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Taxation and the Worlds of Welfare

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Taxation and the worlds of welfare

Abstract:
We use Luxembourg Income Study data to compare the progressivity of the tax structure
in the U.S. and Europe. LIS data allow a comparison of tax rates that attempts to take
different starting rates, thresholds, and exemptions into account. Our study supports the
argument others have made that the US has more progressive taxes than the European
countries. However, we find that Britain's tax structure is more regressive than those of
the continental welfare states, making the mapping of tax structure onto the 'three worlds
of welfare' imperfect. We also show that it is a mistake to assume that income and
property taxes are always progressive: regressive examples of both are common in the
data. But sales taxes are regressive wherever they are found, and we suggest that the
proportion of tax revenue raised through sales taxes can serve as an index of overall
progressivity in situations where the detailed data examined here are not available. We
close by outlining several possible explanations for the inverse correlation between tax
progressivity and welfare state effort.

Taxation and the Worlds of Welfare

The state gives, and the state takes away. But social scientists know much more about the giving than the taking. 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 (but see the contributions to Martin *et al.*, 2009).

Recently, several scholars have argued that examining taxation can enhance—or even transform—our understanding of welfare states. Beginning with Sven Steinmo (1993), a handful of scholars have argued that the liberal welfare states actually have more progressive taxes than the conservative and social democratic welfare states (Wilensky, 2000; Kato, 2003; Lindert, 2004). This insight is important for several reasons. First, it explains the puzzling lack of correlation between economic growth and the size of the state: if taxes hinder economic growth, then it is hard to explain how the European states have collected taxes at a rate of nearly 50% of GDP for decades while still posting strong economic performance. Lindert argues that this is because the European states rely on regressive consumption taxes, which are less distortionary than progressive income taxes, and Wilensky and Kato emphasize that consumption taxes allow a low tax burden on capital.

Second, this argument offers a new perspective on the century-old debate on 'American exceptionalism', specifically on why the US has a much less well-developed welfare state than the European countries: Kato (2003) argues that countries can only develop large welfare states if they first adopt regressive taxes. Because the U.S. adopted

income tax as its major form of finance before the First World War, and because it resisted the value added tax on several occasions, the financial basis for the welfare state was undermined (Morgan and Prasad, forthcoming). It remains to be explained whether the decision to adopt regressive taxes preceded, and enabled, the growth of the welfare state (as Kato argues) or whether policymakers adopted regressive taxes because they wanted a form of finance that would allow the state to grow (as Ganghof, 2006, and Lindert, 2004, argue).

Third, the tax structure helps to explain the turn toward neoliberal economic policies in the US in the 1980s and the lack of such a turn to the right in Europe: Wilensky (2000) argues that regressive taxation keeps the wealthy on the side of the welfare state in Europe, allowing a kind of redistribution that is politically tolerated by all classes, namely, within-class redistribution. Meanwhile, progressive taxation consigns the US to frequent conflict over revenue generation (see also Prasad, 2006).

Finally, Hays (2003) and others have argued that the tax structure explains the resilience of European welfare states in the face of globalization: the European welfare states have managed to avoid the 'race to the bottom' that many feared would be the outcome of globalization because they finance their welfare states with forms of taxation that are not subject to global competition, specifically, taxes on labor rather than capital.

Thus, examining the structure of taxation can help to shed light on the past and the future of the welfare state.[1] These scholars suggest that the progressivity of the tax structure—examined separately from the progressivity of the welfare state—has consequences for the extent and stability of the welfare state, and moreover, that because

decisions on tax came first historically, they may have constrained the decisions on the welfare state that came later.

In this paper, we focus on establishing a crucial prior point: although these arguments have been made for nearly two decades now, not all scholars have been convinced by the evidentiary base for the thesis (see e.g. Musgrave, 1995). We first identify problems with existing attempts to analyze tax progressivity comparatively, and we then construct a more careful analysis than other studies have done. We turn in particular to the Luxembourg Income Study, which allows a comparison of tax rates that attempts to take different starting rates, thresholds, and tax exemptions into account.

Our study supports the general picture that the US has more progressive taxes than the continental or social democratic countries. The comparative tax picture maps onto the 'worlds of welfare' typology, but it is the social democratic states that have the most regressive taxes and the liberal U.S. that has the most progressive taxes. The one exception to this mapping is Britain, a liberal state with a tax structure that is more regressive than that of the continental or social democratic welfare states.

We also show that it is a mistake to assume that income taxes and property taxes are always progressive: there are examples of regressive income taxes in the data, and property taxes are almost always regressive in this sample. Payroll taxes tend to be regressive, but we find a progressive payroll tax on two occasions. The only tax that lives up to its reputation is sales tax, which is regressive in every country, for every year. The role of sales taxes in the tax structure also correlates well with our measure of regressivity, so we suggest that the role that the sales tax plays in the revenue structure is an acceptable proxy for the degree of regressivity of a tax structure in cases where more

detailed data are not available. We close with a discussion of whether the regressivity of the value added tax matters, and what might be causing the inverse correlation between tax progressivity and welfare state effort.[2]

LITERATURE REVIEW AND DATA SOURCES

The international comparison of tax progressivity is not a well-developed field. The first instinct is to compare nominal tax rates on different income groups across different countries, but tax exemptions make this unrealistic: particularly in the U.S., where political lobbying is essentially about obtaining tax exemptions in exchange for campaign donations (see Clawson *et al.*, 1998; Howard, 1997), the tax code is riddled with exemptions. Thus, the political scientists and sociologists who study this issue usually adopt a second approach: they assume that some *kinds* of taxes (income and property taxes) are progressive, while other kinds of taxes (payroll and consumption taxes) are regressive, and they measure the role that these different kinds of taxes play in the tax structure (Steinmo, 1989, 1993; Wilensky, 2002; Kato, 2003; Genschel, 2002; Volkerink, 2000; Cusack and Beramendi, 2003).

But progressivity is not simply a matter of what kinds of things are taxed; progressivity also depends on the rates applied to different income groups *within* different categories of tax. It is possible to envision a regressive income tax or a progressive consumption tax, for example. Two countries may both rely on income taxes, but if the first country has much higher rates of income tax on the wealthy, then the first country will have a more progressive overall tax structure than the other. Or, two countries may both depend on consumption taxes, but one may impose much lower rates on basic

goods, giving it a much more progressive overall tax structure. Therefore, this approach is inadequate for a rigorous testing of the claim about comparative tax progressivity.

A third approach was suggested by Robert Lucas in 1990 in a review of the evidence for the 'supply side' claim. Lucas suggested that a good proxy for progressivity is the tax ratio on different factors of production (labor, capital, land) and on consumption. All that is needed is knowledge about how much tax is collected from a tax on a particular factor, and what the total economic base is of that factor. This allows comparison of the relative tax burdens on labor, capital, consumption, or other factors in different countries and over time. Mendoza *et al.* (1994) worked out the technical issues and produced the first paper giving ratios for several different countries over long stretches of time. Since then, there have been various modifications that change one or another assumption, and the OECD has constructed tax ratios across broad categories of income for all of the OECD countries. The robust findings from this tradition—the findings that hold up no matter how the assumptions are changed—are that the US taxes labor and consumption less than other countries (e.g. Carey and Rabesona, 2002; Mendoza *et al.*, 1994; Volkerink 2000; Sørensen 2004). Beyond that, there is less agreement: some scholars argue that the US also taxes capital more than other countries, but others argue that since the 1970s the US has begun to tax capital less than other countries (Carey and Rabesona, 2002).

But this method only imperfectly reflects the question of progressivity, as the OECD categories only allow us to examine redistribution between very broad income categories, e.g. from capital to labor. This categorization would lead to mis-characterization of (for example) the labor income of those in the highest quintile groups

and the capital income of those from lower quintile groups. Moreover, this method is somewhat unstable, because 'most tax categories as distinguished in the OECD Revenue Statistics relate to more than one macroeconomic category (labour, capital, etc.). Consequently, it is impossible to calculate tax ratios without using some technique to artificially separate out the amounts to be allocated to various macroeconomic categories' (OECD 2001: 21). For example, there is evidence that at the top of the income distribution, executives shift the form in which they take their compensation in response to tax regimes (wages are counted as labor income, but stock options as capital income, and the decision to take compensation as wages or stock options can be made in response to the manner of taxation, Slemrod, 2007). The general assumption underlying this approach is that capital income accrues to upper income groups, and this assumption deserves more careful scrutiny.

A new approach has recently been developed that relies on the examination of income tax returns. This is associated most prominently with the work of Thomas Piketty. For example, Piketty and Saez (2007) use tax returns to estimate progressivity in the U.S., France, and the U.K. They find greater progressivity in the US than in France and the UK until the 1970s, and lower progressivity since. However, while their study includes income, corporate income, payroll, and estate and gift taxes, it excludes state and local taxes as well as consumption tax—an exclusion which their method of examining income tax returns makes unavoidable. They argue that the exclusion of state and local taxes (which are important in the US) counterbalances the exclusion of consumption tax (important in the European countries) but this is not likely to be true: first, while the consumption tax in Europe is everywhere regressive (as we show below),

some state and local taxes in the US, such as income and property taxes, are progressive (see e.g. Formby and Sykes, 1984). Second, state and local taxes make up a much smaller share of the American revenue structure than consumption taxes make up of the European revenue structure (Carey and Rabesona, 2002). And third, state and local sales taxes in the US are not usually levied on services, but European value added taxes are (Carpentier, 1992; European Economic Community 1977). These factors suggest that Piketty and Saez's exclusion of these taxes understates progressivity in the US and understates regressivity in the European countries.

These are the best existing studies of comparative tax progressivity. There are also many studies that claim to compare progressivity while examining only *income* tax progressivity. For example, recently two prominent economists have claimed that the American tax structure is less progressive than the European (Alesina and Glaeser, 2004:37). Their study does not cite their data sources or their methods, and the authors are unable to make their data and methods available[3], so it is not possible to analyze their claim in detail. From the evidence given in their book, however, we can note that they are making a claim only about income taxes, and not the overall tax structure. As we will show below, examining income tax alone distorts the tax progressivity picture, because the role that income tax plays in the overall tax structure varies: Germany, for example, has a progressive income tax, but because it collects so much consumption tax, the progressivity of income tax is overwhelmed by the regressivity of sales tax, leading to an overall tax structure that is regressive. Many other studies are affected by this issue (e.g. Zandvakili, 1994; Bishop *et al.*, 1998).

We suggest that Luxembourg Income Study data are a useful source of international tax data with which to supplement the above studies. The LIS provides income survey data across 30 countries, explicitly aimed at making cross-national comparison possible. While it has been used as the main source for a rich and growing series of international comparisons of the welfare state, its resources for comparisons of taxation have been less thoroughly explored. The main advantage of the LIS data are that they allow a systematic comparison that does attempt to take issues such as different tax rates, thresholds, and exemptions into account: the LIS data capture taxes actually paid, either directly through tax returns, or through household surveys and simulations based on reports of income and models of tax legislation (the sources vary for each country; see detailed descriptions at http://www.lisproject.org/techdoc.htm).

A handful of scholars have used the LIS data to calculate tax progressivity for one or a handful of countries. Zandvakili (1994) calculates international comparisons of tax progressivity using a method similar to ours on LIS data from the early 1980s. We update this work with data from more recent LIS waves, and we also extend it in one way: Zandvakili calculates tax progressivity for several countries (as do we) but does not weight progressivity according to the importance of a particular tax in the nation's revenue structure (as we do). This leads, as we will show below, to a misleading characterization of tax progressivity: the German case, again, shows that a very progressive income tax can be combined with heavy reliance on consumption and payroll tax to lead to overall regressivity.[4]

Mahler and Jesuit (2006) have used LIS data to analyze tax concentrations as part of their analysis of 'fiscal redistribution'. Tax concentration is a measure of who pays the

taxes: if the bulk of the taxes are being paid by the wealthy, the measure of tax concentration will be high. However, tax concentration is not the same thing as tax progressivity, because pre-tax inequality will artificially inflate tax concentration. Consider two countries that both have the same structure of tax progressivity, but that have very different structures of pre-tax inequality: the more unequal country will raise more tax revenues from the wealthy and less from the poor (because a larger proportion of the population is in the higher tax brackets), and will therefore have a higher tax concentration, even though the structure of progressivity is in fact the same.

Similarly, comparisons of pre-tax inequality and post-tax inequality privilege highly unequal countries: consider two countries with equally progressive tax structures with three tax brackets that have exactly the same rates and bases. Now consider that country A has 10% of its population in the lowest tax bracket, 80% of its population in the middle bracket, and 10% of its population in the highest bracket, while country B has 10% in the lowest bracket, 60% in the middle bracket, and 30% in the top bracket. Country B has greater pre-tax inequality. Because of the greater percent of people in the top bracket, it also collects more taxes, and therefore has greater 'reduction in inequality through taxation': if we simply compare pre-tax to post-tax inequality, country B will have had greater reduction in inequality due to taxes, but this is a function of its inequality, not of the progressivity of its tax structure.[5]

To get a better measure of tax progressivity it is necessary to use a measure that accounts for pre-tax inequality, as we do below.

METHODS

The LIS database is drawn from individual and household surveys on income receipts and tax payments in a large number of countries at different time points. LIS data are based on uniform definitions, making possible reliable comparisons across countries and over time. Our analysis is restricted to the period 1979–2004 as data prior to this period are incomplete or exist for only a few countries. The LIS is not conducted annually, but in 'waves' which take five years each; each country has a maximum of one observation within each wave, but for some years and some measures the data are incomplete. There have been five waves to date. We include 13 countries for which data on income, payroll, and property taxes are available: Australia, Belgium, Canada, Denmark, Finland, France, Germany, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

The ability to estimate consumption taxes from LIS data is more limited, and is only possible for five countries (U.K., Belgium, France, Germany, and Switzerland). Fortunately, these five countries include all three 'worlds' of welfare. In addition, Bureau of Labor Statistics data allow estimation of consumption tax for the U.S[6]. Because the LIS measures do not provide consumption taxes on housing across all countries, we exclude housing expenditure from the consumption tax measures.

We first calculate progressivity on the three sets of taxes for which the LIS data are relatively complete for all 13 countries, income tax, property and wealth taxes, and mandatory employee contributions (payroll taxes). We then address how adding consumption tax changes the substantive findings for the 6 countries for which this calculation is possible.

We define income quintiles using factor income. We adopted quintiles because the BLS data we use for the American sales tax calculations are formatted only in quintiles; however, we also show in the online supplement to this article results using deciles for the overall tax structure excluding sales tax.

We choose factor income (which excludes taxes and transfers) instead of gross disposable income because we are interested in examining the operation of the tax code on the pre-tax, pre-transfer distribution of income.

We follow the practice of Mahler and Jesuit (2006) in excluding countries and years for which the LIS data are not complete or are problematic, and we follow their procedure for constructing an equivalency scale for households (486). This weighting procedure attempts to take into account the fact that household members cannot simply be aggregated due to economies of scale.

We measured three major categories of variables: factor income (earnings before taxes and after transfer payments), four varieties of taxes (income tax, sales tax, property and wealth tax, and mandatory employee contribution), and transfer payments (the sum of total social transfers plus the non-cash transfers of housing, medical, heating, education and health benefits). To obtain progressivity we accumulate percentages of household income per quintile ranking from the highest to the lowest and use them to estimate the Gini coefficient $G_x(p)$ as our measure of pre-tax income inequality:

$$G_x(p) = 1 - 2 \int_0^1 L_x(p) dp$$

where $L_x(p)$ is the Lorenz curve of income inequality.

Tax and transfer units are estimated respectively as the amount of tax borne and benefits received by corresponding population quintiles. Results are then converted to percentages and accumulated to obtain the concentration index $C_T(p)$ of tax and transfer.

$$C_T(p) = 1 - 2 \int_0^1 L_T(p) dp$$

where $L_T(p)$ is the concentration curve for tax and transfer.

We calculated the incidence of these taxes on different income quintile groups using the Kakwani (1977) index of tax progressivity. The Kakwani index (K) measures the difference between the Gini index and the concentration index of tax/transfer in a simple equation shown below:

$$K = C_T(p) - G_X(p)$$

This method attempts to take pre-tax/pre-transfer income inequality into account, by calculating how concentrated tax revenues are, and subtracting from that the concentration of pre-tax/pre-transfer income. A higher index of concentration (C) means that tax revenues are coming from one part of the income distribution rather than being spread out over the whole income distribution. A higher Gini score (G) indicates greater income inequality. (Note, however, that this is income inequality before taxes and transfers.) The Kakwani index thus assigns high scores to countries where tax revenues are concentrated (i.e. coming mostly from high income groups), and penalizes countries for high pre-tax, pre-transfer inequality. Our unit of analysis is the household and all

estimates use the available sampling weights to achieve population estimates. In separate analyses available in the online supplement we also calculated the Suits (1977) index of tax progressivity and the index of concentration for tax and transfer. The different methods of analysis did not change the substantive findings, so we report only the Kakwani index here as the most popular index of tax progressivity.

One complication with the tax data is that total taxes include taxes paid on transfers—what scholars call tax 'clawbacks', because these taxes give back to the government a portion of the transfers (Adema, 2000, 2001). This means that where transfers are high, taxes on transfers may be high, but this is not 'true' tax, simply a reduction in the amount of transfer given. To achieve a measure of true tax paid, then, the amount of clawbacks should be subtracted from the total tax paid. But whether clawbacks lead to a bias in favor of or against our thesis depends on the progressivity of the clawbacks. If clawbacks increase for higher income groups—that is, if higher income groups pay larger taxes on transfers than lower income groups do—then the true tax structure is more *regressive* than it seems, because the true tax amount paid by higher income groups is lower than it seems (that is, if we subtract the clawback from the total tax paid to get the true tax paid, then when the clawback is larger the true tax paid will be smaller).

Unfortunately data limitations do not allow us to take clawbacks completely into account, so we first use other research to estimate the direction of their effect. Adema (2000, 2001) has estimated clawbacks, and finds that taxes on transfers are highest in several social democratic countries (Denmark, Sweden, Finland, and the Netherlands) and lowest in several liberal countries (U.S., Australia, and the U.K.). This means that the

tax progressivity of the social democratic countries is more likely to be affected by clawbacks than that of the liberal countries. But in what way will it be affected? The only estimation of clawbacks across income deciles that we have found is by Gerlinde Verbist (2005), who uses Euromod data to estimate pensions and unemployment clawbacks (with no data on the U.S.; but Adema's data show that clawbacks are not an issue in the US); her figures show that the highest pension clawbacks are in Denmark, Sweden, and Finland, and the lowest in Portugal; and that the highest unemployment clawbacks are in Sweden, Denmark, the Netherlands and Finland, and the lowest in the UK, Portugal, Ireland, Germany, and Austria. As shown in the online supplement, these clawbacks are generally larger for higher income groups, except for in Denmark, and with a partial exception in unemployment clawbacks for Sweden (which are closer to proportional). Because clawbacks are to be *excluded* from total tax paid, this means that where the clawback is larger, the true tax paid is smaller. This in turn means that the larger the clawbacks paid by higher income groups, the more regressive the tax structure. Since the clawbacks are largest, and highest for high income groups, in the social democratic countries, this makes the tax structure in those countries *even more* regressive. With the exceptions noted, including clawbacks would therefore largely *favor* our thesis; that is to say, if we could accurately take clawbacks into account, our thesis would be even stronger. The patterns for Denmark do not go in this direction, so it should be kept in mind that our figures may underestimate progressivity in Denmark. In addition, unemployment clawbacks in Sweden do not clearly go in this direction, but the amounts under discussion are so small that we do not expect them to have a noticeable effect on overall progressivity.

We also estimated the effect of clawbacks on our data using the method of Ferrarini and Nelson, which is to apply the rate of taxation on total income to the amount of transfers in each income quintile, and subtract this from the total tax paid. This is not a perfectly satisfactory method, as the rate of taxation on transfers is likely to be different from the general rate of taxation. This estimation reduced the Kakwani index for all the countries, but the comparative pattern of greater progressivity in the U.S. still held, leading us to be confident of the robustness of the general thesis. These calculations are available in the online supplement.

Thus, while the data limitations suggest the need for further research on clawbacks, the size and progressive nature of clawbacks in conservative and social democratic countries suggest that they do not change the general picture that we describe in this paper. The numbers shown in the remainder of this paper are unadjusted figures, that is, they do not take the issue of clawbacks into account.

Because of the widely varying degree of pre-tax inequality in the countries under study, it is important to reiterate that the Kakwani index does take income inequality into account: if two countries have equally concentrated tax revenues, the country with greater inequality gets a lower Kakwani number, and is counted as less progressive.

Because a great deal of work has been done recently on tax expenditures ('loopholes'—e.g. Howard, 2003) it is also worth pointing out that the LIS data do attempt to take tax expenditures into account. If they did not take tax expenditures into account—that is, if they only measured the nominal tax rate on households—then the U.S., which relies on tax expenditures that go largely to the middle class, would look much more progressive than it does here.

FINDINGS

We compared the index of tax progressivity to several measures of the welfare state: Esping-Andersens's decommodification index (1990), Scruggs and Allan's replication of the decommodifiation index and their benefit generosity index (2006), and the OECD's SOCX measure. Because the overall picture does not change no matter which of these indices is used, we present here only the Esping-Andersen measure; results using the other three measures are available in the online supplement, along with the full findings for this article.

The social democratic and conservative states have more progressive property taxes than the liberal states (figure 1; each dot on the graph represents one country, and the measure is an average for that country over all years for which the LIS has data on that country; average and individual values are available in the online supplement[7]).

FIGURE 1 ABOUT HERE

Property and wealth taxes are more regressive in the more liberal states, perhaps because of the more widespread nature of home ownership in these states[8].

FIGURE 2 ABOUT HERE

The social democratic countries have more regressive payroll taxes (figure 2).

FIGURE 3 ABOUT HERE

Income tax progressivity is higher in the liberal states than the social democratic and conservative ones (figure 3).

FIGURE 4 ABOUT HERE

Consumption taxes are regressive in all countries for which this calculation is possible, but there is a trend of less regressivity in the liberal states and greater regressivity in the social democratic states (figure 4).

Because property taxes make up such a small portion of tax revenue (between 2% and 6%) in social democratic states, the greater progressivity of property taxes in those states does not have a large effect on overall tax progressivity. On the other hand, the large role played by income and sales taxes in total tax collections in all countries means that greater or lesser progressivity in income tax *does* have a large effect on overall tax progressivity. Figure 5 shows the results of weighting the progressivity of income, property, and payroll taxes by their share in total tax revenue, and adding together the weighted progressivities.[9]

FIGURE 5 ABOUT HERE

The overall pattern of tax progressivity in these three taxes is that the liberal states have more progressive taxes than the social democratic states. Figure 6 shows the results of weighting the progressivity of income, sales, property, and payroll taxes by their share in total tax revenue, and adding together the weighted progressivities, for the six countries for which consumption tax data is available. (The online supplement also shows the overall tax structure, minus sales tax, using deciles rather than quintiles. The picture is largely the same.)

FIGURE 6 ABOUT HERE

A closer examination of these results leads to three conclusions:

(1) As other scholars have suggested, the US has a more progressive tax structure than the European welfare states. Of the six countries for which it was possible to

calculate sales tax, the U.S. is the only country to have an overall progressive tax structure. All other countries for which it is possible to calculate overall tax progressivity have been, and remain, regressive throughout the period of study. For the 13 countries for which it was possible to calculate income, payroll, and property tax progressivity, the U.S. has the most progressive tax structure; Sweden and Denmark are the most regressive. Our finding of an inverse correlation between tax progressivity and welfare state effort supports those scholars who suggest that regressive taxes allow the growth of the welfare state, while progressive taxes constrain it.

(2) However, Britain's tax structure is more regressive than the continental welfare states, making the inverse mapping onto the 'worlds of welfare' typology imperfect. Comparing figures 5 and 6 shows that Britain's regressivity is driven by the large role that sales taxes play in the tax structure. Although the LIS data do not extend to the pre-Thatcher period, we know from other studies (e.g. Johnson and Stark, 1989) that the Thatcher government made the tax structure more regressive by increasing the role of sales taxes and reducing the role of income taxes, and we suspect that our measures are a result of those changes. If the arguments discussed above are correct, we might expect the increasing regressivity of the British tax structure to lead to a larger British welfare state in coming years, as a regressive tax structure has in other cases served to stabilize the finances of the welfare state.

(3) It is a mistake to assume that income and property taxes are necessarily progressive, and that payroll taxes are necessarily regressive. Regressive income taxes are common in the social democratic countries, and the property tax tends to be regressive in this sample of countries (with a few exceptions in the social democratic

countries for some years). Payroll taxes tend to be regressive, as scholars have guessed, but we find a progressive payroll tax on two occasions (the UK in 1991 and 1995). The one tax that does live up to its reputation is the sales tax, which is regressive in every country and every year.

Because the extremely detailed data of the kind that the LIS makes available for the developed contemporary world are not available for earlier historical periods and for other countries, we wondered whether any of the less data-intensive methods could be used as an acceptable proxy for overall progressivity[10]. If a method that requires less data gives a similar result to our findings, it would be possible to use it to analyze progressivity in other contexts. In particular, the role that direct and indirect taxes (specifically income and sales taxes) play in the revenue structure is often available even for very early historical periods. We therefore examined whether either the role of income taxes or the role of sales taxes in the tax revenue structure correlates with our findings. The correlation is low for income tax, but much higher (r= -0.744) for sales tax (see online supplement). This accords with our detailed findings, as we found several cases of regressive income taxes in the social democratic and continental countries, but uniformly regressive sales taxes everywhere. Thus, the role of sales tax in the overall revenue structure is a better proxy for progressivity than the role of income tax: the higher the role of sales tax, the lower the overall progressivity. We also examined the correlation between our method and several different methods of calculating tax ratios (Eurostat 2005; Martinez-Mongay 2003; Carey and Tchilinguirian 2003; Volkerink and de Haan 2001; Mendoza *et al.* 1997; Daveri and Tabellini 1997) available in the online supplement. There were no clear results, but in most cases tax ratios on consumption

correlated most highly with our measures, again suggesting that sales taxes provide the best proxy for regressivity.

LIMITATIONS AND CONCLUSION

We have criticized above the data and methods of other studies. Our study has limitations as well, and two issues deserve further discussion. First is the problem of the top-coding of income data, that is, censoring extremely high incomes because their rarity would make the taxpayers concerned identifiable. The LIS top-codes data at 10 times the median of non-equalized income. The rule of 10 times the median was adopted in 1995, as the number of taxpayers earning over that level was negligible then. With increasing income inequality, especially in the U.S., that number has risen, but is still small (in 2007 median household was slightly over $50,000, so 10 times the median would be households earning over $500,000 per year). The second issue that limits our findings is tax evasion, the magnitude and direction of which will have clear implications for our discussion. Despite creative attempts (e.g. Slemrod 1985), conclusive estimates of tax evasion remain elusive, and cross-cultural comparisons are particularly limited (see the reviews in Andreoni *et al.*, 1998; Slemrod, 2007). In particular, if high income groups are more likely than low income groups to evade in the U.S., and if low income groups are more likely than high income groups to evade in Europe, then our comparative conclusions would change.

To assess whether these issues affect our substantive conclusions, we conducted two simulations. First, we simulated what would happen to our measures if the top 1% of taxpayers in the U.S. pay zero income, property, and payroll taxes (data availability

restricts the ability to perform this calculation for sales taxes). This simulation tests what would happen if the US tax code is extremely regressive at the very top, where the top coding issue matters. Even with these drastic assumptions, the U.S. is more progressive overall, except for Australia in some years. While the tax rates of top taxpayers are politically important, the small numbers of people in this category limits their influence on the overall progressivity picture. These findings are available in the online supplement.

Second, to give a picture of the robustness of the overall progressivity score including sales tax in the face of possible tax evasion, we took the year in which the American tax code is most regressive (1994) and compared it with the most progressive overall score, including sales tax, for any European country for any year (Germany in 1989). We then calculated what percent of American taxpayers would have had to pay an income tax of zero for the two scores to be equal. For the US Kakwani Index of 1994 to match the German Kakwani Index of 1989, 63.6% of the top quintile group of taxpayers in the US in 1989 would have had to pay an income tax rate of zero. These calculations are available in the online supplement.

We therefore conclude that top coding does not change the comparative picture. And while tax evasion is certainly an important issue, both substantively and analytically, these numbers suggest that even extremely widespread evasion at the top of the income distribution in the US would not change the comparative progressivity picture: even in the year in which the US is most regressive, almost two-thirds of the top quintile group of taxpayers would need to pay an income tax rate of zero (i.e. evade their tax obligations

completely) for the US Kakwani index to match the most progressive score of any European country, for any year.

The most important limitation on our study is that although we believe our methods are the best possible, the analysis is only as good as the underlying data. The LIS data that we use are collected by agencies within each country and harmonized by the LIS. While the LIS strives to present the best data possible, and while its efforts are clearly of the highest quality currently possible, the data may be compromised at several points, including the initial collection, the estimation procedures used by each country if necessary, and the secondary collection and formatting at the LIS.

Because of these difficulties, our study cannot be the last word on the question of tax progressivity. Indeed, it seems clear that no study can be the last word on this issue, as the cross-national examination of tax progressivity is a complicated enterprise for which no one data source will yield fully reliable conclusions. In this situation, the way forward is to examine what common conclusions the different data sources yield, what discrepancies arise, and what might be causing the discrepancies.

The one finding that holds across all of these studies is that the U.S. has historically had a more progressive tax structure than other countries: studies that use the tax ratio method, studies that use income tax returns data, and our study using household survey data all come to this conclusion (table 1). While the recent picture produces less consensus, there is agreement that, at least until the rise of the neoliberalism of Ronald Reagan, the U.S. had a more progressive tax structure.

TABLE 1 ABOUT HERE

However, beyond this point, there are differences in our findings and those of other studies. First, while Piketty and Saez find greater progressivity in the US only until the 1970s, we find it continues to today. We suspect that this discrepancy arises because of Piketty and Saez's exclusion of the value added tax. For reasons explained above, we believe that exclusion of the value added tax and other sales taxes distorts the tax progressivity picture, and is a disadvantage of the method of using income tax returns to measure progressivity.

While some studies put Britain and the U.S. in similar categories, we find that Britain has a tax structure that is as regressive as that of the continental welfare states. We suspect that this is a result of the Thatcher era increases in consumption taxes. If this is true, and if consumption taxes form a strong financial base for the welfare state, then the Thatcher tax changes may ironically have strengthened the British welfare state by stabilizing its financial base.

The one finding of ours that clearly contradicts the assumptions of some of the earlier research is our conclusion that it is a mistake to consider particular kinds of taxes progressive or regressive, as many scholars do. Income and property taxes are usually considered progressive taxes; but in the LIS data the progressivity of these taxes varies across countries, and these taxes are often regressive, especially in the social democratic countries. Similarly, payroll tax, which is usually considered a regressive tax, is progressive on two occasions. The only tax which uniformly behaves as scholars have assumed is consumption tax: this tax is regressive in every country for which we have data. The proportion of tax revenue generated from taxes on goods and services correlates better with our overall tax progressivity pictures than the proportion of income taxes, so

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we suggest that in situations where the detailed calculation of overall progressivity is not possible, the proportion of tax revenue raised from the taxation of goods and services is an acceptable proxy.

Does the regressivity of consumption taxes, such as the value added tax, matter? Some economists have argued that it does not, because although the value added tax is regressive if looked at at one point in time, it looks proportional if looked at over the life course: that is, because people become wealthier over the course of their lives, the heavy tax burden that hits them when they are younger is counterbalanced by the relatively lighter tax burden that they must bear when they are older and wealthier. Caspersen and Metcalf (1994) use Panel Study of Income Dynamics data to measure lifetime incidence of a hypothetical value added tax, and find that a VAT would be roughly proportional in the US if it is being assessed with regard to lifetime income. Similar incidence of consumption taxes in the other countries would make the overall tax picture less regressive in countries with large VAT.[11]

This is a point about income mobility over the life course rather than a specific point about progressivity. If we calculate all taxes and welfare spending from the point of lifetime incidence, we come back to a point known two decades ago, namely, that welfare states in general do not redistribute between classes so much as across the life course, and 'take…from the lucky and the young to give to the unlucky and the old' (Stinchcombe, 1985: 424). The VAT picture fits that pattern.

For purposes of examining the consequences of welfare states, however, the lifetime incidence perspective is unsatisfactory, because it does not consider the ways in which tax structures may alter behavior. Consider a household facing the decision of

whether or not to increase its income through increased labor. In a progressive tax structure the household will receive a lower after-tax return on increased income than a similarly positioned household in a regressive tax structure. If the two tax structures are equivalent over the long run, then taxpayers who are indifferent between present and future income will not be affected by the progressivity or regressivity because it will balance out in the long run. However, taxpayers with a high discount rate will forego income under the progressive tax structure even if the two tax structures are equivalent over the long run. In addition, Caspersen and Metcalf's calculation assumes that the VAT itself does not change patterns of income mobility. But a tax that is assessed on people when they are young and poor may have consequences that distort income mobility across the life course: for example, it may interfere with the attempt to acquire human capital by making it more difficult to recover from financial setbacks, as well as by reducing purchasing power at earlier points in the life course. In the US context, a value added tax would have more severe repercussions than in the European context, because it would limit the ability of poor households to overcome financial setbacks caused by health care costs (a significant factor in American bankruptcies). It would, in short, damage the income mobility that is the source of Caspersen and Metcalf's critique.

For these reasons, we conclude that the lifetime incidence perspective is inappropriate for the analysis of the progressivity of the VAT, and to the analysis of the consequences of progressivity more broadly.

Aside from the case of Britain, our study confirms the intuition of other scholars of an inverse mapping of tax progressivity onto the 'worlds of welfare': welfare state effort is higher where tax progressivity is lower. The reasons for this inverse correlation,

however, are not well understood. We close by outlining five possible explanations for this inverse correlation:

(1) Timing of Industrialization. Theorists have suggested that countries that industrialize later than their neighbors develop a larger state apparatus (Gerchenkron, 1962). A combination of this literature with the recent resurgence of interest in the work of Karl Polanyi's (2001 [1945]) observations about market embeddedness may shed light on the inverse correlation described above. It may be that industrialization unsettled the fabric of local communities everywhere, as Polanyi argues, but that the response to this varied according to the capacities of the state at the time of the rise of mass capitalism. Late and state-driven industrialization may mean that the state has greater capacity to deliver welfare benefits to citizens at the time of industrialization. In early industrializing countries the absence of administrative capacity may make punitive taxation the only way of disciplining capital at the time of industrialization: because the early stages of progressive taxation required the state to pursue only a very small number of very wealthy citizens, it may simply have been more feasible than any other form of 'embeddedness'.

(2) Economic Consequences of Progressive Taxation. It is possible that progressive taxes lead to greater economic inefficiency than regressive taxes. Lindert (2004) argues that consumption taxes are more economically sustainable because they do not penalize work effort as income taxes do, and therefore do not interfere with economic growth. Extending this line of thought, it may be that progressive taxes in general dampen incentives for economic growth (if greater income leads to a higher tax bite, some workers will forego the extra income for leisure), whereas regressive taxes sharpen

incentives for economic growth (if greater income will be rewarded with a lower tax rate, some workers will forego leisure for extra income). If this is the case, then regressive taxes are more compatible with economic growth, and progressive taxes may interfere with economic growth. If a tax system based on progressive taxes gets too large, the consequences for economic growth may then lead to political and popular support for cutting taxes, effectively putting a ceiling on the size of the welfare state. While this hypothesis is logically sound, it is unclear whether economic behavior is as responsive to incentives as this hypothesis assumes. It is also unclear whether the mechanism hypothesized, which puts a great deal of emphasis on economic voting and the ability of voters and politicians to pinpoint the reasons for economic decline, can be historically demonstrated.

(3) Political Institutions. Progressive taxation and small welfare states may both result from majoritarian political structures. In an examination of the question of whether globalization is causing a 'race to the bottom' Hays (2003) argues that institutions that force political adversaries to compromise, such as proportional representation or the practice of governing through coalitions, constrain the translation of majority preference into public policy. Polities without such restraining institutions are more likely to see policy-making driven by majority preference. It is possible to apply this institutional logic to the case here. Because progressive taxation was directed against a very small minority of wealthy taxpayers at its inception at the turn of the century, it was likely to have represented the preferences of the majority (this period precedes the era of systematic opinion polling, but documentary sources do reveal widespread popular interest in 'soaking the rich' in many countries—see Morgan and Prasad, forthcoming).

In countries in which majority opinion translates easily into policy, it may have allowed politicians a way to appeal to the majority of their constituents at the expense of a small minority. In addition, the fragmentation of policymaking power in the U.S. may have made it difficult to implement any welfare legislation that did not display such high majority preference. On the flip side, countries with restraining corporatist institutions and less fragmented policymaking would be more likely to find adversaries striking a bargain of extensive welfare policies paid for by regressive taxes. While this hypothesis is intriguing, the restraining corporatist institutions in many countries come after the decisions about tax structure. Nevertheless, versions of this argument have recently received a great deal of attention (Iversen and Soskice, 2006) and deserve careful testing.

(4) Political Consequences of Progressive Taxation. It is possible that progressive taxes lead to political protest and increased political attention on the issue of taxation. Harold Wilensky (2002) has been the most prominent advocate of this argument. Wilensky argues that progressivity implies visibility of taxation: to implement a tax that discriminates by income, the state needs fine-grained information on taxpayer income. The process of collecting this income gives taxpayers detailed information about their tax liabilities, making taxation more visible than in states that rely on taxes that do not discriminate based on income, such as consumption taxes. It may also be that progressive taxation diverted political attention away from the welfare state (for example, by focusing the attention of third parties and social movements on progressive taxation rather than on national health care) and generated a political world centered around the politics of tax exemptions (which eventually channeled the American welfare state down private rather than public lines).

(5) Preferences for a Small State. Finally, politicians may have chosen progressive taxation in some countries precisely in order to keep the state small by keeping its costs visible. In this understanding, the ultimate causal factor is a preference for a small state, and political actors are aware that progressive taxes will be more visible and less popular than regressive taxes and will therefore keep the state small, and choose progressive taxes for that reason.

Assessing the reasons for the inverse correlation thus requires historical investigation into the origins and consequences of tax progressivity. While it is beyond the scope of this article to investigate these alternative explanations, we hope that our work will help to focus research attention onto this question.

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Figure 1: Property/Wealth Tax Progressivity
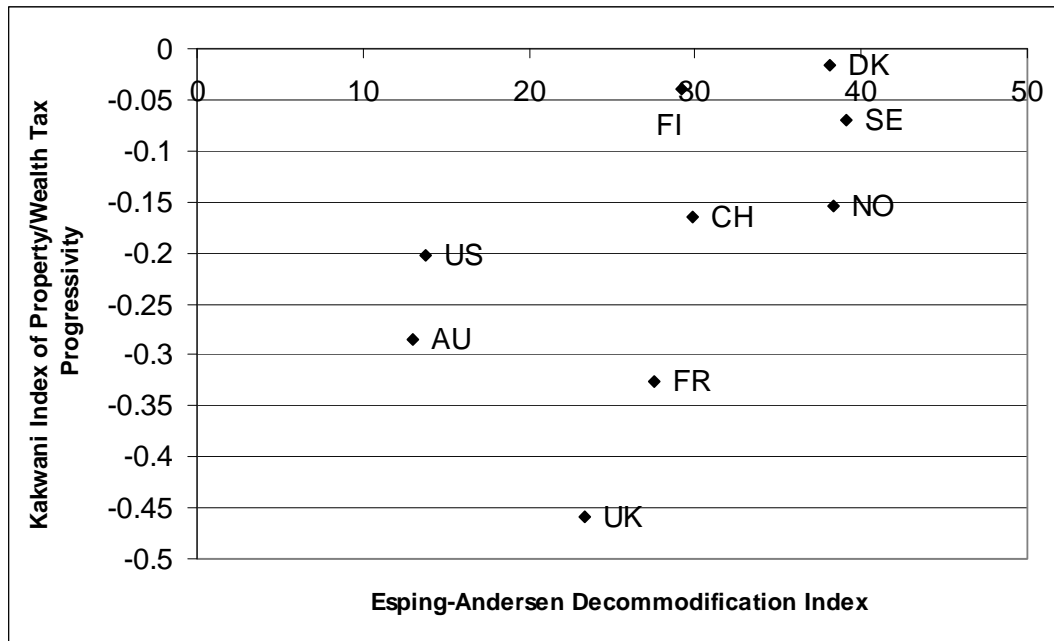
Note: countries included in figure above and figures below are Australia (AU), Belgium (BE), Canada (CA), Denmark (DK), Finland (FI), France (FR), Germany (DE), the Netherlands (NL), Norway (NO), Sweden (SE), Switzerland (CH), the United Kingdom (UK), and the United States (US).
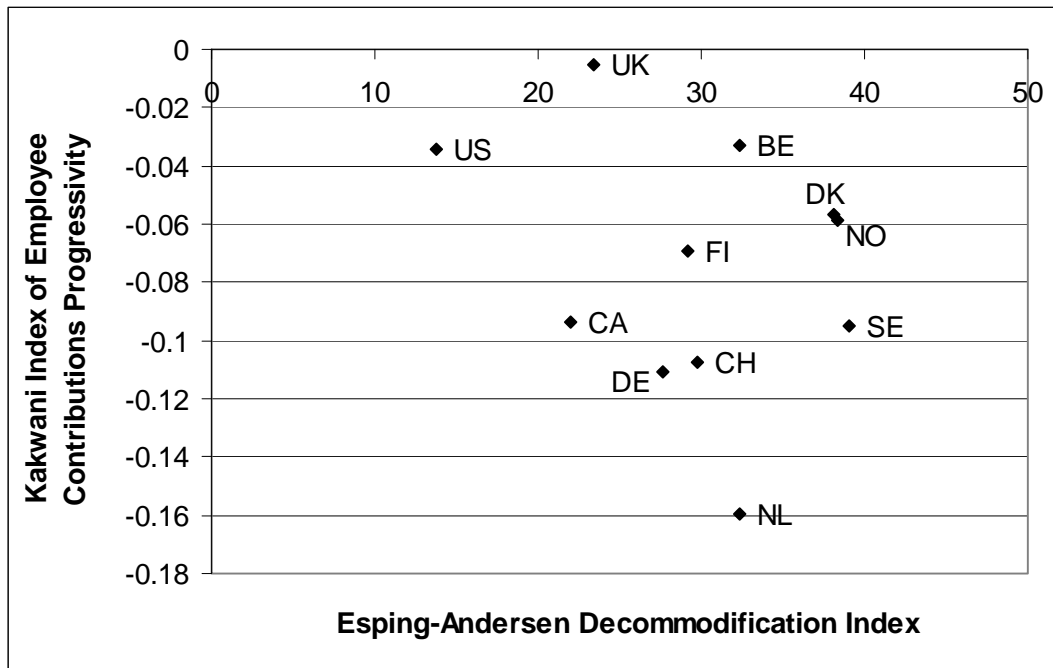
Figure 2: Payroll Tax Progressivity

(Scatter plot: y-axis labeled "Kakwani Index of Employee Contributions Progressivity" ranging from 0 to -0.18; x-axis labeled "Esping-Andersen Decommodification Index" ranging from 0 to 50. Data points: UK ≈ (23, -0.005); US ≈ (13, -0.034); BE ≈ (32, -0.033); DK ≈ (38, -0.057); NO ≈ (39, -0.058); FI ≈ (29, -0.070); CA ≈ (23, -0.094); SE ≈ (39, -0.095); CH ≈ (30, -0.107); DE ≈ (29, -0.110); NL ≈ (32, -0.160).)

Figure 3: Income Tax Progressivity

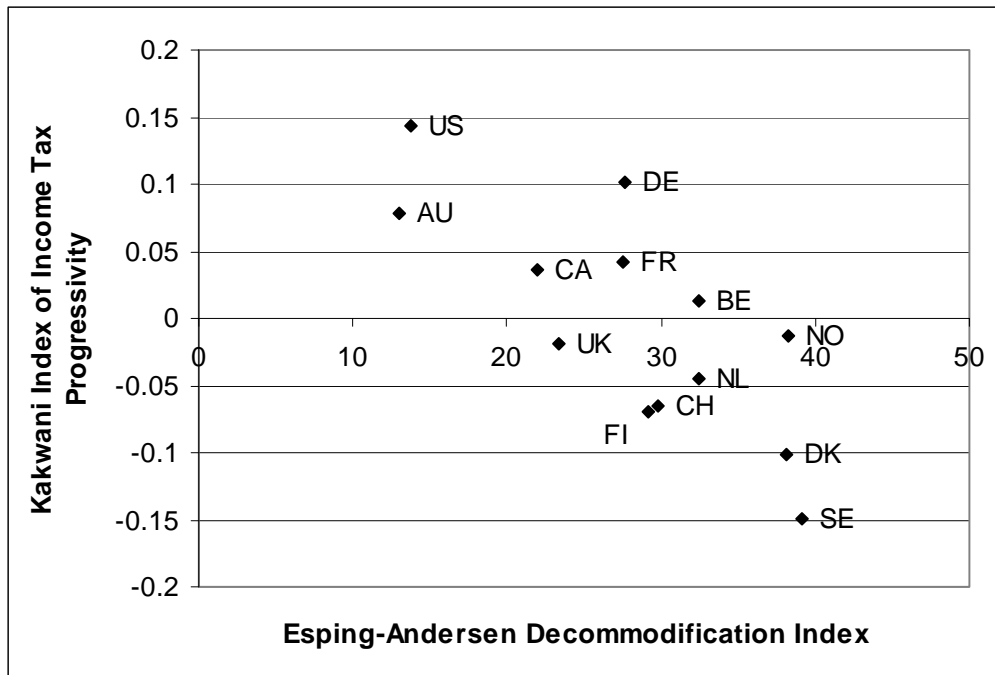**Figure 4: Sales Tax Progressivity**
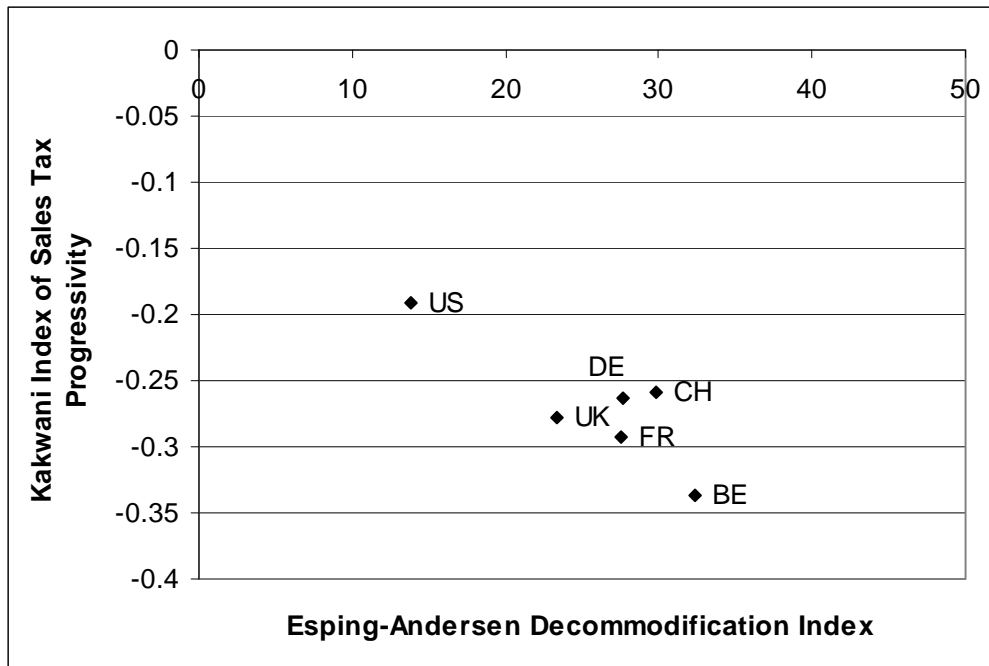
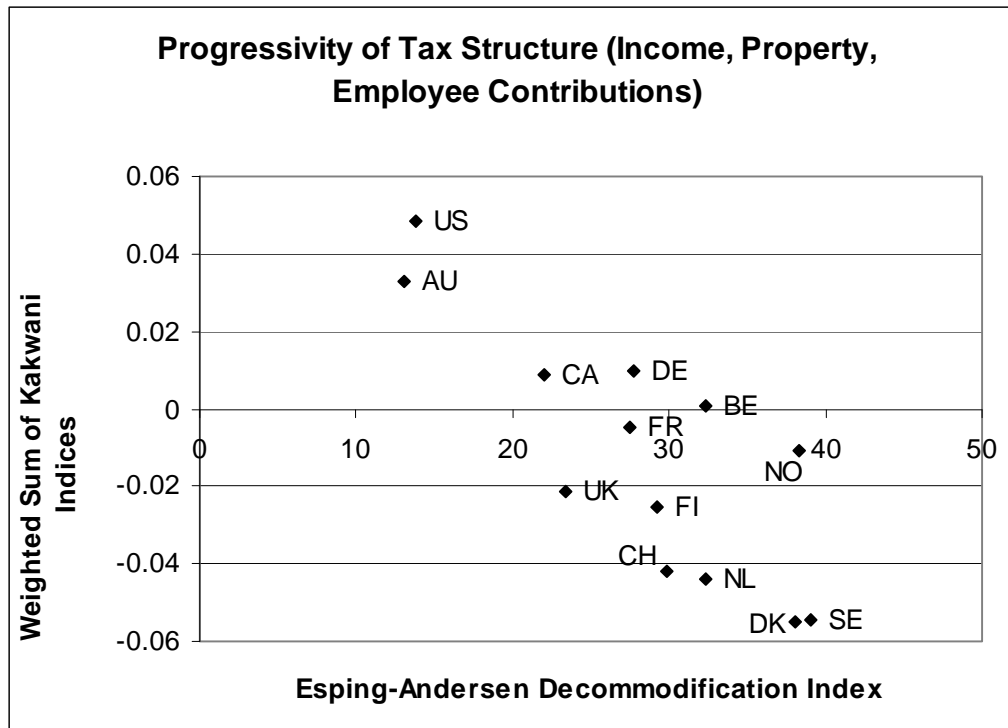**Figure 5: Overall Progressivity of Tax Structure (Excluding Sales Tax)**

Progressivity of Tax Structure (Income, Property, Employee Contributions)

Weighted Sum of Kakwani Indices

Esping-Andersen Decommodification Index

Figure 6: Overall Progressivity of Tax Structure (Including Sales Tax)

Progressivity of Tax Structure (Income, Sales, Property, Employee Contributions)

(Y-axis: Weighted Sum of Kakwani Indices, from -0.14 to 0.04)
(X-axis: Esping-Andersen Decommodification Index, from 0 to 50)
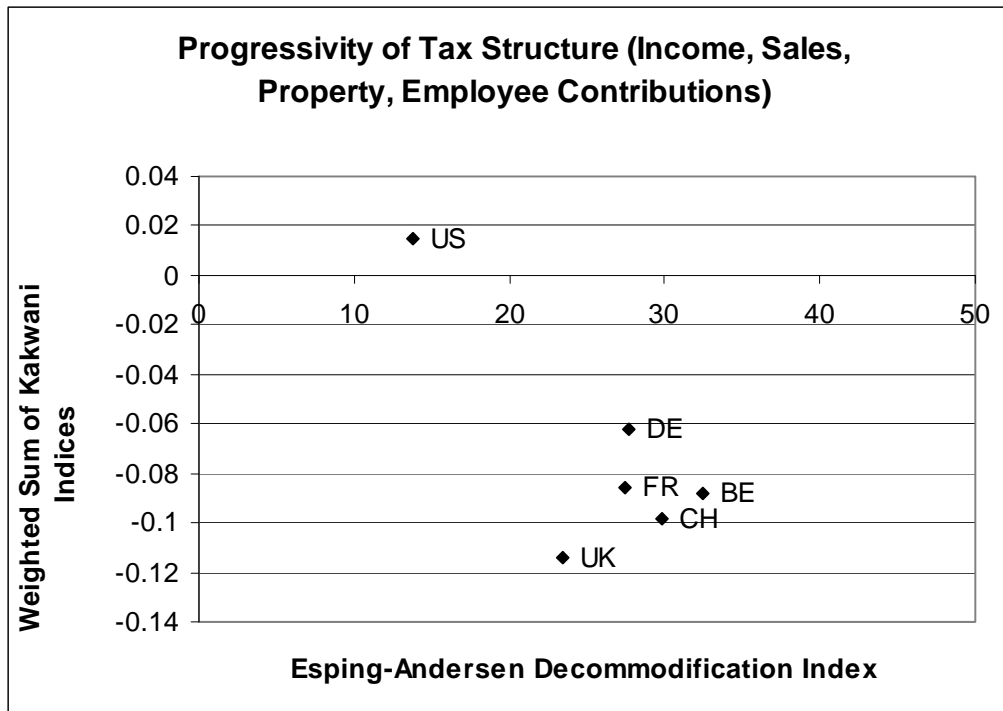
Data points:
- US
- DE
- FR
- BE
- CH
- UK

Table 1: Cross-national comparisons of tax progressivity

	method	studies	main comparative finding
percent of tax revenue	measure role of different kinds of taxes (income, payroll, sales, etc) in tax structure	Steinmo, 1989, 1993; Wilensky, 2002; Kato, 2003; Genschel, 2002; Volkerink, 2000; Cusack and Beramendi, 2003	US relies on "progressive" taxes, large welfare states rely on "regressive" taxes
tax ratio	measure total tax paid by one factor of production (e.g. capital, labor) as proportion of total economic base of that factor	Carey and Rabesona, 2002; Mendoza and Tesar 1994; Volkerink 2000; Sørensen 2004	US taxes labor and consumption less than other countries do; at least until 1970s, US taxed capital more than other countries did [studies disagree about whether this has changed after 1970s]
income tax returns	use official tax returns data to measure progressivity of income tax	Piketty and Saez, 2007; Piketty and other collaborators	US more progressive than France and UK until 1970s
LIS tax data	use Luxembourg Income Study data to measure progressivity of all taxes, weight progressivity by role of tax in tax structure	this paper	US more progressive than any other country

ENDNOTES

[1] An overall picture of progressivity or regressivity also requires attention to what is done with those taxes. Korpi and Palme (1998) have shown that transfers are also more progressive in the liberal countries.

[2] There has been confusion in the comparative historical scholarship about whether the relevant independent variable is best measured by the factors being taxed (e.g. labor or capital), the form of taxation (e.g. income or payroll), the methods of tax collection (e.g. visible vs. invisible, earmarked to spending or non-earmarked), or the degree of progressivity. Positions can be found in the literature to support each of these four possibilities. In this paper we examine tax progressivity only: the theoretical prediction about the economic consequences of taxes is entirely about progressivity (namely, if we tax higher income and wealth, then people will behave in ways that avoid leading to higher income and wealth, damaging economic growth). The theoretical predictions about the political consequences are more varied, but progressivity is one element of them. But our focus on progressivity should not be read as exclusion of the possibility of issues such as the visibility of tax collection having important political effects. Progressivity is not the only important feature of the tax structure. But it is one important feature.

[3] Personal communication, Alberto Alesina.

[4] In addition, some scholars have recently used LIS data to decompose the elements of tax progressivity and ask 'what makes the income tax progressive' (Wagstaff and Doorslaer, 2001)—that is, whether progressivity in different countries is a function of progressive rate structures, a progressive tax base, or progressive exemptions.

[5] We also note that both tax concentration measures, and measures of reduction in inequality, are biased *in favor of* the thesis developed in this paper. That is another reason why we do not use them.

[6] Note that the US data available through BLS consist of consumer expenditure data by income quintiles rather than the actual consumption tax data available for the other cases from the LIS. We use the share of expenditure by income quintiles to approximate the quintile-specific share of consumption tax paid.

[7] We average over the waves because graphing each wave would make the correlation seem stronger than it is; see page 8 in the online supplement.

[8] The LIS definition of property tax does not include estate and inheritance taxes, so we have excluded those from the OECD numbers and the resulting calculations. As a check, we repeated the calculations with estate and inheritance taxes included. This does not affect the results.

[9] There were a few cases of missing data on property and payroll taxes, and incomplete data for some years for France; excluding these does not affect the overall picture described here (see online supplement, pages 15–16).

[10] We are grateful to a reviewer for posing this question.

[11] Graetz (2005) has made two additional arguments against using lifetime income as the measure of progressivity of VAT. First, he notes that the ability of young individuals to borrow against future or lifetime earnings is limited—in practice, it depends on factors such as the regulation of credit and the risk aversion of individuals and capital markets. Second, he notes that the calculation of lifetime incidence makes the assumption that the VAT rate will be constant over the lifetime. But continuity in policy cannot be guaranteed.