

Describing the socio-demographic structure of social transfers across Europe with regression trees

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Abstract

There is considerable research on the effects of country-level variables on social transfers and other characteristics of the welfare state (e.g. labor market rigidity). There is also large theory-laden literature, that describes and systemizes the general structure of welfare states. With this paper, we choose an approach in between, by looking descriptively at the socio-demographic structure of social transfers, while avoiding theoretical presuppositions and using a data-driven analysis. The descriptive goal is to find out, which socio-demographic clusters can be separated that receive or pay similar levels of social transfers, and if and how these clusters differ across countries and with respect to country-level indicators.

More specifically, we look at social transfers at the household level, i.e. the sum of unemployment, old-age, survivor', sickness, and disability benefits and educated-related allowances at the person level in a household and family related and housing allowances and benefits for other social exclusions at the household level minus the sum of taxes on wealth and income, social insurance contributions, and inter-household cash transfers. We regress this dependent variable on multiple socio-demographic variables and macro-level indicators. We use a regression tree as a descriptive tool to overcome the limitations of OLS of having to specify all nonlinear relations of the socio-demographic and country-level ex-ante. Moreover, the regression tree directly separates clusters described by the relevant independent variables with similar levels of social transfers.

Our preliminary findings show that social transfers are mainly structured along age of oldest person in the household, household income, family structure, and work intensity. The social transfers differences across these groups within countries are larger than the overall country differences, i.e. country-level indicators like the marginal tax rate, state expenses or government spending ratio play only a minor role for the differences in social transfers in comparison to the socio-demographic variables.

Our approach and the concrete application come with several limitations. Most importantly, similar to techniques like cluster analysis regression tree are notoriously instable and prone to overinterpretation. Therefore, we conduct multiple specifications to find stable patterns across different trees.