

How effective is monetary information to promote the purchase of energy-efficient appliances? Evidence from a field trial in big retailers in Spain

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Overview

As EU seeks to achieve energy savings of at least 32.5% in all sectors by 2030 under the Energy Efficiency Directive (2018/2002), energy efficiency has become one of the main instruments for reducing household energy consumption (Labandeira et al., 2020). Although energy efficiency (EE) presents several benefits (cost reduction), these are not enough to successfully nudge consumers towards energy-efficient choices. This effect is known as the energy efficiency gap or the energy efficiency paradox, and refers to situations in which apparently beneficial investments are not made, and/or apparently non-beneficial ones are (Jaffe and Stavins, 1994). There are several failures that could promote the energy efficiency gap: *market failures*, *behavioural failures*, and *other personal factors* (Solà et al., 2020). For the aim of this study, we will only focus on informational failures. Energy labels are the most used instrument for addressing these failures and reducing the EE gap (Solà et al., 2020). EE labels usually highlight the EE level and the energy consumption of an energy-using product (Ramos et al., 2015).

The effectiveness of the EE label is crucial to successfully promote the adoption of energy-efficient appliances (de Ayala et al., 2020; Waechter et al., 2015). Recent studies have proposed and tested the idea of converting the energy consumption information (in kWh/year) to monetary information in monetary terms (Allcott and Taubinsky, 2015; Carroll et al., 2016; Kallbekken et al., 2013; Stadelmann and Schubert, 2018) to enhance the purchase of more efficient appliances but its effectiveness it is not totally clear. Making use of this lack of consensus, this work seeks to analyse if providing lifetime energy cost information (LEC) in € on the energy efficiency of household appliances in Spain could successfully nudge consumers to purchase the most energy-efficient options. This is done through a field experiment that will give the energy consumption information in € at a well-known big Spanish retailer (El Corte Inglés, <https://www.elcorteingles.es/>).

Methods

A field experiment is carried out in order to analyse the impact of a real effect of a shock (the lifetime energy cost information through different channels). To that end, information on energy cost over the lifetime of a product is displayed in monetary terms (€) for four types of appliance: washing machines, fridges, dishwashers, and tumble-driers. These appliances are selected to study if LEC information has different impacts on different appliances and compare the decision-making of consumers for each appliance. The information was displayed in two formats: 1) by training sales staff to provide the information; and 2) by training sales staff and at the same time include a complementary label with monetary information on the energy cost though a lifetime of the product. Twenty-nine stores participated in the experiment, geographically distributed around the country in different autonomous communities.

For this experiment, we distribute the stores into two groups: (i) treatment group, and (ii) control group. The tasks of each group differ. The stores in the treatment group are responsible of implementing the different treatments while stores in the control group should behave as usual. The treatment group is composed by 10 stores while the control group is composed by 19 stores. In addition, the assignment to treatment group or control group was done by El Corte Inglés according to stores' characteristics and the closeness to central offices. The experiment was carried out from the 15th August of 2018 to 24th of December of 2018. Treatment 1 consisted in providing monetary information on the LEC through the sales staff and Treatment 2 consists on providing monetary information through the sales staff and through a complementary label. The label used during this treatment shows LEC information in euro for all the products under study (washing machines, fridges, dishwashers, and tumble driers). In some Autonomous Communities where El Corte Inglés stores are located, a rebate program called RENOVE is in force before starting the experiment. In this study we will also try to test if having a RENOVE program before the experiment has any effect on the experiment itself.

Results (preliminary)

We propose the following identifying equation for a multinomial logit estimation for the products under study (washing machines, fridges, dishwashers and tumble-driers): $P(y|x) = \beta_0 + \beta_1 \text{Trat1} + \beta_2 \text{Trat2} + \sum_{i=1}^m \beta_i \text{Attributes}_i + \beta_{m+1} \text{Income} + \beta_{m+2} \text{Renove} + \beta_{m+3} \text{Price} + \epsilon_{it}$, where y the outcome of interest, i.e. the energy efficiency level of the products. Trat1 is equal 1 if the sale is under Treatment 1, and thus, β_1 captures if

treatment 1 increases or decreases the probability of buying highly energy-efficient appliances. Analogously, β_2 is equal 1 if the sale is under Treatment 2, and therefore β_2 captures if treatment 2 increases or decreases the probability of buying highly efficient appliances. *Attributes* variable will capture those variables that describes all the appliances under study. We have also included *Income* (this will take the value of the income of the zone where the product is sold), *Renove* (it will take value 1 if the place where the product is sold had a Renove rebate policy before starting the experiment) and *Price* (reflects the approximate value of the price of the product). Preliminary results show:

- Washing machines: treatment 1 (information on LEC is given through sales staff) is effective on promoting the purchase of A++ washing machines, while this treatment decreases the probability of buying an A+++ washing machine. In the case of Treatment 2 (information on LEC is given through sales staff and a complementary label), the same effect is found: increases the probability of buying an A++ washing machines, while decreases the probability of buying an A+++ washing machine.
- Fridges: Treatment 1 is effective and increases the probability of buying A++ fridges, while decreases the probability of buying A+++ fridges. No statistically significant effect was found for Treatment 2 surprisingly.
- Dishwashers: Treatment 1 increases the probability of buying A++ dishwashers, while decreases the probability of buying A+++ dishwashers. The same effect was found in Treatment 2 (increases the probability of buying A++ while decreases the probability of buying A+++ products).
- Tumble-driers: Treatment 1 is effective and increases the probability of buying A+ tumble-driers while Treatment 2 increases the probability of buying A+++ tumble-driers.

Conclusions (preliminary)

As these are preliminary results, further research is needed to understand why apparently Treatment 1 and Treatment 2 are effective and increases the probability of buying A++ appliances, while the opposite effect is seen for A+++ appliances. However, some potential explanations can be found. On one hand, there could be opposite and internal incentives to promote the purchase of certain type of products (e.g. the chain has a lot of appliances of a specific type they could have internal incentives to promote the sale of those appliances to clear the stock). On the other hand, it could also happen that the purchaser ignore the recommendations of the sales staff.

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