

FAIRNESS AND THE WILLINGNESS TO PAY FOR RENEWABLE ENERGY

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Overview

For a long time fairness has been disregarded in both economic theory and empirical work. At least since Rabin's (1993) incorporation of fairness into game theory, experimental evidence suggests that fairness affects a plethora of economic outcomes. We build upon Fehr and Schmidt (1999), modeling fairness as self-centered inequality aversion with respect to individual contributions to a public good. Furthermore, we take into account Thaler's (1985) concept of transaction utility according to which it is not only the value of a good but also the value of getting a good deal that influences individual well-being.

We analyze the implications of fairness in the context of the promotion of renewable electricity in Germany. In 2000 the German government introduced a set of technology-specific feed-in-tariffs that led to an increase of renewable capacity from 12 to 104 Gigawatt in 2016, while the share of electricity generation rose from 6.2 to 31.7%. Yet, to achieve the ambitious renewable goal of producing 80% of electricity in 2050 a multiple of today's capacities is required. The cost of this promotion amounts to about 25 billion Euro per year and is allocated to the customers of electricity via a fixed surcharge on the net price of electricity, which climbed from 1.39 to 6.35 cents per kWh between 2009 and 2016. Principally, every customer of electricity is subject to the surcharge, but energy-intensive companies are eligible for rebates to assure their international competitiveness.

Methods

We conducted a discrete-choice experiment with randomized information treatments on more than 11,000 households and analyze whether informing respondents about the existence of the payment system, in particular the rebates for energy-intensive companies, and the abolition of the rebates affect their willingness to pay for public goods. Participants were randomly split into three groups and asked a single binary question whether they are willing to pay additionally x ct/kWh to increase the share of renewable energies to 35% by 2020, where x is randomly assigned and takes the values 1, 2, and 4 ct/KWh. Households in the *Keep Condition* were informed that about 4% of industrial companies, which are responsible for about 40% of industrial electricity consumption, are not subject to paying the entire surcharge and subsequently asked about their willingness-to-pay contingent on keeping the derogation. In the *Abolish Condition* households received the same information, but were asked about their willingness-to-pay contingent on abolishing the exemption. Lastly, households in the *Uninformed Condition* did not receive any additional information.

We estimate the average treatment effects by estimating a linear probability model where the dependent variable is a binary indicator that takes the value one if a participant is willing to pay the requested hypothetical raise in the surcharge and zero otherwise. To shed light on heterogeneous effects, we interact the treatment indicators with a set of socio-economic characteristics.

Results

We find that the percentage of positive answers differs – as hypothesized – substantially between the experimental conditions. For instance, the share of respondents willing to pay in the *Abolish Condition* is about 35-40 percentage points higher than in the *Keep Condition*. This effect is equivalent to quartering the increase of the hypothetical surcharge. On the other hand, informing people about the existence of the exemption decreases the share of positive answers by some 20 percentage points.

It bears highlighting that respondents with green attitudes are particularly likely to answer the willingness-to-pay question positively. Moreover, the share of positive answers is higher among elderly respondents, women, college

graduates, and respondents who think that the exemptions are justified. In contrast, residents in East Germany and high-consumption households are less likely to be willing to pay for renewables.

Furthermore, we find strong preferences for fairness among respondents with high household incomes, respondents living in areas with a large share of industrial production, and respondents with high estimated electricity consumption figures.

Conclusions

We investigate the relationship of fairness and the willingness-to-pay for public goods. Conducting a discrete-choice experiment among more than 11,000 households allows us to estimate the causal effect of changing the payment system and providing information on the payment system on the willingness-to-pay for public goods. We find that a payment system that distributes the costs equally among the consumers (here, in particular, between the industry and households) fosters the willingness-to-pay substantially. In contrast, learning about the existence of an unequal payment system reduces the willingness-to-pay for public goods.

References

- Fehr, E., Schmidt, K. M., 1999. A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics* 114 (3), 817-868.
- Rabin, M., 1993. Incorporating fairness into game theory and economics. *The American Economic Review* 83, 1281-1302.
- Thaler, R., 1985. Mental accounting and consumer choice. *Marketing Science* 4 (3), 199-214.