Water Tariffs and Consumers’ Inaction*

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Abstract

We study adoption by more than 150,000 households of an optional transitional water tariff implemented in the South-East of England in conjunction with an universal metering programme. We show how less than a third of customers who would benefit from adopting the transitional tariff actually do, thus relinquishing substantial financial gains. Households are more likely to switch tariff just after receiving a bill and they are more responsive to short-term gains than to overall gains from adopting the tariff. Households in high income/high education neighbourhoods display a higher responsiveness to potential savings, as do households where the contract holder is of prime age instead of being more senior or junior. Finally, the probability of adoption is positively associated with adoption by neighbours, thus suggesting the presence of peer effects. The institutional context points at status quo bias due to decision avoidance as the most likely driver of this behavior. For adopters, we also look at the timing of the call, showing how most customers choose to call early on, when less information is available, but the issue is more prominent. Moreover, the choice of when to call is consistent with customers taking into account the option value of waiting, as well as future consumption patterns.

Keywords: status quo bias, tariffs, water

JEL: D12, L95, Q25

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1 Introduction

A central tenet of economic theory is that consumers pursue the course of action that maximize their utility given the constraints they face. Policies aimed at increasing consumers’ choice have been implemented in a variety of realms where markets are not perfectly competitive (e.g. schools, healthcare, utilities), with the idea that consumers will take advantage of increased choice to improve their welfare. There is, however, growing evidence that consumers may fail to do so, either because they face constraints (e.g. in terms of time) that limit their ability to evaluate alternatives (Sallee, 2014), or because they are not fully rational, for instance using heuristics rather than “rational calculus” to determine the course of action. A recent example of such failure is Keys et al. (2016), who find that approximately 20% of U.S. households failed to take advantage of lower rates by refinancing their mortgage, with a median present-discounted cost of $11,500. Clerides and Courty (2015) find evidence that consumers purchase a dominated option using Dutch and American scanner data from grocery stores, while Lacetera et al. (2012) find evidence of information-processing heuristics in the used-car market.

In this paper we examine the choice of water tariff among more than 150,000 households in the South-East of England. They could choose, after the installation of water meters due to a compulsory metering programme that took place between 2010 and 2015, whether to pay according to a standard tariff based on consumption, or to pay for up to two years according to a transitional tariff, called “changeover” tariff, a combination of the standard tariff and the “old” unmetered tariff, based solely on the characteristics of the house. What we uncover is massive inaction by consumers, who for the most part fail to take advantage of the option and, as a result, end up paying higher water bills, losing on average more than £120 (median £80). We also show how households tend to opt for the changeover tariff just after receiving a bill and how they respond not only to overall gains, that is to gains over the whole two-years period, but also to more short-term gains from adopting the tariff, that is to gains arising in the most recent billing period.¹ Households in high income/high education neighbourhoods display a higher responsiveness to potential savings, as do households where the contract holder is of prime age instead of being more senior or junior. Finally, we find evidence consistent with peer-effects, with the likelihood of taking (advantageous) action increasing if the house neighbours call or if there is a higher number of street neighbours doing so. We also look at the timing of the call over the two-years transitional period, showing how most customers choose to call early on, when less information is available, but the issue is more prominent. Finally, we also show how the choice of when to call is consistent with customers taking into account the option value of waiting (Kridel et al., 1993), as well as, in some instances, future consumption patterns, thus showing a certain degree of sophistication among some callers.

Several aspects of our setting make consumers’ inaction less likely to be observed compared

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¹ Actual gains are potentially endogenous to the choice of tariffs. However, using predicted gains leaves the results qualitatively unchanged.
to other contexts. First, the choice we study is not a routine choice that, as such, can be easily overlooked or postponed indefinitely. Instead, it is part of a considerable change in the way water is paid, the installation of a meter, that is therefore likely to focus attention on water consumption. Therefore, lack of salience (as, for instance, in Chetty et al., 2009) is unlikely to be behind our results. Moreover, the choice is time limited, as the option needs to be exercised within two-years after the installation of the meter, so it cannot be postponed indefinitely, and this makes procrastination, due for instance to some present-biased preferences, a less likely explanation. Second, customers who should opt for the changeover tariff experience by definition higher bills compared to what they used to pay. Therefore, loss aversion (documented, for instance, by Genakos et al., 2015 in the case of telephone bills) cannot be an explanation for the lack of action, but, on the opposite, should make customers more likely to act. Related to this, numerous studies have documented what has been called a “flat-rate bias”, that is, a preference for payment plans that are less sensitive to actual consumption (e.g. Della Vigna and Malmendier, 2006; Lambrecht and Skiera, 2006; Ater and Landsman, 2013; see, however, on the opposite Miravete, 2003). Again, this cannot be an explanation in our context, as a “flat-rate bias” should induce people to opt for the tariff with a lower marginal price and higher fixed payment, that is, it should make it more likely to choose the changeover tariff. Third, in our context search costs, a potential explanation for lack of action by rational agents, do not play a role. Indeed, customers have simply to choose how to pay for the very same product. The switching cost is non-zero, but minimal, simply involving a telephone call. Relatedly and differently from many other studies in which consumers inaction has been documented, true or perceived brand effect (as documented in the case of electricity markets by Hortaçsu et al., 2017) is not at play, as there is no need to change company. Also, the choice is binary (changeover or metered tariff) so choice overload (see, for instance, Chernev et al., 2015) cannot be an explanation. At the same time, customers are given information not only about the features of the changeover tariff, but also about the financial consequences they are likely to face based on their own characteristics, reducing the likelihood of misunderstanding (Samek and Sydnor, 2017). Moreover, customers are reminded multiple times about the need to opt in.

Given the institutional context, we can therefore exclude many explanations that have been proposed in the literature as grounds for lack of action by consumers. Status quo bias could be behind the fact that customers stick with the default option even if it is disadvantageous to them from a financial point of view and they have repeated opportunities to take action. Regarding this, it has to be underlined that in our setting, before the universal metering programme, the status quo for water bills was the unmetered tariff. Customers could at any time opt to have a meter installed at no cost, but those subject to the metering programme clearly did not do it. This means that our results cannot be due to a “preference for metering”, for instance because metering is perceived as a fairer way of paying for water or because metering acts as a commitment device to reduce consumption and, thus, for instance, benefit the environment (e.g., in a different context,
Della Vigna and Malmendier, 2006). Then, due to the implementation of the programme, the status quo became the metered tariff. Some customers could gain financially by going back, at least partially and temporarily, to the previous system through the changeover tariff, but most of them did not take advantage of this opportunity. Thus, in our setting, the status quo bias cannot be due to the role of the status quo as a reference point which alters preferences (as in Tversky and Kahneman, 1991) or with customers “sticking with what they know”. Decision avoidance (as in Tversky and Shafir, 1992) appears instead to be the most likely candidate to explain our findings, of course with some other factors like switching costs also potentially playing a role, at least for some customers. Indeed, when the status quo was the unmetered tariff and the alternative was the metered tariff, households in our sample stayed with the unmetered tariff. Then, when, due to a compulsory metering programme, the status quo becomes the metered tariff and the alternative is a tariff close to the unmetered one, most households stay with the metered tariff. The fact that most customers in our study stay with the status quo both before and after a policy intervention that essentially switches between the default tariff and the alternative tariff, is strong evidence in favor of decision avoidance. This is related to models of behavioural inattention, recently surveyed in Gabaix (2017). Despite this, our findings show that customers are prompted to take action if they receive a strong enough stimulus, be it in the form of economic incentives or some form of peer pressure.

This paper contributes to a growing literature on choice architecture and, in particular, on the role of consumers’ inaction. This has been documented in a variety of settings, including health insurance markets (Handel and Kolstad, 2015), retirement plans (Benartzi and Thaler, 2007; Madrian and Shea, 2001), and electricity (Fowlie et al., 2017). Beside documenting the role of consumers’ inaction in a new context and in an institutional set up that allows us to exclude many standard explanations for it, we also explore how different demographic characteristics are associated with inaction, a topic of high relevance for policy-making, because of its equity implications. This is also investigated in a recent contribution by Letzler et al. (2017), where they exploit a natural experiment about a fraudulent subscription programme and the sending of letters asking consumers to cancel them by taking action. They find that “[c]onsumers from low socio-economic status (SES) neighbourhoods and racial and ethnic minorities were even less likely to respond to the notification letters than consumers from higher SES communities and consumers who were likely to be white”. Beshears et al. (2015) study 401(k) plans and find lower opt-out odds for the low-income group, as well as for younger employees. Bhargava et al. (2017) find that low-income employees are significantly more likely to choose dominated health plan. Also Hortaçsu et al. (2017) find evidence of inaction being larger in “neighbourhoods with lower income, lower education, and more senior citizens”. Given that the promotion of an increase in competition

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2Handel and Schwartzstein (2018) have reviewed the literature on information acquisition and processing.
3Also regarding behavioural aspects of water consumption, Ito (2013) provides evidence that consumers respond to average rather than marginal price.
among suppliers is a centrepiece of market regulation, in particular for utilities, and that, to be
effective, this needs active consumers, our findings bear important implications for policy makers
that we discuss in the conclusions.

The next section describes the institutional setting, providing details regarding the tariff, the
timing of the choice and the information provided to customers. Section 3 gives some descriptive
statistics, while in the following section we present the results. We first investigate the decision of
whether or not to call, then look at the timing of the call within the two-years period. The last
section concludes.

2 Institutional Setting

In this section we describe in detail what a changeover tariff is, the choices customers can take
regarding it and the information provided to customers through the different stages of the metering
process. This section is based on documentation sent by the water utility to its customers. See
Ornaghi and Tonin (2018) for additional information on the metering programme.

2.1 The changeover tariff

The metered tariff consists of a standing charge and a volume charge. The standing charge is a fixed
charge based on the size of the meter fitted to the water supply and covers the costs of maintaining
the water services account. The volume charge is based on the amount of water supplied to the
home, that is, the volume of water recorded on the meter in each billing period.

The unmetered tariff does not depend on water consumption and consists of a standing charge
and a rateable value charge. The standing charge is a fixed amount for all properties and covers
the costs of maintaining the water services account. The rateable value charge is based on the
rateable value of the house. The rateable value was used as the basis for local authority taxation
prior to 1990. Rateable values were set by the Valuation Office (part of HM Revenue and Customs)
to reflect the rental value of the property. The rateable value is no longer used for taxation and no
longer updated. The water company normally use the rateable value quoted in the Valuation List
in force on 31 March 1990.

The changeover tariff consists of a weighted average of the metered and unmetered tariffs
described above. The weight of these two elements depends on how much time has gone by since
the switch to metered charges. In particular, during the first year after the switch, the bill is 1/3
of the metered tariff and 2/3 of the unmetered tariff, while during the second year the bill is 2/3
of the metered tariff and 1/3 of the unmetered tariff.
2.2 Timing

Approximately three months after meter installation, customers automatically switch from paying unmetered charges to paying metered charges. Starting from this moment, customers, however, may opt for the changeover tariff simply by calling the water company.

There is flexibility regarding the period of application of the changeover tariff. In particular, customers may choose whether to have the changeover tariff applied from the date they switched to metered charges, or from the start date of a later billing period within the first 24 months of metered charging.

This choice is reversible. Customers who are on the changeover tariff can choose at any time to switch to the normal metered tariff. If they do so, they can choose whether to have the normal metered tariff applied from the date when they switched to the changeover tariff, or from the start date of a later billing period. This choice is then irreversible, in that customers who choose to switch from the changeover tariff to the normal metered tariff cannot switch back to the changeover tariff at a later date. In practice, as we will see in section 3, multiple switches are very rare and customers tend to adopt the metered tariff or the changeover tariff for the whole period.

2.3 Information

Figure 1 summarizes the typical customer journey with the information received at the different stages of the programme.

![Figure 1: Typical customer journey](image)

The figure shows that approximately four to six weeks before installation customers receive a booklet titled “Your water meter is coming - part 1 of 2”, where the changeover tariff is mentioned.4

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4The document reads as follows: “All our customers will be given the opportunity to choose a changeover tariff for paying their water bills. This means that if your metered bill is higher than your old bill, we will reduce your bill for the first two years and you do not have to pay the difference. This is to help you adjust to paying for your water when you are paying for what you use. Please be aware that you cannot opt for our Changeover tariff until your meter charges start.”
A brief mention to a changeover period is also present in the leaflet titled "Southern Water’s metering programme" that customers receive approximately three weeks before installation and that is also distributed at key locations within the installation area (e.g. post offices, libraries, etc.). On the day of installation, customers receive a leaflet titled “Your water meter is here - part 2 of 2”. Here the changeover tariff is explained in more details. In particular, customers are informed that about six months after installation, they will receive the so-called 3-Months letter “explaining how much water you have used and how much your first metered bill is likely to be if you keep using the same amount of water. You will also be given the choice to opt for our changeover period of payment”. Then, they are informed that about nine months after installation, they will receive “your first metered bill and be given a second, and final opportunity, to opt for our changeover period of payment.” Finally, the leaflet explains the changeover period and provides an example based on a rateable value bill of £378 and a would-be fully metered bill of £450. The example is illustrated through a pie chart that shows how adopting the changeover tariff saves money for the customer (see in the Appendix an extract from the installation leaflet explaining the changeover tariff in detail).

Documents from which customers can get essential information about their consumption and payments are, of course, bills. First of all, customers receive a 3-Months letter, informing them about their water usage in the first three months after the meter has been turned on. We report a sample in the Appendix, undelying in yellow the parts mentioning the changeover tariff. In Figure 2, we report the key section of the 3-months letter dealing with the changeover tariff.

As can be seen, the letter contains a personalised pie chart, with calculations based on the actual unmetered charges applying to the customers and on a projection about metered charges based on the observed consumption in the three months period. Thus, customers not only receive information about the main features of the changeover tariff, but also a clear indication of the potential savings arising from it given their specific characteristics. Recent research by Samek and Sydnor (2017) shows how, in the case of health insurance, moving from describing the features of plans to providing information about their different financial consequences through “consequence graphs” greatly reduces the share of people choosing financially dominated options thanks to improved understanding. In our case, we would thus expect the clear representation of the financial consequences of adopting the changeover tariff to reduce the scope for misunderstanding. In the letter, it is also clearly indicated that customers need to take action in order to adopt the tariff. In particular, under the pie chart it is mentioned how “[o]pting in to the changeover tariff is easy, just call us on 0333 200 3011”. At the end of the page explaining the changeover tariff there is, moreover, the bright banner reported in Figure 3, making it very prominent that a call is needed to adopt the tariff.

The first bill is sent after a further three months and also includes a personalised pie chart, highlighting both the yearly fully metered charge and the changeover charge under the assumption
Figure 2: Main Information in 3-Months Letter

Changeover tariff

On our ‘changeover’ tariff, if your metered bill is higher than your old bill, we will reduce your bills for the first two years – and you don’t have to pay us back the difference at the end! This is to help you adjust to paying for your water now that you are paying for the amount you use.

If you keep using the same amount of water, instead of £346 per year your total bill could be:

Year 1
£251
We get this by charging two thirds of your old unmetered bill and adding one third of your metered bill

Year 2
£298*
We get this by charging one third of your old unmetered bill and adding two thirds of your metered bill

Year 3
£346*
In year 3 you then start to pay your fully metered bill amount

*Example based on year 1 prices

Opting in to the changeover tariff is easy, just call us on 0333 200 3011

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Figure 3: Banner in 3-Months Letter

To help you adjust to metered bills for the first two years just call us on 0333 200 3011

that the customer keeps using the same amount of water (see Appendix for a sample, with parts mentioning the changeover tariff highlighted in yellow). Also here there are multiple indications that customers need to take action in order to switch to the changeover tariff. Under the pie chart it is indicated how “The charge for this period of £[personalized amount] is your fully metered charge. If you want to go on our changeover tariff just call 0333 200 3012 and we’ll send you a revised bill. If you don’t contact us you will stay on the standard metered tariff”. There is once again at the end of the page the banner of Figure 3 and, in the following page, after detailing the charges, it is written “This is your first metered bill. For your first four metered bills, when your metered amount is higher than your old bill, you can go on our ‘changeover’ tariff - call 0333 200
3012 to go on this tariff.”

The changeover tariff is not mentioned in the remaining three bills in which customers could potentially decide to switch if they have not done so. For customer who have decided to switch and are on the changeover tariff, the first two bills include the pie chart and a notice indicating the number to call in case the customer wants to come off the changeover tariff and pay the fully metered bill amount instead. All the first four bills contain detailed calculation of the changeover tariff, separately indicating the “old unmetered bill calculation” and the “new metered bill calculation”, as well as the “changeover tariff calculation”. After the fourth bill, of course, the changeover tariff no longer applies. Southern Water also produces detailed guides about applicable charges, available on its website.5

3 Descriptives

In the previous section, we have described the formal rules concerning the adoption of the changeover tariff. While customers could not pick the most advantageous tariff in each of the four billing periods, it was theoretically possible to switch twice, with many possible combinations of tariffs over the two-years period. Looking at the realised payment combinations, however, it is evident how only very few customers (less than 0.05%) ended up paying part of the bills according to the metered tariff and part of the bills according to the changeover tariff. The vast majority of households paid over the two-years transition period always the metered tariff or always the changeover tariff. This is the case even if we observe many customers who opted for the changeover tariff not immediately, thus having initial bills issued according to the metered tariff. For the vast majority of these customers, previous bills were reissued according to the changeover tariff once they decided to switch. For this reason, in what follows we will consider as if the choice was between the changeover or the metered tariff for the whole period, without the possibility of alternating between them.

In Table 1, we report some descriptive statistics of the different bills. Out of a sample of more than 150,000 households, around 10% called to take advantage of the changeover tariff. For the sample as a whole, the average sum of metered bills over the two-years period is around £822 (median: £780)6, while the average for the changeover bills is higher at £869 (median: £862), so indeed it makes sense for most customers not to call. For more than 50,000 households, however, the changeover bill would actually be lower than the metered bill, with an average gain over the two-years period of £146 (median: £101), a non-trivial saving compared to the sum of bills reported above.

As the last bill received may be particularly prominent in people’s mind, Table 1 shows descriptive statistics of this variable too. For those who indeed opt for the changeover tariff, we report the

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5 www.southernwater.co.uk/our-charges
6 To provide a term of comparison, according to the Office of National Statistics, the average household consumption in the South-East was, for the years 2012-2014, approximately £2,600 per month. This means that water represents approximately between 1 and 2% of households’ expenditures.
### Table 1: Summary Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Call indicator</td>
<td>156193</td>
<td>0.104</td>
<td>0</td>
<td>0.305</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Metered Bill (M)</td>
<td>156193</td>
<td>822</td>
<td>780</td>
<td>402.5</td>
<td>48</td>
<td>12589</td>
</tr>
<tr>
<td>Changeover Bill (C)</td>
<td>156193</td>
<td>868.6</td>
<td>862</td>
<td>306.7</td>
<td>113</td>
<td>7860</td>
</tr>
<tr>
<td>C-M (all bills)</td>
<td>156193</td>
<td>-46.6</td>
<td>-55.8</td>
<td>196.6</td>
<td>-1879</td>
<td>4999</td>
</tr>
<tr>
<td>C-M if C&gt;M (all bills)</td>
<td>55832</td>
<td>146</td>
<td>100.6</td>
<td>157.9</td>
<td>0.001</td>
<td>4999</td>
</tr>
<tr>
<td>C-M (last bill)</td>
<td>156193</td>
<td>-9</td>
<td>-11.6</td>
<td>60.1</td>
<td>-757</td>
<td>6815</td>
</tr>
<tr>
<td>C-M if C&gt;M (last bill)</td>
<td>58388</td>
<td>41.5</td>
<td>26.5</td>
<td>59.9</td>
<td>0.001</td>
<td>6815</td>
</tr>
<tr>
<td>Education Score</td>
<td>154524</td>
<td>-0.241</td>
<td>-0.198</td>
<td>0.174</td>
<td>-0.94</td>
<td>-0.001</td>
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<td>Income Score</td>
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<td>-0.11</td>
<td>0.079</td>
<td>-0.53</td>
<td>-0.01</td>
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<tr>
<td>Age</td>
<td>116822</td>
<td>56.5</td>
<td>55</td>
<td>15.1</td>
<td>17</td>
<td>105</td>
</tr>
<tr>
<td>House Neighbour</td>
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<td>0.09</td>
<td>0</td>
<td>0.285</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>N of Callers</td>
<td>156193</td>
<td>1.38</td>
<td>1</td>
<td>1.72</td>
<td>0</td>
<td>16</td>
</tr>
</tbody>
</table>

**Notes:** Call indicator is a dummy taking the value of 1 for customers calling to adopt the changeover tariff. Metered Bill indicates for each customer the sum of all four metered bills over the two-year period. Changeover Bill indicates for each customer the sum of all four changeover bills over the two-year period. C-M (all bills) is the difference between the sum of changeover bills and metered bills. C-M (last bill) considers only the last bill before calling or a randomly selected bill if the customer never calls. Education Score measures the extent of deprivation in terms of education, skills and training in an Output Area. Income Score measures the extent of deprivation in terms of low income in an Output Area. Age is the age of the contract holder. House Neighbour is a dummy equals to 1 if at least one of the next-door neighbours has adopted the changeover tariff. N of Callers is the number of UMP customers adopting the changeover tariff in the postcode.

actual bill they received before calling,\(^7\) while, for those who did not call, we report a randomly selected bill among the four they receive over the two-year period, making sure that the distribution in terms of bill number is the same as for the optants.\(^8\) Savings for the last bill are negative for the sample as a whole, with an average difference between metered and changeover bill of -£9 (median -£12), but there is a large share of households for whom the last bill is lower under the changeover tariff compared to the metered tariff, with an average gain of £42 (median: £27).

To explain households’ behaviour, we combine our consumption data with data on income and education at Output Areas (OA) level from Neighbourhood statistics. OA is the lowest geographical level at which census estimates are provided. These were built from clusters of adjacent unit postcodes and, in 2011, had an average population of 309.\(^9\) The education score measures the extent of deprivation in terms of education, skills and training in an area.\(^10\) The income score is based on the proportion of the population in an area experiencing deprivation related to low

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\(^7\)For those calling before the first bill, we report the bill implied by the three-months letter. In a few cases where the three-months letter is not available, we use the first bill instead.

\(^8\)This means that, for instance, we undersample the third and fourth bill, given that few people call after these.

\(^9\)For details, see: [http://www.ons.gov.uk/methodology/geography/ukgeographies/](http://www.ons.gov.uk/methodology/geography/ukgeographies/)

\(^10\)It is based on a series of indicators like, for instance, the proportion of adults aged 25-54 with no or low qualifications or the proportion of young people not staying on in school or non-advanced education above age 16.
Education and income score are calculated at the Output Areas level and, originally, they are between 0 and 1, with an higher index indicating more deprived areas. We transform these variables by multiplying them by -1, so that a lower index is associated with more deprivation. Table 1 reports descriptive statistics of these two scores. From the table it emerges how in our sample there is a higher variation in the education score rather than the income score. As it could be expected, the correlation between the two scores is rather high, at 0.84. For most households, we also observe the age of the contract holder, which is on average 57 (median 55). As a term of comparison, for England as a whole, the equivalent measure of the scores are rather similar, at -0.22 (median -0.16) for the education score and -0.15 (median -0.11) for the income score, while the median age of the household reference person in 2014 was 51 years, according to LFS statistics.

Finally, to investigate possible peer effects, we use the following two variables: *House Neighbour* is a dummy taking the value of one if at least one of the next-door neighbours has adopted the changeover tariff; *Number of Callers* is the number of UMP customers adopting the changeover tariff in the postcode. This last variable goes between 0 and 16, with a mean of 1.4 (median 1). In our sample, we have more than 20,000 full postcodes, with an average of 7.5 (median 5) households affected by the UMP.

The economic incentives to call and adopt the switchover tariff are represented by the difference in the total water bills when applying the changeover tariff and the metered tariff for the whole two-years period. We plot this quantity in Figure 4, where the upper part refers to customers who did not call to have the changeover tariff (around 140,000), while the lower part is about those who, at some point within the two-years period, did call to apply the changeover tariff (around 16,000).

Overall, customers who stayed with the metered tariff mostly did the right choice from a financial point of view, as they would have lost on average around £75 by applying the changeover tariff for the four billing periods. It is also evident, however, how many of those who did not call would have gained from switching to the changeover tariff. The right panel in the upper part zooms in on these customers by plotting the distribution only on the positive domain. Of the almost 140,000 customers that did not call, more than 40,000 would have gained by calling, with an average gain of £123 (median £80), a non trivial amount compared to the overall bills over the two-year period reported in Table 1. By comparison, the average gain of the more than 16,000 customers who did actually call (bottom left quadrant) is almost double, at £195 (median £159). There is also a small group of customers (bottom right quadrant) who called and have had the changeover tariff applied for the two-years transitional period, while they would have been better off with the metered tariff. These are just few, less than 800 out of the more than 16,000 who call, and the average loss is less than £50 (median £29). Zooming in on the behaviour of these customers who lose money as

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11 It is based on a series of indicators such as adults and children in Income Support families or adults and children in Income-Based Jobseekers Allowance families.

12 For around 1,600 households we could not match the reported postcode to any OA, so these variables are missing.

13 The reference person is the adult contributing most to the total income of the household, a concept not equivalent to the contract holder, but nevertheless informative.
Notes: The figure plots the distribution of the difference in payments when applying the metered tariff versus the changeover tariff over two-years. The blue (red) lines indicate the mean (median) of the distribution. We windsorized the distribution at £-500 and £500.

A consequence of their action, rather than inaction, it is useful to look at the moment when they actually did take action. From figure 5, it is evident how, for most of them, the changeover tariff was more convenient than the metered tariff in the last bill they received before switching (upper right quadrant) or adding up all the bills up to the call (lower right quadrant), with an average gain above £10. Thus, most of these customers acted too hastily and did not act to switch back to the metered tariff later on, but for most of them the changeover tariff looked convenient when they took action.

It is also of interest to look at the timing of the changeover call. In particular, it seems plausible that receiving a bill focuses people’s attention on water consumption and, therefore, that people tend to call shortly after receiving a bill. We do not know the exact date when people make the telephone call. For most of those calling after having received the first bill, we can, however, exploit the fact that the water company reissues the bill calculated according to the changeover tariff when people opt for it. We can then look at the number of days between the posting of the last bill before the call and the posting of the new changeover bill. This overestimates the days passing between receiving a bill and making the call, as some time naturally incurs between posting the bill and its reception by the customer, as well as between making the call and posting the new bill. Figure 6 shows that, within the 6-months billing cycle, there is indeed a tendency to call just after having received a bill, with just 13 days passing at the median between posting the last bill and posting.
Figure 5: Difference in bills for impatient changeover

Notes: The figure plots the distribution of the difference in payments when applying the metered tariff versus the changeover tariff over two-years (top-left), for the last bill before calling (top-right) or for all the bills up to the time of calling (bottom-right). The blue (red) lines indicate the mean (median) of the distribution. We windsorized the distributions at £-500 and £500 (top-left) or £-100 and £100.

In this section we have shown evidence of massive inaction. There is also evidence of financial gains influencing the choice of calling, as well as the tendency to react to the last bill received. The next section further investigates customers’ behaviour regarding the adoption of the changeover tariff.

4 Results

In this section, we first study the decision of whether or not to call considering the two-year period as a whole, then we delve deeper into the issue of when people call within the allowed time frame. This part of the analysis allows us to investigate the degree of sophistication in the decision process of customers not displaying status-quo bias.

4.1 Calling or not calling

From the figures presented above, it appears that customers respond to economic incentives, albeit imperfectly, in the sense that they do not fully exploit the opportunity to save on their bill. To understand in more detail what drives customers’ decision to adopt or not the optional tariff, we
Figure 6: Call reaction time

Notes: The figure plots the distribution of days passed from posting the metered bill to posting the changeover bill for households calling to adopt the changeover tariff at least after bill 1. The right hand side zooms in the period between 0 and 20 days.

now conduct some regression analysis.

The first factor we consider is economic incentives. The hypothesis is that customers’ are more likely to call as the amount they save thanks to the changeover tariff grows. While they may easily forego a few pounds, for instance because they do not focus their attention on small amounts or because the opportunity cost of a telephone call is small but positive, customers should be more inclined to take action when savings become sizeable. It is also of interest to check how savings over different time horizons affect the likelihood of calling. In particular, the most relevant savings should be those over the whole two years period, as these represent the overall gain of adopting the changeover tariff. However, it is plausible that the latest bill is very salient and large savings in the last bill could be instrumental in customers overcoming decision avoidance. So, savings arising in the last billing period before making the call could be of special relevance. In practice, to conduct the regression analysis we split the positive domain of the distribution of total gains from adopting the changeover tariff over the two-years period into eight different groups and create a dummy for each of them, while the negative domain represents the base group. We do the same for the distribution of gains arising from the last bill. To check the robustness of our results, we construct two different sets of dummies: one where the eight groups refer to the absolute amount of money (e.g. between £15 and £30) and another where the eight groups are based on the position in the distribution (e.g. between 20-35 centiles). When considering absolute amounts, we choose
monetary ranges to take into account the distribution of gains, so that ranges are larger for larger amounts of savings, as fewer customers experience them. When considering the position in the distribution, we use slightly smaller intervals at the extremes to have a better idea of what happens for small or large amounts of savings.

Beyond economic incentives, there are of course other factors that could influence the likelihood of calling. First, we consider peer effects, in particular we check whether having neighbours (defined as someone with the same full postcode) or a close neighbour (defined as someone living next door, as identified through the house number) who have opted for the changeover tariff, is associated with a higher likelihood of opting as well. We do not have exogenous variation across households in whether or not their neighbours switched, and there may be spatial correlation in unobservable factors, so that people who are generally more inclined to switch may choose to live in the same area for unobservable reasons. Therefore, the results presented should not be interpreted in a causal manner, but rather as describing an association consistent with the presence of peer effects. We also use the indicators of income and education at the output area level discussed before, as well as age of the contract holder. Heterogeneity along the age dimension could arise because of time availability, e.g. retirees may have more time compared to working people to read the relevant information and take action. Income may matter as it is reasonable to assume that a given saving in pounds matters more for low-income households than for high-income ones, while the opportunity cost of time may also be higher for high-income people. On the other hand, there is evidence of how concerns related to poverty consume mental resources (Mani et al., 2013), thus reducing the ability to take the proper decision. Regarding education, more educated people may find it easier to process the information about the changeover tariff and, thus, may be more likely to take appropriate action. In particular, in the econometric analysis we discretize income and education scores splitting the distribution in three groups, group 1 (Low) up to first quartile, group 2 (Medium) between the first and third quartile, and group 3 (High) above the third quartile. We also create three groups for age, distinguishing between below 35, between 35 and 65, and above 65.\(^\text{14}\)

Accordingly, we estimate the following logit specification for the probability that a household calls to adopt the changeover tariff:

\[
Pr(\text{Calling} = 1 | X) = \frac{\exp(\beta X)}{1 + \exp(\beta X)}
\]

with

\[
\beta X = \beta_0 + \sum_{j=1}^{8} \beta_j D_j + \sum_{i=1}^{8} \gamma_i L_i + C' \delta,
\]

\(^\text{14}\)For some households for which age is missing, we impute age based on the Mosaic customer classification provided by Experian at the individual level, so that households described with terms like “retired”, “senior” or similar are classified as being above 65.
where $D_j$ are dummies capturing the magnitude of the difference between bills under the metered and the changeover tariff for a given household, $L_i$ are dummies capturing the magnitude of the difference under the metered and the changeover tariff for the last bill while $C$ are explanatory variables at the household level (e.g. Age or House Neighbour) or at the Output Area level (e.g. Edu Score).

Tables 2 and 3 show the results of a logit estimation with dummies $D$ and $L$ based respectively, on the absolute amount of money that an household can gain by switching to the changeover tariff (e.g. between £15 and £30) or the position of their gains in the distribution (e.g. between 20-35 centiles).

Table 2: Probability of Calling

<table>
<thead>
<tr>
<th>$(1)$</th>
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<th>$(5)$</th>
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<td>ALL</td>
<td>ALL</td>
<td>ALL</td>
<td>LAST</td>
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<td>0.055**</td>
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<td>0.079**</td>
<td>0.032**</td>
<td>0.039**</td>
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<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.015)</td>
<td>(0.016)</td>
<td>(0.006)</td>
<td>(0.003)</td>
<td>(0.007)</td>
</tr>
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<td>0.071**</td>
<td>0.097**</td>
<td>0.098**</td>
<td>0.036**</td>
<td>0.098**</td>
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<tr>
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<td>(0.005)</td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.015)</td>
<td>(0.003)</td>
<td>(0.005)</td>
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<td>0.108**</td>
<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
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<tr>
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<td>(0.011)</td>
<td>(0.011)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.006)</td>
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<td>0.108**</td>
<td>0.014**</td>
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<td>0.014**</td>
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<td>(0.005)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>$&gt;50 &amp; &lt;\leq 75$</td>
<td>0.044**</td>
<td>0.108**</td>
<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.006)</td>
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<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
<td>0.014**</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.003)</td>
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<td>0.108**</td>
<td>0.014**</td>
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<td>0.014**</td>
<td>0.014**</td>
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<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.006)</td>
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<td>$&gt;150$</td>
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<td>0.108**</td>
<td>0.014**</td>
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<td>0.014**</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.006)</td>
</tr>
</tbody>
</table>

House Neighbour | 0.007** | 0.007** | 0.007** | 0.007** | 0.007** | 0.007** | 0.007** | 0.007** |
| Number of Callers | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Income Score - Medium | 0.006* | 0.006* | 0.006* | 0.006* | 0.006* | 0.006* | 0.006* | 0.006* |
| (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Income Score - High | 0.006** | 0.006** | 0.006** | 0.006** | 0.006** | 0.006** | 0.006** | 0.006** |
| (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Edu Score - Medium | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* |
| (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Edu Score - High | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* | 0.005* |
| (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Age (>35 and <65) | 0.023** | 0.023** | 0.023** | 0.023** | 0.023** | 0.023** | 0.023** | 0.023** |
| (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Age (>=65) | 0.013** | 0.013** | 0.013** | 0.013** | 0.013** | 0.013** | 0.013** | 0.013** |
| (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |

Notes: Logit estimation. Marginal effects are displayed. Robust standard errors in parentheses. ** significant at 1%, * significant at 5%. Columns (1) and (2) use actual savings, while columns (3) and (4) use predicted savings. In columns (5) and (6) we add savings from the last bill as control variable.

Column 1 of Table 2 shows how, compared to the omitted category, those who over the two-years period lose money if adopting the changeover tariff, the likelihood of calling increases as gains increase. The relationship is monotonic, with a coefficient of 0.055 for very small gains, below £5, increasing to more than 0.40 for very large gains, over £150. Adding controls, in column 2, does not change the overall picture.

Income, measured at the output area level using the income score, shows a positive relationship with the likelihood of calling, with people living in medium and high income neighbourhoods more likely to call, other things being equal, than customers from poorer areas. Also education displays
a positive relationship, with people more likely to call in areas characterised by higher educational achievements. The fact that even for relatively large gains over £50 inaction is prevalent suggests that the minimal costs associated with a telephone call cannot explain by themselves the lack of action. Also, the positive coefficient on income goes against this explanation as, presumably, the opportunity cost of time is higher for higher income households.

Regarding peer effects, the impact of neighbours, measured through the number of callers in the postcode, is positive, with one additional caller associated with an increase in the probability of calling of 0.2%. If the caller happens to be a close neighbour the likelihood of calling increases by a further 0.7%. This is suggestive of peer effects being relevant for the decision on whether or not to call. It may well be the case that customers who adopted the changeover tariff talk about this to their neighbours, thus providing information or increasing its salience and, therefore, increasing the likelihood of them calling. It seems unlikely that this result is purely due to sorting of like-minded people in the same neighbourhood. Even if this was the case, the additional impact of a close-door neighbour would require a very finely-grained sorting, at the level of close-door neighbour, something that seems unlikely to hold. It is also possible that the positive peer effect is due to some omitted variable that affects the switching decisions for a household and its neighbors; for instance there could be some localized advertising campaign done by SW to promote their metering activities that can simultaneously affect the decision of two households to ask for a change in tariff. To control for spatial correlation in unobservables, we re-estimate our specification including more than 1,600 dummy variables, roughly corresponding to a 5 digit post-code, and find that a close neighbour still increases the probability by 0.5%.\textsuperscript{15} As said, we have no source of random variation to unequivocally identify peer effects, but, overall, these findings point at a role of peer effects in the decision to switch. Indeed, a neighbour talking about the switch to the changeover tariff may be instrumental in convincing other customers to take action. Finally, regarding age, there is a hump-shaped relationship, with households where the contract holder is of middle age more likely to call than younger and older households (but younger households being the least likely to call).

One may worry that consumption, and therefore savings, may be endogenous to the tariff. To check whether this is indeed a major issue, instead of using actual savings, we use in columns (3) and (4) predicted savings, based on pre-determined characteristics of the households that are highly predictive of actual savings. In particular, we use the rateable value and the so called periodic consumption. As discussed earlier, the rateable value was set by the Valuation Office (part of HM Revenue and Customs) to reflect the rental value of the property and was the basis for local authority taxation prior to 1990. The water companies normally use the rateable value quoted in the Valuation List in force on 31 March 1990 to determine the unmetered bill. Periodic consumption is an index generated by the water company at the beginning of a contract, using the information provided by the account holder on the number of household members, plus, potentially,\textsuperscript{15} Results available upon request. Note that the specification with postcode dummies cannot include income score and education score as they are captured by the postcode dummy.
some characteristics of the property (e.g. presence of a garden or swimming pool or dishwasher usage). These two variables combined can explain around 50% of the variability in savings.\textsuperscript{16} The overall picture emerging from columns (3) and (4) is rather similar to what described earlier on, indicating that endogeneity of savings to the tariff choice is not a serious issue.

To check whether what matters is only the overall amount of savings or also the dynamics of when they are realized, we estimate a specification with both overall gains and gains from the last bill before calling, without (column 5) and with (column 6) the other explanatory variables. As there is no last bill before calling for customers who do not make a telephone call, we pick a random billing period instead, with the probability of picking one of the four billing periods reflecting the distribution of last bills for those calling. The coefficients on the last bill are significant and of greater magnitude than the coefficients for the overall savings. For instance, having overall savings between £15-30 increases the likelihood of calling by 4.4%, after controlling for savings associated with the last bill. On the other hand, having savings associated with the last bill between £15-30 increases the likelihood of calling by a much larger 15.6%, after controlling for overall savings. Again, adding control variables in column 6 does not change the overall picture. Thus, rather than just considering overall savings, customers are much more sensitive to savings in a given bill. Notice how, also in this case, despite positive marginal effects, the probability of taking action even in the presence of substantial gains is well below 50%.

Our findings are confirmed when we compare overall gains to gains in the last bill in terms of their position in their own distribution, as done in Table 3. For instance, realising overall gains that are in the 36-50 percentile of the overall gain distribution is associated with a coefficient of 0.06, while having gains in the last bill in the 36-50 percentile of the last bill distribution has a much larger coefficient of 0.16, despite the fact that savings in absolute amounts are larger for overall savings than for last bill savings. This shows that overall savings are not the main factor taken into account when deciding whether or not to call, as the timing of when these savings are realized also matters. In the next section, we will delve deeper into the timing of calling.\textsuperscript{17} This evidence goes against a model in which households consider the overall gains and costs of undertaking certain actions, in this case switching to the changeover tariff, and decide accordingly. It seems rather the case that customers avoid taking a decision, with some households managing to overtake such tendency only in presence of a strong enough stimulus, in this case having received a bill with substantial savings. The previous evidence about the timing of the call, showing that there is a peak just after receiving a bill, is also consistent with this mechanism playing an important role.

To further investigate the heterogeneity in the effect, we estimate a set of new specifications

\textsuperscript{16} These two variables are not always available and this explains the lower number of observations in columns (3) and (4) compared to columns (1) and (2).

\textsuperscript{17} A gain of £20 of course represents a small gain in percentage terms for an household with a high metered bill and a much larger gain in percentage terms for an household with a low metered bill. To account for this, we also estimated our specification including percentiles for percentage gains (instead of absolute gains) and we find that the absolute amount of money is more important to explain the probability of calling.
<table>
<thead>
<tr>
<th>Percentile</th>
<th>ALL (1)</th>
<th>ALL (2)</th>
<th>ALL (3)</th>
<th>ALL (4)</th>
<th>ALL (5)</th>
<th>LAST (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;0 &amp; &lt;=10</td>
<td>0.068**</td>
<td>0.068**</td>
<td>0.107**</td>
<td>0.106**</td>
<td>0.036**</td>
<td>0.033**</td>
</tr>
<tr>
<td>&gt;10 &amp; &lt;=20</td>
<td>0.110**</td>
<td>0.111**</td>
<td>0.177**</td>
<td>0.115**</td>
<td>0.045**</td>
<td>0.073**</td>
</tr>
<tr>
<td>&gt;20 &amp; &lt;=35</td>
<td>0.159**</td>
<td>0.160**</td>
<td>0.156**</td>
<td>0.154**</td>
<td>0.048**</td>
<td>0.120**</td>
</tr>
<tr>
<td>&gt;35 &amp; &lt;=50</td>
<td>0.227**</td>
<td>0.228**</td>
<td>0.224**</td>
<td>0.218**</td>
<td>0.058**</td>
<td>0.159**</td>
</tr>
<tr>
<td>&gt;50 &amp; &lt;=65</td>
<td>0.293**</td>
<td>0.296**</td>
<td>0.295**</td>
<td>0.291**</td>
<td>0.067**</td>
<td>0.187**</td>
</tr>
<tr>
<td>&gt;65 &amp; &lt;=80</td>
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<td>0.369**</td>
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<td>0.325**</td>
<td>0.079**</td>
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<tr>
<td>&gt;80 &amp; &lt;=100</td>
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<td>0.446**</td>
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<td>Income Score - Medium</td>
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<td>0.004**</td>
<td>0.005**</td>
<td>0.005**</td>
<td>0.006**</td>
<td>0.005**</td>
</tr>
<tr>
<td>Income Score - High</td>
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<td>0.009**</td>
<td>0.012**</td>
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<td>0.005**</td>
<td>0.005**</td>
<td>0.005**</td>
<td>0.005**</td>
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<tr>
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<td>0.007**</td>
<td>0.007**</td>
<td>0.007**</td>
<td>0.007**</td>
<td>0.007**</td>
</tr>
<tr>
<td>House Neighbour</td>
<td>0.007**</td>
<td>0.006**</td>
<td>0.006**</td>
<td>0.006**</td>
<td>0.006**</td>
<td>0.006**</td>
</tr>
<tr>
<td>Number of Callers</td>
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<td>0.002**</td>
<td>0.002**</td>
<td>0.002**</td>
<td>0.002**</td>
<td>0.002**</td>
</tr>
<tr>
<td>Age (&gt;35 and &lt;65)</td>
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<td>0.019**</td>
<td>0.019**</td>
<td>0.019**</td>
<td>0.020**</td>
<td>0.020**</td>
</tr>
<tr>
<td>Age (&gt;65)</td>
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<td>0.000</td>
<td>0.000</td>
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</table>

Notes: Logit estimation. Marginal effects are displayed. Robust standard errors in parentheses. ** significant at 1%, * significant at 5%. Columns (1) and (2) use actual savings, while columns (3) and (4) use predicted savings. In columns (5) and (6) we add savings from the last bill as control variable.

where we interact the dummies for total savings with income, age and education, as well as peer effects. Figure 7 shows the estimated coefficients of these specifications. The top-left panel shows the interaction of total savings with the dummy indicating the presence of a next-door neighbour who calls. The red line, when such a neighbour is present, is always above the blue one, confirming the evidence consistent with a positive peer effect, independently of the actual amount of savings. Similarly, looking at the top-right panel, we see how the young households are consistently below the other two categories, across the whole distribution of savings. Looking at income levels (bottom-left) and educations levels (bottom-right), the three curves overlap at low categories, but for higher levels of savings there is a clear difference between the curves for low and high levels of income and education, with the medium category falling between the two but closer to the high category.

To summarise, while for low levels of overall savings there is very low heterogeneity in terms of responsiveness, this emerges for more sizeable amounts. The fact that high income/high education are associated with a higher level of responsiveness may be due to the interaction between a higher ability to understand the structure of the tariff and its implications (which should lead to an upward shift of the curve compared to the low category) with higher opportunity costs of time, that induce households in higher income neighbourhoods to be less responsive to small amounts of savings. The result for age may be explained by low time availability for younger households, perhaps due to the
Figure 7: Heterogeneous effect of some control variables

![Graphs showing the effect of control variables on the probability of calling.](image)

**Notes:** The percentile groups are 1: [0,10], 2: (10,20], 3: (20,35], 4: (35, 50], 5: (50, 65], 6: (65, 80], 7: (80, 90], 8: (90, 100]. The 0 category includes those with negative savings.

Presence of young kids. In any case, these results highlight the regressivity due to the differential likelihood of adopting the optional tariff among households with different income levels. Indeed, high and low income households have a similar propensity to call for low amounts, with a significant difference in favor of better off families appearing only when there are substantial savings.

### 4.2 Calling now or calling later

This section explores the issue of when customers call within the two-years transition period. Waiting until the end of the period would allow customers to observe the actual savings from a switch to the changeover tariff, without incurring the risk of being worse off with the optional tariff due to lower than expected consumption over the relevant time period. On the other hand, by exercising their choice at the end of the period, customers have to wait for up to 18 months before realizing their gains and this may induce impatient or credit-constrained households to anticipate their choice. Also, customers may worry that they may forget to exercise their option once the two-
years period is over, and thus forgo their gains, preferring instead to opt for the changeover tariff when the issue is salient in their mind due to the attention that the implementation of the program gets. Finally, as detailed in section 2.3, the information customers receive mentions (incorrectly) a “final opportunity” to opt for the changeover period after the first bill. For these reasons, it is of interest to investigate when, throughout the two-years period, customers exercise their option. By definition, customers calling to adopt the changeover bill do not display status quo bias and, as seen in the previous section, the vast majority of them does the right choice from a financial point of view, in that the changeover bill is cheaper than the metered bill. In this respect, they could be considered already as “more sophisticated” than inactive customers. In what follows we delve deeper into the decision process of these customers by investigating some of the determinants of the decision on when to call.

We distinguish between customers that call even before receiving the first bill (who may, nevertheless, have some information due to the three-months letter), customers calling after receiving the first bill (but before the second bill) and those calling even later. Table 4 shows how more than half (8,266 out of 16,252) of those calling do it before receiving the first bill, while most of the remaining (6,114) do it at bill 1, with only a minority waiting for later bills.

<table>
<thead>
<tr>
<th>Table 4: Time of Calling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Bill 1 At Bill 1 After Bill 2 Never</td>
</tr>
<tr>
<td>Number of People 8266 6114 1872 139941</td>
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</tbody>
</table>

It seems natural to think that those who have higher savings early on are more likely to call sooner. Also, as there is an option value of waiting, we would expect those who have a higher variability of their bills to be more likely to wait. Accordingly, we estimate a multinomial logit relating the timing of calling to the financial gains arising at different bills and their standard deviation over the two-year period. More specifically, the dependent variable takes the following values: 1 for those calling before the first bill, 2 at the first bill (i.e. after receiving the first bill but before receiving the second bill), 3 after the second bill, with 0 indicating those never calling. The explanatory variables are the financial gains at the three-months letter, at the first bill and at the following three bills, each of them represented through eight dummies capturing the centiles groups used in the previous section, for a total of 24 dummies (plus three dummies for the reference group when there are instead losses). Moreover, we include the standard deviation of financial gains through eight dummies, using the very same centiles groups.

\[18\] For customers opting for the changeover tariff before the first bill, our data does not allow us to distinguish between those calling before or after the three-months letter.
In Fig 8 we report the estimated marginal effects of this multinomial logit (for details see Table A1 in the Appendix). Starting with those calling already before bill 1 (blue line), we see how they are very responsive to potential savings indicated in the three-months letter, as seen by the steep blue line in the top-left panel. They also seem to respond to future gains arising at the first bill (top-right panel) and, to a much lesser extent, in subsequent bills (bottom panel). The declining blue line in the bottom-right panel shows how, in line with expectations, the likelihood of calling before bill 1 decreases as the standard deviation of gains increases. Customers calling at bill 1 (red line) are instead substantially responsive only to potential gains at bill 1. Finally, for customers calling later (green line) the likelihood of calling is increasing with potential gains at bill 1, in particular in the last deciles, while for potential gains in later bills it is generally positive but stronger at lower deciles. Again in line with expectations, the likelihood of calling after bill 2, i.e. waiting, increases as the standard deviation of gains increases.

Figure 8

Notes: The percentile groups are 1: [0,10], 2: (10,20], 3: (20,35], 4: (35, 50], 5: (50, 65], 6: (65, 80], 7: (80, 90], 8: (90, 100].

The results show that customers calling immediately, that is, before receiving the first bill, respond to gains arising in the future, thus showing a behaviour compatible with a forward looking
attitude and an ability to forecast to some degree future consumption patterns. This seems not to be the case for customers calling at the first bill, who are instead highly responsive only to contemporaneous gains, that is, gains arising in the first bill. Finally, the few customers calling later on do not seem to take advantage of the additional information that is available to them, as their reaction to potential gains in bills after the first one does not have a positive slope. This may be related to the information provided that, as explained in section 2, stops giving straightforward comparisons between changeover and metered tariff after the first bill. As the likelihood of calling early (respectively, late) declines (respectively, increases) with the variability of gains, the analysis is in line with customers taking into consideration the option value of waiting, thus displaying some degree of sophistication in their decision making.

5 Conclusion

This paper shows how consumers fail to choose the most convenient option in terms of water tariff, in a setting where water tariffs should be very salient and the presence of a deadline should discourage procrastination. Status quo bias is a likely explanation for this behaviour and, in particular, status quo due to decision avoidance rather than to other mechanisms that have been proposed in the literature, like status quo as reference point or “sticking with what you know”. Indeed, before the implementation of compulsory metering, these consumers stayed with the status quo, unmetered tariffs, instead of opting, at no cost to themselves, for being metered. After being metered, the vast majority stays with the new status quo, metered tariffs, instead of switching temporarily to a tariff close to the unmetered one. The likelihood of switching is increasing as the financial advantage of doing so increases, but it stays at relatively low levels also for large amounts of savings.

These findings have important implication for current policies concerning market regulation, where consumer choice is a centrepiece of a policy package promoting an increase in competition among suppliers. For instance, the ability for consumers to “have a better choice of supply” and “access to reliable energy price comparison tools” feature prominently in the recent EU proposal for Clean Energy for All Europeans (EuropeanCommission, 2016). As has long been underlined by the literature (Waterson, 2003), the impact of such measures is of course greatly diminished 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 raises distributional issues, as people from low socio-economic background appear to be the least likely to benefit from increased choice. In the specific context of the optional tariff we examine, this was introduced to ease the transition from unmetered bills to metered bills for vulnerable customers. Our results suggest that this aim may not have been reached, as the transitional tariff benefitted more customers in well-off neighbourhoods. An alternative would have been an automatic application of the best tariff. This would of course have been more costly in terms of lost revenues, but at least it would have
avoided the regressive outcome that we document.\textsuperscript{19} This is indeed what the water company did for a minority of customers for which it was not technically feasible to install a meter. For these customers the water bill remained independent of actual consumption, but changed from being based on the so-called rateable value (based on the rental value of the property as of 1990) to assessed charges (based on the number of bedrooms). The water company automatically placed customers that were going to be worse off due to the new system under the changeover tariff.

The issue of customers’ status quo bias, and its heterogeneity in the population, has recently entered the policy debate in the UK, with reference to energy prices. The fact that “[a]bout a third of households are charged a variable price for their energy at a default rate set by their energy company, because they have not chosen to shop around for a cheaper fixed-price deal”, led Prime Minister Theresa May to declare, referring to recently introduced legislation aimed at capping standard variable tariffs, “[i]t’s often older people or those on low incomes who are stuck on rip-off energy tariffs, so today we are introducing legislation to force energy companies to change their ways.”\textsuperscript{20} Beyond this type of regulation, our finding about neighbours, consistent with peer pressure being effective in counteracting inaction, suggests that tools such as “word-of-mouth” incentives, increasingly used by firms in their marketing campaigns (Kumar et al., 2007), could also be deployed by regulators to leverage the effectiveness of consumer choice.

\textsuperscript{19}Lost revenues would be paid by customers through higher prices given that the water regulator, Ofwat, operates a revenue correction mechanism, which means that, over the course of each five year price control period, water companies ultimately only recover the amount of revenue allowed by Ofwat in their so-called final determinations made prior to the start of that period. This means that, if a company exceeds (under recovers) the amount of revenue allowed by Ofwat during the five year period, then this is returned to (recovered from) customers on a net-present-value-neutral basis in the form of lower (higher) prices in future years.

\textsuperscript{20}www.bbc.com/news/business-43192583
References


Appendix
<table>
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<tr>
<th>Percentile</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
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<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
<th>Before Bill 1</th>
<th>At Bill 1</th>
<th>After Bill 2</th>
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<td>0.005*</td>
<td>0.022***</td>
<td>0.011***</td>
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</table>

**Notes:** Number of Observations: 154457. Robust standard errors in parentheses. *** significant at 1%, ** significant at 5%, * significant at 10%. 
Our ‘changeover’ period

We want to help our customers adjust to paying for the water they use once they have been converted to metered billing.

Based on the information you will receive at around 6 months after installation explaining how much water you have used, and you think your bill is going to be higher when you start receiving your metered bill, we can help ease you in to your new bill with our ‘changeover’ period.

This means that if your metered bill is higher than your old bill, we will reduce your bills for the first two years – and you do not have to pay us back the difference at the end. See how it works below.

You can only opt onto our ‘changeover’ period once your meter charges have started.

If you have any questions about our ‘changeover’ period, then you can contact our Customer Contact Centre on 0333 2003 014.

How it works

As an example, assuming that your current rateable value bill is £378 and your fully metered bill would be £450, then if you keep using the same amount of water, instead of £450 per year you pay:

- **Year 1**
  - £402
  - We get this by charging two thirds of your old unmetered bill and adding one third of your metered bill

- **Year 2**
  - £426
  - We get this by charging one third of your old unmetered bill and adding two thirds of your metered bill

- **Year 3**
  - £450
  - In year 3 you then start to pay your fully metered bill amount.

*Example based on year 1 prices
13 October 2011

It’s been three months since we turned on your water meter

With a meter you pay for the water you use, it’s a fairer way to charge.

Your water usage

<table>
<thead>
<tr>
<th>Your meter readings</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter reading when we turned on your meter</td>
<td>10 May 2011 1</td>
</tr>
<tr>
<td>Meter reading after three months</td>
<td>10 October 2011 44</td>
</tr>
<tr>
<td>Total volume of water used (1m³ = 1,000 litres)</td>
<td>43m³</td>
</tr>
</tbody>
</table>

Since we turned on your meter, the average daily water usage for your household = 305 litres. The average person uses 150 litres a day.

Your first metered bill will be in three months time

- Your first half-yearly metered bill will be around £173 (if you keep using the same amount of water).
- Your total spend for the year will be around £346.
- If you were still getting your old bill it would be £204 for the year.

Trouble paying? Can you afford it?

Will you find it hard to pay this? If the answer is yes, go to www.southernwater.co.uk or call 0333 200 3011 for advice about saving water and reducing your water and energy bills.

If you still think you can’t reduce the amount of water you use by much and are unable to pay, please turn over for more details on how we can help you adjust to your new bill amount with our ‘changeover’ tariff.

Turn over for more details ▶

Customer number: 01234567

Meter payment reference number:
0123 4567 89101

About your new meter

You can find your meter: outside your property

Serial number: SWNUMBE0123456

Supply address
7 SAMPLE ROAD
SAMPLEVILLE, SA10 1EL

Any questions about your new meter, your account, or your payments?
Just call 0333 200 3011

Opening hours
8am - 7:30pm Monday to Friday
8am - 1pm on Saturdays

Or go to
www.southernwater.co.uk
and click on ‘contact us’

Southern Water, PO Box 41,
Worthing BN13 3NZ
Southern Water Services Limited,
Registered Office – Southern House,
Yeoman Road, Worthing BN13 3NX
Registered in England No. 2366670
**Changeover tariff**

On our ‘changeover’ tariff, if your metered bill is higher than your old bill, we will reduce your bills for the first two years – and you don’t have to pay us back the difference at the end! This is to help you adjust to paying for your water now that you are paying for the amount you use.

If you keep using the same amount of water, instead of £346 per year your total bill could be:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>£251</td>
</tr>
<tr>
<td>Year 2</td>
<td>£298*</td>
</tr>
<tr>
<td>Year 3</td>
<td>£346*</td>
</tr>
</tbody>
</table>

*Example based on year 1 prices

Opting in to the changeover tariff is easy, just call us on 0333 200 3011

**Payment Options**

Why not pay by Direct Debit? You can pay in full, or by monthly instalments. To set up a Direct Debit please visit our website www.southernwater.co.uk or you can telephone our 24 hour automated service on 0845 270 1508.

If you have any questions, just give us a call.

Kim Salmon, Director of Customer Services & Revenue
18 June 2012

It’s been six months since we turned on your water meter
With a meter you pay for the water you use, it’s a fairer way to charge.

Your water usage

<table>
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<tr>
<th>Description</th>
<th>Reading Date</th>
<th>Reading</th>
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<td>Meter reading when we turned on your meter</td>
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<td>45</td>
</tr>
<tr>
<td>Meter reading after three months</td>
<td>23 Feb 2012</td>
<td>94</td>
</tr>
<tr>
<td>Meter reading after six months</td>
<td>31 May 2012</td>
<td>138</td>
</tr>
<tr>
<td>Total volume of water used (1m³ = 1,000 litres)</td>
<td></td>
<td>93m³</td>
</tr>
</tbody>
</table>

Since we turned on your meter, the average daily water usage for your household = 465 litres.

- **We enclose your first half-yearly bill for this period of £307.30**

  *This amount excludes any transfers, adjustments and payments.

  If you keep using the same amount of water your spend for the year will be around £561.

  To help you compare, if you were still getting your old bill it would be £385 for the year.

Trouble paying? Can you afford it?

Will you find it hard to pay this? If the answer is yes, go to www.southernwater.co.uk or call 0333 200 3012 for advice about saving water and reducing your water and energy bills.

If you still think you can’t reduce the amount of water you use by much and are unable to pay, please turn over for more details on how we can help you adjust to your new bill amount with our ‘changeover’ tariff.

Turn over for more details
Changeover tariff

On our 'changeover' tariff, when your metered bill is higher than your old bill, we reduce your bills for the first two years - and you don't have to pay us back the difference at the end! This is to help you adjust to paying for your water now that you are paying for the amount you use.

If you keep using the same amount of water, instead of £561 per year your total bill could be:

- **Year 1**
  - £443
  - We get this by charging two thirds of your old unmetered bill and adding one third of your metered bill

- **Year 2**
  - £502*
  - We get this by charging one third of your old unmetered bill and adding two thirds of your metered bill

- **Year 3**
  - £561*
  - In year 3 you then start to pay your fully metered bill amount

*Example based on year 1 prices

The charge for this period of £307.30 is your fully metered charge. If you want to go on our changeover tariff just call 0333 200 3012 and we'll send you a revised bill.

If you don't contact us you will stay on the standard metered tariff.

Your Direct Debit plan

As you pay your water bills by Direct Debit, we will continue to take payments from your account. If you go on our changeover tariff, your Direct Debit payment amounts will be reduced accordingly.

If you have any questions, just give us a call.

Kim Salmon, Director of Customer Services & Revenue

To help you adjust to metered bills for the first two years just call us on 0333 200 3012
Your metered statement
For 14 November 2011 to 31 May 2012

Your account summary £

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your last bill</td>
<td>0.00</td>
</tr>
<tr>
<td>Transfers</td>
<td>67.54 cr</td>
</tr>
<tr>
<td>What you paid</td>
<td>219.03 cr</td>
</tr>
<tr>
<td>Your balance before this bill</td>
<td>286.57 cr</td>
</tr>
</tbody>
</table>

Charges this period £

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metered water and sewerage charges</td>
<td>307.30</td>
</tr>
</tbody>
</table>

Total £20.73

For information only. Payment is by Direct Debit.
This is your first metered bill. For your first four metered bills, when your metered amount is higher than your old bill, you can go on our 'changeover' tariff - call 0333 200 3012 to go on this tariff. Please note your new payment reference.

Managing your water

How do you compare?
This period you've used an average of 465 litres of water per day. Have a look at this table to see how efficient your water usage is based on the size of your household.

### Efficient total daily water use (litres)

<table>
<thead>
<tr>
<th>Flat</th>
<th>House/garden</th>
</tr>
</thead>
<tbody>
<tr>
<td>173</td>
<td>188</td>
</tr>
<tr>
<td>304</td>
<td>319</td>
</tr>
<tr>
<td>373</td>
<td>388</td>
</tr>
<tr>
<td>418</td>
<td>433</td>
</tr>
<tr>
<td>489</td>
<td>504</td>
</tr>
<tr>
<td>577</td>
<td>592</td>
</tr>
</tbody>
</table>

Your usage is the same as an efficient five person household without a garden

How to pay your bill

- **Direct Debit** – please fill in the enclosed form if you prefer to pay by Direct Debit or visit our website [www.southernwater.co.uk](http://www.southernwater.co.uk).

- **Debit and credit cards** – Pay online at [www.southernwater.co.uk](http://www.southernwater.co.uk) or you can ring our automated line on 0845 270 1508 (available 24 hours a day).

- **Home or telephone banking** – please quote your payment reference number. Our bank sort code is 67 70 63 and our bank account number is 00000000.

- **Payment card** – ring our 24 hour automated service on 0845 270 1508 to apply for a payment card. This can be used at all Post Offices and Paypoint outlets. We can offer weekly, fortnightly or monthly payment options to help you budget.

- **PayPoint** – cash payments can be made anywhere you see the PayPoint sign. Please take your bill or your payment card with you.

- **At the bank or Post Office** – payments can be made at most banks or post office branches using the payment slip provided. This service is free of charge if paid at the post office, any branch of your own bank or at a NatWest bank (excludes Santander and Halifax)

- **By post** – complete and tear off the payment slip and send it with your cheque made payable to Southern Water at PO Box 41, Worthing, West Sussex BN13 3NZ. Please note, we do not issue receipts for cheques or postal orders unless you send us the bill.

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If Southern Water has registered a Default on your Consumer Credit File, the charges from this bill will be added to the total default amount outstanding. Southern Water will have sent you previous correspondence to advise you of our default process.

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Have you read my top 10 tips at [www.southernwater.co.uk](http://www.southernwater.co.uk)?

Customer Number: [NUMBER HERE]
Payment reference number: 0004 0423 15516
Bill Date: 18 June 2012
Supply address: [ADDRESS HERE]