

Disclosing Multiple Product Attributes



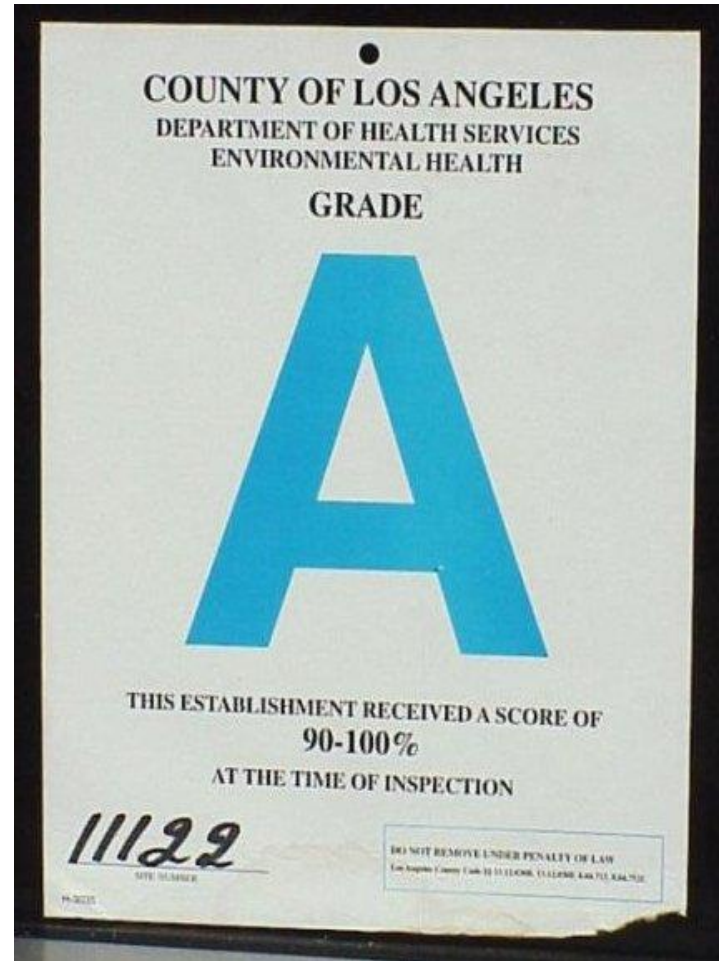
Monic Sun
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A true story

- I walked into Saks looking for a moisturizer
- Sales associates at some counters gave me a free sample, but others refused
- Why would they refuse me?! Grossman 1981, Milgrom 1981: unraveling

Evidence of unraveling

- Jin and Leslie
2003: almost
all restaurants
in Los Angeles
County
voluntarily
display hygiene
cards





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Counter evidence on unraveling

- Mathios 2000: half of salad dressings carry nutrition labels before NLEA of 1990

Nutrition Facts	
Serving Size 1 cup (228g)	
Serving Per Container 2	
Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 3g	15%
<i>Trans</i> Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

Other mixed evidence

- Jin 2005: HMOs' participation in quality surveys is not complete, participation rate is higher in Accreditation than in HEDIS
- Accreditation: Full, one-year, provisional, denial
- HEDIS: a long list of measures

HEDIS® 2007 Summary Table of Measures and Product Lines

HEDIS 2007 Measures	Applicable to:			
	Medicaid	Commercial	Medicare	PPO ¹
Effectiveness of Care				
Childhood Immunization Status	X	X		X
Adolescent Immunization Status	X	X		X
Appropriate Treatment for Children With Upper Respiratory Infection	X	X		X
Appropriate Testing for Children With Pharyngitis	X	X		X
Inappropriate Antibiotic Treatment for Adults with Acute Bronchitis	X	X		X
Colorectal Cancer Screening		X	X	X
Breast Cancer Screening	X	X	X	X
Cervical Cancer Screening	X	X		X
Chlamydia Screening in Women	X	X		X
Osteoporosis Management in Women Who Had a Fracture			X	X
Controlling High Blood Pressure	X	X	X	X
Beta-Blocker Treatment After a Heart Attack	X	X	X	X
Persistence of Beta-Blocker Treatment After a Heart Attack	X	X	X	X
Cholesterol Management for Patients With Cardiovascular Conditions	X	X	X	X
Comprehensive Diabetes Care	X	X	X	X
Use of Appropriate Medications for People With Asthma	X	X		X
User of Spirometry Testing in the Assessment and Diagnosis of Chronic Obstructive Pulmonary Disease (COPD)	X	X	X	X
Follow-Up After Hospitalization for Mental Illness	X	X	X	X
Antidepressant Medication Management	X	X	X	X
Follow-Up Care for Children Prescribed Attention-Deficit/Hyperactivity Disorder (ADHD) Medication	X	X		X
Glaucoma Screening in Older Adults			X	X
Use of Imaging Studies for Low Back Pain	X	X		X
Disease Modifying Anti-Rheumatic Drug Therapy in Rheumatoid Arthritis	X	X	X	X
Annual Monitoring for Patients on Persistent Medications	X	X	X	X
Drugs to Be Avoided in the Elderly			X	X
Potentially Harmful Drug-Disease Interactions in the Elderly			X	X
Medical Assistance With Smoking Cessation	X	X	X	X
Flu Shots for Adults Age 50-64		X		X

More broadly...

- Cars, books, digital cameras, drugs, computers, job market candidates
- Consumers do not know which product is good and/or provides the best fit
- Information: consumer reviews, free returns, samples, test-drive, research statements

Prior theories

- Incomplete information of seller: Shin 1994
- Cost of information acquisition / dissemination: Jovanovic 1982, etc
- Competition: Hotz and Xiao (forthcoming), etc
- Informative advertising:
 - Lewis and Sappington 1994: best or worst signal
 - Anderson and Renault 2006: partial revelation

Research questions

- How do multiple product attributes *jointly* determine sellers' disclosure incentives?
- How might such incentives change over time?
- Does mandatory disclosure always help consumers? (It obviously hurts the seller)

Model setup: the seller

- Monopoly has no production or disclosure cost
- Product has two attributes: vertical v and horizontal l
 - Eg: age vs. grape variety of wines
- Both are random variables: $v \geq 0$ and $0 \leq l \leq 1$

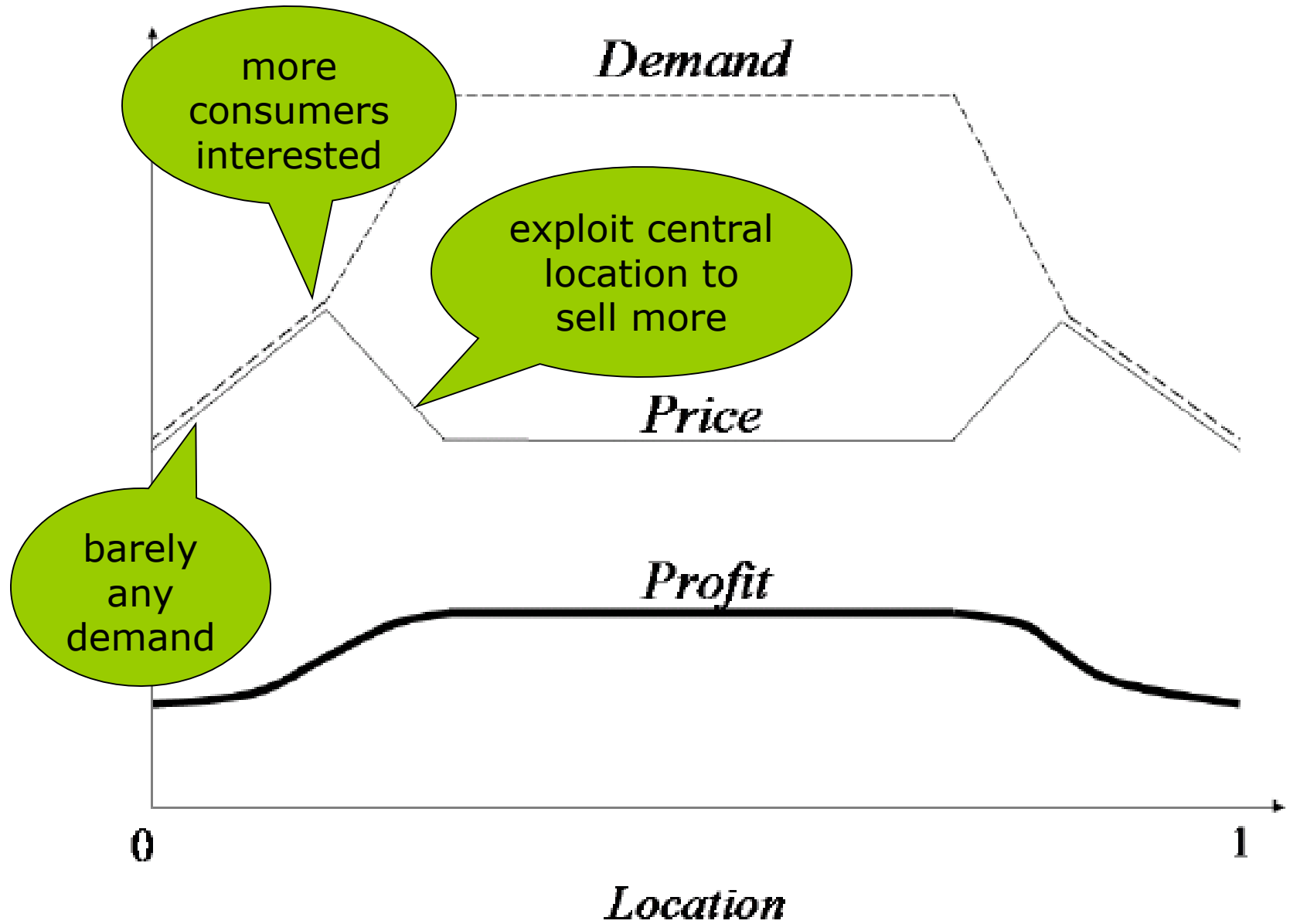
Model setup: consumers

- Consumers of mass 1 are uniformly distributed in taste space $c \sim U[0,1]$
- A consumer knows her own location and has unit demand
- Consumer c 's utility:

$$U(c; p; v, l) \equiv v - |c - l| - p.$$

Complete information benchmark

- Realizations of v and l are known: very well understood products / search goods
- Monopolist sets price to maximize profit
- **Prop 1:** equilibrium profit and demand increase in v and decrease in $d = |l - 0.5|$, price increases in v but may not be monotonic in d



Known quality, unknown location

- Stage 1: Nature determines l . The monopolist knows l ; consumers know $g(l)$ but not l
- Stage 2: Monopolist chooses whether to disclose l
- Stage 3: Monopolist chooses a price; consumers decide whether to buy

Fully Revealing Eq. (FRE)

- **Prop 2:** a FRE always exists
- Consumers believe firm is located at 0 whenever it chooses nondisclosure
- In a FRE, price, demand and profit are the same as in the complete info. benchmark

Partially Revealing Eq. (PRE)

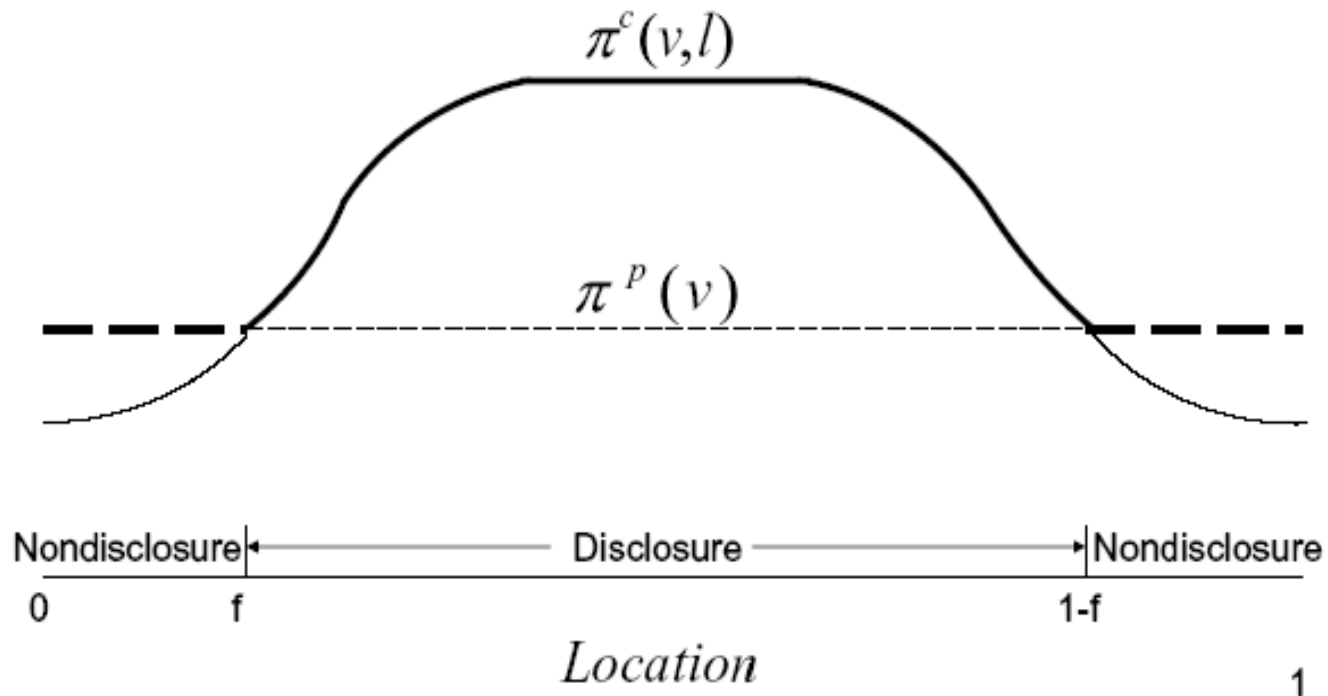
- Lemma 1: all nondisclosing firms make the same profit in a PRE, π^P
 - Why?

- Lemma 2: in a PRE,

$$\pi^c(v, 0) = \pi^c(v, 1) \leq \pi^P \leq \pi^c(v, 0.5)$$

PRE: disclosure threshold

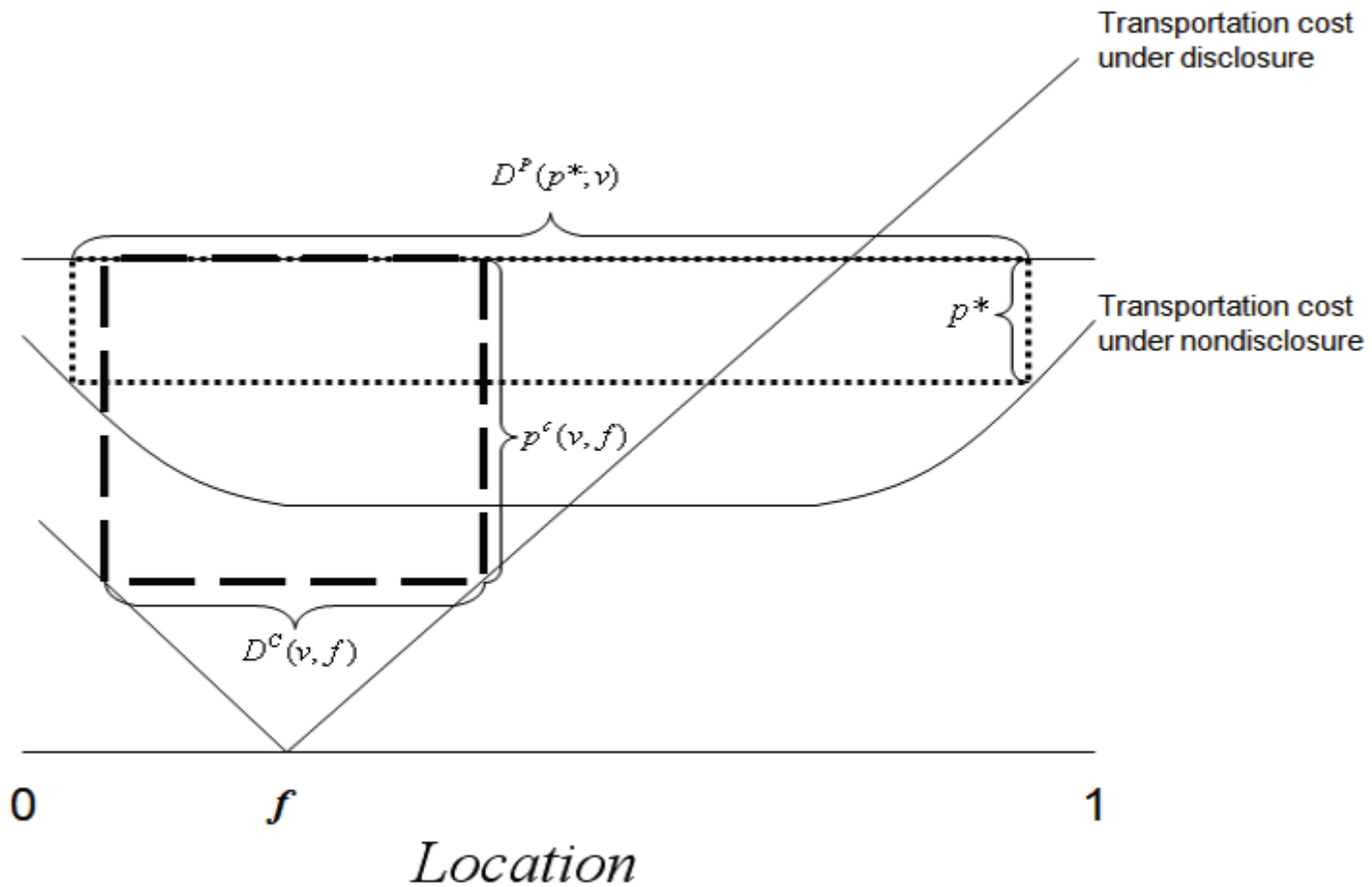
- **Prop 3:** monopolist chooses disclosure iff his complete information profit is higher than π^P



PRE: existence

- Assume that location is symmetrically distributed around .5
- **Prop 4:** A PRE in which all nondisclosing firms charge the same price exists when $g(0) > 0$ and $v > 2 - \sqrt{2}$
- A PRE with $f=0.5$ exists when $v \geq 1$
- Unraveling equilibrium is not unique

Intuition: why is firm f indifferent?



PRE: monotonicity

- **Prop 5:** When quality increases, fewer firms choose disclosure in the HPSE
 - When quality is high, consumers always buy, disclosure lowers prices (La Mer, Sisley)
 - When quality is low, disclosure secures demand from well-matched consumers (Clinique, EL)
- So what about research statements?

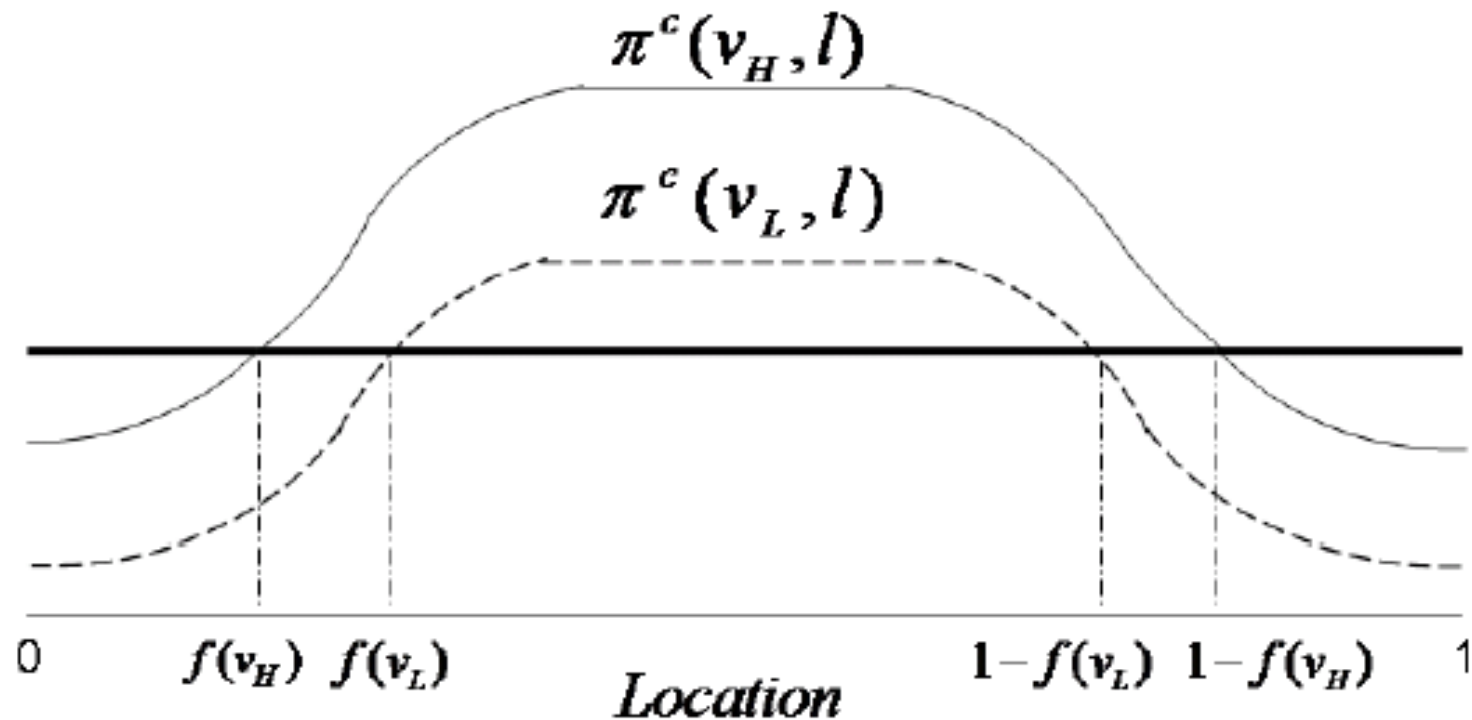
Magazine market

TABLE 1 Decisions of award-winning magazines to offer free trials

	No. of Mags	No. of Mags with Trials	% of Mags with Trials
Amazon.com	100	49	49
2000-2006 Award	13	4	31
2001-2006 Award	11	3	27
2003-2006 Award	9	2	22
2005-2006 Award	6	1	17

Unknown quality and location

Reversed monotonicity:



Existence of PRE

- Assume symmetric location distribution
- PRE exists when $\underline{v} > 2 - \sqrt{2}$ and $h(\underline{v}, 0) > 0$
- One can find examples in which no firm discloses its location: quality is close
- The symmetry assumption is not essential to the existence of PRE

Other implications

- Mandatory disclosure hurts the seller
 - consumers: higher price, no regret
 - Locations mostly central → hurt consumers
- More measures discourage participation in surveys
- Disclosure dynamics:
 - High quality firms decrease disclosure to exploit reputation
 - Low quality firms increase disclosure to exploit match

Thank You!



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Proof of Prop 5 (Monotonicity)

- Claim 1: nondisclosing firms' demand is always higher than the indifferent firm's complete-info demand
- Claim 2: when v goes up by Δv , nondisclosing firms can increase their prices by Δv without lowering demand
- Claim 3: when v goes up by Δv , the indifferent firm's complete-info profit goes up by Δv times its original demand