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Tackling income inequality: The role of taxes and transfers

by
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*Taxes and transfers reduce inequality in disposable income relative to market income. The effect varies, however, across OECD countries. The redistributive impact of taxes and transfers depends on the size, mix and the progressivity of each component. Some countries with a relatively small tax and welfare system (*e.g. *Australia) achieve the same redistributive impact as countries characterised by much higher taxes and transfers (*e.g. *Germany) because they rely more on income taxes, which are more progressive than other taxes, and on means-tested cash transfers. This article provides an assessment of the redistributive effect of the main taxes and cash transfers, based on various OECD data sources, a set of policy indicators and a literature review. Using cluster analysis, it also identifies empirically four groups of countries with tax and transfer systems that share broadly similar features.*

JEL Classification: H2, H23, H53, I3, I38

Keywords: Income inequality, taxes, transfers, welfare systems, redistribution, progressivity, cluster analysis

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In many OECD countries, income inequality has drifted up over the past decades (OECD, 2011a). In some countries, top incomes have captured a large share of the overall income gains, while poverty remains a pressing policy issue, not least because of the increase in unemployment over the last few years. The recent financial and fiscal crises have also pushed governments to contain public spending, including cash transfers, while both fiscal consolidation and equity considerations have led some governments to raise taxes, in particular on top incomes.

Against this background, Section 2 assesses the redistributive impact of different tax and transfer policy approaches in the late-2000s. Section 3 summarises tax and transfers policy indicators in country profiles and provides an illustration of how these profiles can be used to identify reform options for two OECD countries (Australia and Germany). It also provides a typology of tax and transfer systems, identifying four groups of countries sharing broadly similar features.

This article relies on, and compares, various data sources and methods. The *OECD Income Distribution and Poverty Database* – which draws mostly on national household survey data – contains comparable cross-country information on income, public cash transfers and taxes at the household level by income decile.[1] This data source is used to derive the redistributive impact of taxes and transfers and the contribution of both size and progressivity in lowering inequality. Given the inherent limitation of these data, other indicators of the size and progressivity of taxes and transfers are presented to investigate the characteristics of specific tax and benefit schemes. A cluster analysis of 15 carefully selected policy indicators, capturing the progressivity, size and mix of taxes and benefits, is then implemented to identify groups of OECD countries sharing common redistributive approaches.

1. Main findings

1.1. *The redistributive impact of taxes and transfers*

Taxes and transfers have a significant redistributive impact. Inequality in income *after* taxes and transfers, as measured by the Gini index, was about 25% lower than for income *before* taxes and transfers on average in the OECD area in the late 2000s.[2] For the same period, poverty measured after taxes and transfers was 55% lower than before taxes and transfers for the OECD average. Various additional points are worth noting:

- Countries with a more unequal distribution of market income tend to redistribute more.
- Cash transfers reduce income dispersion more than taxes in most OECD countries. On average, three quarters of the reduction in inequality between market and disposable income are due to transfers, the rest to taxes.
- The redistributive impact of cash transfers varies widely across countries. Countries with a similar dispersion of household market income may follow different redistributive strategies. In some, cash transfers account for a large share of household

disposable income, redistributing income mainly over the life-cycle rather than across individuals. Old-age pensions often fall into this category, and their progressivity is low in many countries. Some countries with smaller cash transfers tend to rely more on targeted benefits.

- Family and housing benefits are, in most countries, the most progressive cash transfers, though their redistributive impact is limited as they are often small in size. Disability and unemployment benefits reduce income inequality although their degree of progressivity to a large extent depends on their design.
- The cross-country variation in the redistributive impact of household taxes is more limited than that of transfers, despite large differences in tax-to-GDP ratios. High-tax countries tend to have less progressive household taxes.
- The progressivity of labour taxes (including social security contributions) has increased in the majority of OECD countries. Although personal income rate schedules have often become flatter, reflecting the steep decline in top marginal tax rates, social security contributions for low-income earners have been cut or tax reliefs made more generous in some countries so as to reduce the cost of labour for groups at high unemployment risk. Furthermore, earned income tax relief has been raised to make work more attractive for low-income earners, raising the progressivity of labour income taxes.
- The personal income tax is the most progressive tax, although there are significant cross-country variations. Social security contributions, consumption taxes and real estate taxes tend to be regressive in most countries.
- Tax expenditures pertaining to personal income tax tend to benefit the well-off, a main exception being in-work tax credits.
- The taxation of capital income, wealth and inheritance has been reduced in many countries, which has reduced the redistributive impact of tax systems.

1.2. Indicators of tax and transfer policies help to identify different country models

- The redistributive impact of taxes and transfers depends on their size, mix and the progressivity of each component. A set of policy indicators has been compiled which breaks down the redistributive impact of both taxes and transfers into these three dimensions. Individual country profiles facilitate the comparison of each country with the OECD average and thus help to identify reform options.
- Four groups of countries sharing broadly comparable tax and transfer systems have been identified empirically, based on the set of policy indicators:
  - ❖ A "Nordic model" characterised by large and mostly universal cash transfers, a high level of spending on in-kind services and a tax mix which promotes redistribution (all Nordic countries and also Belgium are in this group).
  - ❖ A "Continental European model" characterised by large cash transfers with the lion's share for old-age pensions – *i.e.* redistributing income mostly over the lifecycle instead of across individuals – and a tax mix which does not promote redistribution across individuals, reflecting a small role for the personal income tax (Austria, France and Germany are representative).
  - ❖ An "Anglo-Saxon model", characterised by small cash transfers, and a tax mix which promotes income redistribution. This model can be divided in two sub-groups: those countries with transfers highly targeted on low-income groups (Australia and

New Zealand being examples) and those countries characterised by little progressivity of cash transfers which are largely spent on old-age pensions (Japan and the United States are in this sub-group).

- A lower-income group, where the welfare system is not well developed. Spending on transfers and the level of taxation are considerably below the OECD average, with a heavy reliance on consumption taxes (Chile and Turkey are in this group).

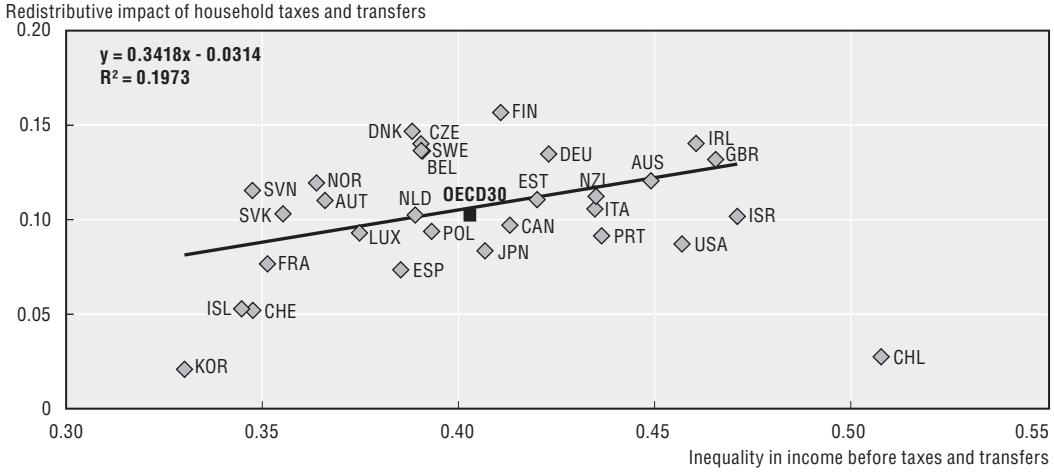
2. The redistributive impact of taxes and transfers

Taxes and transfers are key policy levers to influence distributional outcomes. Information based on household surveys suggests that OECD-wide, taxes and cash transfers reduced the market income dispersion – as measured by the concentration coefficient – by about 25% and relative poverty by about 55% in the late 2000s (Pisu, 2012).[3] Their redistributive impact tends to be high in the Nordic countries (Iceland being an exception) and eastern European countries (Figure 1). It is low in Iceland, Korea and Switzerland, all characterised by little market income dispersion, and in Chile. The data suggest that there is a positive link between the redistributive impact of taxes and transfers and the level of market income inequality. Focusing on the working age population yields the same pattern.[4]

Cash transfers reduce income dispersion more than taxes (Figure 2).[5] The United States, however, is an outlier with virtually the same redistribution achieved through taxes as cash transfers. It relies heavily on the tax code to provide support to low-income groups – the Earned Income Tax Credit is one of the largest US social programmes – while other countries rely more on cash transfers.[6]

Figure 1. **Taxes and transfers reduce income dispersion, and more so in "unequal" countries**

In the late 2000s

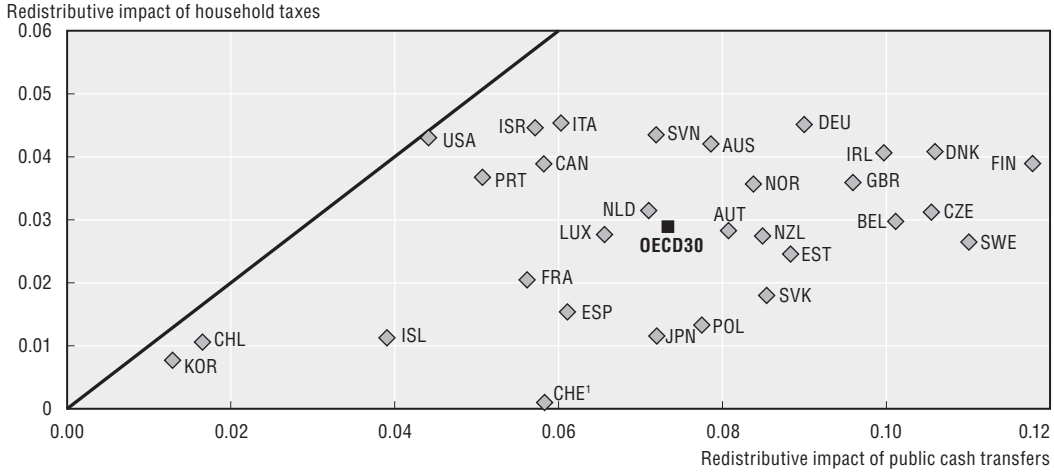


Note: Inequality in income before taxes and transfers is measured by the concentration coefficient. The redistributive impact of taxes and transfers is defined as the difference in the concentration coefficients for income before cash transfers and taxes (*i.e.* household market income) and after cash transfers and taxes (*i.e.* household disposable income). Two approaches can be used to measure the concentration of market income, *i.e.* by ranking households by their market income or by their disposable income. In this illustration, and throughout the article, households have been ranked by disposable income due to data limitations. Joumard *et al.* (2012) compares the two approaches. It also shows that the relation between income inequality before taxes and transfers and the redistributive impact of taxes and transfers is stronger when calculating the concentration of market income based on ranking households by market income. Data for France and Ireland refer to mid-2000s. The trend line shown above has been calculated excluding Chile.

Source: OECD Income Distribution and Poverty Database.

Figure 2. **Cash transfers reduce income dispersion more than taxes**

Point reduction in the concentration coefficients, in the late 2000s



Note: The redistributive impact of public cash transfers is measured as the difference between the concentration coefficient of market income and that of income after transfers. The redistributive impact of household taxes is measured as the difference between the concentration coefficient of post-transfer income and that of disposable income (*i.e.* post-tax and transfers). Data for France and Ireland refer to mid-2000s.

1. The redistributive impact of household taxes for Switzerland is slightly negative (–0.006), but has been set to zero.

Source: OECD Income Distribution and Poverty Database.

The redistributive impact of taxes does not vary widely across countries, despite large cross-country differences in the size of the tax take and progressivity of the tax system. Some countries have opted for a high tax take but, as they are constrained to tax virtually all citizens, with little progressivity. Others have a smaller but more progressive tax system. By contrast, the redistributive impact of transfers displays large cross-country differences. In Denmark, Finland and Sweden, it is more than five times higher than in Korea and about three times higher than in the United States. However, the annual income distribution data may overstate significantly the degree of redistribution across individuals as social security schemes have a – sometimes large – component that provides redistribution over the lifetime rather than redistributing across individuals (Box 1). Countries that spend the most on cash transfers tend to concentrate more on redistribution across the life-cycle (in particular through old-age pensions). In contrast, those countries that focus more on redistribution between the rich and the poor, through extensive use of targeting, spend less.

2.1. The redistributive impact of cash transfers: cross-country differences and driving forces

2.1.1. The redistributive impact of cash transfers is large but varies significantly across countries

The main features of the size and redistributive impact of cash transfers are as follows:

- On average across the OECD, cash transfers amounted to 11% of GDP and 20% of household disposable income in 2007 (Figure 3). They reduced income inequality, as measured by the fall in concentration of market income before and after transfers, by about 19% in the late 2000s. Those countries that spend the most are not always those where the redistributive impact is strongest. Cash transfers ranged from 2½ per cent of GDP in Mexico and Korea to over 17% in Austria. In Austria, however, the redistributive impact is close to the OECD average.

Box 1. **Welfare systems: Beveridge *versus* Bismarck? Public *versus* private?**

In most OECD countries, welfare systems have three main objectives:

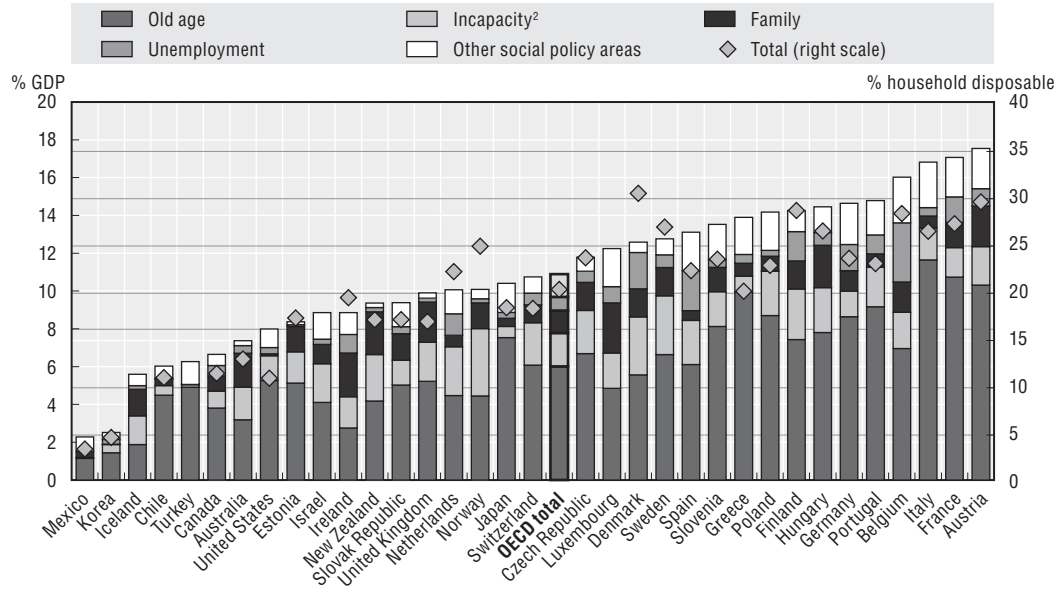
- Redistributing income over the life-cycle (from working-age to retirement age), with public old-age pensions largely financed out of social security contributions or general taxation.
- Providing income maintenance or insurance to cope with adverse risks, such as unemployment, disability and sickness.
- Avoiding poverty or a too wide dispersion in living standards, with benefits financed mostly out of general taxation. These benefits can be either universal or means-tested.

Bismarckian-type welfare states rely on social insurance, with benefits financed out of social security contributions. They give priority to the first two objectives. Beveridgean-type welfare states give priority to the third objective with social benefits targeted on those in need and financed by tax revenues. A third welfare model, as recognised by Esping-Andersen (1990), is implemented in the Nordic countries. It involves universal benefits – involving a "de-familialisation" of welfare responsibilities, with complete coverage both for child and elderly care – and thus a high level of taxation. In practice, welfare systems involve a mix of redistribution between the rich and the poor, risk insurance and lifetime redistribution. They also often provide both means-tested and universal benefits. These features, however, differ between countries. In a comparative study, Stahlberg (2007) estimated that in Australia 38% of lifetime benefits received by individuals were financed through taxes they paid at another stage of their life-cycle, and the remaining 62% involved redistribution between the rich and the poor. In Sweden, 18% of lifetime benefits involved redistribution between individuals and 82% involved redistribution over different phases of the life-cycle of an individual. Sweden, as the other Nordic countries, relies heavily on universal benefits while Australia relies more on targeted and means-tested transfers. The choice between targeted and means-tested transfers is often reflected in tax rates: means-tested benefits can generate high marginal effective tax rates during the withdrawal phase, whereas universal benefits generally lead to high average tax rates because they are costly. Unfortunately, the data available often do not allow disentangling redistribution across individuals from the redistribution over the life-cycle. Nor they allow an analysis of income mobility – *i.e.* individuals moving between different quantiles of the income distribution over time.

Cross-country differences in the public/private nature of insurance mechanisms and in the taxation of social benefits are also important. Some countries rely mostly on private pension funds to ensure income redistribution across the life-cycle and, often to a lesser extent, on private insurance companies to provide insurance against health risks. Because contributions to, and benefits received from, private funds are not considered as part of the redistributive system, the size of the welfare system is smaller than in the countries which rely mostly on public coverage. At the same time, the countries that rely more on private schemes may display more progressive public schemes since these do not include pensions and other benefits governed by insurance mechanisms, which often benefit lower income households less. The taxation of social benefits also affects cross-country comparisons. In some OECD countries, transfers are subject to broadly the same tax treatment as wage income (*e.g.* Nordic countries) while in others (*e.g.* Japan) they are largely untaxed. Adema and Ladaique (2009) provide estimates for net public social expenditure, *i.e.* adjusting for the impact of the taxation of social benefits and tax breaks with a social purpose as well as for indirect taxes. This leads to a reassessment of the magnitude of welfare states and to a greater similarity in social expenditure-to-GDP ratios across countries.

Figure 3. **Public cash transfers to households: level and composition**[1]

2007



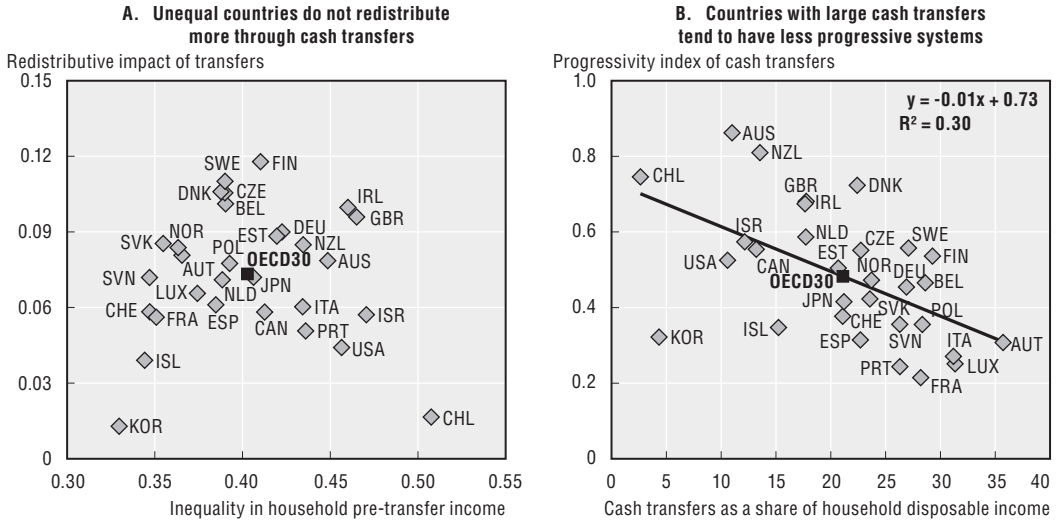
1. The data shown here exclude private mandatory spending which accounts for an important share of total social spending in some countries (in particular Chile, Germany and Switzerland). In addition, public cash transfers shown here may not fully account for those programmes and services provided, or co-financed, by local governments. Measurement gaps may be high, notably in federal countries such as Canada.
2. Incapacity-related spending covers expenditure on disability pensions and sick leave schemes (occupational injury and other sickness daily allowances).

Source: OECD Social Expenditure Database.

- There is no clear link between the degree of market income inequality and the redistributive impact of transfers – the most unequal countries do not redistribute more (Figure 4, Panel A). The redistributive impact is highest in the Czech Republic, Finland, Sweden and Denmark, all characterised by a dispersion of market income close to the OECD average. The redistributive impact of cash transfers is especially low in Korea and Chile, followed by Iceland, the United States and Portugal. Moreover, countries with a similar dispersion in household market income (*e.g.* Finland and Canada) can opt for distinct redistributive strategies – the redistributive impact of cash transfers in Finland is about twice as large as in Canada.
- The cross-country variation in the redistributive impact of cash transfers reflects differences in the size and progressivity of these transfers (the annex provides information and analysis on the various measures used in this paper to assess the redistributive impact of taxes and transfers). Countries obtain a similar redistributive impact through drastically different size and progressivity combinations (Figure 4, Panel B). For instance, in Portugal and the United States transfers attain about the same reduction in inequality but for different reasons. In the United States, the limited reduction in inequality is due to the smaller size of transfers compared with the OECD average whereas in Portugal it is mainly due to their lower progressivity.
- From the mid-1990s to the late 2000s, the redistributive impact of cash transfers slightly weakened on average for the 19 countries for which data are available. This decline is due to a lower size, partly owing to a reduction in unemployment, whereas progressivity increased. The lack of, or incomplete, indexation of cash transfers has impinged

Figure 4. **The redistributive impact of cash transfers**

In the late 2000s



Note: Inequality in household pre-transfer income is measured by the concentration coefficient for household market income. The redistributive impact of cash transfers is measured as the difference between the concentration coefficient of market income and that of market income after transfers but before taxes. The progressivity index of cash transfers is the Kakwani index, defined as the concentration coefficient for market income less the concentration coefficient for transfers (see the annex). Data for France and Ireland refer to the mid-2000s.

Source: OECD Income Distribution and Poverty Database.

negatively on their generosity. The examination of 10 countries suggests that incomplete indexation of benefits resulted in recipients losing ground in a majority of these countries (OECD, 2011a). The choice of indexation – to prices *versus* wages – affects the income loss, which is often more pronounced at lower income levels.[7]

- The progressivity of transfers varies significantly across benefit schemes. It tends to be lower for old-age and disability pensions as well as unemployment benefits than for family and housing benefits. The transfer mix thus plays a role in explaining cross-country differences.

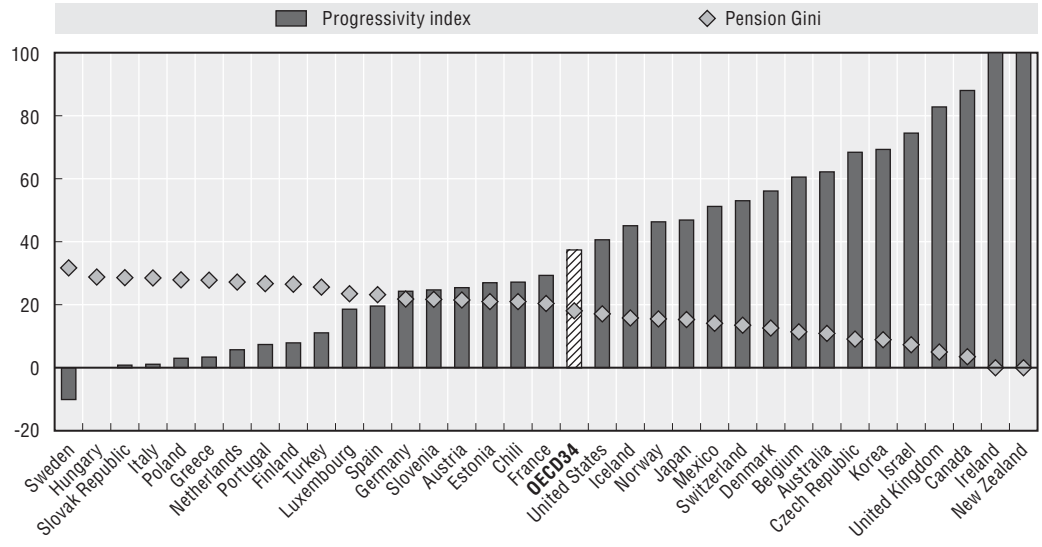
2.2. The redistributive impact of pension systems depends on their design

Old-age pensions account for the largest share of total cash transfers – 55% in the mid-2000s for the OECD on average. Unsurprisingly, for people above 65, they accounted for the bulk (more than 90%) of total transfers received, but for working-age people, their share was also large: 37% for the OECD average but around 80% in Italy and 60% in Poland.[8] Old-age pensions can be sub-divided into three tiers (OECD, 2011c). The first two tiers are mandatory whereas the third is voluntary. The first tier has a redistributive function and is publicly provided. The second tier plays mostly an insurance or income-replacement role, ensuring a living standard comparable to that prior to retirement. The third tier reflects voluntary pension arrangements, and is thus likely to have little or no redistributive impact.

The OECD has produced a progressivity index for mandatory old-age pensions. For flat basic pensions, the index reaches 100 (OECD, 2011a; Whitehouse, 2006). New Zealand and Ireland are the only OECD countries where public pensions have flat and universal payments, without second-tier schemes. As a result, they have the most progressive pension system (Figure 5). Other countries with highly progressive pension systems are Canada, the United Kingdom, Israel, Korea and the Czech Republic. On the other hand,

Figure 5. **Progressivity index of the pension system**[1]

2008, pensions before tax



1. The progressivity index is calculated considering only the mandatory part of the pension system plus the quasi-mandatory parts with broad coverage. For instance, in Denmark and Sweden there are quasi-mandatory, occupational defined contribution schemes with broad coverage that are included in the index. The index shown here is not a Kakwani index. It is based on pension systems' parameters and is computed as 100 minus 100 times the ratio of the Gini of pension payments to the Gini of personal gross earnings in 2008. The Gini indices are calculated using the OECD average earnings distribution. Pension entitlements are computed using the OECD pension model and refer to workers entering the labour market in 2008. The calculations are based on the rules applying in 2008. They include the effects of pension reforms legislated by 2008 but to be phased in later. The pension Gini is the Gini index for pension payments multiplied by 100.

Source: OECD pension models and OECD (2011c), *Pensions at a Glance* 2011.

Sweden has a regressive mandatory pension scheme, due to the U-shaped profile of the replacement rate.[9] Some of the southern and eastern European countries, as well as Finland and the Netherlands, also show little progressivity. Among these countries, Italy and Poland now have defined-contribution second-tier pensions, which have been specifically designed to forge a strong link between contributions and benefits – *i.e.* redistribution over the life-cycle instead of across individuals.[10]

Differences in mortality rates across individuals and the design of tax systems – two issues not covered by the progressivity index above – often reduce the progressivity of pensions. Low-income earners tend to die at a younger age than high-income earners (*e.g.* Waldrom, 2007; Christia, 2007; Marmot and Shipley, 1996). The shorter average life span of low-income individuals reduces particularly the progressivity of contributive insurance-type pension systems, as part of low-income earners' contributions ultimately finance pension payments of high-income earners.[11]

Taxes and social security contributions can affect the progressivity of pensions, and therefore the degree of redistribution they achieve, substantially (Keenay and Whitehouse, 2003). Pension income is in general taxed at lower rates than work-related income because: *i*) the personal income tax is progressive and gross replacement rates are generally below 100%; *ii*) pensioners are often exempt from certain types of social security contributions or pay them at a reduced rate. The effect of taxes on pension progressivity can be gauged by comparing the gap between gross (before taxes) and net (after taxes) replacement rates for low and high-income earners.[12] Figure 5 shows that taxes and social

security contributions slightly reduce the progressivity of retirement-income schemes on average across the OECD. Still, in 15 out of the 34 countries, taxes and social security contributions enhance the progressivity of pensions.

Over the past two decades, pension reforms have slightly reduced pension progressivity on average for the 20 countries for which data are available (OECD, 2009; Whitehouse, 2009), though there was again wide cross-country heterogeneity. The drop in the progressivity of pensions in countries such as the Slovak Republic, Poland and Hungary is partly due to the introduction of defined-contribution schemes, which provide a stronger link between pensions and earnings. On the other hand, pension reforms which increased the number of years required to calculate the earnings basis for pension payments (in addition to raising the effective retirement age) have tended to make pension systems more progressive, because higher income individuals typically have a steeper wage profile over their working life.

2.3. Disability benefits are redistributive but risk creating poverty traps

Cash transfers associated with disability and sickness benefits are also large. They amounted to 2% of GDP on average in the OECD in 2007 and reached more than 3% in the Nordic countries and the Netherlands. In 2007, around 6% of the working-age population received such benefits on average across the OECD, and in some countries this share was well above the unemployment rate (OECD, 2010d). During the past 10-15 years, the number of recipients increased in around half of the OECD countries partly reflecting the use of disability programmes to soften the impact of downturns (Benítez-Silva *et al.*, 2010) and, to a lesser extent, population ageing. The increase also reflects a shift away from early retirement schemes and unemployment benefits as governments have tightened the eligibility criteria of these programmes.

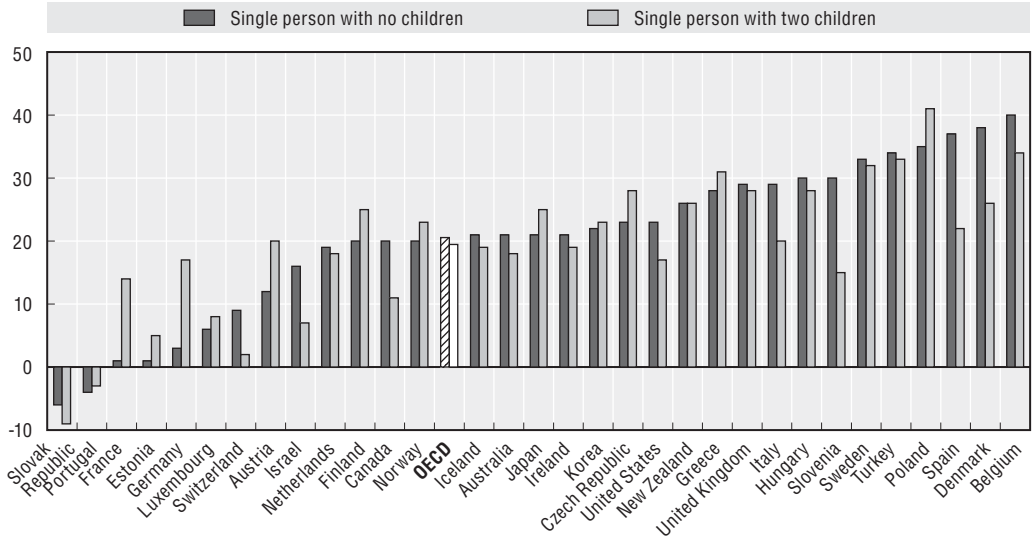
Disability benefits reduce income inequality at a given point in time, as net replacements rates for low-wage earners are higher than for high-wage earners (OECD, 2010d). However, they may increase lifetime income inequality by reducing income mobility and creating poverty traps. Across the OECD, disability benefits are often the only means of sustenance for people with a disability, but often do not suffice to escape poverty.[13] People receiving disability benefits indeed have lower employment and higher unemployment rates than people with no disability. Many countries have thus started to reform disability benefits to reach a better, and more sustainable, balance between income security and labour market (re-)integration of disabled people.

2.4. Unemployment benefits are mostly insurance-based and thus not very progressive

The redistributive effect of unemployment benefits depends on the system's parameters including eligibility criteria, replacement rates for low and high-income earners and benefit duration. These benefits are conditional on past contributions, and are earnings-related in most countries. Greece, Iceland, Ireland, Poland and the United Kingdom are exceptions since they provide flat though relatively low benefits, enhancing their redistributive impact. Many countries impose a ceiling on unemployment benefits, thus also introducing an element of progressivity. However, the ceiling is sometimes fairly high, and for a few countries, there is no upper limit.

The progressivity of unemployment benefits can be gauged by comparing the net replacement rates of low and high-income earners. Figure 6 shows that unemployment benefits for the initial phase of unemployment tend to be progressive, with a wide

Figure 6. **Progressivity of unemployment benefits net of taxes**
Measured by the difference in net replacement rates between low and high income earners[1]
2009, initial phase of unemployment



1. Progressivity is defined as the difference in the net replacement rate for low and high earners defined as having earnings equal to 67 and 150% of the average wage. The larger the difference, the more progressive are unemployment benefits. Countries are ordered from the smallest to the largest values in progressivity for a single person with no children. These replacement rates refer to all unemployment benefits and not only to those insurance-based, but no social assistance "top-ups" are included in either the in-work or out-of-work situation. One limitation of this indicator is that it does not take into account the duration of the unemployment spell. In addition, it is based on net replacement rates and thus also reflects the progressivity of personal income taxes (any income taxes payable on unemployment benefits are determined in relation to monthly values, multiplied by 12, even if the maximum benefit duration is shorter than 12 months). Children are aged 4 and 6 and neither childcare benefits nor childcare costs are considered.

Source: OECD, *Tax-Benefit Models*, *www.oecd.org/els/social/workincentives*.

cross-country variation.[14] Unemployment benefits have become slightly more progressive over the past decade, in particular in those countries where they were initially less progressive. In contrast, progressivity has declined in countries where the systems were the most progressive.

Most OECD countries also operate minimum-income programmes as a last-resort safety net (Immervoll, 2010). The benefit level is unrelated to previous income and has thus a considerable redistributive effect. The overall redistributive impact is however difficult to gauge as it depends on how minimum income benefits are combined with other social assistance schemes. For instance, in continental Europe, minimum income programmes often complement other benefits delivering important first-tier safety nets whereas in Australia and New Zealand it represents the main benefit for individuals without income.

2.5. *Family cash benefits are targeted towards low-income groups*

Family cash benefits have a rather strong redistributive impact. Although they account for a rather small share of total cash transfers in most countries, they tend to be more progressive than other transfers.[15] In the mid-2000s, the redistributive impact of family cash benefits was the largest in Ireland, followed by the Netherlands, Australia and Austria, but well below the OECD average in the United States, Switzerland, Portugal, Denmark and Norway. As with other cash benefits, cross-country variations in the redistributive impact reflect differences in the size and progressivity of such benefits. While the majority of

OECD countries implements universal family cash benefits, some rely on income-tested schemes. In addition, child benefits based on the number of children in the household can benefit low-income groups more as these households often have more children, at least in some countries including the United Kingdom (ONS, 2010).

2.6. The redistributive impact of taxes: cross-country differences and driving forces

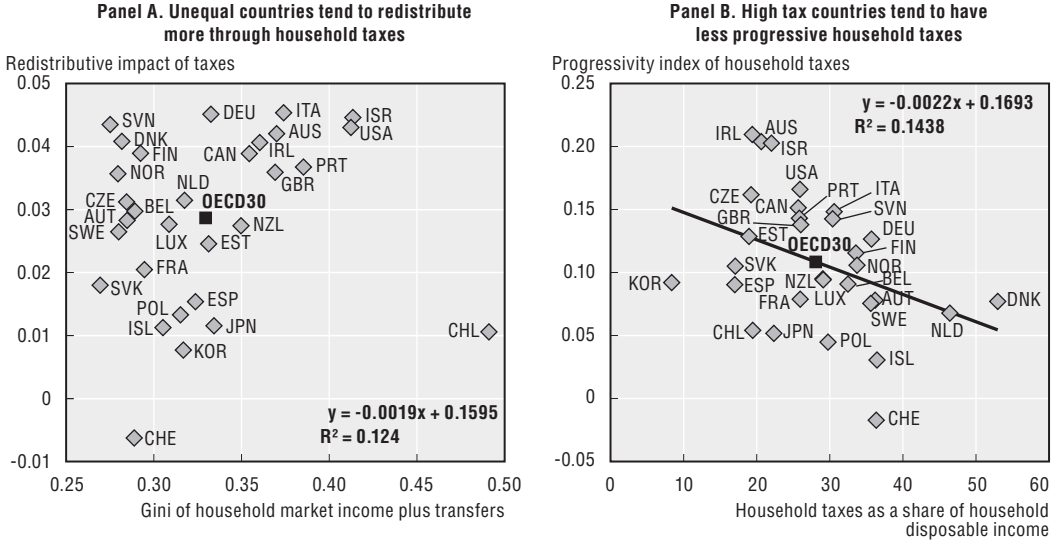
The overall redistributive impact of taxes depends on the amount of taxes collected (size), the tax mix and the progressivity of each tax. Household surveys are useful as they provide actual tax payments including tax relief. But they exclude social security contributions paid by employers and consumption taxes. In addition, household taxes covered by household surveys vary across countries. This section thus includes additional information to assess the redistributive impact of taxes.

2.7. Redistribution via household taxes as gauged by household surveys

The redistributive impact of taxes can be gauged by the difference in the concentration coefficients for income before and after taxes, as derived from household surveys (see the annex). In the late 2000s, the redistributive impact was the highest in Australia, Denmark, Germany, Israel, Italy and the United States (Figure 7, Panel A). It was by far the lowest in Switzerland, followed by Iceland, Korea and Japan. Some of the countries with the highest inequality in market income tend to redistribute more through household taxes than less unequal countries. Australia, Israel, Italy, the United Kingdom and the United States are examples. Chile, however, clearly stands out, having a wide market income dispersion combined with little redistribution *via* the tax system.

Figure 7. **The redistributive impact, size and progressivity of household taxes**

In the late 2000s



Note: The redistributive impact of household taxes is measured as the difference between the concentration coefficient of income after transfers but before taxes and that of disposable income (*i.e.* after taxes and transfers). The progressivity index of household taxes is the Kakwani index computed as the concentration coefficient for taxes less the concentration coefficient for income after transfers and before taxes (see the annex). Data for France and Ireland refer to the mid-2000s. In Panel A, the trend line excludes Chile. Data for Greece, Hungary, Mexico and Turkey are not available.

Source: OECD Income Distribution and Poverty Database.

The redistributive impact of household taxes depends on both their share in disposable income (*i.e.* their size) and their progressivity. The redistributive impact varies little across countries despite large cross-country differences in the size of taxes. As an illustration, household taxes absorbed more than 35% of household disposable income in Austria, Denmark and Sweden in the late 2000s, but their redistributive impact was lower than in Australia, Israel and the United States, all characterised by a much lower tax-to-income ratio. In many high-tax countries, taxes have a relatively low redistributive impact because they embody little progressivity (Figure 7, Panel B) – this is particularly the case in Belgium, Denmark, Iceland and Sweden. And household taxes are more progressive in the United States than in most EU countries.[16] However, some countries (including Chile, Korea and Japan) combine a relatively low tax burden with very little progressivity.

2.7.1. Going beyond household surveys when assessing the redistributive impact of taxes

Assessing the redistributive impact of tax systems based on household surveys has serious limitations. Respondents may not be able and willing to give the correct information.[17] In addition, the data are available for only a few years, which makes it difficult to assess the impact of tax reforms. Furthermore, most household surveys focus on the personal income tax, social security contributions paid by employees and, sometimes, property taxes.[18] They do not therefore take into account consumption taxes, employers' social security contributions and corporate income taxes, thus leaving aside more than 50% of total tax revenues on average across the OECD. This omission creates serious biases since the tax mix varies widely both across countries and over time. In particular, consumption taxes – which are often seen as being regressive (see below) – have declined as a share of total tax revenue in most OECD countries.[19] In 2008 this share ranged from about 15% in Japan and the United States to over 30% in Chile, Denmark, Greece and Poland. The rest of this section will go beyond household surveys to assess the redistributive impact of taxes, by relying on statutory tax schedules and actual tax revenues as well as a literature review.

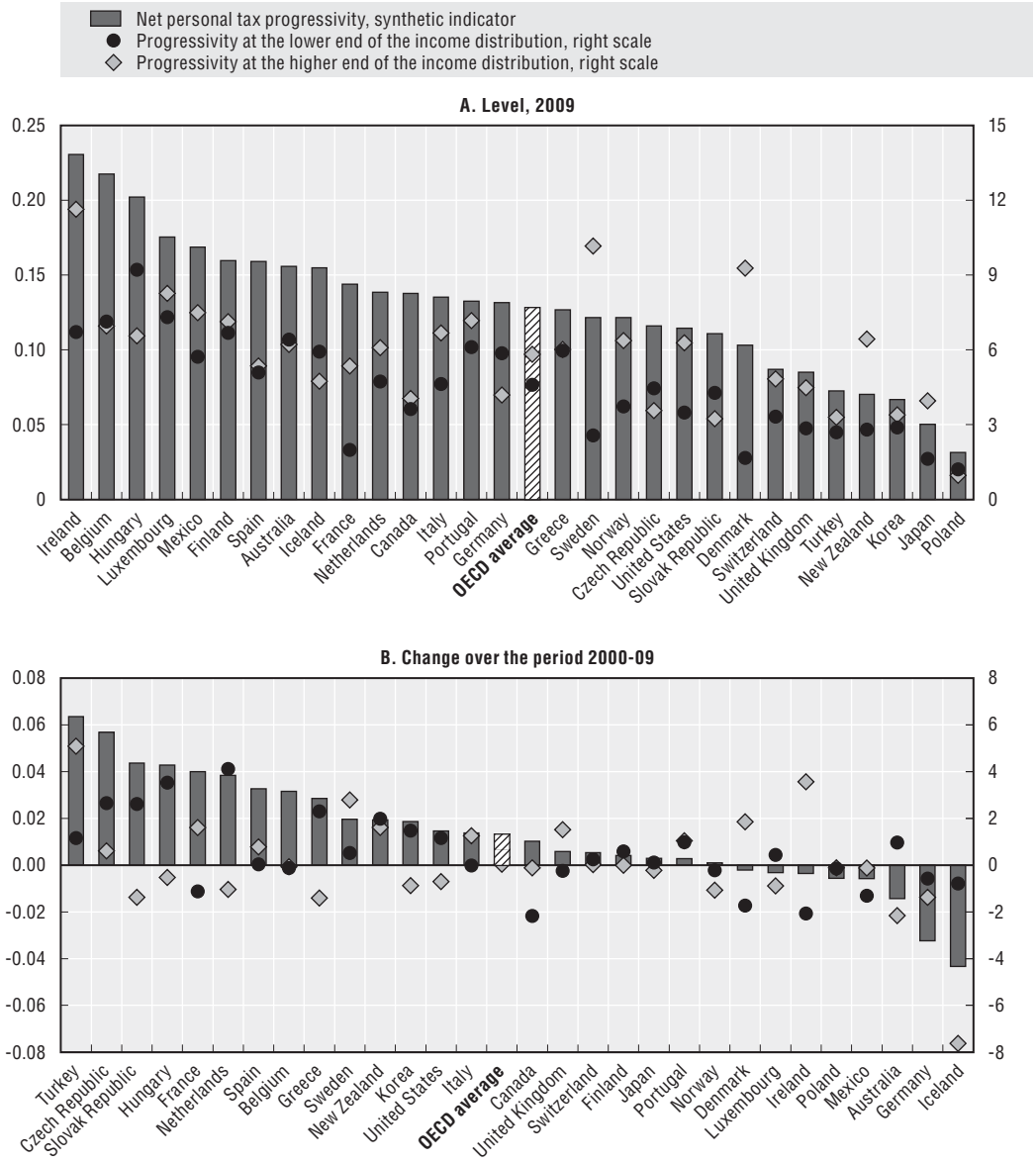
2.8. Labour income taxes: progressivity indicators based on statutory tax schedules

The progressivity of tax systems can also be measured by statutory tax schedules. Compared with those derived from household surveys, such measures have the main advantage of being unaffected by cross-country differences in the definition of household taxes and by differences in responding to household surveys. The OECD has built synthetic indicators of labour income tax progressivity, based on statutory tax schedules, over a wide income range.[20] Focusing on a single wage earner (Figure 8, Panel A) shows that there is wide cross-country variation in the degree of progressivity of statutory schedules for personal income taxes and employees' social security contributions.

Also interesting are the differences in the progressivity structure along the income ladder. Progressivity at the higher end of the income distribution – *i.e.* income equal to 167% of the average wage – is strongest in Ireland, Sweden and Denmark. At the lower end of the income distribution – *i.e.* income equal to 67% of the average wage – tax schedule progressivity is highest in Hungary, Luxembourg and Belgium. The US tax schedule has slightly more progressivity at the upper end but its overall progressivity is below the OECD average – at least for single wage earners – while Japan and Korea have very little progressivity embedded in their tax schedule for labour income.[21]

Figure 8. **Progressivity of statutory personal income tax and employee social security contribution schedules**

Based on statutory tax schedules for single tax payers without children



Note: Net personal income tax is defined as the sum of personal income tax and employee social security contributions net of standard cash transfers. Standard tax relief measures – including those linked to marital and family status and income level – are accounted for. Non-standard tax relief measures, *i.e.* those determined by reference to actual expenses incurred (such as the amount of interest paid on loans), are not included. The synthetic indicator for net personal tax progressivity presented here is not a Kakwani index. It is calculated as the difference between the average net personal tax rate at two income levels based on the assumption of a similar income dispersion across OECD countries. This difference is then divided by the change in income level. Progressivity at the lower end (respectively higher end) of the income distribution is computed as the difference in personal income tax rates (personal income tax and employee social security contributions expressed as a per cent of gross wage earnings) between the average wage and 67% of the average wage (respectively between 167% of the average wage and the average wage).

Source: OECD (2008b), *Taxing Wages 2008-2009* and OECD estimates.

2.8.1. Despite cuts in top marginal rates, labour taxes have often become more progressive

Statutory tax schedules can also be used to assess changes in progressivity over time. Personal income tax schedules have generally become flatter over the past decades (Piketty and Saez, 2007; Sabirianova Peter *et al.*, 2008). Top marginal rates have declined in the vast majority of the OECD countries since 2000, by more than 10 percentage points in Belgium, the Czech Republic, France, Mexico and the Slovak Republic (Table 1). In addition, the income thresholds from which these top marginal rates apply have been raised in some countries including Australia, Canada, Germany and the United States. Finally, cross-country variation in top rate thresholds is wide: the top rate applies to those earning the average wage in Denmark while in the United States it applies only to those earning about 10 times the average wage.

Despite cuts in top rates, tax schedule progressivity has increased in a majority of OECD countries since 2000, largely driven by changes at the lower end of the income distribution (Figure 8, Panel B). To make work more attractive for spouses and low-paid workers, many countries (including Belgium, Canada, Finland, France, the Netherlands, the Slovak Republic, Sweden, the United Kingdom and the United States) have introduced or strengthened in-work benefits targeted at low-income groups, thereby incidentally increasing the progressivity of the personal income tax. Several countries (including Austria, Finland, Germany, Italy and the Slovak Republic) have also raised the tax-free allowance[22] or made social security contributions less regressive by removing or raising social security contribution caps or floors (for instance, France and the United States).[23] In parallel, partial or total exemptions for social security contributions below a given income threshold have been introduced or made more generous in some European countries (including Austria, Belgium, France, Spain and the United Kingdom) to reduce the cost of labour for low-paid workers.

2.9. The progressivity of the personal income tax is often hollowed out by tax expenditures

The use of tax expenditures has been growing in many OECD countries (OECD, 2010e) and their value tends to increase with income. With the main exception of earned-income tax credits targeted at low income groups, the value of tax reliefs often increases for higher tax brackets, because the income or transaction targeted is most commonly used by higher-income individuals.[24] Tax breaks for health and child care, education, owner-occupied housing and retirement savings often fall into this category. Regarding the latter, Antolin *et al.* (2004) confirm that in Canada, the United Kingdom and the United States voluntary tax-favoured retirement schemes benefit disproportionately upper income individuals. Overall, tax expenditure can thus reduce the progressivity of the personal income tax significantly. Landais *et al.* (2011) further show that, in France, tax expenditures result in a decline of the effective personal income tax rate beyond an income threshold.

Only the United States provides much information on who benefits from tax expenditures. There, tax expenditures pertaining to the personal income tax clearly raise after-tax incomes more for higher-income than lower-income taxpayers (Burman *et al.*, 2008). More than 90% of the savings from preferential tax rates on long-term capital gains and qualified dividends go to taxpayers in the top quintile of the income distribution, and nearly half of the benefits go to people in the top 0.1% (Williams, 2011). Concerning health care related tax expenditure (1.3% of GDP), Toder *et al.* (2009) estimated that more than 40%

of the implicit subsidy accrues to the 20% richest households. Likewise, almost 70% of the implicit subsidy associated with the deductibility of mortgage interest on owner-occupied homes benefits the top income quintile.[25]

Table 1. **Top personal income tax rates and thresholds**

	Top statutory income tax rate (%)[1]			Threshold (multiple of the average wage)[2]		
	2000	2009	Change 2000 to 2009	2000	2009	Change 2000 to 2009
Australia	48.5	46.5	–2.0	1.2	2.8	1.6
Austria	50.0	50.0	0.0	2.3	2.1	–0.2
Belgium	63.9	53.7	–10.2	1.2	1.1	–0.1
Canada	46.4	46.4	0.0	1.7	2.9	1.2
Czech Republic	32.0	15.0	–17.0	2.4	0.4	–2.0
Denmark	59.7	51.6	–8.1	1.0	1.0	0.0
Finland	55.2	49.1	–6.1	2.1	1.8	–0.3
France	58.3	47.8	–10.5	2.9	2.8	–0.1
Germany	53.8	47.5	–6.3	1.7	6.2	4.5
Greece	45.0	40.0	–5.0	3.8	3.6	–0.2
Hungary	40.0	36.0	–4.0	0.9	0.8	–0.1
Iceland	45.4	37.2	–8.2	1.5	0.3	–1.2
Ireland	44.0	41.0	–3.0	1.0	0.9	–0.1
Italy	46.4	44.9	–1.5	3.9	3.2	–0.7
Japan	50.0	50.0	0.0	4.5	4.6	0.1
Korea	44.0	38.5	–5.5	5.5	3.2	–2.3
Luxembourg	47.2	38.9	–8.3	2.1	1.0	–1.1
Mexico[3]	40.0	28.0	–12.0	49.3	4.7	–44.6
Netherlands	60.0	52.0	–8.0	1.6	1.2	–0.4
New Zealand	39.0	38.0	–1.0	1.7	1.5	–0.2
Norway	47.5	40.0	–7.5	2.6	1.6	–1.0
Poland	40.0	32.0	–8.0	3.3	2.8	–0.5
Portugal	40.0	42.0	2.0	3.4	4.3	0.9
Slovak Republic	35.0	19.0	–16.0	3.2	0.5	–2.7
Spain	48.0	43.0	–5.0	4.4	2.4	–2.0
Sweden	55.4	56.5	1.1	1.5	1.5	0.0
Switzerland	43.2	41.7	–1.6	4.0	3.6	–0.4
Turkey	35.6	35.6	0.0	8.1	3.0	–5.1
United Kingdom	40.0	40.0	0.0	1.4	1.3	–0.1
United States	46.7	41.9	–4.8	8.9	9.6	0.7
OECD average	46.7	41.5	–5.2	2.9	2.5	–0.4
Standard deviation	7.9	9.3	1.5	2.0	2.0	0.0

1. These are the top statutory tax rates (combined central and sub-central) that apply from the threshold levels reported in the fourth and fifth columns.
2. These columns report the level of gross wage earnings (expressed as a multiple of the average wage) at which the top personal income tax rate starts to apply. The average and dispersion exclude Mexico.
3. The threshold figure for Mexico in 2000 reflects a tax schedule with two supplementary brackets designed to tax very high earners more heavily. These supplementary brackets were removed in 2002, resulting in the threshold of the upper bracket coming down sharply as a proportion of average earnings.

Source: OECD (2009), *OECD Tax Database*.

2.10. Taxes on capital income have been reduced and are often lower than taxes on labour income

Various savings schemes have long been granted a preferential tax treatment in most OECD countries. Since capital income tends to be concentrated in upper income brackets, such tax relief implies less progressivity of the income tax. Governments promote private

pensions by means of tax incentives in the majority of OECD countries. In the most common regime, private pension savings can be deducted from the income tax base and accrued return on investment is exempt from taxation, but pension benefits arising from these savings are taxed (Yoo and de Serres, 2004). Housing investment also often benefits from a favourable tax treatment with imputed income from owner-occupied dwellings and capital gains on the sale of a principal residence taxed less than other capital income, or not taxed at all, while interest payments on debt-financed investment in owner-occupied housing are sometimes deductible from taxable personal income. These tax-favoured schemes, however, tend to affect the mix, rather than the volume, of private savings. They may thus divert saving and investment away from other activities that may be more conducive to growth.

The low taxation, if any, of capital gains on shares also has important distributional consequences, though its impact on growth is subject to debate. It is often argued that a lower tax rate on capital gains encourages risk-taking and entrepreneurship, thus promoting growth, while high capital gains taxes create an inefficient "lock-in" effect. Burman and Moynihan (2011) show that 94% of the value of capital gains tax breaks in the United States benefit the top quintile. They consider that, since losses are often supported by the government (in the form of reduced taxes), capital gains should be taxed. They also argue that the lock-in effect is small. Because it is often difficult to distinguish between labour and capital income, in particular for the self-employed, low taxation of capital income further creates opportunities for income-shifting and tax planning (Diamond and Saez, 2011). And it may ultimately favour top income groups most (top executives, finance professionals and entrepreneurs), who can benefit from carried interest arrangements and the low taxation of stock options (OECD, 2011a).[26]

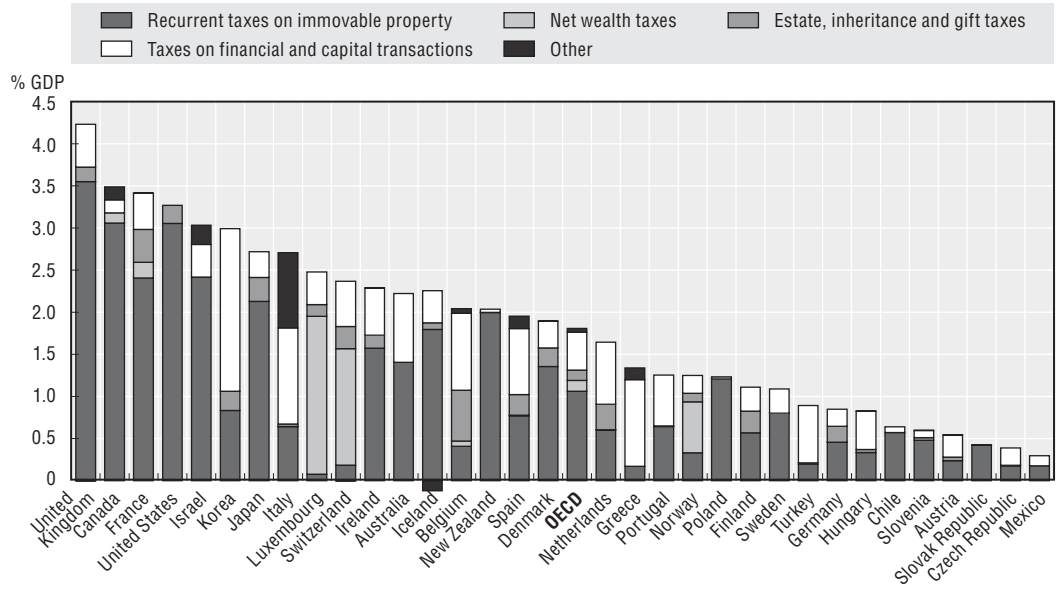
Some countries have moved further towards a non-progressive and reduced taxation of most capital income, in particular in Europe. The main objective of such reform is to reduce tax distortions across savings instruments and incentives for capital exports. Precursors were the Nordic countries which adopted a dual income tax system in the late 1980s or early 1990s. Under such a system, a unique flat tax rate applies to net capital income (interest income, dividends and capital gains) while labour income is subject to a progressive tax schedule. Many countries have not adopted a "pure" dual income tax system but they increasingly tax interest income at flat rates, usually lower than the marginal rates which apply on labour income (Joumard, 2001). In contrast, several countries have continued to tax most types of capital income as labour income, *i.e.* at progressive rates, including Canada, Ireland, Korea, Luxembourg, Switzerland, Turkey, the United Kingdom and the United States (OECD, 2006).

2.11. Property taxes play a minor role in many OECD countries

Raising property taxes is often presented as one option to increase the redistributive impact of tax systems. Property taxes amount to more than 10% of total tax receipts in several OECD countries and about 2% of GDP on average across the OECD. As a share of GDP, they are highest in the United Kingdom, Canada, France and the United States and lowest in several continental European countries and Mexico (Figure 9). Recurrent taxes on immovable property account for the bulk in most countries though taxes on financial and capital transactions play a dominant role in Belgium, Greece, Korea, Italy and Turkey.

Figure 9. **The property tax take varies significantly across OECD countries**

2009, per cent of GDP



Source: OECD (2010c), *Revenue Statistics 2010*.

2.11.1. Real-estate taxes are regressive in some countries

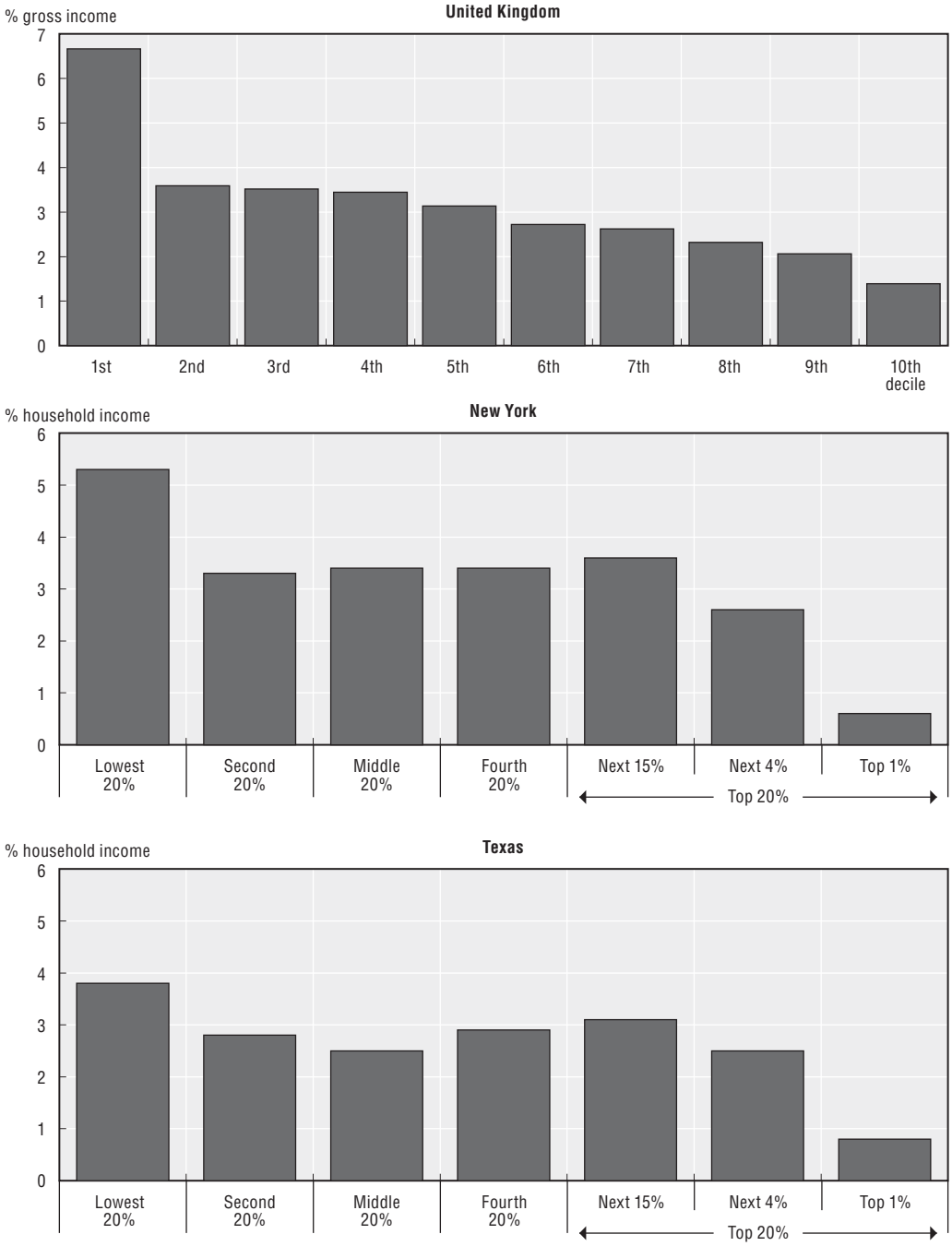
While high-income households pay more recurrent taxes on immovable property in absolute terms, real estate taxes often absorb a larger share of the income of the poorer households. In the United Kingdom, for instance, the Council Tax amounts to over 6% of income for non-retired households in the bottom decile, but less than 2% for those in the top decile (Figure 10). A similar pattern is found in Canada (Chawla and Wannel, 2003) and in the United States (Davis *et al.*, 2009). One explanation is that recurrent taxes on immovable property are often a sub-national government tax whose amount should reflect the benefit of local public services (waste collection, etc.) which does not increase much with income. In some countries, real estate taxes are also paid by renters, who often have low income. Part of the regressive nature of real estate taxes may also reflect the fact that many pensioners own expensive houses but receive relatively little income. Still, Palameta and Macredie (2005) found that this is only part of the story in Canada, since non-seniors make up the majority of lower-income homeowners.

Some countries have introduced tax allowances, income-conditional exemptions or progressive tax rates to reduce real estate tax payments on low-income groups. For instance, regressivity is mitigated in some US states by a flat dollar amount exemption – *e.g.* homestead exemptions – or a tax credit designed to assist low-income taxpayers. Similar tax relief is provided by some Canadian provinces and municipalities. And in France, generous income- and family-related tax relief has succeeded in making the largest recurrent tax on immovable property (*Taxe d'habitation*) slightly progressive since 2000, at least for the first part of the income distribution (Conseil des Prélèvements Obligatoires, 2011; Marical, 2009).[27]

2.11.2. Wealth, inheritance and gift taxes have been reduced in many countries

Taxing household wealth, either annually or at the time of transfer (gift and inheritance), is attractive for various reasons. *First*, the tax base is large and had grown

Figure 10. **Real estate taxes tend to be regressive in the United Kingdom and selected US states**



Note: Data for the United Kingdom refer to the Council tax and Northern Ireland rates, less discounts, Council tax benefits and rate rebates, for non-retired households for the fiscal year 2009/10. They are expressed as a percentage of gross income (market income *plus* transfers). The data for New York and Texas cover property taxes – property primarily includes homes, but may include property other than real estate such as cars – paid by non-elderly households in 2007. The states of New York and Texas were chosen as examples for the United States to represent states with above average (New York) and below average (Texas) property values. In New York State, there is no general homestead exemption for all home-owners, but homeowners with income below $500 000 are entitled to a partial school tax exemption. In Texas, there is a basic homestead exemption available to all homeowners.

Source: ONS (2011), *The Effects of Taxes and Benefits on Household Income*, 2009/10, *www.ons.gov.uk/ons/rel/ household-income/the-effects-of-taxes-and-benefits-on-household-income/2009-2010/the-effects-of-taxes-and-benefits-on-household-income-2009-10.pdf*; ITEP (2009), *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States,www.itepnet.org/whopays3.pdf*.

briskly prior to the crisis. As an illustration, households' net worth in France is five times higher than GDP and it has grown over 7% on average per year and in real terms between 1997 and 2007, compared with a 1.7% average annual increase for GDP (Conseil des Prélèvements Obligatoires, 2011). Taxing wealth at a rather low rate should thus generate large and rising tax revenues. *Second*, real estate accounts for a large share of household net worth (Fredriksen, 2011) and the tax can thus hardly be avoided. *Third*, inheritance and gift taxes, not only on immovable property but on all net assets, could offer an alternative to the taxation of lifelong saving. It could be considered as a way of taxing, for example, income or capital gains that were tax-exempt during a person's lifetime. Inheritance taxes have the advantage of generating less distortion than annual wealth taxes because it is more difficult to find ways of avoiding the tax.[28] Several countries, including the United States, have made inheritance and gift taxes highly progressive by providing tax-free allowances and by applying progressive rates.[29] *Finally*, wealth is more concentrated than income and is becoming more unequally distributed. In the seven OECD countries covered by the Luxembourg Wealth Study, the 10% richest households hold between 40% (Italy) and 70% (United States) of total wealth. And the value of inheritances and gifts as a share of GDP has grown rapidly in some countries – it has risen three-fold since 1950 to reach almost 15% in 2008 in France (Piketty, 2010) – perpetuating income inequality.

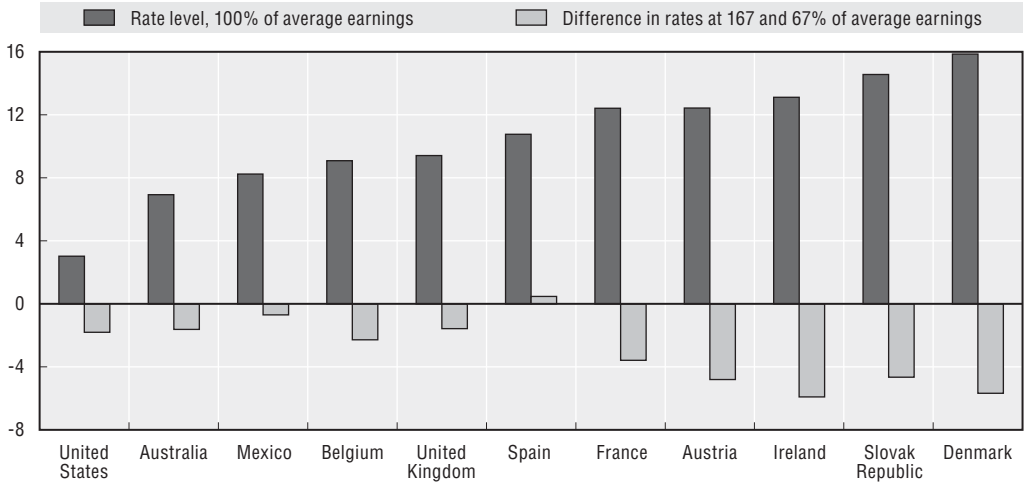
In practice, however, the use of wealth and inheritance taxes has declined. Wealth taxes have been abolished in about a third of the OECD countries since the mid-1990s and several countries (including the United Kingdom) never had this type of tax.[30] In 2010, only four OECD countries (Canada, France, Norway and Switzerland) still imposed wealth taxes (Price and Dang, 2011) and wealth taxes often apply only to a very small fraction of the population. Inheritance and gift taxes are applied rather widely but several countries have reduced or abolished them since the mid-1990s (including Austria, France, New Zealand, Portugal, Slovak Republic and Sweden). The risk of wealth/capital flight to low-tax countries, as well as administrative and collection costs, have often been cited as the main reasons for the limited use of wealth taxes.[31] It could also be argued that wealth and inheritance taxes entail a double taxation of immovable property, since real estate taxes may already be high, while financial wealth is too mobile to be taxed. However, real estate taxes often finance local services that benefit local populations and businesses. The double-taxation argument has thus a weak basis.

2.12. Consumption taxes tend to be regressive

Consumption taxes account for a significant revenue share in all OECD countries (about 27% on average) and tend to decline as a share of household disposable income since lower-income households tend to consume a larger share of their income (Prasad and Deng, 2009; Roach, 2003; Warren, 2008). As an illustration, in the United Kingdom, indirect taxes amounted to 13% of household gross income in 2008 (defined as market income plus cash benefits) but to over 25% for the lowest quintile and less than 10% for the top quintile (ONS, 2010).[32] Likewise, in the United States, sales and excise taxes levied by states are found to be highly regressive. Poor families pay almost eight times more as a share of their income than the best-off families (Davis *et al.*, 2009). It should be noted, however, that calculations based on annual income data may overstate the regressive nature of consumption taxes since consumption largely depends on lifetime income which is less variable than annual household income (Poterba, 1989). In particular, pensioners with low annual income may consume out of their previous (accumulated) earnings.[33]

A lack of data makes it difficult to investigate the redistributive impact of consumption taxes in a cross-country setting. Implicit consumption tax rates can, however, be used to derive estimates (OECD, 2008b). They suggest that the regressive impact of consumption taxes – as measured by the difference in the implicit consumption tax rate for those at 167% of average earnings and those at 67% – is higher in the European countries than in the other OECD countries, due to higher consumption tax rates (Figure 11).[34] Warren (2008) also found a higher regressivity of consumption taxes – measured as the contribution to the Gini coefficient – in Denmark, Finland, Hungary, Norway and Sweden and the lowest regressivity in Japan and the United States. Thus, omitting consumption taxes affects estimates of redistribution achieved through the tax and transfer system, as well as how they differ across countries and evolve over time.

Figure 11. **Average consumption tax rate at different income levels**



Note: Average consumption tax rates are estimated by using microdata on consumption patterns available from household budget surveys and the corresponding tax rates (VAT, sales taxes and excise duties) in order to calculate the tax payments for each individual/family by income level. Estimated tax payments are then divided by net income (*i.e.* gross earnings *minus* personal income tax and employees' social security contributions *plus* family benefits).
1. OECD (2008b), *Taxing Wages*, 2007-2008.

To mitigate the regressive impact of consumption taxes, many OECD countries apply reduced rates and exemptions for goods and services deemed to account for a large share of poorer households' consumption basket. For instance, food, water supply, medical care and public transport are often granted reduced rates or exemptions.[35] This approach typically implies a considerable dead-weight loss, and people at higher income levels often benefit more in absolute terms since they consume more. In the case of Mexico, the total implicit subsidy due to the zero-rating of food was estimated at some 1.8% of GDP in the mid-1990s (Dalsgaard, 2000). The distribution by income decile showed that the highest decile captured nearly 30% of this amount, while the lowest three deciles together received only 12% of the value of the subsidy. Likewise in the Czech Republic, the lower VAT rate covers about 41% of the consumption of goods and services subject to VAT, and there is only very little variation in the share of such goods in the consumption baskets of households across the income deciles. Reduced VAT rates benefit the average individual in the top income decile about 2.5 times as much as the average consumer in the bottom

decile (OECD, 2010b). Moving towards better targeted aid through in-kind benefits, cash transfers and vouchers appears thus as a more effective redistribution tool (EC, 2007; Van den Noord and Heady, 2001).

2.13. A limitation of the analysis: the incidence of taxes and transfers

When assessing the impact of the tax and transfer system on income distribution, most analyses (including this article), assume that taxes and transfers do not affect economic behaviour. The assumption of "no behavioural response" is likely to overstate the amount of redistribution as taxes and transfers typically affect incentives to work and save (Moffit, 2011). It also entails that the efficiency costs of redistributive policies – *e.g.* output foregone and lower real wages – are not accounted for. The ultimate incidence of taxes and transfers crucially depends on how individuals and firms respond to a change in relative prices. The greater the responsiveness, that is, the higher the price elasticities of supply and demand, the more likely it is that someone else will bear the tax burden or somebody else will benefit from a transfer. The ultimate effect will depend on the relative size of the elasticities. For instance, if labour demand is more sensitive to wages than labour supply, then payroll taxes end up being mainly borne by the employee in the form of a lower wage. Conversely, if labour supply is relatively inelastic and labour demand is relatively elastic, then the enterprise will bear more of the tax burden.

Changes in tax progressivity may have a different impact on the labour supply of low- *versus* high-income earners. For low-income groups, more progressivity through earned income tax credit (EITC) schemes increases work incentives but the resulting increase in labour supply may reduce wages – the EITC may increase the dispersion of before-tax income.[36] However, for high-income groups, more progressive taxes may dampen work incentives and lower working hours. This could narrow the earnings dispersion. Taxes may also affect labour demand, with potential job losses more likely to affect low-skilled workers.[37]

The incidence and ultimate income inequality effect of property taxes, housing transfers and consumption taxes may also differ from the first-round effect. While most property taxes are paid by owners, they may largely be passed onto renters in the form of higher rents as the supply of housing is relatively inelastic, at least in the short term. Similarly, housing cash transfers targeted on low-income groups may be reflected in higher rents, in which case they benefit the (higher-income) owners.[38] Consumption taxes will be paid by consumers in the case of strong competition. However, the degree of competition could differ for different goods and services. As an example, recent cuts in French consumption taxes on restaurants have not been fully passed on to consumers. They have partly financed higher wages and employment as well as raised profit margins. These examples suggest that the overall distributional impact of taxes may partly depend on behavioural responses.

3. Tax and cash transfer policy indicators help identify types of welfare systems

Countries rely on various tax and transfers instruments which differ in their design and impact on the income distribution. As discussed above, there are wide variations in the size, mix and progressivity of both taxes levied on and cash transfers paid to households. Indicators on tax and transfer policies have been assembled, which were brought together in country profiles. The country profiles put the tax and transfer policy framework into an

international perspective and allow the identification of reform options to address income inequality. Indicators on tax and transfers policies have also been used to identify groups of countries sharing broadly comparable welfare systems.

3.1. A set of policy indicators on taxes and cash transfers for each OECD country

The redistributive impact of taxes depends on: *i)* a size effect (the overall tax level); *ii)* the tax mix (some taxes are more progressive than others) and *iii)* the progressivity of each tax. The same logic applies to cash transfers. For both taxes and transfers, policy indicators have been assembled for each of these three dimensions using the *OECD Income Distribution and Poverty Database* and various other OECD databases. To identify the tax and transfer policy framework, the country profiles show for each country the value of each indicator compared with the OECD average. As an illustration, the main features that can be gleaned from the set of policy indicators for Australia and Germany are presented below (Figure 12), with a similar presentation for all OECD countries available in Joumard *et al.* (2012). The redistributive impact of taxes and transfers is higher than the OECD average in the two countries but the size, mix and progressive nature of both taxes and transfers differ significantly.

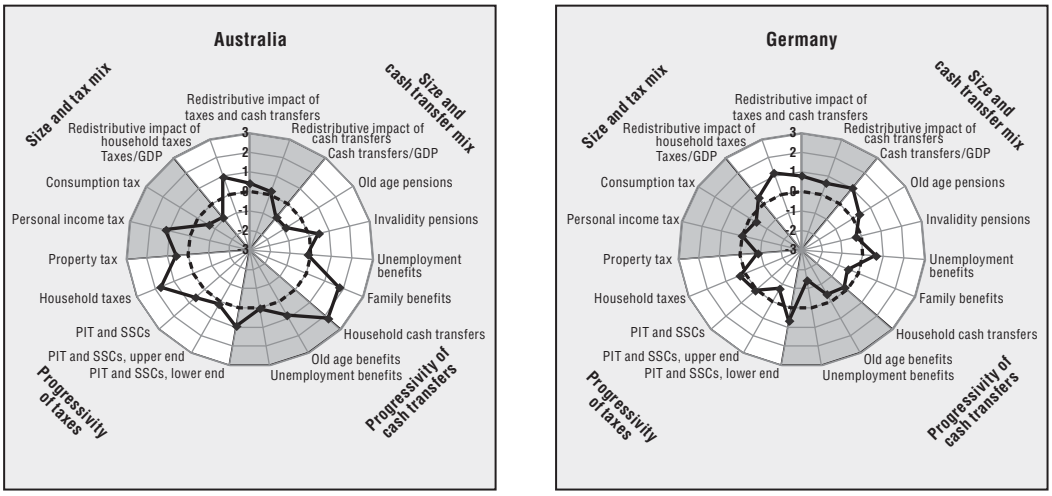
3.1.1. In Australia, taxes and transfers are smaller but more progressive than the OECD average

The redistributive impact of taxes and cash transfers is above the OECD average in Australia. This mainly reflects the higher redistributive impact of taxes, even though the size of the Australian tax system, as measured by the tax to GDP ratio, is considerably below the OECD average (27% and 35%, respectively in 2008). Both the tax mix and the progressive nature of taxes raise the redistributive impact of taxes. Personal income taxes account for a larger share of total taxes, while consumption taxes – which, as discussed above, tend to be regressive – play a less important role than in many other OECD countries. The data contained in the *OECD Income Distribution and Poverty Database* further reveal that household taxes are more progressive – as measured by a Kakwani index – than in the OECD on average. So are the personal income tax and social security contributions paid by employees (based on statutory tax schedules from the *OECD Tax Database*), in particular at the lower end of the income distribution. On the spending side, household cash transfers as a share of GDP are below the OECD average – 8% *versus* 11.5% in 2007 according to the *OECD Social Expenditure Database*. However, the transfer mix favours redistribution across individuals, with family benefits accounting for a relatively high share of total transfers. The progressivity of total cash transfers to households (as measured by the Kakwani index derived from the *OECD Income Distribution and Poverty Database*) is also above the OECD average. This also applies to old-age pensions (based on the OECD progressivity indicator), while the progressivity indicator for the unemployment benefit system is close to the OECD average.

3.1.2. In Germany, taxes and transfers are larger but less progressive than the OECD average

The redistributive impact of taxes and cash transfers in Germany is above the OECD average. On the tax side, the total tax-to-GDP ratio stands above the OECD average (37% and 35%, respectively, in 2008) while the progressivity of household taxes is close to the OECD average. However, the progressivity of the personal income tax and social security contributions is steeper at the lower end than at the upper end of the income distribution.

Figure 12. **Tax and cash transfer policy indicators for Australia and Germany**



Note: The dotted line represents the OECD average, the solid line represents the country shown. Where the solid line falls inside the OECD average, the variable considered stands below the OECD average. For instance, the tax/GDP ratio in Australia is lower than in the OECD area. Inversely, where the solid line is outside the OECD average, the variable is above the OECD average (the cash transfer/GDP ratio in Germany is higher than the OECD average, for example). The indicators are presented in units of standard deviation.

Legend:

Size and mix of taxes:

Taxes/GDP = Total tax revenue, % of GDP.

Consumption tax = Taxes on goods and services, % of total tax revenue.

Personal income tax = Income taxes on individuals or households, % of total tax revenue.

Property tax = Taxes on property, % of total tax revenue.

Progressivity of taxes:

Household taxes = Progressivity of total household taxes (Kakwani index, based on household surveys).

PIT and SSCs = Net personal income tax progressivity, synthetic indicator, based on income tax plus employee contribution schedules net of standard cash transfers as a % of gross wage earnings, single person without children.

PIT and SSCs, upper end = As above, gap in tax rate between those earning 167% of the average wage and those at the average wage.

PIT and SSCs, lower end = As above, gap in tax rate between those earning the average wage and those at 67% of the average wage.

Size and mix of cash transfers:

Cash transfers/GDP = Total cash transfers, public and mandatory private sources, % of GDP.

Old age pensions = Old age and survivors' pensions, % of total cash transfers.

Invalidity pensions = Incapacity related cash transfers, % of total cash transfers.

Unemployment benefits = Unemployment cash benefits, % of total cash transfers.

Family benefits = Family cash benefits, % of total cash transfers.

Progressivity of cash transfers:

Household cash transfers = Progressivity of total household cash transfers (Kakwani index, based on household surveys).

Old age benefits = Progressivity of pensions.

Unemployment benefits = Progressivity of unemployment benefits, net of taxes for a single person.

Total cash transfers to households, at almost 16% of GDP in 2007, are higher than in most OECD countries. Old-age pensions and unemployment benefits account for a larger share in total transfers, while family benefits are less important. The redistributive impact of household transfers is small, because of the low progressivity of the two main transfer components – old-age pensions and unemployment – reflecting their largely insurance-based nature.

3.2. Four tax and transfer systems can be identified

A cluster analysis of 19 policy indicators of the size, mix and progressivity of both taxes and transfers has been performed.[39] It allows identifying four groups of countries with most similar tax and transfer systems:[40]

- A group of four Nordic countries (Denmark, Finland, Norway and Sweden) plus Belgium, Hungary, the Netherlands and Spain is characterised by large cash transfers to households, which are not dominated by old-age pensions and tend to be more progressive than the OECD average. The tax-to-GDP ratio is high (Spain being an exception in this regard), with a tax mix which promotes redistribution – a rather large role for personal income taxes, while consumption taxes account for a small share of total taxes. Labour income taxes are rather progressive. Overall, the redistributive impact of taxes and transfers – as measured by the decline in the concentration coefficient before and after taxes and transfers – is above the OECD average in all of these countries except Spain.
- A group of 10 continental European countries (Austria, Czech Republic, France, Germany, Greece, Italy, Luxembourg, Portugal, Slovak Republic and Slovenia) features large cash transfers to households and a high tax-to-GDP ratio. However, old-age pensions dominate cash transfers whose overall progressivity tends to be below the OECD average – the welfare system is dominated by transfers that redistribute over the lifecycle rather than across individuals. On the tax side, the personal income tax often plays a marginal role in total taxes (Germany and Italy are exceptions) and the progressivity of labour tax schedules is relatively limited.
- A group of 11 countries have in common relatively small cash transfers and taxes, combined with a large role of property and personal income taxes. A sub-group, Australia, Iceland, Ireland, Israel, New Zealand and the United Kingdom, is further characterised by a relatively small share of old-age pensions in total cash transfers which are, in addition, often means-tested and thus highly progressive. Another sub-group consists of Canada, Japan, Korea, Switzerland and the United States. In these countries, cash transfers are dominated by old-age pensions and are less progressive than in the first sub-group.
- A group of four countries – Chile, Mexico, Poland and Turkey – is characterised by relatively small cash transfers to households (Poland is an exception), which are dominated by old-age pensions and often not highly progressive. Two additional features further limit the redistributive impact of the welfare system: public spending on in-kind services (mostly education and health) as a share of GDP is low and consumption taxes play a dominant role in total taxes.
- It is interesting to note that there is a close, but not perfect, correspondence between country clusters based on tax and transfer policy indicators and country clusters based on inequality outcomes (Hoeller *et al.*, 2011). As an illustration, the Nordic countries and Switzerland are all characterised by relatively low inequality emerging from the labour market and they appear in the same inequality outcome group. Looking at the tax and transfer side, the Nordic countries again fit within the same group because their tax and transfer policies are broadly similar. However, Switzerland is in a different policy group because it implements much less redistribution via the tax and transfer system than do the Nordic countries.

Notes

1. The household income data used in this article are "equivalised", taking into account the size of each household type in the population and assigning a value in proportion to its needs. This equivalence adjustment uses a scale which divides household income by the square root of the household size.
2. It should be noted that two populations may have the same Gini but still be characterised by different income distributions, *e.g.* when the share of different quantile groups are examined. These considerations also apply to concentration coefficients and to indicators used to measure the redistributive impact of taxes and transfers, especially as these tend to operate more strongly at the top and bottom of the income distribution, respectively.
3. The *OECD Income Distribution and Poverty Database* relies on household income surveys carried out by national experts who apply common conventions and definitions, thus enhancing cross-country comparability. In the OECD database, however, income data for Greece, Hungary, Mexico and Turkey are presented net of taxes, and data on household taxes are not available. Data from household surveys face other limitations, discussed in Joumard *et al.* (2012).
4. When assessing the redistributive impact of taxes and transfers, most analyses (including this paper) assume that taxes and transfers do not affect economic behaviour. Incidence issues are discussed at the end of this section.
5. Looking at the working age population yields broadly the same message.
6. In the *OECD Income Distribution and Poverty Database*, the Earned Income Tax Credit is booked as a transfer.
7. As an example, social transfers targeted at low-income groups in France – the minimum income (RMI/RSA) and minimum pensions – are only adjusted for price inflation. As the average wage has grown more rapidly than prices over the past decade, the relative income of social transfer recipients has declined substantially, undoing the discretionary measures to improve their generosity (Conseil des Prélèvements Obligatoires, 2011).
8. The high share of pensions received by working age individuals in some countries is attributable to the low effective retirement age. There is a negative correlation between this share and the standard or effective retirement age. The correlation coefficient between them is –0.61 (based on data for the mid-2000s) and is statistically significant at the 1% level.
9. In Sweden, the replacement rates of mandatory pensions are progressive for a large part of the income distribution. The replacement rate declines with income up to a certain income level beyond which it starts to increase. Also, it is worth emphasizing that pension systems with high payments can be characterised by low overall progressivity and *vice versa* as progressivity basically depends on the difference in replacement rates between low- and high-income earners and not on the level of replacement rates.
10. It is worth noting that the pension progressivity index differs from the progressivity indicators used elsewhere in this paper since it focuses on redistribution across individuals.
11. Empirical evidence corroborates this (Garrett, 1995, Goda *et al.*, 2009 for the United States and Hachon, 2009 for France). Hachon (2009) shows that, for sufficiently large differences in mortality rates, insurance-based pension systems can become regressive.
12. In pure flat pension schemes, the replacement rate of benefits decreases monotonically whereas in pure insurance schemes the replacement rate is constant across the earnings distribution. In general, a pension scheme will be more redistributive the larger the difference between the replacement rate of low and high pensions. Although this is a rough progressivity measure, as it does not take into account the inequality in personal earnings, the correlation coefficient between this progressivity measure and the progressivity index used for Figure 6 is 0.85.
13. On average in the OECD, 22% of households with a disabled person receiving benefits live in poverty, compared with around 14% for other households. This gap is especially high in Australia, Ireland, Korea, the United Kingdom and the United States (OECD, 2010d).
14. Progressivity of unemployment benefits also depends on the type of family. For instance, unemployment benefits for a family with children are slightly less progressive than for those without. Long-term unemployment benefits and social assistance for people who have been unemployed for five years or more are, on average, as progressive as those granted during the initial phase of unemployment spells.

15. Family cash benefits do not include public spending on services for families with children (*e.g.* direct financing and subsidising of childcare providers and early education facilities), nor financial support for families provided through the tax system.

16. Various studies have compared the progressivity of tax systems of European countries with that of the United States (see for instance Prasad and Deng, 2009; Piketty and Saez, 2007; Joumard, 2001). Though they use different definitions, methods and databases, they reach the same conclusion: the US tax system is more progressive than those of the continental European countries.

17. After comparing the implied aggregate receipts and other data sources, it has been decided to rely on data for the mid-2000s, instead of those for the late 2000s, for France and Ireland.

18. In OECD (2008a), the data are drawn from household surveys, and household taxes should in principle cover personal income tax, social security contributions paid by employees (but not by employers) and property taxes. In practice, however, the coverage varies from one country to another. Furthermore, the database does not allow a breakdown of these taxes. Coverage also varies significantly across studies. Piketty and Saez (2007) rely on actual tax returns, and include the federal corporate income tax for the United States. Assuming that the incidence of the US federal corporate income tax falls entirely on capital income, they find that the corporate income tax is progressive. With a similar assumption, Roach (2003) reaches the same conclusion but notes that if 25% of corporate taxes are allocated to consumers and another 25% to workers, then the progressivity of corporate taxes virtually disappears. Duncan and Sabirianova Peter (2008) focus on the personal income tax only. Fuest *et al*. (2010) assess the redistributive impact of personal income taxes and social security contributions paid by both employees and employers.

19. Between 1975 and 2008, the share of consumption taxes in total tax revenues dropped from 26 to 22% in Canada, from 32 to 24% in France and from 17 to 14% in the United States.

20. Taxes on labour income consist of personal income taxes, social security contributions paid by employees as well as payroll taxes when relevant. The calculation and coverage of progressivity indices based on tax schedules differ from the Kakwani index presented above. In particular, they include standard cash (mostly family-related) transfers and do not account for non-standard tax reliefs, such as those associated with mortgage interest payments. Drawing international comparisons for single taxpayers without children allows leaving aside most cash transfers to focus mostly on taxes. The correlation between the progressivity index based on tax schedules (for single taxpayers and under the assumption of a similar distribution of income across countries) and the Kakwani progressivity index based on household surveys is 0.58, significant at 5%.

21. Due to the various tax reliefs for low-income earners with children, the US personal income tax is much more progressive for families with children than for single tax payers.

22. The Slovak Republic replaced the progressive personal income tax system by a flat rate system in 2004. However, the basic tax allowance, which declines as income grows, and the refundable tax credit targeted at low-income earners introduced in 2009 reinforce tax progressivity significantly at the lower end of the income distribution.

23. In Denmark, Hungary, Spain and Switzerland, minimum amounts of social security contributions – floors – still have to be paid by employees and/or employers. Caps are in place in many OECD countries.

24. Tax reliefs take different forms, including: *i)* tax allowances and exemptions (amounts are deducted/excluded from the tax base); *ii)* rate relief (a reduced rate of tax applied to a group of taxpayers or transactions); *iii)* tax deferral (a delay in paying the tax); and *iv)* tax credits (amounts deducted from tax liabilities). Standard tax reliefs – including those linked to marital and family status and income – are accounted for in the data on progressivity of personal income taxes and employee social security contributions from *Taxing Wages*. Thus, EITC type tax reliefs are included. Non-standard tax reliefs, *i.e.* reliefs determined by actual expenses incurred (such as the amount of interest paid on loans), are not included.

25. Matsaganis and Flevotomou (2007) used the tax-benefit model EUROMOD to quantify the distributional impact of mortgage interest tax relief in the Netherlands, Sweden, Finland, Italy and Greece. They show that higher-income groups capture a disproportionate share of mortgage interest tax relief in all these countries. The effect is most regressive in the Netherlands and least regressive in Sweden.

26. Individuals may benefit from "carried interest" arrangements when they have a relatively small equity stake in a business. If successful, rewards are taxed as capital gains, hence at a rate that is generally below their marginal personal income tax rate.

27. The Conseil des Prélèvements Obligatoires (2011) also notes that existing taxes on real estate transactions – *Droits de mutation à titre onéreux* – are regressive as they are calculated as the sum of a fixed amount and a percentage of the value of the transaction. The effective tax rate on small transactions is *de facto* much higher and often paid by low-income families.

28. Avoidance is easier when *intervivos* gifts are exempt or pay a lower rate and when business and agricultural assets get favourable treatment (*e.g.* to avoid breaking up family undertakings).

29. Roach (2003) shows that US estate and gift taxes were the most progressive elements of federal taxation because they applied only to large estates/gifts and because rates were progressive.

30. Among the countries that reduced or abolished wealth taxes since the mid-1990s, some have increased the taxation of top incomes (Germany) or capital income (Luxembourg and the Netherlands). Spain introduced a wealth tax in September 2011.

31. In France, about 5 000 individuals paying the wealth tax (ISF) left the country between 1996 and 2005 (Conseil des Prélèvements Obligatoires, 2011).

32. In cash terms, the top fifth of households pay three times as much indirect tax as the bottom fifth. This simply reflects higher expenditure by higher income households. The only indirect taxes where average payments in absolute terms do not vary much across the income distribution are those on.tobacco, television licences and the tax element of the National Lottery.

33. It is worth noting that applying the Kakwani index to define progressivity, in certain countries, depending on the distribution of primary income, the reduced VAT rates would be progressive.

34. Reflecting differences in the level of consumption taxes (standard rates at 5% in Japan and about 7% in the United States, but up to 25% for the standard VAT rate in the Nordic countries), Garfinkel *et al.* (2006) noted that the same hypothetical USD 1 000 cash transfer to low-income households buys more goods in the United States and Japan than in the Nordic countries – more than USD 930 compared with USD 750. Adema and Ladaique (2009) also recognise that consumption taxes reduce the real value of consumption which can be financed out of a given level of benefits. Furthermore, they note that, in some countries, policy explicitly took into account the impact of indirect taxation on the financial position of low-income households. For example, when the Goods and Services Tax was introduced in Australia in July 2000 at a rate of 10% (with food being exempt), a compensation package for social protection benefit recipients was introduced at the same time.

35. For details, see OECD (2011b). Reduced VAT rates and exemptions are taken into account in the OECD estimates of the consumption tax rate at different income levels.

36. Rothstein (2008) found for the United States that the EITC increases labour supply and studied the effect on wages. Low-skilled single mothers keep only $0.70 of every dollar they receive. Employers of low-skilled labour capture $0.72 (of which about 40% from single mothers and the rest from ineligible workers whose after-tax incomes fall). The net transfer to low-skilled workers is about $0.28 per dollar spent.

37. In a perfectly competitive labour market, higher labour taxes should not affect equilibrium unemployment since workers bear the entire tax burden through lower net wages. However, if firms cannot shift the entire tax burden onto workers (for example, because of minimum wages or strong trade unions), higher taxes will reduce labour demand. Several empirical studies support this view (*e.g.* Belot and van Ours, 2004 and Bassanini and Duval, 2006). Also, behavioural responses to changes in capital taxation are particularly problematic in small open economies. If capital is highly mobile across borders, higher capital-income taxes may result in lower capital stock and lower real wages.

38. On the final incidence of property taxes, see Fullerton and Metcalf (2011). On the impact of housing cash benefits on rents paid by low-income groups, see Conseil des Prélèvements Obligatoires (2011) and Facks (2005).

39. The following indicators have been used for the cluster analysis: *i)* for the size – the tax, transfer and in-kind service to GDP ratio; *ii)* for the mix: the shares of old-age pensions, disability, family and unemployment in total transfers; the shares of consumption, personal income and property taxes in total taxes; and the share of education and health in total in-kind transfers *iii)* for the progressivity: *à la Kakwani* progressivity indicator for both total household taxes and total cash transfers and specific progressivity indicators for old-age pensions, unemployment, personal income tax and social security contributions. Estonia has not been included in the cluster analysis because most tax data were missing.

40. Esping-Andersen (1990) proposed a typology of welfare systems consisting of three main regimes: *i)* a "liberal regime" characterised by little public intervention, means-tested benefits and subsidised private welfare, mainly implemented in the English-speaking countries; *ii)* a "socio-democratic regime" with broad social entitlements and universal coverage, largely implemented in the Nordic countries; *iii)* a "conservative welfare regime" built around social insurance where entitlements depend primarily on life-long employment.

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ANNEX

Assessing the redistributive impact of cash transfers and taxes

Various measures can be used to assess the redistributive impact of cash transfers and tax systems. Three are used extensively in this article: the concentration coefficient, the difference in income dispersion before and after redistribution, and a progressivity measure.

The **concentration coefficient for cash transfers** provides an indication of who receives the transfers. It is zero when everyone receives the same transfer. The concentration coefficient is negative when the poor receive more in absolute terms than the rich – *e.g.* when benefits are means-tested – and becomes positive when the rich receive more in absolute terms (*e.g.* old-age pensions). Even in the latter case, there may be redistribution if market income is distributed more unevenly than benefits. Likewise, the **concentration coefficient for taxes** provides an indication of who pays the taxes across the income distribution. If the richest pay most of the taxes, the concentration coefficient will be high. Still, the concentration coefficient for taxes reflects not only the progressivity of the tax system but also the dispersion of pre-tax income. A more unequal country will raise more tax revenues from the wealthy and less from the poor. It will therefore show a higher concentration coefficient even if it features the same tax system as the less unequal country.

The **redistributive impact of cash transfers and taxes** is best measured by the difference in the concentration coefficients for income before and after cash transfers and taxes (Musgrave and Thin, 1948; Norregaard, 1990). It depends on both the size of cash transfers and taxes and their progressivity (Kakwani, 1977 and 1979).

The redistributive impact of cash transfers can be expressed as:

Concentration coefficient of market income *plus* transfers – Concentration coefficient of market income.

It is also equal to:

Size of cash transfers * Progressivity of cash transfers (Kakwani index).

where the size of cash transfers is measured as their share in market income *plus* transfers and the Kakwani index is defined as (Concentration coefficient of cash transfers – Concentration coefficient of market income, *i.e.* before taxes and transfers).

The redistributive impact of taxes can be expressed in the same way:

Concentration coefficient of disposable income – Concentration coefficient of market income plus transfers.

And it is also equal to:

Size of taxes * Progressivity of taxes (Kakwani index)

where the size of taxes is measured as their share in household disposable income and the Kakwani index is defined as (Concentration coefficient of taxes – Concentration coefficient of market income plus transfers).

A tax is considered to be progressive when high-income groups face a higher average tax rate than low-income groups (relative progressivity). In some cases, *e.g.* as regards consumption taxes, high-income groups pay a higher amount of taxes than low-income groups (absolute progressivity) but still face a lower average tax rate. Taxes are then considered as regressive and the Kakwani index becomes negative. Similarly, **cash transfers are considered to be progressive** when they account for a larger share of the low income groups' income. This definition implies that flat cash transfers (*e.g.* a minimum pension for all) are considered to be progressive. And cash transfer programmes which benefit the rich most in absolute terms (*e.g.* subsidies for tertiary studies) are still considered as progressive as long as the share of these transfers in household income is lower for high-income than for low income groups. Joumard *et al.* (2012) provide numerical examples.

In measuring the redistributive impact of taxes and cash transfers, it is assumed in this article that cash transfers are received first and taxes paid afterwards, an approach consistent with OECD (2008a). Indeed, benefits are taxable in many countries. Thus, assessing the redistributive impact of taxes by comparing the concentration coefficient of market income and the concentration coefficient of market income *minus* taxes would distort the picture – the tax system would appear more regressive than it is. However, in some countries benefits are largely set on the basis of after-tax market income. In this case, comparing the concentration coefficients for market income and for market income plus transfers results in a biased measure of the redistributive impact of benefits. In a study of 14 OECD countries (Immervoll and Richardson, 2011), the measurement approach is chosen to reflect, as far as possible, the actual legal sequence implicit in each country's tax and benefit system. In particular, the redistributive impact of taxes is determined by comparing Gini indices of market income and net-of-tax income for Australia, the Czech Republic, Germany, Israel and the United States. This option only partly solves the problem since some of the benefits are taxable in these countries (*e.g.* pensions and unemployment benefits in the United States). Overall, however, a simulation carried out on two countries (France and the United States) suggests that a different sequencing does not alter significantly the estimated redistributive impact of taxes (or transfers).