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# Unit 10: H&R Block/TaxACT

CLASS 15 SLIDES

For October 24, 2019

## Part 1. Market Definition

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Merger Antitrust Law

Georgetown University Law Center

Dale Collins



**TaxAct**<sup>®</sup>

# The deal

## ■ H&R Block to acquire TaxAct

- Signed October 13, 2010
- \$287.5 million (all cash)

## ■ H&R Block

- Missouri corporation headquartered in Kansas City, MO
- Employees: 7900 full-time (107,200 including seasonal employees)
- Revenues: \$3.8 billion
- Tax products
  - Retail (filed 14.7 million returns)
    - Has a brick-and-mortar store within 5 miles of most Americans
    - 10,099 company-owned and franchised locations (average fee: \$190) (2011 10-K)
  - Software products: “H&R Block At Home” (2.2 million returns)
  - Online tax preparation (using H&R Block At Home™ Online Tax Program) (3.7 million)

## ■ TaxACT

- Delaware corporation headquartered in Cedar Rapids, Iowa
- Sells TaxACT-branded tax preparation products and services (5.2 million returns)
- “Freeium” business model

# Tax preparation—Three methods

1. Manual (pen and paper)
2. “Assisted” preparation (hiring a tax professional or going to a retail tax store)
  - ❑ H&R Block operates the largest retail tax store chain in the U.S.
  - ❑ Jackson-Hewitt (retail tax stores)
  - ❑ Liberty Tax Service (retail tax stores)
  - ❑ Individual tax preparers
3. Digital "do-it-yourself" (DDIY) tax software—disks, downloads, and online (35-40 million returns)
  - ❑ *Intuit* (62.2%) — TurboTax
  - ❑ *H&R Block* (15.6%) — “H&R Block At Home” (6.69 million units sold)
  - ❑ *TaxACT* (12.8%) (5 million returns) — “Freemium”
  - ❑ *Others* (9.4%) [including TaxHawk/FreeTaxUSA (3.2%); TaxSlayer (2.7%)]

# Deal rationale

## ■ H&R Block explanation

- Deal allows combined companies to reach more customers with different needs
  - Companies sell complementary products
    - HRB: higher-end, higher-priced products
    - TaxACT: lower functionality, lower-priced products
  - Will maintain both HRB and TaxACT brands (Op. 9)
  - Echoes of Hertz/Dollar thrifty?

## ■ DOJ theory

- IRS was working to promote efilings
  - Partnering with digital tax preparation firms through the Free Software Alliance to create free or “value” products
  - But at request of companies imposed restrictions on which taxpayers could qualify for free products on the IRS web site
- TaxACT was the first company to offer a free DDIY product to all taxpayers for federal filings on its own website
- HRB concerned that “free” DDIY products would undermine HRB paid-DDIY products
- HRB may have targeted TaxACT for acquisition to eliminate a firm that threatened to disrupt HRB’s business model

# DOJ complaint

- *Filed*: May 23, 2011 (7 months after signing)
- *Claim*: Acquisition, if consummated, would violate Section 7:
  - 3 → 2 in digital “do-it-yourself” tax software (disks and online)
  - Would result in a duopoly of Intuit (62.2%) and H&R Block (28.4%)
    - 2FCR = 90.2%
    - Next largest firm: TaxHawk (3.2%)
  - Theories of anticompetitive harm:
    - Coordinated effects
    - Unilateral effects
- *Prayer*: Permanent injunctive relief blocking the transaction

# DOJ strategy

1. Narrow relevant market to DDIY products
2. Use *PNB* presumption to establish the prima facie case
3. Present supporting evidence and reasoned economic arguments on anticompetitive effect
  - To follow Merger Guidelines and make the case more persuasive
  - Focus on likely price effects
4. Anticipate and rebut likely defenses
  - Should know from arguments made by parties in the merger review
  - Focus on—
    - Barriers to entry
    - Lack of sufficient cognizable efficiencies
5. Press the public equities/minimize or negate private equities

# Merger parties' strategy

1. Expand relevant product market to all tax preparation methods to negate the use of the *PNB* presumption
    - ❑ Argue functional substitutability for expanded market
    - ❑ Shares in expanded market too low to trigger *PNB* presumption
      - All tax preparation methods: 140 million returns total
      - HRB ≈ 6.69 million returns (4.7%)
      - TaxACT ≈ 5 million returns (3.6%)
- |                      |
|----------------------|
| Combined share: 8.3% |
| Delta: 34            |
2. Rebut theories of anticompetitive effect
    - ❑ Market not susceptible to coordinated effects
    - ❑ Merger would not create anticompetitive unilateral effects
  3. Offer downward pricing pressure defenses
    - ❑ Entry defense
    - ❑ Post-merger efficiencies offset any upward pricing pressure
  4. Largely ignore equities—Cannot defeat the DOJ on this element



# The trial

## ■ Complaint

- Filed May 23, 2011
- In the District of Columbia

## ■ Judge Beryl A. Howell

- Nominated by President Barack Obama
- Sworn in: December 27, 2010
- Currently Chief Judge (as of March 16, 2016)

## ■ Trial

- Parties stipulate to a TRO—proceed to trial on the merits
  - Court consolidated proceedings under Rule 65(a)(2)
- Trial began on September 6, 2011 (nine days)—4 months after complaint filed
  - 8 fact witnesses/3 expert witnesses
  - Additional testimony by affidavit and deposition
  - 800 exhibits from each side
- Decision: Permanent injunction ordered on October 31, 2011 (filed under seal)
  - < 6 months after complaint filed



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# Market Definition

## Part 1: Qualitative evidence

# Evidence

- Types of evidence

1. Business documents of the merging parties and other companies
2. Testimony of fact witnesses
3. Analysis by expert economists

- Key questions

- Which firms does the company regard as its primary competitors when setting prices, deciding on products attributes or improvements, or in considering strategy?
- Which firms does the company track for prices, product offering, product attributes?

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# Evidence: DDIY belong in the market

- When setting prices and product attributes, merging parties—
  - Look almost exclusively at other DDIY firms and rarely look at other firms
  - Rarely consider loss of DDIY customers to other tax preparation methods
- TaxACT CIM identified HRB and TurboTax as main competitors
- TaxACT strategy documents: Freemium strategy designed to attract customer from other DDIY competitors

# Evidence: Other methods do not belong

- Consumer experience is very different from DDIY experience
  - Different technology
  - Different prices
  - Different convenience levels
  - Different time investments
  - Different type of interaction by the customer with the product
- Prices differ significantly
  - TurboTax: \$55
  - HRB: \$25 (average)
  - TaxACT: Freemium
  - Assisted: \$150-\$200 (not within SSNIP)

} DDIY average price: \$44.13
- No detectable switching based on small changes in relative price
  - Switching that does occur appears the result of changes in tax condition,
    - Not price driven
  - HRB and 3P executives testified that they do not believe that their DDIY compete closely with manual or assisted

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# Market Definition

## Part 1: Quantitative evidence

# Experts

- DOJ: Frederick R. Warren-Boulton
  - Ph.D. in economics (Princeton University)
  - Private consultant (Ankura)
  - Formerly ATD chief economist
  - Expert witness in multiple cases



- Merging parties:
  - Ph.D. in economics (MIT)
  - Private consultant (NERA)
  - First merger case as a testifying expert



# Federal Rules of Evidence

## ■ Rule 602: General rule

"A witness may testify to a matter only if evidence is introduced sufficient to support a finding that the witness has *personal knowledge* of the matter."

## ■ Rule 702: Exception for expert opinion evidence<sup>1</sup>

Personal qualifications:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify *in the form of an opinion* or otherwise if:

Relevance and helpfulness:

(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

Sufficiency of data:

(b) the testimony is based on sufficient facts or data;

Reliability of methods:

(c) the testimony is the product of reliable principles and methods; and

Reliability of application:

(d) the expert has reliably applied the principles and methods to the facts of the case.

<sup>1</sup> See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993); *Ashcroft v. Iqbal*, 556 U.S. 662 (2009).



# Federal Rules of Evidence

- Discovery: Rule 26(a)(2)—Disclosure of expert testimony: Requires
- Identity of any witness who may be used at trial to present expert opinion testimony
- Written report prepared and signed by the witness containing:
  - a complete statement of all opinions the witness will express and the basis and reasons for them;
  - the facts or data considered by the witness in forming them;
  - any exhibits that will be used to summarize or support them;
  - the witness's qualifications, including a list of all publications authored in the previous 10 years;
  - a list of all other cases in which, during the previous 4 years, the witness testified as an expert at trial or by deposition; and
  - a statement of the compensation to be paid for the study and testimony in the case

# Federal Rules of Evidence

- Departures from the expert report
  - New evidence not contained within the expert's report or testimony that significantly departs from the report is objectionable and may be stricken from the record by the court
  
- Observations
  - Rule 26(a)(2) expert reports are discovery products and are not given to the court as a matter of course
  - Experts typically testify at trial
    - But courts can require written reports or written direct testimony

# DOJ's expert evidence

- Warren-Boulton conclusion: Relevant product market is DDIY
  - Hypothetical monopolist of DDIY products could profitably impose a SSNIP *for at least one* DDIY product, and
  - consumer substitution to assisted methods or pen-and-paper would be insufficient to defeat the SSNIP
  
- Organization of testimony
  - Results of review of regular course of business documents
  - Hypothetical monopolist test
  - Merger simulation

# DOJ's expert evidence

1. Started with DDIY as the initial provisional market
  - Functionally similar from user perspective
    - Fundamentally similar service
    - Similar user experience: User sits at computer and interacts with the DDIY software, which prompts user for information
  - Review of defendants' documents indicated they viewed DDIY products in same market
  - *Court*: Agreed that this is an appropriate starting place

# DOJ's expert evidence

## 2. Ruled out manual preparation (in initial provisional market)

- ❑ “Gradual migration of customers to DDIY from more traditional methods like pen-and-paper”
- ❑ DDIY growing in share while manual declining
- ❑ No correlation of switching to manual with changes in yearly average DDIY prices
- ❑ IRS data indicates that switching to manual from DDIY appeared to be driven by decreases in tax return complexity, not relative prices

# DOJ's expert evidence

## 3. Ruled out assisted preparation (in initial provisional market)

- Growth in DDIY not at expense of assisted (from documents and testimony)
- HRB internal studies and IRS data indicate that switching from DDIY to assisted is correlated to increases in tax complexity
- Using IRS switching data from 2004-2009, increase in relative price of assisted was not associated with:
  - Decreases in relative share of assisted, or
  - Increases in relative share of DDIY

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# DOJ's expert evidence

- Used two quantitative tests to confirm DDIY as the relevant market
  - A critical loss implementation of the hypothetical monopolist test
  - Merger simulation

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# Critical Loss Analysis



# Critical loss

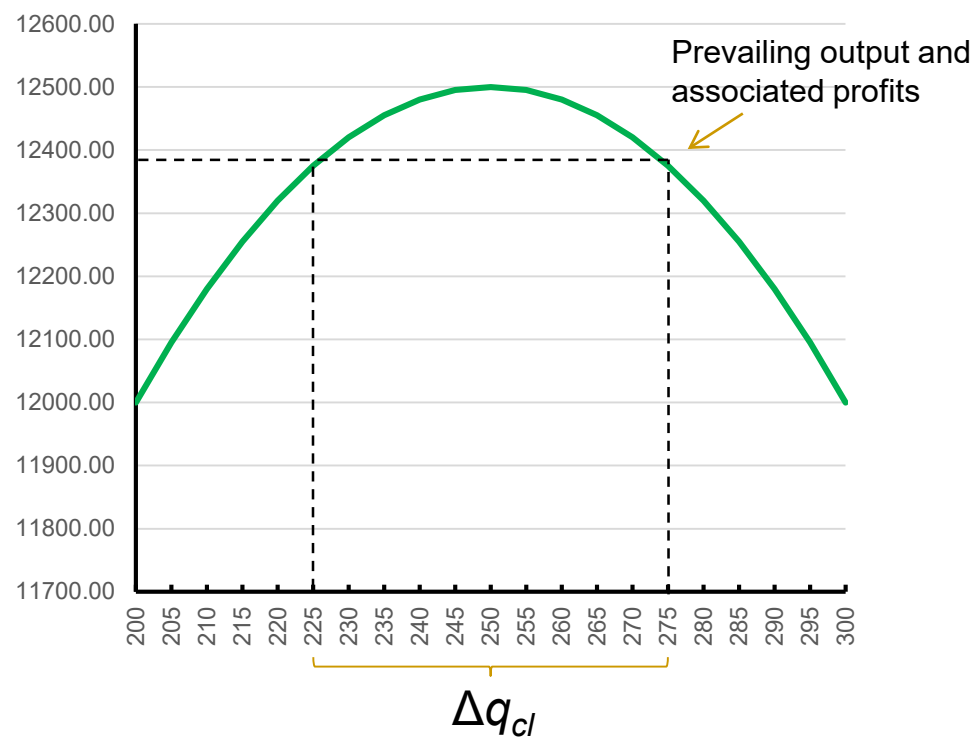
## ■ The basic idea

- The *critical loss*  $\Delta q_{cl}$  for a given SSNIP is the maximum number of units the firm can lose and still have the SSNIP be profitable
  - Can be expressed either in units or percentage

## ■ Example

- Say for a firm (or a hypothetical monopolist)
  - $p_1 = 145$
  - $q_1 = 275$
  - $F = 0$
  - $mc = 100$  (constant)
  - $\pi_1 = 12,375$
- If the firm reduces its output to 225, it makes the same profits
- Then  $\Delta q_{cl} = 275 - 225 = 50$

Profits as a Function of Quantity



# Critical loss

## ■ Formulas for critical loss

- We can express the critical loss  $\Delta q^*$  algebraically in two equivalent ways:<sup>1</sup>

- As an equality of total profits after and before the price increase:

$$(p + \Delta p - c)(q - \Delta q_{cl}) = (p - c)q$$

Breakeven condition

- As an equality of the gross gain in profits on retained sales and the gross loss in profits from lost sales:

Gain on retained sales

$$\Delta p (q - \Delta q_{cl}) = (p - c) \Delta q_{cl}$$

Loss of margin on lost sales

- Note: Critical loss is a function of  $q$ , that is, the magnitude of  $q_{cl}$  depends on the starting point  $q$  as well as on  $p$  and  $c$

1. Solving for  $\Delta q_{cl}$  provides a formula for the *critical loss in units*:

1. Unit critical unit loss formula:

$$(CL =) \Delta q_{cl} = \frac{q \Delta p}{(p + \Delta p) - c}$$

<sup>1</sup> This assumes zero fixed costs and constant marginal costs.

# Critical loss

- Formulas for critical loss

2. Divide Equation 1 by  $q$  to obtain *percentage critical loss*:

$$\begin{aligned} (\%CL) \frac{\Delta q_{cl}}{q} &= \frac{\Delta p}{(p + \Delta p) - c} = \frac{\frac{\Delta p}{p}}{\frac{\Delta p}{p} + \frac{p - c}{p}} \\ &= \frac{\delta}{\delta + m} \end{aligned}$$

2. Percentage critical loss formula:

where

$\delta$  is the percentage price increase:  $\delta = \frac{\Delta p}{p}$

$m$  is the percentage gross margin:  $m = \frac{p - c}{p}$

<sup>1</sup> This assumes zero fixed costs and constant marginal costs.

# Critical loss

## ■ Formulas for critical loss

3. We can also define the *critical elasticity*  $\varepsilon_{cl}$  as the maximum elasticity that will profitably support a price increase of  $\delta$ :

Definition of own-elasticity: 
$$|\varepsilon_{cl}| = \frac{\frac{\Delta q_{cl}}{q}}{\frac{\Delta p}{p}} = \frac{\Delta q_{cl}}{q} \frac{1}{\delta} \Rightarrow \frac{\Delta q_{cl}}{q} = \delta |\varepsilon_{cl}|$$

Percentage critical loss formula: 
$$\frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m} \Rightarrow \delta |\varepsilon_{cl}| \cong \frac{\delta}{\delta + m},$$

Cancelling the  $\delta$ s: 
$$|\varepsilon_{cl}| \cong \frac{1}{\delta + m}$$

### 3. Critical elasticity formula

NB: By convention,  $\Delta q_{cl}$  is a *positive* number. To make the signs work, we have to use the absolute value of the elasticity. *Always watch for the sign of  $\Delta q$  in any equation.*

- Accordingly, when the own-elasticity of demand  $\varepsilon$  is less than the critical elasticity  $\varepsilon^*$  (i.e.,  $\varepsilon$  is more inelastic than  $\varepsilon^*$  or equivalently  $|\varepsilon| < |\varepsilon^*|$ ), then for a small enough SSNIP the price increase will be profitable

- We can express this as:

$$|\varepsilon| < \frac{1}{\delta + m}.$$

# Critical loss and market definition

- The basic idea
  - Recall that under the hypothetical monopolist test, a candidate market is a relevant market if a hypothetical monopolist could profitably raise prices in the candidate market by a SSNIP.
  - So for any candidate market with prevailing aggregate output  $q$  and price  $p$  and a SSNIP  $\Delta p$ —
    - if the associated change in output  $\Delta q$  is less than the critical loss  $\Delta q_{cl}$ ,
    - then a hypothetical monopolist could profitably raise price by the SSNIP
    - and the candidate market is a relevant market

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# Critical loss and market definition

- Example 1

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. When the price for both products is increased by \$5, each firm loses 100 units to outside the market. Do A and B constitute a relevant market under the 2010 Guidelines?

# Critical loss and market definition

## ■ Example 1

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. When the price for both products is increased by \$5, each firm loses 100 units to outside the market. Do A and B constitute a relevant market under the 2010 Guidelines?

Parameters		
Price	$p$	100
Cost	$c$	60
Gross margin	$m$	40
Market output	$Q$	2400
SSNIP	$\Delta p$	5
Customer loss	$\Delta Q$	-200

# Critical loss and market definition

## ■ Example 1

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. When the price for both products is increased by \$5, each firm loses 100 units to outside the market. Do A and B constitute a relevant market under the 2010 Guidelines?

Parameters		
Price	p	100
Cost	c	60
Gross margin	m	40
Market output	Q	2400
SSNIP	$\Delta p$	5
Customer loss	$\Delta Q$	-200

Critical loss	
$\Delta q^* = \frac{q\Delta p}{(p + \Delta p) - c}$	
q $\Delta p$	12000
(p+ $\Delta p$ )-c	45
CL	266.6667

From the breakeven condition (see earlier slide)

Actual loss (200) is less than the critical loss (266.67), so A and B are a relevant market



# Critical loss and market definition

## ■ Example 1

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. When the price for both products is increased by \$5, each firm loses 100 units to outside the market. Do A and B constitute a relevant market under the 2010 Guidelines?

Parameters			Incremental profit calculations		Critical loss
Price	p	100	Gain = (Q+ΔQ)Δp		$\Delta q^* = \frac{q\Delta p}{(p + \Delta p) - c}$
Cost	c	60	Q + ΔQ	2200	
Gross margin	m	40	Δp	5	
Market output	Q	2400	Gain	11000	
SSNIP	Δp	5	Loss = mΔQ		$q\Delta p \quad 12000$ $(p+\Delta p)-c \quad 45$ $CL \quad 266.6667$
Customer loss	ΔQ	-200	ΔQ	-200	
			m	40	
			Loss	-8000	
			Net	3000	

From the breakeven condition (see earlier slide)

Actual loss (200) is less than the critical loss (266.67), so A and B are a relevant market

*Incremental profit calculations confirmation:* Since the gain exceeds the loss, a hypothetical monopolist of A and B could profitably raise price by 5% and so A and B are a relevant market

# Homework problem 1

Products A and B are being tested as a candidate market. The market price for each unit of either product is \$300, each type of product has a constant incremental cost of \$160 per unit and aggregate sales of 1000 units. When the price for both products is increased by \$15, each firm loses 100 units to products other than A and B. What is the critical loss for the candidate market of products A and B? Do A and B constitute a relevant market under the hypothetical monopolist test using critical loss analysis and SSNIP of 5%?

## ■ “Brute force” method

- Breakeven condition:

$$p_1 q_1 - c q_1 = (p_1 + \Delta p_1)(q_1 - \Delta q_{cl}) - c q_1$$

- Rearranging:

$$(p_1 - c) q_{11} = (p_1 + \Delta p_1 - c)(q_1 - \Delta q_{cl})$$

- Substituting parameters:

$$(300 - 160) 2000 = (300 + 15 - 160)(2000 - \Delta q_{cl})$$

- Solving:  $\Delta q_{cl} = 193.548$  units
- Actual loss:  $\Delta q = 200$  units
- *Answer:* Since  $\Delta q > \Delta q_{cl}$ , Products A and B are technically NOT a relevant product market under the Merger Guidelines

Although it is so close that it is unlikely that a court would reject A and B as a relevant market simply because they failed to satisfy the HMT by a few units. Neither precision nor accuracy are hallmarks of market definition.

# Homework problem 2

In *FTC v. Occidental Petroleum Corp.*, No. 86-900, 1986 WL 952 (D.D.C. Apr. 29, 1986), the FTC challenged the pending acquisition by Occidental Petroleum, a major producer of polyvinyl chloride (“PVC”), of Tenneco’s PVC business. Both companies produced PVC in plants in the United States. The parties agreed that the relevant product markets were suspension homopolymer PVC and dispersion PVC, and the PI proceeding focused largely on the relevant geographic market. The FTC alleged that the relevant geographic market was the United States for both types of products; the merging parties argued that the relevant geographic market was worldwide. In the Section 13(b) proceeding for a preliminary injunction, the evidence showed that if the price of all suspension homopolymer PVC produced in the United States was increased by 5%, U.S. customers would divert about 17% of their purchases to imports from foreign suppliers (who were ready to serve these customers). The evidence also showed that that if the price of all dispersion PVC produced in the United States was increased by 5%, U.S. customers would divert about 12% of their purchases to imports from foreign suppliers (again, who were ready to serve these customers). The evidence in the hearing also showed that the percentage gross margins for homopolymer PVC and dispersion PVC were 28% and 45%, respectively. Was the FTC correct that the relevant geographic market was the United States using the hypothetical monopolist test and a SSNIP of 5%?

# Homework problem 2

- Use percentage critical loss method

- Formula:

$$\% \Delta q_{cl} = \frac{\delta}{\delta + m}$$

- Substituting parameters:

$$\% \Delta q_{cl-suspension PVC} = \frac{5\%}{5\% + 28\%} = 15.15\%$$

$$\% \Delta q_{cl-dispersion PVC} = \frac{5\%}{5\% + 45\%} = 10.00\%$$

- Actual percentage loss:

- Suspension PVC: 17%
    - Dispersion PVC: 12%

- *Answer:* The percentage actual loss is greater than the percentage critical loss for both product types, so neither product type technically is its own relevant product market

- Same caution as with HW 1

# Homework problem 3

Premium ice cream sells at \$4.00/pint and has a constant marginal cost of \$2.25/pint. The own-elasticity of aggregate demand for premium ice cream is -1.9, with almost all diversion going to regular ice cream. Two premium ice cream manufacturers proposed to merge. Is premium ice cream a relevant product market under the hypothetical monopolist test under a 5% SSNIP, or should the market be expanded to include regular ice cream?

## ■ Use critical elasticity method

- Formula:

$$|\varepsilon_{cl}| = \frac{1}{\delta + m}$$

- The margin  $m$  is equal to 43.75% (= (4.00 – 2.25)/4.00)
- Substitute parameters:

$$|\varepsilon_{cl}| = \frac{1}{5\% + 43.75\%} = 2.05$$

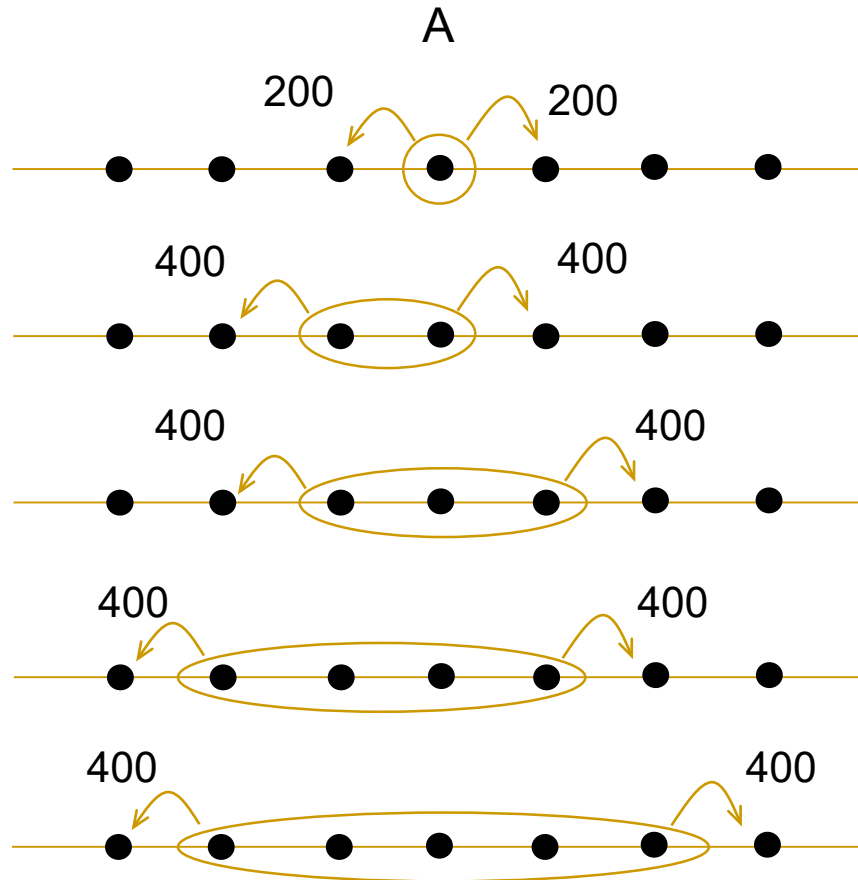
- Actual own-elasticity of premium ice cream: -1.9
- *Answer:* Since the absolute value of the own-elasticity of ice cream (1.9) is less than the absolute value of the critical elasticity (2.05), premium ice cream is a market

# Critical loss and market definition

- Example 2: Gas stations on a road
  - Assume that there is an identical gas station every mile on a straight road. Each gas station charges \$3.25 per gallon, has an incremental cost of \$2.50, and sells 1000 gallons. When the price at a station is increased by 5% (holding the price at all other gas stations constant), the station loses customers who in the aggregate buy 400 gallons. No customer will travel more than one mile, however, to avoid a 5% price increase. For a given station A and assuming a SSNIP of 5%, what is the relevant market?

# Critical loss and market definition

- Example 2: Gas stations on a road

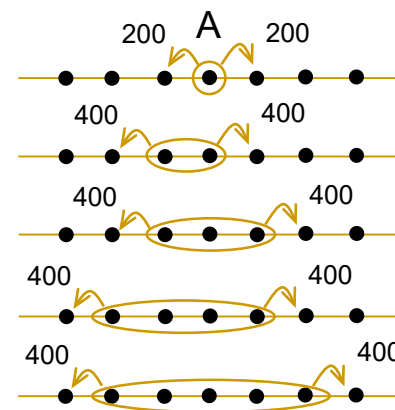


# Critical loss and market definition

## ■ Example 2: Gas stations on a road

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Price	p	3.25
Cost	c	2.50
Gross margin	m	0.75
Percentage SSNIP		5.0%
Actual SSNIP		0.1625
Customers/station		1000
Customer loss		400





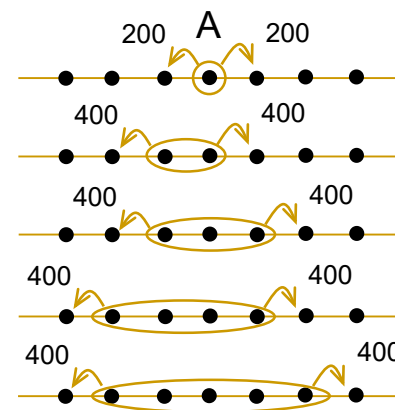
# Critical loss and market definition

## ■ Example 2: Gas stations on a road

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Price	p	3.25
Cost	c	2.50
Gross margin	m	0.75
Percentage SSNIP		5.0%
Actual SSNIP		0.1625
Customers/station		1000
Customer loss		400

Stations in the market	Q	$\Delta Q$	Gain	Loss	Net
1	1000	400	97.50	300.00	-202.50
2	2000	800	195.00	600.00	-405.00
3	3000	800	357.50	600.00	-242.50
4	4000	800	520.00	600.00	-80.00
5	5000	800	682.50	600.00	82.50



# Critical loss and market definition

## ■ Estimating actual loss

- If actual loss is not given, we can estimate it from the own-elasticity if—
  - Premerger pricing satisfies the Lerner Condition ( $\varepsilon = 1/m$ ), and
  - All demand functions are linear in price in the vicinity of the premerger equilibrium point
- First-order approximation of actual loss:

$$\frac{\frac{\Delta q}{q}}{\frac{\Delta p}{p}} \equiv \varepsilon \Rightarrow \frac{\Delta q}{q} \cong \frac{\Delta p}{p} \varepsilon = \delta \varepsilon$$

where  $\varepsilon$  is the own-elasticity of demand of the monopolist

that is, the percentage actual loss is approximately equal to the percentage price change times the own-elasticity of demand

- Summary

$$\frac{\Delta q}{q} \cong \delta \varepsilon$$

4. Percentage actual loss formula

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# Critical loss and market definition

## ■ Example 3

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. The residual demand elasticity  $\epsilon$  for each if is -2.0. Do A and B constitute a relevant market under the 2010 Guidelines?

# Critical loss and market definition

## ■ Example 3

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. The residual demand elasticity  $\varepsilon$  for each is -2.0. Do A and B constitute a relevant market under the 2010 Guidelines using a 5% SSNIP?

1. Summarize parameters and variables:

$$p = \$100$$

$$c = \$60$$

$$\text{Margin } m = \$40$$

$$\text{Total market } Q = q_1 + q_2 = 2400$$

$$\text{Percentage margin } m = \frac{p - c}{p} = \frac{100 - 60}{100} = 40.0\%$$

$$\text{SSNIP } \delta = 5\%$$

# Critical loss and market definition

## ■ Example 3

- Products A and B are being tested as a candidate market. Each sells for \$100, has an incremental cost of \$60, and sells 1200 units. The residual demand elasticity  $\varepsilon$  for each is -2.0. Do A and B constitute a relevant market under the 2010 Guidelines?

Summary:

$$P = \$100$$

$$C = \$60$$

$$\text{Margin} = \$40$$

$$\text{Total market } Q = q_1 + q_2 = 2400$$

$$\text{Percentage margin } m = \frac{p - c}{p} = \frac{100 - 60}{100} = 40.0\%$$

$$\text{SSNIP } \delta = 5\%$$

$$\text{Percentage critical loss } CL = \frac{\delta}{\delta + m} = \frac{5\%}{5\% + 40\%} = 11.1\%$$

$$\text{Estimated actual loss per firm: } L_A = L_B \cong \delta \varepsilon = \frac{5}{100} \times 2.0 \cong 100$$

$$\text{Estimated percentage total actual loss from the candidate market: } \frac{100 + 100}{1200} = 8.3\%$$

*Conclusion:* Since percentage actual loss is less than critical loss, the candidate market is a relevant market

# Critical loss

## ■ Summary of formulas

- *Unit critical unit loss:*

$$(CL =) \Delta q_{cl} = \frac{q \Delta p}{(p + \Delta p) - c}$$

- *Percentage critical loss:*

$$(\%CL =) \frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m}$$

where  $\delta$  is the percentage price increase:  $\delta = \frac{\Delta p}{p}$

$m$  is the percentage gross margin:  $m = \frac{p - c}{p}$

- *Critical elasticity:*

$$|\varepsilon_{cl}| \cong \frac{1}{\delta + m}$$

where  $\varepsilon$  is the own-elasticity of demand of the monopolist (i.e., the aggregate demand curve)

- *Percentage actual loss:*

$$\frac{\Delta q}{q} \cong \delta \varepsilon$$