

Jesuit, David K.; Mahler, Vincent A.

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Luxembourg Income Study Working Paper Series

Working Paper No. 546

Comparing Government Redistribution across Countries: The Problem of Second-order Effects

David K. Jesuit and Vincent A. Mahler

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**COMPARING GOVERNMENT REDISTRIBUTION ACROSS COUNTRIES:
THE PROBLEM OF SECOND-ORDER EFFECTS***

**David K. Jesuit
Central Michigan University**

**Vincent A. Mahler
Loyola University Chicago**

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ABSTRACT

The traditional way of measuring government redistribution across countries is to compare the income households report that they receive from private sources with the income they receive after government transfers have been added and taxes and social insurance contributions deducted. Unfortunately, this conventional measure does not capture “second order” effects whereby income guarantees arising from public pensions make it less necessary for people to save for their retirement, rendering the “pre-government” counterfactual to the observed post-government distribution unrealistic. In addressing this problem, we offer an alternative to the conventional direct redistribution measure that considers claims to future income generated by both the public and the private sectors. Data have been calculated for 51 country-years from household income surveys available from the Luxembourg Income Study.

Among the central concerns of contemporary political economy in the developed countries is the role of the state in redistributing market income. The most straightforward—and most common—way of measuring government redistribution is simply to compare the income households report that they receive from private-sector sources with the income they receive after government transfers have been added and taxes and social insurance contributions deducted. The change in summary measures of inequality between pre- and post-government income represents direct government redistribution. For example, the pre-government Gini index of income inequality in Canada in 2004 was .432. After adding government transfers and deducting income taxes and social insurance contributions the Gini fell to .318, representing a Gini reduction of 114 points.

Unfortunately, measures of direct government redistribution such as this invariably confront the problem of measuring pre-government income, the counterfactual to the income households actually receive. While measures of Gini reduction do indeed capture direct, or “first-order” redistributive effects, they do not capture any “second order” feedback effects whereby taxes or transfers induce taxpayers or transfer recipients to “adjust their economic decisions to the nature and changes of policy interventions” (Beramendi, 2001: 5; see also Pederson, 1994). In particular, it is possible that any direct redistributive effect associated with taxes and transfers will be wholly or partly undermined by their indirect effect of dampening the incentives of income-earners to increase their private sector income or accumulate a reserve of savings. In the words of Bergh (2005: 349), “taxes and benefits are likely to induce a behavioral feedback to the redistributive system” (see also Hicks and Swank, 1984 and Plotnick, 1984).

The problem of accounting for second-order effects has been especially difficult with respect to the largest social transfers in the developed countries, public retirement pensions. The argument is that the “pre-government” counterfactual is particularly problematic in countries

where pensions are entirely or largely provided by the state. As put by Bradley *et al.* (2003: 209), “in countries with comprehensive public pension systems . . . pensioners [will] make little other provision for retirement. . . Thus, pre-tax income inequality (and poverty) will be artificially high and the reduction of inequality also exaggerated.” When one measures pre-government income in such countries, large numbers of elderly households appear to be in poverty, since they have limited private sector income. These pensioners are, however, poor only in a nominal sense, since they enjoy guarantees of future income from the state—guarantees that are not in essence different from the entitlement to future income derived from private pensions in countries where the public system offers less complete coverage. If these second-order effects are not taken into account, the extent of government redistribution in such countries will be exaggerated in comparison to countries with sizable private pension systems.

Is there a practical solution to this problem? At the level of individual countries it would presumably be possible to estimate the second order effects of public pensions on income earners’ decisions regarding employment, savings, the timing of retirement, etc. Even in single-country analyses, though, measuring income that *might have* been earned in the absence of disincentives imposed by public sector benefits is obviously much more difficult than measuring income that is *actually* received from private sources. When one’s analysis is extended to comparisons of countries with varied demographic characteristics, labor force participation rates and pension schemes, these problems are compounded.

One possible solution to counterfactual problems relating to the elderly is to exclude them from consideration by focusing only on the working-aged population. This has, in fact, been the most common alternative to the conventional measure of direct redistribution described above (see. e.g., Bradley *et al.*, 2003; Pontusson, 2005; and Kenworthy and Pontusson, 2005). In our view, however, such a solution has some rather serious problems of its own if one is

interested in the welfare state as a whole—the largest component of which is, of course, social insurance pensions. To start, when one seeks to explain cross-national and over-time variation in government redistribution, many of the most important explanatory variables are political. Economists, for instance, often focus on median voter dynamics (Milanovic, 2000), while political scientists are interested in, among other variables, the partisan nature of governments, the role of public opinion and the level of electoral turnout (Pontusson, 2005; Brooks and Manza, 2007; Solt, 2008). When political variables such as these are introduced, it is obviously problematic to exclude the elderly, who are among the most active participants in the electoral process in the developed democracies and have been very successful in promoting and defending programs that benefit them (Finseraas, 2007; Scruggs, 2005). Moreover, excluding the elderly from consideration offers no sense of the *net* benefits accruing to various income groups from public pensions. The reason is that it is standard practice to deduct social insurance contributions, along with other taxes, when calculating post-government income of the non-elderly. In doing so, however, one is deducting the cost of the social insurance contributions that produced public pension guarantees over the course of income earners' working lives, but excluding the very groups that receive these benefits later in life.

Is there a way of addressing this counterfactual problem other than simply excluding the elderly from consideration? One alternative is to think of payroll contributions that finance public social insurance schemes as a form of savings rather than as a tax deducted from private sector income and of public pensions as essentially similar to their private sector counterparts. From this perspective, payroll deductions differ fundamentally from ordinary taxes in that they produce a concrete and specific claim on future income—an entitlement—rather than contribute to the provision of a public good. In this, they bear a similarity to contributions to private plans, which also produce a claim to future income.

In accounting for public pensions in this way, the starting point is to compute pre-government private sector income. The standard source of detailed data on income for the developed countries is the Luxembourg Income Study (LIS), which offers micro-data for a wide range of private sources of income and government social transfers as well as, in most cases, direct taxes and social insurance contributions. As measured by the LIS, the main components of pre-government income are wages and salaries, self-employment income, cash property income, private sector pensions, pensions of government employees and private transfers such as alimony or child support. To the standard concept of pre-government income we then add the value of public sector pensions, which can be thought of as a delayed drawdown of the savings represented by social insurance contributions over the course of workers' lifetimes.¹ We call this amended concept of pre-government income "primary income."

It is also necessary to adjust the standard definition of post-government disposable income. The ordinary way of computing disposable income is to add government transfers to private-sector income and then deduct income taxes and social insurance contributions. However, since we have reclassified public pensions, it is necessary also to reclassify disposable income so that social insurance contributions are no longer deducted; if these are thought of as a form of savings to finance retirement income, they can no longer be considered alongside other taxes, which finance current government expenditures of various sorts. (Of course, payroll taxes in pay-as-you-go systems do not literally finance individual contributors' benefits, but they do produce concrete individual entitlements to future benefits.) We will call this redefined disposable income concept "adjusted disposable income."

Of course, there are some important differences between public and private pension schemes. For one thing, participation in public social insurance plans is legally mandated for all or nearly all workers, which is obviously not the case with private plans. In practice, however,

this is not so different from the situation in countries with sizable private pension systems, since employers commonly offer substantial co-pays that make it highly undesirable for their workers to opt out of their company's pension scheme. Moreover, private plans are usually closely regulated by government authorities and in many cases receive favorable tax treatment. Second, many public plans involve a measure of redistribution, particularly in the form of minimum benefits. However, despite modest progressiveness in a number of systems, nearly all schemes follow a social insurance model, in which contributions and benefits are closely, if not perfectly, linked. Moreover, many public pensions require fairly lengthy periods of work for recipients to become vested in the system, particularly for a full pension. For example, the U.K. requires 30 years, Denmark 40 years and the Netherlands 50 years of residence, and Switzerland requires contributions for each year from age 21, to qualify for a full pension, while the U.S. requires 40 quarters of work for even a minimum pension (U.S. Social Security Administration, 2010). These programs are clearly not aimed primarily at the poor, whose labor force participation is often limited and state support of whom is ordinarily financed by general revenues, either in the form of direct payments or of in-kind or subsidized goods and services of various sorts.

There are also some areas of concern that arise from no longer deducting payroll contributions from disposable income. Most important is the fact that, while LIS data on both private and public pensions are quite complete and cross-nationally comparable, this is not as true for payroll deductions. For a number of countries (e.g., the U.S., Sweden and Norway) it is possible to isolate payroll contributions for pensions. For others, however, pension contributions cannot be separated from payroll deductions for certain other social purposes. While this is not ideal, in most countries pension contributions constitute by far the largest part of social insurance payroll deductions; in particular, family allowances or means-tested programs aimed at those in

poverty are rarely funded in this way. When all is said and done, it is our view that employing an imperfect adjustment is better than employing none at all.

How much difference does it make to treat public sector pensions in the way we have described above? Table 1 presents the results of a series of calculations from Luxembourg Income Study surveys for 51 country-years. For purposes of comparison we report three different estimates of government redistribution: the conventional approach, which measures direct redistribution by comparing the distributions of pre- and post-government income as ordinarily conceived; the method we have described above, which includes all households but compares “primary” income to “adjusted disposable” income, as we have defined the terms above; and the most common alternative to the conventional measure, which excludes households headed by the elderly.²

TABLE 1 ABOUT HERE

As can be seen, the average Gini index of inequality drops considerably when public pensions are included in one’s definition of “pre-government” income: the mean Gini index declines from .432 to .368. Similarly, figures for adjusted disposable income, which no longer deduct mandatory social insurance contributions, can be compared with the more traditional figures, which do. In this case, the change in Gini is much less than for primary income: when social insurance contributions are not deducted in calculating disposable income, the Gini rises only slightly, from an average value of .276 to an average value of .280, reflecting the fact that pension contributions are typically only slightly progressive, if at all. Is the extent of direct income redistribution by the state affected when contributions to and benefits from public pensions are thought of in the same way as contributions to and benefits from private plans? This table clearly shows that it is: the mean government redistribution using the conventional

approach is 156 Gini points, while the alternative approach produces a redistribution figure of only 88 Gini points, just over half as large a reduction.

The final columns of Table 1 report figures based upon the non-elderly population, which is the most common alternative to the conventional approach in attempting to account for the second-order effects associated with public pensions. As with our alternative measure, including only those households headed by persons between the ages of 25 and 59 results in quite a large adjustment in measures of pre-and post-government income inequality and the difference between them. Specifically, the mean pre-government Gini falls to .356 while the post-government coefficient equals .263. These values are considerably lower than those reported for the total population and somewhat lower than the results generated using our adjusted method. As to the reduction in the Gini for the non-elderly population resulting from government intervention, it averages 93 Gini points, more similar to our adjusted measure (88 points) than to the conventional measure (156 points).

How are individual countries affected by one's choice of a measure of government redistribution? Table 2 presents a series of rankings based upon national averages across multiple surveys, where appropriate. The first column ranks our countries from highest to lowest using the conventional approach. We then re-rank the countries employing our alternative method of estimating government redistribution and finally using a measure that focuses only on non-elderly households. Using the conventional approach, we find that the Belgian social welfare state is the most redistributive, followed by those of Finland and Sweden, while the least redistributive countries are Canada, Switzerland and the U.S. Re-ranking the countries according to our alternative method yields several significant changes. Namely, Belgium, which is often cited as a prime example of a country with an artificial pre-government counterfactual, does indeed move from its status as the most redistributive of all the countries examined to a

position in the middle of the pack, the fifth most redistributive of the eleven countries we examine. Finland's ranking also falls, although only one spot to third place. In contrast, Denmark moves from fifth place to first when the new definition is employed.³ It is interesting to note that the relative rankings of the least redistributive countries change little when adopting the alternative method: Switzerland is now ranked last while the U.S. moves up from last to the tenth most redistributive. The relative position of Germany does, however, drop from sixth to ninth when adopting the alternative approach. With the exceptions of Belgium, Denmark and the Netherlands the country rankings for the non-elderly population are the same as for our alternative measure. While the Netherlands moves down only one spot to fifth place, Belgium moves up from fifth to first place while Denmark drops three spots to finish in fourth.

TABLE 2 ABOUT HERE

In sum, employing an approach to measuring government redistribution that treats pensions and unemployment benefits in a manner similar to private benefits does indeed make a difference. Should researchers, then, employ our alternative figures in conducting cross-national research on government redistribution? For some purposes this might indeed be desirable; although our method produces results that are closer to those produced by the non-elderly measure than by the conventional measure, it does so without employing the questionable expedient of simply eliminating households headed by elderly persons—households which are, after all, not only beneficiaries of the largest public social benefit programs but also potent political actors. On the other hand, there are also limitations to our approach, as have been highlighted above, and for some purposes the conventional figures might well be preferable.

Whatever one's choice of measure, the counterfactual problems associated with the conventional redistribution measure and the most common alternatives to it are real and cannot simply be ignored. Perhaps the most practical course of action is for researchers to compute all

three sets of figures and think carefully about which makes the most sense in a particular study. Whichever redistribution figures are in the end employed, a cross-national study will be more convincing if it can demonstrate empirically whether accounting for feedback effects associated with pensions makes a major difference in its results.

Table 1: Data for Conventional, Alternative and Prime-age Methods of Calculating Government Redistribution

| Country | Year | Conventional | | | Pensions Alternative | | | Prime-age | | |
|-------------|------|--------------|------------|---------|----------------------|------------|---------|-----------|------------|---------|
| | | Private | Disposable | Redist. | Primary | Disposable | Redist. | Private | Disposable | Redist. |
| Belgium | 1992 | 0.449 | 0.224 | 0.225 | 0.342 | 0.243 | 0.100 | 0.347 | 0.212 | 0.135 |
| Belgium | 1997 | 0.481 | 0.250 | 0.231 | 0.374 | 0.266 | 0.108 | 0.375 | 0.237 | 0.138 |
| Canada | 2000 | 0.429 | 0.315 | 0.114 | 0.391 | 0.314 | 0.077 | 0.392 | 0.314 | 0.078 |
| Canada | 2004 | 0.432 | 0.318 | 0.114 | 0.394 | 0.318 | 0.076 | 0.396 | 0.317 | 0.079 |
| Denmark | 1987 | 0.398 | 0.254 | 0.144 | 0.346 | 0.254 | 0.092 | 0.305 | 0.219 | 0.086 |
| Denmark | 1992 | 0.426 | 0.236 | 0.190 | 0.369 | 0.237 | 0.132 | 0.337 | 0.208 | 0.129 |
| Denmark | 1995 | 0.421 | 0.218 | 0.203 | 0.354 | 0.218 | 0.136 | 0.338 | 0.194 | 0.144 |
| Denmark | 2000 | 0.412 | 0.225 | 0.187 | 0.348 | 0.227 | 0.121 | 0.328 | 0.202 | 0.126 |
| Denmark | 2004 | 0.419 | 0.228 | 0.191 | 0.353 | 0.229 | 0.125 | 0.338 | 0.207 | 0.131 |
| Finland | 1987 | 0.393 | 0.209 | 0.184 | 0.299 | 0.213 | 0.087 | 0.299 | 0.188 | 0.111 |
| Finland | 1991 | 0.407 | 0.210 | 0.197 | 0.304 | 0.215 | 0.090 | 0.309 | 0.187 | 0.122 |
| Finland | 1995 | 0.438 | 0.217 | 0.221 | 0.358 | 0.229 | 0.130 | 0.369 | 0.204 | 0.165 |
| Finland | 2000 | 0.459 | 0.246 | 0.213 | 0.374 | 0.254 | 0.121 | 0.361 | 0.231 | 0.130 |
| Finland | 2004 | 0.463 | 0.252 | 0.211 | 0.372 | 0.259 | 0.113 | 0.360 | 0.234 | 0.126 |
| Germany | 1981 | 0.388 | 0.244 | 0.144 | 0.303 | 0.242 | 0.061 | 0.284 | 0.229 | 0.055 |
| Germany | 1983 | 0.385 | 0.260 | 0.125 | 0.308 | 0.256 | 0.052 | 0.299 | 0.248 | 0.051 |
| Germany | 1984 | 0.445 | 0.268 | 0.177 | 0.335 | 0.270 | 0.065 | 0.334 | 0.259 | 0.075 |
| Germany | 1989 | 0.405 | 0.257 | 0.148 | 0.324 | 0.258 | 0.065 | 0.313 | 0.247 | 0.066 |
| Germany | 1994 | 0.442 | 0.273 | 0.169 | 0.358 | 0.277 | 0.082 | 0.354 | 0.269 | 0.085 |
| Germany | 2000 | 0.473 | 0.275 | 0.198 | 0.369 | 0.277 | 0.092 | 0.362 | 0.262 | 0.100 |
| Netherlands | 1983 | 0.470 | 0.260 | 0.210 | 0.386 | 0.272 | 0.114 | 0.385 | 0.253 | 0.132 |
| Netherlands | 1987 | 0.475 | 0.256 | 0.219 | 0.395 | 0.269 | 0.126 | 0.381 | 0.252 | 0.129 |
| Netherlands | 1994 | 0.445 | 0.257 | 0.188 | 0.371 | 0.262 | 0.109 | 0.360 | 0.247 | 0.113 |
| Netherlands | 1999 | 0.372 | 0.231 | 0.141 | 0.321 | 0.240 | 0.082 | 0.309 | 0.222 | 0.087 |

Table 1 (cont.): Data for Conventional, Alternative and Prime-age Methods of Calculating Government Redistribution

| Country | Year | Conventional | | | Pensions Alternative | | | Prime-age | | |
|-------------|------|--------------|------------|---------|----------------------|------------|---------|-----------|------------|---------|
| | | Private | Disposable | Redist. | Primary | Disposable | Redist. | Private | Disposable | Redist. |
| Norway | 1979 | 0.364 | 0.223 | 0.141 | 0.281 | 0.231 | 0.050 | 0.278 | 0.204 | 0.074 |
| Norway | 1986 | 0.352 | 0.233 | 0.119 | 0.276 | 0.240 | 0.036 | 0.262 | 0.209 | 0.053 |
| Norway | 1991 | 0.374 | 0.231 | 0.143 | 0.309 | 0.239 | 0.070 | 0.302 | 0.213 | 0.089 |
| Norway | 1995 | 0.400 | 0.238 | 0.162 | 0.330 | 0.248 | 0.083 | 0.317 | 0.217 | 0.100 |
| Norway | 2000 | 0.403 | 0.250 | 0.153 | 0.347 | 0.258 | 0.089 | 0.328 | 0.234 | 0.094 |
| Norway | 2004 | 0.430 | 0.256 | 0.174 | 0.374 | 0.262 | 0.112 | 0.362 | 0.241 | 0.121 |
| Sweden | 2000 | 0.447 | 0.252 | 0.195 | 0.371 | 0.256 | 0.115 | 0.366 | 0.237 | 0.129 |
| Sweden | 2005 | 0.440 | 0.237 | 0.203 | 0.358 | 0.241 | 0.117 | 0.360 | 0.219 | 0.141 |
| Switzerland | 1982 | 0.397 | 0.309 | 0.088 | 0.339 | 0.311 | 0.028 | 0.310 | 0.291 | 0.019 |
| Switzerland | 1992 | 0.403 | 0.307 | 0.096 | 0.332 | 0.305 | 0.027 | 0.328 | 0.297 | 0.031 |
| Switzerland | 2000 | 0.387 | 0.280 | 0.107 | 0.297 | 0.270 | 0.027 | 0.305 | 0.276 | 0.029 |
| Switzerland | 2002 | 0.392 | 0.274 | 0.118 | 0.297 | 0.266 | 0.030 | 0.306 | 0.265 | 0.041 |
| Switzerland | 2004 | 0.395 | 0.268 | 0.127 | 0.293 | 0.257 | 0.036 | 0.299 | 0.258 | 0.041 |
| UK | 1979 | 0.396 | 0.270 | 0.126 | 0.348 | 0.275 | 0.073 | 0.324 | 0.255 | 0.069 |
| UK | 1986 | 0.476 | 0.303 | 0.173 | 0.427 | 0.310 | 0.117 | 0.418 | 0.304 | 0.114 |
| UK | 1991 | 0.476 | 0.336 | 0.140 | 0.435 | 0.344 | 0.091 | 0.414 | 0.326 | 0.088 |
| UK | 1994 | 0.502 | 0.339 | 0.163 | 0.460 | 0.345 | 0.115 | 0.446 | 0.337 | 0.109 |
| UK | 1995 | 0.503 | 0.344 | 0.159 | 0.463 | 0.352 | 0.111 | 0.455 | 0.346 | 0.109 |
| UK | 1999 | 0.497 | 0.347 | 0.150 | 0.456 | 0.352 | 0.104 | 0.443 | 0.344 | 0.099 |
| UK | 2004 | 0.491 | 0.345 | 0.146 | 0.449 | 0.350 | 0.099 | 0.439 | 0.342 | 0.097 |
| USA | 1979 | 0.402 | 0.301 | 0.101 | 0.375 | 0.303 | 0.072 | 0.354 | 0.286 | 0.068 |
| USA | 1986 | 0.432 | 0.335 | 0.097 | 0.398 | 0.337 | 0.060 | 0.390 | 0.326 | 0.064 |
| USA | 1991 | 0.439 | 0.338 | 0.101 | 0.404 | 0.342 | 0.062 | 0.397 | 0.328 | 0.069 |
| USA | 1994 | 0.465 | 0.355 | 0.110 | 0.427 | 0.359 | 0.068 | 0.422 | 0.347 | 0.075 |
| USA | 1997 | 0.475 | 0.372 | 0.103 | 0.438 | 0.374 | 0.064 | 0.434 | 0.365 | 0.069 |
| USA | 2000 | 0.473 | 0.368 | 0.105 | 0.439 | 0.370 | 0.069 | 0.430 | 0.361 | 0.069 |
| USA | 2004 | 0.481 | 0.372 | 0.109 | 0.445 | 0.375 | 0.070 | 0.437 | 0.363 | 0.074 |
| MEAN | | 0.432 | 0.276 | 0.156 | 0.368 | 0.280 | 0.088 | 0.356 | 0.263 | 0.093 |

Table 2: Country Rankings of Government Redistribution: Three Approaches

| Rank | Country | Conventional Redistribution | Rank | Country | Alternative Redistribution | Rank | Country | Prime-age Redistribution |
|------|-------------|--------------------------------|-------|-------------|-------------------------------|----------|-------------|-----------------------------|
| 1 | Belgium | 0.228 | 5\1 | Denmark | 0.121 | 1\5\1 | Belgium | 0.137 |
| 2 | Finland | 0.205 | 3\2 | Sweden | 0.116 | 3\2\2 | Sweden | 0.135 |
| 3 | Sweden | 0.199 | 2\3 | Finland | 0.108 | 2\3\3 | Finland | 0.131 |
| 4 | Netherlands | 0.190 | 4\4 | Netherlands | 0.108 | 5\1\4 | Denmark | 0.123 |
| 5 | Denmark | 0.183 | 1\5 | Belgium | 0.104 | 4\4\5 | Netherlands | 0.115 |
| 6 | Germany | 0.160 | 7\6 | UK | 0.101 | 7\6\6 | UK | 0.098 |
| 7 | UK | 0.151 | 9\7 | Canada | 0.077 | 8\8\7 | Norway | 0.089 |
| 8 | Norway | 0.149 | 8\8 | Norway | 0.073 | 9\8\8 | Canada | 0.079 |
| 9 | Canada | 0.114 | 6\9 | Germany | 0.070 | 6\9\9 | Germany | 0.072 |
| 10 | Switzerland | 0.107 | 11\10 | USA | 0.066 | 11\10\10 | USA | 0.070 |
| 11 | USA | 0.104 | 10\11 | Switzerland | 0.030 | 10\11\11 | Switzerland | 0.032 |

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ENDNOTES

¹On the advice of the LIS staff, we have reclassified from private to public some Finnish, Dutch and Swiss pensions prior to LIS Wave V (around 2000) that are administered by private employers but are mandated by government. These reclassifications were implemented by the LIS from Wave V on, but are also appropriate for earlier years.

²About half of our LIS surveys fail to report mandatory contributions for self-employed persons. These are, however, a very small component of the work force in most countries.

³Denmark is somewhat unusual in that it simultaneously maintains both a generous public pension scheme and a substantial private pension system. In addition, Denmark's system is atypical in that a large share is financed from general revenues, although there is a supplemental program that is contribution-based.