

Using behavioural and experimental economics to understand consumer behaviour

Presentation to
Copenhagen University Summer
Course on Behavioural Economics
16th August 2013

This morning's session

- 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 some upcoming experiments

But first, a little about London Economics

- Economic consulting firm headquartered in London
- Provision of microeconomic advice to private companies and governments in Europe and internationally
- Multi-lingual consultants, native speakers of a wide range of European languages including Danish
- Wide range of methodologies across all major industries and sectors
- Provision of tailored analysis and advice

www.londecon.co.uk

And, a little about me

- Trained as a behavioural and experimental economist
- Postgraduate studies focused on the use of experiments to design and test policy prior to field implementation
- Main areas were environmental policy, specifically the design of water markets in Australia
- Worked with London Economics since 2007
- Lead our behavioural and experimental work practice area

The consumer decision-making process

How behavioural economics fits into the consumer decision making process

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.

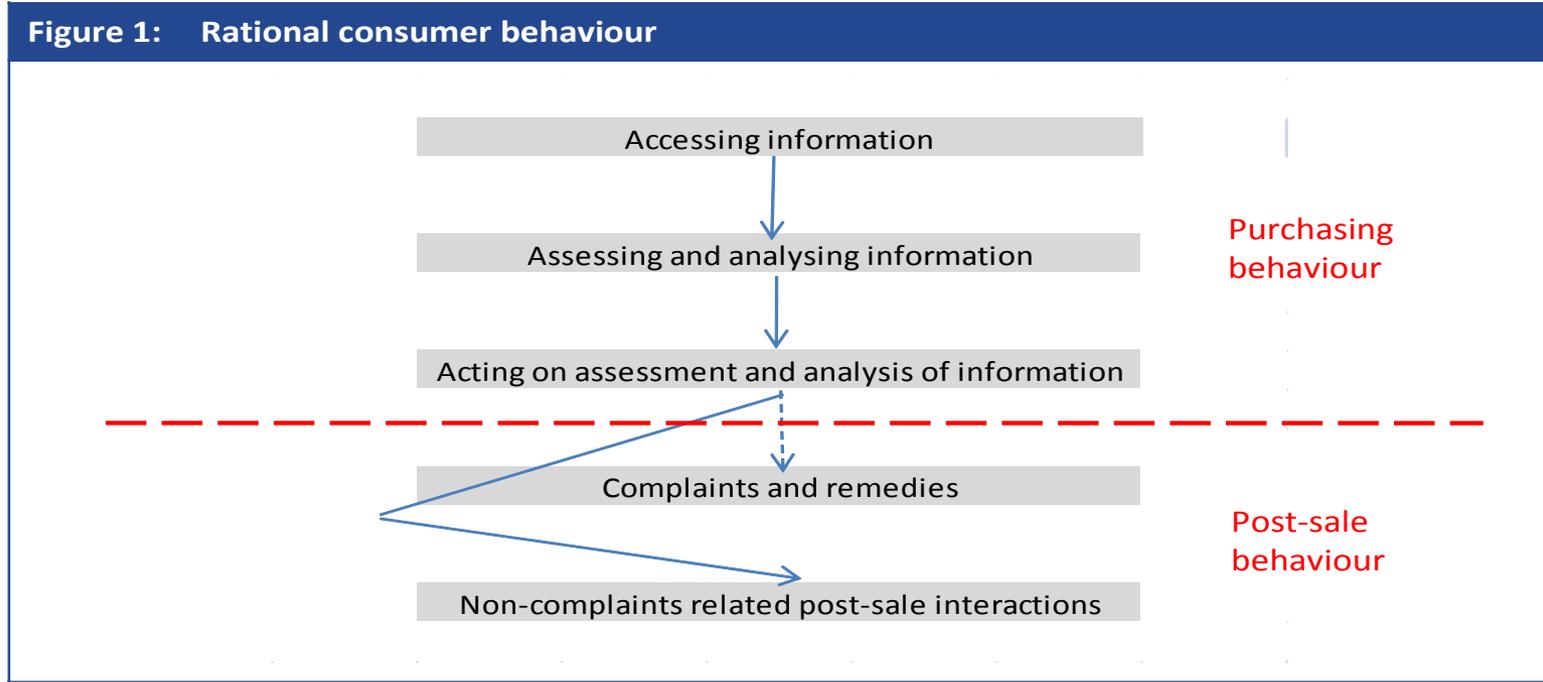
Behavioural biases

- 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 the unobservable.
- Generate quantitative data on actual decisions
- 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 stylized setting

Identifying the stage at which the behavioural bias may occur



- The importance of a particular stage and its duration vary for different consumers and purchasing situations

Impact of biases on decision making process

□ Accessing information:

Cognitive limitations

- Consumers don't search optimally because it is difficult to compute, remember and compare alternatives

Default bias +
loss aversion

- Reduced search effort because of reluctance to switch and fear of potential losses

Suboptimal
search effort

□ Assessing and analysing information:

Default bias

- Too much emphasis on 'reference points'

Hyperbolic discounting

- Mis-prediction of future demand

Loss aversion

- Overemphasis on potential losses

Cognitive limitations

- Adoption of rules-of-thumb

Framing

- Sensitivity to framing

Suboptimal
analysis: mis-
estimation of
WTP and
misperception
of quality

Impact of biases on decision making

- **Acting on information and analysis:**

Default bias

- Failure to switch and inertia

Hyperbolic discounting

- Wrong choices and may put decisions about future events off

Loss aversion

- Excessive weight on switching costs

Cognitive limitations

- Failure to choose or wrong choices if too many alternatives

Framing

- Wrong choices

Decision errors and failure

- **Complaints and remedies**

Loss aversion

- Excessive weight on potential losses associated with complaining and seeking redress

Suboptimal complaint activity

Advertising of Prices

Office for fair Trading UK



The impact of price frames on consumer decision making

A price frame refers to the way a price is presented (“framed”).

Experiment 1:

- straight per-unit prices *“This good costs £1 per unit.”*
- drip pricing *“... plus shipping ... plus handling.”*
- The rhetoric of sales *“Was £2 is now £1.”*
- complex pricing *“3 for 2.”*
- baiting *“£1 while stocks last.”*
- time-limited offers *“£1 only today.”*

Does the way prices are framed matter?

- Economic theory says no
 - 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 spending money on altering price frames.
- Why would they if consumers can behave optimally and are not affected by the price frames?

What we do

- Design a laboratory experiment where (student) subjects are exposed to the different frames.
- Real money is at stake.
- Subjects are endowed with a “payoff function” that maps units of a good purchased into earnings. For example, 120 for first unit purchased, 80 for second, 20 for third, 10 for the fourth.
- There are two shops and search is costly.

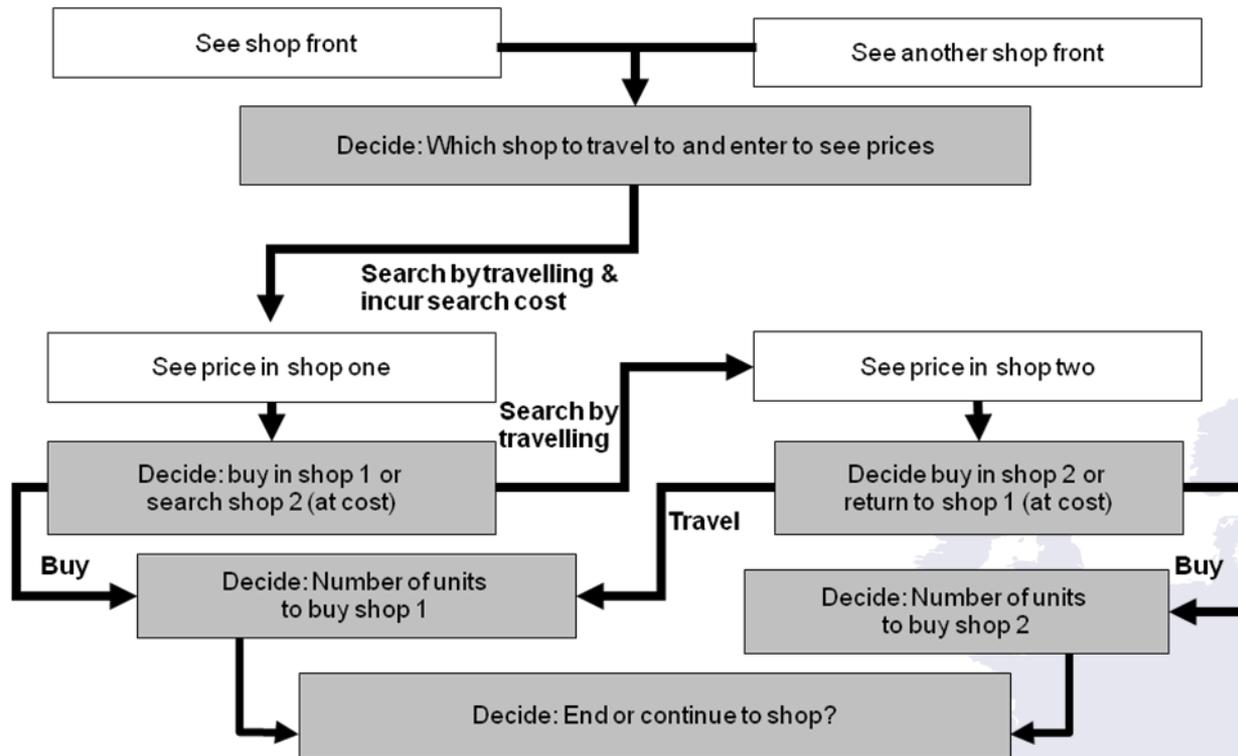
What we do contd.

- This is an unlabelled experiment:
 - The goods are called green, orange, red and blue.
 - We could have called the goods ‘airfare’, ‘package holiday’, ‘theatre ticket’, ‘furniture’, ‘audio visual equipment’.
- When running experiments using labelled or unlabelled terms is a design choice with both benefits and weaknesses:
 - Labels can introduced unobserved emotions into choice which are not controlled for in the experiment.
 - In policy settings labels frame the experiment within the actual policy context.

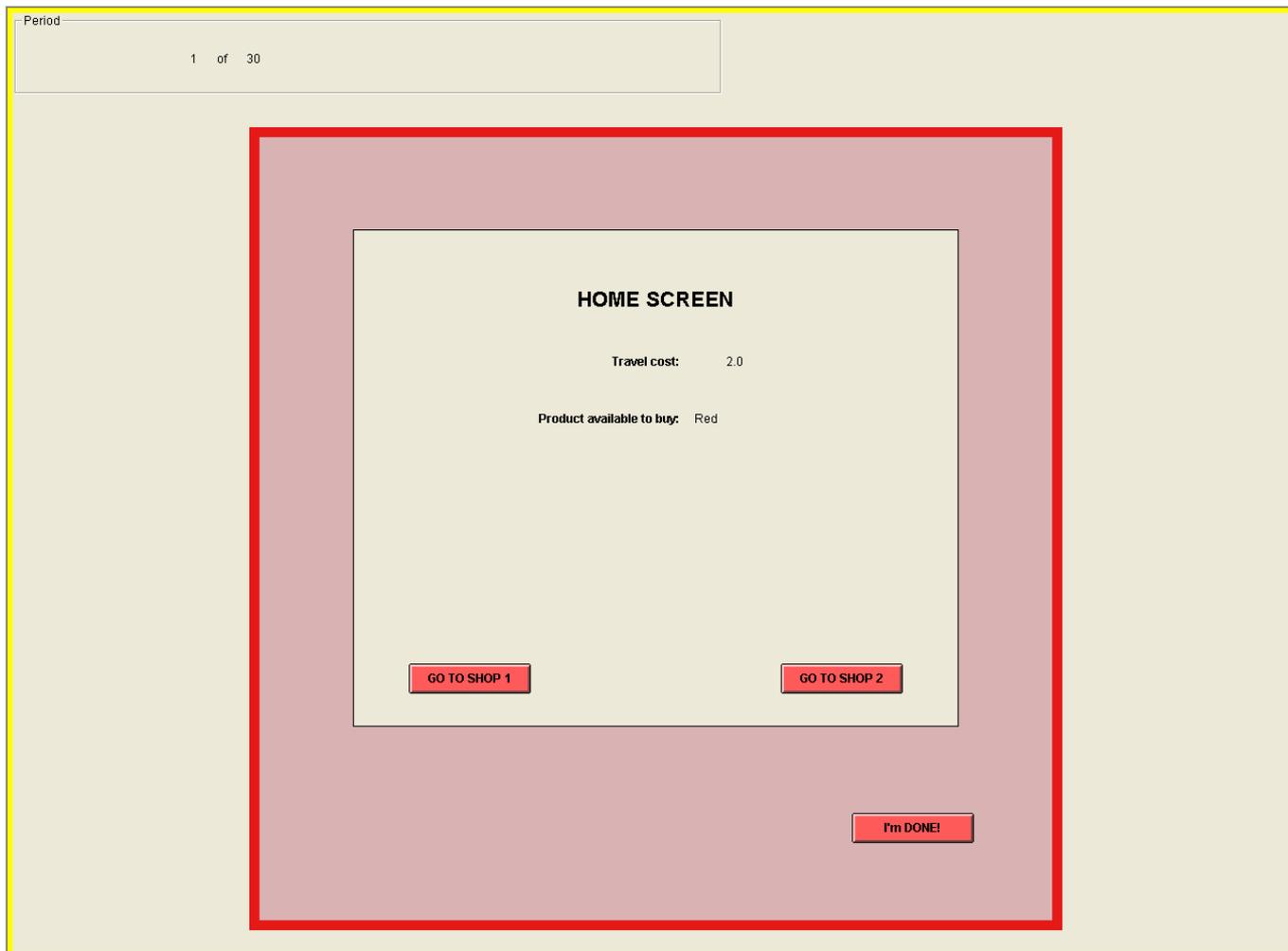
The experimental laboratory



The consumer problem



The home screen



Shop with straight per unit prices

Period

1 of 30

SHOP 1

Price of product (per unit): 105

Units to buy:

[Buy](#)

[Go home!](#)

Implementation of frames

- **Drip pricing:** identical to straight per unit prices, two drips (5%-15%, 10%-20%), two clicks, total price shown

Period
3 of 30

There is an additional shipping charge per unit:

Shipping charge per unit:	13
Base price:	84

Please click CANCEL to return to the shop screen or CONTINUE

Period
3 of 30

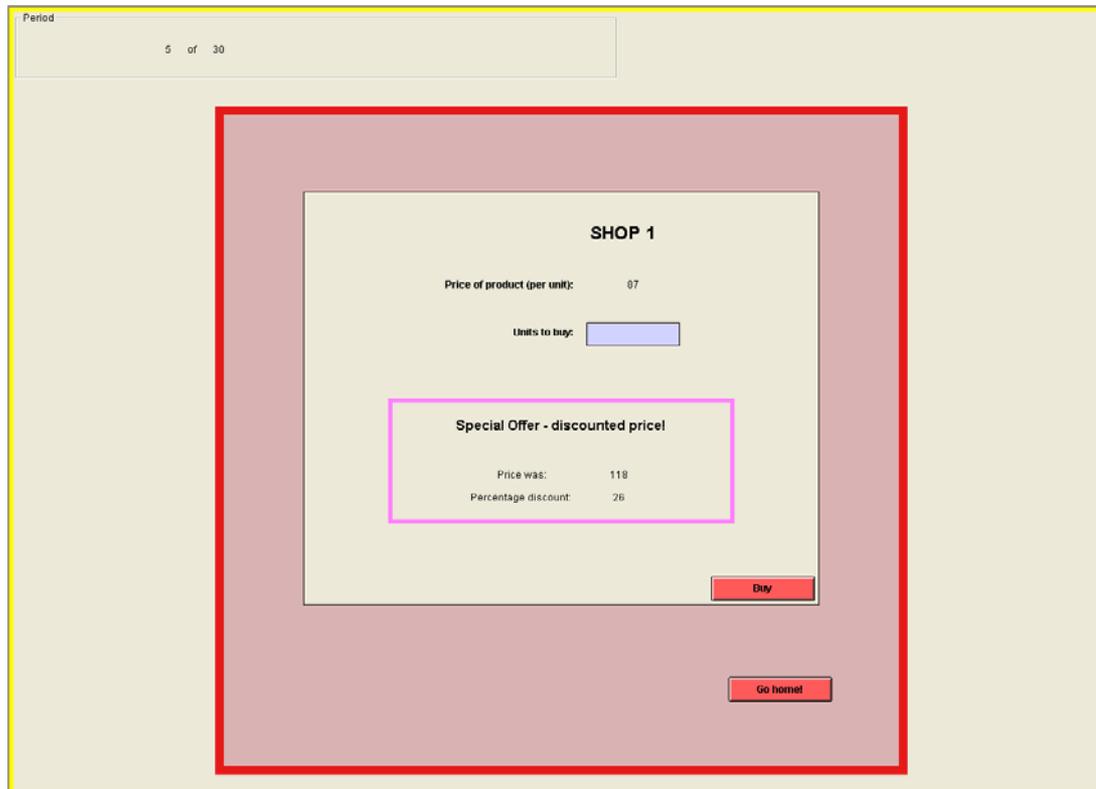
There is a further additional handling charge per unit:

Handling charge per unit:	16
Base price:	84
Shipping charge per unit:	13

Please click CANCEL to return to the shop screen or CONTINUE

Implementation of frames

- **Sales:** identical to unit prices, “former price” between current and max price. Implied % discount shown as well.



Period
5 of 30

SHOP 1

Price of product (per unit): 87

Units to buy:

Special Offer - discounted price!

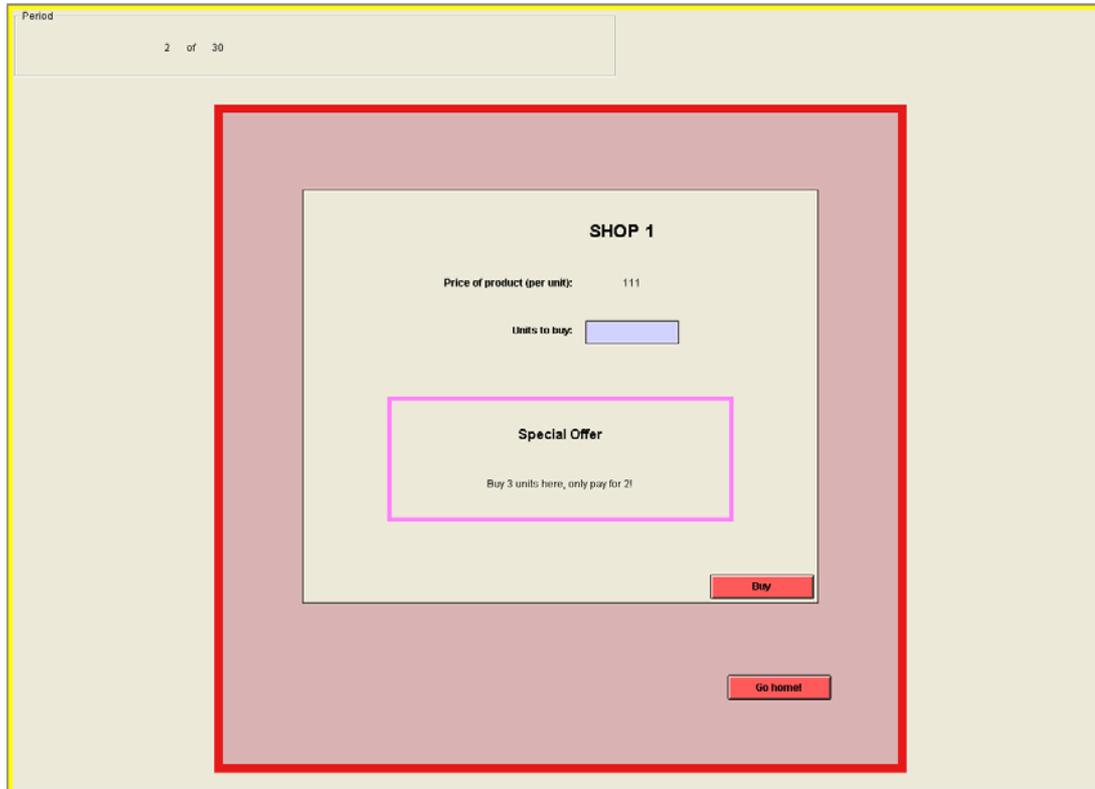
Price was: 118
Percentage discount: 26

Buy

Go home!

Implementation of frames

- **Complex pricing:** identical to unit prices but “3 for 2” offer, i.e., third unit is free.



Period
2 of 30

SHOP 1

Price of product (per unit): 111

Units to buy:

Special Offer

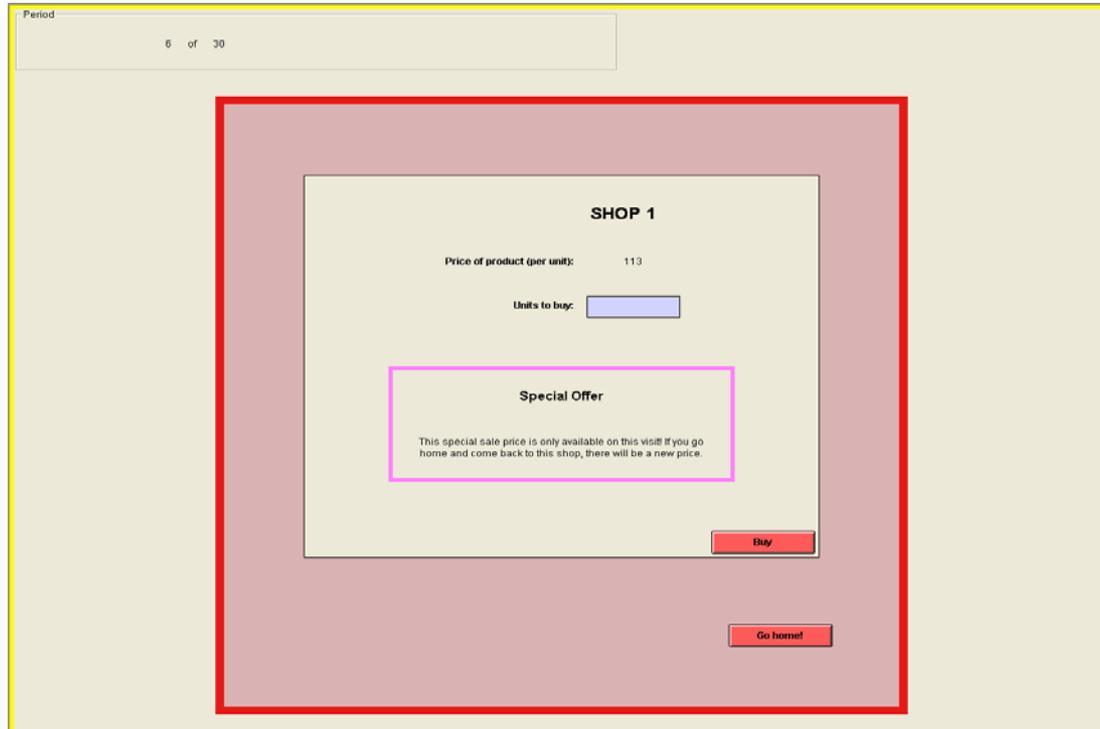
Buy 3 units here, only pay for 2!

[Buy](#)

[Go home!](#)

Implementation of frames

- **Time-limited offers:** Price just now, on return visit new price is drawn from same distribution, so price can go up but also down.



Period

6 of 30

SHOP 1

Price of product (per unit): 113

Units to buy:

Special Offer

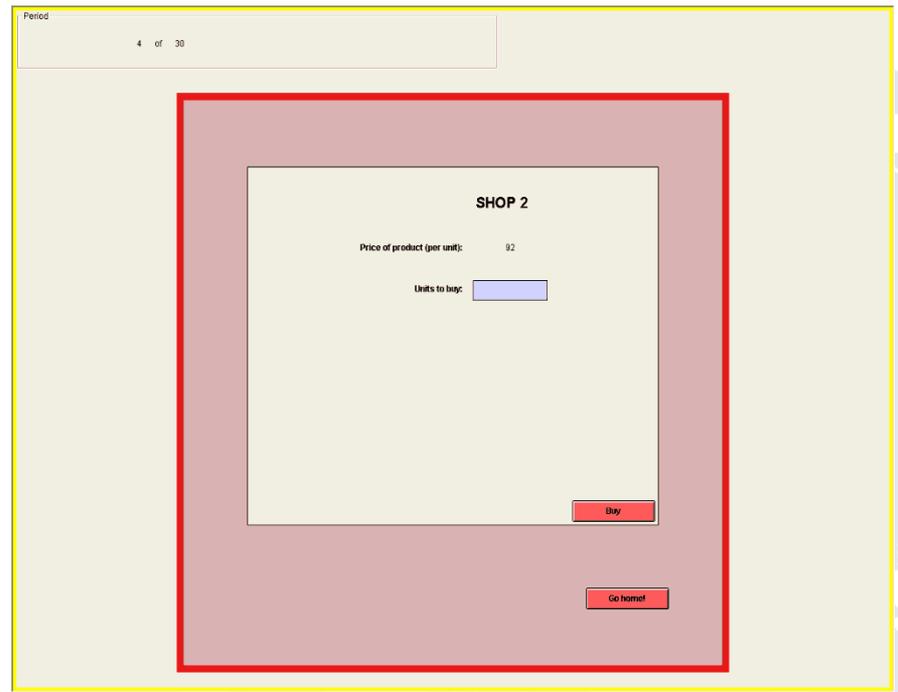
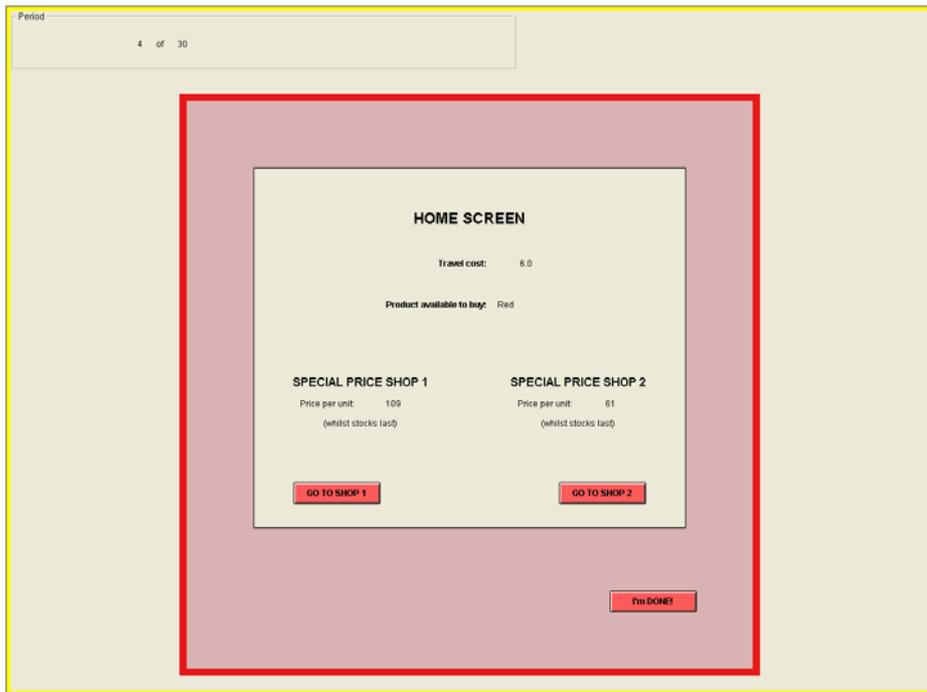
This special sale price is only available on this visit! If you go home and come back to this shop, there will be a new price.

[Buy](#)

[Go home!](#)

Implementation of frames

- **Baiting:** Shops advertise price under generic “while stocks last” warning. True prices determined as before but if true price > 72 , the shop advertises a lower price half the time.



Impact of price frames relative to straight per unit pricing

	Significant welfare loss	Significantly more errors (search errors and purchasing errors)	1 st shop visited benefits	Behavioural biases	Learning helps
Drip pricing	Large (25% loss relative to straight per unit pricing)	Yes, substantially	Yes	Endowment effect/loss aversion	Yes
Time-limited offers	Medium	Yes	Yes	Cognitive errors	No
Baiting	Medium	Yes	Yes, strongly	Endowment effect/loss aversion/sunk cost fallacy	Yes
Complex pricing	Small	No	Yes	Cognitive errors/sunk cost fallacy	Yes
Sales frame	No	Yes	No	Cognitive errors/sunk cost fallacy	Yes

External validity

- External validity refers to how learnings from simplified experiment environments can be transferred to the real world.
- There is asymmetry in our ability to transfer observations:
 - If we observe effects in the simplified environments then in more complex environments the effects will be there
 - If we find no effect in simplified environments then it is harder to say if the effects will also not be present in more complex environments.
- In our simplified environment for price frames with a biased ‘smart’ set of participants, the results translate to the field and the effects would be expected to be worse.

How the outcomes were used

- OFT Action on drip pricing
 - Airline surcharging case
 - Airlines were charging a fee for making payment by debit card and these additional charges not clear in the headline price
 - Concern
 - Made it difficult for consumers to compare prices easily
 - Damaged consumer confidence
 - Impeded effective competition
 - Outcome
 - Voluntary undertakings to include all charges in the headline price
 - Free payment by debit card

Consumer understanding of contracts

A study for the OFT

Objective

- An experiment conducted online with a representative sample of UK consumers.
- To provide evidence to the OFT's Understanding Consumer Contracts Market Study.
 - Specifically:
 - How is consumer choice of the 'best' contract available influenced by the introduction of fees that are probabilistic (dependent on some future outcome), framed as percentages or delayed.
 - How time pressure influences choice.
- Helped inform the OFT, in conjunction with other fieldwork methods, which contract terms cause harm to consumers.

Economic theory of choice

- Standard economic theory provides little guidance on whether consumers are expected to have greater difficulty selecting the most favourable contract under different frames.
 - All necessary information to make the choice was provided
 - There was no cost in accessing the necessary information
- Behavioural economics may lead us to expect that:
 - cognitive limitations may cause performance to decline as frames become more complex
 - For example, energy tariffs, broadband packages, financial contracts
 - consumers may have difficulties assessing future costs or usage
 - For example, car or holiday clubs, gym memberships, season tickets, mobile phone contracts with different call and download allowances

Problems consumer have understanding contracts

- We set-up a simplified environment online:
 - Two choices, contracts were short, presented side by side
 - There was always one option that was better than the other in terms of monetary earnings in the experiment
- We varied the contracts such that fees were presented in the following ways:
 - Probabilistic fees, e.g. Overdrafts
 - Delayed fees, e.g. Pay day loans and credit cards with ‘teaser’ rates
 - Fees presented as a percentage as opposed to an absolute value
 - In some choice we placed a time limit on how long the respondent had to make the choice

Observations

- Probabilistic presentation of fees caused the most problems for the consumers.
- Delayed fees also caused difficulties but to a lesser extent than probabilistic fees.
- When a time limit was imposed on choice the number of correct choices decreased.
 - 8 choices were made by each respondent (half of the respondents made choices under a time limit)
 - The average number of correct choices was 6.67 with no time limit and 3.97 with the time limit
- In this experiment percentage fees did not cause difficulties for consumers.

External validity

- Learnings for field environment (external validity):
 - In this simplified environment consumers had difficulties
 - Problems in choice will most likely be more pronounced than observed in the experiment:
 - more products to choose from,
 - products are presented in more complex ways.

Consumer switching in markets

A controlled laboratory experiment for Ofcom UK

Consumer switching in markets

- Consumer switching behaviour is an important element for competition in markets.
- In many markets including utilities and financial markets a large proportion of consumers are not switching provider.
- How can the switching process be modified to make switching easier?
 - Alternatively suppliers may seek to minimise consumer switching to maintain customers
- Controlled experiment that compared a set of alternative switching processes and their attributes in the telcoms market.

Switching in consumer markets

- Measured consumer welfare and probability of settling on the optimal provider across the alternative processes
 - Switching led by the gaining or losing provider
 - Verification before switch or possibility of slamming
 - Early termination charge warnings if still in contract
 - Time delays (being kept on hold during the process)

Switching in consumer markets

- Measured consumer welfare and probability of settling on the optimal supplier across the alternative processes
- Gaining provider led process – consumers more likely to switch when best to and to choose the best provider
 - Most simplified process with minimum ‘hassle’
- Slamming – consumers make poor choices of provider once slammed
 - Negative shocks led to poorer future choices
- Early termination charge warnings did not help consumers in their choice to switch or not
 - Warning that costs will be incurred did not improve choice
- Behavioural driver: Cognitive limitations in complex environments

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.
 - This is only problematic when we expect behaviour to differ drastically depending on whether the €10 or €100 are at stake.
 - The strength is that we can measure relative outcomes (when consumer make decisions better or worse for example or when a remedy or change in policy operates better or worse) across treatments.

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
 - Be aware of demand effects in analysis of the data
- 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 the experiment, this does not mean that 80% of consumers in the market place 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 consumer in the 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 intervention 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

What are we doing next?

- Labelling and consumer understanding and choice (online and field experiment)
- Add-on insurance market and consumer search and choice (online experiment with representative sample of consumers)
- Extension of price framing looking at price presentation and partitioned prices (controlled laboratory experiment)

Thank you

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