Using behavioural experiments to identify consumer problems in markets: Partitioned pricing practices

Office of Fair Trading  Economic Seminar Series
14\textsuperscript{th} January 2014
Dr Charlotte Duke
Presentation outline

- How we use behavioural economics in understanding consumer decision making and where problems associated with behavioural biases may arise

- Examples of behavioural experiments
  - Controlled laboratory experiments
  - Online experiments with representative samples

- Considerations when designing experiments
  - Perhaps most importantly how valid are experiments when considering behaviour in real markets?

- Look at forthcoming online experiment for the Financial Conduct Authority
Behavioural economics

- Behavioural Economics is concerned with deviations from rational decision making.
- Informational remedies, corrections of market failures and competition interventions may not always improve outcomes for consumers.
- Behavioural economics has been driven by experimentation in economics and psychology.
- Complements our understanding of consumer behaviour and market outcomes using the rational framework.
- There are a set of known ways that consumer behaviour is likely to deviate from fully rational behaviour.
Behavioural biases

Important behavioural biases that cause deviations from fully rational choice are:

- **Cognitive limitations**: Individuals can only handle a limited amount of information and a limited number of alternatives.
- **Default positions**: Individuals are influenced by their default or status-quo; they use it as a reference point.
- **Inertia**: Not switching when it is optimal to do so.
- **Framing**: Decision making is influenced by how information is presented.
- **Hyperbolic discounting**: Individuals overvalue current effects compared to future effects and may fail to optimally account for future consequences.
- **Loss aversion**: Individuals are overly concerned about losses compared to potential gains.
Experiments

- Observe actual consumer behaviour (and/or firm behaviour)
  - They allow policy makers to observe behaviour that would be difficult or costly to do in actual markets

- Generate quantitative data on actual decisions
  - Allow econometric analysis to assess impacts
  - In experiments respondents actually make the decisions
  - Monetary incentives are used to mirror the gains and losses in real markets

- Just like experiments in biology and chemistry they use control and treatment groups

- Because they use control and treatment it is possible to isolate exactly why observed behaviour is changing, and what is causing the observed change in behaviour

- But experiments use a stylised setting
  - This means we have to be careful in how we use experiment findings
  - This is called external validity (more later on this)
Partitioned pricing
A controlled laboratory experiment for the OFT
Price framing

- Not clearly presenting all costs upfront or breaking the total price into parts
  - Additional packaging and shipping charges not shown clearly
  - Additional charges for credit card payments which are not shown up-front
  - Additional costs for late minimum payments which are not shown in headline advertisement

- How prices are framed should not matter
  - The rational decision-maker weighs up the costs and benefits of different alternatives before choosing the alternative that maximises her/his utility.
  - When doing so, the rational decision-maker makes use of all available information unless obtaining it is too costly.

- Yet, we see sellers altering price frames across many markets.

- Why would they if consumers can behave optimally and are not affected by the price frames?
Partitioned pricing experiment

- Builds upon the advertising of prices study (2010)
  - Also included a controlled laboratory experiment that investigated the impact of seven different price frames
    - One of the key findings was the impact of drip pricing
      - Reduced consumer welfare by 25% compared to straight per unit pricing
      - Lead to a reduction in search effort
      - Anchoring and loss aversion, changes consumers’ reference point from which decisions are made

- The 2010 experiment was part of the evidence base used to secure voluntary undertakings in lieu of court proceedings against a number of airlines to
  - Scrap payment surcharges for using debit cards
  - Include all additional charges in the headline price

- The partitioned pricing experiment (2013) informs the OFT research on partitioned pricing
Partitioned pricing experiment

- The 2013 study looks at the situation where the price is broken into parts (partitioned)
  - **Baseline** – straight per unit prices
  - **Two partitions with total** – base plus one extra part and total shown e.g. £7+£3=£10
  - **Two partitions no total** – e.g. £7+£3 and consumer must compute the total price
  - **Drip pricing** – base price and one additional part which is revealed at a later stage
  - **Presentation** – base plus one extra part but the additional part is presented in small font next to the ‘buy’ button
  - **Three partitions no total** – base price plus two additional parts e.g. £7+£2+£1

- 145 UCL students, each participated in the baseline plus the drip pricing and one of the partition frames/treatments

- Each frame was repeated 10 times (i.e. each respondent completed 30 shopping rounds)
Partitioned pricing experiment design

- Shops randomly drew prices from a uniform distribution between 60 and 120
  - Shops/firms were static and did not respond to consumer behaviour, e.g. By adjusting prices to make any impact of pricing frames more pronounced. Or, by signalling to consumers that they do not use these practices.

- The extra price part (the partition) was randomly chosen to be between 5% and 15% of the total sale price

- To mirror real markets search was costly. Namely, respondents incurred a monetary cost to visit shops
Partitioned pricing experiment design

- To mirror the return from consuming a product, respondents were told their utility (payoff) functions.

- Given we (the experiment designers) know all parameters we are able to compute the optimal strategy.

- We can then calculate for each frame, and between frames, how close to the optimal outcome respondents were and if some frames consistently lead to ‘worse’ performance /harm relative to others.
Consumer decision making process

See shop front

See another shop front

Decide: Which shop to travel to and enter to see prices

Search by travelling & incur search cost

See price in shop one

Decide: buy in shop 1 or search shop 2 (at cost)

Buy

Decide: Number of units to buy shop 1

Decide: End or continue to shop?

Search by travelling

See price in shop two

Decide buy in shop 2 or return to shop 1 (at cost)

Travel

Buy

Decide: Number of units to buy shop 2
Example experiment screenshot: Presentation frame

“Price of product (per unit) 58”

“Each unit is subject to a shipping fee of 4”
Findings

- As in the previous study we find that **drip pricing is the most harmful** to consumers:
  - More errors in the number of units that should be optimally purchased
  - Significantly reduces search effort
  - Shows that a reduction from 2 drips to 1 drip still generates problems for consumers

- The use of ‘**presentation**’ leads to a **22% loss in consumer welfare** relative to earnings under the optimal strategy

- In the straight per unit pricing frame the welfare loss was **10%**

- Striking outcome that presentation in this environment lead to welfare loss:
  - Change in presentation was very simple
  - There were no other distractions on the screen
Findings

- **Two partitions no total frame** also has a significant effect on consumer behaviour
  - More overall errors (search and purchase) and reduced effort in shopping around
  - Welfare losses

- **Learning**
  - We find that respondents did learn and made fewer errors the more they encountered the different frames
  - This learning is likely to be slower in the field as consumers tend not to repeat purchases in a short period of time as they did in the experiment
Policy implications: External validity

- External validity refers to the **extent the observations in the experiment will also hold in real markets**
  - The experiment setting was simplified relative to real markets
  - Respondents were university students
  - Respondents only had the experiment to focus on

- Simplified settings and highly selected respondents means we are **more likely to observe optimal behaviour in the experiment than we are in the field**
  - Therefore, when we find that respondents in this setting have problems, it would be very surprising if these problems were not also present in the field, and can be expected to be greater
  - Similarly, if we observe no problems in the experiment setting this does not imply that problems will not exist in more complicated real markets

- This asymmetry in observations means we can be confident that the frames we find generate consumer problems in the experiment also hold in the field and **making prices more transparent for consumers will improve consumer decision making**
General insurance add-ons
An online experiment for the FCA
General insurance add-ons

- Online experiment with UK residents

- Part of the evidence base for the FCA general add-on insurance market study
  - Add-ons are sold alongside the primary product e.g. Home emergency cover, guaranteed asset protection (GAP) insurance, travel insurance, personal accident insurance

- Consider whether consumers are:
  - paying too much for these products;
  - whether the products being sold to them are appropriate for their needs; and,
  - whether they shop around.

- Behavioural research to test the mechanisms that might come into play in add-on sales and whether these can reduce the extent and effectiveness of consumers shopping around for the best deal.
Issues to consider when using behavioural experiments
Considerations in design

- The experiment is a real decision making environment
  - Respondents make decisions that have real monetary consequences – monetary earnings vary depending on the choices made in the experiment.
  - Different to surveys where respondents state what they would do, or what they have done. In experiments they actually make the choice.
  - However, the magnitude of earnings in the experiment is often less than the magnitude of earnings and losses in the real market.
  - The strength is that we can measure relative outcomes across treatments
    - E.g. When consumers make better or worse decisions, or when a remedy or change in policy operates better or worse.
Considerations in design

- **Demand effects**
  - Participants may inadvertently pick up signals as to what behaviour is expected of them in the experiment environment, and as such the experiment itself can generate effects which would otherwise not be there.
  - To manage demand effects:
    - Careful design
    - Demand effects should not vary between treatments

- For example, if the experiment entails searching for and purchasing insurance offers then participants may be more inclined to purchase insurance in the experiment environment than they would be in the real world. The experiment environment itself creates a setting in which buying insurance appears to be the ‘expected’ or ‘appropriate’ behaviour.
  - If 80% of participants purchase insurance in an experiment, this does not mean that 80% of consumers in the marketplace will do the same.
  - But comparing between treatments if 80% buy insurance in treatment 1 and 40% buy insurance in treatment 2 then we can expect this relative difference to persist in the field.
Considerations in design

- **External validity**
  - Measuring absolute magnitude of an effect (e.g. 80% of consumers in an experiment bought insurance under a given presentation frame)
    - This is the hardest to achieve and may require very close replication to field

- **Relative magnitudes and directional effects**
  - This is often the more relevant form of external validity because we want to measure the relative effect of a change on behaviour or welfare
    - E.g. Determine if certain policy interventions can help consumers to choose the cheapest offer or the offer that best meets their needs out of a set of different contracts or tariffs
Considerations in design

- **Order effects:**
  - If participants complete multiple different treatments in the one experiment then participation under one treatment may affect behaviour in another treatment. In the design stage it is important to randomise the order of treatments.

- **Learning:**
  - Due to repeated playing of the same game, subjects may learn throughout the experiment and this can alter the behaviour over time. Learning can have positive as well as negative effects in experiments and, either way, it is important to control for it.
    - We might want to specifically test for learning
    - Learning can also slowly erode treatment effects
In conclusion

- Behavioural experiments are a useful tool to test behaviour and remedies

- Experiment design is important, poor design will lead to inaccurate observations

- Choosing the sample of respondents is important

- How the tasks are framed need to be considered (using real product labels or abstract labels)

- Experiments compliment other methods, and experiments are increasingly being use in consumer cases and market inquiry work
Further reading

- Centre for competition policy (2013) Behavioural economics in competition and consumer policy, University of East Anglia

- Financial Conduct Authority (2013) Applying behavioural economics at the FCA’, Occasional Paper 1

