Time Preferences as Predictor for Energy-Saving Behavior?

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Many decisions relevant to energy saving involve a trade-off between short-term savings and long-term benefits. For example when buying a washing machine, cheaper but less energy-efficient devices have to be compared to options with higher purchase prices but lower operating costs. In a part of these situations investments in energy-efficiency result in lower life-cycle costs. But even if so, decision makers do not always choose the corresponding option and on the societal level a large potential for energy saving is lost.

Time preferences present one possible explanation: They attempt to capture the extent to which a person is present- or future-oriented; expressed as discount rates they are a measure for the change in valuation of an outcome depending on its delay. For example, a person who prefers 100$ today over 150$ in one year's time is said to have a discount rate of over 50%.

In theory, given it pays off in the long run, future-oriented persons are more likely to invest in energy-efficiency than those who are present-biased. After discussing the measures used, this contribution attempts to test the above assumption.

Method and Measures

The analyses are based on data from the *Swiss Environmental Survey 2007* (Diekmann & Meyer, 2008), a representative population study. First, a telephone interview was conducted with 3369 persons; later 83% of these also participated in a written follow-up study. The survey covered a broad range of topics and comprised three measures of time preferences: during the oral interview, the respondents participated in a hypothetical game in which they were to choose between CHF 1000 immediately and CHF 2000 in a year's time. If a respondent decided to wait, the later amount was lowered step by step. From these answers, individual threshold discount rates were computed. The second measure consists of a choice task in which half of the respondents chose between CHF 500 now and CHF 600 in one year's time while the other half chose between CHF 500 in one year's time and CHF 600 in two years' time. As a third measure a hypothetical choice between two refrigerators was presented.

Primary Findings and Conclusions

While the purely monetary measures for time preferences correlated well with one another (r=.61, p<.001), the choice task involving a refrigerator was only marginally (also significantly) connected to the first two measures. Multivariate analyses to account for differences in monetary time preferences revealed robust effects for income, education, age and gender: having a higher income, being male, younger and more educated goes with being more future-oriented. However, modeling the choice of refrigerator revealed contrary effects: women and older people are more likely to choose the more energy-efficient device, thus being more future-oriented. These differences stress the relevance of framing in measuring time preferences.

When monetary time preferences were introduced as a predictor for energy-saving behavior, the results were heterogeneous: for example while people with low discount rates tend to avoid leaving their television set in standby mode, there is no significant effect on buying energy-efficient light bulbs or – in case of home owners – on applying a thermal insulation to one's house. Possible explanations for this heterogeneity range from shortcomings in the (conventional) measurement of time preferences to the notion that time preferences might not be a stable individual difference variable. Several alternative explanations are discussed.

References

Diekmann, A. & R. Meyer (2008). *Schweizer Umwelt-survey 2007. Dokumentation und Codebuch.* Zürich: Professur für Soziologie, ETH Zurich.