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Is there more redistribution in Scandinavia than in the US?

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Abstract

Are the Scandinavian countries more redistributive than the US? Given the impression of Scandinavian egalitarianism one may conjecture that they redistribute more, but there is not irrefutable support for this in the literature. In general, the relationship between income inequality and redistribution from a cross-country perspective is not settled. Differences in how pre-fisc distributions enter into the measurement contribute to the ambiguity, as does the lack of an agreed redistribution measure; more fundamentally, there is not even an agreed methodology for answering the question. In this paper we re-examine the issue, applying both conventional methodology and the transplant-and-compare approach which renders fiscal regimes into a common base by adjusting for differences in pre-fisc income inequality. Redistributive efforts in the US and three Scandinavian countries, Norway, Sweden and Denmark, are found to depend on the method employed and comparisons vary for different redistribution indices. The US stands out as more tax redistributive than the Scandinavian countries using conventional methodology, but according to the common base approach, US redistributive effort is ranked below that of both Sweden and Denmark for a range of indices. This finding of strong dependence of conclusions upon the methodology adopted is worth emphasizing, since substantial efforts are allocated to the theoretical understanding of different results.

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1. Introduction

What is the relationship between income inequality and tax redistribution from a cross-country perspective? It depends – not least because observers have in mind different concepts of redistribution, and then apply different methods. We contend that the ambiguous results found in the literature may stem at least in part from the use of different definitions of redistribution, with regard to the way that pre-tax inequality is taken into account.

Standard methodologies for the measurement of tax redistribution, based on microdata, suggest that the US is rather more redistributive than the three Scandinavian countries we study here, which are Norway, Sweden and Denmark. Such findings certainly run counter to many expectations, but the conundrum can be at least partly understood by noting that the starting point – the pre-fisc distribution – is much more unequal in the US than in Scandinavia. Perhaps there is ‘more work to be done,’ to achieve a degree of equality, in the US than in Scandinavia? The ambiguity is reduced, and perhaps resolved, by applying the transplant-and-compare approach of Dardanoni and Lambert (2002), rendering fiscal regimes into a common base by adjusting for differences in pre-fisc income inequality before conducting redistributive analysis. By measuring redistribution for similar pre-fisc distributions in comparator countries, can we tease out the “pure” effect of tax policies?

The relationship between redistribution and original inequality is undefined from a theoretical standpoint, but the literature offers simplified “stories” to at least two possibilities. First, intuitively one might expect that the countries with the highest pre-tax income inequality are the most redistributive, simply because the potential for redistribution is highest. The median-voter model (Romer 1975, Roberts 1977, Meltzer and Richard 1981) provides a theoretical framework within which such a relationship could be manifested.¹ Second, it is often claimed that redistribution from rich to poor is least present when and where it seems most needed; a finding that Lindert (2004) calls “the Robin Hood paradox”. Bassett *et al.* (1999) find some empirical support for this.² Alesina and Angeletos (2005) suggest that differences in redistributive efforts reflect differences between societies’ social perceptions regarding the fairness of market outcomes. Other investigations include Lambert *et al.* (2003), who note that different attitudes to what are socially acceptable levels of inequality in different countries can account for differing redistributive policies, and Slemrod and Kopczuk (2002) who suggest that low income countries will restrain both the size of government and the progressivity with which the size is financed. Relationships may also be rationalized by results of the optimal income tax theory: Kanbur and Tuomala (1994) argue that the optimum income tax/transfer system becomes more progressive as inequality increases, using the Mirrlees model. In Milanovic (2010), econometric issues and problems are highlighted which may have significantly contributed to the mixed empirical findings in the literature.

Ambiguity in empirical findings undoubtedly arises from the use of different measurement methodologies. In Section 2, we briefly survey the methodologies and indices which have been used to measure the redistributive efforts of governments. In Section 3, we first apply conventional methodology and then we use the transplant-and-

¹ For subsequent work in this line, see Alesina and Rodrik (1994), Persson and Tabellini (1994), Perotti (1996) and Milanovic (2000).

² See also Bénabou (2000) and Moene and Wallerstein (2001) on this.

compare procedure to filter out influences stemming from or reflecting diverse original inequality experiences. For each, we compute a range of redistribution indices, and we find that the picture changes with the methodology used. In Section 4, we reassess the redistributive stances in the US and Scandinavian countries in light of the empirical results, and we set our findings in a broader international context. Our main conclusion, in a nutshell, is that the outcome of an analysis depends very much upon the empirical approach used.

2. Approaches to the measurement of redistribution

In the literature employing microdata to discuss distributional issues, the relationship between initial conditions (the pre-tax income distribution), policy tools (the tax system) and outcomes (the post-tax income distribution) differs for different measurement methodologies and index measures. A central strand of the literature is that initiated by Kakwani (1977), for whom tax progressivity is measured by redistributive effect using the Gini coefficient when a contribution from the distribution of post-tax income is taken into account, and by disproportionality using a concentration coefficient when a contribution from the distribution of the tax burden is taken into account. A different approach, due to Blackorby and Donaldson (1984), uses the welfare function and inequality index due to Atkinson (1970), for a chosen degree of inequality aversion, to quantify redistributive effect as the proportion of after-tax income the social observer would hypothetically pay to convert a flat tax system with the same yield into the given one with no loss of welfare. For this approach, when pre-tax inequality is low, the observer will pay less in order to avoid a proportional tax, hence we can expect to find smaller redistributive effects in countries which are more equal before tax.³

There are variants on both approaches. Musgrave and Thin (1948) and Pechman and Okner (1974) offered precursor measures to the redistributive effect index advocated by Kakwani (1977) (which is that of Reynolds and Smolensky 1977). These variants can be seen as normalizations of the achieved inequality reduction, in which the normalization is by the equality or inequality level prevailing before the tax was applied – clearly affecting comparisons dramatically when pre-tax inequality differs between regimes. Fellman *et al.*'s (1999) “optimal yardstick” approach measures the redistributive property of an in-place income tax relative to the redistribution that could have been achieved had the tax been designed to have maximal inequality impact given the tax level, using an extended Gini coefficient. The Blackorby and Donaldson (1984) and Kiefer (1985) progressivity indices each adopt the welfare function approach, but with different normalizations.

All of these measures conflate tax system differences with pre-tax distributional differences. When used to make cross-country comparisons of redistributive effect, this tangled, twofold informational content prevents pre-tax inequality and what we might call “redistributional effort” from being explored as distinct phenomena. In Dardanoni and Lambert (2002) a methodology is proposed which fixes this problem, rendering common-base estimators for cross-country comparisons of redistribution. Post-tax income distributions are adjusted on the basis of differences between the pre-tax distributions they are derived from by controlling for location and spread differences. By eliminating all other pre-tax income inequality differences, for whatever reason they happened

³ Lambert and Thoresen (2009) found, when applying the Blackorby-Donaldson index, that the Norwegian tax system is not very redistributive. Duclos and Lambert (2000) contains evidence of much higher values for Canada.

(behavioral incentive differences or demographic variations, for instance), we get closer to identifying the effect of tax policies or “redistributional ambitions” across countries. Any of the measures of redistributive effect described above can be computed for transplanted income distributions.

We chose to focus primarily on effects of tax policies in this study, though we shall discuss constellations for the US and Scandinavia in respect of the expenditure side of the governments’ interventions very briefly at the end of the next section.⁴ Lambert *et al.* (2010) contains technical details about the measures of redistribution referenced here, and about implementation of the transplant and compare procedure, as well as details of the high quality and internationally comparable data on household incomes we have used (which comes from the LIS database, <http://www.lisproject.org>).⁵

3. Different answers to the question, “Is there more redistribution in Scandinavia than in the US?”

3.1 Findings using standard approaches

Unadjusted findings in respect of three of the six redistribution measures we have specified are summarized in Table I.⁶ In fact all six measures produce similar “stories”, with one exception, that of Pechman and Okner, which normalizes redistribution by pre-tax inequality. For the Pechman-Okner measure, redistribution is higher in the Scandinavian countries than in the US, whilst for all of the other measures the Scandinavian countries are less redistributive than the US. The three indices we show results for are those of Reynolds-Smolensky, Kiefer and Fellman *et al.* The first two are direct analogues, as each measures inequality reduction directly - but differently, using the Gini coefficient and the Atkinson inequality index respectively. The third is different in spirit, as it captures redistributional effort relative to an optimal design of taxes. The capacity of different measures to produce different comparative results is clear from Table I.

Table I. Conventional rankings of US and Scandinavia for different redistribution indices

	Index of redistribution		
	Reynolds-Smolensky	Fellman <i>et al.</i>	Kiefer
Most redistributive	US	US	US
Second most redistributive	Denmark	Denmark	Sweden
Second least redistributive	Sweden	Norway	Denmark
Least redistributive	Norway	Sweden	Norway

⁴ Progressivity measurement can be extended to government expenditure benefits, if attributed to individuals or households in cash-equivalent terms, and to a combined tax and benefit system. See Kim and Lambert (2009) and Fellman *et al.* (1999) for Gini-based measures and Duclos and Lambert (2000) for Atkinson-index-based measures.

⁵ Our findings are drawn with respect to one pre-tax/transfer definition of income, corresponding to what Milanovic (2000) characterizes as *factor P income*: income (including pensions) before tax and social transfers, where the latter includes social insurance transfers and social assistance transfers (see <http://www.lisproject.org/techdoc.htm> for further details).

⁶ The reader may consult Lambert *et al.* (2010) for a more extensive description of results.

3.2 Findings using the transplant and compare procedure

According to our reading of the redistribution hypothesis and other conjectures of the link between pre-tax inequality and redistribution, the most relevant measure(s) of redistribution would come from using a methodology that provides results in terms of a common baseline: one would like to see how countries' redistributive efforts would compare if computed for (hypothetically) the same level of pre-tax income inequality. Therefore we redid our analyses using the transplant and compare method, which necessitated adjusting post-tax income values by a fitted deformation function. We see a completely different picture for the comparison between the US and Scandinavia, clearly spelled out in Table II. Now, both for the Reynolds-Smolensky index and the Kiefer index, the US is ranked after both Sweden and Denmark, but equal to (Reynolds-Smolensky) and above (Kiefer) Norway.

There is good reason for the dramatically different results. The deformations reduce the redistributive effects in countries with high pre-tax income inequality, as the non-equiproportionate compression reduces pre-tax income differentials more than post-tax income differentials. Thus, the standard procedure may suggest that high pre-tax income inequality countries, such as the US, deliver more redistribution than is actually true for an empirical strategy that seeks to identify common-base redistributive efforts.

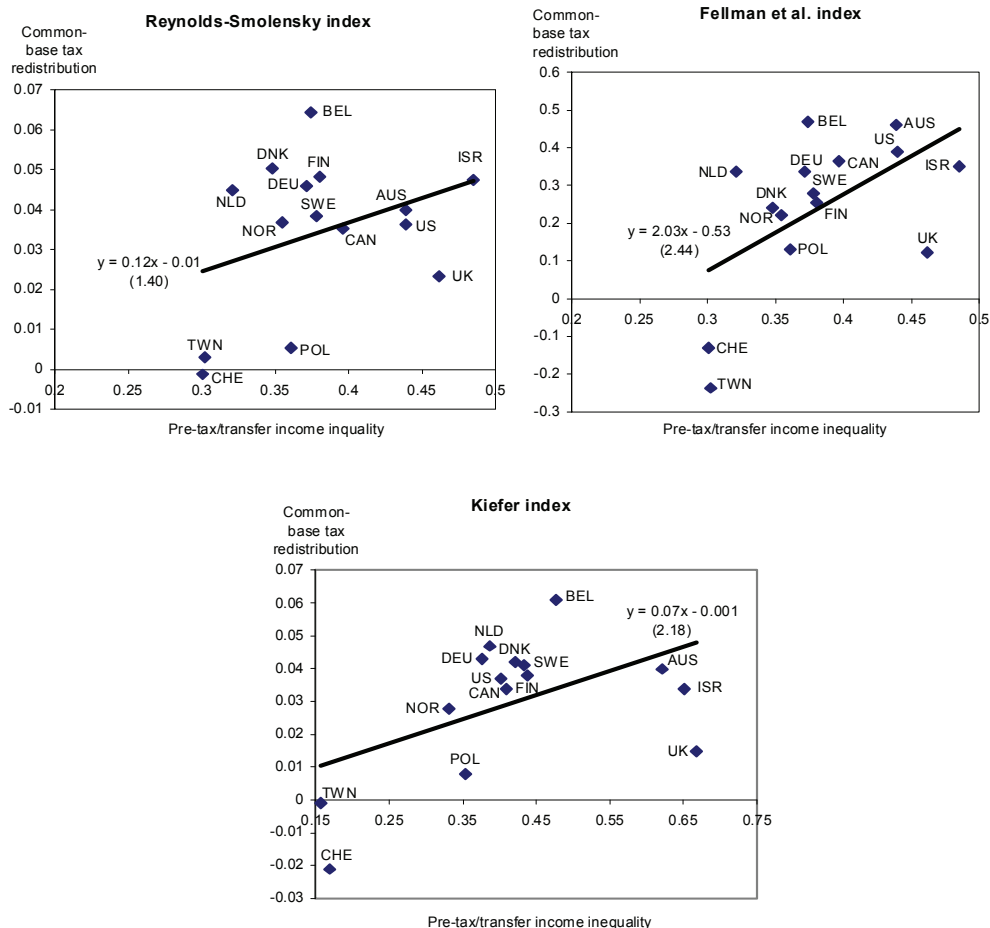
The US upholds the highest rank according to the Fellman *et al.* index for the common base method: the choice of index remains important. The Fellman *et al.* measure captures redistributive effort relative to an optimal design of taxes: perhaps countries with high inequality succeed in taxing people more closely to the relevant optimum? We speculate that the act of transplanting into a common base distribution (non-linearly between countries) changes the tax effort needed to achieve the maximal redistribution differently for different countries, but we leave further investigations of this interesting issue for future studies.

Table II. Common base rankings of US and Scandinavia for different redistribution indices

	Index of redistribution		
	Reynolds-Smolensky	Fellman <i>et al.</i>	Kiefer
Most redistributive	Denmark	US	Denmark
Second most redistributive	Sweden	Sweden	Sweden
Second least redistributive		Denmark	US
Least redistributive	Norway/US	Norway	Norway

In Figure 1, the results for the Scandinavian countries and the US from Table II are placed in a wider international context, involving 11 other countries present in the LIS database: Australia (AUS), Belgium (BEL), Canada (CAN), Finland (FIN), Germany (DEU), Israel (ISR), Netherlands (NLD), Poland (POL), Switzerland (CHE), Taiwan (TWN), and the United Kingdom (UK), all for the time period 1999-2001. We include fitted linear relations with upward slopes in Figure 1, but as reflected by the *t*-values (in parentheses), the identification of the relationship between common base redistribution and pre tax/transfer inequality is weak for the Reynolds-Smolensky index, though clearly positive for the Kiefer and Fellman *et al.* measures.

Figure 1. Relationship between common base tax redistribution and pre-tax/transfer income inequality



As noted in Section 2, many authors associate redistribution with features of the expenditure side or the size of public budgets. We obtained some results for these facets of the US and Scandinavian governments' operations. The links between redistribution and the *size* of the government were interesting. For three measures of size, the share of total income taken in personal income tax, the share of GDP accounted for by total tax revenue, (including corporate taxes, indirect taxation, etc), and total government outlays (consolidations of accounts for the central, state, and local governments plus social security) as a share in GDP, the Scandinavian countries stand out as clearly more redistributive than the US, suggesting a more pronounced "social inclination" in Scandinavia, perhaps. But the links between expenditure side redistribution and pre-tax/transfer income inequality were not very clear and are not reported here; see Lambert *et al.* (2010) for more detail.

4. Overview and ways forward

The understanding of the development of fiscal policies in response to pre-fiscal distributions of income is an intriguing but very challenging question. One major problem is that policies and income distributions evolve over time in close interrelation to

each other, suggesting that they are endogenous in a cross-country perspective. Nevertheless, the relationship attracts substantial attention, not least from a political economy perspective: does inequality create a political demand for redistribution (redistribution hypothesis) or do we observe a “Robin Hood paradox”, according to which redistribution from rich to poor is least present when and where it seems most needed, i.e. in the US in the present case?

The literature offers mixed results. In this study, we see a rather clear picture. When income tax systems are evaluated according to their own pre-tax/transfer inequality baselines, personal taxes appear to be more redistributive in the US than in the Scandinavian countries for 5 out of 6 indices; but, using the transplant-and-compare methodology, the apparently higher performance of the US is contested; the US ranks below both Sweden and Denmark for two of the three indices shown in Table II. Nevertheless, according to the Fellman *et al.* index, the US is seen as more redistributive than the Scandinavian countries. We have offered a possible explanation for this finding.

The contrasting evidence presented here and from past studies does not fully settle the question “as between the US and Scandinavia, which is the most redistributive?”, nor does it more generally determine which countries are most redistributive in a cross-country perspective. If what authors actually have in mind, when discussing the relationship between income inequality and redistribution across countries, is the concept of *redistributional effort for (hypothetically) the same level of pre-tax income inequality*, then the most relevant measure(s) of redistribution would be common-base measures. Using these, we see that there may well be *no link* between pre-tax/transfer income inequality and redistributional effects of the personal income tax (noting the index dependence for the ranking of the US and the Scandinavian countries in Table II, and the results for the Reynolds-Smolensky index in a wider cross-country perspective shown in Figure 1). Our approach supports neither the redistribution hypothesis nor the “Robin Hood paradox” depiction of the relationship in that wider context, perhaps a somewhat negative finding, which maintains the rift that has heretofore existed between theoretical suggestions and empirical findings. Clearly, one needs to be rather precise about which type of redistribution one is addressing before discussing theoretical explanations for relationships.

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