

Social Cues and Electricity Consumption: Evidence from a Randomized Control Trial in Armenia.

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Overview

To avoid harmful climate effects global greenhouse gas emissions need to be reduced and reach net zero by 2050 (Tsiropoulos, Nijs, Tarvydas, & Ruiz, 2020). As households represent over 30 percent of global energy consumption, reducing household energy consumption, and thus carbon emissions is an essential part of the decarbonization efforts. We study the effect of household energy decisions by providing information and social cues, also referred to as “nudges” (Leonard, 2008) in Armenia, a developing country. Developing countries are precisely the countries where the most rapid growth in energy consumption is observed, and many results and outcomes observed in the Western world proved to be hard to replicate in the context of developing countries (Henrich et al., 2010). The case of Armenia is also important as the energy consumption in Armenia is generally more sensitive towards income, as shown by the significant Granger causality between income level, and energy consumption in Armenia, while this relationship is insignificant for neighboring Azerbaijan, and Georgia (Kalyoncu et al., 2013).

In this study, we have collected information on the energy consumption (electricity) in Armenian households over 6 months. We asked the households the information regarding their electricity consumption and their socio-economic characteristics.

The research focuses on people living in Yerevan, the capital of Armenia. To avoid possible interference by the type of agency problems that occur by renters, the research is focused exclusively on homeowners. A total of 300 participants were randomly and evenly distributed over 3 treatment groups. The randomization is done on the level of participants. In our treatments, we provide the households with peer comparison reports of their energy consumption and associated costs. The peer comparison reports reflect the average values of similar households.

The first group is the control group (C), and the second group is the social comparison treatment (S). The households in the second treatment are given feedback in the form of the average electricity consumption of similar households and the difference in their own electricity consumption. The third group is the social comparison treatment with a focus on monetary savings (SM). The households are given the same feedback as in group two (the average of similar households’ consumption and the difference with their own consumption), but, in addition, the potential or realized monetary savings relative to the average of similar households’ monetary expenditure are also introduced.

Methods

We use a standard fixed effect regression to estimate the effects of our interventions on electricity consumption.

$$E_{it} = a_i + \tau_t + b_1 Info_{it} + b_2 InfoCost_{it} + \varepsilon_{it}$$

E_{it} Electricity consumption by household i in period t .

$Info_{it}$ The interaction term that indicates observations from the Information treatment group in the treatment period.

$InfoCost_{it}$ The interaction term that indicates observations from the Information plus Cost treatment group in the treatment period.

a_i Household fixed effects

τ_t Month fixed effects

ε_{it} the idiosyncratic error term

Results

We find that the households in both treatment groups exhibit reduced levels of energy consumption, especially among those households where the interviewed person was female. The effect becomes stronger and more statistically significant for the subset of females with higher education.

Conclusions

One of the programs that are the most important/prevalent to lower energy consumption in the residential sector is the Demand Side Management (DSM) program (Aydin et al., 2018). The DMS programs aim to lower the energy demand of households and thus reduce carbon emissions.

In this study, we implement an information provision experiment in Armenia. As demonstrated by the results of our information provision experiment there is a place for information provision policy interventions in Armenia, especially those targeted at females with higher education.

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