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BASQUE CENTRE FOR CLIMATE CHANGE
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The effect of energy labelling on consumers' purchasing decision: a field experiment in Spanish appliances' retailers

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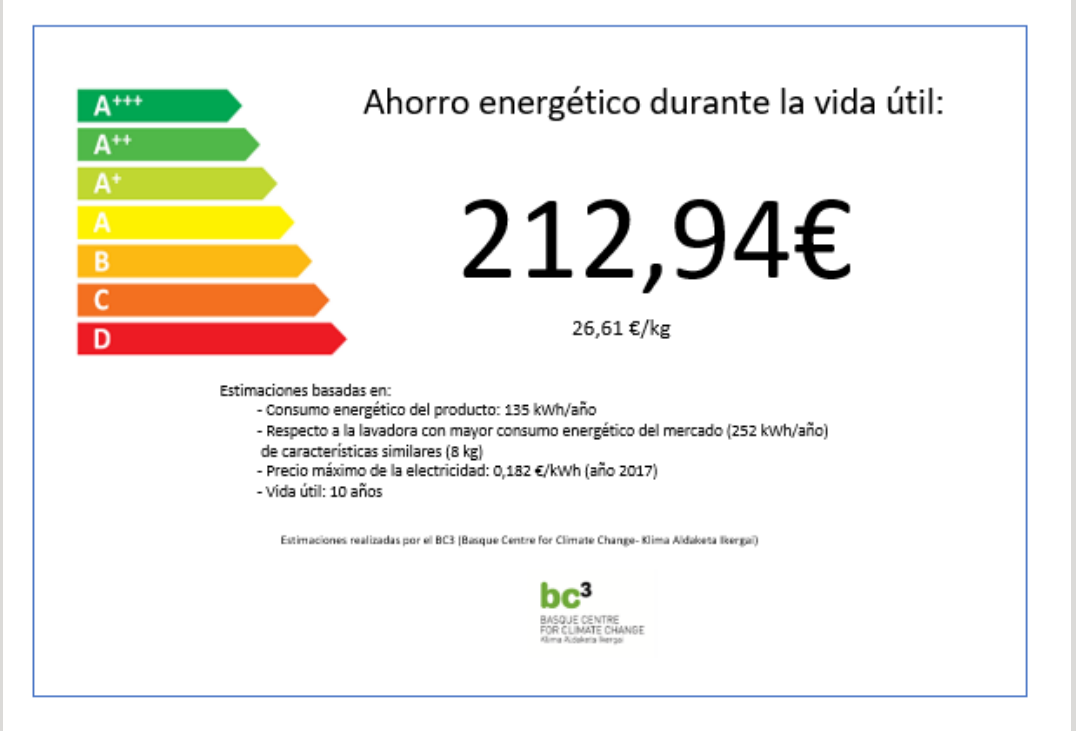
1 INTRODUCTION

- **Energy efficiency gap:** households and businesses invest less in energy efficiency (EE) than what may appear economically rational

  - Possible explanations: market failures, behavioural failures and **informational failures**

- EE policies to cope with informational failures: Energy Labelling System

- Current Directive: EU Energy Labelling Directive (2010/30/EU)
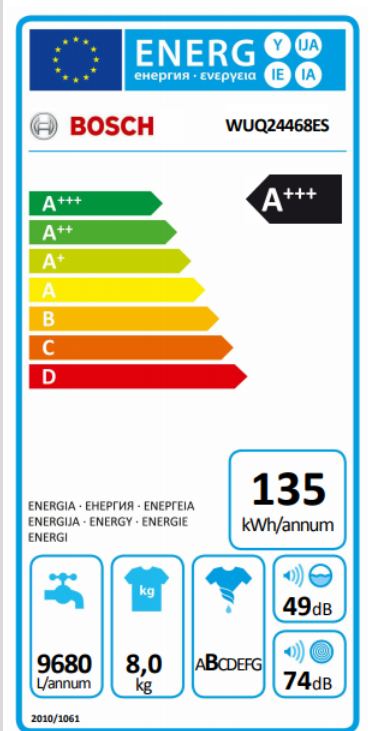
2 MOTIVATION AND OBJECTIVE

- **Motivation:** Promote the purchase of energy efficient appliances

- **Objective:** Test the effectiveness of presenting a monetary lifetime oriented label with energy savings information.

- How?
  - Field experiment

- Why a field experiment?
  - A real situation is needed to test the effectiveness of the monetary label, based on actual purchases
  - Field experiment video: https://vimeo.com/242586754

3 FIELD EXPERIMENT DESIGN IN 9 STEPS

1. **WHAT APPLIANCES?** Washing machines, Fridges, Dishwashers
2. **WHEN?** 6 month experiment (Start: February 2018, End: July 2018)
3. **WHERE?** Small stores in the Basque Country, Cantabria, Comunidad Foral de Navarra and Aragón
4. **WHAT INFORMATION?** Savings information of the energy consumption during the lifetime of the products (Lifetime: 10 years; Electricity Price (p_{elec}): 0,182 €/kWh)
5. **HOW ARE ENERGY SAVINGS CALCULATED?** $Energy\ savings = (MEC - EC) * p_{elec} * L; MEC =$ Maximum energy consumption of similar products

Proposed monetary Energy Efficiency label

Current Energy Efficiency Label

6. **HOW IS IMPLEMENTED THE EXPERIMENT?**

Treatment group (N=14)	Treatment description	Treatment Period	Control group (N=12)	Control description
Treatment 1	Energy savings label	5th February – 4th April of 2018	Control	The control group is a group of small retailers with no intervention.
Treatment 2	Training of the sales staff	5th April – 3rd June of 2018		
Treatment 3	Energy savings label + Training of the sales staff	4th June – 31th July of 2018		

7. **IMPROVEMENTS REGARDING THE LITERATURE:**

	Carroll et al. (2016)	Kallbekken et al. (2013)	My study
What type of information is provided by the label?	5 year energy cost	Lifetime energy cost	Lifetime energy savings
How many treatments are?	One treatment (based on the label)	Three treatments (not only based on the label)	Three treatments (not only based on the labels)
How many control and treatment stores were chosen?	T=4 C=16	T=6 C=18	T=14 C=12
How is defined the control group? And the treatment group?	Simultaneous control	Simultaneous control and treatments group	Simultaneous control group and ordered treatments
Where is the experiment implemented?	Big retailers	Big retailers	Small retailers
Products	Tumble driers	Tumble driers Freezers	Washing machine Fridge Dishwasher

8. **COLLECTED DATA:** Sales data (Type of appliance, Brand, Date of the sale, Price of the appliance, Discount in force) and Customer's questionnaire (Age range, Gender, Postal code).

9. **ESTIMATION OF THE MODEL:** Probit model $P(y = 1 \mid X) = \beta_1 + \beta_2 Treatment1 + \beta_3 Treatment2 + \beta_4 Treatment3 + \beta_5 Price + \beta_6 Attributes + e$

4 MAIN RESULTS

Washing machines		Fridges		Dishwashers	
Treatments	Marginal effect	**Treatments**	Marginal effect	**Treatments**	Marginal effect
Control	-----Ref-----	Control	-----Ref-----	Control	-----Ref-----
Treatment 1 (=1 if the sale is under treatment 1)	0.0072 (0.0095)	Treatment 1 (=1 if the sale is under treatment 1)	0.0406* (0.0246)	Treatment 1 (=1 if the sale is under treatment 1)	0.0273 (0.1211)
Treatment 2 (=1 if the sale is under treatment 2)	-0.0094 (0.0078)	Treatment 2 (=1 if the sale is under treatment 2)	0.0429* (0.0234)	Treatment 2 (=1 if the sale is under treatment 2)	-0.0063 (0.1094)
Treatment 3 (=1 if the sale is under treatment 3)	-0.0086 (0.0078)	Treatment 3 (=1 if the sale is under treatment 3)	0.0461** (0.0235)	Treatment 3 (=1 if the sale is under treatment 3)	-0.1032 (0.1045)
Attributes		**Attributes**		**Attributes**	
Capacity (kg)	0.0417*** (0.0079)	Height (mm)	-3.93e-06 (9.32e-06)	Size (=1 if the size is 600mm)	0.4940** (0.2523)
Type of embedding (=1 if free installation)	0.0548*** (0.011)	Type of embedding (=1 if free installation)	0.0161 (0.0513)	Number of services	0.1643*** (0.0611)
Water consumption (L)	-0.0001*** (6.26e-06)	Capacity- Volume of the fridge (L)	0.0021*** (0.0003)	Water consumption (L)	-0.0019*** (0.0002)
Price	0.0001* (0.0001)	Capacity- Volume of the freezer (L)	0.0004 (0.0009)	Price	0.0006* (0.0003)
		Price	0.0002*** (0.0001)		
Socio-economic factors		**Socio-economic factors**		**Socio-economic factors**	
Gender (=1 if the consumer is a woman)	-0.0015 (0.0058)	Gender (=1 if the consumer is a woman)	-0.0040 (0.0167)	Gender (=1 if the consumer is a woman)	-0.1280 (0.0819)
Less than 30 years (=1 if the consumer is less than 30 years old)	-0.0055 (0.0225)	Less than 30 years (=1 if the consumer is less than 30 years old)	0.0359 (0.0630)	Less than 30 years (=1 if the consumer is less than 30 years old)	0.1417 (0.3952)
Between 30 years and 45 (=1 if the consumer is between 30 and 45 years old)	-0.0092 (0.0078)	Between 30 years and 45 (=1 if the consumer is between 30 and 45 years old)	0.0089 (0.0226)	Between 30 years and 45 (=1 if the consumer is between 30 and 45 years old)	0.0314 (0.1026)
Between 45 and 60 years (=1 if the consumer is between 45 and 60 years old)	-0.0032 (0.0068)	Between 45 and 60 years (=1 if the consumer is between 45 and 60 years old)	0.0253 (0.0202)	Between 45 and 60 years (=1 if the consumer is between 45 and 60 years old)	0.2320* (0.0959)
Income	1.80e-06*** (6.81e-07)	Income	-4.65e-07 (1.96e-06)	Income	-6.39e-06 (9.06e-06)
Number of observations	1403	**Number of observations**	848	**Number of observations**	432
LR chi2(12)	185.12	LR chi2(13)	243.25	LR chi2(12)	412.04
Prob > chi2	0.0000	Prob > chi2	0.0000	Prob > chi2	0.0000
Pseudo R2	0.2963	Pseudo R2	0.3518	Pseudo R2	0.7014

Notes: ***, ** and * indicate significance at 1%, 5% and 10% level. Standard deviation under parentheses.

- Washing machines:
  - None of the treatments are significant
- Dishwashers:
  - None of the treatments are significant
- Fridges:
  - All of the treatments are significant. The monetary energy savings labelling system, the training of the sales staff and the combination of both are significant.
    - Potential increase in the probability of buying a more energy efficient fridge with respect to the status quo (official energy label)

5 MAIN CONCLUSIONS

- **Washing machines and dishwashers**: No effects were found

  - A tentative explanation: usage of washing machines very much determines the actual consumption of the appliance, consumers give little importance to energy savings when purchasing the dishwasher.

- **Fridge:** The three treatments increase the probability of buying an energy efficient appliance (A+++)

  - A tentative explanation: fridges are usually connected 24 hours and every day, and it is unlikely that the degree of cold is often changed.

- **ONGOING WORK:** Further researcher will be needed to provide evidence on why monetary information on savings may seem to work in the case of fridges but not in the case of dishwashers and washing machines.

CONSEED CONSumer Energy Efficiency Decision Making

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