

Appendix to “Four levers of redistribution: The impact of tax and transfer systems on inequality reduction”

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November 2018

1 The impact of imputed tax in the LIS dataset

The Luxembourg Income Study (LIS) dataset harmonizes household surveys from many countries to allow researchers to make cross-country comparisons. Household surveys generally only measure the taxes paid by employees and not those paid by employers. Employer social-security contributions are not measured in the LIS dataset. This is a problem as the split between employer and employee contributions varies considerably across countries.

Imputing missing taxes on labour income has a considerable impact on the average tax rate and tax progressivity measured in the LIS household data. First, as shown in Figure 1, the percentage of the aggregate tax figure from OECD Macro data that our micro LIS data cover shifts sharply to the right. The imputed values are clearly large in size.

Figure 2 provides a breakdown of the impact of the imputations on the average tax rate and progressivity. In the great majority of countries, the imputations raise the average tax rate considerably and reduce progressivity. In addition to the size of the effect, its heterogeneity across countries is striking. Some countries, such as France, are greatly affected by the imputations, whereas there are only small changes in others, such as Canada.

As a result of this heterogeneity, international comparisons without these imputations will be biased. Work based on the LIS data without imputation will underestimate the tax rate and, in most countries, overestimate progressivity. Take France and Germany as an example. Before imputation, France appears to be very progressive with a low average tax rate, and very dissimilar to Germany in these respects. In stark contrast, after imputation, France and Germany have almost identical average tax rates and progressivity.

The imputations also change the balance of redistribution between taxes and transfers (Figure 3). As the imputations lead to higher average tax rates, the redistribution due

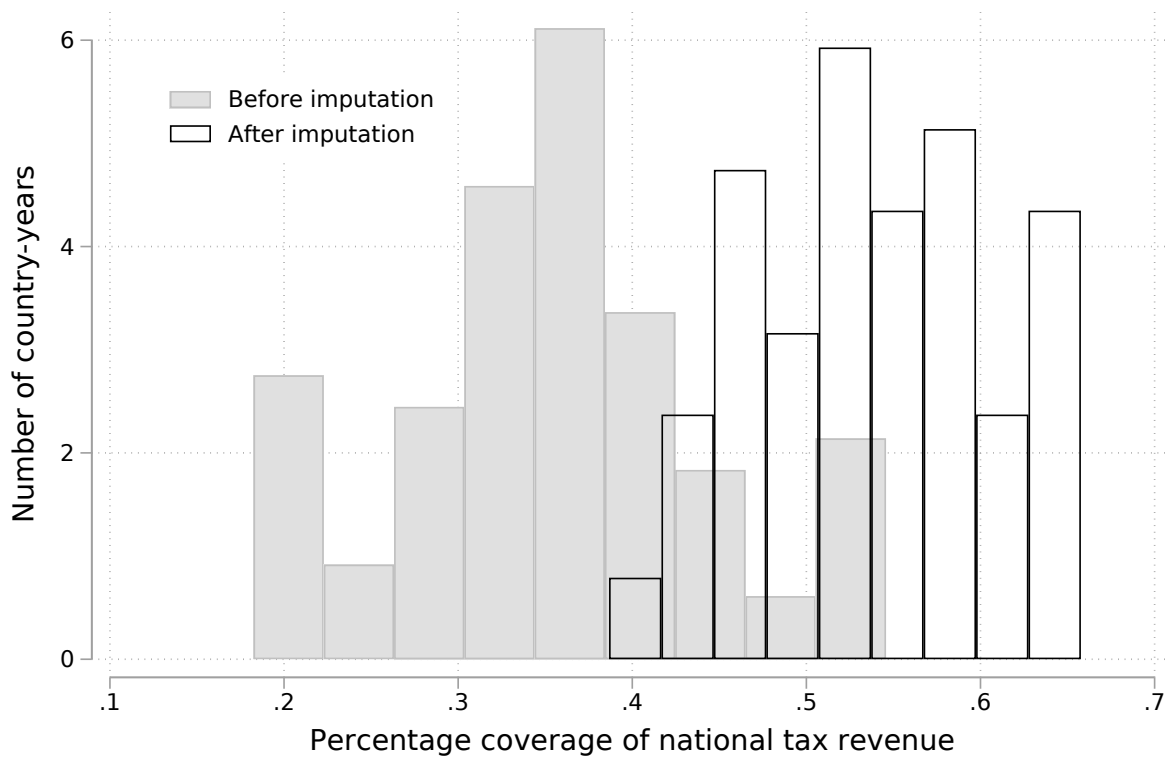


Figure 1: Tax coverage before and after the imputation of employer social-security contributions.

Source: Revenue Statistics, OECD.

to taxes rises substantially in many countries. Finland, Sweden and France rely more on transfers before imputation and more on taxes after imputation (as these countries cross the 45-degree line). In summary, the imputations provide a far more accurate picture of the combination of policy levers used in each country for redistribution.

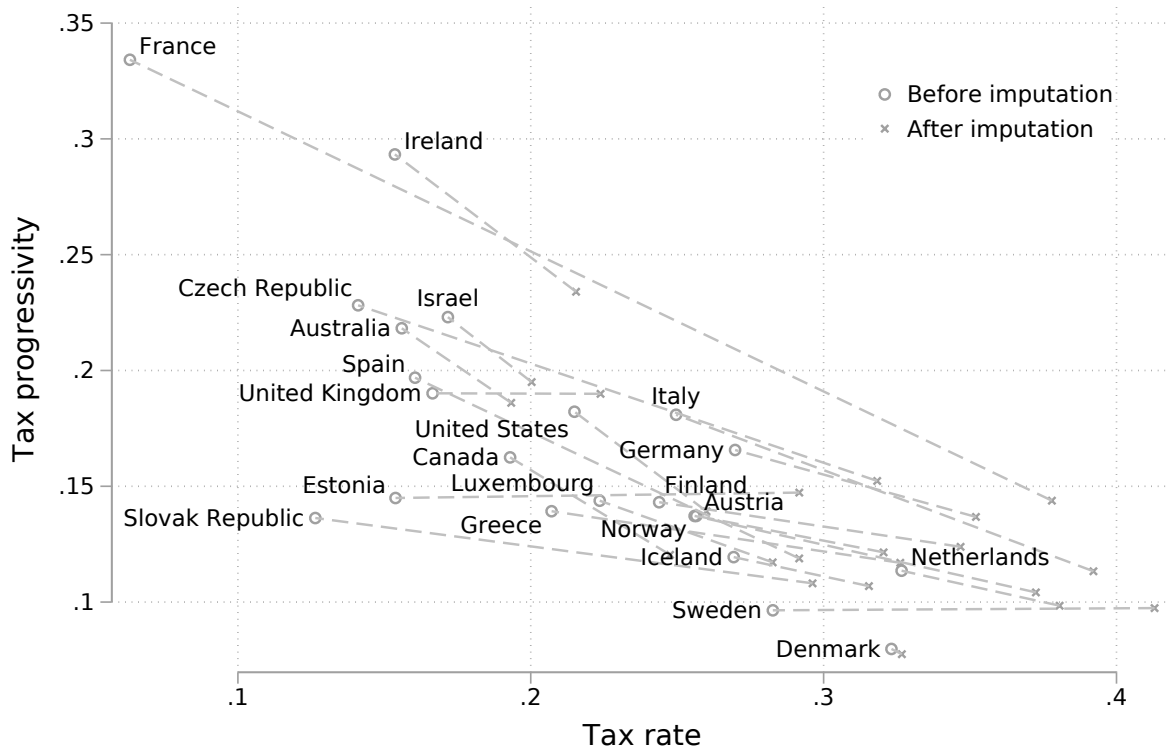


Figure 2: The impact of tax imputations on tax rates and progressivity.

Note: The X points refer to the data after our tax imputations while the O points show the original LIS data without imputation. The differences between the two points for each country show that our tax imputations have large effects on average tax rates and tax progressivity. The data refers to 2013, except for Sweden (2005), Ireland (2007), Australia, France, Iceland and Israel (2010), Italy (2014), Germany (2015) and the United States (2016).

Source: Authors' calculations based on LIS micro data.

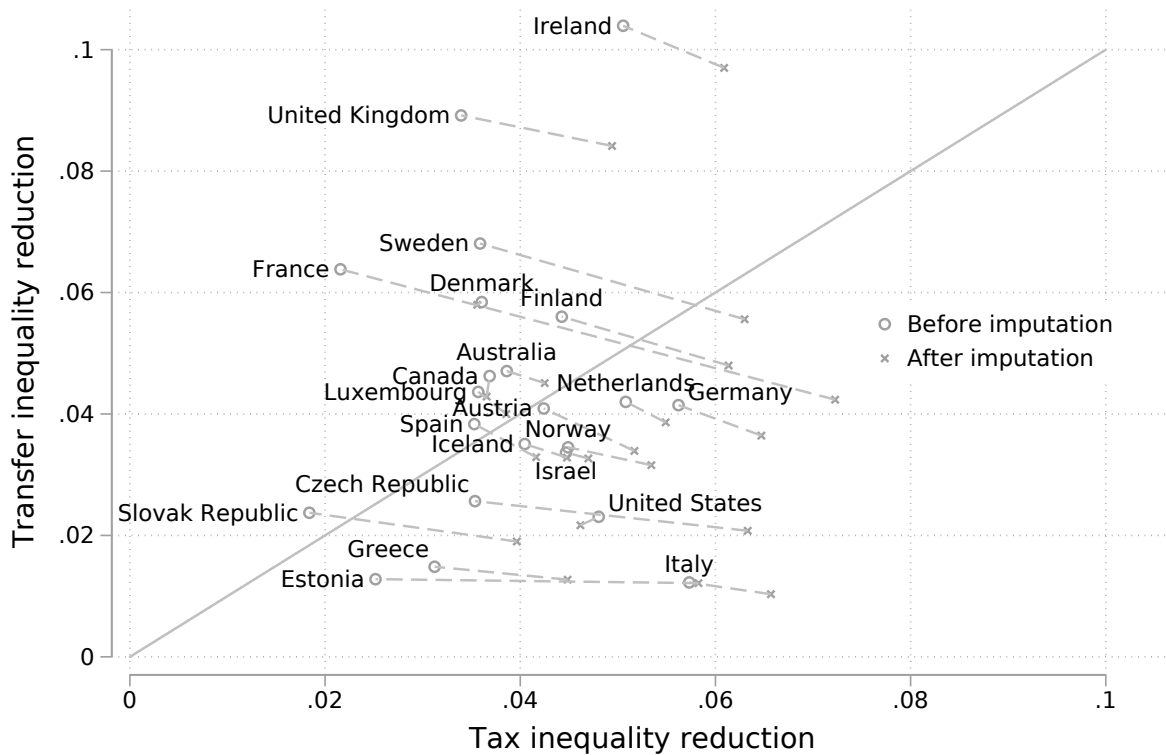


Figure 3: The tax and transfer contributions to inequality reduction before and after tax imputation.

Note: The X points refer to the data after our tax imputations while the O points show the results for the original LIS data. The differences between the points show that imputing employer social-security contributions changes the redistribution due to taxes, and therefore the overall monetary redistribution for a number of countries. The data refers to 2013, except for Sweden (2005), Ireland (2007), Australia, France, Iceland and Israel (2010), Italy (2014), Germany (2015) and the United States (2016).

Source: Authors' calculations based on LIS micro data.

2 Pensions

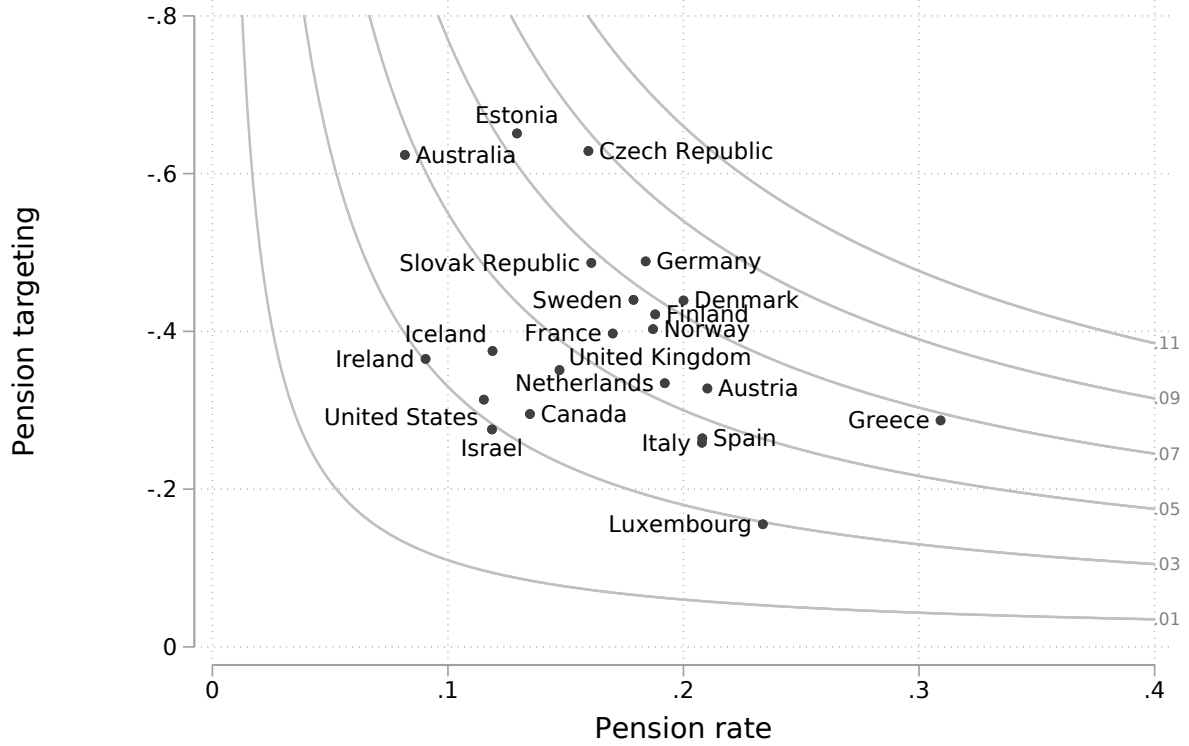


Figure 4: The inequality reduction from pensions: average rates and targeting.

Note: The closer the targeting index is to zero the less pensions are targeted at poor households. The curves show the change in the Gini index before and after pensions are added to market income, but without corrections for re-ranking. Two points on the same curve represent the same reduction but different combinations of pension targeting and pension rates.

Source: Authors' calculations based on LIS micro data.

3 Figures repeated for the working-age subsample

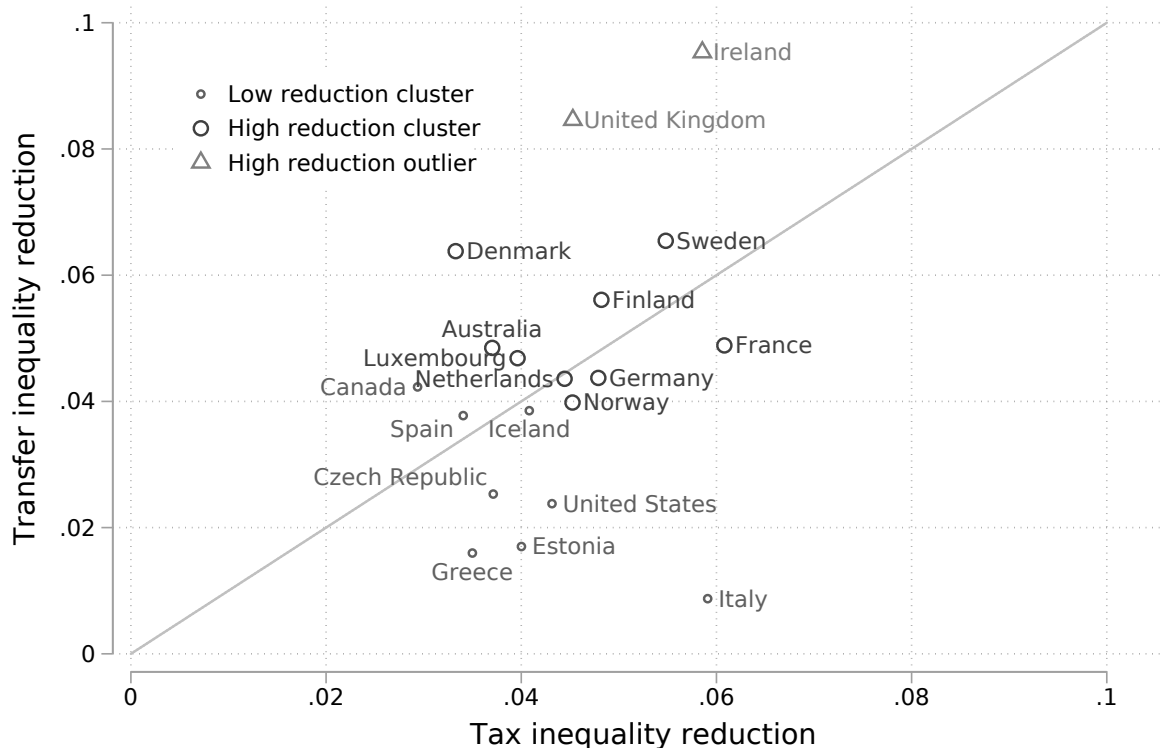


Figure 5: Tax and transfer contributions to inequality reduction: working-age households.

Note: The vertical axis shows the reduction of inequality between market income and gross income (the Reynolds-Smolensky index). The horizontal axis shows the reduction in inequality between gross income and disposable income. Countries below the 45-degree line rely more on taxes than transfers for redistribution. The sample is restricted to working-age households, where the household head is between 25 and 60 years of age at the time of the survey.

Source: Authors' calculations based on LIS micro data with imputations.

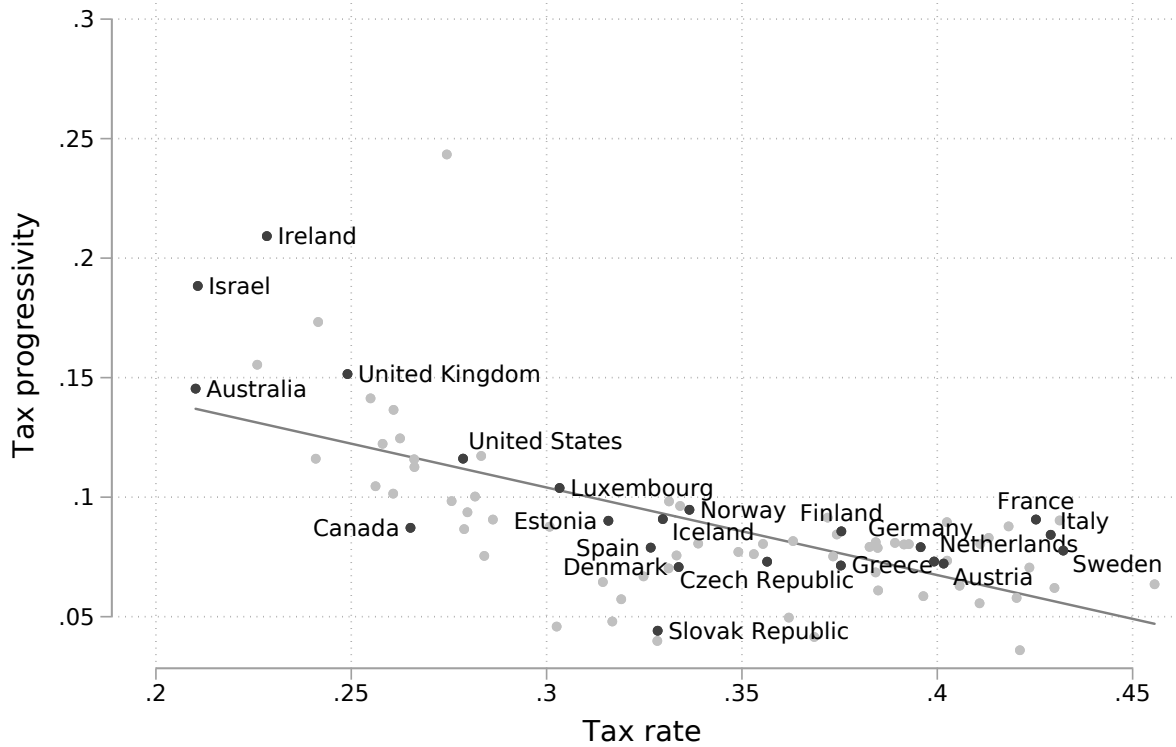


Figure 6: High average tax rates are incompatible with progressivity: working-age households

Note: There is a negative relationship between progressivity and the average tax rate. The most recent year is highlighted for each country, which is between 2010 and 2016 with two exceptions. For Ireland, we use the pre-crisis year of 2007 and the most recent year for Sweden is 2005. The sample is restricted to working-age households, where the household head is between 25 and 60 years of age at the time of the survey.

Source: Authors' calculations based on LIS micro data with imputations.