

# Inattention vs Switching Costs: An Analysis of Consumers' Inaction in Choosing a Water Tariff

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## Consumers' Inaction

- Large and mounting evidence that people often fail to take actions that would benefit them financially.
- Two different but not mutually exclusive explanations: Attention and Switching Costs
- **Switching Costs**: some individuals may assess that the gains are not worth the hassle
- **Attention**: others may fail to consider the potential gains, because they do not receive or disregard relevant information

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- **To decrease inequalities:**

Simplified application processes for social benefits may be effective if the main barrier for applicants is transaction costs ..

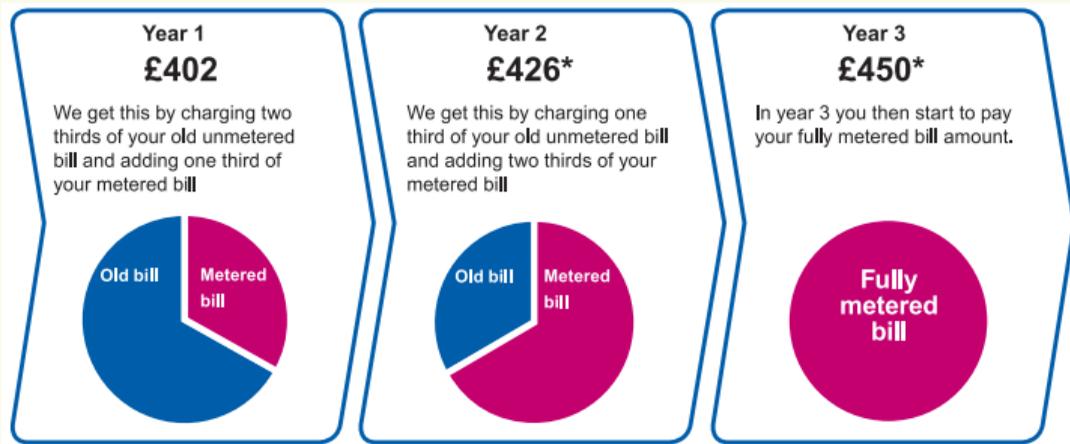
... but may not be so effective if the main issue is instead lack of attention

## Institutional Settings

- We examine the choice of water tariff among more than 50,000 households in the South-East of England.
- Compulsory metering programme between 2010 and 2015 with around 500K meters installed
- Soon after installation, households were moved by default to the new metered tariff.
- However, they were also offered the possibility to pay for two years a transitional tariff, called changeover tariff, a combination of the metered tariff and the “old” unmetered tariff

## Institutional Settings

- We observed massive inaction by consumers: they fail to take advantage of the option, end up paying higher water bills, losing on average £121 (median 83)
- This despite consumers face a rather simple binary choice, whose financial implications are clearly communicated and that requires only a telephone call.



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The simple decision setting and the provision of personalized information makes identification of the relative importance of inattention and switching costs cleaner compared to other studies that have focused on more complex settings

## Empirical Model

- We define a simple empirical framework whereby the probability that an household take advantage of the changeover tariff depends on two different elements: attention and switching costs.
- Our identification strategy rests on the fact that information about the specific financial gains cannot affect the probability of attention because the financial gains are revealed only after an household reads the documents.
- Customers can learn about their potential financial gains only by paying attention and, therefore, we assume that these gains are excluded from the attention stage.

## Specification

Overall, the probability of household  $i$  switching to a metered plan is

$$\pi_i^s(\mathbf{x}_i, g_i) = \pi_i^a(\mathbf{x}_i) \cdot \pi_i^{s|a}(\mathbf{x}_i, g_i). \quad (1)$$

- $\pi_i^a(\mathbf{x}_i)$  denote the attention probability, which depends on sociodemographic characteristics  $\mathbf{x}_i$
- $\pi_i^{s|a}(\mathbf{x}_i, g_i)$  denote the probability of household  $i$  switching *given* they pay attention, which depends not only  $\mathbf{x}_i$  but also on the individual savings,  $g_i$
- We assume that households who pay attention decide to switch if  $g_i \geq c_i$ .
- We, as researchers, observe  $g_i$  and model  $c_i$  as a random variable

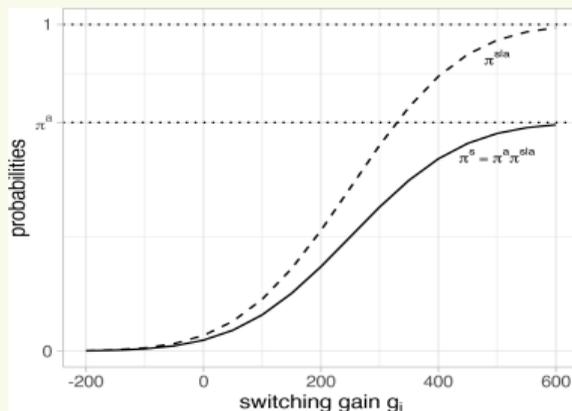
$$\pi^{s|a}(g_i) = \Pr(c_i \leq g_i)$$

which is the c.d.f. of the switching costs  $c_i$  evaluated at the observed gains  $g_i$

## Identification

Figure below shows these probabilities for a hypothetical example without covariates  $\mathbf{x}_i$

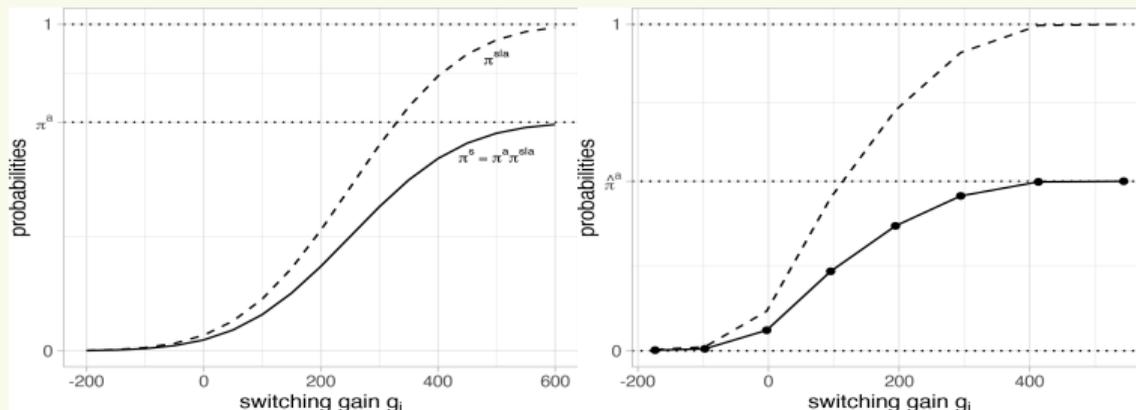
- The dashed line is the cond probability  $\pi^{s|a}(g_i)$ , i.e. the c.d.f. of switching costs.
- The attention probability  $\pi_i^a$  is a fixed number (in the graph, it's 0.7).
- We assume that switching probability  $\pi_i^s(g_i) = \pi_i^a \cdot \pi^{s|a}(g_i)$  converges to  $\pi_i^a$  as  $g \rightarrow \infty$ ; i.e. we rely on financial gains to be large enough for some households to induce them to switch with certainty if they pay attention.



## Identification

Figure (b) shows the share of switching for 8 groups of households.

- This is a basic estimate of the function  $\pi_i^s(g_i)$  without any covariates.
- Switching rate increases with  $g_i$  and converges to around 0.5 as  $g_i$  grows
- This is used as an estimate of the attention probability  $\pi_i^a$ :  
If 50% of customers don't pay attention, overall switching cannot exceed 50%



(a) Model structure

(b) Empirical illustration

## Identification

- Once we have an estimate of  $\pi_i^s(g_i)$  and  $\pi_i^a$ , we can get an estimate of switching probabilities conditional on attention, and in turn the distribution of the switching costs, as:

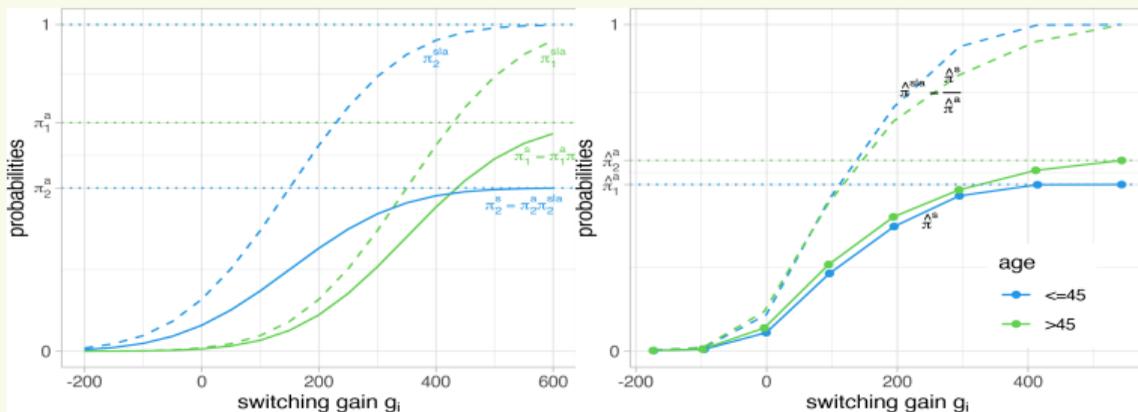
$$\hat{\pi}_i^{s|a}(g_i) = \frac{\hat{\pi}_i^s(g_i)}{\hat{\pi}_i^a}.$$

- In Figure (b), this estimate is shown as the dashed line. It crosses 50% at around 110 pounds which according to the model structure can be interpreted as estimated median switching costs.

## Identification with Covariates

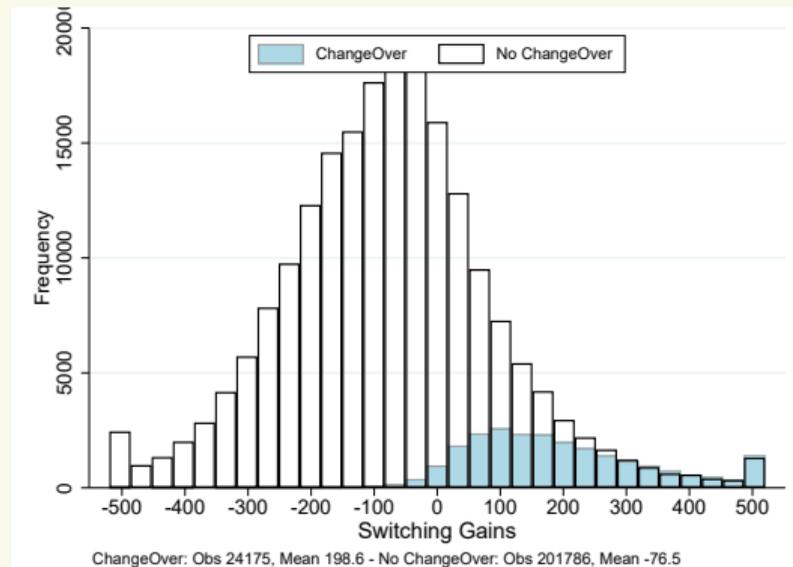
Figure below show the effect of sociodemographic characteristics for two age groups: seniors (in green) and youth (in blue)

- Left: seniors have a higher attention but also higher average switching costs.
- Right: switching converges to a lower number (so lower attention) for youth.
- The  $\hat{\pi}_i^{s|a}(g_i)$  curves of the youngest households is slightly shifted to the left, which would imply lower switching costs



## Savings

Distribution of savings for the 225,961 households in our sample, distinguishing between the 24,175 households who switched to the changeover tariff and the 201,786 who did not, resulting in a switching rate just above 10% ( $=24,175/225,961$ ) for the whole sample and 28% ( $=(24,175-1,162)/81,815$ ) for those with positive gains



## Descriptive Statistics

Variables	Changeover			No Changeover		
	Mean	Median	Std Dev	Mean	Median	Std Dev
<i>SW Data</i>						
Changeover Gains	198.60	167	166.53	-76.47	-77	177.13
Unmetered Bill	203.44	202.22	58.80	225.10	222.56	77.17
Occupants	3.62	4	1.12	2.41	2	1.15
Age	49.49	49	12.06	55.38	55	15.32
<i>ONS Data</i>						
Education Score	-0.258	-0.219	0.178	-0.236	-0.194	0.173
Income Score	-0.142	-0.120	0.086	-0.126	-0.110	0.082
Social Rented	0.159	0.146	0.091	0.156	0.142	0.096
Homogeneity	0.788	0.835	0.158	0.809	0.850	0.143

## Probability of Switching

Results for our “full” model and for a “restricted” model where individuals are assumed to pay attention with probability 1.

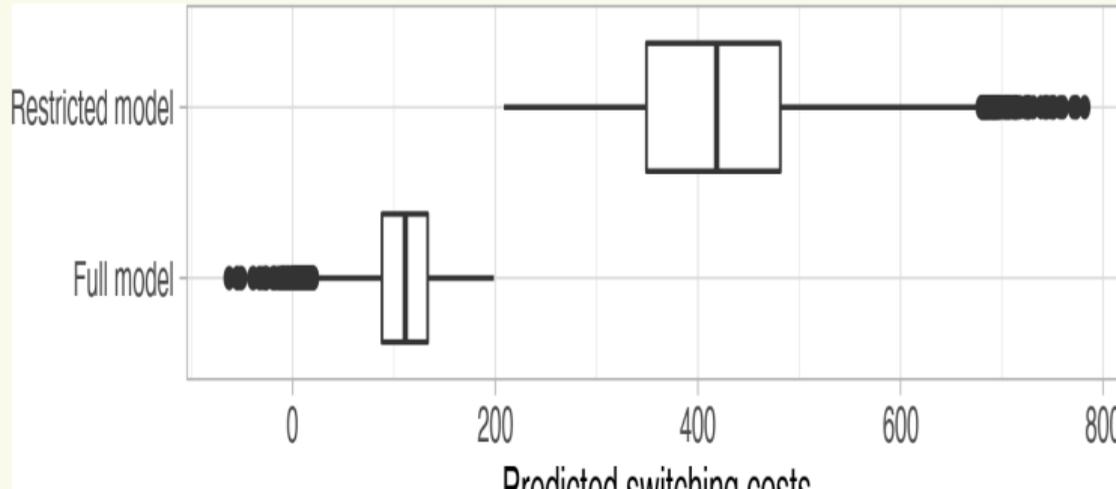
Table: Probability of Switching

All Households	Restricted Model	Full Model
Switching $\pi_i^s(\mathbf{x}_i, g_i; \beta, \gamma, \sigma)$	0.104	0.107
Attention $\pi_i^a(\mathbf{x}_i)$	1.000	0.475
Switching if attentive $\pi_i^{s a}(\mathbf{x}_i, g_i)$	0.104	0.217
Households with positive gains	Restricted Model	Full Model
Switching $\pi_i^s(\mathbf{x}_i, g_i; \beta, \gamma, \sigma)$	0.244	0.275
Attention $\pi_i^a(\mathbf{x}_i)$	1.000	0.495
Switching if attentive $\pi_i^{s a}(\mathbf{x}_i, g_i)$	0.244	0.558

## Switching Costs

This large difference in the probability of switching implies different estimated switching costs.

- The restricted model estimates median switching costs above £400 which seems unrealistically high, given the low effort required to adopt the changeover tariff..
- The full model estimates this cost at a much more reasonable figure of around £100.



	Restricted Model	Full Model
<i>Switching costs:</i>		
Intercept	496.19 (9.02)***	168.48 (7.22)***
2 Occupants	-126.93 (7.15)***	-27.64 (5.49)***
3 Occupants	-212.88 (7.21)***	-55.27 (5.61)***
4 Occupants	-263.98 (7.61)***	-72.77 (5.96)***
5+ Occupants	-230.22 (7.88)***	-66.79 (6.00)***
Age 35-65	-34.04 (3.56)***	-1.39 (3.29)
Age >65	8.64 (4.42)	-4.65 (3.89)
Education medium	4.13 (3.02)	7.54 (2.62)**
Education high	0.72 (4.05)	8.77 (3.39)**
Income medium	-6.60 (2.84)*	8.28 (2.42)***
Income high	13.02 (5.33)*	9.67 (4.25)*
Social rented	105.88 (14.52)***	28.44 (12.19)*
Homogeneity	-3.65 (2.62)	15.94 (2.14)***
Unmetered bill	34.55 (2.14)***	-15.80 (1.60)***
Std deviation $\sigma$	272.43 (1.75)***	97.50 (0.99)***
<i>Attention Probability:</i>		
Intercept		0.13 (0.09)
2 Occupants		0.03 (0.09)
3 Occupants		-0.05 (0.08)
4 Occupants		-0.01 (0.08)
5+ Occupants		0.09 (0.08)
Age 35-65		0.20 (0.03)***
Age >65		0.07 (0.03)*
Education medium		0.06 (0.02)**
Education high		0.09 (0.03)**
Income medium		0.10 (0.02)***
Income high		0.05 (0.04)
Social rented		-0.24 (0.10)*
Homogeneity		0.13 (0.02)***
Unmetered bill		-0.20 (0.02)***
Log likelihood	-52328.08	-48795.59

**Table:** Probability of Switching and Paying Attention

	Pr(switching)	Pr(attention)	Pr(switching—attention)
Average prob.	10.66	47.50	21.71
2 Occupants	1.74	1.14	3.13
3 Occupants	2.82	-2.04	6.73
4 Occupants	4.43	-0.33	9.26
5+ Occupants	4.97	3.63	8.38
Age 35-65	1.74	7.64	0.17
Age >65	0.84	2.65	0.58
Education medium	0.03	2.22	-0.95
Education high	0.23	3.47	-1.10
Income medium	0.38	4.00	-1.04
Income high	-0.17	1.82	-1.21
Social rented	-3.33	-9.17	-3.34
Homogeneity	0.13	5.16	-1.98
Unmetered bill	-0.83	-7.61	2.04

## Results

- In both models, ↑ number of occupants is associated with ↓ switching costs, possibly because of division of tasks within large households.
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- In both models, ↑ number of occupants is associated with ↓ switching costs, possibly because of division of tasks within large households.
- However, the restricted model produces estimates of the switching costs that are five to ten times higher than the full model.
- The restricted model suggests that switching costs are not different across areas with low or high education scores.
- However, the full model shows that households in less deprived areas pay attention but, conditional on attention, have higher switching costs
  - Households in medium or high education neighborhoods are more likely to pay attention by 2.2 and 3.4 percentage points, respectively.
  - Households in medium and high income neighborhoods are more likely to pay attention by 4 and 1.8 percentage points,.

## Conclusions

- We disentangle the role of inattention and switching costs in a setting where customers' are offered the choice of a potentially more convenient tariff.
- We show that inattention plays a central role, and explore heterogeneity along dimensions like income and education.
- Our finding of large inattention in an environment that should be favourable to consumers taking action suggests that policy makers should not take consumers' attention for granted.
- Policy Relevant for Energy Sectors.
  - Consumer choice is a centrepiece of current market regulation policies promoting an increase in competition among suppliers.
  - However, benefits of this are undermined if consumers display a high degree of passivity, as documented in this paper.
  - Our finding that low income/low education is associated with lower responsiveness also raises distributional issues, as people from low socio-economic background appear to be the least likely to benefit from increased choice.