Penalty Pricing

Optimal Price Posting Regulation with Inattentive Consumers

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Motivation 1 - Marginal Price Uncertainty

- Consumers may be aware of nonlinear contract terms, but unaware of the marginal price of any particular transaction, because they do not track past usage.
  - Cell phone customer with 500 free minutes:
    Is the next call free?
  - Bank customer with $35 overdraft fees:
    Is the next transaction an overdraft?

- Empirical support
  - Labor (Saez 2002, 2010)
  - Electricity (Borenstein 2009)
  - Overdraft charges (Consumer Reports National Research Center 2009, Stango & Zinman 2009, 2010)
  - Cellphones (Grubb & Osborne 2010)

Motivation 2 - Lack of Disclosure

- Firms often choose not to disclose whether or not a penalty fee is applicable at the point of sale.
  - Cell phone screen could flash "overage rate applies"
  - Debit card terminal could ask "overdraft applies: continue? yes/no"
- Question: Would it be a good idea to require such disclosure?

Motivation 3 - Recent Regulatory Attention

- Cellular charges: Bill Shock regulation under consideration by the FCC would alert consumers of rapidly accruing charges by text message
- Overdraft Fees: Effective July 1st, 2010 the Fed requires opt-in for overdraft protection on ATM and debit card transactions.

Talk Outline

- Inattentive Consumption: constant threshold strategies
- Model (1) - Benchmark
- Model (2) - Price Discrimination
- Model (3) - Biased Beliefs

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  - Surprise penalty fees for excessive usage
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  - Application: Bank overdraft charges (Fed overdraft opt-in rule)
  - Surprise penalty fees for excessive usage
  - PPR welfare effects are ambiguous, but protect consumers from exploitation and may increase competition

Benchmark Model

1. Time $t = 0$: Differentiated firms each offer a non-linear contract:

$$P = M + p(q_1 + q_2) + penalty \cdot q_1 q_2$$

   Consumers sign a contract or choose their outside option.

2. Time $t \in \{1, 2\}$: Consumer makes a buy-or-not-buy decision, choosing quantity $q_t \in \{0, 1\}$ given private value $v_t \sim F(v)$.

3. Standard risk-neutral payoffs
   - Consumer utility has an additive brand shock
   - Firms have constant marginal cost c

Inattention

- A game of imperfect recall: An inattentive consumer cannot condition her purchase decision in period t on past usage q^{t-1} because she does not keep track of usage.
- Optimal Strategy: Buy if and only if $v_t \geq v^*$:

$$v^* = p + Pr(v \geq v^*) \cdot penalty$$

(the expected marginal price)

Policy Interventions

- Require Disclosure: *Price posting regulation* (PPR) requires firms to disclose the marginal price of the current unit. Given $T = 2$, this is equivalent to disclosing past usage, thereby making inattentive consumers attentive.
- Ban Penalty Fees: Require firms to charge constant marginal prices. This restricts prices to a menu of two-part tariffs.
- Remark: The main results are the same for both interventions. I focus on PPR.

Equivalence Result

Proposition

If consumers have homogeneous unbiased beliefs $v_t \sim F(v)$, then inattention and PPR have no substantive effect.

- *Unaffected: Welfare, profits, consumer surplus, market shares. Allocations are first best (conditional on service)*
- *Attentive Pricing: marginal cost pricing, no penalty fees*
- *Inattentive Pricing: Prediction $v^* = c$. Feasible equilibrium prices include 3-part tariffs with $p \in [0, c]$ & penalty $\in \frac{c-p}{1-F(c)}$*

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Jamie Dimon, CEO of JPMorgan Chase:

> *If you're a restaurant and you can't charge for the soda, you're going to charge more for the burger. Over time, it will all be repriced into the business.*

Price Discrimination (Model 2)

Revised Time Line:

1. Time $t = 0$: Differentiated firms each offer a menu of two contracts, indexed $s \in \{L, H\}$

$$P_s = M_s + p_s(q_1 + q_2) + penalty_s \cdot q_1 q_2$$

   Consumers privately receive a signal $s \in \{L, H\}$.
   Consumers sign a contract or choose their outside option.

2. Time $t \in \{1, 2\}$: Consumer learns her taste shock v_t distributed iid conditional on s: $v_t \mid s \sim F_s(v)$ and chooses quantity $q_t \in \{0, 1\}$.

F_H first order stochastically dominates F_L.

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Inattentive Result

Given sufficient competition ($\tau > 0$ sufficiently small):
In the unique (up to penalty fees) symmetric pure strategy equilibrium, **allocations are first best**. *There are* **surprise penalty fees** *and the set of equilibrium prices includes:* $p_s = 0$, $penalty_s = c/(1 - F_s(c))$.

Duopoly Pricing (2)

PPR Result

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Intuition:

- Attentive case: In order to give L types a discounted markup $\mu_L < \mu_H$, the firm must raise marginal price on contract L, and distort L's allocation downwards. Otherwise H would choose contract L.
- With consumer inattention and penalty fees, the firm can give type L a discounted markup $\mu_L < \mu_H$ without distorting allocations.
- Using penalty fees on contract L, the firm can raise expected marginal price to (deviating) H, while keeping expected marginal price equal to c for L.

Interpretation

- Surprise penalty fees and consumer inattention can be socially valuable by relaxing incentive constraints in price discrimination problems.
- FCC bill shock regulation could be counter productive.
- The result is only unambiguous when consumers have correct beliefs and markets are fairly competitive.
- The result does NOT apply to bank overdraft fees. How can overdraft fees be explained?

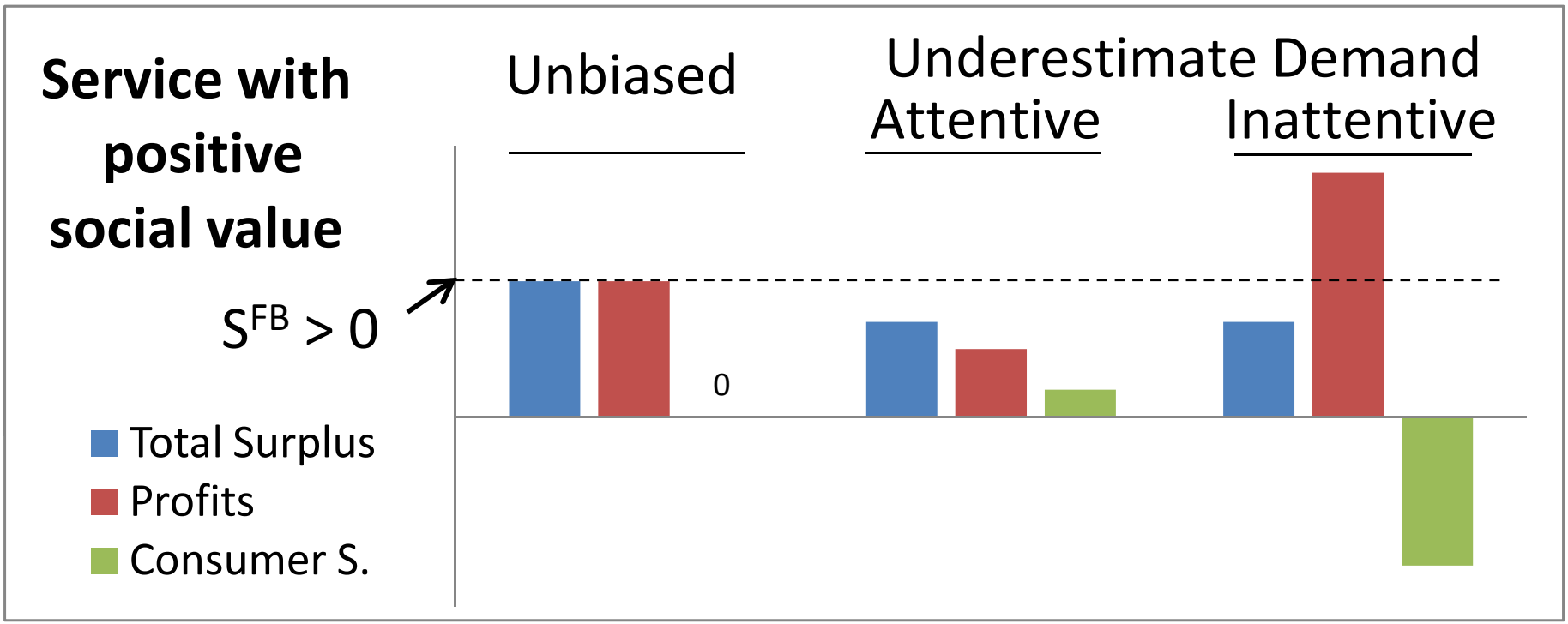
Biased Beliefs (Model 3)

- Firms know $v_t \sim F$, but consumers believe $v_t \sim F^*$
- Consumers underestimate demand: F FOSD F^*.
- Impose exogenous (e.g. $penalty \leq penalty^{max}$) or endogenous (e.g. *No Free Lunch* constraint) limit on penalty fees

- Similar to model with naive β - δ discounters

Interaction of Inattention and Biased Beliefs

Monopoly Case



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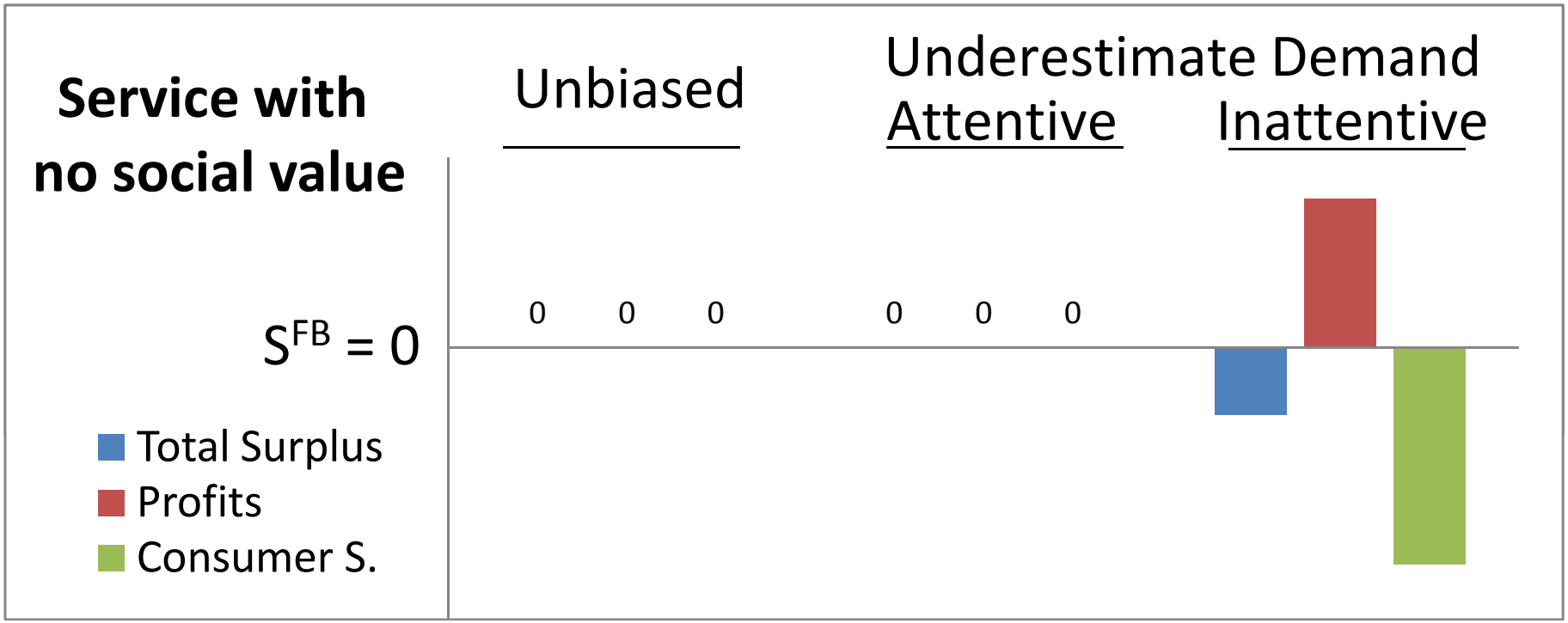

Underestimating value may promote overconsumption

- Typical problem when consumers **underestimate** product value is **under**-consumption of valuable goods (e.g. MMR vaccines).
- Its not surprising that when consumers **overestimate** product value, there may be inefficient sales with $v < c$...
- Inattention means **underestimating** product value can also cause **over**-consumption.
- Given inattention, some businesses exist only to charge penalty fees and would increase welfare if they shut down.

- PPR eliminates this problem and closes these businesses
  - Is this what happened to Bank of America's overdraft business?
  - In general, welfare consequences are ambiguous

Distributional Consequences: Inattention leads to exploitation and softens price competition

- Distributional consequences of inattention may overshadow welfare consequences
- Consumers who underestimate demand can be *exploited* (receiving $U < 0$ so that firms earn $\Pi >$ total surplus) **only** if they are also inattentive.
- Inattention can soften price competition and raise firm markups because firms compete only on penalty fees. (e.g. "free" checking)
- PPR eliminates exploitation and can increase consumer surplus by much more than total first best surplus

Conclusion

When consumers are inattentive

- Homogeneous & unbiased beliefs: inattention & PPR have no substantive effect on market outcomes.
- Heterogeneous & unbiased beliefs: inattention increases welfare in competitive markets, and PPR is counter productive. Results are ambiguous with market power.
  - Penalty fees can be socially valuable by relaxing IC constraints
  - Focal application: cellular phone pricing.
- Homogenous & biased beliefs: PPR may increase or decrease welfare. PPR's largest effect may be reducing consumer exploitation, even in competitive markets.
  - Focal application: bank overdraft charges.