Consumer Reactions to Complex Pricing Schemes

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  - energy billing
  - income tax system
  - credit card interest charges and fees
- Such complexity and changes make it difficult, due to information gathering and cognitive costs, to easily understand marginal pricing, and hence to choose the right amount of consumption.

Research Questions

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2. If not obtaining the information, how do consumers update their beliefs about the pricing scheme based on observation of their total bill?

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- In each period, subjects face an induced demand:

Unit number	Marginal resale value	Cumulative resale value
1	30.5	30.5
2	9.5	40.0
3	8.5	48.5
4	7.5	56.0
5	6.5	62.5
6	5.5	68.0
7	4.5	72.5
8	3.5	76.0
9	2.5	78.5
10	1.5	80.0

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- In period t, the per unit price p_t is determined as follows:
  1. p_1 is drawn from the uniform distribution on $1, 2, ..., 10$.
  2. If $t > 1$, then p_t is determined as follows. Define $\widehat{p}_t$ by

$$\widehat{p}_t \equiv \begin{cases} p_{t-1} - 2 & \text{w.p. } 1/12 \\ p_{t-1} - 1 & \text{w.p. } 1/6 \\ p_{t-1} & \text{w.p. } 1/2 \\ p_{t-1} + 1 & \text{w.p. } 1/6 \\ p_{t-1} + 2 & \text{w.p. } 1/12 \end{cases} \tag{2}$$

If $\widehat{p}_t \in \{1, 2, ..., 10\}$, then $p_t = \widehat{p}_t$, otherwise $p_t = p_{t-1} - (\widehat{p}_t - p_{t-1})$. That is, per-unit price jumps out of the range $\{1, 2, ..., 10\}$ are reversed in sign.

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- Blocks are ordered randomly across subjects to control for order effects. The only exception is that the ambiguous treatment always comes before the risky treatment.

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- At the end of each period, subjects are informed about how much they actually paid for their purchase (i.e., $P_t(x_t)$)

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  - their estimates of over-the-limit and roaming per-minute charges

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- Reverse-engineering this result, if subjects do make optimal purchase decisions given their beliefs, then the mean of the belief about p_t can be obtained as

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  2. Demand for pricing information decreases with the number of periods left until the end of the block.
  3. Demand for pricing information increases with size of the surprise in the amount of the total bill, symmetrically so for positive and negative surprises.

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- Given beliefs about p_t before observing the purchase bill, these beliefs are updated according to the Bayes rule based on observation of the purchase bill.

- Comparative statics predictions: a higher (lower) than expected consumption bill increases (decreases) the mean of the posterior belief about p_t, and hence also p_{t+1}. The effect is quantitatively symmetric for positive and negative bill surprises.

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  - these figures are about 3 p.p. higher in the second half of the experiment
- Message: it is reasonable to use the formula $E(p_t) = 11 - x_t$ to infer the mean of beliefs of most of the subjects.

Data Restriction (1)

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- Let I be the set of periods within a given block in which a subject purchases pricing information. The use only those subject-blocks in which

$$\max_{t \in \{1,..12\}} |x_t - (11 - p_t)| \leq 1 \tag{6}$$

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- Summary: 457 out of 642 subject-blocks, or about 71% of the data will be used in the subsequent analysis.

Results: Demand for Information (LPM)

	(1)	(2)	(3)	(4)
Sample	All Data	All Data	Restricted	Restricted
Surprise	Stated	Computed	Stated	Computed
c=2	0.186***	0.193***	0.224***	0.228***
	(0.000)	(0.000)	(0.000)	(0.000)
c=4	0.070***	0.073***	0.085***	0.086***
	(0.004)	(0.003)	(0.003)	(0.003)
c=6	-0.037*	-0.037*	-0.035	-0.031
	(0.052)	(0.063)	(0.102)	(0.154)
c=8	-0.109***	-0.110***	-0.110***	-0.104***
	(0.000)	(0.000)	(0.000)	(0.000)
c risky	0.035*	0.034*	0.027	0.027
	(0.058)	(0.070)	(0.190)	(0.197)
Period	-0.005***	-0.006***	-0.004**	-0.005**
	(0.000)	(0.000)	(0.019)	(0.012)
$-10 \leq$ shock < -5	0.001	-0.006	-0.001	-0.002
	(0.939)	(0.728)	(0.959)	(0.913)
$-5 \leq$ shock < 0	-0.035**	-0.029	-0.033	-0.023
	(0.039)	(0.111)	(0.131)	(0.320)
$0 \leq$ shock ≤ 5	0.005	-0.016	-0.010	-0.025
	(0.808)	(0.397)	(0.676)	(0.269)
$5 <$ shock ≤ 10	0.070***	0.057**	0.060**	0.060**
	(0.002)	(0.015)	(0.025)	(0.039)
$10 <$ shock	0.144***	0.119***	0.128***	0.129***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.202***	0.216***	0.201***	0.207***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	4,555	4,555	3,358	3,358
Number of Subject ID	107	107	95	95

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  - increasing with the size of a positive shock in the amount of the consumption bill
- Contrary to theoretical predictions, demand for pricing information is insensitive to negative shocks in the amount of the consumption bill
- In regards to updating, data are consistent with Bayesian updating.