Regulating Inaction: The Case of Price Walking

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Outline

Inert customers receive bad outcomes in financial markets.

Attempted remedies:

1. Financial education.
2. Encouraging competition.
3. Nudges.
4. Direct regulation. Global regulations

Pricing Regulation

Price walking

- Low price for new customers, increased on renewal.
- Tenure-based price discrimination.
- Prevalent in UK insurance.

UK 2022 insurance intervention

- Renewal price $\leq$ equivalent new-business price.

Many similar regulations across the world. Global regulations

Outline

1. Model of price walking & regulation.

2. Test predictions in UK insurance market.

3. Model & data: firms respond to blunt even well-designed regulation.

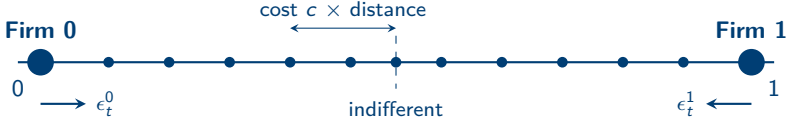
Model

Setup: Consumers & Firms

OLG of **customers**

- Unit mass joins each period and stays for two.
- Uniformly distributed on Hotelling line.
- Purchase good each period.

Two **firms** at opposite ends; zero marginal cost; i.i.d. demand shocks ϵ_t^i.



Setup: Pricing & Inertia

In first period, all consumers actively choose product based on today's utility.

In second period:

- Fraction λ are inert, and remain with original firm.
- Fraction $1 - \lambda$ actively shop again.

Each firm i sets two prices each period t:

- p_t^i for new customers (both new entrants and switchers).
- Renewal price r_t^i for inert customers.

Maximum price K.

Solution: Markov Perfect Equilibrium.

Equilibrium Without Regulation

Proposition. Unique equilibrium, where:

- Renewal price set at maximum K.
- New customer price:
  - Teaser rate.
  - Decreasing in inertia λ and maximum price K.

Equilibrium Price Walking

- Price discrimination by tenure. Details
- Market shares are i.i.d. across time.

Price Walking Regulation

Regulation ties new customer price to renewal price $\rightarrow p_t^i = r_t^i$.

Back books: share of period $t-1$ cohort who purchased from a given firm.

Proposition. Unique equilibrium in affine strategies, where:

- Price is increasing in a firm's back book. Details
- Market shares follow a stable, oscillating AR(1) process. Details

Intuition: trade-off between competing for new customers and exploiting back book.

Price Walking Regulation

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Intuition: trade-off between competing for new customers and exploiting back book.

Empirical predictions:

- Firms with large back books are less competitive post-regulation.
- Negative autocorrelation in market shares post-regulation.

Additional Predictions

Product Proliferation

- Introducing a new product softens trade-off induced by policy.
- Proliferation incentives larger for firms with large back books.

Prices of new policies

- Average price of new policy is higher with regulation.
- Price rise increasing in inertia λ.

Regulation & Welfare

Anticipated Regulation

Profits & Prices

Data & Setting

Data

8mn motor insurance enquiries from UK's largest price comparison website, 2019-23.

Customer details.

- Demographics, car, driving history, level of insurance cover.

Each quote on the menu they are offered.

- Price, insurance policy ('product'), anonymous insurer.
- Multi-insurer, multi-product menus.

Which product they choose.

Survey data on renewals.

Demographics | Menus | Search & choice | Prices

Regulatory Intervention

From January 2022, price for renewing customer can be no higher than price for equivalent new business.

Prices can still be increased for renewing (and new) customers.

Policy was anticipated:

- Details set out in September 2020.
- Policy action foreseeable earlier.

Empirical Results

Testing the Model's Implications

1. Firms with large back books less competitive post-policy.
2. Oscillating market shares post-policy.
3. Product proliferation to segment market.
4. Up-front discounts offered to attract inert customers shrink.
5. Large gains to search—costs of inertia—remain.
   - Higher if insurer introduced a new product.

Pricing & Back Books

Prediction:

- After the regulation: large back books $\rightarrow$ high prices.

Empirical approach

- Relate competitiveness of product quotes to its back book.
- Back books:
  - Type $\theta_i = \{\text{year of birth}, \text{car value quintile}, \text{level of cover}\}_i$.
  - Purchases of product j by type θ_i 12 or 24 months before time t. Back book
- Rich data: compare two products quoted to the same customer.

Pricing & Back Books

Regressions of the form:

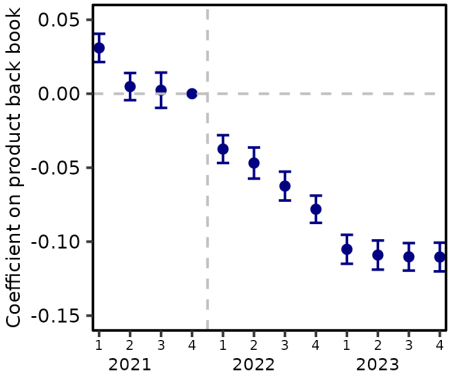
$$\text{top}_{ijt} = \beta_0 \text{BB}_{\theta(i)jt} + \beta_1 \text{Post}_t \text{BB}_{\theta(i)jt} + X_{ijt}\Gamma + \epsilon_{ijt}$$

where:

- i is enquiry at time t.
- j is product.
- top_{ijt}: dummy equal to 1 if j is cheapest for i at t.
- $\text{BB}_{\theta(i)jt}$: j's share of the back book for type $\theta(i)$ of i at t.
- Post_t: dummy equal to 1 after policy.
- X_{ijt}: controls including fixed effects.

Pricing & Back Books

	Cheapest in menu		
	(1)	(2)	(3)
Back book	0.065***	0.065***	
	(0.002)	(0.002)	
Back book × post	-0.091***	-0.091***	-0.090***
	(0.002)	(0.002)	(0.003)
Fixed effects			
Type-month	Yes	No	No
Type-product	Yes	Yes	Yes
Product-month	Yes	Yes	Yes
Enquiry	No	Yes	Yes
Firm-enquiry	No	No	No
Varying slopes			
Firm back book	No	No	Yes
Mean dep. var.	0.007	0.007	0.007
Observations	730mn	730mn	730mn



- Moving from 5th largest to largest back book ↓ P(cheapest) by 1.3 × mean.

Within firm

Oscillating Market Shares

Prediction:

- After the regulation: market shares oscillate.

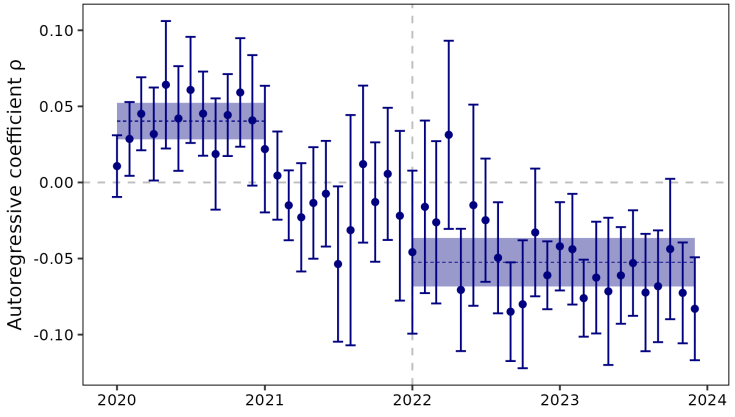
Empirical approach

- Compute market share $s_{j\theta t}$ for each product j, type θ and month t.
- Run regression:

$$s_{j\theta t} = \rho_t s_{j\theta t-12} + \delta_{j\theta} + \epsilon_{j\theta t}$$

- Empirical prediction: ρ_t falls due to policy.

Oscillating Market Shares



Market shares persistent before policy, but oscillate afterwards.

Product Proliferation

Prediction

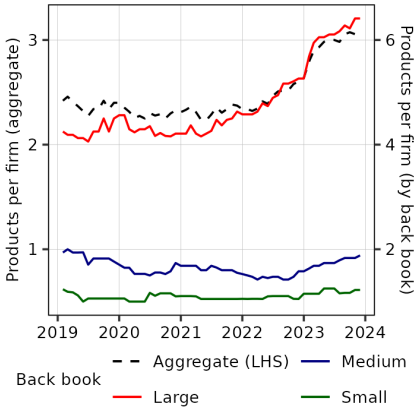
- Firms with large back books respond to policy by introducing new products to segment market.

Empirical approach

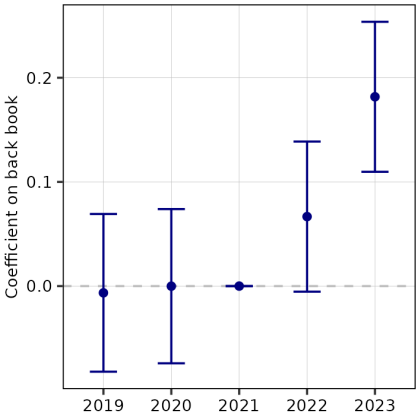
- Track number of products through time.
- DiD: (pre- vs. post-regulation)$\times$(large vs. small back book)
- Product offerings are long-term, firm-wide decisions.
  $\rightarrow$ **aggregate back books:** share of all purchases since start of sample.

Product Proliferation

(a) Products per firm



(b) Difference-in-Difference



Top third by back book: **increase product offering by 50%**.

Testing the Model's Implications

1. Firms with large back books less competitive post-policy.✓
2. Oscillating market shares post-policy.✓
3. Product proliferation to segment market.✓
4. Up-front discounts offered to attract inert customers shrink.✓
5. Large gains to search—costs of inertia—remain.✓
   - Inactive still pay 40% above cheapest offer (∼£270/year on median policy).
   - Higher if insurer introduced a new product.✓

Teaser rates | Gains to search | Gains & proliferation

Conclusion

Results highlight difficulty of using policy to help inert customers with non-inert firms.

Firms' alternative means to profit from customer inertia may be harmful.

Endogenous firm responses need accounting for in policy design.

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Firms' alternative means to profit from customer inertia may be harmful.

Endogenous firm responses need accounting for in policy design.

Comments:
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Related Literature

Inaction in household finance. Allen, et al. (2019), Allen & Li (2025), Andersen et al. (2020), Brot-Goldberg, et al. (2023), Chiappori & Salanié (2000), Choi et al. (2003), Cosconati (2026), Fisher et al. (2024), Gottlieb & Smetters (2021), Handel (2013), Heiss et al. (2021), Honka (2014), Ho et al. (2017), Madrian & Shea (2001), Stango & Zinman (2016).

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Motor insurance markets. Chiappori & Salanié (2000), Cohen & Einav (2007), Cosconati (2026), Dionne et al. (2001), Abbring et al. (2003), Israel (2005), Honka (2014), Honka & Chintagunta (2017), Puelz & Snow (1994), Rubinstein (2026). Back

Pricing Regulations Around the World

Year	Jurisdiction	Competent Authority	Scope
2013	Netherlands	Netherlands Authority for the Financial Markets (AFM)	Lending
2014	South Korea	Korea Communications Commission	Telecom
2014	United States	State insurance departments	Insurance
2019	Australia	Australian Energy Regulator (AER)	Energy
2020	New Zealand	Electricity Authority (EA)	Energy
2021	Australia	Australian Securities & Investments Commission (ASIC)	Ins. add-ons
2022	United Kingdom	Financial Conduct Authority (FCA)	Insurance
2022	Ireland	Central Bank of Ireland (CBI)	Insurance
2025	Colombia	Comisión de Regulación de Comunicaciones (CRC)	Telecom
2026	Canada–Ontario	Financial Services Regulatory Authority of Ontario (FSRA)	Insurance

Note: **20 US states** have adopted measures on pricing practices since Maryland on 31-10-2014: MD, OH, CA, NY, FL, VA, VT, WA, IN, PA, DC, ME, MT, RI, DE, CO, MN, CT, AK, MO, MI.

Equilibrium Price Walking: Details

Inert customers price insensitive $\rightarrow$ renewal price $r_t^i = K$.

Prices for new customers:

$$p_U^0(\Delta_t) = c - \frac{\delta\lambda}{2-\lambda}K + \frac{c}{3}\Delta_t, \quad p_U^1(\Delta_t) = c - \frac{\delta\lambda}{2-\lambda}K - \frac{c}{3}\Delta_t.$$

where:

- $\Delta_t = \epsilon_t^0 - \epsilon_t^1$ is net demand shock for firm 0.
- K is maximum price.
- c is transportation cost.
- λ is share of inert customers.
- δ is discount rate.

Back

Pricing with Regulation: Details

Proposition 1. There exists a unique MPE in affine strategies:

$$p_R^0(y_t, \Delta_t) = c(m + a\Delta_t + by_t), \qquad p_R^1 = c(m - a\Delta_t - by_t)$$

where

- $m := \frac{2+\delta b}{2-\lambda(1-\delta)} \in (1, 2)$.
- y_t is excess market share of firm 0 in prior period.
- $a \in (0, \frac{1}{2})$
- $b \in (0, 1)$.

Back

Oscillation: Details

Proposition 2. In the unique affine-strategy MPE, market shares follow a stable, oscillating AR(1) process:

$$y_{t+1} = -by_t + \left(\frac{1}{2} - a\right)\Delta_t,$$

where:

- y_t denotes excess market share of firm 0 in previous period.
- $a \in (0, \frac{1}{2})$ and $b \in (0, 1)$. Back

Regulation and Welfare

Proposition. There exists discount factor $\delta^*_\lambda \in (\frac{1}{2}, 1]$ such that:

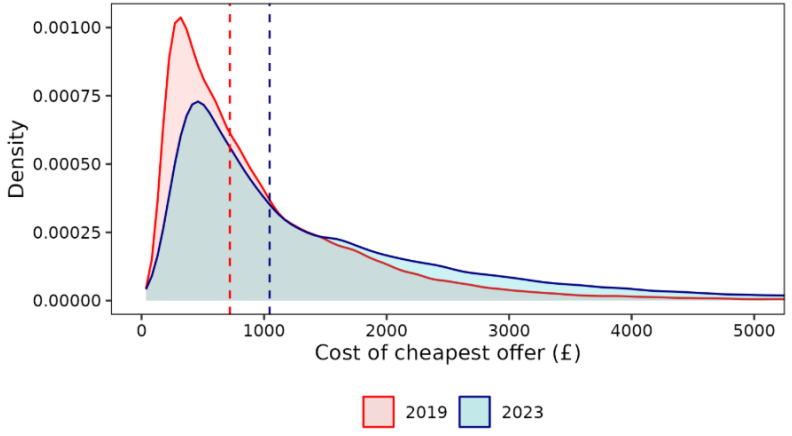
- Regulation increases total surplus iff $\delta > \delta^*_\lambda$.
- Cutoff δ^*_λ is increasing in inertia λ.

Regulation reduces total surplus if:

- Firms are sufficiently impatient.
- There are sufficient inert customers.

Prediction. Regulation harms customers that are sufficiently inert. Back

Insurance Pricing



Large increase in cost of insurance in recent years.

$\rightarrow$ Partly linked to post-Covid supply chain issues. Back

Summary Stats: Demographics

	Mean	Median	Std. dev.	10th pctile	90th pctile
Customer characteristics					
Driver age	35	29	16	19	58
Years with licence	11	7	10	0	25
Car value (£)	8459	4855	14319	900	19900
Annual mileage	7508	6000	6950	3000	10000
Offered menu					
Num. Products	62	64	33	16	103
Num. Firms	25	26	13	5	41

Back

Summary Stats: Prices

	Mean	Median	Std. dev.	10th pctile	90th pctile
Offered prices and dispersion within menu (£)					
Cheapest quote	1266	681	2818	242	2445
2nd − cheapest	246	33	1584	1	416
3rd − cheapest	421	72	2228	9	722
4th − cheapest	536	101	2554	16	922
5th − cheapest	623	127	2890	23	1106
Worst − cheapest	6957	4006	17051	1075	15633
Offered prices and dispersion within menu (% car value)					
Cheapest quote	55	15	186	3	126
2nd − cheapest	11	1	121	0	15
3rd − cheapest	19	2	167	0	28
4th − cheapest	24	2	190	0	38
5th − cheapest	29	3	206	0	47
Worst − cheapest	302	87	814	12	738

Back

Customer Choice

	Percent of sample
Selected a product	11
Customer chose:	
cheapest product	43
top 2 products	62
top 3 products	72
top 4 products	78
top 5 products	83
Customer searched:	
in one year only	36
in multiple years	64
once in year	47
multiple times in year	53

Back

Back Books

	Mean	Median	90th pctile	99th pctile
Product-segment back book				
Count	1	0	2	71
Share	0.006	0.000	0.018	1.000
Aggregate firm back book				
Count	9052	2365	28681	68752
Share	0.017	0.004	0.054	0.129

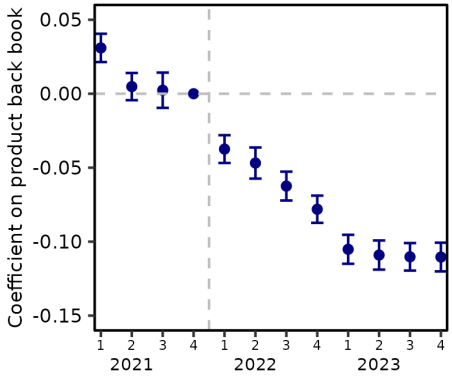
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Pricing & Back Books

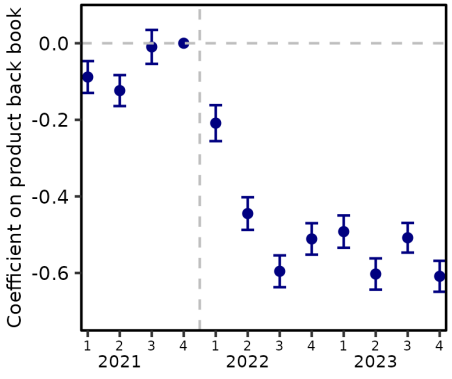
	Cheapest in menu			Cheapest in firm		
	(1)	(2)	(3)	(4)	(5)	(6)
Back book	0.065***	0.065***		0.293***	0.318***	
	(0.00182)	(0.00182)		(0.00986)	(0.00721)	
Back book × post	-0.091***	-0.091***	-0.090***	-0.388***	-0.423***	-0.451***
	(0.00232)	(0.00232)	(0.00257)	(0.01085)	(0.00849)	(0.00886)
Fixed effects						
Type-month	Yes	No	No	Yes	No	No
Type-product	Yes	Yes	Yes	Yes	Yes	Yes
Product-month	Yes	Yes	Yes	Yes	Yes	Yes
Enquiry	No	Yes	Yes	No	No	No
Firm-enquiry	No	No	No	No	Yes	Yes
Varying slopes						
Firm back book	No	No	Yes	No	No	Yes
Mean dep. var.	0.007	0.007	0.007	0.184	0.184	0.184
Observations	730mn	730mn	730mn	730mn	730mn	730mn

Pricing & Back Books Through Time

(a) Cheapest in menu



(b) Cheapest in firm



Moving from 5th largest to largest back book:

- $\downarrow P$(overall cheapest) by 1.3 $\times$ mean.
- $\downarrow P$(firm's cheapest) by 0.25 $\times$ mean. Back

Discounts for Inactive Customers

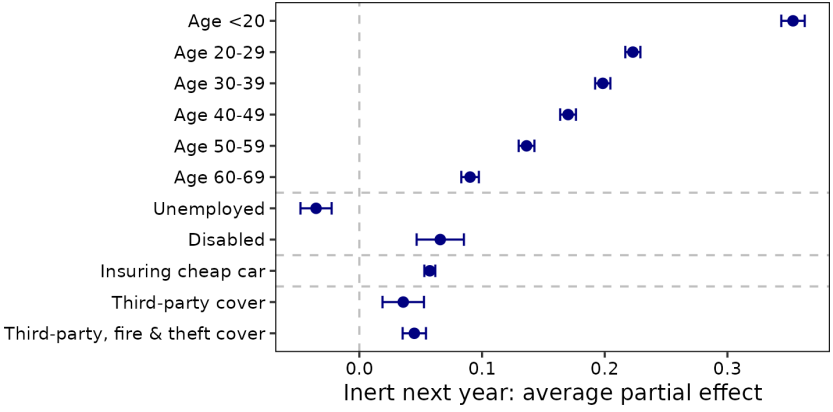
Prediction:

- Discounts for inert customers shrink due to policy.

Approach:

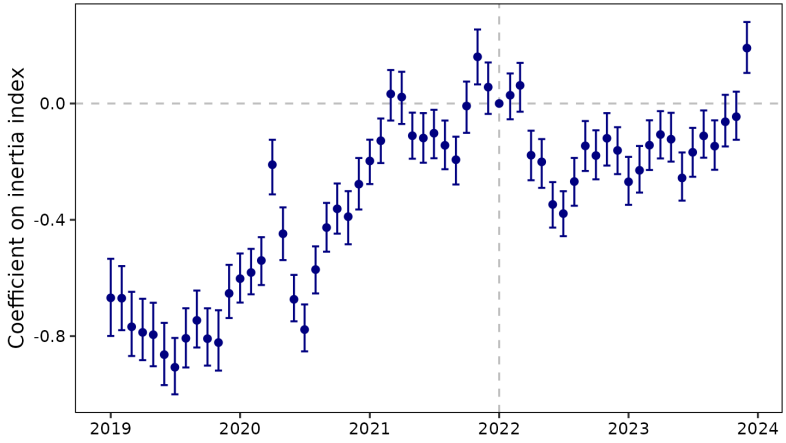
1. Identify inactive customer groups based on repeat search data.
2. Plot difference in prices offered to active/inactive customers around policy.

Inactive Customers



- Use these results to construct ‘inertia index’ for all customers.

Discounts for Inert Customers



- New-business prices for inactive customers increase relative to active customers.

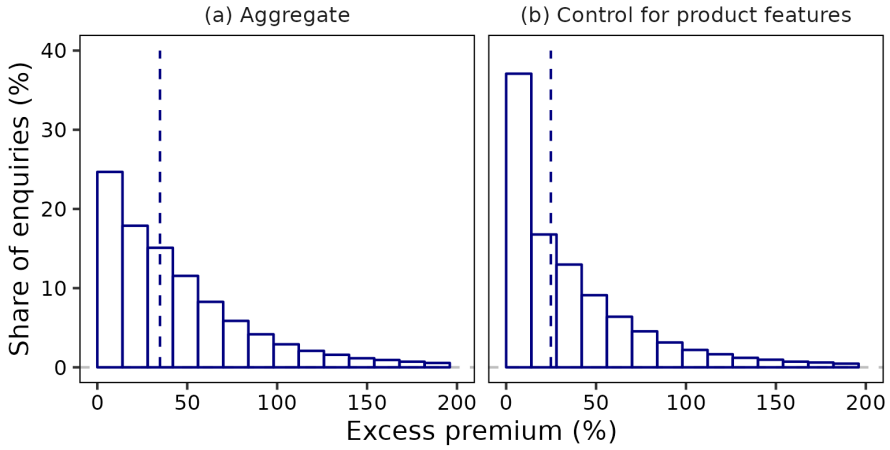
Cost of Inertia

Prediction:
Gains to search remain large post-policy.

Approach:

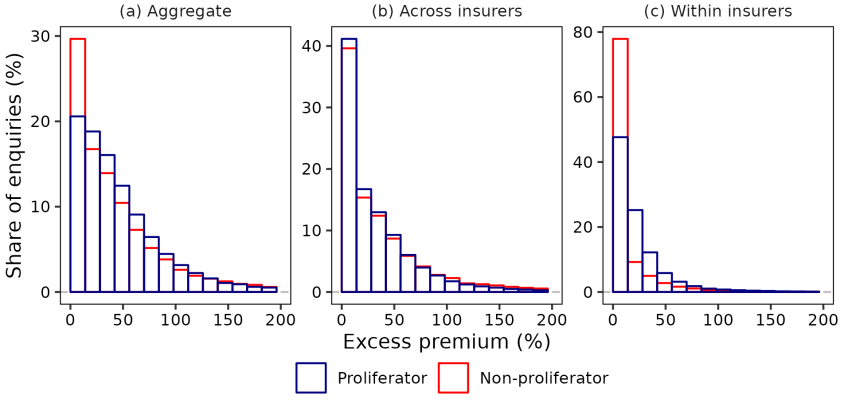
1. Restrict sample to those who picked product and searched again following year.
2. Excess premium: extra cost of 'incumbent' product as % of cheapest offer.
3. Control for characteristics: subtract original excess premium.
4. Split: firms that introduced new product ('proliferators') and did not.
5. Decompose: within-firm vs. across-firm.

Gains to Search



- Large costs to being inactive remain after the policy.

Gains to Search



- Costs of inaction greater if customer's firm introduces a new product.