Shrouded Attributes (Gabaix and Laibson)

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Outline

Overview

Illustration Via Examples

General Model

- Model and Interpretation
- Main Result
- Welfare

Big Picture: Exploiting Naive or Myopic Consumers

- We have seen that if a consumer is naive or myopic (makes mistakes), then there is scope for a monopoly to exploit the consumer and extract additional surplus.
- But won't competition will lead firms to offer contracts that maximize consumer surplus, and to educate or inform the myopic customers of their competitors? That is, competition eliminates consumer exploitation, right?
- Wrong—competition may drive firms down to zero profits, but inefficient contracts, prices, or information may still persist in equilibrium.
- There are many examples of this in the behavioral IO literature. One of the first is Gabaix and Laibson (2006), which will be the focus of our discussion.

Shrouded Attributes

- Firms hide some information from consumers, such as hidden fees or the cost of add-ons that consumer may not realize that they want/need. Examples:
  - Low prices of ink-jet printers are advertised; the cost of expensive ink cartridges are not.
  - Banks offer promotions or advertise the benefits of their accounts; hidden costs such as ATM fees, bounced check fees, or minimum balance fees are not emphasized.
  - Credit cards offer introductory rates on balance transfers; consumers may not realize payments are applied to introductory balances before balances with higher APRs.
  - Hotel advertise base prices; price of add-ons like internet, parking, or phone service are not transparent.
- Refer to such examples as shrouded attributes: Note that shrouding does not reflect exogenous communication costs—it is intentional obfuscation.

Bayesian Response to Shrouded Attributes

- Bayesian (sophisticated) consumers infer that hidden add-on prices (e.g., price of ink cartridges for a printer) are going to be high in equilibrium. They will take this into account when comparing with other products.
- Thus, to understand the scope for shrouding as an optimal strategy for firms, we will need at least some myopic consumers in the market.

Outline

Monopoly Pricing for Myopic Consumers

- Consider first an example with a monopoly and myopic consumers.
- We gradually introduce other aspects of the model into this example, such as competition and debiasing consumers.

Example (Case 1 — Monopoly facing myopic consumers)

Suppose Hilton is a monopoly in the hotel industry in a particular area.

- Consumers' valuation for a room: $v = 120$
- Consumers' ex post maximum willingness to pay for add-ons they didn't anticipate needing to pay for (e.g., internet, parking): $\bar{p} = 20$
  - Interpretation 1: Consumer value v includes the value of the add-on if the consumer (mistakenly) thought it was included for free, so value of room without the add-on is $v - \bar{p}$.
  - Interpretation 2: Or the WTP for add-on $\bar{p}$ could be an added value on top of v, so that the value from hotel room plus add-on is $v + \bar{p}$.
  - We focus on the first interpretation, but the model mechanics are the same in either case.

Monopoly Pricing for Myopic Consumers

Example (Case 1 — Monopoly facing myopic consumers)

- Consumers' valuation for a room (plus add-on): $v = 120$
- Consumers' ex post maximum WTP for add-ons: $\bar{p} = 20$
- Hilton's cost for supplying room: $c = 100$
- Hilton's cost for supplying add-ons: $\hat{c} = 0$

Hilton's optimal pricing is:

- Price for room (base good): $p = 120$
- Price for add-ons: $\hat{p} = 20$

Welfare analysis (in per consumer terms):

- Firm profit: $\pi = 140 - 100 = 40$
- Consumer surplus: $CS = 120 - 140 = -20$
- Social surplus: $W = 20$

Competitive Pricing for Myopic Consumers

- Now consider the effect of introducing competition into the example.
- Suppose again that all consumers are myopic

Example (Case 2 — Competition, myopic consumers)

Suppose another hotel chain called "Transparent" (for reasons that will be clear later) enters the market.

- Hotels are perfect substitutes, so again: $v = 120, \ \ \bar{p} = 20$
- Both firms have the same costs: $c = 100, \ \ \hat{c} = 0$
- In this setting, Bertrand competition drives profits to zero.

Competitive Pricing for Myopic Consumers

Example (Case 2 — Competition, myopic consumers)

$v = 120, \;\; \bar{p} = 20, \;\; c = 100, \;\; \hat{c} = 0$

Equilibrium pricing:

- Price for room (at both H and T): $p = 80$
- Price for add-ons (at both H and T): $\hat{p} = 20$
  - Since the additional cost $\hat{p}$ is not understood by consumers when choosing between hotels, hotels are chosen on the basis of p alone.
  - Hence, setting $p = 100$, $\hat{p} = 0$ would attract no consumers when the other firm sets $p = 80$, $\hat{p} = 20$.

Welfare analysis (in per consumer terms):

- Profit for each firm: $\pi = \frac{1}{2}[100 - c] = 0$
- Consumer surplus: $CS = v - 100 = 20$
- Social surplus: $W = 20$

Competitive Pricing when Firms Can Debias Consumers

- What if firms can educate (debias) consumers, so that they become aware of the add-ons and their prices at the two firms?
- We will refer to this as unshrouding. Note that unshrouding reveals the add-on prices $\hat{p}$ at **all** firms, not just the one that unshrouds.
  - Interpretation: Once consumers are educated about add-ons, they know to check the add-on pricing at all firms.

Example (Case 3 — Competition, firms can debias consumers)

- Consider a candidate equilibrium where Hilton and Transparent shroud and follow the pricing strategy from above: $p = 80$, $\hat{p} = 20$
- Could Transparent benefit from deviating to unshrouding?
  - In this case, needs to have $p_T + \hat{p}_T \leq 100$ to attract any consumers, since $p_H + \hat{p}_H = 100$.
  - But this yields at most zero profit for T.
  - Thus, unshrouding is not a (strictly) profitable deviation.
- Our candidate equilibrium is indeed an equilibrium.

Taking Stock

- So far, we have observed that competition does drive firms to zero profits, but it does not lead firms to educate consumers (unshroud).
- Is this a problem?
  - In Cases 2 and 3, consumers earn positive surplus and social surplus is maximized.
  - Thus, it appears that the persistent consumer myopia does not create any real issues.
- We will next add two more layers to the example:
  1. Educated consumers can take (costly) steps to substitute away and avoid the add-ons.
  2. Some portion of the population is initially sophisticated instead of myopic.
- We will see that when all of these elements are present, inefficiencies can arise.

Competitive Pricing when Add-Ons Can Be Avoided

Example (Case 4 — Competition, debiasing, avoidable add-ons)

- Suppose that if consumers are debiased and therefore aware of add-ons, they can take costly measures in advance to avoid the add-ons.
  - The consumer might arrange a cell phone plan that enables a Wi-Fi hotspot instead of using hotel internet.
  - Or the consumer may take a taxi instead of renting a car that requires parking.
- Importantly, these measures must be undertaken in advance and they come at some effort cost of the consumer: $e = 10$
  - One could interpret $\bar{p}$ as either the utility loss from not having the add-on or the effort cost of avoiding the add-on at the last minute, whichever is less.
  - In the case where $\bar{p}$ is a last minute effort cost for avoiding the add-on, it is natural to assume that $e < \bar{p}$.

Competitive Pricing when Add-Ons Can Be Avoided

Example (Case 4 — Competition, debiasing, avoidable add-ons)

$v = 120, \;\; \bar{p} = 20, \;\; c = 100, \;\; \hat{c} = 0, \;\; e = 10$

- Consider again the candidate equilibrium where Hilton and Transparent shroud and follow the pricing strategy: $p = 80, \; \hat{p} = 20$
- Could Transparent benefit from deviating to unshrouding?
  - In this case, needs to have $p_T + \hat{p}_T \leq 90$ (and $\hat{p}_T \leq 10$) to attract any consumers to buy both the base good and the add-on, since $p_H = 80$ and $e = 10$. This is not profitable.
  - And needs to have $p_T \leq 80$ to attract any consumers to buy just base good, since $p_H = 80$. This is also not profitable.
  - Thus, unshrouding is not a profitable deviation.
- Our candidate equilibrium is indeed an equilibrium.

- Note that there is also another equilibrium in this example where both firms unshroud and set $p = 90$, $\hat{p} = 10$. In the general model, there will be multiple equilibria for some ranges of parameter values.

Competitive Pricing when Some Consumers Are Sophisticated

- For the final element of our example, suppose that some fraction of the population is sophisticated.
- Sophisticates do not observe $\hat{p}$ when it is shrouded, but form (correct) beliefs about its value in equilibrium.

Example (Case 5 — Competition, debiasing, sophisticates)

- Suppose fraction $\alpha = 0.75$ of the population is myopic and the remaining fraction $1 - \alpha = 0.25$ is sophisticated.
- How do we solve for equilibrium in this case? We'll use a few observations to help form a candidate equilibrium:
  - Firms must earn zero profits.
  - If firms unshroud, they will set $\hat{p} = e$.
  - If firms shroud, they will set $\hat{p} = \bar{p}$.
- Consider a candidate equilibrium where Hilton and Transparent shroud and follow the pricing strategy: $p = 85$, $\hat{p} = 20$

Competitive Pricing when Some Consumers Are Sophisticated

Example (Case 5 — Competition, debiasing, sophisticates)

$v = 120,\ \ \bar{p} = 20,\ \ c = 100,\ \ \hat{c} = 0,\ \ e = 10,$ fraction $\alpha = 0.75$ myopic

- Candidate equilibrium: both shroud and set $p = 85,\ \hat{p} = 20$
  - Response of myopic consumers: buy good and add-on for total price $p + \hat{p} = 105$
  - Response of sophisticated consumers: buy good for $p = 85$ and substitute away from add-on at effort cost $e = 10$.
  - Profit of each firm: $\pi = \frac{1}{2}[\alpha 105 + (1 - \alpha)85 - c] = 0$
- Could Transparent benefit from deviating to unshrouding?
  - In this case, needs to have $p_T + \hat{p}_T \leq 95$ (and $\hat{p}_T \leq 10$) to attract any consumers to buy both the base good and the add-on, since $p_H = 85$ and $e = 10$. This is not profitable.
  - And needs to have $p_T \leq 85$ to attract any consumers to buy just base good, since $p_H = 85$. This is also not profitable.
  - Thus, unshrouding is not a profitable deviation.

Competitive Pricing when Some Consumers Are Sophisticated

Example (Case 5 — Competition, debiasing, sophisticates)

$v = 120, \ \bar{p} = 20, \ c = 100, \ \hat{c} = 0, \ e = 10,$ fraction $\alpha = 0.75$ myopic

We have therefore confirmed that we have an equilibrium:

- Both firms shroud and set $p = 85$, $\hat{p} = 20$

Welfare analysis (in per consumer terms):

- Consumer surplus for myopes: $CS^M = v - 105 = 15 < 20$
- Consumer surplus for sophisticates: $CS^S = v - e - 85 = 25 > 20$
- Social surplus: $W = \alpha 15 + (1-\alpha)25 = 17.5 < 20$

Some key observations:

- Firms exploit myopic consumers.
- Sophisticated consumers take advantage of these exploitative contracts. However, this is socially inefficient since $e > \hat{c}$, so there is an overall welfare loss.
- Debiasing myopic consumers is good for the consumer but bad for both firms—neither firm has an incentive to do it. ("Curse of debiasing")

Competitive Pricing when Many Consumers Are Sophisticated

- For one last twist, suppose that **many** (rather than just some) consumers are sophisticated.

Example (Case 6 — Competition, debiasing, many sophisticates)

- Suppose that only $\alpha = 0.25$ fraction of the population is myopic. (Before it was $\alpha = 0.75$.)
- As before, use the zero profit condition to conjecture a possible equilibrium.
- Consider the candidate equilibrium where Hilton and Transparent shroud and follow the pricing strategy: $p = 95$, $\hat{p} = 20$

Competitive Pricing when Many Consumers Are Sophisticated

Example (Case 6 — Competition, debiasing, many sophisticates)

$v = 120,\ \bar{p} = 20,\ c = 100,\ \hat{c} = 0,\ e = 10,$ fraction $\alpha = 0.25$ myopic

- Candidate equilibrium: both shroud and set $p = 95,\ \hat{p} = 20$
  - Myopic consumers: buy good and add-on for total price $p + \hat{p} = 115$
  - Sophisticated consumers: buy good for $p = 95$ (no add-on)
  - Profit of each firm: $\pi = \frac{1}{2}[\alpha 115 + (1 - \alpha)95 - c] = 0$
- Could Transparent benefit from deviating to unshrouding?
  - In this case, needs to have $p_T + \hat{p}_T \leq 105$ (and $\hat{p}_T \leq 10$) to attract any consumers to buy both the base good and the add-on, since $p_H = 95$ and $e = 10$.
  - Unshrouding and setting $p_T = 95,\ \hat{p}_T = 9$ is a profitable deviation.
  - Thus, shrouding breaks down in equilibrium.
- Unshrouded equilibrium: both unshroud and set $p = 90,\ \hat{p} = 10$.

- Thus, a sufficiently large faction of myopes are needed to sustain shrouding in equilibrium.

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Model and Timeline

- Period 0:
  - Firms ($n \geq 2$) simultaneously decide whether to shroud or not, pick prices for a base good p and add-on $\hat{p}$. The maximum price the firm can charge for the add-on (either due to willingness to pay, regulation, or other reason) is $\bar{p}$.
  - Marginal cost of base good is c and MC of add-on is $\hat{c} < \bar{p}$. (Main section of the paper sets these to zero.)
- Period 1:
  - Fraction $1 - \alpha < 1$ of consumers are sophisticated and take the add-on and its price into consideration. If shrouded, don't observe add-on price but form (correct) equilibrium beliefs about it. If unshrouded, observe add-on price perfectly.
  - Fraction α of consumers are myopic and only consider the add-on if they directly observe the add-on information. If unshrouded, fraction $\lambda \in (0, 1]$ of myopes observe the add-on information.
  - ...

Model and Timeline

- Period 0: Firms ($n \geq 2$) decide whether to shroud, pick p and $\hat{p} \leq \bar{p}$.
- Period 1:
  - Fraction $1 - \alpha < 1$ of consumers are sophisticated.
  - Fraction α are myopic. If unshrouded, fraction $\lambda \in (0, 1]$ of myopes observe the add-on information (become sophisticated).
  - Goods are perfect substitutes (paper uses discrete choice model), and consumers have value $v > c + \hat{c}$ for good plus add-on.
  - Consumer who anticipates or observes a high add-on price can exert costly effort $\hat{c} < e < \bar{p}$ in period 1 to substitute away from add-on.
- Period 2:
  - Consumers observe the add-on price (if they have not already) and can purchase the add-on. Consumers who have previously engaged in substitution in period 1 do not purchase the add-on.

Interpretation of v and $\bar{p}$

- Interpretation 1: As noted in the discussion of the examples above, we will assume that myopic consumers (mistakenly) assume that the add-on is included with the base good at no charge, so v is the value for the combined bundle of base good and add-on.
  - In this case, $\bar{p}$ could be the ex post value for keeping the add-on (so the value of the base good alone is $v - \bar{p}$).
  - Alternatively, it could be the cost of substituting away from the add-on at the last minute.
  - Or it could be a regulated maximum price that can be charged for the add-on.
- Interpretation 2: Another interpretation is that the add-on is an additional good that the consumer did not anticipate wanting that adds additional value. In this case, v is the value for the base good and $\bar{p}$ could be the additional value of the add-on.
- We will focus on the first interpretation for concreteness, but the equilibrium analysis is the same in either case.

Examples of Applications

- Hotel: $\hat{p}$ is fee for add-ons, $\bar{p}$ is ex post value of add-ons, $e > 0$ is the effort cost to substitute away from use of add-ons in advance.

- Bank with high minimum balance fee (or ATM fees): $\hat{p}$ is the fee, and $e > 0$ is the effort or loss associated with transferring balances from higher-interest-paying accounts to avoid the fee. In this case, $\bar{p}$ may be a regulated maximum fee.

- Credit card with promotional rate on balance transfers: $\hat{p}$ is the interest charge to subsequent purchases, $\bar{p}$ is the loss (monetary or time cost) associated with paying off the low-interest-rate balance immediately, and e is the effort cost associated with obtaining another credit card for purchases following an initial balance transfer.

- Ink cartridges: $\bar{p}$ is the difference in value for having replacement cartridges or not, and e is the effort to print some items in another location, such as at the office.

Outline

Main Result

Theorem

Let

$$\alpha^* = \frac{e - \hat{c}}{\bar{p} - \hat{c}}.$$

1. *If $\alpha > \alpha^*$, there exists a symmetric equilibrium in which firms shroud the add-on price and set*

   $$p = c - \alpha(\bar{p} - \hat{c}) \qquad \text{and} \qquad \hat{p} = \bar{p}.$$

   In this equilibrium only myopes purchase the add-on.

2. *If $\alpha < \alpha^*$, there exists a symmetric equilibrium in which firms do not shroud the add-on price and set*

   $$p = c - (e - \hat{c}) = c + \hat{c} - e \qquad \text{and} \qquad \hat{p} = e.$$

   In this equilibrium all consumers purchase the add-on.

Discussion

Theorem (summary of prices)

$$\alpha^* = \frac{e - \hat{c}}{\bar{p} - \hat{c}}.$$

1. *Equilibrium when $\alpha > \alpha^*$:* $p = c - \alpha(\bar{p} - \hat{c})$ *and* $\hat{p} = \bar{p}$.
2. *Equilibrium when $\alpha < \alpha^*$:* $p = c - (e - \hat{c}) = c + \hat{c} - e$ *and* $\hat{p} = e$.

- Recall that we focus on perfect competition, so firms earn zero profits in either equilibrium.
  - The paper instead considers a discrete choice framework with imperfect substitutes (and perfect competition as a limiting case).
  - The paper also suppresses firm costs.
- The shrouding equilibrium is inefficient (since sophisticates substitute away at cost $e > \hat{c}$) and the unshrouding equilibrium is efficient.
  - Also, if $\lambda = 1$ then any prices with $p + \hat{p} = c + \hat{c}$ can occur in unshrouding equilibrium, but when $\lambda < 1$ we must have $\hat{p} = e$.

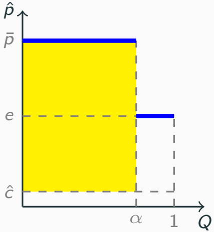
Some Basic Intuition

Theorem (summary of prices)

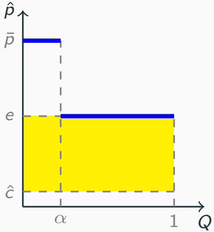
$$\alpha^* = \frac{e - \hat{c}}{\bar{p} - \hat{c}}.$$

1. *Equilibrium when $\alpha > \alpha^*$: $p = c - \alpha(\bar{p} - \hat{c})$ and $\hat{p} = \bar{p}$.*
2. *Equilibrium when $\alpha < \alpha^*$: $p = c - (e - \hat{c}) = c + \hat{c} - e$ and $\hat{p} = e$.*

To get some intuition for the cutoff α^*, consider a *hypothetical* demand curve for add-ons if all consumers purchase the base good, sophisticates all observe $\hat{p}$, and myopes do not. Prefer to set $\hat{p} = e$ and sell add-on to everyone when $\alpha < \alpha^*$.



Case 1: $\alpha > \alpha^* \iff \alpha(\bar{p} - \hat{c}) > (e - \hat{c})$



Case 2: $\alpha < \alpha^* \iff \alpha(\bar{p} - \hat{c}) < (e - \hat{c})$

Proof Sketch

We now sketch the proof, beginning with case 1.

Case 1 ($\alpha > \alpha^*$): Shroud and $p = p^* \equiv c - \alpha(\bar{p} - \hat{c})$ and $\hat{p} = \bar{p}$.

1. Showing no firm has profitable price deviation while shrouding:
   - Deviating from $\hat{p} = \bar{p}$ does not help the firm since sophisticates will continue to believe $\hat{p} = \bar{p}$ (and since $\hat{p} = \bar{p}$ is optimal for myopes).
   - Deviating from $p = p^*$ does not help the firm by the usual Bertrand competition arguments. That is, letting $\pi^S(p, \hat{p})$ denote firm profit under shrouding (when other firms set $p = p^*$ and $\hat{p} = \bar{p}$):

$$\pi^S(p, \bar{p}) = \begin{cases} 0 & \text{if } p > p^* \\ \frac{1}{n}[(p^* - c) + \alpha(\bar{p} - \hat{c})] = 0 & \text{if } p = p^* \\ [(p - c) + \alpha(\bar{p} - \hat{c})] < 0 & \text{if } p < p^* \end{cases}$$

   - Thus, no firm a has profitable deviation under shrouding.

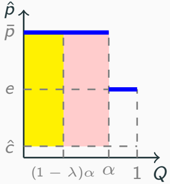
2. Showing no firm has profitable deviation involving unshrouding...

Proof Sketch

Case 1 ($\alpha > \alpha^*$): Shroud and $p = p^* \equiv c - \alpha(\bar{p} - \hat{c})$ and $\hat{p} = \bar{p}$.

2. Showing no firm has profitable deviation involving unshrouding: The key intuition is that if deviating to unshrouding is optimal, then $\hat{p} = e$ will be optimal, but this will be dominated by shrouding since $\alpha > \alpha^*$. Formally, there are two cases:

   - For $\hat{p} > e$, $\pi^U(p, \hat{p}) \leq \pi^U(p, \bar{p}) < \pi^S(p, \bar{p})$.



   - For $\hat{p} \leq e$, $\hat{p} = e$ is optimal (otherwise changing to $(p - \varepsilon, \hat{p} + \varepsilon)$ attracts the same number of sophisticates and more of the remaining myopes). Since $\hat{p} = e$, must have $p \leq p^*$ to attract either the remaining $(1 - \lambda)\alpha$ myopes or the sophisticates. But since $\alpha > \alpha^*$,

$$(p^* - c) + (e - \hat{c}) < (p^* - c) + \alpha(\bar{p} - \hat{c}) = 0,$$

so there is no way to earn positive profits from this deviation.

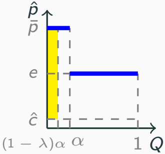
Proof Sketch

Case 2 ($\alpha < \alpha^*$): Unshroud and $p = p^* \equiv c - (e - \hat{c})$ and $\hat{p} = e$.

1. Showing no firm has a profitable price deviation while unshrouding: If unshroud, then either $\hat{p} = e$ or $\hat{p} = \bar{p}$ is optimal. Clearly, no profitable deviation involving $\hat{p} = e$. For $\hat{p} = \bar{p}$:
   - If $p > p^*$, then no one buys from firm.
   - If $p = p^*$, then same fraction of consumers buy base good and fraction $(1 - \lambda)\alpha$ of those buy add-on, but since $\alpha < \alpha^*$,

     $$(1 - \lambda)\alpha(\bar{p} - \hat{c}) < \alpha(\bar{p} - \hat{c}) < (e - \hat{c}),$$

     so negative overall profit.

   - If $p < p^*$, then all consumers buy base good from firm, but again negative profit.
2. Showing no profitable deviations involving shrouding: Since other firms already unshroud, shrouding changes nothing and analysis is just as above.

Multiplicity of Equilibrium

- Notice that when $\alpha > \alpha^* > (1-\lambda)\alpha$, both the shrouded and unshrouded prices equilibria exist.
    - The first inequality implies that when firms are shrouding, setting the add-on price to $\hat{p} = \bar{p}$ is preferred to unshrouding and setting $\hat{p} = e$.
    - The second inequality implies that when other firms are already unshrouding, so that only $(1-\lambda)\alpha$ fraction of the population remains myopic, setting $\hat{p} = e$ remains optimal.
- When $(1-\lambda)\alpha > \alpha^*$, firms will prefer to set $\hat{p} = \bar{p}$ even if unshrouding.
    - There is an equilibrium where firms unshroud and set $\hat{p} = \bar{p}$, since there is no (strict) benefit from shrouding when other firms are already unshrouding. (Unshrouding is weakly but not strictly dominated in this case.)
    - Introducing either a small cost of unshrouding or introducing an equilibrium refinement based on perturbations (such as the extensive form trebling-hand perfect equilibrium concept of Selten (1975)) will eliminate the unshrouded equilibrium in this case.

Outline

Welfare

Relative to the first best, shrouding equilibrium ($\alpha > \alpha^*$) involves subsidies from myopes to sophisticates along with a deadweight loss:

- Sophisticates surplus:

$$CS^S = v - p^* - e = v - c + \alpha(\bar{p} - \hat{c}) - e > v - c - \hat{c}$$

(since $\alpha > \alpha^*$ implies $\alpha(\bar{p} - \hat{c}) > e - \hat{c}$)

- Myopes surplus:

$$CS^M = v - p^* - \bar{p} = v - c + \alpha(\bar{p} - \hat{c}) - \bar{p}$$
$$= v - c - \hat{c} - (1 - \alpha)(\bar{p} - \hat{c}) < v - c - \hat{c}$$

- Firm profits: $\pi = 0$ (by construction of p^*)

- Social surplus:

$$W = (1 - \alpha)[v - p^* - e] + \alpha[v - p^* - \bar{p}]$$
$$= v - p^* - (1 - \alpha)e - \alpha\bar{p} = v - c + \alpha(\bar{p} - \hat{c}) - (1 - \alpha)e - \alpha\bar{p}$$
$$= v - c - \alpha\hat{c} - (1 - \alpha)e < v - c - \hat{c}$$

- Deadweight loss: $(1 - \alpha)(e - \hat{c})$.

Interventions

See Section IV.B in Gabaix and Laibson (2006) as well as page 1108 in Kőszegi (2014). The latter refers to papers that make two points:

1. First, educating some fraction of myopes lowers social welfare since it increases the number of people who engage in costly efforts to avoid the add-ons (this only holds until $\alpha = \alpha^*$).

2. Second, since a competitive market redistributes income from naive to sophisticated consumers, and since no consumer believes that they is naive, everyone believes that they benefit from the redistribution.

Gabaix, X. and D. Laibson (2006): “Shrouded Attributes, Consumer Myopia, and Information Suppression in Competitive Markets”, *Quarterly Journal of Economics*, 121, 505–540 (pages 3, 36).

Kőszegi, B. (2014): “Behavioral Contract Theory”, *Journal of Economic Literature*, 52, 1075–1118 (page 36).