Indirect taxes and government inequality reduction: A cross-national analysis of the developed world

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This article explores the role of indirect taxes in helping to finance public social transfers in the developed countries, with special attention to the seeming paradox whereby countries whose social benefit programs provide the most inequality reduction tend to finance those programs with the most regressive tax mix. It finds that the share of indirect taxes in a country's GDP and the degree to which market inequality is reduced by public social transfers are positively related, even controlling for other tax types, the share of the population that is elderly and the unemployment rate; that a large indirect tax burden is politically possible because of some combination of fiscal illusion and the fact that indirect taxes do not retard economic growth or investment; and that the high indirect taxes that finance public social transfers are often the product of a political process in which democratic corporatism, institutional structures and union density play key roles. The article concludes with a discussion of the incidence of indirect taxes, finding that their regressive effect is outweighed by the redistribution accomplished by the public social transfers they help to finance.

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1 Introduction

The substantial increase in income inequality in the developed world since about 1980 has moved the topic of government inequality reduction to the forefront of the both the scholarly and policy agendas (see, for example, Piketty, 2014; Hoeller et al., 2014; Gornick & Jäntti, 2013; Stiglitz, 2012; Garfinkel et al., 2010). Certainly, inequality of market income has grown sharply in recent decades: the average Gini index of market income inequality in developed countries for which micro-data are available from the Luxembourg Income Study rose from 0.425 in 1980 to 0.497 in 2013, an increase of 72 Gini points.[1] Inequality of post-government disposable income also rose over this period, but the growth was much smaller: the average Gini index increased from 0.275 to 0.302, a change of only 27 Gini points. The difference is attributable to redistributive taxes and public social transfers, which have substantially – if not completely – kept pace with market inequality. Whether this will continue to be the case, or whether government efforts to reduce inequality will instead run up against increasing fiscal and political constraints, is one of the central questions facing the contemporary developed world.[2]

As might be imagined, a great deal of attention has been devoted to charting and explaining cross-national and over-time variation in the extent and nature of public sector efforts to ameliorate market inequality. One of the most common observations has been that a large and growing share of government inequality reduction has been the result of public social transfers rather than taxes. Across 19 developed countries over the last 30 years, the share of total redistribution resulting from direct taxes averaged only 22.0 percent; the other 78.0 percent was the result of public social transfers. Moreover, while inequality reduction as a result of transfers has steadily increased, reduction resulting from direct taxes has remained stagnant for decades. This trend was noted long ago by Esping-Andersen (1990: 56), who observed that "the role of tax systems has gradually [been] replaced by social transfers as the major weapon for redistribution."

The central claim of this article is that the widespread impression that inequality reduction by way of taxes constitutes a small and shrinking component of the contemporary welfare state is misleading. The reason is that the only taxes examined in the vast majority of empirical work on the topic are those assessed directly on households or individuals, the most important of which are income taxes and social security contributions. There are two reasons for this focus on direct taxes. The first is that personal income taxes, the single most important source of revenue in most developed countries, are almost always progressive: unlike most other taxes, their aim is not only to raise revenue but also to redistribute income, making them a natural focus of those studying government inequality reduction. The second reason is practical: the income surveys that are the basis of nearly all empirical studies on this topic ordinarily do not measure indirect taxes, whose incidence is thus very

difficult to determine.

The argument of this article is that an exclusive focus on direct taxes offers a limited and somewhat distorted picture of the role taxes play in government inequality reduction. The reason is that, even though indirect taxes (the most important of which are value-added, sales and excise taxes) are not themselves progressive – in fact, are almost always regressive – they nonetheless play a critical role in raising the revenue that funds redistributive public social transfers. Without them, the public social transfers that provide the bulk of government redistribution would be much smaller, and overall inequality reduction greatly diminished.

The study seeks to contribute to the comparative literature on the role of indirect taxes in several ways. After a brief overview of the prominence of various taxation modes in OECD countries, the article will review the relatively few empirical studies of government inequality reduction that have focused on indirect taxes. A common theme of these studies is that the countries that provide the greatest inequality reduction by way of public social transfers also tend to have the most regressive tax mix. In exploring this seeming paradox, an empirical analysis will be conducted that explores the relationship between indirect taxes and inequality reduction in more detail and with reference to many more countries and years than has heretofore been the case. In particular, this analysis moves beyond the focus of much previous empirical work on the size of public social transfers by also considering their internal progressiveness, making use of household-level micro-data from the Luxembourg Income Study (LIS). In addition, we will consider the sources of cross-national variation in the share of indirect taxes in GDP in a more systematic way than has commonly been done, considering explanatory traditions that look to people's subjective perceptions of their tax burden, the hypothesized role of indirect taxes in encouraging investment, and the effect of political bargains in which large public social transfers are politically possible only if they are financed by taxes that do not unduly burden the owners of capital. Finally, we will conclude with a discussion of the incidence of indirect taxes, which are almost always regressive but whose regressivity is often reduced by exemptions or lower rates for necessities such as food or medicine.

2 Indirect taxes and the welfare state

The most authoritative source of comparative data on taxes in the developed countries is the OECD's database Revenue Statistics - OECD Member Countries (OECD, 2017). Table 1 lists the share in GDP of 7 major tax types in 19 OECD countries in 2013: indirect taxes on the consumption of goods and services; individual taxes on income, profits and capital gains; corporate taxes on income, profits and capital gains; social security contributions; payroll and workforce taxes; property taxes; and other taxes. Since the focus is on indirect taxes, the countries are listed in that

order.

Table 1: Tax Modes as a Share of GDP, 2013

Country	Indirect Taxes: Taxes on Goods and Services	Taxes on Income, Profits and Capital Gains – Individual	Taxes on Income, Profits and Capital Gains – Corporate	Social Security Contributions	Payroll and Workforce Taxes	Property Taxes	Other Taxes	Total Tax Revenue
Denmark	15.1	25.5	2.8	0.1	0.3	1.8	0.0	46.8
Finland	14.5	12.8	2.4	12.6	0.0	1.3	0.0	43.6
Sweden	13.9	6.0	1.1	10.8	0.0	3.0	0.0	35.6
Greece	12.3	12.2	2.7	10.0	4.6	1.1	0.0	42.9
Iceland	12.1	13.8	2.2	3.7	0.3	2.5	0.6	36.0
Austria	11.7	9.8	2.2	14.6	2.9	0.7	0.2	42.5
Netherlands	11.5	11.6	2.6	13.1	0.0	2.7	2.0	44.0
UK	11.0	9.9	8.3	9.5	0.0	1.2	0.0	39.9
Norway	10.9	6.9	2.2	14.9	0.0	1.2	0.2	36.5
Belgium	10.7	8.7	4.8	11.0	0.0	2.8	0.0	38.1
Germany	10.7	9.0	2.5	6.1	0.0	4.0	0.0	32.5
Luxembourg	10.2	9.5	1.8	13.9	0.0	0.9	0.0	36.4
Ireland	9.5	9.0	2.4	5.0	0.2	2.0	0.0	28.2
Spain	9.4	7.5	2.1	11.5	0.0	2.2	0.4	33.3
Canada	7.9	10.7	4.9	0.0	1.4	2.6	0.0	27.6
Australia	7.1	11.2	3.3	4.7	0.6	3.7	0.0	31.0
Switzerland	6.1	8.4	2.8	6.7	0.0	1.7	0.1	26.9
Japan	5.3	5.8	4.0	12.4	0.0	2.7	0.1	30.3
USA	4.5	9.9	2.1	6.2	0.0	2.9	0.0	25.7
Mean	10.2	10.4	3.0	8.8	0.5	2.2	0.2	35.7

Note: OECD (2017).

As can be seen, three tax types dominate: indirect taxes on goods and services; individual taxes on income, profits and capital gains; and social security contributions. Together these account for an average of 10.2, 10.4 and 8.8 percent of GDP respectively, some five-sixths of the share of GDP accounted for by all taxes. However, the specific tax mixes that comprise these averages vary considerably across countries. Of particular note is that countries with less redistributive welfare states tend also to be at the low end in terms of their reliance on indirect taxes. For example, the United States has the lowest share of indirect taxes in GDP among the 19 countries, followed by Japan, Switzerland, Australia and Canada in that order. At the top of the list are several Nordic countries, Denmark, Finland and Sweden, followed by Greece, Iceland, Austria and the Netherlands. Other countries fall in between.

It is widely recognized that indirect taxes tend to be more regressive than direct taxes (Joumard et al., 2014; Warren, 2008). Because of this, several commentators have noted a "paradox" whereby the countries that accomplish the most inequality reduction by way of public social transfers tend to be the very countries that rely the most on regressive indirect taxes to raise the revenue that makes these transfers possible. One of the earliest scholars to make this point was Steinmo (1993), who begins his comparative study of tax policy in Sweden, Britain and the United States by noting that "for most of the twentieth century both the United States and Britain have had more progressive tax systems than 'socialist' Sweden," (pp. 1-2), but that

Sweden nonetheless accomplished much more government inequality reduction. As he goes on to say, "The key here is that Sweden . . . has been able to build a tax system that generates huge revenues to the state. These revenues translate into public spending . . . and the effects of this spending are substantially more redistributive than steeply progressive taxes" (p. 2).

A more recent study is that of Beramendi and Rueda (2007), who depict a "paradoxical situation" in which redistributive public social transfers tend to be funded by regressive taxes (p. 621). They suggest that "this pattern poses a puzzle for partisanship theory. Social democratic parties are assumed to protect the interests of citizens in the bottom half of the income distribution, and yet they seem to make ample use of a tool that clearly undermines this goal" (p. 620). They encourage more research on this somewhat neglected topic: "Comparative political economy has devoted a great deal of attention to understanding the determinants of both social expenditures and public revenues. But within that body of literature the analysis of indirect taxation appears largely as a residual category" (p. 621).

Another recent study that considers redistribution by way of indirect taxes, along with other tax modes, is Prasad and Deng (2009). These authors agree with Beramendi and Rueda that indirect taxation has not received enough attention in the literature on the welfare state: "The study of how the state distributes benefits to citizens boasts a sophisticated and varied research tradition, but the study of how the state generates the revenue for its redistributive and other functions is much less well developed" (p. 431). However, their primary aim is to compare tax modes rather than explore their relationship to public social transfers, although they do note in passing that governments that are highly redistributive often rely to a greater extent on regressive taxes than less redistributive countries.

Kato (2003: 51) takes the argument a step further in arguing that "a shift to regressive taxes makes it politically possible to maintain a large public sector" since "the development of a tax state and welfare state is path-dependent upon the development of the state's funding capacity." Martin (2015: 33-34) agrees, observing that "scholars appropriately attribute the relationship between large public sectors and regressive taxation systems to the needs of the welfare state: the post-war boom in social spending required a robust revenue-raising system, and taxes imposed largely on upper-income people reap insufficient income." Finally, Kenworthy (2008: 2) concludes that "The chief contribution of taxes to inequality reduction is indirect. Taxes provide the money to fund the transfers that reduce inequality."

3 Indirect taxes and public social transfers: A cross-national analysis

Is the level of indirect taxes relative to GDP in fact positively related to the extent to which developed countries reduce market inequality by way of public social transfers? That is the claim of the studies cited above. However, this premise has

been the subject of relatively little systematic cross-national analysis across a wide range of countries and points in time. For example, Kato (2003) and Martin (2015) focus on the historical processes that led to welfare states' reliance on indirect taxation with reference to a handful of detailed case studies, while Prasad and Deng (2009) focus on taxes in general rather than their role in funding public social transfers. Of the few studies (e.g., Beramendi & Rueda, 2007) that have offered fuller cross-national analyses, these have nearly always focused on the size of public social transfers relative to GDP rather than the extent to which those transfers have reduced market inequality. However, the size of public social transfers and the degree to which they reduce inequality are not the same thing; as put by Milanovic (2000: 370), "a society with high taxes and transfers may have contributors and beneficiaries who are the same people."

The aim of this article is to address some of these limitations of previous cross-national work. Specifically, we will measure not only countries' reliance on various tax modes but also the degree of inequality reduction achieved as a result of public social transfers. The analysis covers 19 countries for various points in time between 1980 and 2013, for a total of 119 country-years in all – a considerably larger dataset than those employed in the analyses cited above. The countries and years are listed in Table 2.

Before reporting the results of the empirical analysis, it is necessary to introduce the variables that will be employed. As has been indicated, the dependent variable in most previous work on this topic has been public social expenditures as a share of GDP. However, as has also been noted, the sheer size of social benefit expenditures is not the same as inequality reduction.[3] In this analysis, data on inequality reduction as a result of public social transfers have been calculated from household-level income surveys available from the Luxembourg Income Study (LIS), a cross-national database that harmonizes data from authoritative national income surveys so that they can be compared across countries (LIS Cross National Data Center in Luxembourg, 2017).[4]

The starting point in calculating government inequality reduction by way of public social transfers is to measure the distribution of pre-tax and -transfer income. The most important source is earnings, which are comprised of wages, salaries and income from self-employment, including (as much as possible) non-cash compensation. To this figure are added capital income such as interest and dividends, rental income, royalties, "voluntary individual" pensions received by private and public sector employees, and private transfers such as merit-based educational payments, payments from non-profit institutions, and inter-household transfers like alimony and child support.

In measuring the extent of inequality reduction by way of social transfers, it is necessary to add public social benefits to market income. The main such transfers are employment-related retirement, disability and survivors pensions; child and

Table 2: Countries and Years

Country	Years
Australia:	1981, 1985, 1989, 1995, 2001, 2003, 2008, 2010
Austria:	2004, 2007, 2010, 201
Belgium:	1992, 1997
Canada:	1981, 1987, 1991, 1994, 1997, 1998, 2000, 2004, 2007, 2010, 2013
Denmark:	1987, 1992, 1995, 2000, 2004, 2007, 2010, 2013
Finland:	1987, 1991, 1995, 2000, 2004, 2007, 2010, 2013
Germany:	1981, 1983, 1984, 1989, 1994, 2000, 2004, 2007, 2010, 2013
Greece:	2007, 2010, 2013
Iceland:	2004, 2007, 2010
Ireland:	1987, 2004, 2007, 2010
Japan:	2008
Luxembourg:	2004, 2007, 2010, 2013
Netherlands:	1983, 1987, 1990, 1993, 1999, 2004, 2007, 2010, 2013
Norway:	1991, 1995, 2000, 2004, 2007, 2010, 2013
Spain:	2007, 2010, 2013
Sweden:	1974, 1979, 1981, 1987, 1992, 1995, 2000, 2005
Switzerland:	1982, 1992, 2000, 2002, 2004, 2007, 2010, 2013
United Kingdom:	1986, 1991, 1994, 1995, 1999, 2004, 2007, 2010, 2013
United States:	1986, 1991, 1994, 1997, 2000, 2004, 2007, 2010, 2013

Note: The limiting factor in country coverage is the availability of pre- and post-government income data from the LIS Cross-National Data Center in Luxembourg (2017).

family allowances; unemployment compensation; sickness, maternity and work-injury pay; and means-tested social assistance of various kinds.

The standard summary measure of inequality, which will be employed here, is the Gini index, which ranges from 0 (all households receive the same income) to 1 (one household receives all income). Government inequality reduction is measured as the reduction of the Gini index of market income when public social transfers are added. For example, in the United States in 2013, the Gini index of market income inequality was 0.508. When public social transfers were added to pre-government income the Gini fell to 0.417, a decline of 91 Gini points. In Germany in the same year, the Gini index of market income inequality was slightly higher than in the United States: 0.520. However, when public social transfers were added to German households' market income, the Gini declined to 0.344, a reduction of 176 Gini points – nearly twice the decline in the United States.

As to independent variables, these tap countries' reliance on various types of taxes, each measured as a share of GDP. Indirect taxes, our primary focus, are taxes that are levied on the consumption of goods and services; they are called indirect because they are paid through intermediaries, such as retail outlets.[5] The most common such tax is the value added tax (VAT) which is, in the words of Burman

and Slemrod (2013: 268), "a form of consumption tax collected from businesses based on the value each firm adds to a product." In practice, producers pay tax on their gross receipts but then receive credits for taxes paid by producers below them on the supply chain, with the total accumulated amount due at the point of sale. A related tax, which is widely employed by state and local governments in the United States (but not at the national level), is the sales tax, whereby retailers simply remit a percentage of their sales receipts to tax authorities. A third, less important, type of indirect tax is the excise tax, which is a tax levied on a particular product, typically gasoline, alcohol or tobacco.

As has been noted, all types of indirect tax have two characteristics in common. One is that their incidence is much harder to measure than is the case with direct taxes; few people know, or could easily find out, the amount they paid in indirect taxes in a given year and household-level data are thus rarely collected in income surveys. Second, indirect taxes are levied on consumption, but not savings or investment. This, it is often said, contributes to economic growth by rewarding investment in future productivity relative to immediate consumption. It is also the basis of the expectation that indirect taxes will be regressive, since the share of households' total income that is allocated to savings or investment, and thus not taxed, tends to rise steadily with income. However, this regressivity can be – and often is – mitigated if necessities such as food or health care are taxed at a lower rate than other goods and services.

Other types of taxes and their expected redistributive effect can be more briefly described. The single most important tax in the developed world is the individual income tax, which is levied on income, profits and capital gains of households. Individual income taxes are almost always progressive. However, the progressiveness of tax schedules has declined in many countries in recent decades and personal income taxes are often subject to exemptions which are more beneficial to middle- or high-income households than to low-income ones.

Another type of direct tax is the corporate tax on income, profits and capital gains. On average, across the 19 countries considered here, this tax mode constituted 3.0 percent of GDP in 2013, less than a third the share of the individual income tax. As to redistribution, there is disagreement as to whether the burden of this tax is ultimately borne by shareholders, which would make it progressive; workers, which would make it proportional; or consumers, which would make it regressive in a manner similar to an indirect tax on consumption.[6]

A third tax mode is social security contributions.[7] These taxes, which are on average the third largest source of revenue in the developed world, are generally roughly proportional to wages. There are, however, sometimes maximum contributions which reduce proportionality and, of course, the tax is not levied on income from capital. On the other hand, the programs these taxes fund often offer minimum benefits or otherwise progressive payout schemes, making them somewhat

progressive.

Property taxes are a less important source of revenue than any of the tax modes discussed so far; on average they accounted for 2.2 percent of GDP across our 19 countries in 2013. Since these taxes are levied on the ownership of property, which is strongly related to income, they have a progressive component. On the other hand, the most important property taxes in most countries are on housing (whether directly or indirectly by way of rent), which typically consumes a larger share of the income of lower and middle income groups than of the wealthy.

The final tax types in the OECD classification are payroll and workforce taxes not linked to public social transfers, which exist in only a few countries, and "other" taxes. Together these taxes constituted an average of only 0.7 percent of GDP in our countries in 2013.

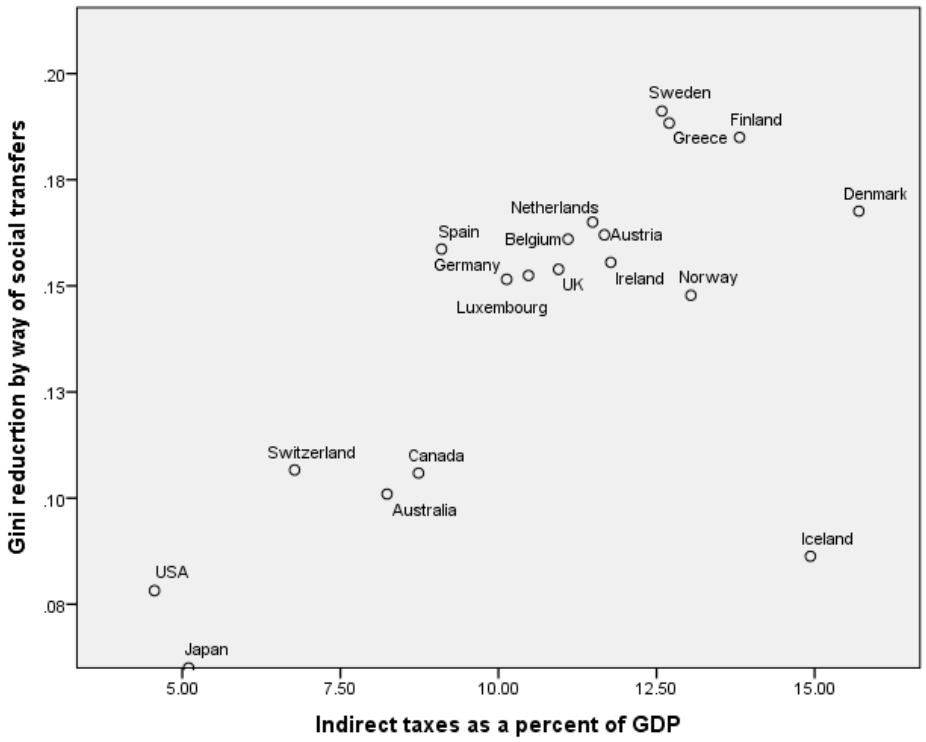
Now that the primary variables have been introduced, it is time for an analysis of the relationship between tax type, particularly indirect taxes, and government inequality reduction by way of public social transfers.[8] As has been noted, a positive relationship between these variables has frequently been posited, but less often examined empirically – especially in cross-national analyses covering a large number of countries and years.

Figure 1 offers a scattergram depicting the bivariate relationship between the average share of GDP constituted by indirect taxes and the extent of government inequality reduction by way of public social transfers.[9] On the lower left are countries that are on the low end of the developed-country spectrum in terms of government inequality reduction, the United States, Japan, Switzerland, Canada and Australia. Each of these countries also raises relatively little revenue by way of indirect taxes. In general, as a country moves up on the scale of indirect taxes it also moves up on the scale of inequality reduction. There is one exception: the case of Iceland, which is at the high end on revenue raised by indirect taxes but at the low end on inequality reduction by way of public social transfers. This is no doubt a result of Iceland's position as the country among the 19 with the lowest market Gini index; even with relatively little government inequality reduction, Iceland is among the most egalitarian of the countries examined in its distribution of post-government income. With this exception, the relationship between indirect taxes and government inequality reduction is strongly positive.[10]

Although the simple bivariate relationship described above is a useful starting point, it takes us only part of the way toward understanding the relationship between taxation and government inequality reduction. The next step is to construct a multiple regression that includes five other modes of taxation along with indirect taxes for all 119 country-years (The "other" category is omitted).[11]

In addition to the tax types described above, it is useful to include two control variables that tap the "need" for public social transfers. The first is the share of the population in a country that is age 65 or above (from Armingeon et al.,

Figure 1: Indirect taxes and inequality reduction by way of public social transfers, National averages



Note: Gini reduction: calculated from LIS Cross-National Data Center in Luxembourg (2017); Indirect taxes/GDP: OECD (2017).

2016), accounting for the fact that, once established, social security pensions tend to grow automatically as a larger share of the population becomes eligible. The second is the unemployment rate (from Armingeon et al., 2016), which is tied to unemployment compensation and means-tested social assistance, the largest public social transfers aimed at those of working age. Controlling for these variables helps better specify our model since they are arguably related to both transfer redistribution and revenue raising. For example, an older population will tend both to spend less, thus reducing indirect tax revenues, and to necessitate greater expenditures for public social security pensions, while a higher unemployment rate is likely both to reduce tax revenues and to require greater expenditures on public social transfers aimed at those of working age.

Table 3 reports the results of such an analysis. As can be seen in part A, even when controlling for the relative magnitude of other tax types as well as the share of the population that is elderly and the unemployment rate, consumption taxes

continue to be statistically significantly related to inequality reduction by way of public social transfers. Indeed, the only other tax type that is significantly related is social security contributions – which, of course are directly linked to public social security pensions at the level of individual workers.

Table 3: Tax Modes and Inequality Reduction by way of Public Social Transfers

	Coefficients	Robust SE	t	P>|t|
A. All transfers				
Indirect Taxes	0.005	0.002	2.68	0.015
Corporate Income Taxes	0.003	0.002	1.34	0.197
Individual Income Taxes	0.002	0.001	1.75	0.097
Social Security Contributions	0.004	0.001	5.17	<0.001
Payroll Taxes	0.004	0.003	1.27	0.221
Property Taxes	0.002	0.004	0.47	0.645
Elderly	0.003	0.003	1.22	0.240
Unemployment	0.002	0.001	2.78	0.012
Year	0.001	0.000	1.51	0.149
Constant	-1.316	0.807	-1.63	0.120
B. Pensions				
Indirect Taxes	0.002	0.001	1.53	0.143
Corporate Income Taxes	0.002	0.001	1.65	0.117
Individual Income Taxes	0.001	0.000	2.77	0.013
Social Security Contributions	0.003	0.000	7.19	0.000
Payroll Taxes	-0.000	0.002	-0.07	0.946
Property Taxes	-0.003	0.002	-1.69	0.108
Elderly	0.003	0.001	2.39	0.028
Year	0.000	0.000	1.81	0.087
Constant	-0.767	0.416	-1.84	0.082
C. Programs Aimed at Persons of Working Age				
Indirect taxes	0.003	0.001	2.45	0.025
Corporate Income Taxes	0.002	0.001	1.41	0.175
Individual Income Taxes	0.000	0.001	0.47	0.641
Social Security Contributions	0.001	0.001	0.92	0.371
Payroll Taxes	0.004	0.003	1.35	0.193
Property Taxes	0.005	0.005	1.02	0.321
Unemployment	0.003	0.001	3.75	0.001
Year	0.000	0.000	0.86	0.402
Constant	-0.512	0.351	-2.06	0.054

Note: A: $R^2 = 0.746, F_{9,18} = 27.52 (p < .001), n = 119$; B: $R^2 = 0.791, F_{8,18} = 34.29 (p < .001), n = 119$; C: $R^2 = 0.553, F_{8,18} = 6.71 (p =< .001), n = 119$; Source: Inequality reduction: calculated from LIS Cross-National Data Center in Luxembourg (2017); Tax modes: OECD (2017); Unemployment rate and over-65 population: Armingeon et al. (2016).

In exploring this topic further, it is useful to disaggregate inequality reduction by way of public sector transfers into two components: public social security pensions, which accrue primarily to the elderly, and transfers directed mainly at the working-age population, such as unemployment compensation, means-tested social assistance and child and family allowances. Part B of Table 3 focuses on public social security pensions, this time controlling only for the share of the population that is elderly. As can be seen, the tax mode that is most strongly related

to inequality reduction by way of pensions is social security contributions; this is hardly surprising, since this tax mode is directly linked to pensions. There is also a somewhat weaker positive relationship with individual income taxes, as well as one with the share of the population that is elderly.

Part C of Table 3 describes the relationship of various tax modes to programs primarily aimed at those of working age. Here there are two statistically significant relationships: those with indirect taxes and with our control for the unemployment rate. Clearly, the mode of inequality reduction that is most strongly related to the prominence of indirect taxes in a country's economy is not public social security pensions, which usually have a dedicated source of funding, but programs aimed at persons of working age, which are more likely to be funded by general revenues.

In sum, it appears that indirect taxes do play an important role in financing inequality reduction by way of public social transfers, and this is especially true of programs aimed at those of working age. Although we would not wish to over-analyze this broad breakdown of program types, it does seem clear that public social security pensions, with a longstanding and dedicated source of financing (although one that is hardly exempt from fiscal pressure), are less dependent on revenue-raising by indirect taxes than are programs that rely on general revenues – which require tradeoffs with other government priorities. This is not to say that consumption taxes are directly financing public social transfers to those of working age in a manner similar to social security contributions; with that exception, tax revenues are largely fungible. It does, however, seem fair to say that cross-national empirical evidence drawn from 19 countries over a three-decade period supports the hypothesis that indirect taxes on consumption represent a powerful revenue-raising vehicle that funds an array of public social transfers which, in turn, substantially reduce market inequality.

4 Sources of cross-national variation in indirect taxes

Now that a positive relationship between indirect taxes and inequality reduction by way of public social transfers has been confirmed, it is time to consider variables that are hypothesized to explain cross-national variation in the level of indirect taxes, moving one step backward on the chain of causation. Three basic mechanisms have been proposed. One well-established tradition looks to "fiscal illusion," the notion that resistance to taxes tends to be directed at those that are most visible, the most prominent of which are direct taxes. In the words of Wilensky (2002: 380), "overreliance on visible taxes triggers tax revolts. . . The most unpopular of all taxes are property taxes on households and income taxes . . . Despite their regressivity, sales taxes appear to be most popular" (p. 382). A similar point is made by Kato (2003), who observes that countries "achieved and were likely to maintain a high level of welfare provision owing . . . to the use of a less visible taxation such

as indirect taxes on consumption. . . . In contrast, a visible progressive income tax that is best for redistribution may not be an effective measure or a politically feasible solution for raising revenue." (pp. 7-8).

How well does this explanation fare empirically? One way of addressing the fiscal illusion hypothesis is to consider whether people's subjective perception of the tax burden in their country is systematically related to the share of their country's GDP that is actually paid in taxes – and, more specifically, indirect taxes. As has been shown, the share of indirect taxes in GDP varies by a factor of more than three to one across the countries examined here. The fiscal illusion hypothesis predicts that this variation will be unrelated to people's subjective perception of how heavily they are taxed.

This claim can be examined empirically by making use of public opinion surveys that are available for 15 of our countries from the International Social Survey Programme (ISSP; Leibtitz Institute for the Social Sciences), which asks respondents whether they believe that taxes on each of three groups, those with high, middle or low income, are "much too high," "too high," "about right," "too low" or "much too low." Responses are from two ISSP surveys, "Social Inequality IV" (2006) and "The Role of Government IV" (2009).[12] Average national responses to these questions were related to the share of indirect taxes (and also taxes as a whole) in GDP for the most recent time point in our dataset. Despite substantial variation in national tax burdens, there was not a single statistically significant relationship between public perceptions of the tax burden on any of the three income groups and the actual level of either indirect or total taxes: in particular, even objectively high levels of indirect taxes do not appear to have led to a widespread subjective perception that taxes were too high. This is consistent with the conclusion of Martin & Gabay (2013) that the extent of tax protest in a country, a measure of particularly strong discontent with taxes, is not systematically related to the actual level of taxes.

A second broad approach looks to another feature of indirect taxes: the fact that they are levied on consumption rather than savings or investment and, as a result, do not have direct taxes' perceived disadvantage of discouraging economic growth. In the words of Lindert (2004), "The high-spending welfare states have developed a style of taxation that few have noticed when debating the effects of the welfare state. In general, high-budget welfare states have a more pro-growth and regressive mix of taxes" (p. 31). As he goes on to say, "The preference for taxing labor rather than capital is regressive, of course. It is also pro-growth, to the extent that capital is internationally mobile and would take positive productivity effects with it when migrating" (p. 241). Capital mobility is also a theme of Plümper & Troeger (2012), who find that countries relying on progressive taxes on income and capital have been more vulnerable to foreign tax competition than countries relying on indirect taxes.

Is it indeed the case that indirect taxes facilitate (or at least do not retard) the allocation of resources to investment as opposed to immediate consumption and, consequently, lead to more rapid economic growth? One way of evaluating this claim is to relate the level of indirect taxes to the share of private sector gross domestic capital formation in GDP (from OECD, 2015a) as well as to the growth of real GDP (from Armingeon et al., 2016). As it happens, across our 119 country-years there is not even a remotely statistically significant relationship between the level of indirect taxes (or of all taxes) and either variable, offering cross-national confirmation for Lindert's claim that extracting resources in this way to support social benefit provision does not come at the expense of economic dynamism.

A third broad approach to the relationship between indirect taxes and public social transfers is that of Beramendi & Rueda (2007). These authors take an historical institutionalist perspective in arguing that the strategy of financing government inequality reduction by way of indirect taxes is the result of a bargain whereby social democratic regimes, particularly those operating in corporatist settings, are able to achieve substantial government redistribution only if public social transfers are financed by taxes that impose a burden on labor as well as business. Similarly, Martin (2015) depicts a process whereby employers have historically been willing to support the establishment or extension of redistributive public social transfers only if they were financed by taxes that did not place an unduly heavy burden on capital.

Concretely, Beramendi and Rueda focus on two main variables. The first is the relative prominence of social democratic political parties, which tend to favor inequality-reducing public social transfers, partly on ideological grounds and partly because such transfers disproportionately benefit their supporters (Korpi & Palme, 2003). Partisan orientation is measured as the share of social democratic and other leftist parties in all cabinet posts in a country in a given year, weighted by days; data are from Armingeon et al. (2016). Second, they argue that the regimes most likely to support redistributive public social transfers will be not only social democratic but also corporatist, with corporatism in this context defined as "institutional arrangements whereby important political-economic decisions are reached by a negotiation between or in consultation with peak-level representatives of employees and employers and/or other interest groups and the state" (Kenworthy, 2003: 10). The expectation is that the more centralized and coordinated this process is, the more extensive government inequality reduction will be. As elaborated by Wallerstein (1999: 673-676), there are several reasons for this: centralized bargaining is said to be more economically efficient than decentralized bargaining, providing more total resources to be distributed; to make it more difficult to play workers off against one another and thus to improve their position vis-à-vis employers; and to lead to a broadening of norms of distributive justice across society, again to the benefit of low-income groups. Data for the level of wage bargaining are from Visser

(2015). The measure ranges from 1 (fragmented wage bargaining confined to individual firms and plants) to 5 (centralized bargaining across the entire economy by peak federations or the equivalent).

In the interest of developing a fully specified model, several other variables are also included. One is union density, the share of the active work force that belongs to a labor union. One reason for considering this variable is that unions focus almost exclusively on economic concerns; this is in contrast to political parties, which simultaneously pursue policy objectives in such areas as foreign policy, education, environmental protection and moral issues such as marriage or abortion, among others. The basic argument is that when unions comprise a large share of the labor force, workers will be more successful in socializing some of the costs of retirement, disability, child-rearing and unemployment — benefiting many members of society, but especially those of low and middle income. In addition, unions are said to play a critical role in encouraging electoral turnout, particularly among low-income groups, increasing the pressure for government redistribution (Swank, 2015: 19). Finally, several recent studies have emphasized the critical role of unions in shaping public knowledge about and preferences for government redistribution, an educative role that is enhanced when unions comprise a large share of the work force (Iversen & Soskice, 2015; Mosimann & Pontusson, 2016). Data on union density are from Visser (2015).

Another variable that is commonly employed in cross-national studies of government redistribution is economic globalization. The arguments are familiar. On the one hand, it is often argued that integration into the global economy enmeshes governments in a competitive "race to the bottom" in social protection (Rodrik, 1997). On the other hand, it is often claimed that global economic liberalism is only politically viable if it is "embedded" in a broader mechanism to compensate vulnerable domestic groups – the "domestic compensation" approach (Ruggie, 1982). In the words of Garrett (1998: 824), "The coupling of openness with domestic compensation remains a robust and desirable solution to the problem of reaping the efficiency benefits of capitalism while mitigating its costs in terms of social dislocations and inequality." The measure employed is the KOF index of economic globalization (2017), which taps not only actual movement of merchandise trade, services trade and direct foreign investment across borders but also restrictions on cross-border movements such as tariffs, non-tariff barriers and capital controls. It ranges from 0 (least globalized) to 100 (most globalized).

Finally, many political scientists seeking to explain cross-national variation in social redistribution have looked not to partisan factors but rather to institutional variables. The basic intuition is that expanding social redistribution to keep pace with growing market inequality is easier in regimes in which there are fewer institutional constraints on the central government such as federalism, difficult-to-amend constitutions or strong central bank autonomy. The more constraints on the central

government, it is claimed, the more opportunities opponents of redistribution will have to forestall the expansion of existing programs and creation of new ones. The measure, developed by Schmidt (1996) and reported in Armingeon et al. (2016: 11), ranges from 0 to 6, with "high values indicating powerful constraints and low values indicating the central government has a great deal of maneuverability."

Table 4: Political Sources of Reliance on Indirect Taxes

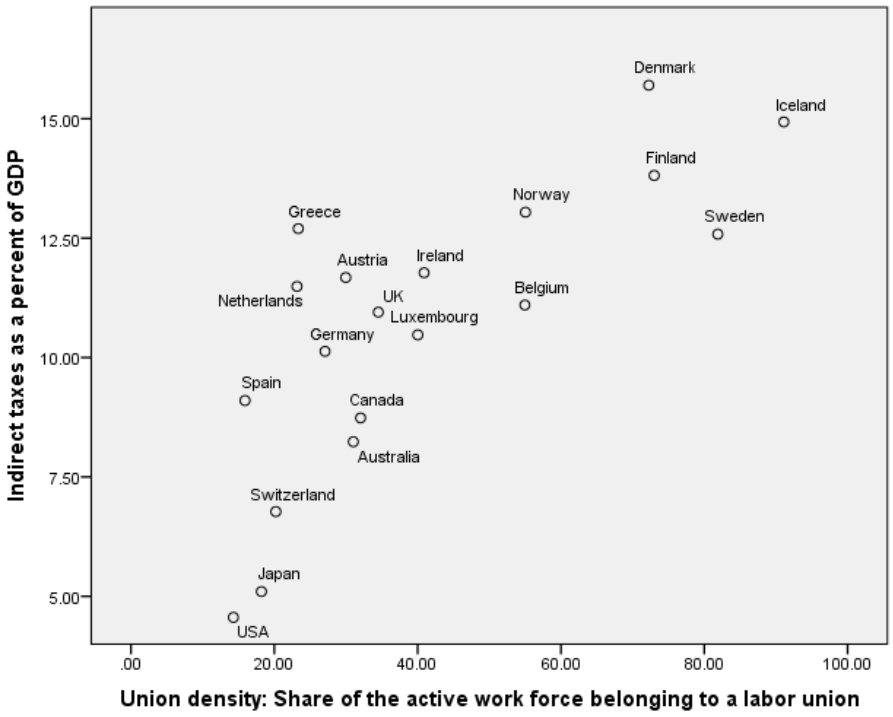
	Coefficients	Robust SE	t	P>|t|
Indirect Taxes/GDP				
Left cabinet	0.001	0.005	0.15	0.886
Wage coordination	0.530	0.265	2.00	0.061
Union density	0.063	0.019	3.35	0.004
Economic globalization	0.038	0.030	1.29	0.216
Institutional constraints	-0.714	0.294	-2.43	0.027
Year	0.038	0.028	1.36	0.192
Constant	-70.504	54.345	-1.30	0.212

Note: $R^2 = 0.704, F_{6,17} = 11.49 (p < .001), n = 116$; Wage coordination data are unavailable for Iceland; Source: Left cabinet, Institutional constraints: Armingeon et al. (2016); Wage coordination, Union density: Visser (2015); Economic globalization: KOF Swiss Economic Institute (2017).

How are these variables related to the share of indirect taxes in a country's economy across our country-years? As can be seen in Table 4, two variables are statistically significantly related to the share of a country's GDP constituted by indirect taxes. The strongest is union density: as the share of a country's labor force that belongs to a union increases, so too does its willingness to pay indirect taxes to help finance government inequality reduction. Also significant is the variable measuring institutional constraints on the central government: as expected, as constraints increase, public sector redistribution tends to decline. Finally, there is a positive but not-quite-significant relationship between indirect taxes and wage coordination: as suggested by Beramendi & Rueda (2007), corporatism tends to facilitate redistribution.

As has been noted, union membership appears to play a particularly important – if sometimes neglected – role. The critical role of unions has been recognized in several recent studies of trends in wage inequality, a key component of inequality as a whole (e.g., Western & Rosenfeld, 2011; Rosenfeld, 2014).[13] The results reported above suggest that similar dynamics operate with respect to another component of inequality, redistributive public social transfers. Figure 2 depicts graphically the relationship between union density and indirect taxes.

Figure 2: Union density and indirect taxes: National averages



Note: Indirect taxes: OECD (2017); Union density: Visser (2015).

5 The incidence of indirect taxes

The analysis to this point has confirmed, with reference to relatively extensive cross-national evidence, that indirect taxes serve as powerful revenue-raising vehicles that meet limited taxpayer resistance and have little negative effect on capital investment or economic growth. These revenues can, in turn, be used to help finance redistributive public social transfers that counteract trends toward greater inequality in pre-government income.

A further assumption of nearly all previous work on this topic has been that indirect taxes are regressive; the "paradox" so widely noted in the literature is that, despite their internal regressivity, such taxes in the end accomplish more redistribution than progressive direct taxes because the public social transfers they fund are both large and internally redistributive. However, a limitation of nearly all previous cross-national studies on this topic is that the assumption of regressivity has not been systematically tested; as put by Joumard et al. (2014: 121; see also Timmons, 2010), a lack of cross-nationally comparable data "makes it difficult to investigate the redistributive impact of consumption taxes in a cross-country setting." In ad-

dressing this limitation, the final section of this article will explore the incidence of indirect taxes. The discussion will of necessity be much more tentative than the earlier analyses for the simple reason that, as has been noted, indirect taxes are rarely if ever measured in income surveys, the original source of data for nearly all studies of government inequality reduction.

As a starting point, it is useful simply to list countries' standard (nominal) rates of indirect taxes. These are provided in Table 5. As can be seen, there is a great deal of variation, ranging from a low of 5 percent to a high of over 25 percent.[14] However, although they are much-discussed, standard rates are of limited value in estimating relative tax burdens across income groups because nearly all systems specify categories of goods and services that are exempt or taxed at a lower rate, most commonly food, medicine, health care, public transportation, child care and educational services. Because such goods and services tend to consume a larger share of the income of low-income households than of high-income households, these exemptions serve to reduce the inherent regressivity of consumption taxes – as is their intention.

Table 5: VAT and GST Rates, 2012

	Standard Rate	**VRR**	**VRR-adj. rate**
Australia	10.0	0.47	4.70
Austria	20.0	0.59	11.80
Belgium	21.0	0.48	10.08
Canada	5.0	0.48	2.40
Denmark	25.0	0.59	14.75
Finland	23.0	0.56	12.88
Germany	19.0	0.55	10.78
Greece	23.0	0.37	8.51
Iceland	25.5	0.45	11.48
Ireland	23.0	0.45	10.35
Japan	5.0	0.69	3.45
Luxembourg	15.0	1.13	16.95
Netherlands	19.0	0.53	10.07
Norway	25.0	0.57	14.25
Spain	18.0	0.41	7.38
Sweden	25.0	0.56	14.00
Switzerland	8.0	0.71	5.68
United Kingdom	20.0	0.44	8.80

Note: GST (goods and services tax) is a variation of the VAT that is used in Canada and Australia; Source: OECD (2014, 2015b).

One way of adjusting standard rates to reflect exemptions is to employ a measure devised by the OECD (2014: 94-107) called the VAT Revenue Ratio (VRR).

It is calculated as follows: $VRR = VR/[(FCE - VR) * r]$, where: VR = actual VAT revenue, FCE = final consumption expenditure, from National Accounts Statistics, and r = the standard VAT rate (i.e., not accounting for exemptions).
By employing this formula, it is possible to compare the actual revenue raised from consumption taxes with the revenue that would have been raised if all consumption were taxed at the standard rate. VRR values are reported in Table 5. As can be seen, VRR-adjusted rates are generally considerably lower than standard VAT rates, on average not much more than half as high.[15] There are several possible reasons for this, but exemptions are likely the most important.[16]

By offering a better sense of the actual, as opposed to the nominal, incidence of indirect consumption taxes, VRR-adjusted rates are clearly a step in the right direction. However, they do not tell us whether reductions or exemptions apply mainly to goods and services that constitute a larger share of the income of low-income than of high-income households. While this seems reasonable, it is difficult to be more specific than that because VRR-adjusted rates are not based on data collected at the level of households, which is the level at which the effect of taxes on income inequality ultimately operates. This leads us to ask whether anything further can be learned about this topic from LIS micro-data – data which are not only based on household-level income surveys but are also carefully harmonized to facilitate cross-national comparison. A modest step in the right direction would be to apply the VRR-adjusted standard rate to each household's consumption and then deduct the tax on that consumption from its disposable income, equivalizing for household size as usual. This captures the hypothesized regressivity of indirect taxes arising from the fact that as income rises the share of income that is consumed, and thus taxed, tends to fall.[17] Unfortunately, most of the national income surveys on which the LIS relies for its raw data do not measure household consumption at all, and many of those that do are seriously incomplete in this regard. There are a handful of exceptions: Australia (2010), Germany (1983), Switzerland (2000, 2002, 2004), and the UK (1986, 1991, 1995), each of whose LIS surveys provide reasonably complete coverage of household consumption. Accordingly, the VRR-adjusted VAT rate in these countries for the appropriate year has been multiplied by each household's reported consumption. The product has then been deducted from households' disposable income and a Gini index calculated. This Gini can be compared to the Gini before this estimate of indirect taxes was deducted from households' income to arrive at an (admittedly rough) estimate of their effect on income inequality.

When this is done, as shown in Table 6, we find that the Australian, German, Swiss and British Gini indexes increase by between 5 and 12 Gini points, indicating that indirect taxes are indeed regressive. However, the degree to which they result in a more inegalitarian distribution of income is modest in comparison to the Gini reduction as a result of public social transfers, which is in each case over 100 Gini

Table 6: Gini coefficients adjusted for VAT and GST taxes

	Year	Gini DHI*	Gini DHI	Difference
Australia	2010	0.330	0.338	0.008
Germany	1983	0.260	0.265	0.005
Switzerland	2000	0.280	0.286	0.006
Switzerland	2002	0.273	0.278	0.005
Switzerland	2004	0.268	0.273	0.005
United Kingdom	1986	0.303	0.311	0.008
United Kingdom	1991	0.336	0.344	0.008
United Kingdom	1995	0.344	0.356	0.012

Note: *DHI refers to disposable household income; Source: Authors' calculations from LIS Cross-National Data Center in Luxembourg (2017).

points. Clearly, the regressivity of indirect taxes is in these cases far outweighed by the size and progressiveness of the transfers they, in part, finance. More generally, the notion that much of the inequality reduction accomplished by public social transfers is "clawed back" by the regressivity of the taxes that finance them seems exaggerated.

These results are broadly consistent with the handful of studies that have mostly relied upon imputations derived from the EUROMOD tax-benefit microsimulation model (see Sutherland & Figari, 2013).[18] For example, Decoster et al. (2010) found that the incidence of indirect taxes in the UK in 2003 increased the Gini coefficient by 0.011, in comparison to our figure for the UK in 1995 of 0.012. Another study finds that indirect taxes increased the UK's Gini index by about 0.017 in 1998 (O'Donoghue et al., 2004) and yet another finds that indirect taxes increased the Gini by 0.014 in the UK in 2003 (Figari & Paulus, 2013: 22).

6 Conclusion

This article has explored the role of indirect taxes in financing government inequality reduction in the developed countries, a topic that has received limited attention in the large literature on the contemporary welfare state. It found that there is indeed a positive relationship between the share of indirect taxes in a country's GDP and the degree to which pre-government inequality is reduced by way of public social transfers, even controlling for other tax types; that a large indirect tax burden is politically possible because of some combination of fiscal illusion and the fact that indirect taxes do not retard economic growth or investment; and that the high indirect taxes that help to finance public social transfers are often the product of a political process in which the lack of institutional constraints on the central government, democratic corporatism and – especially – union density play key roles. Finally, our analysis ended with a an empirical analysis of the incidence of indirect

taxes, concluding that, although their basic structure is indeed regressive, this is often reduced substantially by the lower rates or exemptions for basic necessities that are built into many systems.

As was suggested at the beginning of the article, public social transfers have in large part – although not completely – kept pace with the substantial increase in market income inequality in most developed countries over the last 35 years. One of the central questions of coming decades will be whether the public sector will continue to play this moderating role, or whether such efforts will instead run up against increasing fiscal or political constraints on states' ability or willingness to ameliorate market inequality. In any such process, indirect taxes, a revenue-raising workhorse in many highly redistributive countries, are likely to play a critical role.

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Notes

[1]"Market income", as defined here, includes earnings, income from capital and private transfers (although the last is not strictly a "market" transaction).

[2]Gini indexes in this and the next paragraph have been calculated from LIS Cross National Data Center in Luxembourg (2017) household-level income surveys for the countries and years listed in Table 2. Averages are for LIS waves I (about 1980) and IX (about 2013). Figures reflect only government redistribution by way of direct taxes and public social transfers; they do not include inequality reduction by way of regulations or government consumption expenditures.

[3]Inequality reduction is a product of both the size of public social transfers and their internal progressiveness. In constructing pre- and post-transfer Ginis, we follow the common practice in which households are re-ranked when transfers are added to pre-fisc income.

[4]Household size equivalization follows the usual LIS practice of dividing total household income by the square root of the number of members, which accounts for variation in household size while at the same time allowing for economies of scale accruing to larger households. Households are weighted by size; as a result, inequality is ultimately measured at the level of individuals, but in a manner that takes into account the size of the household

in which they are living. Calculations follow the usual LIS practice of top-coding household income at 10 times the median of non-equivalized income and bottom-coding at 1 percent of the equivalized mean. The very small number of households that report zero disposable income are excluded, on the assumption that they must receive at least some income from unreported sources.

[5]Beramendi & Rueda (2007) employ a different measure of indirect taxes than is used here: the average effective indirect tax rate on average household consumption relative to average income. In this article the more common tax type/GDP measure is used. There are two reasons for this. First, this approach permits a fuller comparison with other tax types, which is particularly important in that most taxes are fungible. More practically, the data set upon which these authors rely for their indirect tax measure extends only to the mid-1990s, about the halfway point of our country-years.

[6]An extensive discussion of the incidence of corporate taxes, in which all three perspectives are represented, is offered in a special issue of the National Tax Journal edited by Diamond (2013).

[7]In this study, we only deduct mandatory employee contributions, which has been standard approach in this literature. These amounts are reported by respondents in LIS surveys, just one would report any direct taxes paid. This, therefore, does not measure employers' contributions to social retirement funds. A recent study has made a substantial contribution by imputing these amounts for a number of LIS surveys by applying statutory rates to individual wages and then aggregating at the level of the household (Guillaud et al., 2017a: 8). One of the study's main findings is that the "inclusion of employer social security contributions raises the average contribution of the tax system to inequality reduction and slightly diminishes the role of the transfer system" (p. 10).

[8]Clearly, there are other ways in which governments can contribute to inequality reduction beyond those examined here. As pointed out by Kleven (2014), many Scandinavian countries' tax systems are structured in such a way that it is hard to evade taxes, either legally through exemptions or illegally through tax avoidance, thus contributing to horizontal equity in tax liability. In addition, many Scandinavian countries provide in-kind benefits, especially subsidized child care, which contribute to inequality reduction while at the same time encouraging productivity through increased labor force participation.

[9]Much cross-national work in this area measures total government redistribution by way of both direct taxes and public social transfers rather than transfers alone. However, for our purposes this would muddy the test of the relationship between indirect taxes and public social transfers because part of the variation in overall government inequality reduction across countries would be the product of direct taxes: The literature in this area does not claim that indirect taxes are related in any particular way to direct taxes – that, say, indirect taxes allow higher (or necessitate lower) direct taxes – only that they make possible greater redistribution by way of public social transfers. Having said all of this, we have constructed supplementary regressions in which the dependent variable is total fiscal redistribution and found that the results are similar.

[10]One advantage of the absolute measure employed here is that it does not depend on trends in the pre-fisc "starting point": a given amount of inequality reduction counts the same regardless of the market distribution. That said, and with the Icelandic case in mind, a variable has been calculated which measures Gini reduction not in absolute terms but relative to the pre-fisc starting point. The two measures are strongly positively correlated (r = +0.943) and the choice of measure has little effect on results.

[11]Since LIS surveys constitute an unbalanced pooled cross-sectional time series (i.e., the years of surveys in a given LIS wave vary and not all countries are represented in every wave) cross-national analyses employ a statistical technique that uses OLS regression with Huber White "sandwich" robust standard errors clustered by country; see Bradley et al. (2003) and Kenworthy & Pontusson (2005) for applications in a similar situation. Equations also control for year, in an effort to account for phenomena in a given time period, such as widespread recessions, that affect many countries simultaneously; Bradley et al. (2003) also do this, in a limited way, in a supplementary analysis. (Results are similar if year is not included.) Collinearity is a potential problem, since the share of various tax modes in GDP tend to be correlated. However, it is in practice not serious in this case: the highest Variance Inflation Factor (VIF) in any equation is 2.21, well below conventional criteria for concern. Regressions were conducted using Stata 14.2.

[12]The countries are Australia, Austria, Canada, Denmark, Finland, Germany, Ireland, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, the UK and the US. When the same country was included in both surveys, the more recent was used.

[13]While he does not consider indirect taxes, Pontusson (2013) finds a strong positive relationship between union density and redistribution, although he notes that this has become somewhat weaker in recent years as de-unionization has moved the average union member upwards on the income scale.

[14]The US, which does not have a national consumption tax, is not included in the OECD study that is the source of these data. In the US, not only are there entirely different systems in each of the 50 states, but state rates are often supplemented by municipalities. There are thus hundreds of different rates, and consumers can easily pay several rates by traveling a short distance on a single shopping trip.

[15]The exception is Luxembourg, whose very special situation is explained in OECD (2014: 95).

[16]VRRs also reflect under-collection of taxes because of the underground economy, but such transactions are likely underestimated in national accounts statistics as well.

[17]It does not, however, allow us to assess the possibility that particular exempted goods and services constitute a larger share of the income of low-income groups than of high-income group, since consumption surveys do not offer a sufficiently detailed breakdown of individual products and services consumed.

[18]A notable exception to using the EUROMOD microsimulation for the imputation of indirect taxes is Guillaud et al. (2017b: 31-32). Using LIS surveys, they impute marginal propensities to consume by income quantile from OECD national accounts data and Eurostat. One of their main conclusions echoes our finding that indirect taxes are universally regressive (p. 54).