth and the eighth family types, whose earnings are 33 per cent of APW wage level, obtain the relief for low income earners, so its comprehensive vertical distributive role cannot be appreciated

Family status reliefs. During the whole period 1996-2002, a tax credit has been available to taxpayers who contribute to the maintenance of a dependent spouse, and is phased out when the spouse's separate net income exceeds a certain amount. Through this relief, whose amount has enlarged slightly over the last seven years, the Australian government provides a favourable fiscal treatment to families in which only one earner works full-time while the spouse takes charge of the household duties and education of the children. From 1996 to 1999, the amount of this tax credit could be increased if there were dependent children, and another tax credit was available to single, widowed or divorced residents who had the sole care of a dependent child. In 1997, the Australian government introduced the so-called Family tax initiative, a special relief for children; this relief had a complex structure, and could take the form of cash transfer (Family tax payment) or tax credit (Family tax assistance) depending on the family income and other personal circumstances. This Family tax initiative was composed of two main parts: eligibility for part A benefit was based on the combined taxable income of the parents, while eligibility for part B depended on a separate income test for the non-working spouse. The amount of this relief and the income ceiling for its eligibility varied according to the number of children. In 2000, a main reform introduced the "new family benefit" (FTB), a cash transfer which replaced several forms of tax reliefs and benefits. As a consequence of this restructuring measure, from 2000 the equalising effectiveness of the family tax reliefs has been substantially reduced; this decrease in the tax system's redistributive power is fully compensated by the "New family benefit", which plays a strong equalising role.

From 1996 to 1999, the Australian government employed a system of benefits for children; its amount depended both on family income and the number of children. Additional cash transfers were paid to low income families; all together, these cash transfers had a strong redistributive impact on taxpayers' income, especially for single parents with low income and for one-earner couples with children. In 2000, the government implemented a vast reform which led to the creation of the FTB (New family benefit). As we have seen above, this benefit replaced the previous Family tax assistance (including the rebate for a dependent spouse and children and the sole parent credit) and the other cash transfers, although it shares some of their basic characteristics. The FTB can be claimed either through the taxation system or as a cash transfer, but in the *Taxing Wages* methodology it is treated as a cash transfer. The FTB is composed of two main parts and families may be entitled to one or both parts depending on their family circumstances.[2]

These new cash transfers play an important role in reducing inequality between families of different composition, especially between single taxpayers with the same level of gross income but with different personal characteristics (–28.3%). From 1 July 2001, a refundable tax offset, called "baby bonus", was introduced to recognise that one of the hardest times for families financially is the birth of their first child, when one partner gives

up or reduces their paid employment. Unfortunately, this last tax benefit has not been considered in the model, as the report *Taxing Wages* considers only children between 6 and 11 years old.

Table II.1. **Main characteristics of Australia's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	4	4	4	4	4	4	4
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as proportion of APW	0.15	0.15	0.14	0.14	0.14	0.14	0.13
Deductions for Social Security Contributions (SSC)	–	–	–	–	–	–	–
Effective average tax rates for an individual at APW wage level (tax wedge)	24.4%	24.8%	25.4%	25.9%	22.8%	23.3%	23.6%
Highest rate starts at (proportion of APW wage)	1.42	1.35	1.29	1.26	1.44	1.36	1.31

First of all, if we focus on Table I.2.4, we note that the Australian tax system is able to reduce the vertical low-wage income gap by 4.6 percentage points, while the reduction in the income gap between the APW taxpayer and the taxpayer earning 167 per cent of APW wage level is 11.8 percentage points. Table I.2.4 also provides figures on vertical equity for married couples; once again, the redistributive power of the income tax system is less effective than for single individuals as it is able to reduce vertical inequality by only 2.9 percentage points.

Then we focus on inequality between single parents (fourth family type) with two children and single individuals without children (first family type) (Table I.2.12). The tax/benefit system is able to reduce this inequality by 28.4 percentage points, indicating a strong redistributive role. Moving to inequality between married couples with and without children, we can observe the tax system is able to reduce the income gap slightly (–3.96%). We should note that in this case the tax/benefit framework plays a less effective redistributive role than in the single parent case.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the tax system tends to favour two-earner families and increasingly so as the family's gross income rises. In fact, while the tax system benefits two-earner families at APW wage level by producing a gap of 3.2 per cent in relation to one-earner families, it provides an over 10 percentage points more favourable treatment to two-earner families with a gross income of 167 per cent of APW than to one-earner households. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

2. Austria

The Austrian tax system is progressive through the use of brackets, with a maximum statutory rate of 50 per cent through the whole period under consideration. The tax unit is the individual. The system employs a series of general as well as targeted allowances and credits to assure a more equitable redistribution of welfare: particular consideration is given to employees, who receive a number of reliefs attached to work expenses, even though the redistributive effects of these reliefs is not very significant. From 1996 to 1999, the tax schedule was composed of five income brackets, with tax rates ranging from 10 to 50 per cent. A tax reform in 1999 became effective in 2000: this reform intended to progressively reduce the tax level, through both cutting effective tax rates slightly in favour

of the lower income brackets, and increasing general tax credits: a zero-rate band was designed which corresponds to about 15 per cent of APW wage level. The progressivity of the income tax is – at least for low and medium incomes – more a result of tax credits than brackets.

Employees' social security contributions have remained unchanged through the period, with a proportional structure and a fixed total rate of 18.1 per cent; consequently, they play no direct roles in the redistribution of income among different taxpayers. On the other hand, a part of these contributions is deductible from the taxable income; this, combined with the individual taxation, tends to benefit families where both spouses work. There are no State or local taxes in the Austrian tax system.

Basic reliefs. The Austrian tax system provides a minimum allowance and a general tax credit to all taxpayers. The minimum allowance is a lump-sum deduction for all taxpayers for "special expenses"; its main purpose is to simplify administration. From 1997, the amount of the allowance is phased out when gross income reaches a fixed threshold. The value of the basic tax credit increased after the 1999-2000 reform. Together with the zero-rate band introduced in 2000, these reliefs contribute to reduce the effective tax burden of all individuals, irrespective of their family status or occupation. Together, basic tax reliefs considerably affect the level of inequality between individuals at different levels of income, reducing the low-wage income gap by four percentage points and the high-wage income gap by only 3.4 percentage points.

Reliefs for work-related expenses. During the last seven years, a tax allowance correlated to work-related expenses has been available to all employees: the amount of the relief is fixed and has remained unchanged over the period 1996-2002. Also, two tax credits are provided to all employees for work and commuting expenses; the budget consolidation measures for 2001 cut employees' tax credit by 14 per cent. The ability of all these reliefs to reduce vertical inequality between taxpayers with different gross income is negligible (see Table I.2.11). In fact, the main purpose of these work-related reliefs is to reduce administrative costs, otherwise all employees would have to be assessed separately.

Family status reliefs. During the whole period 1996-2002, a sole-earner and a sole-parent tax credit have been available to taxpayers who contribute to the maintenance of a dependent spouse or dependent children; the sole-earner credit is not given if the dependent spouse's income exceeds a certain threshold that differs if there are dependent children. The equalising effect of the family status tax credit operates only for single individuals, contributing to reduce the income gap by 3.2 percentage points. A children tax credit is also provided; the amount increased slightly in 1999 and in 2000. As this tax credit is paid together with children cash transfers and is not connected with income tax assessment, the *Taxing Wages* model treats it as a transfer.

Regarding universal cash transfers, a so-called family allowance is given by the Austrian government for each child: the value of this transfer increases for children over 10 years of age and for students. In 1999 and 2000, the amount of the cash transfers increased slightly, and in 2000 the Austrian policy makers differentiated the value for the first, second and subsequent children. The redistributive power of these cash transfers is strong: it reduces the gap between single taxpayers with the same level of gross income but with different personal characteristics by 28.4 percentage points, and the gap between couples with and without children by 16.6 percentage points.

Table II.2. **Main characteristics of Austria's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	5	5	5	5	4	4	4
Zero-rate band	–	–	–	–	y	y	y
Zero-rate band as a proportion of APW	–	–	–	–	0.16	0.16	0.15
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC a proportion of APW	0.18	0.23	0.18	0.18	0.18	0.18	0.18
Effective tax rate for a single individual at APW wage level (tax wedge)	41.5%	45.6%	45.8%	45.9%	44.9%	44.5%	44.8%
Highest rate starts at (proportion of APW wage)	2.37	2.34	2.29	2.25	2.19	2.17	2.12

Let us now focus on Table I.2.4 the Austrian tax system is able to reduce the vertical low-wage income gap by eight percentage points, while the income gap between the APW taxpayer and the taxpayer earning 167 per cent of APW wage level is 9.5 percentage points. This could substantiate that the redistributive role of income taxation is stronger for taxpayers in the middle of the income scale than for those at the bottom. Observing figures on vertical equity for married couples, we note that the tax framework serves to decrease vertical discrimination between couples earning 133 per cent of APW wage level and those earning 167 per cent of APW by about 3.7 percentage points.

Table I.2.12 provides information on inequality between single parents with two children (fourth family type) and single individuals without children earning the same gross income (first family type). The tax system is able to reduce this inequality by more than 32 points, indicating a strong redistributive role. Moving to inequality between married couples with and without children, the tax system appears to be able to reduce this income gap by 16.6 percentage points. The tax framework plays an effective redistributive role in both the single parent case and married couple sample.

Table I.2.16 shows the pre/post-tax differentiation between one-earner and two-earner families: the tax framework provides the most favourable treatment to two-earner families with a gross income of 167 per cent of APW, as it seems to produce a gap of more than 10 percentage points between one-earner and two-earner households. The gap between families at APW wage level and at 133 per cent of APW wage level is around 6-7 percentage points. If we compare the equivalent gross and net incomes of the different family types analysed, we can observe that a *re-ranking* phenomenon takes place between couples earning 167 per cent of APW with two children and couples without children earning 133 per cent of APW. In the pre-tax/benefit situation the equivalent gross income of couples with no children (EUR 22 955, see Table I.2.12) is higher than that of couples with two dependent children (EUR 16 396, see Table I.2.12). The tax system puts this last family type in a better post-tax/benefit position.

3. Belgium

The key features of the Belgian tax system are the large number of brackets (seven from 1996 to 2001, six in 2002), the high marginal tax rates of the income tax schedule and the choice of tax unit. The Belgian tax system combines a joint assessment with separate taxation of earned income (including pensions and social transfers) for two-earner married couples, a splitting system for one-earner married couples, and family taxation for one-earner couples or two-earner couples where one spouse earns less than 30% of the total earned income of both spouses (in which case the familial quotient must be applied). Such

a system represents a mix of family taxation and separate taxation, but it seems more realistic to consider it as separate taxation.

In 1996 and 1997, the APW income belonged in the fourth income bracket, while in 1998-2002 it shifted to the fifth bracket, subject to a statutory rate of 50 per cent. In 2002, a tax reform improved the general tax structure. The aims of this reform are clearly specified by the policy makers: it is intended "to ease the tax burden on earned income, to be life-style neutral, to provide better treatment for taxpayers with dependent children and to make taxation more environmentally responsible".[3] The major consequences of this reform are the abolition of the highest statutory tax rate of 55 per cent, an increase in the work-related expenses allowance rate for taxpayers in the lowest bracket, a rise in the first bracket rate from 20% to 23% (25% in 2003) and the introduction of a basic tax credit.

Social security contributions from employees have a roughly proportional structure, with a rate of 13 per cent for single individuals earning the APW wage level. In 2000, a reduction scheme of these social security contributions was designed for low-income workers; its extent inversely depends on the gross earnings of taxpayers. A special annual social security contribution is also taken from taxpayers. Contributions paid by wage-earners are deductible for taxable income calculation purposes, except for the special social security contributions. Besides general income taxes and social security contributions, a proportional local tax is imposed on all taxpayers at a rate of seven per cent.

Compared with the other OECD countries, the Belgian fiscal system shows a highly progressive income tax schedule, with a significant maximum statutory tax rate of 55 per cent from 1996 to 2001 and 52.5 per cent in 2002, together with a large number of brackets. The 2002 reform contributed to slightly flattening this structure: the highest statutory rate and the number of brackets were cut, thus reducing the tax burden for taxpayers at the top of the income scale. The effects of this change can be observed looking at the level of income subject to the highest statutory rate (see Table II.3): from 1996 to 2001 it was more than 200 per cent of APW, while in 2002 it fell to 1.41 times the APW level. On the other hand, a general tax credit was introduced to benefit mainly taxpayers at the bottom of the income rank; in fact, the empirical analysis shows that its effects on redistribution are still minor.

Basic reliefs. A basic tax credit is available to all resident taxpayers; its amount varies with the marital status of the taxpayer. The basic tax credit is able to lessen the low-wage vertical income gap by only 0.1 percentage point (see Table I.2.10).

Reliefs for work-related expenses. During the last seven years, a tax allowance correlated to work expenses has been available to all employees; the amount depends directly on the level of gross earnings through a regressive rate scheme, which was modified slightly in 2002. This relief plays a subsidiary role in reducing vertical inequality between taxpayers with different gross incomes; in 2002 it was able to reduce low-wage vertical inequality by 0.9 percentage point and high-wage vertical inequality by 0.2 per cent (see Table I.2.11).

Family status reliefs. During the whole period 1996-2002, a number of exemptions were provided to taxpayers depending on their particular family situation. A first exemption is given if there are dependent children; its amount depends on the number of children and whether there are dependants with handicaps. Also, an additional tax allowance is granted when the taxpayer is a single parent or widow(er).

As we can observe in Table I.2.13, the equalising effect of the family status tax credit contributes to reduce the income gap between a single individual without children and a single parent with two children by 7.7 percentage points, and the income gap between married couples with and without children by 2.9 percentage points.

Regarding universal cash transfers, an annual benefit is available to taxpayers for each dependent child; its amount depends on the age and number of children Thanks to this benefit, the gap between single taxpayers with the same level of gross income but with different personal characteristics can be reduced by 17.6 percentage points, and the gap between couples with and without children by 10.3 percentage point.

Table II.3. **Main characteristics of Belgium's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	7	7	7	7	7	7	6
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Effective tax rate for a single individual at APW wage level (tax wedge)	27.4%	27.6%	27.8%	27.9%	27.9%	27.8%	27.5%
Highest rate starts at (proportion of APW wage)	2.27	2.21	2.16	2.14	2.11	2.09	1.41
Highest statutory rate	55%	55%	55%	55%	55%	55%	52.5%

Table I.2.12 provides figures on inequality between single individuals without children (first family type in *Taxing Wages*) and single parents with two children (fourth family type in *Taxing Wages*); the tax system is able to reduce this inequality by more than 26 percentage points. Moving to inequality between married couples with and without children, the tax system is able to reduce this inequality by 13.5 percentage points.

If we focus on Table I.2.4, we see that the Belgian tax system is able to reduce both the vertical low-wage and high-wage income gaps by more than 11 percentage points. Table I.2.4 also provides figures on vertical equity for married couples; the redistributive power of the income tax system is still significant but less effective than for single individuals. In fact, it is able to reduce vertical inequality by 6.8 percentage points.

Finally, Table I.2.16 shows the behaviour of the Belgian tax system in respect of one-earner and two-earner families. The system tends to create a post-tax/benefit divergence in the net income of families with different numbers of wage-earners in favour of two-earner households types. This divergence is 2.88 percentage points for families at APW wage level, 2.35 for middle-wage households and 3.87 for families earning 167% of APW wage level. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

4. Canada

The Canadian tax system is characterised by a quite flat tax schedule, with three income brackets from 1996 to 2000, four income brackets thereafter and a maximum statutory rate of 29 per cent throughout the period (some way behind the 2002 average OECD level of 38.7 per cent). The tax unit is the individual. Given this smooth tax schedule, progressiveness is attained using mainly basic and targeted reliefs that are together able to guarantee a more impartial redistribution of welfare; the Canadian government thus demonstrates special consideration for families, who receive a group of tax credits and

transfers correlated to their personal situation and to the presence of dependent members. Over the period, there has been a series of timid tax reforms or adjustments involving the level of brackets and statutory tax rates, and improvements related to the amounts of basic or family benefits. As we can see in Table II.4, during the period 1996-2002, the effective tax wedge on APW has shown a declining trend, from 32.1 per cent in 1996 to 30.8 per cent in 2002. Given that social security contributions for a single individual at APW wage level have increased along the time (from 5.5 per cent in 1996 to 6.5 per cent in 2002), the lower taxation should totally correlate with the reforms to the income tax system. Employees' social security contributions have a proportional structure for gross earnings not exceeding a fixed threshold, and a fixed amount for higher gross incomes. On the whole, this structure causes social security contributions to have a minor regressive effect in the redistribution of income. State and local taxes depend on the Federal governments of the different Canadian provinces and have a complex and varied structure. The *Taxing Wages* model assumes a fixed and homogeneous provincial tax rate of 49 per cent for the calculation of Canadian taxes, which is approximately equal to the weighted average of the rates in nine provincial tax schedules.

Basic reliefs. The Canadian tax system provides a basic tax credit to all taxpayers; its amount has been progressively adjusted through the period. Also, all wage-earners who contribute to general unemployment insurance are eligible for an unemployment tax credit equal to a certain percentage (16 per cent in 2002) of the contributed amount. These two reliefs play a part in reducing the effective tax burden of individuals, even though their redistributive effect is quite different (Table I.2.10). The basic tax credit plays a small equalising role, lessening the low-wage income gap by 1.7 percentage points and the high-wage gap by 1.5 percentage points.

Finally, an ***age relief*** is provided to all taxpayers aged 65 and over: Canada is the sole country that reserves a general standard tax credit for senior individuals, but unfortunately we are unable to assess the redistributive effects of this relief as it has not been estimated in the *Taxing Wages* pattern.

Family status reliefs. During the whole period 1996-2002, a marital status relief was provided to taxpayers supporting a spouse and to single parents. This relief takes the form of a tax credit whose amount is inversely correlated to the dependent spouse's income. The equalising effect of the family status tax credit operates only for single individuals, contributing to reduce the income gap by 7.4 percentage points. A number of children reliefs were also provided to families with dependants. From 1996 to 1999, these benefits were all assessed as tax credits by the *Taxing Wages* model, and contributed to directly reduce the income tax level. All these tax credits are described in the *Taxing Wages* report, but not all of them are calculated in the *Taxing Wages* model (for example, the tax credits for infirm children and care-givers). From 2000, all the calculated reliefs are now treated as cash transfers.

Table I.2.14 provides figures on universal cash transfers: a child tax benefit is provided for children under 18, and supplements are designed for each child under 7 where no child care expenses are deducted, and for the 3rd and each additional child. This basic benefit is reduced if family net income exceeds a fixed threshold. In addition, a national targeted child benefit supplement (NCB) is provided to low-income families with children. The value of NCB depends on both the number of children and family net income; it is phased out when family income goes beyond the eligibility ceiling. This benefit has an important

role in lessening inequality between single taxpayers with the same level of gross income but with different personal characteristics (20.8 percentage points), but a lesser one for couples with and without children (3.9 percentage points).

Table II.4. **Main characteristics of Canada's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	3	3	4	4
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC and income taxes	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	32.1%	32.3%	31.7%	31.1%	31.3%	30.4%	30.8%
Highest rate starts at (proportion of APW wage)	1.78	1.72	1.71	1.71	1.67	2.66	2.67

If we focus on Table I.2.4, we note that the Canadian tax system is able to reduce the vertical low-wage income gap by 6.5 percentage points and the high-wage income gap by 3.9 percentage points. Moving to married couples, the tax system is able to lessen vertical inequality by 3.6 points. On the whole, the vertical equalising strength of the income tax framework is not very significant, especially in respect of the individual-cases. A reason for these undersized figures could be that the Canadian tax system tends to focus on large families and to discriminate between families with and without children; it is based on a smooth rate schedule which tends to have minor vertical progressive power.

Table I.2.12 shows some figures on inequality between single individuals without children earning 67% of the APW wage level and single parents with the same gross income and two children. The tax system is able to reduce this inequality by more than 29 percentages points. In Table I.2.12 we can also observe figures on inequality between married couples with two children and married couples without children; the tax system appears to be able to reduce this income gap by only 3.9 percentage points. Thus, the tax framework seems to play an effective redistributive role in the single parent case, while in the married couple sample the impact is less intense.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the Canadian tax system tends to favour two-earner families in all the points considered on the wage scale. This tendency can be observed from the 2-4 percentage points post tax/benefit differentiation in the net incomes, especially for the APW family-type case. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

5. Czech Republic

The Czech tax system is characterised by an individual tax unit. From 1996 to 1999, the tax schedule was composed of five income brackets. In 2000, a reform cut the number of tax brackets from five to four, and the marginal tax rate for income earners in the top bracket dropped from 40 per cent to 32 per cent. This reform seems to have followed the common direction of a number of OECD countries that have moved towards a smoother tax framework during the last seven years; this tendency is confirmed when we observe the level of income subject to the highest statutory rate. From 1996 to 1999, this level was at least four times the level of APW (in 1999 it was 6.66 times the APW), and the APW income belonged in the second bracket. With the 2000 reform, the level of income subject to the highest tax rate was lowered and is now 1.6 times the APW wage level. On the other hand,

the highest statutory rate was cut by eight percentage points, highly rewarding taxpayers at the top of the income scale.

Social security contributions collected from employees in the Czech tax system have a proportional structure and there are no remarkable effects on the redistribution of income among citizens. These contributions were characterised by the same rate through the whole period 1996-2002, and are deductible from gross earnings in income tax liability calculation. No regional or local income taxes are collected by the Czech local government.

A number of general and exclusive reliefs contribute to improve the redistributive role of Czech tax system; they all take the form of allowances. To assess the redistributive power of these different allowances in 2002, we will compare the effective tax rates in the *Taxing Wages* model with the tax rates that would be obtained if the tax system did not provide these reliefs. It will also be possible to measure the capacity of the different reliefs to reduce vertical inequality between taxpayer-types.

Basic reliefs. A basic allowance is provided to all individuals; this amount is fixed and has been regularly adjusted in line with the increasing levels of income. Its capacity to reduce the vertical income gap has been minor; in fact, it seems to have lowered both low-wage and high-wage inequality by only one percentage point (see Table I.2.10).

Family status reliefs. During the whole period 1996-2002, a number of allowances were available to taxpayers who contribute to the maintenance of one or more dependants. First of all a marital status relief is provided to taxpayers who support a spouse earning a zero or small income. Also, one spouse may claim an allowance for each dependent child fulfilling one or more specified conditions (age, school position, and handicap). Thanks to these reliefs, whose amounts have been adjusted during the last seven years, the Czech government gives special consideration to families where only one member works full-time, sharing the income with the other members, or where spouses face the expenses associated with having children.

If we concentrate on their equalising role, we might note that in 2002 the family status allowances contribute to reduce inequality between individuals, with and without children, by more than four percentage points; they have also been able to lessen discrimination between the sixth and the eighth family-samples by 2.8 percentage points (see Table I.2.13).

Central government pays an allowance for each dependent child; it is based on the family income level which cannot exceed three times the relevant minimum living standard (MLS). Family income includes the earnings of both parents, net of income tax and employees' social security and health insurance contributions. An additional allowance is paid by local government to low income families; the amount transferred depends on budget capacity and is provided if total family income, including family allowances, is lower than the MLS. Unfortunately it has not been possible to evaluate the redistributive effects of this last transfer as no information is available in the *Taxing Wages* model. From 1999, families are also entitled to a social allowance if there is at least one child in the family, and the net monthly income is below 1.6 times the minimum living standard. All together, these targeted cash transfers have a strong redistributive impact on citizens' income, especially in the cases of single parents with low income and one-earner couples with children. They reduce inequality between single taxpayers with the same level of gross income but with different personal characteristics by 27.5 percentage points, and discrimination between couples with and without children by 7.1 percentage points.

Table II.5. **Main characteristics of the Czech Republic's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	5	5	5	5	4	4	4
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Effective tax rate for a single individual at APW wage level (tax wedge)	42.6%	42.9%	42.8%	42.7%	43.1%	43.1%	43.5%
Highest rate starts at (proportion of APW wage)	4.48	5.38	5.37	6.66	1.77	1.72	1.61

First of all, if we focus on vertical inequality (Table I.2.4), we note that the Czech tax system is able to reduce the vertical low-wage income gap between individuals by only 2.7 percentage points, and the high-wage income gap by four percentage points. The tax structure here seems to be more progressive at the central points of the income scale than at the bottom of it. Table I.2.4 also provides figures on vertical equity for married couples: the tax system is able to lessen vertical inequality by 6.08 percentage points. The vertical equalising strength of the tax system is more significant in the married-couples case than in the individual-case, in contrast to what happens in the majority of OECD countries.

Table I.2.12 provides information on inequality between families with different personal characteristics. First we compare a single individual without children (first family type in *Taxing Wages*) with a single parent with two children, both with the same gross income (fourth family type in *Taxing Wages*). The tax system is able to greatly lessen this inequality (33.5 percentage points) thus demonstrating an intense redistributive power. Regarding inequality between married couples with and without children, the tax system is able to reduce this income gap by 10.9 percentage points. We can say that, on the whole, the Czech tax framework plays an effective redistributive role in both the single parent and married couple cases. Once again, the Czech government is showing special consideration for large families.

Finally, Table I.2.16 shows the tax treatment of families in respect of the number of wage-earners. The Czech tax system benefits two-earner families earning 100% of APW wage level by creating a gap of 0.94 percentage point against one-earner families. This tendency increases together with the level of income, as the tax system produces a divergence of 2.41 percentage points between incomes of one-earner and two-earner households earning 167% of APW. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

6. Denmark

Denmark's income tax system is based on a fairly smooth schedule. Earned income of spouses is taxed separately: there are three income brackets, the number remaining unchanged during the period 1996-2002. Tax rates have progressively fallen for all taxpayers. From 1996 to 2002, the APW has belonged in the top income bracket and is subject to the highest statutory tax rate.

The progressivity of the Denmark tax system is correlated to a number of reliefs targeted at specific categories of taxpayers; cash transfers for children play a central role in the redistribution of income, while reliefs for work-related expenses and family status seem to have a weak equalising power.

Two major tax reforms took place during the period; the main elements of the 1994-1998 tax reform were the introduction of a new tax schedule and lower tax rates, combined with the introduction of social security contributions based on gross earnings.

The second tax reform was implemented in the years 2000-2002. The key aspects of this reform were the introduction of a new tax schedule and the reduction of statutory rates for all taxpayers, combined with a limitation in the value of tax reliefs for interest paid and deductible work-related expenses. From 1998 to 2002, the low bracket tax rate was reduced from 8 per cent to 5.5 per cent, and the highest from 29 per cent to 26.5 per cent. As explained in the *Taxing Wages* country chapter, the aim of the policy makers was mainly to reduce the tax burden of taxpayers with lower incomes, even though the ultimate redistributive effects of this reform are not easy to capture. In fact, although the average income tax rates of the income tax have, especially in 2000, effectively declined, social security contributions have followed a noteworthy upward trend: the contribution rate for an individual at APW wage level was 8.8 per cent in 1996, then it increased to 11.7 per cent in 2000, and finally declined slightly to 10.6 per cent in 2002. Employees' social security contributions have a composite structure with a partly fixed amount and a partly proportional structure with a sole tax rate. These contributions are deductible from taxable income.

Local taxes are levied by the counties, municipalities and the church. They have a flat rate and the tax base is that used by central government for income tax assessment. The *Taxing Wages* model assumes an average rate for its tax calculation purposes: in 2002 this average rate was 33.2 per cent. No other information on these local taxes is available in the *Taxing Wages* country chapter or in the equation worksheet; thus, as estimated in the model, they seem unable to have any redistributive function.

Basic reliefs. Throughout the period 1996-2002, Denmark's tax system provided a personal allowance to all individuals, which is converted in a wastable tax credit by applying the marginal tax rate of the first bracket of the income tax schedule. This allowance is applied in the calculation of both general income taxes and local taxes. Table I.2.10 provides figures on the redistributive power of these personal allowances: they are able to reduce low- and high-wage vertical inequality by 3.4 and 2.4 percentage points respectively.

Reliefs for work related expenses. During the last seven years, a tax allowance has been available to all employees; if the wage earner has expenses related to his work supply (*e.g.* transport, trade union membership dues, unemployment premiums), these are fully deductible. The *Taxing Wages* model takes contributions to unemployment insurances specifically into account

The ability of all these reliefs to reduce vertical inequality between taxpayers with different gross incomes is fairly small: in 2002 the reliefs served to reduce low-wage vertical inequality by 0.6 percentage point and high-wage vertical inequality by 0.5 percentage point (see Table I.2.11).

Family status reliefs. No reliefs are specifically designed for taxpayers with a dependent spouse or dependent children; however, if a married person cannot fully utilise the personal allowance, the unutilised part is transferred to the spouse. The way this transfer is made is fairly complicated. The redistributive power of this relief in 2002 was almost irrelevant, and the resulting effects on inequality appear somewhat ambiguous.

The family status tax credit operates only for married couples, with a negligible inverse effect (see Table I.2.13).

Regarding universal cash transfers, the Danish government grants a transfer for each child: the value of this transfer does not depend on the parents' income, and varies according to the age of children. From 1996 to 2001, the amount increased progressively. There is also a special cash transfer for single parents and another special amount in cases where the "absent parent" does not contribute to the children's maintenance. The cash transfers provided to families with dependent children seem to play a key role in redistributing welfare and in reducing inequality between different family types. As we can see in Table I.2.14, they help reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 34.3 percentage points, and the gap between couples with and without children by 7.7 percentage points.

Table II.6. **Main characteristics of Denmark's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	3	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.07	0.08	0.08	0.09	0.09	0.08	0.08
Effective tax rate for a single individual at APW wage level (tax wedge)	44.8%	45.1%	43.7%	44.5%	44.4%	43.6%	43.4%
Highest rate starts at (proportion of APW wage)	0.98	0.95	0.94	0.94	0.95	0.95	0.91
Highest statutory rate	32%	31%	29%	29%	28%	27.25%	26.5%

Table I.2.4 shows that the Danish tax system is able to reduce the vertical low-wage income gap by 4.89 percentage points, and the vertical high-wage inequality by 13.77 percentage points. This could demonstrate that the redistributive power of income taxes is stronger for taxpayers in the middle of the income scale than for those at the bottom. Also, if we compare these figures on general tax equity with those associated with specific reliefs in Table I.2.10, we can observe that only a small part of the equalising function is correlated with basic and work-related expenses reliefs. Most of the equalising function is connected directly with the rate and bracket structure. Table I.2.4 also provides figures on vertical equity for married couples: the tax framework serves to decrease vertical discrimination between couples earning 133 per cent of APW wage level and those earning 167 per cent of APW by 4.17 percentage points.

Table I.2.12 provides information on inequality between single individuals without children and single parents with two children. The tax system is able to reduce this inequality by about 33 percentage points. This strong equalising effect is mainly associated with the cash transfers provided to single parents. The fact that the amount of these transfers is not correlated with the parent's earnings suggests that there is a major equalising role, even for individuals in the midpoints of the income scale. Moving to figures on inequality between married couples with and without children, the tax system appears to be able to reduce this income disparity by 7.7 percentage points. Comparing this with the figure in Table I.2.15, we are able to verify that the equalising power of the Danish tax system relates mainly to the cash transfers for families with children.

Table I.2.16 shows the pre/post-tax income differential between one-earner and two-earner families: the tax framework discriminates in favour of two-earner families with a

gross income of 167 per cent of APW, producing a post-tax/benefit income discrepancy of almost seven percentage points. The figures for families at 133 per cent of APW wage level are around 2.75 percentage points, while the opposite effect occurs for families at APW wage level. In fact, the tax system seems to give a more favourable treatment to one-earner low-wage families than two-earner families at the same income position. This last result must be interpreted with caution as calculations do not take into account the non-standard reliefs provided by the tax system. Local governments in Denmark typically pay 70% of the cost of day care for children below school age, thus providing a strong incentive for labour force participation from both spouses. No *re-ranking* phenomena can be observed in our empirical calculations.

7. Finland

Finland's tax system is composed of a fairly progressive rate schedule, with the individual as the tax unit-basis. The APW income belonged in the fourth bracket during 1996-2000, and in the third bracket in 2001-2002. The income tax framework was progressively modified during the period 1996-2002, with timid reforms, and generally lower tax rates in line with the trend followed by most OECD countries. In 2001, the number of brackets dropped from six to five, the lowest rate of five per cent was eliminated, and the bracket subject to a zero tax rate was enlarged from 0.3 to 0.4 times the APW level. The wage level subject to the highest statutory tax rate as a proportion of APW remained stable through the period, being about two times the APW income.

Social security contributions from employees maintained a fairly progressive structure during the period 1996-1998; they then assumed a proportional configuration. In 1996 and 1997, the lower rate of the social security contribution for sickness was 1.90 per cent, and 1.45 percentage points higher for taxable incomes above a fixed threshold. In 1998, the base tax rate was reduced to 1.5 per cent, while in 1999 the incremental rate for high incomes was removed. In addition, there were pension and unemployment insurance contributions with rates that were progressively modified over time, from 5.8 per cent in 1996 to 4.8 in 2002. These two contributions are deductible from taxable income. Focusing on results in Table II.7 regarding individuals earning the APW wage level, we note that the general effects of these adjustments and the income tax reforms have been a progressive reduction of the effective average tax rate during the last seven years. This reduction involves all family types in the *Taxing Wages* model.

Finland's tax system imposes a local tax on income, called municipal tax. This has a flat rate which has been slightly modified over time; it is not deductible against central government taxes. From 1997, a work-related allowance and a basic allowance have been provided to taxpayers for municipal tax calculation purposes; the amount has changed significantly over the period.

Finland's tax system provides a series of reliefs that serves to promote a fairer distribution of welfare. To assess the equalising power of these means in 2002, we will proceed in the traditional way by comparing the effective tax rates available in the *Taxing Wages* model with the tax rates that would be obtained if the tax system did not provide these reliefs, and by measuring the capacity of these different reliefs to reduce inequality among taxpayers.

Basic reliefs. A basic allowance is granted on the basis of taxable income; it is meant for all low-income recipients to improve their portion. The base is a fixed amount and it is fully

phased out when income reaches a certain threshold. As this threshold corresponds to less than 67% of APW, it has not been possible to assess the redistributive power of this allowance.

A zero-rate band is available to all resident taxpayers, which makes the income earned up to a certain amount subject to a zero tax rate. This amount has been progressively adjusted as part of the subsequent timid tax reforms described above.

An earned income allowance is provided to employees and the self-employed to encourage employment and improve the position of low-income earners; it is more extensive than the basic allowance so we can calculate its redistributive function. The allowance amounts to 35 per cent of income below a first threshold, then it is phased out until income reaches a maximum value. In 2002, the basic allowances were able to reduce the low-wage vertical income gap by 3.2 percentage points and high-wage inequality by 2.7 percentage points (see Table I.2.10).

Reliefs for work-related expenses. During the last seven years, a tax allowance has been available to taxpayers with work-related expenses. The rate of this tax allowance, which is equal to 3 per cent, has remained unchanged during this time, while the eligibility threshold has been subject to some marginal changes. The equalising power is small compared with other countries that give allowances for work-related expenses (0.2 percentage point for both low-wage and high-wage income gaps).

Family status reliefs and cash transfers. Finland's tax system provides no reliefs related to family status, but employs a universal cash transfer for children; its amount is correlated to the number of children and does not depend on the parents' income assessment. A supplemental cash transfers is also paid to single parents. All together, these cash transfers have a strong redistributive impact on taxpayers' income, especially for single parents with low income. They play an important role in reducing inequality, especially among single taxpayers with the same level of gross income but with different personal characteristics (–20.2 percentage points).

Table II.7. **Main characteristics of Finland's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	6	6	6	6	6	5	5
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as a proportion of APW	0.31	0.32	0.33	0.32	0.31	0.41	0.41
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.06	0.06	0.06	0.06	0.06	0.05	0.05
Effective tax rate for a single individual at APW wage level (tax wedge)	50.3%	48.9%	48.8%	47.4%	47.3%	45.9%	45.4%
Highest rate starts at (proportion of APW wage)	2.12	2.13	2.17	2.13	2.05	2.02	1.94
Highest statutory rate	39%	38%	38%	38%	37.5%	37%	36%

Table I.2.4 shows that Finland's tax system is able to reduce the vertical low-wage income gap by 8.47 percentage points and the high-wage income gap by 11.74 percentage points. Observing results on vertical equity for married couples, we note that the tax system is able to lessen vertical inequality by three percentage points. The vertical equalising strength of the income tax framework appears more significant in individual-cases than for married couples. A reason for this divergence could be partially linked with the family types chosen in the empirical analysis. As we observed in the first paragraph,

Finland's system tends to largely benefit taxpayers at the bottom of the income scale thanks to the zero-rate band and low tax rates for incomes below the APW wage level. On the other hand, the analysis of the individual low-wage income gap involves individuals with gross earnings (the first individual earns 67 per cent of APW and the second taxpayer earns APW wage level) that are lower than those of couples used for the married couple analysis (the two couples earn respectively 133 per cent and 167 per cent of APW wage level).

Table I.2.12 presents some figures on inequality between single individuals without children and single parents with two children with the same gross income (67% of APW wage level), which the general income tax system is able to reduce by 20.2 percentage points. We can also observe figures on inequality between married couples with and without children: the tax system appears able to reduce this inequality by 8.48 percentage points. On the whole, the tax framework seems to play a stronger redistributive role in the single parent case than in the married couple sample.

Finally, Table I.2.16 shows the differences in the tax treatment of families in relation to the number of worker members: in all the three cases, the Finnish tax system seems to discriminate in favour of two-earner couples. In the first and the second cases, it supports two-earner families, providing them with an over 10 percentage points more favourable tax treatment than one-earner households. Regarding one-earner and two-earner families earning 167 per cent of APW, the tax system produces a gap of 13.78 percentage points in favour of two-earner households. As there are allowances for work-related expenses (which obviously double in a family with two earners) on the one hand, and no reliefs for dependent spouses on the other, both spouses are encouraged to enter the job market. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

8. France

The French tax system is characterised by a highly progressive tax schedule and a fairly complex set of general and targeted reliefs directed at different categories of taxpayers. The tax unit is joint family income and the "family quotient"[4] is applied for tax burden calculation; the spouses are always taxed together, while children and other family members are included only if they are dependants. Table II.8 provides some basic information on the French tax system during the period 1996-2002; the tax schedule is composed of six income brackets, plus a bracket subject to zero tax rate. The level of income in this first exempted bracket corresponded to about 20 per cent of the APW wage level during the entire period. From 1996 to 1999, the statutory tax rates remained unchanged, ranging from 10.5 per cent to 54 per cent, while the bracket thresholds were slightly adjusted in line with inflation tendencies. During the tax year 2000, there was a first timid reform on the tax schedule, reducing all the tax rates by one or two percentage points. Another adjustment was made in 2002, leading to a further tax rate cut for all taxpayers. The APW income belonged in the third bracket throughout the whole period, and was subject to a statutory rate of 33 from 1996 to 1999, 31.75 per cent in 2000-2001 and 31 per cent in 2002.

Social security contributions from employees have a flat rate and a maximum ceiling which make them rather regressive; the tax rates of the different contributions (pension, sickness, unemployment, etc.) have changed slightly over time, with an appreciable

reduction in 1998 (the contribution rate for an individual at APW wage level was 17.7 per cent in 1997 and 13.2 per cent in 1998) and subsequent minor adjustments. Local taxes on wage-earning households consist of a housing and property tax set by local authorities; their rates vary widely from one locality to another. These taxes are not calculated in the *Taxing Wages* model, so it is not possible to evaluate their progressiveness and redistributive power.

Basic reliefs. The French tax system provides two different general reliefs to all taxpayers, irrespective of their family or professional status. First, a basic allowance is provided to all individuals. Its value corresponds to 20 per cent of the difference between a family's gross earnings and work-related allowances together with social security contributions; this means that the amount of the relief depends on the value of taxable income. The allowance base tends to rise slowly at the bottom of the income scale as increasing gross earnings are offset by correspondingly increasing contributions and work-related reliefs; then it increases progressively more than earnings when gross income exceeds a certain threshold, as both the value of work allowance and social security contributions reach their fixed maximum ceilings. Second, a first bracket is subject to a zero-rate band, which contributes to increase the tax system's progressivity: the income in this exempted band corresponds to about 20 per cent of the APW level.

Overall tax allowances play a minor equalising role at the bottom of the income scale, reducing low-wage vertical inequality by 0.7 percentage point, while they show greater power in reducing high-wage inequality (2.3 percentage points).

Reliefs for work-related expenses. During the whole period 1996-2002, an allowance for work-related expenses was provided to wage earners; its amount corresponds to 10 per cent of the net wage when this net wage is under a certain threshold and becomes equal to a fixed ceiling when the wage exceeds the threshold. The net wage is calculated as the difference between the family's gross earnings and social security contributions paid by family earners. As we observe in Table I.2.11, in 2002 the equalising role of the work-expenses allowance appears somewhat ambiguous: it is able to reduce low-wage vertical inequality by 0.6 percentage point but has a regressive function in the high-wage vertical inequality case (+1.4 percentage points).

Family status reliefs. From 2001, a tax credit, called "prime pour l'emploi" is provided for full-time employees belonging to low-income households. The tax credit is means-tested, and its amount is calculated taking the whole family situation into account. The presence of dependants and the taxpayer's marital status affect eligibility for the credit and increase the premium paid. On account of its composite structure, this relief is clearly associable neither with a simple work-related allowance nor with a relief for low-wage taxpayers. Its amount depends on both the income and personal situation of the individual; the way its amount is calculated appears quite complex. For the purposes of our analysis, we decided to focus on the equity power of the "prime pour l'emploi": we analysed what would happen to the family tax rate and inequality between different households if the family status were excluded from the eligibility conditions, and the additional amount for dependents were assumed equal to zero. Thanks to this benefit, the gap between single taxpayers with the same level of gross income, but with different personal characteristics, can be reduced by only 0.7 percentage point, while there are no effects on couples with or without children.

Focusing on universal cash transfers, a family benefit is available to households with dependent children; its amount depends on the number of children, and is higher when children are under three years old. The redistributive power of this cash transfer is shown in Table I.2.14. There is a marked capacity for cash transfers to lessen unfairness even though this capacity appears weaker than in other OECD countries. The transfers reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 9.6 percentage points, and the gap between couples with and without children by 5.2 percentage points.

Table II.8. **Main characteristics of France's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	6	6	6	6	6	6	6
Zero-rate band	y	y	y	y	y	y	Y
Zero-rate band as a proportion of APW	0.21	0.20	0.20	0.19	0.19	0.19	0.19
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.19	0.19	0.18	0.18	0.18	0.18	0.18
Effective tax rate for a single individual at APW wage level (tax wedge)	49.7%	48.7%	47.6%	48.1%	48.2%	48.3%	47.9%
Highest rate starts at (proportion of APW wage)	2.38	2.20	2.22	2.16	2.19	2.13	2.12

Table I.2.4 concentrates on vertical inequality: regarding the two individual-cases, the French tax system is able to reduce low-wage inequality by 8.62 percentage points, high-wage inequality by 5.23 percentage points, and married-couple inequality by 2.41 percentage points. If we compare these results with those described in Table I.2.10-I.2.15, we note a partial correlation with basic and work-related reliefs, but there is also an effect of general tax schedule progressivity.

First of all, we focus on inequality between families with different personal characteristics (Table I.2.12): overall, the French tax framework is able to reduce inequality between an individual with children and an individual with the same gross income, but without children, by 12.25 percentage points. Table I.2.12 also provides figures on inequality between married couples: the equalising power of the tax system for married couples is able to reduce this by about 8.06 percentage points. The tax structure generally plays a moderate redistributive role both in the single parent and married couple cases.

Table I.2.16 provides some information on the tax treatment of one-earner and two-earner families: the tax system tends to slightly benefit two-earner households in the first two empirical cases, and seems to favour one-earner households at the top of the income scale. It appears to produce post-tax/benefit income gaps of 3.01 per cent in favour of two-earner families earning the APW wage level, and of 0.94 per cent in favour of two-earner families earning 133 per cent of APW. It benefits two-earner families at 167 per cent of APW by only 0.30 percentage point more than one-earner households in the same income situation. All figures, however, are small and the reason could be correlated to the fact that the French tax system is based on the family tax unit: the application of the "quotient familial" leads the system to total all the members' earnings before taxes are calculated, thus reducing the ability to differentiate families according to the number of wage-earners.

Finally, no *re-ranking* phenomena can be observed in our empirical analysis, suggesting that the tax framework is able to preserve the pre-tax income rank among families.

9. Germany

The German tax system is the based on a continuous progressive structure that determines the effective tax liability of different taxpayers. Spouses are normally assessed jointly, and income tax is calculated by applying what is known as the "splitting method".[5] The income of dependent children or other family members, however, is not assessable with that of the parents.

A first income band is subject to a zero-rate band, contributing to increased progressivity at the bottom of the income scale: during the whole period, the value of this exempted bracket corresponded to about 20 per cent of the APW wage level. On the other hand, the maximum statutory tax rate used in the tax formula dropped progressively from 53 per cent in 1996 to 48.5 per cent in 2001-2002, mainly benefiting taxpayers in the top bracket. During the whole period 1996-2002, the effective tax wedge for an individual earning the APW remained quite high (over 50 per cent); it has been modified slightly throughout the last seven years without following a clear upwards or downwards trend.

Income subject to the maximum statutory tax rate as a proportion of APW has progressively fallen: in 1996, it was about two times the APW level, while in 2002 it corresponded to about 1.66 times the value of the worker-production wage level.

Social security contributions collected from employees correspond to the sum of different contributions correlated to the pension scheme, sickness, unemployment and care assurances: all these dues are based on a flat rate and a maximum ceiling which have been adjusted slightly over time. The overall social security contribution scheme has a proportional structure for low and medium incomes, while it becomes regressive for highest earners. The effective rate for single individuals earning the APW wage level was 20.2 per cent in 1996 and to 20.7 per cent in 2002. All contributions paid by wage-earners are deductible for taxable income calculation purposes, up to a specific ceiling; the calculation of this deduction is quite complex and corresponded to about 6-7 per cent of the APW wage level during the whole period.

No local taxes are imposed on taxpayers besides general income tax and social security contributions; church taxes, however, are deductible from taxable income and the model takes into account this deduction for tax calculation purposes.

Basic reliefs. As we have seen in the first paragraph, the tax schedule comprises a first income bracket subject to a zero tax rate. This exempted band represents a basic relief as it benefits all taxpayers irrespective of their personal or professional condition; it has not been possible, however, to evaluate its redistributive effects for the different family-types in the *Taxing Wages* model on account of the continuous structure of the tax scheme.

Reliefs for work-related expenses. During the last seven years, a lump-sum allowance, correlated to work expenses, has been available to all employees; the amount has remained unchanged throughout the whole period. In 2002 this relief played quite a trivial role in reducing the vertical inequality between taxpayers with different gross incomes; it was able to reduce both low-wage and high-wage vertical inequality by 0.2 percentage point (see Table I.2.11).

Family status reliefs. During the whole period 1996-2002, a number of reliefs were provided to taxpayers depending on their particular family situation. There is also a child tax credit; its amount depends on the number of dependent children and has progressively increased over time. Also, a lump-sum lone-parent allowance is given to single parents.

Together, these reliefs contribute to reduce the income gap by 26.5 percentage points for single individuals and 12.4 percentage points for married couples with or without children.

No cash transfers are available in the German tax system.

Table II.9. **Main characteristics of Germany's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	The tax system is formula based						
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as a proportion of APW	0.21	0.21	0.21	0.21	0.22	0.22	0.22
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.07	0.07	0.07	0.06	0.06	0.06	0.06
Effective tax rate for a single individual at APW wage level (tax wedge)	51.2%	52.3%	52.2%	51.9%	51.8%	50.8%	51.3%
Highest rate starts at (proportion of APW wage)	2.08	2.06	2.02	1.97	1.84	1.70	1.66
Highest statutory income tax rate	53%	53%	53%	53%	51%	48.5%	48.5%

First of all, we focus on Table I.2.4: the Germany tax system is able to reduce both the vertical low- and high-wage income gaps by about 10-11 percentage points. Table I.2.4 also provides figures on vertical equity for married couples: the income tax system is able to reduce this by 7.3 per cent. These figures are probably the result of the zero-rate band and deductions for social security contributions.

Then we focus on inequality between single individuals without children and single parents with two children, with the same gross income (Table I.2.12). The tax system is able to reduce this inequality by 26.53 per cent, indicating a strong redistributive role. Moving to married couples with and without children, the pre-tax income gap of 33.33 per cent is offset by the tax system by over 12 percentage points. In general, the tax framework seems to play a more effective redistributive role for single parents than for married couples: this difference is probably correlated to the existence of the sole-parent allowance.

Finally, Table I.2.16 shows the behaviour of the Germany tax system families in relation to the number of earners: it tends to discriminate in favour of dual-earner households when the family's gross income is equal to the APW level and 133 per cent of APW (the post-tax/benefit gaps are, respectively, 0.94 percentage point and 0.18 percentage point). On the other hand, the system mainly benefits one-earner couples earning 167% of APW, guaranteeing them a net income of 2.35 percentage points higher than two-earner couples. This result is most likely correlated to the German tax system being based on the family tax unit.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

10. Greece

The Greek tax system is progressive through the use of brackets, and the tax unit is the individual. In addition, it presents some peculiar and noteworthy characteristics: first, the presence of a first large bracket subject to a zero-rate band, whose value increased progressively over time, from 46 per cent of APW in 1996 to 80 per cent of APW in 2002. Second, we should notice that the allowance for work-related expenses is embodied in the tax schedule, contributing to an increased value of the zero-rate band for dependent workers.

These features guarantee a highly progressive tax scheme and a low effective average income tax rate for all workers, irrespective of their family status. Social security contributions with a constant tax rate of 15.9 per cent for the whole period in part balanced the high income tax progressivity and contributed to raise the workers' tax liability. On the other hand, social security contributions are totally deductible in the taxable income computation, as we can see in Table II.10.

During the last seven years, some adjustments have been made to the tax schedule and value of income tax rates. From 1996 to 2000, the tax framework was composed of six brackets, with a maximum statutory tax rate of 45 per cent. The amounts in income brackets have gradually modified in line with economic changes and inflation trends. In 2001, a first timid reform was carried out, with the maximum tax rate dropping from 45 per cent to 42.5 per cent. Finally, in 2002 the number of brackets was reduced from six to three, the first tax rate of 5 per cent was eliminated and the maximum tax rate lowered to 40 per cent. Observing Table II.10, we could say that the 2002 reform mainly benefited individuals in the top income brackets. The effective average tax wedge for workers earning the APW wage level remained relatively stable throughout the period, with a small reduction of 1 per cent in 2002, while the value of income subject to the reduced maximum statutory tax rate dropped from 4.56 times the APW in 2001 to 2.02 in 2002.

No State or local income taxes exist in the Greek system.

Basic reliefs. A basic relief is available to all resident taxpayers, making income earned up to a certain amount subject to a zero tax rate. As we observed earlier, the value of this zero-rate band increases for dependent workers, incorporating a form of allowance for work-related expenses. The *Taxing Wages* framework takes this allowance into account and calculates it in the tax schedule for all the family types considered. The amount of the zero-rate band and the allowance for work expenses have been progressively adjusted. The tax system seems to benefit workers earning the APW to almost the same degree as individuals at 67 per cent of the APW wage level: this is probably why the capacity to reduce vertical inequality does not appear significant at the bottom of the income scale (the low-wage vertical income gap reduction appears to be only 0.5 percentage point). In contrast, the high-wage inequality reduction is 5.5 per cent (see Table I.2.10).

Family status reliefs. During the whole period, a relief has been available to taxpayers who contribute to the maintenance of one or more dependent children; this relief takes the form of a tax credit whose amount is not means-tested and depends only on the number of children. The value of child tax credit has increased slightly over time, but its weight has remained small compared with the income level of the different family-types.

In fact, in 2002 the redistributive power of the family tax relief was negligible for single parents with low income, and minor for married couples with children. From Table I.2.13, we note that the family status credit has been unable to reduce inequality between individuals with and without children, and has lessened discrimination between the sixth and eighth family-samples by only 1.4 percentage points.

The general tax system provides no universal cash transfers for dependent children; however, employees can obtain a cash transfer from their employers under the relevant Collective Labour Agreement or by arbitrary decision. This transfer represents a certain percentage of the salary and its amount is governed by the number of children and the presence of a spouse, independently of his/her income status. The *Taxing Wages* empirical

model takes into account this transfer for gross earning calculations but we cannot consider it a universal cash transfer as it does not belong in the central Government income tax system.

Table II.10. **Main characteristics of Greece's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	5	5	5	5	5	5	3
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as a proportion of APW	0.46	0.44	0.42	0.56	0.56	0.64	0.80
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Effective tax rate for a single individual at APW wage level (tax wedge)	35.8%	35.8%	36.1%	35.7%	36.0%	35.7%	34.7%
Highest rate starts at (proportion of APW wage)	5.34	5.17	4.88	4.77	4.56	4.56	2.02
Highest statutory income tax rate	45%	45%	45%	45%	45%	42.5%	40%

If we focus on vertical inequality (Table I.2.4), we note that the Greek tax system is able to reduce the vertical low-wage income gap between individuals by only 0.46 percentage point, while the high-wage income gap is reduced by 8.17 percentage points. Consequently, the tax structure seems to be more progressive at the central points of the income scale than at the bottom: the reason could be related to the fact that in 2002 individuals earning 67 per cent of APW and those earning the APW wage level were both able to greatly benefit from the zero-rate band (80 per cent of APW was subject to a zero tax rate). Table I.2.4 also provides figures on vertical equity for married couples; the tax system seems to have slightly fostered vertical inequality, even though the increase appears negligible (0.15 percentage point).

Table I.2.12 provides information on inequality between taxpayers with and without children. The tax system is not able to lessen this inequality for single workers, demonstrating that the family status reliefs cannot play an effective redistributive role on account of their small amount. Moving to married couples with children and married couples with two children, results confirm those for single taxpayers. The tax system is able to reduce this income gap only by 0.54 percentage point.

Finally, Table I.2.16 shows the tax treatment of one-earner and two-earner families. The tax system benefits two-earner families at APW wage level by producing a post-tax/benefit gap of only 1.07 per cent in respect of one-earner families, and this tendency seems to increase together with the family's gross income. The Greek system provides an 11 percentage points more favourable treatment to two-earner families with a gross income of 167 per cent of APW than to one-earner households in the same gross income situation. A simple explanation of this phenomenon could be, once again, the presence of a large exemption band. If in a family there is only one earner, he/she can benefit from the zero-rate band only to a limited degree, and when his/her gross income exceeds a certain threshold, the zero-rate band tends to lose substance. In contrast, when the family income is divided between two earners, they can both benefit from the large exemption band.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

11. Hungary

In 2002, the Hungarian tax system was characterised by a roughly flat tax schedule with only three income brackets and statutory rates ranging from 20 to 40 per cent. The tax structure has had several adjustments over time: in 1996, the tax scheme was composed of six brackets with rates ranging from 2 to 48 per cent. In 1997, the first two tax rates increased, while the maximum statutory rate fell from 48 to 42 per cent. Finally, in 1999, the number of brackets was reduced from six to three, and the maximum statutory rate adjusted from 42 to 40 per cent. The amount of income brackets has also been progressively modified in line with earnings and inflation trends.

The tax unit is the separate individual. Observing the structure of the Hungarian tax system during the period 1996-2002, we notice the introduction of several standard reliefs. All take the form of tax credits; they are composite and together seem to have played an effective and increasing redistributive role. First, during the whole period 1996-2002, a tax credit is provided on housing loans, but it is not possible to estimate its redistributive effect due to lack of information in the *Taxing Wages* model. From 1997, a basic tax credit is provided to all taxpayers, corresponding to a certain percentage of the annual wage; also, from 1998, 25 per cent of the new pension contributions[6] and membership fees can be deducted from tax payable. Finally, in 1999, a tax credit for children was introduced for all taxpayers with dependent children; its amount depends on the number of children and has been progressively increased. The effects of all these changes are complex: as we see in Table II.11, a progressive reduction in the tax wedge for sole individuals at APW wage level has occurred, even though no extraordinary changes can be observed. On the other hand, deep alterations can be noticed from the tax wedge for sole parents earning 67 per cent of APW, whose effective average tax rate moved from 26.8 in 1996 to 29.7 in 1999 and 17.7 in 2002.

Social security contributions do not show any redistributive power: they had a roughly proportional structure, with a tax rate of 11.5 from 1996 to 1998 and 12.5 in 1999-2002. As we have seen in the first paragraph, social security contributions are partially deductible from income tax. In Hungary there are no local taxes: the central income tax collected by the general tax system is split between the central government and local governments. At the same time, the *Taxing Wages* country chapter specifies that local governments can levy taxes on employment, business activities, buildings and tourist facilities, etc. but no calculations are made concerning these levies.

Basic reliefs. Since 1997 the Hungarian tax system has provided a basic tax credit to all taxpayers; its amount is correlated to the wage income level. In 1997-1998, the tax credit was estimated as 20 per cent of the annual wage, with a fixed maximum ceiling correlated to income level. In 1999, the rate of the basic tax credit was reduced to 10 per cent, and an income threshold fixed for tax credit eligibility. Finally, in 2002, its rate increased to 18 per cent for the first four months of the year and at the same time the eligibility threshold was raised. In 2002, the tax credit was able to lessen the low-wage income gap by 3.3 percentage points, and the high-wage gap by 7.9 percentage points.

Family status reliefs. During the whole period 1999-2002, a child relief was provided to taxpayers with one or more dependent children. This relief takes the form of a tax credit whose amount is not correlated to the spouses' income, but is based on the number of dependants. The value of the child tax credit has progressively increased over time. The redistributive power of this tax credit appears overall significant: the child tax credit seems

to reduce the single parents' income gap by 10.9 percentage points and the gap between married couples with and without children by 7.7 percentage points.

Table I.2.14 also provides figures on universal cash transfers; a benefit is provided to families with dependent children. In 1996, the amount of family benefits depended on the parents' disposable income, but subsequently became independent from this. In particular, during 2002, it was correlated to the number of children, the presence of disabled dependants and the event of single parenthood; the value of the cash transfer increased for the last four months of the year. Family benefits have an important role in lessening inequality as they reduce the gap between single taxpayers with the same level of gross income, but with different personal characteristics, by 21 percentage points, and that between couples with and without children by 10.5 percentage points.

Together, the child tax credit and cash transfers play a significant and noteworthy redistributive role: through the use of these targeted benefits the Hungarian tax system shows special consideration to families, and the tax framework is able to pursue a strong equalising function.

Table II.11. **Main characteristics of Hungary's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	6	6	6	3	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	y	y	y	y	Y
Deductions for SSC as a proportion of APW	–	–	0.02	0.02	0.02	0.02	0.02
Effective tax rate for a single individual at APW wage level (tax wedge)	52.0%	52.0%	51.6%	50.7%	52.0%	49.0%	46.3%
Highest rate starts at (proportion of APW wage)	1.96	1.98	1.70	1.37	1.07	1.10	1.14
Effective tax rate for a single parent at 67 per cent of APW wage level (tax wedge)	26.8%	28.8%	28.1%	24.0%	29.7%	19.5%	17.7%

Table I.2.4 shows vertical inequality between individual taxpayers: the Hungarian tax system serves to lower the vertical low-wage income gap by 7.33 per cent and the high-wage income gap by 16.36 percentage points. Regarding figures on vertical equity for married couples, the tax system is able to lessen vertical inequality by 4.3 percentage points. On the whole, the vertical equalising strength of the income tax framework is relatively noteworthy, especially in respect of the individual-cases. The different figures in respect of low-wage and high-wage individual inequality could be linked to the basic tax credit and its ceiling: individuals earning an income equal to or lower than the APW wage level fully benefit from this tax credit, while taxpayers earning 167 per cent of APW or higher incomes are excluded.

Table I.2.12 provides information on inequality between single individuals without children (first family type in *Taxing Wages*) and single parents with two children (fourth family type in *Taxing Wages*): the tax system is able to reduce this inequality by more than 34 percentage points. We can also observe figures on inequality between married couples with different personal conditions. The tax framework is able to reduce this income gap by 19.05 percentage points. Compared with the other OECD countries, these results authenticate the profound redistributive power of the Hungarian tax system.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families. The tax system benefits two-earner families at APW wage level by

producing a gap of 7.93 percentage points with one-earner families, and those with a gross income of 133 per cent of APW by producing a post-tax/benefit gap of 12.24 percentage points. Two-earner families at 167 per cent of APW benefit from the tax system by 16.94 percentage points more than one-earner families in the same earning position.

12. Iceland

Iceland's tax system is characterised by a roughly flat central income tax system, based on two income brackets, and by a considerable local income tax with a proportional structure. The income tax base both for central and local income taxes is composed of "personal income" (*e.g.* wages, salaries, pensions, etc.) taxed on an individual basis, and "capital income" taxed jointly on married couples.

Personal income tax is mainly at a single rate, even though an extra tax rate is imposed temporarily on individuals with a monthly income above a fixed threshold. This extra-tax does not affect the tax burden of the family-types examined in the *Taxing Wages* model.

The value of tax rates in the central income tax system has progressively fallen, moving from 33.15 (plus five per cent for incomes belonging in the second bracket) in 1996 to 25.75 (plus seven per cent for incomes exceeding the threshold) in 2002; the local flat tax rate, on the other hand, has gradually increased from 8.8 per cent in 1996 to 12.8 per cent in 2002. The combined effects of these adjustments have contributed to maintaining the tax wedge of individuals at APW wage level almost stable around the value of 25 per cent. Also, social security contributions imposed on employees have almost no effect on the tax wedge of taxpayers, being a fixed amount of about 0.2-0.25 per cent of APW wage level during the whole period. The compulsory payment to pension funds is fully deductible for taxable income calculation purposes.

As we can see in Table II.12, the APW wage level belonged in the first bracket throughout the years 1996-2002; an analysis of the tax framework leads us to expect that the redistributive role of the tax system depends mainly on the reliefs and benefits provided to taxpayers, as the general tax schedule presents a roughly proportional and regular structure.

Basic reliefs. Iceland's tax system provides a basic tax credit to all individuals over sixteen years old irrespective of their family or professional status. The tax credit is of a fixed amount to start with – its relevance is significant in respect of low incomes (in 2002 this amount corresponded to about 13.7 per cent of APW) – and downgrades as incomes exceed a certain value, thus serving to increase the general tax framework progressivity. The redistributive power of the basic tax credit in 2002 can be observed in Table I.2.10: figures clearly demonstrate the effectiveness of the basic tax credit in the equalising field. It seems to have lowered the low-wage vertical inequality by 7.6 percentage points and the high-wage inequality by 5.2 percentage points.

Reliefs for work-related expenses. During the whole period 1996-2002, a deduction for related transport expenses was provided to wage earners, and is described in the Iceland country chapter of the *Taxing Wages* report. However, no information is available on the amount and ceiling of this exemption, so it could not be estimated in the empirical model. This lack of information prevents us from evaluating the vertical distributive role of the work-related allowance.

Family status reliefs. Since 1996 married couples may utilise up to a certain percentage of the spouse's unutilised portion of his/her basic tax credit. This percentage was

maintained at 80 per cent during 1996-1999; then it increased gradually up to 95 per cent in 2002. This measure serves to benefit married couples, and does not affect single parents with dependent children. The equalising role of the allowance is minor for both single individuals and couples; the result is coherent with eligibility for this relief not being correlated to the presence of dependent children.

Regarding universal cash transfers, during the whole period a child benefit has been available to households with dependent children. Its structure modified gradually over time: in 1996-1997, a benefit was available irrespective of the parents' income; its value was correlated to the age of children and single parenthood. Moreover, a supplemental allowance was provided to low-income families. In 1998-2000, all the child benefits were associated with family income and became means-tested. Subsequently in 2001, a reform was implemented to reduce the linkages between the value of the transfer and the household income. Today, the transfer is composed of a fixed amount available to all taxpayers and associated with the age of their children, plus a supplemental value partly correlated to the parents' income. The redistributive power of these cash transfers is shown in Table I.2.15: The transfers have a significant capacity to lessen unfairness, reducing the gap between single taxpayers with the same level of gross income but with different personal characteristics by about 25 percentage points, and that between couples with and without children by 7.1 percentage points.

Table II.12. **Main characteristics of Iceland's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	2	2	2	2	2	2	2
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.03	0.04	0.04	0.06	0.06	0.08	0.08
Effective tax rate for a single individual at APW wage level (tax wedge)	24.5%	24.4%	24.8%	24.2%	25.0%	25.5%	25.8%
Highest rate starts at (proportion of APW wage)	1.91	1.76	1.61	1.79	1.67	1.82	1.75
Highest statutory income tax rate	38.2%	34.3%	32.4%	33.4%	33.4%	33.1%	32.8%

If we focus on Table I.2.4, we note that Iceland's tax system is able to reduce the vertical low-wage income gap by about seven percentage points and the high-wage income gap by 16.34 percentage points. Table I.2.4 also provides figures on vertical equity for married couples: the tax system is able to lessen vertical inequality by 7.22 percentage points.

Table I.2.12 shows some figures on inequality between single individuals with and without children: the tax system is able to reduce this inequality by 25.39 percentage points. In Table I.2.12, we can also observe figures on inequality between married couples with different personal characteristics: the tax system appears to be able to reduce this income gap by 7.12 percentage points. In general, the tax framework seems to play a stronger redistributive role in the single parent case than in the married couple one; this is because there exists a supplemental benefit for single parents and the eligibility threshold for single individuals is higher than for marred couples.

Finally, Table I.2.16 shows the behaviour of Iceland's tax system in relation to one-earner and two-earner families: generally, it seems to treat families uniformly regardless of the number of earners. It tends to produce a one/two-earner gap of about 0.3-0.4 percentage

point in the first and the second family types, and to benefit two-earner families earning 167 per cent of APW by only 0.29 per cent more than one-earner families in the same gross income situation. As allowances for work-related expenses (which double in a family with two earners), described in the *Taxing Wages* country chapter, are not empirically estimated in the model, we are less able to evaluate the effective role of the tax system in discriminating against families based on the number of wage earners. No *re-ranking* phenomena can be observed in the study.

13. Ireland

The Irish tax system gives great consideration to families. Firstly, the Irish government has chosen the family as the relevant tax unit. Secondly, the tax schedule is differentiated according to the taxpayer's family status, providing a more favourable bracket structure to single parents (since 2001) and married couples (since 1996), especially in the presence of two wage earners. Thirdly, a set of selected reliefs and transfers are provided to taxpayers with dependent children, and in particular to sole parents.

The tax schedule is composed of two income brackets, differentiated according to the taxpayer's family status. Tax rates have gradually dropped over time, moving from 27-48 per cent in 1996 to 20-42 per cent in 2002. As we can observe in Table II.13, this progressive reduction has had a major impact on the tax burden of individuals earning the APW wage level, reducing the effective average tax rate from over 36 per cent in 1996 to 24.5 per cent in 2002. At the same time, income subject to the maximum tax rate has been enlarged, shifting from 66 per cent of APW to 1.11 times the APW level. This means that from 2001 the APW now belongs in the first income bracket (see Table II.13).

Another peculiar characteristic of the Irish tax framework is the presence of an exemption system which is granted to individuals with small income: where total income is less than or equal to a certain exemption limit, that income is exempt from tax. The value of this exemption limit is different according to the marital status of taxpayers, and increases when there are dependent children. The exemption scheme is quite complex: during the whole period 1996-2002, the marginal relief rate of tax, charged at a rate of 40 per cent on the difference between total income and the relevant exemption limit, applies where liability to tax at the marginal relief rate is less than what would be chargeable under the normal tax schedule and where total income is less then twice the relevant exemption limit. Otherwise tax is charged under the normal tax schedule. No family type considered in the *Taxing Wages* can benefit from this exemption system.

A major change was implemented in relation to the 1999 Finance Act: the system moved towards a tax credit system by standard-rating the basic single and married personal allowances as well as the work-related allowance. Before this adjustment, all reliefs took the form of allowances at the taxpayers' marginal tax rate; they now became tax credit allowed at the standard rate of income tax.

In 1996, social security contributions collected from employees were composed of employment, health and pension contributions, based on flat tax rates; as taxpayers with an earned income that was less than a fixed amount were exempted from employment and health contributions, these two levies were slightly progressive. On the other hand, pension contributions are based on a flat rate and on a maximum ceiling. One of the measures of the 1999 Finance Act was the abolition of the employment contribution, accompanied by an increase in the health contribution rate from one to two per cent. On

the whole, employees' social security contributions seem to play a minor redistributive role thanks to their progressive structure.

No state or local income taxes are collected in the Irish tax system.

Basic reliefs. Throughout the whole period 1996-2002, the Irish tax system provided relief to all individual taxpayers irrespective of their professional or family status. From 1996 to 1998, this basic relief took the form of a basic allowance of a fixed amount which contributed to a reduction in taxable income before taxes were imposed. From 1999, following what is known as the Finance Act, the relief was converted into a tax credit. Before the adjustment, the allowances led to a tax reduction associated with marginal taxpayers' tax rate, while after the reform they were allowed at the standard rate of income tax. Table I.2.10 provides figures on the redistributive power of this personal relief in 2002. It seems to reduce low-wage income by 2.9 percentage points and the high-wage gap by 2.3 per cent.

Reliefs for work-related expenses. During the last seven years, a tax relief has been available to all dependent workers. As with the basic tax credit, this relief took the form of allowance from 1999, then it was converted into a tax credit of a fixed amount. The value of this work-related tax credit has been progressively increased over time. The ability of this relief to reduce vertical inequality between taxpayers with different gross income is relatively noteworthy: in 2002, it served to reduce low-wage vertical inequality by 1.2 percentage points and high-wage vertical inequality by 0.9 percentage point (see Table I.2.11).

Family status reliefs. A set of reliefs are explicitly designed for taxpayers with a dependent spouse or dependent children: first of all, married couples receive a basic tax credit equal to twice the individual tax credit, irrespective of the number of income earners. This measure has some effective equalising effects and is correlated to the fact the Irish tax system is based on the family tax unit. Second, single parents receive a tax credit equal to double the individual relief to take into account of their particular family status.

As of 2000, a new tax credit called "new carer allowance" is provided to families where one spouse stays at home to care for children or other dependent members and the income of the sole worker spouse is less than a fixed amount. This credit and the possibility for the taxpayer to be subject to the favourable bracket scheme available to two-earner families (see above) are mutually exclusive; the taxpayer may opt for whichever appears the most beneficial. Due to its composite structure, the "new carer" relief is clearly associable neither to a simple work-related tax credit nor to a relief for low-wage taxpayers. In fact, its amount depends both on the income and personal situation of individuals, and the way the amount is estimated appears quite complex. As we did for the "prime pour l'emploi" (see the France country chapter), we decided to focus on the equity power of the "new carer allowance": we analysed what would happen to the family tax liability and to inequality between different households if the family status were excluded from the eligibility conditions and if the additional amount for dependents were assumed equal to zero. The effects on inequality appear negligible.

Regarding universal cash transfers, the Irish government has offered two main transfers during the last seven years. First, a benefit is provided for each child; its value does not depend on the parents' income and varies according to the number of children. From 1996 to 2002, the amount of these cash transfers increased progressively. Second, a special cash transfer is offered to low-income families where either the principal earner

and/or the spouse are in full-time employment. The level of benefit depends on the value of family income and the number of children.

Finally, from 2002 a new non-taxable payment called "one parent family payment" is available to men and women who are bringing up a child or children without the support of a partner. The payment is means-tested and on account of the complex system, this type of transfer is excluded from the empirical tax calculation model.

The cash transfers have a significant capacity to lessen inequality: they reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 22.2 percentage points and the gap between couples with and without children by 6.4 percentage points.

Table II.13. **Main characteristics of Ireland's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	2	2	2	2	2	2	2
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	–	–	–	–
Deductions for SSC as a proportion of APW	0.06	0.06	0.05	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	36.1%	33.9%	33.0%	32.4%	28.9%	25.8%	24.5%
Highest rate starts at (proportion of APW wage)	0.66	0.69	0.65	0.86	0.98	1.07	1.11
Highest statutory income tax rate	48%	48%	46%	46%	44%	44%	42%

If we focus on Table I.2.4, we note that the Irish tax system is able to reduce the vertical low-wage income gap by 7.56 percentage points and vertical high-wage inequality by 13.49 percentage points. The difference between the results could demonstrate that the redistributive power of income tax is stronger for taxpayers at the middle of the income scale than for those at the bottom. Also, if we compare these figures on general tax equity with those associated with specific reliefs in Table I.2.10 and Table I.2.11, we observe that only a part of the equalising function is correlated with basic and work-related expenses reliefs; the rest can be connected directly to the rate and bracket structure. Table I.2.4 also provides figures on vertical equity for married couples: the tax framework serves to decrease vertical discrimination between couples earning 133 per cent of APW wage level and those earning 167 per cent of APW by 4.26 percentage points.

Table I.2.12 provides information on inequality between single individuals with and without children. The tax system is able to reduce this inequality by almost 30 percentage points. This strong equalising effect is partly associated with the cash transfers provided to single parents. We can also observe figures on inequality among married couples. The tax system appears able to reduce this by 6.43 percentage points.

Table I.2.16 shows the differences in the pre/post-tax income between one-earner and two-earner families: the tax framework provides a more favourable treatment to two-earner families in all three examples. The post-tax/benefits gap for families at 167 per cent of APW wage level is equal to 4.14 per cent; for families at 133 per cent of APW wage level it is equivalent to 1.24 percentage points; and for families at APW wage level it is equal to 2.84 per cent. As we have described in the first part of this chapter, the Irish government has designed a differentiated tax schedule where two-earner married couples benefit from the most favourable bracket system; this measure manifestly aims at providing an encouraging treatment to families where both spouses work. On the other hand, one-

earner married couples can receive a special allowance (the "new carer allowance") if one spouse decides to stay at home to care for dependent members; this partially offsets the effect of the differentiated income bracket system and discourages the marginal spouse to enter the job market. No *re-ranking* phenomena can be observed in our empirical calculations.

14. Italy

The Italian tax unit is the individual; special consideration, however, seems to be shown a taxpayer's family situation, given the large and somewhat complex set of reliefs for households with dependants. In 1996 the tax schedule was composed of seven income brackets, with a strong progressive structure; in 1998 the number of brackets was reduced and the tax rates flattened. Thanks to this reform, the tax burden of individuals and families earning the APW wage level has considerably declined. Also, the income subject to maximum statutory tax rate has moved from 8.4 times the APW in 1996 to 3.5 in 1998. Since then, successive timid adjustments have led to other minor personal income tax rates reductions, but no main changes can be observed in Table II.14.

Social security contributions collected from the employees have maintained almost the same structure over time; the rate schedule appeared proportional in 1996-1999 and slightly progressive since 2000, even though small adjustments have not affected the value of contributions paid by the family types evaluated in the model. On the whole, contributions have not had any direct distributive role; they are though fully deductible for the calculation of taxable income, contributing to reducing it by about nine percentage points before taxes are levied.

From 1998, a proportional regional tax is imposed by local governments; taxable income is the same as for central government income taxes. The average tax rate chosen for the empirical calculation moved from 0.5 per cent in 1998-1999 to 0.9 per cent since 2000.

Basic reliefs. A tax credit is provided to all workers.[7] In 1996-1997, the amount was fixed, while for the rest of the period it has had a progressive structure with two main components: the first is invariable and the second inversely correlated with the taxpayer's income.

Even though the *Taxing Wages* country chapter refers to this relief as an employment tax credit, we decided to consider it a basic relief since it is not associated with any particular work-related expense. Table I.2.10 provides some figures on the redistributive role of this relief in 2002: it played almost the same role in both the low-wage and high-wage income gaps, reducing them by 1.8-1.9 percentage points.

Family status reliefs. During the whole period, a set of tax credits has been offered to those who contribute to the maintenance of dependants: first, a tax credit for a dependent spouse is provided if the marginal spouse's income is less than a fixed threshold. The value of this credit is calculated according to a bracket scheme, as is the basic tax credit. Second, a child tax credit is granted to each parent, equal to 50 per cent of the total amount allowed.[8] From 2001, its amount depends on both the number of children and the individual taxable income of each parent, while previously it varied only with the number of children. From 2001, the value of the child credit can increase slightly for a widowed spouse or single parent. Finally, a third tax credit is granted if the household has other dependant(s), subject to the latter's income not exceeding a fixed threshold; this last relief

cannot be evaluated empirically on account of the characteristics of the *Taxing Wages* family types.

All together, the family status credits play a noteworthy redistributive role in 2002: their capacity to reduce the income gap is particularly effective in the single parent case where they seem to have lowered the inequality between sole individuals and taxpayers with children by 7.8 percentage points (see Table I.2.13).

The cash transfer system for dependent children takes into account both family income (means-tested) and the number of children; once again, it is based on a bracket scheme where the value of benefit is inversely correlated with family income. The bracket scheme is differentiated for married couples and single parents. Its equalising effect operates for single individuals with or without children, contributing to reduce their income gap by 15 percentage points, and to a lesser extent for married couples, with an estimated reduction of 2.0 percentage points.

Table II.14. **Main characteristics of Italy's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	7	7	5	5	5	5	5
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.10	0.10	0.09	0.09	0.09	0.09	0.09
Effective tax rate for a single individual at APW wage level (tax wedge)	50.8%	51.5%	47.5%	47.2%	46.7%	46.1%	46.0%
Highest rate starts at (proportion of APW wage)	8.39	7.88	3.47	3.47	3.39	3.34	3.25
Highest statutory income tax rate	51%	51%	45.5%	45.5%	45.5%	45%	45%

If we focus on vertical inequality (Table I.2.4), we note that the Italian tax system is able to reduce the vertical low-wage income gap between individuals by 5.77 percentage points and the high-wage income gap by 7.17 percentage points. Here, the tax structure seems as progressive at the central points of the income scale as at the bottom; this tendency confirms the figures observed in the basic tax credit (Table I.2.10). Table I.2.4 also provides figures on vertical equity for married couples: the tax system is able to lessen vertical inequality by 3.3 percentage points.

Table I.2.12 provides information on inequality between families of different composition. The tax system is able to lower the inequality between individuals with and without children by more than 23 percentage points, thus demonstrating an effective redistributive power. We can also observe figures on inequality between married couples with and without children: the tax system is able to reduce this income gap by 5.14 percentage points. On the whole, the Italian tax framework plays an effective equalising role in the single parent case and a less valuable one in the married couple case.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the system slightly benefits two-earner families, a tendency that seems to increase as the gross family income rises. The tax system benefits two-earner families at APW wage level 5.16 percentage points more than one-earner families in the same income position, while it provides a 7.68 percentage points more favourable treatment to two-earner families with a gross income of 167 per cent of APW than to one-earner households.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

15. Japan

The Japanese personal tax system is characterised by an individual tax unit, a tax schedule composed of four large income brackets and a composite collection of general and targeted reliefs. In 1999 a tax reform was implemented: as part of this tax restructuring, the highest marginal rate of personal income tax imposed by the central government was reduced from 50 per cent to 37 per cent, and the number of brackets from five to four. The income brackets are quite sizeable, with individuals earning the APW in the same bracket as those earning 167 per cent of the APW wage level: this element will probably affect the results of our analysis as we will not be able to properly contemplate the progressiveness of the tax system in relation to incomes in the top brackets. Table II.15, shows that the value of income subject to the maximum statutory rate corresponded to more than seven times the APW from 1996 to 1998, and to about four times the APW after the reform took place. The APW level continued to belong in the second bracket along the entire period 1996-2002: the figures in Table II.15 show that the tax schedule adjustment led to an increase of about four percentage points in the income tax rate for individuals at APW wage level. On the whole, empirical data suggest that the tax reform has mainly benefited taxpayers at the top of the income scale, reducing their tax burden, and worsened the situation of those earning a salary less than or equal to the APW wage level.

Apart from the 1999 tax schedule tax reform, there have been no other notable adjustments to the central income tax system or to tax reliefs for the different taxpayers. We should notice that, beginning in 1999, once the tax liability is calculated, a so-called "proportional tax reduction" based on a flat reduction rate and a maximum ceiling for higher incomes can apply.

Employees' social security contributions present a regressive schedule. They are composed of two large brackets: contribution rates and brackets were slightly modified during tax year 2000, leading to an increase in contributions of about 3 percentage points for all the family types considered. From 1996 to 1999, individuals earning 167 per cent of APW benefited from this regressive structure with a lower contribution rate, while after the adjustment these high-wage individuals moved to the first bracket, where they were subject to the same rate as the rest of the modelised family cases. Social security contributions are fully deductible from taxable income in the calculation of income tax.

State and local income taxes in Japan consist of a prefectural inhabitant's tax and a municipal inhabitant's tax which are collected together: the tax base is the individual taxable income computed for the previous year's central income tax, while the amounts of the basic and family status reliefs are slightly different from those correlated with central income tax. The prefectural tax presents a fixed amount; the municipal tax is based on a progressive system and can be lowered according to a "proportional tax reduction" system.

Basic reliefs. A basic allowance is available to all resident taxpayers; the amount is fixed and has remained unchanged throughout the whole period 1996-2002. The allowance is applied in the calculation of both central and local taxable income even though the amount is slightly different in the two cases.

A basic tax credit is also provided to taxpayers; it takes the form of a proportional tax reduction applied on income tax. The redistributive power of the two basic reliefs is minor,

and seems to have a reverse effect as the individual earning increases, as we can notice in Table I.2.10.

Reliefs for work-related expenses. During the last seven years a tax allowance has been available to all employees: it has a slightly progressive structure which remained unchanged throughout the whole period.

The equalising effects that appear in Table I.2.11 are controversial: in 2002 the work-related allowance increases the low-wage gap slightly by 1.0 percentage point and high-wage vertical inequality by 2.4 percentage points.

Family status reliefs. An allowance is given to taxpayers with a dependent spouse if the spouse's income is equal to zero, and another allowance is designed for taxpayers with dependent children; all these reliefs have a fixed value which has remained unchanged throughout the last seven years. The amount of child allowance increases when dependent children are between 16 and 23 years old; however, this aspect could not be taken into account in the model on account of the characteristics of the estimated family types.

In 2002, the equalising effect of the family status tax allowances operated for both the individual-case (reducing the unfairness by 3.6 percentage points) and married couples, lowering inequality between families with and without children by 1.9 percentage points.

A fixed cash transfer is provided for dependent children; the eligibility age was under three years old from 1996 to 2000 and under six years old thereafter. On account of this age condition, which is not covered in the *Taxing Wages* family types, the cash transfer could not be evaluated by our empirical tax model.

Table II.15. **Main characteristics of Japan's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	5	5	5	4	4	4	4
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.07	0.07	0.07	0.10	0.10	0.10	0.10
Effective tax rate for a single individual at APW wage level (tax wedge)	19.4%	20.7%	19.6%	24.0%	24.1%	24.2%	24.2%
Highest rate starts at (proportion of APW wage)	7.18	7.02	7.14	4.27	4.19	4.18	4.23
Highest statutory income tax rate	50%	50%	50%	37%	37%	37%	37%

Regarding vertical inequality (Table I.2.4), data suggest that the Japanese tax system is roughly powerless to reduce it. The tax structure looks almost proportional at the bottom and at the central points of the income scale, so the system is able to reduce the vertical low-wage income gap between individuals by only 1.09 percentage points and the high-wage income gap by 3.39 percentage points. The column on vertical equity for married couples shows that the tax system seems to play here an even more negligible redistributive role, reducing vertical income gap by only 0.98 percentage point.

Table I.2.12 provides information on inequality between families of different composition. The tax system is able to lessen this inequality for single workers by only 3.58 percentage points, demonstrating that family status reliefs play a minor redistributive role on account of their small value. Moving to figures on inequality between married couples with and without children, results confirm those for single taxpayers. The tax system is able to reduce this income gap by only 1.85 percentage points.

Finally, Table I.2.16 shows the behaviour of the Japanese tax system in relation to one-earner and two-earner families: the tax system seems to provide a more favourable treatment to one-earner families than to two-earner households at the bottom of the income scale (APW and 133% of APW wage levels), thanks to the allowance for dependent spouses and to the regressive structure of the work-related allowances.

However, moving to the top of the income scale, the tax system seems to provide a slightly more favourable treatment to two-earner families, producing a post-tax/benefit gap between one-earner and two-earner households of 0.62 percentage point. As the family income starts to rise, the weight of the allowance for dependent spouse loses its significance, while the work-related relief begins to play an effective role in encouraging both spouses to enter the job market.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

16. Korea

The Korean tax system is composed of a progressive tax schedule, with four quite sizeable income brackets; the APW wage level belonged in the second bracket (subject to a marginal tax rate of 20 per cent) during the whole period 1996-2002. The income brackets have remained unchanged throughout the period, while the tax rates fell slightly in 2002, benefiting in particular the top bracket (see Table II.16).

Employees' social security contribution rates rose progressively from 1996 to 1999, causing a corresponding increase in the tax burdens of worker taxpayers. These contributions present a proportional structure, so they cannot play any significant redistributive role; from 1996 to 2000, they were not deductible for taxable income calculation purposes, while in 2001 and 2002, employees could deduct their pension contributions (in 2001 the deductibility was limited to 50 per cent of pension contributions).

A local income tax is collected by the Korean local Government: the tax base is the income tax paid to the central government and the tax rate is flat. Local authorities can choose a rate between a lower limit of 3.75 per cent and an upper limit of 11.25 per cent. The *Taxing Wages* model fixed the rate at 10 per cent for its calculation purposes.

A set of reliefs contributes to slightly reduce the tax burden of individual workers earning the APW wage level. To assess the equalising power of these reliefs in 2002, we will proceed in the traditional way by comparing the effective tax rates available in the *Taxing Wages* model with the tax rates that would be obtained if the tax system did not provide these reliefs, and by measuring the capacity of these different reliefs to reduce inequality among taxpayers.

Basic reliefs. First of all, taxpayers can deduct a fixed allowance from their income. Second, a lump-sum relief is provided to taxpayers if their deductible expenses (insurance premiums, medical or educational expenses, charities, etc.) are less than a determined amount. Given that the *Taxing Wages* model does not take into account these expenses, taxpayer types fully benefit from this lump-sum allowance. The value of these two allowances has not changed during the last seven years, and their redistributive power can be considered of no great significance.

A basic tax credit is also provided to wage and salary earners: it has a progressive structure and a maximum ceiling; its amount has remained constant during the whole period 1996-2002. Together, the capacity of the two tax reliefs to reduce the income gap

between different taxpayers is controversial: although the low-wage gap increases slightly, a redistributive effect of 2.5 points can be observed regarding the high-wage gap.

Reliefs for work-related expenses. Worker taxpayers are entitled to an employment deduction; its amount is calculated through a progressive schedule. In 1996 the deduction scheme was composed of a minimum amount associated with low-wage earnings, and a flat rate for higher incomes. This schedule has been slightly modified over time, moving from one rate in 1996-1998 to four deduction rates in 2002. The employment deduction seems to reduce the effective tax rate of single individuals with the lowest estimated income (67 per cent of APW) by about 4.7 percentage points, that of individuals earning the APW by 7.9 percentage points, and the tax liability of single individuals with the highest estimated income (167 per cent of APW) by 6.8 percentage points. Once again, the equalising effects of this relief are ambiguous: while it appears to lessen the high-wage gap by 1.2 percentage points, an inverse and noteworthy result (+3.3 per cent) can be observed regarding low-wage inequality. This contradictory result could be linked to the fact that the relief is effectively allowed at the taxpayer's marginal tax rate, as it helps cut taxable income before taxes are calculated. As individuals earning 67 per cent of APW belong in the first bracket and are subject to a lower marginal tax rate, they benefit less from the allowance than individuals at APW wage level.

Family status reliefs. Taxpayers are entitled to a fixed allowance if their spouse's income is under a certain amount. The same amount of allowance is provided to taxpayers with dependent children aged 20 or under, or with other dependent family members (parents aged 60 or over, brother/sister aged over 60 or under 20). An additional allowance is available when dependent children are under 6 years old or if the dependent members are 65 or over. Some of these reliefs, that depend on the personal characteristics of the different family types, are estimated in the *Taxing Wages* model.

On the whole, the equalising role of the reliefs serves to reduce inequality by less than one percentage point for both the individual and married couple cases.

Finally, the Korean tax system is characterised by an extra allowance, with eligibility conditions that in part run counter to the traditional family status considerations: a relief is provided to single individuals without a spouse or any other dependants; its amount is equal to that provided for a dependent spouse or dependent children. Also, if a single income earner has only one dependant (a spouse or a child), he/she may deduct a supplemental relief from gross income. These two allowances offset the equalising role of the family status allowances. So, although a single parent can benefit from the children deduction, a single individual who lives alone can also obtain an allowance on the basis that he/she supports no dependants.

No cash transfers are designed for dependent children by the Korean Government.

If we focus on Table I.2.4, we observe that the Korean tax system is able to reduce the vertical low-wage income gap by 1.4 percentage points while the income gap reduction between the APW taxpayer and the taxpayer earning 167 per cent of APW wage level is 7.53 percentage points. Table I.2.4 also shows results for the tax system's vertical equity for married couples: the tax framework serves to decrease vertical discrimination between couples earning 133 per cent of APW wage level and those earning 167 per cent of APW by only 0.01 percentage point.

Table II.16. **Main characteristics of Korea's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	4	4	4	4	4	4	4
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	–	–	–	y	y
Deductions for SSC as a proportion of APW	–	–	–	–	–	0.02	0.02
Effective tax rate for a single individual at APW wage level (tax wedge)	6.3%	12.4%	14.7%	16.1%	16.5%	16.6%	16.0%
Highest rate starts at (proportion of APW wage)	5.76	5.52	5.76	4.52	4.16	3.92	3.69
Highest statutory income tax rate	40%	40%	40%	40%	40%	40%	36%

Table I.2.12 provides information on inequality between single individuals earning 67 per cent of APW with or without children: the tax system is almost powerless to reduce this inequality (–0.53 percentage point). We can also observe figures on inequality between married couples with and without children. The tax system once again appears ineffective as an equalising instrument.

Table I.2.16 shows the pre/post-tax differences in the level of income between one-earner and two-earner families: the tax framework provides the most favourable treatment to two-earner families with a gross income of 167 per cent of APW in respect of one-earner households in the same income situation (7.6 per cent). Results at APW wage level and at 133 per cent of APW wage level are respectively 1.36 and 4.66 percentage points in favour of two-earner families.

17. Luxembourg

The key features of Luxembourg's tax system are the large number of brackets (seventeen in 1996, sixteen in 2002), the notable progressivity of the tax schedule and the presence of a first bracket subject to a zero tax rate. Also, a deduction is provided for low-wage earners; its amount is differentiated according to the taxpayers' family status. All together, these elements make the overall income tax structure an effective redistributive source.

Another noteworthy characteristic of Luxembourg's tax framework is the great consideration given to families and to the taxpayers' personal situation. The central income tax system is based on the family tax unit,[9] the tax base deduction is differentiated according the taxpayer's family status, and a set of benefits (a tax credit plus a cash transfer) are provided to families with dependent children.

During the last seven years, a series of adjustments has been made to the tax schedule, with a progressive lowering of the statutory tax rates particularly for the top income brackets. In 1996, statutory rates ranged from 10 to 50 per cent, in 1998 all tax rates were reduced by 4 percentage points, in 2002 they were again lowered, to range from 8 to 38 per cent. These gradual reforms mainly benefited individuals at the extremes of the income scale, while the consequences for the APW individual have been not very substantial, as we can see in Table II.17.

In 1996, the income bracket subject to the zero-rate band represented about 23 per cent of the APW level, while in 2002 it moved up to 31 per cent; besides the zero-rate band we should notice that, from 1998, a deduction for low-wage earners contributes to cutting taxable income. This deduction is differentiated according to the marital status of taxpayers and contributes to giving families a more favourable treatment. Single

individuals who cannot benefit from the higher low-wage deduction can obtain a supplemental deduction if they are widow(er)s or have dependent children.

Once income tax is calculated, there is a standard 2.5 percentage points increase representing a contribution to the unemployment solidarity fund.

Social security contributions collected from employees present a proportional structure, with a rate of 12.5 per cent in 1996 progressively increased up to 14 per cent in 2000; in 1999, the so-called "Assurance-dependance" was introduced. On account of its proportional rate, contributions have no direct redistribution power even though they are fully deductible in the calculation of taxable income.

Basic reliefs. During the whole period 1996-2002, a general deduction and a so-called compensation allowance were provided to wage earners for all "special" expenses (the nature of these special expenses is not specified in the *Taxing Wages* country chapter). The allowances have a fixed amount and, on account of their small value, cannot play an effective redistributive role. On the other hand, the zero-rate band, which in 2002 represented about 30 per cent of the APW level, seems to take an effective part in the tax system's redistributive activity. The presence of these reliefs serves to lessen the low-wage income gap by 1.2 percentage points and the high-wage gap by 1.1 percentage point.

Reliefs for work-related expenses. During the last seven years, two lump-sum allowances have been available to all employees; these correspond to professional and travel expenses and their amount has remained unchanged during the whole period. In 2002, this relief played a minor role in reducing the tax rates of the taxpayers with different gross incomes evaluated in our analysis. Its effects on the vertical inequality are slightly unsatisfactory: in fact, almost no changes can be observed on low-wage and high-wage vertical inequality levels (see Table I.2.11).

Family status reliefs. During the whole period 1996-2002, an extra deduction has been given families where both spouses earn a salary; this takes the form of a fixed allowance. This relief is provided only to the principal earner and serves to compensate for the higher sacrifices and expenses faced by the couple when both spouses work outside. In fact, in choosing to give these cases more consideration than households with a dependent spouse, the Luxembourgian government demonstrates an interesting, even though quite unusual, approach compared with the rest of the OECD countries.

A child relief is also provided to taxpayers supporting one or more dependent children. This relief takes the form of a tax credit whose amount is fixed and depends on the number of dependants. However, if the tax credits results in a higher tax liability, it simply serves to offset the taxes due and the resulting extra value is wasted. In fact, given the gross income of the different estimated family types and the Luxembourgian tax structure, individuals at 67 per cent of APW and two-earner couples with children at 133 per cent of APW cannot fully benefit from this tax credit. The lump-sum value of the child tax credit has dropped slightly over time.

The redistributive power of the two reliefs does not appear very significant: family status reliefs only seem to reduce the income gap between married couples with and without children by 1.8 percentage points.

Table I.2.14 also provides figures on universal cash transfers: a benefit is provided to families with dependent children; its value is not means-tested but depends on the number and age of the children. The redistributive power of these cash transfers is intense, especially in favour of low-wage single parents, as the gap between single taxpayers with

the same level of gross income but with different personal characteristics is reduced by 25 percentage points, and the gap between couples with and without children by 13.4 percentage points.

Table II.17. **Main characteristics of Luxembourg's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	17	17	17	17	17	15	16
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as a proportion of APW	0.23	0.23	0.24	0.24	0.23	0.32	0.31
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.13	0.13	0.13	0.14	0.14	0.14	0.14
Effective tax rate for a single individual at APW wage level (tax wedge)	34.5%	35.2%	33.8%	34.6%	35.5%	33.9%	31.5%
Highest rate starts at (proportion of APW wage)	1.34	1.30	2.39	2.33	2.38	1.11	1.10
Highest statutory income tax rate	50%	50%	46%	46%	46%	42%	38%

If we focus in Table I.2.4 on vertical inequality between individual taxpayers, we note that the tax system serves to lower the vertical low-wage income gap by 5.96 percentage points and the high-wage income gap by 11.84 percentage points. Observing figures on vertical equity for married couples, we notice that the overall tax framework is able to lessen vertical inequality by 3.3 percentage points. We can argue that the vertical equalising strength of the income tax system is relatively noteworthy, especially in respect of the individuals-cases. It is partially correlated to the basic reliefs, as we can observe comparing these figures with those in Table I.2.10, but is primarily associated with the general tax structure, which itself appears highly progressive.

Table I.2.12 provides information on inequality between single individuals without children and single parents with two children earning the same gross income. The tax system is able to reduce this inequality by almost 29 percentage points. Table I.2.12 also shows figures on inequality between married couples with and without children: the tax framework seems to reduce this income gap by 15.68 percentage points. Compared with the other OECD countries, these results authenticate the deep redistributive power of the Luxembourg tax system.

Finally, Table I.2.16 shows the attitude of the Luxembourgian tax system towards families with different numbers of wage earners: the tax treatment is neutral with regard to the first two family types, but favours two-earner couples at 167 per cent of APW wage level. The tax system seems to give equal treatment to one-earner and two-earner families with earnings equal to APW and 133 per cent of APW wage level: these results could be associated with the family tax unit issue. As the household's income is the tax unit, the spouses' earnings are added together before reliefs are awarded and the tax liability calculated.

On the other hand, two-earner families at 167 per cent of APW benefit from the tax system by 2.77 percentage points more than one-earner families at the same earnings position. The results could be correlated with the presence of the extra tax relief for families where both spouses earn a salary, which assumes a relevant weight compared with the tax liability when family income exceeds a certain amount.

18. Mexico

The Mexican income tax system is based on a highly progressive schedule and on a set of general reliefs correlated to the occupational status of the taxpayers.

From 1996 to 1998, the tax schedule was composed of eight income brackets which increased progressively from the bottom to the top; in 1999, the number of brackets rose to ten, while in 2002, it dropped again. The income in the top bracket was equal, in 1996, to about 7 times the APW wage level; as part of the 1999 tax schedule reform, the value of the top bracket moved up to about 50 times the APW level in 1999, but shifted back to 11 times the average production worker level in 2002. The APW wage level remained stable in the fourth bracket (subject to the marginal rate of 25 per cent), even though the effective tax wedge seems to have dropped markedly since 1996: this reduction is partly correlated with the general decline in the social security contributions rate. A first distinct reduction was made in 1997, as part of the Social Security reforming law that fundamentally changed the financing of non-government employees' social security.[10] Subsequent adjustments were made on the contribution rates, with corresponding effects on the tax burden.

Social security contributions have a slightly progressive structure, as a supplemental rate is imposed on workers if their wage exceeds three times the minimal legal wage: thanks to this structure, they play a small redistributive role.

No State or local taxes are levied by local authorities. However, in 2002 a federal payroll tax of 3 per cent was introduced, which is applied to the wages paid. This is an optional tax as the employer can choose to pay and deduct it, obtaining the salary tax credit in full, or to not pay it, but then the employer will take credit only for the difference between the full salary tax credit and the corresponding payroll tax. The *Taxing Wages* model assumes that the full value of the tax is applied to the wages. The payroll tax has a proportional structure and no substantial redistributive power.

Basic reliefs. The basic reliefs comprise, over the whole period 1996-2002, a set of basic allowances and basic tax credits, which together serve to guarantee workers a more favourable tax treatment. First of all, two basic allowances (the holiday bonus and the end-of-year bonus) are provided to taxpayers: the minimum holiday bonus represents 25 per cent of six days of the worker's wage, with a maximum value equal to 15 days of the legal minimum wage. The end-of-year bonus is equal to 15 days of the worker's wage, with a maximum ceiling equivalent to 30 days of the legal minimum wage.

Tax credits provided to taxpayers have a complex progressive structure: the basic tax credits vary depending on the workers' income, and their amount has been adjusted over time in line with increases in income. Another fiscal tax credit is available to taxpayers: this depends on the employee's taxable income and on the percentage that average fringe benefits given by the employer to all workers represent of such income. The subsidy's absolute amount increases at a diminishing rate as income rises, and diminishes with the decrease in the share of fringe benefits.

Apart from their complex structure, it is important to focus on the strong redistributive role of the basic reliefs: together they seem to lower the low-wage gap by 4.5 percentage points and the high-wage inequality by 3.9 percentage points.

No reliefs or benefits are provided to individuals in relation to their marital status or to the presence of dependent children: this deficiency has some obviously unfavourable effects as regards the tax system's equitability, as we will observe in the subsequent tables.

On the other hand, Mexico has chosen to focus on other aspects of redistribution, given it is facing demographic issues and its general social and economic policies are trying to reduce the country's birth rate.

Table II.18. **Main characteristics of Mexico's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	8	8	8	10	10	10	8
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC and income taxes	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	25.4%	20.8%	21.9%	14.2%	15.4%	14.4%	16.1%
Highest rate starts at (proportion of APW wage)	6.97	7.20	6.87	50.53	47.87	46.56	11.18
Highest statutory income tax rate	35%	35%	35%	40%	40%	40%	35%

Table I.2.4 shows that the Mexican tax system plays an effective role in reducing the vertical income gap between taxpayers in a different pre-tax income condition: in fact it seems to reduce the low-wage gap existing between individuals at 67 per cent of APW and individuals earning the APW by 6.38 percentage points, and that between APW individuals and high-wage individuals (167 per cent of APW) by 7.8 percentage points. Moving to married couples, the tax system appears able to lower vertical inequality by 2.1 percentage points. These results are in part correlated with the basic tax reliefs analysed earlier, but they also depend on the general tax structure.

Table I.2.12 provides figures on the power of the tax system to reduce inequality between families of different composition: the Mexican government has not designed any relief correlated to the taxpayers' family status, which prevents the tax system from playing an effective equalising role.

Finally, Table I.2.4 shows the tax treatment of families in relation to the number of wage earners: on the whole, the figures suggest that the Mexican system reserves a more favourable tax treatment to households where both spouses supply work, and it strongly encourages the marginal spouse to enter the job market. Regarding families at APW wage level, the tax system provides a 10.55 percentage points more favourable treatment to two-earner households than to one-earner households. Nearly the same result can be found for families earning 167 per cent of APW wage level, while there is a moderately lower figure (9.02 percentage points) for households earning 133 per cent of APW wage level. As we have seen in the first part of the chapter, all the basic reliefs provided to workers are in some way correlated to the taxpayer's wages, thus promoting families where both spouses decide to supply work.

19. Netherlands

The Netherland's tax system has been considerably renovated in the last seven years: in 1996, the income tax schedule was composed of three brackets, with the first rate at 6.35 per cent, the second 50 per cent and the third 60 per cent. Adjustments in terms of the income tax structure include the split of the first bracket into two parts in 1999, the progressive increase of the brackets in line with inflation, and the lowering of tax rates in 2001. The highest tax rates dropped from 60 to 52 per cent and from 50 to 42 per cent, while the first two tax rates were slightly modified.

During the period 1996-2000, a set of allowances were provided to taxpayers, which took into account both the professional and personal conditions of the taxed individuals: in 2001 the basic and work-related allowances were transformed into tax credits and an extra tax credit for households with children was introduced.

A key feature of the Netherlands' tax system is the existence of a strong correlation between income tax and social security contributions, which makes the overall system somewhat complex, but at the same time contributes to enlarge tax progressivity and guarantee a more impartial redistribution of welfare among citizens.

Overall, the tax schedule is characterised by a strong progressive structure, with the highest tax rate well above that of the majority of OECD countries: from 1996 to 1998, the APW wage level belonged in the second bracket, subject to a marginal rate of 50 per cent, and then it shifted to the third income band. The effective tax wedge for an individual at APW wage level has effectively dropped over time, moving from 43.8 per cent in 1996 to 35.6 per cent in 2002. On the other hand, the income subject to the highest statutory rate ranged between 1.8 times the APW in 1998 and 1.54 times the APW in 2002, without any relevant alteration.

Spouses are taxed separately on their professional income.

Employees' social security contributions present a complex and progressive structure and play an active redistributive role: contribution rates have been adjusted slightly over time, affecting the tax wedge for workers. These social security contributions are deductible, with the exception of health insurance contributions. Employers' health insurance contributions are subject to income tax.

There are no local income taxes in the Netherlands' tax system.

The reliefs refer to year 2002, following the tax reform in 2001. All tax credits are applied to the combined amount of income tax levied and premiums paid for the social security scheme: the share of the credit attributed to tax is related to a ratio calculated as the fraction between the tax rate and the sum of the tax rate plus the social security contributions rate in the first bracket of the tax schedule. On account of this ratio, in 2002 only 9.1 per cent of tax credits are attributed to income tax, while the remaining 90.9 per cent are attributed to social security contributions.

Basic reliefs. As we have observed above, in 2001 the basic allowances was substituted by a basic tax credit of a fixed amount. Thanks to its fixed amount, the credit assumes a stronger relevance among low-wage taxpayers while it progressively loses significance as income starts to increase: it is able to reduce low-wage inequality by about 3.2 percentage points and the high-wage discrepancy by 3.1 percentage points.

Reliefs for work-related expenses. The work-related credit corresponds to a chosen percentage of wage earnings, with a maximum ceiling associated with a gross income exceeding a fixed threshold. Like the basic tax credit, these work-related reliefs play a certain redistributive role, contributing to reduce vertical low-wage income gap by 1.8 percentage points and the high-wage income gap by 1.7 percentage points (see Table I.2.11).

Family status reliefs. During the period 2001-2002, a set of deductions was designed for families with dependent children. All these reliefs take the form of tax credits and partially replaced the allowances available in 1996-2000. First, a set of means-tested child credits (a "child credit", an "additional child credit" and a "combination credit") are provided to taxpayers if the spouse's income is below the fixed threshold; second, a single parent credit

is available to single parent taxpayers; its amount is composed of a fixed part and a proportional one.

As we have seen previously, all taxpayers are entitled to a wastable basic tax credit. However, a benefit is provided to families, which allows the principal taxpayer and the spouse to share the general tax credit; it thus provides a more favourable tax treatment to couples than individuals. If spouses cannot fully exploit the basic tax credit and their partners have a surplus of tax and premiums payable over their own tax credit, the tax credit of the principal taxpayers is increased by (at most) the surplus of tax and premiums payable by their fiscal partner. As a consequence, the tax credit of the first-mentioned taxpayers will exceed their tax and premiums payable, resulting in a pay-out of the residual tax credit to the taxpayers by the tax authority.

The equalising effect of the family status reliefs seems to reduce the single parents' income gap by 15.7 percentage points and the gap between married couples with and without children by 1.3 percentage points. On the whole, the Netherlands' government shows great consideration to the personal conditions of different taxpayers, in particular to single parents and low-wage families with dependent children.

Table I.2.14 provides figures on universal cash transfers: a tax free benefit is available to families with children; its amount depends on the number and age of dependants. Cash transfers reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 8.8 percentage points, and the gap between couples with and without children by 5.4 percentage points.

Table II.19. **Main characteristics of the Netherlands' tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	4	4	4	4
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.06	0.06	0.04	0.03	0.04	0.03	0.03
Effective tax rate for a single individual at APW wage level (tax wedge)	43.8%	43.6%	43.5%	44.3%	45.1%	42.3%	35.6%
Highest rate starts at (proportion of APW wage)	1.64	1.55	1.80	1.78	1.73	1.57	1.54
Highest statutory income tax rate	60%	60%	60%	60%	60%	52%	52%

Table I.2.4 shows that the Netherlands' tax system is able to reduce the vertical low-wage income gap by 8.62 percentage points and the vertical high-wage income gap by about 2.5 percentage points. Table I.2.4 also provides figures on vertical equity for married couples: the income tax system is able to reduce vertical inequality by 3.33 percentage points.

Table I.2.12 shows the effect of the tax system on inequality between single individuals with and without children: we see that the tax system is able to reduce this by 25.78 percentage points, indicating a strong redistributive role. Moving to married couples with and without children, the pre-tax income gap, is narrowed by 6.79 percentage points. The tax framework seems to play a more effective redistributive role in the single parent case than in the married couple one, thanks to the single-parent tax credits.

Finally, Table I.2.16 shows the differences in the tax treatment of families in relation to the number of wage earners: two-earner families at APW wage and 167% of APW benefit

more than one-earner couples in the same income position (respectively 6.58 per cent and 1.98 per cent). On the other hand, the system slightly favours one-earner families at 133 per cent of APW: in effect, it guarantees them a net income that is 0.09 percentage point higher than that of two-earner couples in the same wage position. The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

20. New Zealand

The New Zealand tax system is characterised by a fairly smooth tax schedule, which has been subject to a series of slight adjustments over time. Figures in Table II.20 clearly confirm this flat tendency. There were three brackets in 1996; the number was consequently modified in 1997-2000, and has remained unchanged during the last three years. The tax rates have increased slightly, with the maximum statutory rate moving from 33 per cent in 1996-1999 to 39 per cent thereafter. These progressive adjustments have affected the tax wedge of individuals at APW wage level only marginally: the effective average tax rate for the benchmark individuals dropped from 22.3 per cent in 1996 to 21.6 per cent in 1997 and 20 per cent in 1998, remaining almost unchanged thereafter.

Income subject to the maximum statutory rate rather exceeds the APW level, apart from in 1997 when the APW wage level was already subject to the maximum rate of 33 per cent.

New Zealand has neither State and local income taxes nor compulsory social security contributions. On the whole the tax system presents a straightforward structure, and its redistributive power depends mainly on the general and targeted reliefs provided to taxpayers.

Basic reliefs. Two main general reliefs are provided to taxpayers: a so-called "low income rebate" applies to individuals whose income is under a fixed eligibility ceiling. It has a proportional structure for low incomes, and is phased out for earnings exceeding a fixed intermediate threshold. In 2002, the maximum ceiling was about 96 per cent of the APW level and the intermediate threshold corresponded to 24 per cent of APW, so individuals earning the APW could not benefit from this relief, while individuals earning 67 per cent of APW could do so only partially.

Another relief called "*Transitional tax allowance*" is available to persons with low incomes: like the "low income rebate", this allowance has a proportional structure for incomes below a fixed threshold, while it is phased out for earnings between this threshold and the eligibility limit. In 2002, the eligibility threshold corresponded to about 25 per cent of APW: none of the estimated individuals could benefit from this second relief as their incomes never satisfy the eligibility condition.

Family status reliefs. No tax allowances or standard tax reliefs are designed for taxpayers supporting dependent children or a dependent spouse. A set of cash transfers are provided to families. First of all, a scheme called "Family tax credit" ensures a guaranteed minimum family net income for all full-time earners with dependent children. The "Parent Tax Credit" provides a cash transfer per week for the first eight weeks of a child's life. The "Family Support Tax Credit" is available for each dependant and its amount depends on the age of the children, while the "Child Tax Credit" is an additional transfer per dependant, available to families not receiving any of the main social welfare benefits. The total of these three credits is abated against the combined income of the parents.

All together, these cash transfers exhibit a noteworthy equalising power at the bottom of the income scale, reducing inequality among individuals by about 18 percentage points; they are powerless in reducing inequality between families with or without children at 133 per cent of APW. This result is easily explained: on account of the eligibility threshold, the transfers have a strong impact for taxpayers earning a low income, while they progressively lose importance as incomes start to increase.

Table II.20. **Main characteristics of New Zealand's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	2	3	2	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	22.3%	21.6%	20.0%	19.4%	19.5%	19.5%	20.0%
Highest rate starts at (proportion of APW wage)	1.02	0.99	1.07	1.07	1.63	1.58	1.52
Highest statutory income tax rate	33%	33%	33%	33%	39%	39%	39%

Table I.2.4 concentrates on vertical inequality: regarding the two individual-cases, New Zealand's tax system is able to reduce low-wage inequality by only 1.54 percentage points and high-wage inequality by 7.04 percentage points. The redistributive power increases in the middle of the income scale and depends mainly on the tax structure, given the minor redistributive power of the basic reliefs.

With regard to the last column of Table I.2.4, the tax system reduces married-couple inequality by only 0.42 percentage point.

First of all, we shall focus on inequality between families of different composition (Table I.2.12). Regarding the pre-tax and post-tax income gaps between two single individuals with the same gross earning but with different personal characteristics, New Zealand's tax framework seems to reduce inequality between an individual with children and an individual with the same gross income but without children by 18.19 percentage points. In contrast, the tax system plays no equalising role for married couples.

Table I.2.16 provides some information on the different tax treatment of one-earner and two-earner families: the tax system tends to favour two-earner families; this tendency emerges more at the top of the income scale than at the bottom. It seems to provide two-earner families at the APW wage level a 2.44 percentage points more favourable treatment than one-earner families, while it contributes to favouring two-earner families at 167 per cent of APW eight percentage points more than one-earner families in the same income situation. The spouse considered as the marginal worker, earning a low gross income in all three estimated cases, can benefit from the basic reliefs described above, which helps explain these figures. Thanks to low-wage reliefs, New Zealand's tax system acts to encourage both spouses to work.

Finally, no *re-ranking* phenomena can be observed in our empirical analysis, suggesting that the tax framework is able to preserve the pre-tax income rank among families.

21. Norway

The Norwegian tax system is based on two different classes: single taxpayers without dependants are taxed individually (class 1), while families and single parents can choose a

joint taxation system (class 2) which is more favourable if the marginal spouse has little or no individual income. Children under 17 years old are generally taxed together with their parents, but they may be taxed individually. Differences between class 1 and class 2 concern the income bracket structure in the central tax system, the amount of allowances and the calculation of local taxes.

With this double taxation, the Norwegian government shows families special treatment, in particular where there is only one earner, and also single parents with dependent children.

The central income tax is arranged in two parts: over the whole period, all individuals were subject to a flat rate tax (13.5 per cent in 2002) regardless of their income. The second part of the central income tax, called surtax, was composed from 1996 to 1998 of two brackets with a smooth rate structure (9.5 and 13.5 per cent) plus an initial bracket subject to zero tax rate; in 1999, there was only one bracket with a statutory rate of 13.5 per cent, while in 2000, there were again two income bands, the higher rate rising from 13.5 to 19.5 per cent.

There are no allowances for taxpayers under central government income tax, and the tax base is personal income.[11] Local income tax plays a significant role in the overall Norwegian tax framework: the local government tax base is ordinary income, and the tax rate is flat (equal to 14.3 per cent in 2002).[12] With their smooth structures, the central and local tax schemes appear slightly progressive and seem to have approximately attained a redistributive purpose. Central and local tax rates have been modified slightly over time, but no main effects can be observed on the average tax rates of our different family types.

Some noteworthy reforms to the tax system have been carried out over the last seven years: first of all, from 1998, the so-called parental allowance provided to taxpayers with dependent children is only granted for documented expenses. On account of this adjustment, the *Taxing Wages* framework can no longer evaluate the amount and redistributive role of this allowance. From 1996 to 2000, a lump-sum child tax credit was provided to all taxpayers; its amount differed according to the number of dependent children. In 2001, the tax credit for children was abolished and the child support cash transfer became the only relief.

Employees' contributions to the national Insurance scheme have had a proportional and invariant tax rate of 7.8 per cent throughout the whole period; on account of their flat rate and non-deductibility in the taxable income calculation, social security contributions are unable to have any redistributive function.

Table II.21 shows that the tax wedge for individuals at APW wage level remained roughly stable over this period: it decreased slightly in 2001 but no important adjustments can be observed. From 1996 to 1999, income subject to the highest statutory rate was almost equal to the APW wage level, while it increased to about 2.8 times the APW in 2000 following the tax schedule reform.

Basic reliefs. Throughout the whole period 1996-2002, the Norwegian tax system has provided a basic allowance and a basic relief to all individuals. The basic allowance is a fixed amount, differentiated for class 1 and class 2 taxpayers; this amount has increased progressively over time. The basic relief corresponds to a certain percentage (23 per cent in 2002) of personal income, with a minimum and maximum ceiling. Table I.2.10 provides figures on the redistributive power of these personal reliefs in 2002. Focusing on the results

of the tax system's equalising power, we observe decreases in the low-wage income gap of 4.6 percentage points and the high-wage gap of 3.4 percentage points.

Family status reliefs. From 2001, no reliefs are explicitly designed for taxpayers with a dependent spouse or dependent children. Regarding universal cash transfers, the Norwegian government has offered a child support benefit during the last seven years. This is provided for each child and its value does not depend on the parents' income. From 1996 to 2000, the amount of these cash transfers depended on the number of children; it afterwards took a lump-sum value. Single parents receive transfers to the value of one more child than the actual number. For children aged one and two, there is an additional child support. Families living in the northernmost part of Norway receive an extra child transfer.

All these transfers have a significant capacity to lessen inequality between families of different composition; they reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 20 percentage points, and the gap between couples with and without children by 7.6 percentage points.

Table II.21. **Main characteristics of Norway's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	2	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	37.6%	37.4%	37.5%	37.3%	37.2%	36.9%	36.9%
Highest rate starts at (proportion of APW wage)	1.08	1.10	1.08	1.01	2.82	2.85	2.84
Highest statutory income tax rate	27.4%	27.4%	27.4%	27.2%	33.2%	33.2%	33.2%

Regarding vertical inequality (Table I.2.4), Norway's tax system is able to reduce the vertical low-wage income gap between individuals by 4.63 percentage points and the high-wage income gap by 10.47 percentage points. Consequently, the tax structure seems to be more progressive at the central points of the income scale than at the bottom. Regarding married couples, the vertical income gap seems to have been reduced by 3.14 percentage points.

Table I.2.12 provides information on inequality between different families. The tax system is able to lessen this inequality for single workers by 25.34 percentage points: this result is mainly correlated with child transfers, but is also linked with the double taxation system. Single parents are subject to the class 2 tax system, which shows a more favourable fiscal treatment thanks to higher allowances and the income bracket's structure. Table I.2.12 also exhibits figures on inequality between married couples with and without children: the tax system is able to reduce this income gap by 7.62 percentage points. This result is entirely related to child cash transfers: unlike the case of individuals, both couples with children and those without dependants can benefit from the class 2 tax system and are subject to the same tax schedule.

Finally, Table I.2.16 shows the behaviour of the Norwegian tax system towards one-earner and two-earner families: the tax structure tends to discriminate in favour of dual-earner families and this tendency seems more pronounced as the gross family income increases. The tax system benefits two-earner families at APW wage level 3.65 percentage points more than APW one-earner families, and two-earner families earning 133 per cent

of APW 5.04 percentage points more than one-earner families in the same revenue condition. It provides the most favourable treatment to two-earner families with a gross income of 167 per cent of APW, producing a post-tax/benefit gap between one-earner and two-earner households of almost nine percentage points.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

22. Poland

The Polish tax system is characterised by a combination of a slightly progressive tax schedule and a set of general and selected reliefs which together contribute to achieve better redistribution of welfare among citizens. Individuals are taxed on their own income but married couples can opt to be taxed on their joint income.[13]

During the whole period 1996-2002, the income tax scheme was composed of three income brackets. Tax rates were progressively revised from 1996 to 1998, following a declining tendency; the lowest rates dropped slightly, while the highest statutory rate moved from 45 per cent in 1996 to 40 per cent from 1998 onwards. In contrast, income brackets have gradually adjusted in line with inflation.

Other major improvements have taken place during the last seven years: in 1999, social insurance and health care programmes were reformed. Social insurance premiums were split into employer and employee contributions, and employers were obliged to raise employees' salaries by the amount of the employees' contributions. In 1999, as part of the health insurance reform, a new mandatory health insurance premium was introduced; the premium paid is deducted from tax.

All these corrections partially affected the effective average tax rates of our benchmark taxpayer: the tax wedge for individuals at APW wage level moved from 44.7 per cent in 1996 to 42.7 per cent in 2001-2002. On the other hand, income in the top brackets moved marginally, ranging from 3.0-3.4 times the APW in 1996-1998 to 2.9-3.0 times the APW thereafter.

As we have seen, employees' social security contributions were only introduced in the Polish tax system during 1999; they have a flat rate tax of 18.71 per cent and are fully deductible for the calculation of taxable income. Also, a health insurance contribution is paid by employees at a rate of 7.75 per cent; this can be deducted from tax liability as a wastable tax credit. In spite of their proportional structure, social security contributions can play an effective redistributive role thanks to their deductibility.

Basic reliefs. A non-refundable tax credit is available to all taxpayers throughout the period 1996-2002. This is a lump-sum tax credit; its amount has been progressively increased over time and corresponds to about two per cent of the APW level. As we can observe in Table I.2.10, thanks to the basic tax credit, the low-wage income gap exhibits a 1.3 percentage points reduction, and high-wage inequality shows a decline of one percentage point.

Reliefs for work-related expenses. Standard deductions for work-related expenses depend on the number of workplaces and on whether the workplace is the same as the dwelling place. These deductions, of a fixed amount, take the form of tax allowances. Because of their small value compared with the APW level, they show a minor matching role: they are able to lower the low-wage gap by 0.7 percentage point and high-wage inequality by only 0.6 per cent points (see Table I.2.11).

Family status reliefs. No reliefs are specifically addressed to taxpayers correlated to their family status. On the other hand, a non-taxable family benefit is provided to taxpayers with dependent children when the annual household income, divided by the number of family members, does not exceed a fixed eligibility threshold. The amount of this means-tested cash transfer is fixed and equal for each dependent child; its redistributive function operates only for low-wage family types, while families earning 104 per cent of APW or more cannot benefit from the transfers as their income exceeds the threshold. Given that families earning 133 per cent of APW do not receive family benefit, we cannot appreciate its equalising role among large family types. On the other hand, the redistributive power among individuals contributes to reduce unfairness by 7.7 percentage points.

Table II.22. **Main characteristics of Poland's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	3	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	–	y	y	y	y
Deductions for SSC as a proportion of APW	–	–	–	0.19	0.19	0.19	0.19
Credits for health insurance contributions	–	–	–	y	y	y	y
Effective tax rate for a single individual at APW wage level (tax wedge)	44.7%	43.9%	43.2%	43.0%	43.0%	42.7%	42.7%
Highest rate starts at (proportion of APW wage)	3.07	3.22	3.37	2.91	2.90	3.07	2.92
Highest statutory income tax rate	45%	44%	40%	40%	40%	40%	40%

Table I.2.4 shows that the Polish tax system plays an operative but not extraordinary role in reducing the vertical income gap between taxpayers in different pre-tax income conditions: there seems to be a 2.08 percentage points reduction in the low-wage gap existing between individuals at 67 per cent of APW and individuals earning the APW, and a 1.66 percentage points reduction between APW individuals and high-wage individuals (167 per cent of APW). Moving to married couples, the tax system appears able to lower vertical inequality by 1.28 percentage points. These results are entirely correlated to the basic tax credit and work-related expenses reliefs analysed earlier.

Table I.2.12 provides figures on the capacity of the tax system to reduce inequality between different family types. The tax system is able to reduce inequality between individuals with different characteristics by more than seven percentage points. Comparing this result with that of Table I.2.15, we can argue that the equalising power of the Polish tax system depends significantly on the means-tested family benefit. In Table I.2.12 we can also observe figures on inequality between married couples with and without children: the tax system appears unable to reduce this income gap.

Finally, Table I.2.16 shows the tax treatment of families in relation to the number of wage earners: figures suggest that the system reserves a slightly more favourable tax treatment for households where both spouses supply work, thus encouraging the marginal spouse to enter the job market. Regarding families at APW wage level, the tax system provides a 1.46 percentage points more favourable treatment to two-earner households than to one-earner households. Noticeably lower results can be found for families earning 167 per cent of the APW wage level (0.9 percentage point) and households earning 133 per cent (1.12 percentage points).

No *re-ranking* phenomena can be observed when comparing the different family types evaluated.

23. Portugal

An explicit aim of the Portuguese tax/benefit system is to support the taxpayers' family situation: for this reason, a system of joint taxation of family income has been instituted by the Portuguese government, using the income-splitting method to determine taxable income, while a set of targeted reliefs are provided to taxpayers according to their family status. Thanks to these tax instruments, the overall tax framework helps guarantee families a more favourable fiscal treatment and operate an effective redistribution of welfare among citizens.

In contrast to the general OECD trend, the Portuguese income tax schedule has experienced a progressive increase in the number of income brackets over the last seven tax years; in 1996, the tax scheme was composed of four brackets, ranging from 15 to 40 per cent. During 1999 the first bracket was split into two parts, subject to rates of 14 and 15 per cent, while in 2001 the top bracket was divided into two income bands and the four lowest tax rates were reduced slightly. These adjustments have mainly benefited taxpayers at the extremes of the income scale, and they contribute to effectively lessen the tax rate of individuals earning the APW wage (see Table II.23).[14] The effective tax rate of our benchmark taxpayer dropped from 33.8 per cent in 1996 to 32.5 per cent in 2001-2002.

Income subject to the top rate of 40 per cent corresponded to about 4 times the APW wage level from 1996 to 2000, while it moved up to 6.2 times the APW wage level in 2001 after the top income bracket split.

During the overall period 1996-2002, employees' social security contributions presented a flat rate of 11 per cent of gross pay, with no ceiling: these contributions could be deducted from gross taxable income in place of standard deductions when they exceeded the standard deduction amount. Standard deductions are equal to total gross income up to 72 per cent of 12 times the highest minimum monthly wage. In our eight family cases, standard deductions always figure higher than contributions, so social security contribution deductibility is not effective: the deductibility starts to become effective for individuals or families at a high point of the income scale.

No state or local taxes are levied by the local Portuguese governments. However, in the autonomous regions of the Azores and Madeira, the tax schedule is slightly different from the central tax schedule: in particular, the Azores tax rates are reduced by 20 percentage points for all resident individuals, while in Madeira, tax rates range from 10 to 39 per cent.

Basic reliefs. As we have indicated in the first paragraph, there exists a standard deduction available to all wage earners, calculated as the maximum between the gross earnings up to 72 per cent of the minimum annual wage and the value of the social security contributions paid by the wage earner.

Second, a basic tax credit is provided to all taxpayers; its amount is differentiated according to the taxpayer's married status. This tax credit has a particular structure and it could be considered both as a general tax deduction available to all wage earners, and as a family status relief, which treats larger households differently from sole taxpayers. To take all these aspects into account, we have analysed this tax credit both as a basic relief, evaluating what would happen to the individuals' tax rate if this credit were totally eliminated, and as a family status relief, estimating what would change if an identical amount were offered to all taxpayers regardless of their marital status.

The two general reliefs contribute to reduce the vertical low-wage income gap by 1.7 percentage points and high-wage inequality by 3.8 percentage points.

Family status reliefs. First, the amount of the basic tax credit is differentiated according to taxpayers' marital status. Unlike what we could expect, the amount for each married taxpayer is lower than for a single individual; the ultimate effect is a more favourable fiscal treatment for singles than for married couples. Second, during the whole period 1996-1997, a lump-sum child tax credit was provided for each dependent child; its amount has increased progressively. From 2001, a single parent tax credit is also available for sole taxpayers with dependent children; its amount is fixed and eligibility does not depend on the taxpayer's gross income. All together, these tax credits have an effective though not substantial redistributive function: thanks to the family status reliefs, the income gap between individuals with and without children is reduced by 1.8 percentage points and inequality between couples with and without children declines by 2.7 percentage points.

These results partially contradict the tax credit structure; in fact, single parents should receive the highest deduction, since they obtain a higher basic tax credit and an additional single parent tax credit, while married couples should show a lower figure. A possible explanation for this incoherence could be correlated to the family tax unit issue: even though married couples receive slightly lower family status reliefs, the influence of the latter broadens as these reliefs combine with the joint taxation system and the splitting method, for which single parents are not qualified.

Table I.2.15 provides figures on the effect of non-taxable cash transfers available to taxpayers with dependent children; the amount of this benefit depends on the parents' income, age and number of children. There is also a special family allowance scheme for disabled children. These two benefits reduce the income gap between individuals by 11.4 percentage points and inequality between couples with and without children by 4.7 percentage points.

Table II.23. **Main characteristics of Portugal's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	4	4	4	5	5	6	6
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Effective tax rate for a single individual at APW wage level (tax wedge)	33.8%	33.9%	33.8%	33.4%	33.5%	32.5%	32.5%
Highest rate starts at (proportion of APW wage)	4.62	4.47	4.47	4.39	4.30	6.25	6.16
Highest statutory income tax rate	40%	40%	40%	40%	40%	40%	40%

Table I.2.4 shows vertical inequality between individuals: the Portuguese tax system is able to reduce the vertical low-wage income gap by 4.18 percentage points and the high-wage income gap by more than 8 percentage points. Comparing these figures, we observe that the effectiveness of the tax structure in lowering vertical unfairness rises when a taxpayer's income increases. Table I.2.4 also provides figures on the tax system's vertical equity for married couples: the pre-tax/benefit income gap is 20 per cent, and the redistributive power of the income tax system is able to reduce vertical inequality by 3.31 percentage points.

Table I.2.12 provides figures on inequality between single individuals with and without children: the tax system is able to reduce this by more than 13 percentage points. Moving to married couples with and without children, the tax system is able to reduce this inequality by 7.48 percentage points. Comparing these general results with those correlated with the separate effects of the family status tax reliefs and cash transfers, we can see that the Portuguese tax system's equalising power is strongly correlated with the different reliefs and benefits available to taxpayers. As we have observed earlier, the effects of the family status reliefs should be interpreted taking the issue of the family tax unit into consideration: the reliefs and transfers combine with the splitting method, contributing to a more favourable fiscal treatment for large families.

Finally, Table I.2.16 shows the differences in the tax treatment of families with one and two wage-earners: the tax system tends to treat low-wage families uniformly (it creates a post tax/benefit income gap of only 0.28 percentage point in favour of two-earner households), while it discriminates in favour of dual-earner couples at 133 per cent and at 167 per cent of APW by creating a post tax/benefit income gap of about 3 percentage points. The figures concerning low-wage families are partially correlated to the choice of family tax unit: joint taxation treats one-earner and two-earner families equally as the family income is totalled and divided equally before taxes are calculated, irrespective of the number of earners and the proportion of the spouse's income. On the other hand, we should take into account that there exists a substantial deduction for wage-earners, which guarantees two-earner households higher reliefs and whose relevance increases as gross earnings rise.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

24. Slovak Republic

The Slovak Republic was included in the OECD *Taxing Wages* report during tax year 2000: consequently data and figures in Table II.24 only refer to the period 2000-2002.

The tax framework is characterised by a strongly progressive tax schedule, comprising seven income brackets in 2000-2001 and five in 2002. A set of targeted allowances and benefits are associated with taxpayers' professional and family status.

During the last three years, one main reform was implemented by the Slovakian fiscal authorities on the income tax structure, reducing the number of brackets from seven to five, the lowest statutory rate from 12 to 10 per cent and the maximum statutory rate from 42 to 38 per cent; some adjustments have been also made on the amounts of certain targeted reliefs and on the eligibility thresholds for some benefits.

Throughout the whole period, the APW level belonged in the second bracket, subject to a marginal rate of 20 per cent; the highest statutory rate was correlated to an income level corresponding to about 7-8 times the APW wage level in 2000-2001, while the top bracket was reduced to 3.67 times the APW following the tax schedule reform.

Social security contributions imposed on employees show a proportional structure, with a flat rate of 12.8 per cent: they are fully deductible in the calculation of taxable income, thus playing a minor redistributive role. No State or local taxes are levied by the Slovakian local authorities; a fixed amount, however, is transferred each year into the municipalities's budgets out of the total revenue from income tax.

Basic reliefs. During the whole period 2000-2002 a basic relief has been available to all individuals; its amount is reduced if the taxpayer derives a partial or full disability pension, or other income on the grounds of disability. Unfortunately the *Taxing Wages* model cannot take into account the case of disability, or thus consider the maximum lump-sum amount of the allowance. Focusing on the results of the tax system's equalising power (Table I.2.10), we observe a one per cent decrease in the low-wage income gap, while the high-wage gap seems to have been reduced by 0.9 percentage point. These poor results are not easily explained: they could be associated with the combination of the allowance on taxable income and the structure of the income brackets. When low-wage individuals no longer receive the basic relief, they move from one income bracket to the next, thereby incurring a higher statutory rate; the effect of the allowance on APW individuals is less significant.

Family status reliefs. A lump-sum allowance is available to taxpayers when their spouse's earnings are less than a fixed threshold. The eligibility threshold corresponds to the amount of the basic allowance. Also, a relief is provided for dependent children, when the children are under 18 years old, or when they are under 26 years old in full-time education or physically/mentally disabled; this allowance is given irrespective of the child's own income. The amount of the child relief increased slightly in 2002.

The redistributive power of all these reliefs in 2002 was noteworthy rather than substantial. As we could expect, married couples receive both the spouse and children reliefs, while single parents cannot benefit from the first allowance. The equalising effect of the family status tax reliefs operates progressively in both cases, as unfairness between individuals with and without children can be reduced by 3.4 percentage points and that between larger families with and without children by 1.9 percentage points.

Regarding universal cash transfers, a non-taxable family benefit is paid by the central government for each dependent child; the amount is based on the level of the family income and is subject to this income not exceeding two times the relevant minimum living standard (MLS). The amount of this means-tested benefit depends on the age of the children. An additional allowance, whose amount depends on the income of family, is paid by the local government to low-income families. Finally, there exists a transfer related to status: a family is entitled to a social allowance if the net monthly income of the members of the family does not exceed a fixed eligibility threshold. The last two transfers (the local and social benefits) are not considered in the *Taxing Wages* calculations.

Cash transfers play a key role in redistributing welfare and in reducing inequality. As we can see in Table I.2.15, they reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 21.9 percentage points, and the gap between couples with and without children by 11.9 percentage points.

Table II.24. **Main characteristics of the Slovak Republic's tax system, 2000-2002**

	2000	2001	2002
Number of brackets	7	7	5
Zero-rate band	–	–	–
Deductions for SSC	y	y	y
Deductions for SSC as a proportion of APW	0.13	0.13	0.13
Effective tax rate for a single individual at APW wage level (tax wedge)	41.9%	42.1%	41.4%
Highest rate starts at (proportion of APW wage)	8.22	7.60	3.67
Highest statutory income tax rate	42%	42%	38%

Regarding Table I.2.4 and vertical inequality between different individuals, the tax system is able to reduce the vertical low-wage income gap by 1.65 percentage points and vertical high-wage inequality by 5.03 percentage points. The difference between the results could demonstrate that the redistributive power of income taxes is stronger for taxpayers in the middle of the income scale than for those at the bottom. Comparing these figures on general tax equity with those associated with basic reliefs in Table I.2.10, we observe that the overall tax system's equalising function is only in part correlated with the basic allowances. The rest of the equalising function could be connected directly with the rate and bracket structure. Table I.2.4 also provides figures on vertical equity for married couples: the tax framework serves to decrease vertical discrimination between couples earning 133 per cent of APW wage level and those earning 167 per cent of APW by 6.33 percentage points.

Table I.2.12 provides information on inequality between single taxpayers without children and single parents with two children with the same gross income. The tax system is able to reduce this inequality by more than 26 percentage points. This strong equalising effect is associated with both the family means reliefs and the cash transfers provided to single parents. Table I.2.12 also exhibits figures on inequality between married couples: the tax system appears to be able to reduce this income gap by 14.05 percentage points. Once again, the figures suggest that the equalising power of Slovakian tax system is strongly correlated with the reliefs and cash transfers provided to families with children.

Table I.2.16 shows the pre/post-tax income differential between one-earner and two-earner families: in all three examples the tax framework provides a more favourable treatment to two-earner families. The figure for families at 167 per cent of APW wage level shows that the Slovakian tax structure guarantees two-earner households a 2.57 percentage points more favourable treatment than one-earner families. Results for families at 133 per cent of APW wage level and for families at APW wage level are slightly lower, around 1.6-1.9 percentage points. When the marginal spouse has no income or receives an income lower than the basic allowance, the principal taxpayer obtains the spouse allowance. On the other hand, when both spouses work, they can both receive the basic allowance and deduct social security contributions from taxable income. The combination of these fiscal measures contributes to encouraging both spouses to join in the job market.

No *re-ranking* phenomena take can be observed in our empirical calculations.

25. Spain

The Spanish tax system comprises three different tax frameworks (individual, head of household and joint taxation). It is strongly oriented towards families: married couples can opt to be taxed jointly if this guarantees a lower tax burden, and single parents with children can be treated as heads of household, thus obtaining more favourable fiscal treatment. From 1996 to 1998, different income brackets and dissimilar tax rate structures applied to individuals and to larger families. During the whole period 1996-2002, the amount of basic relief was differentiated according to the taxpayer's family status, and the calculation of targeted reliefs (work-related and child) differed within the three different tax frameworks.

This tax structure appears somewhat complex, and some difficulties could arise in interpreting the results. With this composite tax framework, the Spanish government gives special consideration to taxpayers' personal status.

During the last seven years a series of reforms and adjustments has been implemented in the income tax system. A main tax reform was carried out in 1999: the tax schedule was unified for individuals and married couples, and the number of brackets dropped from eight to six. The zero-rate band was eliminated and the highest statutory rate reduced from 47.6 to 39.6 per cent, contributing to flattening the general tax schedule. Finally, basic and child tax credits were replaced by corresponding allowances on taxable income.

Other noteworthy adjustments can be noticed from Table II.25: before the 1999 reform, the number of income brackets had already been reduced from 17 in 1996 to 8 in 1998, and the highest statutory rate of central income tax had been significantly lowered.

The reduction of the central income tax rates in 1997 was associated with the introduction of a local income tax; in 1997, a regional tax was incorporated into the Spanish framework. In this new system, income tax is split into two parts: a central tax (85 per cent of the total tax revenue) and a regional tax. Each region can modify income brackets and tax credits in the local tax schedule, even though the *Taxing Wages* model has a single, fixed tax scheme for tax liability calculation.

Regional tax rates ranged from 3 per cent to 8.4 per cent in 1997, with ten income brackets plus an initial bracket subject to a zero tax rate. Comparing the tax system in 1996 and that in 1997 following the regional tax reform, we notice that when adding the regional and central maximum statutory rates, we obtain a rate of 56 per cent, identical to that in 1996; this result is valid for most of the other rates. This helps us to understand why no significant changes have occurred in the tax wedges of different family types despite the reforms in 1997.

Following the main 1999 reform, the number of brackets in the regional income tax was reduced and tax rates adjusted in line with modifications in the central income schedule; today the schedule is composed of six brackets, with rates ranging from 3 per cent to 8.4 per cent.

The tax wedge for sole individuals earning the APW wage level fell slightly in 1999 thanks to the main reform, and gradually increased thereafter; there appear now to be no substantial adjustments. Income subject to the maximum statutory rate ranged between 4.7 times the APW in 1996 and 4.16 times the APW in 2002.

Social security contributions on employees are composed of an unemployment payment, a pension scheme and a professional training charge. They are assessed on the basis of a flat rate of 6.4 per cent on employees' gross earnings. Minimum and maximum ceilings are fixed on contributions, making their structure slightly regressive. Social security contributions are, however, deductible from taxable income, and thus play a minor redistributive role. The rate for contributions to unemployment social security has dropped from 1.6 per cent in 1999 to 1.55 per cent in 2000.

Basic reliefs. From 1996 to 1998, a basic tax credit was available to all taxpayers; its amount depended on both the taxpayer's gross earning and family status. From 1999, the tax credit has been replaced by a basic allowance, differentiated according to family status. Unlike the previous basic tax credit, which was phased out as the individual income exceeded a fixed threshold, the amount of the general allowance does not depend on the taxpayer's income. As the basic allowance amount is differentiated according to family status, it could be examined both as a general tax deduction available to all wage earners and as a family status relief, which treats larger households and single parents differently from sole taxpayers. To take into account all these aspects, we have analysed this tax credit both as a basic relief, evaluating what would happen to the individuals' tax rate[15] if this allowance

were totally eliminated, and as a family status relief, estimating what would change if an identical amount were offered to all taxpayers regardless of their marital status. The results presented in Table I.2.10 show that this relief has some vertical distributive power: thanks to this allowance, the low-wage gap can be reduced by 2.5 percentage points and the gap between individuals at APW wage level and high-wage individuals by 1.5 percentage points.

Reliefs for work-related expenses. During the whole period 1996-2002, a work-related allowance was provided to wage-earners; it contributes to reduce net work income, calculated as gross income less employee social security contributions. The amount of this relief is phased down when net earning exceeds a first fixed threshold, and stops at a ceiling. The ability of this relief to reduce vertical inequality between taxpayers with different gross income is fairly noteworthy: in 2002, it served to reduce low-wage vertical inequality by 2.6 percentage points and high-wage by 1.0 percentage point (see Table I.2.11).

Family status reliefs. As we have noticed previously, the amount of the basic tax relief is differentiated according to taxpayers' family status: married couples receive two times the value of the basic credit, irrespective of the number of wage earners, while single parents receive a higher amount. As we are now considering it as a family status relief, we will estimate what would change in the different family types' tax rate if an identical amount were offered to all taxpayers regardless of their marital status.

From 1996 to 1998, a lump-sum tax credit was provided to taxpayers for each dependent child. The amount depended on the number of children and could be increased in the presence of disabled children; a tax credit was also available to taxpayers supporting a family member over 65 years old.

From 1999 a child allowance replaced the child tax credit; its amount depends on the number of dependants.

Together, the redistributive power of these family tax reliefs in 2002 was substantial: they contributed to reduce inequality between individuals with and without children by almost eight percentage points, while they were able to lessen discrimination between the sixth and the eighth family samples by 1.7 percentage points (see Table I.2.13).

A cash transfer is provided for dependent children when taxpayers' income is below a certain amount; however, the *Taxing Wages* model did not take into account this benefit which is means-tested for the Spanish tax system calculation.

First of all, regarding vertical inequality (Table I.2.4), the Spanish tax system is able to reduce the vertical low-wage income gap between individuals by 6.39 percentage points, and the high-wage income gap by 5.95 percentage points. Moving to figures on vertical

Table II.25. **Main characteristics of Spain's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	17	10	8	6	6	6	6
Zero-rate band	y	Y	y	–	–	–	–
Zero-rate band as a proportion of APW	0.20	0.19	0.20	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Effective tax rate for a single individual at APW wage level (tax wedge)	38.8%	39.0%	39.0%	37.5%	37.6%	37.9%	38.2%
Highest rate starts at (proportion of APW wage)	4.70	4.61	4.46	4.55	4.50	4.29	4.16
Highest statutory income tax rate	56%	47.6%	47.6%	39.6%	39.6%	39.6%	39.6%

equity for married couples, the tax system is able to lessen vertical inequality by only 0.35 percentage point. The vertical equalising strength of the tax system is more significant in the individual-case than in the married couple's case.

Table I.2.12 provides information on inequality between family types of different composition: regarding single individuals with and without children, the tax system is able to lessen this inequality by 7.92 percentage points, thus demonstrating a noteworthy but not extreme redistributive power. Moving to married couples with and without children, the tax system is able to reduce this income gap by only 1.71 percentage points. This figure can be explained taking into account the family tax unit issue: single parents are subject to a more favourable tax regime than sole individuals as they support dependent children. This means that they benefit from the "head of family" tax schedule and also receive a higher basic relief and child allowance. On the other hand, both couples with and without children benefit from the joint tax regime; the only fiscal means which differentiates these couples is the presence of the child allowance.

Finally, Table I.2.16 shows the behaviour of the Spanish tax system towards one-earner and two-earner families and its capacity to encourage both spouses to enter the job market: the system tends to advantage two-earner couples when the gross family income increases, while it seems to treat low-wage households uniformly, irrespective of the number of workers. Regarding households at APW wage level and at 133 per cent of APW, the tax system seems to benefit two-earner families by only one and 0.58 percentage point more than one-earner ones, while the column on families with a gross income of 167 per cent of APW shows a 3.72 percentage points increase in the income gap in favour of two-earner households. Families can benefit from joint taxation, whereby they are subject to the same fiscal treatment irrespective of the number of wage earners (the spouses' incomes are added together before taxable income is estimated); this plays an effective role among low-wage couples but loses significance among high-income families. The results are also affected by the combination of work-related reliefs and the deductibility of social security contributions.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

26. Sweden

The Swedish income tax system is based on a complex combination of a smooth progressive central income tax and a proportional local tax scheme; a set of general reliefs is also provided to taxpayers, contributing to enlarge the general tax system's progressivity.

From 1996 to 1998, central income tax was based on two brackets, the first subject to a lump-sum tax and the second to a 25 per cent rate. From 1999, the first bracket has been subject to a tax rate of 20 per cent and a zero-rate band has been introduced; its amount was around the APW wage level. The maximum statutory rate has remained unchanged throughout the whole period.

A local income tax is imposed by the Swedish local government with a flat tax rate and a proportional structure, plus a lump-sum tax for individuals irrespective of their income; the tax rates may differ between municipalities, but a weighted average rate has been chosen in the *Taxing Wages* model for the calculation of local tax. The average tax rate ranged from 31.66 per cent in 1996 to 30.52 per cent in 2002, showing a slight downwards

tendency. Central and local income taxes are completely coordinated in the assessment process and refer to the same tax base.

Some main reforms were carried out during period 1996-2002: first of all, a tax credit was introduced for low and average income earners in 1999. The credit was reduced for incomes above a fixed threshold. A tax credit of 25 per cent of the social security contribution paid by employees and the self-employed was introduced in 2000; this was increased to 50 per cent in 2001 and 75 per cent in 2002.

Social security contributions from employees are based on a flat tax rate and a maximum amount associated with incomes exceeding a certain threshold. The proportional tax rate increased slightly over time, moving from 4.95 per cent in 1996 to 7 per cent in 2002. On account of its maximum ceiling, contributions show a fairly regressive structure. From 1996 to 1999 contributions were fully deductible; in 2002, 75 per cent of them could be deducted from taxable income, while the amount deductible moved down in 2001 (50 per cent) and 2002 (25 per cent).

Sweden's tax system provides a set of general reliefs that together serve to promote a fairer distribution of welfare. To assess the equalising power of these means in 2002, we will compare the effective tax rates available in the *Taxing Wages* model with the tax rates that we would obtain if the tax system did not provide these reliefs, and by measuring the capacity of these different reliefs to reduce inequality among taxpayers.

Basic reliefs. A basic allowance is available to all resident taxpayers, with a progressive structure based on three different deduction rates. The estimation of the basic allowance requires a fairly complicated calculation, and allowance rates have slightly increased during the last two years. As we could imagine this relief mainly benefits taxpayers at the bottom of the income distribution scale thanks to its progressive structure.

From 1999, central income taxation has comprised a zero-rate band. The amount of income subject to the zero tax rate has been adjusted modestly over time, and in 2002 it corresponded to 1.13 times the APW level.

From 1999, a basic tax credit has been available to all taxpayers. This tax credit has a fixed amount for low income and is phased down when gross earnings exceed a certain threshold. From 2000, another basic credit is provided to wage-earners; this is associated with the amount of social security contributions.

Together, the redistributive power of these tax reliefs appears noteworthy (see Table I.2.10): in 2002, the equalising power of tax reliefs appears more substantial in respect of high-wage inequality, with a 9.5 percentage points reduction, than in respect of individuals at the bottom of the income scale (the low-wage gap reduction is 3.3 percentage points).

Family status reliefs. The Swedish tax system provides no reliefs related to family status, but it employs a universal cash transfer for children; its amount depends only on the number of children and not the parents' income. These cash transfers have a strong redistributive impact on taxpayers' income, especially for single parents with low income (Table I.2.15). They play a role in reducing inequality especially among single taxpayers with the same level of gross income but with different personal characteristics, contributing to reduce unfairness by 17.6 percentage points; the result for married couples is 9.5 percentage points.

Table II.26. **Main characteristics of Sweden's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	2	2	2	2	2	2	2
Zero-rate band	–	–	–	y	y	y	y
Zero-rate band as a proportion of APW	–	–	–	0.99	1.04	1.09	1.13
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.05	0.06	0.07	0.07	0.07	0.04	0.02
Effective tax rate for a single individual at APW wage level (tax wedge)	50.2%	50.7%	50.7%	50.5%	49.5%	48.5%	47.6%

Table I.2.4 shows that Sweden's tax system is able to reduce the vertical low-wage income gap by about three percentage points and the high-wage income gap by eight percentage points. Table I.2.4 also provides figures on vertical equity for married couples: overall, the tax system is able to lessen vertical inequality by 2.3 percentage points. The vertical equalising strength of the income tax framework appears once again more significant in the individual-cases than in the married couples example.

Table I.2.12 shows some figures on inequality between single individuals with and without children. The tax system is able to reduce this inequality by 17.56 percentage points. In Table I.2.12 we can also observe figures on inequality among married couples: the overall tax system reduces this income gap by 9.46 percentage points. On the whole, the tax framework seems to play a stronger redistributive role in the single parent case than in the married couple sample.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the differences appear significant in all three cases, benefiting families where both spouses supply work, especially high-wage families. In fact, as regards the first and the second family types, the tax system tends to produce a post-tax one/two-earner income gap for two-earner households of about 4 percentage points, while it provides a 9.02 percentage points more favourable treatment to two-earner families earning 167 per cent of APW than to one-earner families in the same income position. That there are no reliefs for dependent spouses on the one hand, and that contributions are deductible on the other, makes the system largely benefit two-earner families. Overall, it encourages both spouses to enter the job market, especially when the income of both spouses exceeds a certain amount.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

27. Switzerland

The Swiss tax system is characterised by a coordination of a central and a cantonal income tax. The tax schedule is differentiated according to the taxpayer's marital status. Regarding single individuals, central income tax is composed of a minimum lump-sum tax and eleven income brackets, with tax rates ranging from 0.77 per cent to 11.5 per cent, plus an initial bracket subject to a zero tax rate. On the other hand, the cantonal income tax scheme is composed of a minimum lump-sum amount plus 12 income tax brackets (with rates from 2 per cent to 13 per cent) and a first zero-rate band. Regarding married couples, the central tax system is characterised by 15 income brackets (tax rates from 1 per cent to 11.5 per cent) plus an initial bracket subject to a zero tax rate. The amount of this zero-rate band is larger for married couples than for single individuals, irrespective of the number of

wage earners, while the minimum lump-sum tax is slightly lower. The cantonal income tax scheme for married couple shows the same minimum fixed levy as for individuals, the same number of brackets and the same rates as in the single cases; the only difference involves the size of the zero-rate band and the value of incomes corresponding to the various brackets.

Table II.27 provides information on the central income tax structure: during the whole period, the zero-rate band corresponded to about 25 per cent of the APW level. The APW level belonged in the sixth income bracket in 1996 (subject to the marginal tax rate of 6.6 per cent), fell to the fifth in 1997 and the fourth during 1998-2001, while it returned to the fifth bracket in 2002, where it incurred a marginal rate of 5.94 per cent. The highest statutory rate of 11.5 per cent places it relatively well behind most of the other OECD countries; this feature mainly benefits taxpayers at the very top of the income scale. Moreover, income subject to the highest statutory rate corresponded to about 10-11 times the APW level throughout the overall period. When the gap between the APW level and income in the highest bracket reaches these proportions, there is a risk that only a modest percentage of taxpayers with a very high level of income will be concerned by the top statutory tax rate, thus reducing tax progressivity. In fact, the progressiveness of the Switzerland tax system is mainly correlated to the presence of targeted reliefs provided to taxpayers according to their professional and family status.

Only small adjustments have been made to the central income tax schedule regarding the values of income brackets, while some remarkable changes have occurred in cantonal income tax: in 1999, the canton of Zurich, chosen as benchmark for the *Taxing Wages* calculation, moved from a system of biennial taxation of presumed income to annual taxation on income received by natural persons. A zero-rate band was established while the minimum lump-sum tax increased slightly. Once the basic amount of cantonal tax is evaluated, the canton, commune and parish raise their taxes by applying a multiple on the tax amount: this multiple remained unchanged from 1996 to 1999, and dropped slightly from 2000 onwards. The effects of these changes on the tax wedge of individuals at APW wage level have been minor: as we can see in Table II.27 the average tax rate fell in 1999 and 2000, even though we cannot talk about a clear downward trend.

Social security contributions imposed on employees show a proportional rate structure, with a rate of 11.6 per cent during the whole period; they are composed of old-age insurances, pension contributions and an unemployment levy. This last contribution has a maximum ceiling which makes it fairly regressive. Overall, social security contributions play a minor redistributive role due to the fact they are deductible from taxable income.

Basic reliefs. Central income tax exhibits a zero-rate band throughout the whole period 1996-2002, while the cantonal tax system included a first exempted bracket during tax year 1999. In 2002, the central zero-rate band corresponded to about one fourth of the APW level, while the cantonal band represented about 9 per cent of the APW wage level. They lessen both the low-wage income gap and the high-wage gap by only 0.1 percentage point.

Reliefs for work related expenses. During the last seven years, a tax allowance has been available to all employees, corresponding to 3 per cent of net income. Net income is calculated as the difference between gross income and social security contributions. The work-related relief has a minimum and a maximum ceiling; its amount is identical both for the central and the cantonal tax system.

The ability of this allowance to reduce vertical inequality between taxpayers with different gross incomes is minor: in fact, in 2002 it does not seem to have modified the

pre/post-tax low-wage income gap, while a negligible controversial effect can be observed with respect to high-wage inequality (see Table I.2.11).

Family status reliefs. During the whole period 1996-2002 a relief has been provided to taxpayers when their spouse supplies work and receives a positive income. This relief takes the form of a proportional allowance whose amount is directly correlated to the spouse's income, with a minimum and a maximum ceiling. The ceiling is slightly different for the calculation of cantonal tax. As in the case of Luxembourg's tax system, this relief is provided only to the principal earner and serves to offset the higher sacrifices and expenses faced by the couple when both spouses supply work outside.

A child allowance is also provided to taxpayers supporting dependent children under 18 years old or older children in full-time education: this relief has a fixed amount, differentiated between the central and cantonal income tax systems. The value of the child relief has increased progressively over time.

Finally a deduction for sickness insurance and life insurance is provided to taxpayers; its amount is differentiated according to the taxpayer's family status. To eliminate this family-related differentiation, we will simulate an identical amount for all individuals irrespective of their personal situation.

Table I.2.13 shows the equalising effect of family tax reliefs, which operate equally for single individuals and married couples, contributing to reduce the vertical income gap by around three percentage points.

Table II.27. **Main characteristics of Switzerland's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	11 for single individuals, 15 for married couples	11-15	11-15	11-15	11-15	11-15	11-15
Zero-rate band	y	y	y	y	y	y	y
Zero-rate band as a proportion of APW	0.24	0.26	0.25	0.27	0.26	0.26	0.25
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.07	0.07	0.12	0.12	0.12	0.12	0.12
Effective tax rate for a single individual at APW wage level (tax wedge)	30.4%	30.0%	30.0%	29.8%	29.5%	29.5%	29.6%
Highest rate starts at (proportion of APW wage)	9.58	10.36	10.29	11.03	10.89	10.59	10.34
Highest statutory income tax rate	11.5%	11.5%	11.5%	11.5%	11.5%	11.5%	11.5%

The transfers have an important role in lessening inequality as they reduce the gap between single taxpayers with the same level of gross income, but with different personal characteristics, by 11.5 percentage points, and the gap between couples with and without children by 5.7 percentage points. The fixed amount explains why the transfers' equalising power is higher among low-wage taxpayers: the transfers are effectively substantial in relation to gross earnings of individuals at the bottom of income scale, while they tend to lose importance as gross incomes increase.

First of all, we focus on vertical inequality (Table I.2.4): data suggest that the Switzerland tax system is able to reduce the vertical low-wage income gap between individuals by 3.52 percentage points and the high-wage income gap by 5.88 percentage points. Regarding the column on vertical equity for married couples, the tax system seems to reduce vertical income gap by 3.93 percentage points.

Comparing these results with those referring to the zero-rate band and work-related expenses (which are both fairly small), we can hold that the vertical equalising power of the Swiss tax system depends mostly on the tax schedule's structure and on the contributions' deductibility.

Table I.2.12 provides information on inequality between different family types. The tax system is able to lessen the inequality between single workers with and without children by 17.47 percentage points: this figure is partially correlated to the child reliefs and child transfers, but is also associated with the more favourable tax schedule for single parents. Regarding married couples with and without children, the tax system is able to reduce this income gap by 8.75 percentage points. In this case the figure is entirely related to the family status reliefs and transfers as both married couples without children and larger families benefit from the joint tax system.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the tax system seems to provide a relatively more favourable treatment to two-earner families than to one-earner households, even though figures are overall low, around 1.5 percentage points.

These small results are associated with the joint taxation system: family income is assessed together irrespective of the number of wage earners, thus reducing the differences in tax treatment between two-earner and one-earner families. On the other hand, the presence of a relief for families where both spouses earn a salary contributes to encourage the marginal spouse to enter into the job market, and discriminates between one and two-earner households.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

28. Turkey

The key features of the Turkey income tax system are the existence of a highly progressive tax schedule and of two mainly general reliefs: a basic allowance and a deduction for social security contributions. From 1999, the tax unit is the individual; before this, if each of the spouses worked separately and individually earned more than a fixed gross income threshold, they were taxed jointly.

From 1996 to 1998, the tax scheme was composed of seven brackets, with rates ranging from 25 to 55 per cent, while the number of brackets was reduced to six in 1999, with tax rates ranging from 15 to 40 per cent; this main reform resulted in the tax wedge for individuals at APW wage level dropping from 40.3 to 30.3 per cent. This reduction was offset afterwards by inflation.

During the period 1996-2002, Turkey experienced a high inflation trend, which led the APW value for 2002 to be over 20 times higher than the 1996 APW amount. As we have seen in Part I, the phenomenon of inflation affects tax policy and the social purposes of the tax system in the presence of a progressive tax system, contributing to enlarge the tax incidence even in the absence of any explicit tax reform. As the gross nominal earning increases, it moves from one income bracket to the next, subject to a progressively higher marginal rate. This fact could explain the figures in Table II.28: after the 1999 tax reform, the average tax rate associated with our benchmark individual jumped from 30.3 per cent to more than 40 per cent in 2000 and to 43.6 per cent in 2001.

To reduce this so-called "*fiscal drag*" phenomenon. the Turkish government has gradually adjusted the values and sizes of the brackets and increased the amounts of the allowances.

No local taxes are imposed by local Turkish authorities; social security contributions from employees show a proportional structure, with a flat rate of 14 per cent during 1996-2000, 16 in 2001 and 15 per cent in 2002. When gross income exceeds a certain earning ceiling, which is determined at least twice a year, a maximum lump-sum contribution is imposed on taxpayers. Due to the inflation tendency from 1996 to 1999, the earning ceiling corresponded to less than 67 per cent of APW level, so all our estimated family types were subject to the maximum fixed tax and contributions showed a strongly regressive structure. In 2000, 2001 and 2002, the ceiling was progressively adjusted to offset this phenomenon. Social security contributions are fully deductible from gross income.

Basic reliefs. A lump-sum tax allowance is provided to all taxpayers, irrespective of their professional or family status. The allowance amount has been gradually adjusted in line with inflation.

A disablement allowance is added to the basic relief for disabled workers, but the *Taxing Wages* model could not take this extra relief into account, for lack of information.

Table I.2.10 provides figures on the redistributive role of the basic allowance during 2002: the allowance plays a small equalising role at the bottom of the income scale, reducing low-wage vertical inequality by 0.5 percentage point, while it shows weaker power in reducing high-wage inequality (0.2 percentage point). This result is easily explained: on account of its fixed amount, the exemption bracket has a stronger impact on taxpayers earning a low income, and progressively loses importance in relation to gross earnings as the latter start to increase. On the other hand, the overall distributive power of the allowance is minor given its small amount compared with estimated incomes: in fact, during 2002, it corresponded only to four per cent of APW, and to five per cent of estimated low-wage earning (67 per cent of APW).

Table I.2.4 shows that the Turkish tax system plays an effective role in reducing the vertical income gap between taxpayers in different pre-tax income conditions: it seems to reduce the low-wage gap existing between individuals at 67 per cent of APW and individuals earning the APW by 1.79 percentage points, and the gap between APW individuals and high-wage individuals (167 per cent of APW) by 3.18 percentage points. Moving to married couples, the tax system appears able to lower vertical inequality by only 0.40 per cent. These results are only in part correlated with the basic tax reliefs analysed early; they depend mainly on the general tax structure.

Table II.28. **Main characteristics of Turkey's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	7	7	7	6	6	6	6
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	y	y	y	y	y	y	y
Deductions for SSC as a proportion of APW	0.07	0.09	0.09	0.08	0.14	0.16	0.15
Effective tax rate for a single individual at APW wage level (tax wedge)	35.7%	40.7%	40.3%	30.3%	40.4%	43.6%	42.4%
Highest rate starts at (proportion of APW wage)	32.46	16.67	13.39	13.66	11.27	9.03	9.56
Highest statutory income tax rate	55%	55%	55%	40%	40%	40%	40%

On the other hand, Table I.2.12 provides figures on the effectiveness of the tax system to reduce inequality between families of different composition: the Turkish government has not designed any relief correlated to the taxpayer's family status, which prevents the tax system from playing any equalising role.

Finally, Table I.2.16 shows the tax treatment of families in relation to the number of wage earners: on the whole, the figures suggest that the system reserves a more favourable tax treatment to households where both spouses supply work, and it encourages the marginal spouse to enter the job market. Regarding families at APW wage level, the tax system provides a 2.76 percentage points more favourable treatment to two-earner households than one-earner households. Almost the same result can be found for families earning 133 per cent of APW wage level, while a higher figure (4.13 per cent) is related to households earning 167 per cent of APW wage level.

29. United Kingdom

The income tax system is characterised by the combination of a progressive tax schedule and a set of general and targeted reliefs, which together contribute to guarantee a more equitable redistribution of welfare. The tax unit is the individual. During the whole period 1996-2002, the tax scheme was composed of three brackets, but the size of the income bands and statutory tax rates were subject to a series of adjustments. From 1996 to 1998, income tax rates ranged from 20 to 40 per cent, in 1997 the second rate was reduced slightly from 24 to 23 per cent and the brackets gradually increased over the period. In 1999, a noteworthy reform was implemented: the size of the first bracket was cut and the tax rate reduced from 20 to 10 per cent. Subsequently, only small adjustments have been carried out within the general tax schedule.

Overall, we can emphasise that the tax structure is fairly smooth: the first bracket represented only about one fourth of the APW wage level from 1996 to 1998, and less than ten per cent of APW thereafter, while the highest bracket corresponded to about 1.5-1.6 times the APW level during the whole period.

From 1996 to 1998, employees' social security contributions were characterised by a 10 per cent flat rate imposed on incomes between a minimum exempted level and a maximum threshold, plus a lump-sum contribution from all individuals earning more than the exemption amount. In 1999, this lump-sum contribution was eliminated. Depending on eligibility criteria, members of the national insurance scheme qualify for pensions, sickness, industrial injury, unemployment benefits, etc. Overall, we can state that the contributions structure is slightly progressive at the bottom of the incomes scale while it becomes regressive for individuals placed at the top of the incomes rank: when individuals earn less than the exemption limit, they have no contributions liability, while the contributions of taxpayers with incomes higher then the maximum liability ceiling are reduced to zero.

No regional or local income taxes are imposed on worker taxpayers.

Regarding Table II.29, we can underline that the tax wedge of individuals earning the APW wage level fell fairly significantly in 1999, following the reform of the tax schedule and the elimination of the lump-sum contribution. The effective tax rate showed a falling tendency, moving from 32 per cent in 1998 to 30.8 per cent in 1999, 30.1 per cent in 2000 and less than 30 per cent thereafter.

Some important adjustments have also involved the reliefs correlated to the taxpayer's family status: from 1996 to 1999, a marital status relief was provided to married

taxpayers and single parents with children. This relief took the form of a wastable tax credit at a rate of 15 per cent (10 per cent in 1999). During tax year 2000, this relief was abolished and the so-called "Working families' tax credit" (WFTC) was introduced, a means-tested non-wastable tax credit available to low- and middle-income families, where one earner works at least 16 hours a week, and who have at least one dependent child. Finally, in 2001, a children wastable tax credit (CTC) was designed to help families with at least one dependent child; it replaced the marital status relief and has a flat rate of 10 per cent.

Basic reliefs. A basic relief has been granted to each individual during the full period 1996-2002. This relief takes the form a personal allowance with a fixed amount; the value of the basic allowance has increased progressively over time. From an equalising perspective, the basic relief is able to lessen the low-wage income gap by 3.0 percentage points and the high-wage gap by only 0.7 percentage point. On account of the fixed amount, the redistributive power of the personal allowance appears substantial at the bottom of the income scale, while it progressively loses importance in relation to higher incomes (see Table I.2.10).

Family status reliefs. As we have seen earlier, two main reliefs are available to taxpayers; these are linked to family status. From 2000, a non-wastable "Working families' tax credit" (WFTC) is provided to low and middle income families, where one earner works at least 16 hours a week, and who have at least one child under 16 (or 19 if still in full-time non-advanced education). The amount depends on hours worked, the number and ages of children, eligible childcare costs, and net income after tax and national insurance contributions. A family with two children under 16 where one earner works at least 30 hours a week would get a maximum credit before taking eligible childcare costs into account. This credit is progressively reduced for net incomes above a fixed threshold.

Second, starting from 2001, a wastable child tax credit is provided to taxpayers with at least one dependent child under 16 years old. The tax credit is available at the flat rate of 10 per cent, and is phased down for incomes exceeding a fixed threshold. There is an additional tax credit for families with a child under the age of one, but the *Taxing Wages* model could not modelise it as the age of the benchmark child is between six and eleven.

The redistributive power of the two reliefs appears very significant: the reliefs are able to reduce the single parents' income gap by 26.2 percentage points and the gap between married couples with and without children by 2.3 percentage points. Overall, the family status reliefs designed by the United Kingdom government play a substantial equalising role: in particular, the figure for single individuals with children appears the highest in the OECD countries.

Table I.2.15 provides figures on the effect of universal cash transfers: during the whole period 1996-2002, a child benefit was paid in respect of each child up to age 16 (or 19 if still in full-time non-advanced education), irrespective of the parents' gross income. An additional transfer is given to one-parent families in respect of the first child. None of these benefits is subject to tax. The redistributive power of these cash transfers is intense, even though less effective than that of family status tax credits: in fact, the transfers reduce the gap between single taxpayers with the same level of gross income but with different personal characteristics by 9.8 percentage points, and the gap between couples with and without children by 6.0 percentage points.

Table II.29. **Main characteristics of the United Kingdom's tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	3	3	3	3	3	3	3
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	32.6%	32.0%	32.0%	30.8%	30.1%	29.5%	29.7%
Highest rate starts at (proportion of APW wage)	1.60	1.56	1.55	1.57	1.54	1.55	1.52
Highest statutory income tax rate	40%	40%	40%	40%	40%	40%	40%

Table I.2.4 shows vertical inequality among individual taxpayers: the tax system serves to lower the vertical low-wage income gap by 5.38 percentage points and the high-wage income gap by 3.65 percentage points. Table I.2.4 also provides figures on vertical equity for married couples, showing that the overall tax framework is able to lessen vertical inequality by 4.67 percentage points. We can argue that the vertical equalising strength of the income tax system is partially correlated to the basic reliefs, as we observe comparing these figures with those in Table I.2.10, but is also associated with the general progressive tax structure.

Table I.2.12 provides information on inequality between single individuals with and without children: the tax system is able to reduce this inequality by more than 38 percentage points. Compared with the other OECD countries, these results authenticate the deep redistributive power of the United Kingdom's tax system. Table I.2.12 also shows figures on inequality among married couples with and without children: the tax framework seems to reduce this income gap by 8.46 percentage points. Comparing these figures with those in Table I.2.13 and Table I.2.15, we notice that the equalising power of the tax system is strongly correlated with the family status reliefs and child transfers provided to taxpayers.

Finally, Table I.2.16 shows the differences in the tax treatment of one-earner and two-earner families: the tax system appears to discriminate in favour of dual-earner families in respect of all the estimated household types. Two-earner families earning the APW level benefit from the tax system 5.64 percentage points more than one-earner families at the same earning position. The corresponding figures for two-earner families at 133 per cent of APW and at 167 per cent of APW are 7.71 and 5.70 percentage points. These results are partially associated with the presence of a personal allowance, whose amount in 2002 was more than 23 per cent of APW wage level. Due to its high value and the fact that each individual benefits from it only if he/she individually supplies work, the basic relief plays an important role in differentiating between one-earner and two-earner families.

30. United States

The United States' government has chosen the family as the relevant tax unit of the federal income tax system. The federal tax schedule is differentiated according to the taxpayer's family status, providing a more favourable bracket structure to single parents and married couples. The amount of most standard reliefs is differentiated according to the taxpayer's family status, and a set of means-tested selected reliefs are provided to taxpayers with dependent children.

From 1996 to 2001, the tax schedule was composed of five income brackets, differentiated according to the taxpayer's family status, while in 2002 the number of brackets increased to six. Tax rates have gradually fallen over time, with the maximum rate

moving from 39.6 per cent in 1996-2000 to 38.6 per cent in 2002. This reduction is part of a more comprehensive middle-term fiscal reform, designed for the period 2001-2006. The reform involves the federal tax schedule as well as the structure and amounts of basic and targeted reliefs. The adjustments already implemented have slightly affected the tax burden of individuals earning the APW wage level, as we can observe in Table II.30, reducing the effective average tax rate from 31.1 per cent in 1996 to 29.6 per cent in 2002. The APW wage level belonged in the second bracket throughout the whole period, while the income subject to the maximum statutory rate was about 9.5 times the APW wage level during the entire period of time.

Most of the states as well as the District of Columbia impose a state income tax; in addition, some local governments (cities and counties) impose an individual local tax. State individual income tax structures are usually related to the federal tax structure by the use of similar definitions of taxable income, with some appropriate adjustments. The *Taxing Wages* model utilises the tax system imposed in Detroit, Michigan, as the relevant benchmark for the calculation of state tax. The state of Michigan allows a personal exemption for the taxpayer, the spouse and each child; it taxed income at a flat rate of 4.40 per cent in 1996-1999 and 4.2 per cent thereafter. The city of Detroit grants a personal exemption and taxes income at a flat rate (3.0 per cent from 1996 to 1999, 2.85 per cent in 2000 and 2.75 per cent thereafter). Michigan provides a credit for Detroit city taxes paid, which is phased down for incomes exceeding a fixed threshold. Even though this local tax is based on a flat tax rate, it appears progressive and provides a more favourable tax treatment to larger families thanks to the exemption system.

A peculiar characteristic of the United States' tax framework is the presence of a personal exemption, in addition to the standard basic relief, which is granted to all individuals and phased down for incomes exceeding a fixed eligibility amount; the value of this exemption limit is identical irrespective of the family status of taxpayers, but the eligibility threshold depends on the taxpayer's personal situation. Moreover, if taxpayers have dependent children or other dependants, a dependency exemption is provided for each dependant, of an amount that is identical to the personal exemption. The value of the personal and dependency exemption is indexed annually for inflation. The United States tax framework shows an encouraging tax treatment to married couples and families with dependent children.

Apart from the personal deduction, a series of general and targeted reliefs is provided to individuals according to professional and personal characteristics: in particular, beginning in 1998 a non-wastable tax credit is available for individuals with dependent children under the age of 17. The maximum credit is reduced for taxpayers with income in excess of certain thresholds, and the eligibility thresholds are differentiated depending on the taxpayer's marital status.

During the whole period 1996-2002, a credit for low-income workers (EIC) was provided to individuals whose gross income was lower than a minimum threshold: the relief takes the form of a non-wastable tax credit, with a rate that is increased in the presence of dependent children. Once again, the eligibility threshold is differentiated according to the taxpayer's marital status, providing a more favourable treatment to married couples than to single parents.

From 1996 to 2002, social security contributions collected from employees were based on a flat rate of 6.2 per cent on gross incomes up to a maximum ceiling, plus 1.45 per cent for all

individuals irrespective of their income situation. No changes can be noticed in the structure of social security contributions over the period: they show a proportional structure for incomes lower than the maximum ceiling, while they become regressive at the top of the income scale. No family type considered in the *Taxing Wages* exceeds this exemption ceiling, so the model is not able to provide information on social security's inverse redistributive role.

Basic reliefs. Throughout the whole period 1996-2002 the United States tax system provided a basic relief to all individuals: this basic relief took the form of a basic allowance with a fixed amount and contributed to reduce the taxable income before taxes were imposed. The allowance amount is differentiated for single individuals, single parents and married couples: this amount was indexed annually for inflation.

In addition to the standard relief, a personal exemption is given every taxpayer, including both husband and wife filing the joint taxation described above; the value of the personal exemption depends on the family's gross income and is phased out when incomes exceed a fixed threshold. The eligibility threshold is differentiated according to the taxpayer's family status.

These two reliefs have a particular structure and could be examined both as general tax deductions, available to all wage earners, and as family status reliefs, which treat married couples and single parents differently from sole taxpayers. To take all these aspects into account, we have analysed the basic allowance and personal exemption both as basic reliefs, evaluating what would happen to the individuals' personal income tax rate if they were totally eliminated, and as family status reliefs, estimating what would change if an identical amount were offered to all taxpayers regardless of marital or family status.

Table I.2.10 provides figures on the redistributive power of this personal relief in 2002. The overall tax system shows a minor equalising power: the low-wage income gap seems to remain unchanged before and after taxes, while the high-wage income gap has been reduced by only 1.4 percentage points.

Family status reliefs. First, as we noted in the previous paragraph, the basic tax allowance and personal exemption are differentiated according to taxpayers' family status. Second, the value and eligibility conditions of the credit for low income workers (EIC) described in the first part of the chapter are based on the taxpayer's family and marital status. Treating all these reliefs as means to provide families a more favourable tax treatment, we estimated what would change if an identical amount were offered to all taxpayers regardless of family status.

Finally, some reliefs are explicitly designed for taxpayers with dependent children: a dependency lump-sum exemption is available to all taxpayers with dependent children or other persons claimed as dependants. From 1998, taxpayers are allowed a tax credit for each qualifying child under the age of 17. The maximum credit is reduced for taxpayers with income in excess of certain thresholds. These threshold amounts are differentiated according to the taxpayer's marital status. A taxpayer with three or more qualifying children may be allowed a supplemental refundable (non-wastable) child credit subject to certain restrictions: given the characteristics of the family types in the *Taxing Wages'* model, it has not possible to take into account this supplemental tax credit.

The redistributive power of all these reliefs in 2002 is noteworthy. On the whole, the equalising effect of the family status tax reliefs operates progressively for both single parents, since unfairness against single individuals without children can be reduced by

24.7 percentage points, and for married couples, where there is an income gap reduction of 6.7 percentage points compared with married couples without children.

Table II.30. **Main characteristics of the United States' tax system, 1996-2002**

	1996	1997	1998	1999	2000	2001	2002
Number of brackets	5	5	5	5	5	5	6
Zero-rate band	–	–	–	–	–	–	–
Deductions for SSC and income taxes	–	–	–	–	–	–	–
Effective tax rate for a single individual at APW wage level (tax wedge)	31.1%	31.1%	31.0%	31.1%	30.8%	29.8%	29.6%
Highest rate starts at (proportion of APW wage)	9.60	9.48	9.58	9.44	9.33	9.52	9.54
Highest statutory income tax rate	39.6%	39.6%	39.6%	39.6%	39.6%	39.1%	38.6%

Regarding Table I.2.4 and vertical inequality between individuals, the overall tax system is able to reduce the vertical low-wage income gap by 3.12 percentage points and the high-wage income gap by almost eight percentage points. We can observe that the effectiveness of the tax structure in lowering vertical unfairness rises as the taxpayer's income increases. Table I.2.4 also provides figures on the tax system's vertical equity for married couples: the pre-tax/benefit income gap is 22 per cent; the redistributive power of the income tax system is able to reduce vertical inequality by three percentage points.

Comparing these results with those in Table I.2.10 we notice that the vertical equalising power of the system is only in part correlated with the reliefs provided to taxpayers; it depends mostly on the progressivity of the federal tax schedule.

Table I.2.12 provides figures on inequality between single individuals with and without children: the tax system is able to reduce inequality by more than 25 percentage points. Moving to inequality among married couples with and without children, the tax system is able to reduce this inequality by 6.72 percentage points. Comparing these general results with those correlated with the separate effects of family status tax reliefs in Table I.2.13, we can claim that the United States tax system's equalising power is fully correlated with the different reliefs available to taxpayers depending on family status.

Finally, Table I.2.16 shows the attitude of the United States' tax system towards one-earner and two-earner families: the tax system seems to treat equally one-earner and two-earner families with earnings equal to APW, 133 and 167 per cent of APW wage level. These results could be associated with the application of the family tax unit: the system treats one-earner and two-earner families equally as the whole family income is totalled and equally divided before taxes are calculated, irrespective of the number of earners and proportion of the spouse's income.

The tax system is still able to preserve the pre-tax rank order of the households, thus avoiding any *re-ranking* phenomena.

Notes

1. The amount moved from 5 400 A$ in 1996-1999 to 6 000 A$ from 2000.
2. Part A: Eligibility is based on the combined taxable income of the parents. There is an income ceiling, over which the transfer is reduced by 30%; the amount increases with the number of children.

Part B: Targeted at single income families, eligibility contingent upon the spouse meeting a separate income test and the existence of at least 1 dependent child under the age of 16 (or under the age of 18 if a full-time student). There is no income ceiling, but there is a spouse income threshold above which the amount is reduced by 30%.

3. *Cf.* OECD, 2002, *Taxing Wages*.
4. The "Family quotient" system takes into account the taxpayers' marital status and dependants. Net taxable income is divided by the number of "parts": one part for each spouse, half a part for each child or other dependant, a whole part for the third child, an additional half-part for persons with handicaps, etc. The total tax bill is equal to the amount of tax for one part multiplied by the total number of parts. Taxpayers with three or more children receive an extra half-part.
5. The spouses' gross incomes are added together: the taxes are then estimated with respect to one-half of the joint taxable income and the resulting amount is doubled to give income tax liability.
6. In 1998, a new pension system became effective: participation in the pension scheme is obligatory for all employees.
7. The amount for dependent workers is generally higher than for self-employed workers.
8. *E.g.* If there is one dependent child in the household and the family income is less than EUR 51 646, the total child tax credit of EUR 285 is split into two equal parts of EUR 142 for each parent.
9. A family quotient is applied on the taxable income for income tax calculation purposes.
10. The government no longer manages these accounts; new private financial institutions were created specifically for this purpose. However, the contractual obligation is between the workers and the government, not with the private administrator of the fund, because legally these contributions are still considered as contributions to social security, independently of who may manage the fund. It should be noted that the federal government also contributes to each pension account and guarantees a minimum pension to every beneficiary of the social security system, again independently of the administration of the fund.
11. The personal income tax system has two tax bases: personal income and ordinary income. Personal income is defined as income from personal work and pensions and is a gross income base from which no deduction may be made. Ordinary income includes all types of taxable income from work, pensions, business and capital. Certain costs and expenses, including interest paid on debt, are deductible in the computation of ordinary income. Central and local governments share tax on ordinary income.
12. Overall tax on ordinary income is at a total rate of 28 per cent; local government tax represents about half of this. The *Taxing Wages* model considers only this local part of the ordinary income tax system.
13. In joint taxations, the "splitting method" system applies: the tax bill for the couple is twice the income tax due on half the joint income. Joint income does not include capital income taxed at the flat 20 per cent rate.
14. Income tax plus employees' social security contributions minus family cash benefits.
15. Income tax plus employees' social security contributions minus family cash benefits.

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OECD Tax Policy Studies

Taxing Working Families

A DISTRIBUTIONAL ANALYSIS

Apart from revenue raising, taxes are often regarded as effective instruments to achieve a wide variety of public policy goals. For example, policy makers may wish to use the tax system to influence consumer and producer choices, or to modify the distribution of personal incomes and wealth. Even in cases where – in setting tax policy – governments abstain from pursuing explicit distributional goals, tax burdens are seldom distributed in a way in that leaves the shape of the pre-tax distribution of personal incomes unchanged after tax.

Taxing Working Families provides insights into how income taxes and social security contributions affect the distribution of income between different types of families in OECD countries. Certain generally available cash benefits for families – regarded as negative taxes – are also taken into account.

The study concentrates on the effects of these taxes on the distribution of income between different types of working households, looking at three dimensions of inequality: vertical inequality between households at different income levels, horizontal inequality between households with different numbers of children and the tax treatment of one-earner *versus* two-earner households.

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