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MEASURING INCOME AND ENERGY DISTRIBUTION IN GERMANY WITH THE ATKINSON INDEX

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ABSTRACT

The Atkinson index is an inequality measure based on a social welfare function. The Atkinson index is widely employed by economists to analyse income distribution. However, up to now, it has not been used in energy analysis. It provides a new tool not only to measure the distribution of income but also to estimate the distributional dimensions of energy consumption. The quality of life is hence determined by household income and by the various consumption decisions based on this income. And in this context the availability of energy is the central defining element for the quality of life of any society.

We will use the Atkinson index as an analytical tool to examine the interactions between economic activity and energy services. The Atkinson index has a specific feature for the calculation of distribution. The index uses the epsilon parameter to explicitly reveal the inequality aversion of society. Epsilon defines how sensitively the Atkinson index should react to income inequalities. The greater epsilon is, the more strongly the Atkinson index reacts to inequalities. Epsilon therefore represents the inequality aversion of society. It ranges from zero if society is totally indifferent to the distribution of income to infinity if society is only concerned with the position of the lowest income group. One can say that epsilon represents the social trade-off between social equality and economic efficiency. With the epsilon parameter, a normative dimension is therefore incorporated into the inequality analysis, which allows a degree of social aversion to be introduced. The advantage of the Atkinson index is that the epsilon parameter can be varied in such a way that the welfare of the lower income groups is weighted strongly or weakly in the welfare measurement. A socially acceptable value for the parameter epsilon can be determined with Okun's leaky bucket experiment.

For our analysis, we used disaggregated consumption and income data from the German Household Expenditure Survey conducted by the German Federal Statistical Office. The Federal Statistical Office thus delivers important data for the assessment of the income situation, standard of living and the expenditure behaviour of the whole population and its various social groups. For our analysis, we concentrated on the net household income and the following household groups: all households, single woman, single man, single parent, married couple without children, married couple with children.

Based on the statistical data basis of the Household Expenditure Survey, we examined the distribution of income and energy consumption in Germany. In the first step, the social welfare function will be determined, which defines the whole benefit for society by summing up the single benefit for individuals in society, followed by a modified Atkinson index.

The analysis shows that a distribution analysis based on the Atkinson index can make an important contribution to the social debate about the distributional justice of income and energy consumption. The results of applying the Atkinson index could make a significant contribution to science and policy debates on income and energy equity in the context of sustainable development.

KEYWORDS: Energy, Income, Distribution, Atkinson Index