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Income Tax Statistics Analysis: A Comparison of Microsimulation Versus Group Simulation

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Abstract:

Microsimulation based on income tax statistics may be useful in tax reform discussions. Unfortunately, access to appropriate data is still rather restricted and expensive for ad-hoc analyses, and individual data is often even not available at all. In this paper we take Germany and its data situation as a proxy for many countries' restrictions in terms of tax data availability. Analyzing how much reliability and robustness of results we lose if we employ group simulation instead of microsimulation, we compare both methods. Investigating tax scale effects by the group model leads to very good results. Determining the financial effects of modified tax bases, the deviation from the microsimulation results increases, especially if tax base cuts vary between taxpayers. In addition, we take account of the class of taxpayers with a negative taxable income. Neglecting this class we identify a systematic underestimation of the financial consequences of a modified tax base with the group model assuming a progressive tax scale. If the group simulation data is not arranged according to the taxable income, but rather according to the total amount of income, we also find a tendency towards higher deviations from the microsimulation results. Quantifying the tax revenue effects of alternative tax settings the group simulation model represents a good compromise between the desire to capture the complex reality and the achievable accuracy when facing limited resources and data. Furthermore, for those cases in which group simulation is the appropriate tool, we provide a very simple method to interpolate a suitable income distribution and thereby the tax distribution within the classes. This interpolation makes future estimates of tax revenues a lot easier. We conclude that, although microsimulation in general is the superior approach, a group simulation model remains of interest, especially for analyses of rather old data and cross-country analyses, when sufficiently detailed data for micro analyses is missing.