Abstract

The aim of this report is to discuss a simulation method for the construction of individual life time profiles in Sweden and to describe the effects of the social security and tax systems on the life time income distribution. Previous analyses of the distributional effects of social security are made on a cross-sectional basis, using data for a single year. Some of the systems are however designed to transfer resources between different periods within an individuals life. Such transfers are of course not possible to measure with data from a single year. For this reason a micro simulation method, which generates 2 000 individual "lifes" has been constructed. The synthetic "lifes" are generated by a statistical matching procedure.

The simulation method utilises data from a two-year panel of income data, i.e. a short time series of two years for every individual. The simulation process, which is driven by empirical changes, is schematically described in figure 2.1. For each "life" we start with an individual for which the income is known at ages 18 and 19. This individual is represented by the leftmost bold line in the figure. To give this individual an income and other properties at age 20, we search for another individual, *a twin*, among the individuals for which we have data at the ages of 19 and 20. The individual closest in income is chosen as the *donator*. Our synthetic individual now has a yearly income for three years. The process continues in this manner until the individual dies.

Some restrictions are used when searching for a *twin*. Matching is only permitted within a group defined by a set of categories. These categories are gender, socio-economic class, number of adults and number of children in the family. If the individual found changes category from the first to the second year, so does our synthetic individual.

One advantage with our method compared to methods based on explicit models*, is that it is simpler to accomplish and that no econometric modelling is necessary. Another advantage is that the synthetic individual data for every age is donated from an existing individual. Therefore the different variables for a given age, including those for the household members, are real and consistent. A drawback with the method is that behavioural changes due to changes in the tax or transfer systems, are more difficult to account for.

When a twin has been found, two sets of income at every age are available and thus it is possible to compute how much they differ. This distance can be used to adjust aggregate measures of life time income distribution such as the coefficient of variation and the Gini coefficient.

Our simulation method is used to compare the dispersion of annual income with the dispersion of model-generated lifetime income. The coefficient of variation is about 70 percent lower for lifetime income compared to annual income. About half of this decrease is however a result of matching distances.

We have also estimated the part of the public social security benefits that is returned to the individual in other years of lifetime and the part that is transferred to other individuals. Compared to a similar British study (LIFEMOD, Falkingham et al 1993) we found that in Sweden a greater part of the benefits is returned to the individual than in Britain. The main reason for this is that the pension system in Sweden to a greater extent is public.

The model has also been used to compare the proposal of a new pension system with the existing pension system. It was found for an assumption of 1.5% growth, that the proposed rules give a bit lower pensions but have lower marginal effects than the existing system.

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* See Falkingham et al (1993), Harding (1990b)