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# Anticompetitive Effect in Horizontal Mergers

Class 16 class notes

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Merger Antitrust Law

Fall 2018 Georgetown University Law Center

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# Topics

- Refresher: Anticompetitive effect under Section 7—Class 15
- The *PNB* presumption—Class 15
- Entry/Expansion/Repositioning Defenses—Class 15
- Coordinated effects—Class 15
- Eliminating “mavericks”—Class 15
- Unilateral effects—Class 16
- Other defenses—Class 16
  - “Power buyer”
  - Efficiencies
  - Failing firm

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# Unilateral Effects

REVIEW 2010 DOJ/FTC HORIZONTAL MERGER GUIDELINES § 6

# Unilateral effects

## ■ Definition

- Unilateral effects is a theory of anticompetitive harm that goes to the elimination of significant “local” competition between the merging firms, so that the merged firm can raise prices independently of how other incumbent firms react.

A merger is likely to have unilateral anticompetitive effect if the acquiring firm will have the incentive to raise prices or reduce quality after the acquisition, independent of competitive responses from other firms.<sup>1</sup>

- The idea is that can increase prices to an identifiable subset of customers in the market even *without* any accommodating conduct from the nonmerging firms in the market, and that this price increase is a cognizable anticompetitive effect under Section 7<sup>2</sup>
  - The concept of unilateral effects as a theory of merger anticompetitive harm was introduced in the 1992 DOJ/FTC Horizontal Merger Guidelines
  - The theory has been accepted as valid under Section 7 by the courts<sup>2</sup>

<sup>1</sup> United States v. H&R Block, Inc., 833 F. Supp. 2d 36, 81 (D.D.C. 2011).

<sup>2</sup> See, e.g., United States v. Anthem, Inc., 236 F.Supp.3d 171, 215-20 (D.D.C.), *aff'd*, 855 F.3d 345 (D.C. Cir. 2017) ; FTC v. Sysco Corp., 113 F. Supp. 3d 1, 61-65, 67-70 (D.D.C. 2015); *H&R Block*, 833 F. Supp. at 81-88; FTC v. CCC Holdings Inc., 605 F. Supp. 2d 26, 67-72 (D.D.C. 2009) (but finding a failure of proof); FTC v. Foster, No. CIV 07-352 JBACT. 2007 WL 1793441, at \*27-\*31 (D.N.M. May 29, 2007); United States v. Oracle Corp., 331 F. Supp. 2d 1098,1113-23 , 1166-73 (N.D. Ca. 2004) (but finding a failure of proof).

# Unilateral effects

- The basic idea
  - Competitor firms A and B are going to merge
  - Premerger, firm A sets price so that marginal revenue equals marginal cost.
    - If the firm raises its price, then its quantity will fall and MR will become greater than MC, and the firm loses profits. The firm should lower its price.
    - If the firm lowers its price, then its quantity will increase and MR will become less than MC, and the firm loses profits. The firm should raise its price.
  - Postmerger, look at the pricing incentives of firm A
    - Assume that the combined firm holds product B's price remains at its premerger level.
    - If the combined firm lowers the price of product A, then A's quantity will increase. Some of this increase in demand will come from lost sales of product B (as B's marginal customers switch to A in light of A's lower relative price). So a cost to the combined firm is the lost marginal profits that product B would have earned if the combined firm had not raised the price of product A. (B's lost profits if irrelevant to A premerger.)
      - The loss of marginal profits on product B's diverted sales is an *opportunity cost* of selling an additional unit of product A due to the merged firm's ownership of both products
    - When we take into account B's marginal profit loss, A's marginal revenues postmerger are less than A's marginal revenues premerger at any given price. This means that at A's premerger price, its postmerger marginal revenues are less than its marginal costs, so that A should raise its price.

# Unilateral effects

- The basic idea

- Remember the breakeven condition for firm A:

$$\underbrace{\Delta p_A (q_A + \Delta q_A)}_{\text{Gain on retained sales}} = \underbrace{(p_A - c_A) \Delta q_A}_{\text{Loss of margin on lost sales}}$$

- Rearranging:

$$\underbrace{p_A + \frac{\Delta p_A}{\Delta q_A} (q_A + \Delta q_A)}_{\text{Marginal revenue}} = \underbrace{c_A}_{\text{Marginal cost}}$$

- Now increase  $q$  by  $\Delta q$  (and so lower  $p$  by  $\Delta p$ ). Some of the increased sales come from firm B. Call this  $\Delta q_{B \rightarrow A}$ . Firm B loses its margin on those sales:

$$\text{Firm B's loss of margin: } \Delta q_{B \rightarrow A} (p_B - c_B)$$

- Suppose that A and B merge. Now A must take into account B's loss of margin when increasing A's sales volume. This reduces the combined firm's marginal revenue, and so requires the merged firm to reduce output and raise price to reequilibrate marginal revenue and marginal cost

# Unilateral effects

## ■ The basic idea

- Look at the merged firm's breakeven condition when we increase A's output by one unit and so decrease A's price (holding B's price constant and allocating all profits and losses to A):

Sign of the term

$$p_A + \frac{\Delta p_A}{\Delta q_A} (q_A + \Delta q_A) + \underbrace{\Delta q_{B \rightarrow A} (p_B - c_B)}_{\text{Opportunity cost re Firm B}} = c_A$$

Opportunity cost re Firm B  
(i.e., B's sales diverted to A  
times their gross margin)

- Note that the opportunity cost for Firm B is *negative* (because B is losing sales)
  - This means that at Firm A's premerger levels of output and price, Firm A's postmerger marginal revenue is *less* than its marginal cost
  - Consequently, to achieve marginal revenue = marginal cost, firm A must decrease output and increase price
- Note also that the magnitude of the opportunity cost—and hence the amount that A must decrease output and increase price is directly related to:
  - The magnitude of the diversion of products from B to A ( $\Delta q_{B \rightarrow A}$ )
  - The magnitude of Firm B's margin ( $p_B - c_B$ )

# Unilateral effects

## ■ The basic idea

- On the prior slide we looked at the merged firm's breakeven condition when we increased Firm A's output. Now look at the merged firm's breakeven condition when we increase A's price ( $\Delta q_A = -1$ ) and so decrease A's output by one unit (again holding B's price constant and allocating all profits and losses to A):

$$\underbrace{-p_A}_{-} - \underbrace{\frac{\Delta p_A}{\Delta q_A}(q_A + \Delta q_A)}_{+} + \underbrace{\Delta q_{A \rightarrow B}(p_B - c_B)}_{+} = \underbrace{-c_A}_{-}$$

Recapture of profits from Firm A's sales that are diverted to Firm B

- Note that the profit recapture from Firm B in the above equation is positive (because Firm B is gaining sales)
- Now multiply both sides by -1 (this preserves the breakeven condition):

$$p_A + \frac{\Delta p_A}{\Delta q_A}(q_A + \Delta q_A) - \Delta q_{A \rightarrow B}(p_B - c_B) = c_A$$

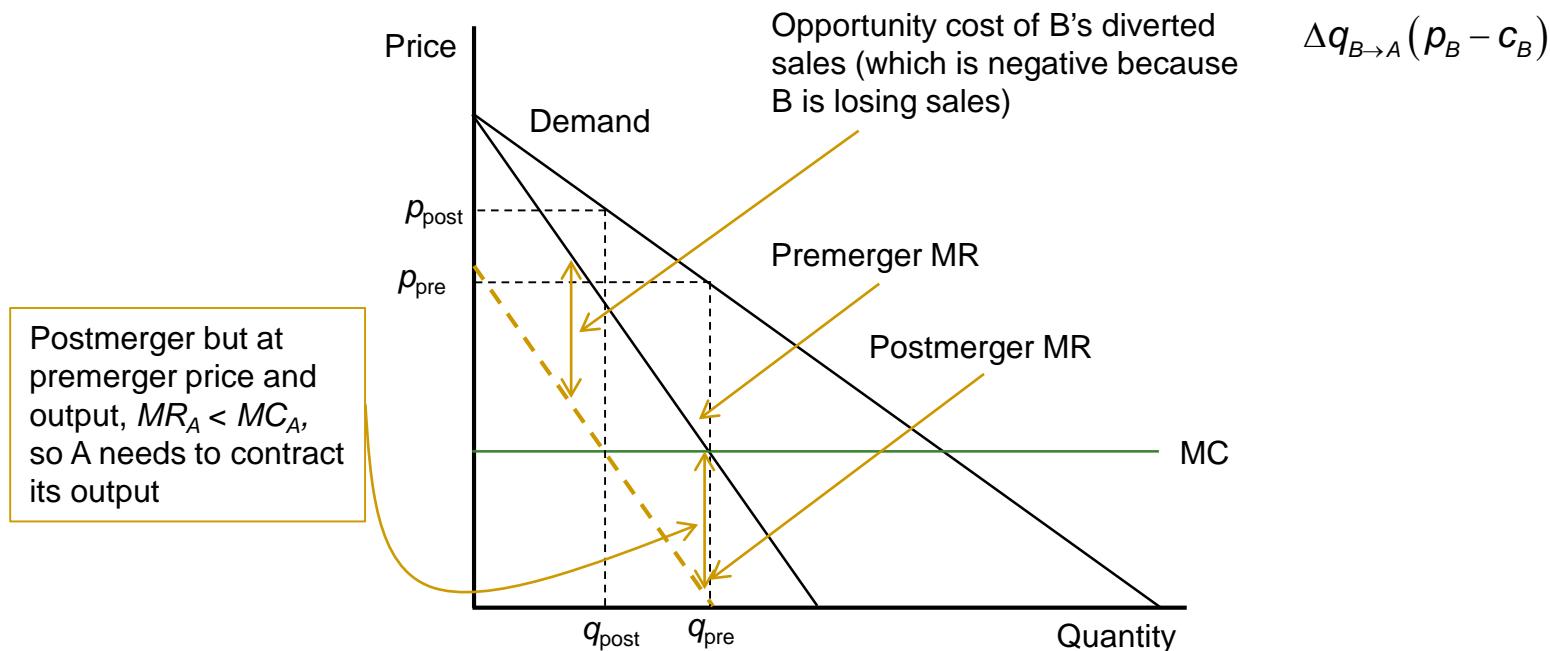
- This means that at Firm A's premerger levels of output and price, Firm A's postmerger marginal revenue is *less* than its marginal cost
- Consequently, to achieve marginal revenue = marginal cost, firm A must decrease output and increase price



# Unilateral effects

## ■ The basic idea

- The diagrammatic approach (when thinking about expanding Firm A's output)
  - Premerger:  $MR_A = MC_A$
  - Postmerger:  $MR_A + \text{opportunity cost from B's lost profits} < MC_A$  at A's premerger output and price because the opportunity cost is negative
  - *Rule:* When  $MR < MC$ , contract output to maximize profits



# An example

## Firm 1 (producing Product 1)

Assume linear demand ( $p = \text{price intercept} - \text{quantity}$ )

Price intercept	300
Marginal cost	20 (constant)
Margin	140
(price minus marginal cost at premerger profit-maximizing price)	

## Recapture of Products from Diverted Sales to Firm 2

Diversion ratio	0.3
Firm 2 margin	140 (assume the same as Firm 1 at premerger price)

### PREMERGER

Price	Quantity	Revenue	MR	Cost	MC	Profit	Margin (p - mc)
0	300	0	-300	6000	20	-6000	-20
10	290	2900	-280	5800	20	-2900	-10
20	280	5600	-260	5600	20	0	0
30	270	8100	-240	5400	20	2700	10
40	260	10400	-220	5200	20	5200	20
50	250	12500	-200	5000	20	7500	30
60	240	14400	-180	4800	20	9600	40
70	230	16100	-160	4600	20	11500	50
80	220	17600	-140	4400	20	13200	60
90	210	18900	-120	4200	20	14700	70
100	200	20000	-100	4000	20	16000	80
110	190	20900	-80	3800	20	17100	90
120	180	21600	-60	3600	20	18000	100
130	170	22100	-40	3400	20	18700	110
140	160	22400	-20	3200	20	19200	120
150	150	22500	0	3000	20	19500	130
160	140	22400	20	2800	20	19600	140
170	130	22100	40	2600	20	19500	150
180	120	21600	60	2400	20	19200	160
190	110	20900	80	2200	20	18700	170
200	100	20000	100	2000	20	18000	180
210	90	18900	120	1800	20	17100	190
220	80	17600	140	1600	20	16000	200
230	70	16100	160	1400	20	14700	210
240	60	14400	180	1200	20	13200	220
250	50	12500	200	1000	20	11500	230
260	40	10400	220	800	20	9600	240
270	30	8100	240	600	20	7500	250
280	20	5600	260	400	20	5200	260
290	10	2900	280	200	20	2700	270

### POSTMERGER RECAPTURE

(holding Firm 2's price constant at the premerger level)

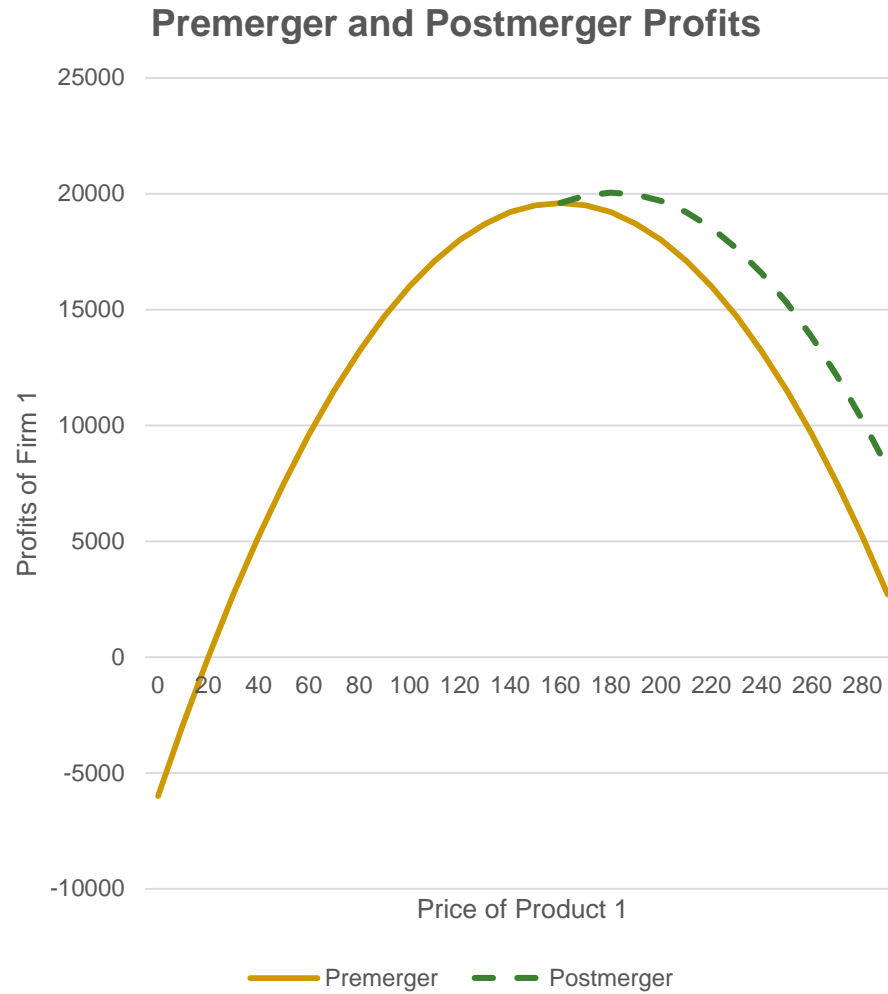
Firm 1 Lost units	Firm 1 Lost profits	Diversion to Firm 2	Profit Recapture	Post-merger Profit	Difference
0	0	0	0	19600	0
10	100	3	420	19920	320
20	400	6	840	20040	440
30	900	9	1260	19960	360
40	1600	12	1680	19680	80
50	2500	15	2100	19200	-400
60	3600	18	2520	18520	-1080
70	4900	21	2940	17640	-1960
80	6400	24	3360	16560	-3040
90	8100	27	3780	15280	-4320
100	10000	30	4200	13800	-5800
110	12100	33	4620	12120	-7480
120	14400	36	5040	10240	-9360
130	16900	39	5460	8160	-11440

## Merger Antitrust Law

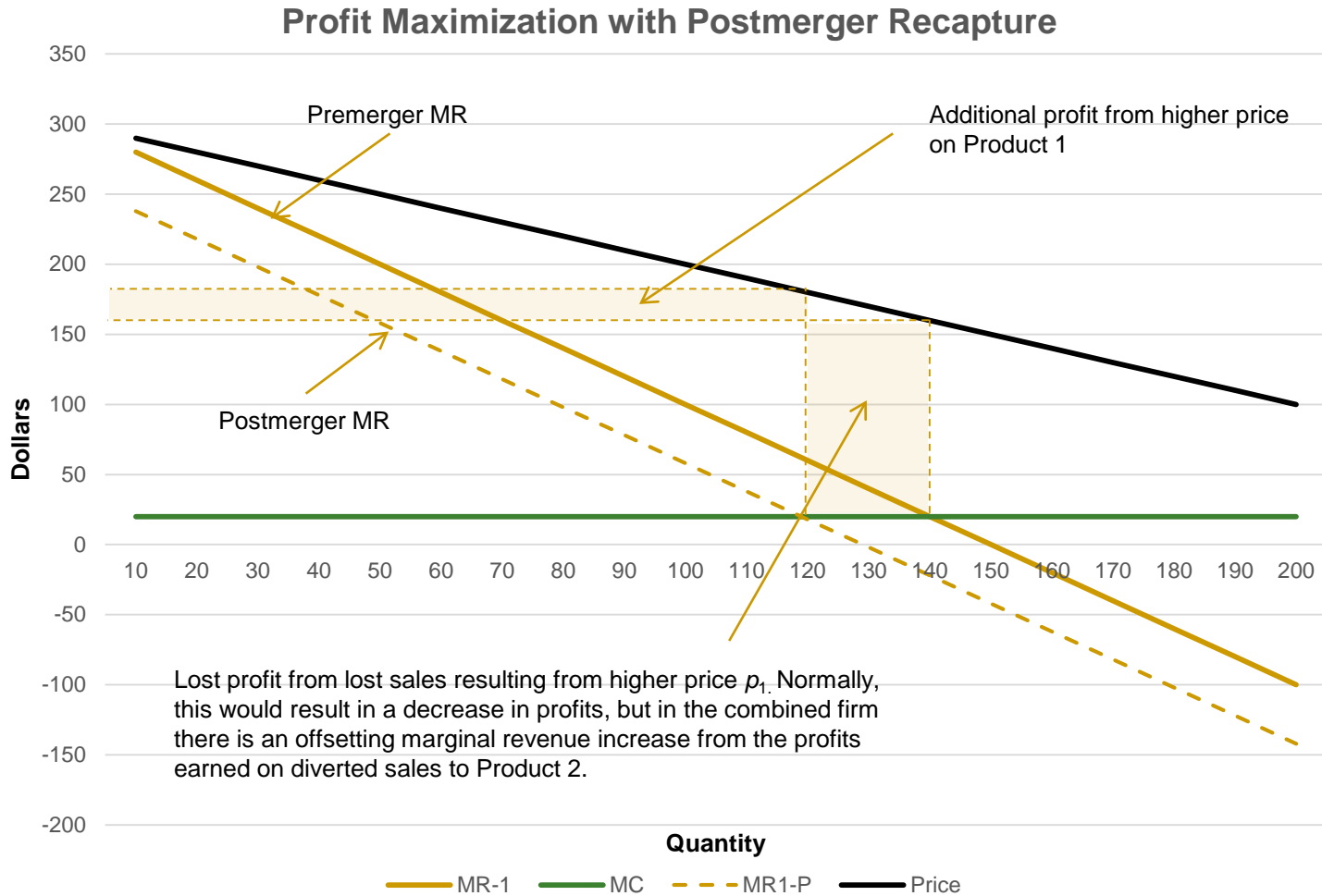
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# An example



# An example



# Unilateral effects

- Example: Nestlé-Dreyer's<sup>1</sup>
  - Nestlé to acquire Dreyer's for \$2.8 billion
  - Both companies make regular and super-premium ice cream
    - Nestlé makes Häagen Dazs
    - Dreyer's makes Dreamery, Godiva and Starbucks
    - Unilever distributes Ben & Jerry's

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<sup>1</sup> *In re* Nestlé Holdings, Inc., 136 F.T.C. 791 (2003) (settled by consent decree).

# Unilateral effects

## ■ Example: Nestlé-Dreyer's<sup>1</sup>

### □ Two approaches

- *Unilateral effects as originally conceived*: Allege an all-ice cream market and apply unilateral effects theory to Nestlé and Dreyer's in their super-premium products
  - PNB presumption not triggered in this market
- *PNB approach*: Narrow relevant to a three-firm super-premium ice cream relevant market in order to invoke *PNB* presumption

The consistent agency approach has been to narrow the markets for increase the market shares of the merging firms in order to take advantage of the *PNB* presumption

- The agency approach is consistent with the Merger Guidelines as long as the combined firm maximizes its prices by raising the price of at least one of the products by at least a SSNIP. If so, then the products of the two firms constitute a relevant market.
  - This market approach often can be expanded to include all of the firms making close substitutes.
  - The only situation where the plaintiff needs to use the unilateral effects theory as originally conceived is when the profit-maximizing price increase of the merged firm for any or all of its products is less than a SSNIP—and those situations are unlikely to attract the investigating agency's interest in the first instance

<sup>1</sup> *In re Nestlé Holdings, Inc.*, 136 F.T.C. 791 (2003) (settled by consent decree).

# Unilateral effects

## ■ Example

- Nestlé-Dreyer's in the super-premium segment of an all ice cream market

Super-Premium Ice Cream (1)			
(all channels)			
	Sales	Share	HHI
Ben & Jerry's	\$254.40	42.4%	1797.76
Nestlé	\$219.00	36.5%	1332.25
Dreyer's	\$114.60	19.1%	364.81
Others	\$12.00	2.0%	4
	<u>\$600.00</u>	<u>100.0%</u>	<u>3498.82</u>
Combined share		55.6%	
Premerger HHI			3,501
Delta			1,396
Postmerger HHI			4,897

Note: If premium ice cream is a relevant product market, then the Nestlé-Dreyer's merger violates Merger Guidelines. But if premium ice cream is not a relevant market, then in the absence of a unilateral effects theory the transaction does not violate the market share thresholds of the Merger Guidelines.

All Ice Cream (2)			
(supermarket sales in 2002)			
	Sales	Share	HHI
Store brands (10)	\$997.2	23.0%	53
Dreyer's	\$795.4	18.4%	339
Breyer's	\$686.8	15.9%	253
Blue Bell	\$253.4	5.8%	34
Ben & Jerry's	\$199.8	4.6%	21
Nestle	\$192.7	4.4%	19
Wells Diary	\$136.9	3.2%	10
Armour Swift	\$106.7	2.5%	6
Turkey Hill	\$105.2	2.4%	6
Marigold Foods	\$88.2	2.0%	4
Others (10)	\$769.1	17.8%	32
	<u>\$4,331.4</u>	<u>100.0%</u>	<u>776</u>
Combined share		22.8%	
Premerger HHI			776
Delta			162
Post-merger			938

<sup>1</sup> Complaint, *In re Nestlé Holdings, Inc.*, 136 F.T.C. 791 (2003) (settled by consent decree).

<sup>2</sup> Sherri Day, *Nestlé and Dreyer's to Merge in \$2.4 Billion Deal, Creating Top U.S. Ice Cream Seller*, N.Y. Times, June 18, 2002.

# Requirements

## ■ General requirements

- The products of the merging parties are close substitutes for one another
  - That is, they have high cross-elasticities of demand/diversion ratios with one another
- The products of (most) other firms are much more distant substitutes
  - That is, they have low cross-elasticities of demand with the products of the merging firms
- Repositioning into the product of the merging firms is difficult
  - That is, other firms in the market cannot easily change their product's attributes or introduce a new product that would be a close substitute to the products of the merging firm
  - This is closely related to barriers to entry and expansion that arise in the ease of entry defense (see below)—and pose similar high hurdles for defendants in showing that repositioning is easy

## ■ Specific Guidelines requirements

- 1992: Merging companies had to be each other's closest competitors and the combined firm had to have a market share of at least 35%
  - *Problem:* Some cabining was necessary, since otherwise the unilateral effects theory applies too broadly to any merger where the combining firms have positive cross-elasticity with one another and a positive margin and the market exhibits barriers to entry and repositioning
- 2010: Eliminated both the closest substitute and 35% share requirements



# Evidence

- Shared unique product attributes
  - Much be such as to create a high cross-elasticity of demand between the products of the merging firms and significantly lower cross-elasticity of demand with other products in the broader market
    - *Example:* Super-premium ice cream<sup>1</sup>
  - “Product attributes” should be broadly defined to include ancillary services
    - *Example:* Sales of office supplies to very large volume customers (including customized IT services and special commitments for rapid delivery)<sup>2</sup>
- Uniquely observed head-to-head competition
  - Merging firms disproportionately compete head-to-head for customers compared to other firms in the broader market, with little prospect for replacement competition postmerger
    - *Example:* Staples and Office Depot consistently competed with each other—but few other office supply firms—in the sale of office supplies to large B2B customers, and customers testified (with supporting reasons) that no other supplier could replace this competition after the merger<sup>3</sup>

<sup>1</sup> *In re* Nestlé Holdings, Inc., 136 F.T.C. 791 (2003).

<sup>2</sup> *FTC v. Staples, Inc.*, No. CV 15-2115 (EGS), 2016 WL 2899222 (D.D.C. May 17, 2016)

<sup>3</sup> *Id.*

# More theory

OPTIONAL

- The simple calculus (in a Cournot setting)
  - Consider the profit-maximization problem for each of the two merging firms premerger:

$$\max_{q_i} \pi_i = p_i q_i - c q_i$$

- So at a profit-maximizing level of output  $q_i$ , the first-order condition is:

$$\frac{\partial \pi_i}{\partial q_i} = \overbrace{p_i + q_i \frac{\partial p_i}{\partial q_i}}^{\text{Marginal revenue}} - \underbrace{c}_{\text{Marginal cost}} = 0$$

- This simply requires marginal revenue to be equal to marginal cost
  - The standard requirement for any profit-maximizing firm in a neoclassical model
- The *second-order condition* for a profit-maximum is:

$$\frac{\partial^2 \pi_i}{\partial q_i^2} = \frac{\partial}{\partial x} \left[ p_i + q_i \frac{\partial p_i}{\partial q_i} - c \right] < 0$$

This means that the profit curve is bending increasingly downward as quantity increase and so assures that we are at the “top of hill” of the profit function rather than the bottom (that is, profits decrease if we either increase quantity or decrease quantity). Remember, the bottom of the hill also has a slope of zero.

# More theory

OPTIONAL

- The simple calculus (in a Cournot setting)
  - Now consider the profit maximization problem for the combined firm:

$$\max \pi = (p_1 q_1 - c q_1) + (p_2 q_2 - c q_2)$$

where the combined firm is choosing both  $q_1$  and  $q_2$ .

- As before, there are two first order conditions for this problem. Consider the FOC with respect to  $q_1$ :

$$0 = \frac{\partial \pi}{\partial q_1} = p_1 + q_1 \frac{\partial p_1}{\partial q_1} - c + p_2 \frac{\partial q_2}{\partial q_1} - c \frac{\partial q_2}{\partial q_1}$$

or

$$\left[ p_1 + q_1 \frac{\partial p_1}{\partial q_1} + \frac{\partial q_2}{\partial q_1} (p_2 - c) \right] = c$$

Marginal revenue

Marginal cost

which is postmerger marginal revenue (including lost margin on diverted sales) is equal to postmerger marginal cost

# More theory

OPTIONAL

- The simple calculus (in a Cournot setting)
  - Let's look at the marginal revenue term (in brackets) more closely:

$$\left[ p_1 + q_1 \frac{\partial p_1}{\partial q_1} + \frac{\partial q_2}{\partial q_1} (p_2 - c) \right] = c$$

Negative number (since demand curve is downward-sloping)

Intuitively, this means that Firm 1's postmerger marginal revenue is equal to:

$p_1$  = The revenue received from the sale of an additional unit of Product 1 adjusted for:

$+ q_1 \frac{\partial p_1}{\partial q_1}$  = The loss in revenue resulting from the decrease in  $p_1$  necessary to clear the market with an added unit of output (a negative number)

$+ \frac{\partial q_2}{\partial q_1} (p_2 - c)$  = The loss in revenue of Firm 2 entailed by a diversion in sales from Product 2 to Product 1 resulting from the decrease in  $p_1$  (a negative number)

Negative number (since products are substitutes)

But when evaluated at premerger prices and quantities, marginal revenue is *less* than marginal cost (because of the recognition of Firm 2's lost margin on reduced sales). When marginal revenue is less than marginal cost, the profit-maximizing solution is to reduce output in order to re-equilibrate marginal revenue and marginal cost (which in turn anticompetitively increases prices).

# More theory

OPTIONAL

- Another way to look at this (still in a Cournot setting)
  - We just derived the first-order condition for the combined firm to price Product 1 by differentiating profits with respect to an *increase* in output  $\left(\frac{\partial \pi}{\partial q_1}\right)$ . Given a downward-sloping demand curve, the increase in output requires price to *decrease*, which in turn diverts sales from Product 2 to Product 1.
  - Now consider the first-order condition for the combined firm to price Product 1 by differentiating profits with respect to a *decrease* in output, which causes  $p_1$  to increase, which in turn diverts sales from Product 1 to Product 2. We can do this by multiplying both sides of the first order condition by -1:

Here,

$$\left[ -p_1 - q_1 \frac{\partial p_1}{\partial q_1} - \frac{\partial q_2}{\partial q_1} (p_2 - c) \right] = -c$$

$-p_1 =$  The revenue lost by reducing output by one unit (a negative number)

$-q_1 \frac{\partial p_1}{\partial q_1} =$  The gain in revenue resulting from the increase in  $p_1$  necessary to clear the market with one less unit of output (a positive number)

$-\frac{\partial q_2}{\partial q_1} (p_2 - c) =$  The gain in revenue of Firm 2 entailed by a diversion in sales from Product 1 to Product 2 resulting from the increase in price (a positive number number). This is the *recapture of profits* in the standard unilateral effects story.

# More theory

OPTIONAL

- One final look (this time in a Bertrand setting)<sup>1</sup>
  - Consider the profit maximization problem for each of the two merging firms premerger:

$$\max_{p_i} \pi_i = p_i q_i - c_i q_i$$
$$\frac{\partial \pi_i}{\partial p_i} = q_i + p_i \frac{\partial q_i}{\partial p_i} - c_i \frac{\partial q_i}{\partial p_i} = q_i + (p_i - c_i) \frac{\partial q_i}{\partial p_i} = 0$$

- Divide both sides of the first order condition by  $p_i \left( \frac{\partial q_i}{\partial p_i} \right)$  and recall that  $\varepsilon_i = - \left( \frac{p_i}{q_i} \right) \left( \frac{\partial q_i}{\partial p_i} \right)$  is the own elasticity of product  $i$ 's demand:

$$L_i \equiv \frac{p_i - c_i}{p_i} = \frac{1}{\varepsilon_i}$$

which is the equation we already have seen for the Lerner index  $L_i$ .

<sup>1</sup> Remember, in Bertrand competition the firm's control variable is price, not quantity. A good way to think about this is that firms compete mainly by posting a price and then supplying the quantities that customers demand at that price.

# More theory

OPTIONAL

- One final look (this time in a Bertrand setting) (con't)
  - Now consider the profit maximization problem for the combined firm:

$$\max_{p_1, p_2} \pi_c = p_1 q_1 - c_1 q_1 + p_2 q_2 - c_2 q_2$$

$$\frac{\partial \pi_c}{\partial p_1} = q_1 + (p_1 - c_1) \frac{\partial q_1}{\partial p_1} + (p_2 - c_2) \frac{\partial q_2}{\partial p_1} = 0$$

There is an analogous FOC with respect to product 2

- Dividing both sides by  $p_1 \left( \frac{\partial q_1}{\partial p_1} \right)$  as we did before yields:

$$L_1 \equiv \frac{p_1 - c_1}{p_1} = \frac{1}{\varepsilon_i} - \frac{p_2 - c_2}{p_1} \left( \frac{\partial q_2}{\partial p_1} \right) \left( \frac{\partial p_1}{\partial q_1} \right) = \frac{1}{\varepsilon_i} + \frac{p_2 - c_2}{p_1} \left( -\frac{\partial q_2}{\partial q_1} \right)$$

Extra term introduced by merger

Gross margin

Diversion ratio

- The right-hand side of this equation has an extra term at the end compared to the premerger case. Note that this term is the margin times the diversion ratio
  - If the merging firms produce *substitutes*, then the diversion ratio is positive, so that  $p_1$  and the Lerner index must *increase* postmerger
  - If the merging firms produce *complements*, then the diversion ratio is negative, so that  $p_1$  and the Lerner index must *decrease* postmerger

Note: Since the equation for  $L_2$  is symmetrical with the equation for  $L_1$ , the same results hold for product 2

# Diversion ratios

## ■ Diversion ratios

### □ Diversion and recapture

- The loss of units  $\Delta q_{B \rightarrow A}$  from Firm B to Firm A when Firm A increasing its output (and lowers its price) is a critical component of the merged firm's opportunity cost
- Likewise, the recapture of units  $\Delta q_{A \rightarrow B}$  (and profits) by Firm B when Firm A increases its price (and contracts its output) is a critical component of the merged firm's recapture of profits

### □ Problem

- These measure are in absolute amounts and hence change with different measures of quantities (say units v. tons) and price (say dollars versus pounds)
- We can create a metric that is independent of the measures by using percentages (just as we did with elasticities)

### □ Definition (when firm A raises in price):

$$D_{A \rightarrow B} \equiv D_{AB} = \frac{\frac{\Delta q_B}{\Delta p_A}}{\frac{\Delta q_A}{\Delta p_A}} = \frac{\Delta q_B}{\Delta q_A},$$

This is the *diversion ratio* from A to B. It is the percentage of the total units that Firm A's loses when it raises price that go to Firm B.

where firm A loses total units of  $\Delta q_A$ , of which  $\Delta q_B$  go to Firm B



# Diversion ratios

- A bit more formally (in calculus terms):

$$D_{A \rightarrow B} \equiv D_{AB} \equiv \frac{\frac{\partial q_B}{\partial p_A}}{\frac{\partial q_A}{\partial p_A}} = \frac{\partial q_B}{\partial q_A}.$$

- Caution:
  - The primary story we told to motivate unilateral effects had A's price decreasing
  - The definition of diversion ratios is motivated by A's price increasing

# Diversion ratios

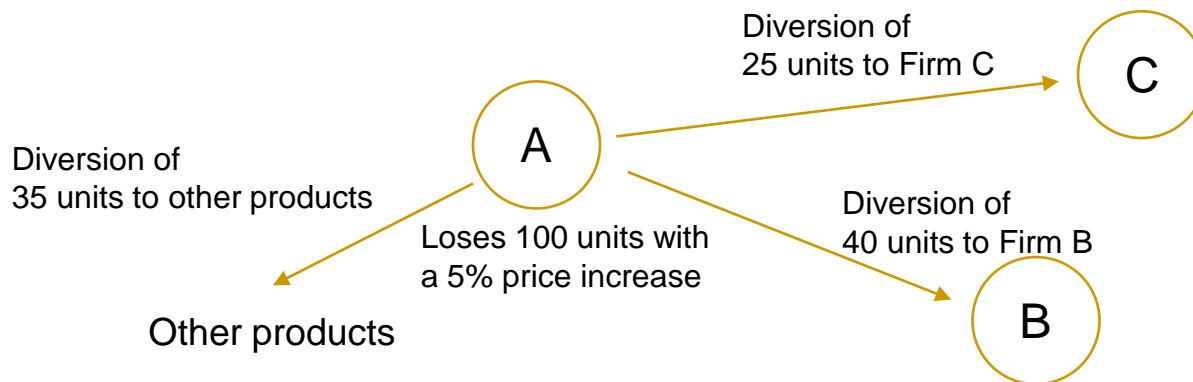
## ■ Illustration

- Firm A raises its price by 5% and loses 100 units
  - 40 units divert to Firm B
  - 25 units divert to Firm C
  - 35 units divert to other products
- Then:

$$D_{A \rightarrow B} = \frac{40}{100} = 0.40 \text{ or } 40\%$$

$$D_{A \rightarrow C} = \frac{25}{100} = 0.25 \text{ or } 25\%$$

Since  $D_{A \rightarrow B} > D_{A \rightarrow C}$ ,  
B is a closer substitute  
to A than C



# Diversion ratios

- Relation of diversion ratios to elasticities

- Recall

- Cross-elasticity of B with respect to A:

$$\varepsilon_{BA} = \frac{\frac{\Delta q_B}{q_B}}{\frac{\Delta p_A}{p_A}} = \frac{\Delta q_B p_A}{\Delta p_A q_B}$$

- Own-elasticity of A:

$$\varepsilon_A = \frac{\frac{\Delta q_A}{q_A}}{\frac{\Delta p_A}{p_A}} = \frac{\Delta q_A p_A}{\Delta p_A q_A}$$

Equals to 1

- So:

$$D_{A \rightarrow B} = \frac{\frac{\Delta q_B}{q_B}}{\frac{\Delta q_A}{q_A}} = \frac{\frac{\Delta q_B}{\Delta p_A} \frac{p_A}{q_B}}{\frac{\Delta q_A}{\Delta p_A} \frac{p_A}{q_A}} = \frac{\left[ \frac{\Delta q_B p_A}{\Delta p_A q_B} \right] \frac{q_B}{p_A}}{\left[ \frac{\Delta q_A p_A}{\Delta p_A q_A} \right] \frac{q_A}{p_A}} = \frac{\varepsilon_{BA} q_B}{\varepsilon_A q_A}$$

- Therefore, the diversion ratio contains no information that cannot be derived from the cross-elasticity and own-elasticity

# Diversion ratios

## ■ Relation of diversion ratios to elasticities

### □ Example

- Say that the own-elasticity of Product A is -2 and that the cross-elasticity of B with A is 1.2 and that the unit sales of A and B are 1000 and 500, respectively.
- So

$$D_{A \rightarrow B} = \frac{\varepsilon_{BA} q_B}{\varepsilon_A q_A} = \frac{1.2 \cdot 500}{2.0 \cdot 1000} = 30\%$$

- We can check this by looking at the total loss of sales by A and the amount of sales diverted to B:

$$\frac{\Delta q_A}{q_A} \cong \varepsilon_A \frac{\Delta p_A}{p_A} \Rightarrow \Delta q_A \cong \varepsilon_A \frac{\Delta p_A}{p_A} q_A = 2 \times 0.05 \times 1000 = 100$$

$$\frac{\Delta q_B}{q_B} \cong \varepsilon_{BA} \frac{\Delta p_A}{p_A} \Rightarrow \Delta q_B \cong \varepsilon_{BA} \frac{\Delta p_A}{p_A} q_B = 1.2 \times 0.05 \times 500 = 30$$

- Now calculate the diversion ratio:

$$D_{A \rightarrow B} = \frac{\Delta q_B}{\Delta q_A} = \frac{30}{100} = 30\% \quad \checkmark$$

# Diversion ratios

## ■ Diversion ratios

### □ How are diversion ratios estimated?

- Data collected during the regular course of business (including win-loss data)
- Indications in the company documents
- Consumer surveys
  - But very sensitive to survey design and customer ability to accurately predict product choice in the presence of a price increase
- Switching shares as proxies
  - Where switching behavior is not limited to reactions to changes in relative price
  - *Example:* H&R Block/TaxACT (where the court accepted a diversion the analysis based on IRS switching data only as corroborating other evidence)
- Demand system estimation/econometrics
  - Econometric estimation of all own- and cross-elasticities of all interacting firms
  - Usually possible only in retail deals where point-of-purchase scanner data is available
- Market shares as proxies
  - Assumes that customers divert in proportion to the market shares of the competitor firms (after adjusting for any out-or-market diversion):

$$D_{A \rightarrow B} = \left( 1 - \frac{\Delta q_{outside}}{\Delta q_A} \right) \frac{s_B}{1 - s_A},$$

where  $s_A$  and  $s_B$  are the market shares of firms A and B, respectively, in the market and  $\frac{\Delta q_{outside}}{\Delta q_A}$  is the percentage of Firm A's lost sales that are diverted to firms outside of the market

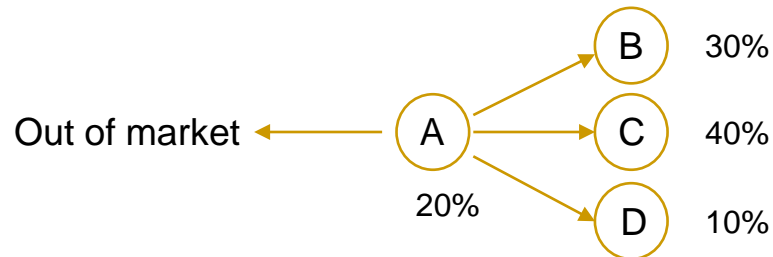
# Diversion ratios

## ■ Diversion ratios

### □ How are diversion ratios estimated?

#### ■ Market shares as proxies--Example

- *Example:* The market consists of four firms collectively producing 1200 units with market shares of 20%, 30%, 40%, and 10%. Firm A raises its prices by 5% and loses 100 units.



- When Firm A raises its price, assume all of the diverted products stay within the market. Then estimating diversion ratio to Firm B based on market shares yields:

$$D_{A \rightarrow B} = \left( 1 - \frac{\Delta q_{outside}}{\Delta q_A} \right) \frac{s_b}{1 - s_A} = \frac{0.3}{1 - 0.2} = 37.5\%$$

- Alternatively, assume that Firm A still loses 100 units but 10% diverts out of the market. Then:

$$D_{A \rightarrow B} = \left( 1 - \frac{\Delta q_{outside}}{\Delta q_A} \right) \frac{s_b}{1 - s_A} = (1 - 0.10) \times \frac{0.3}{1 - 0.2} = 33.75\%$$

# Diversion ratios

## ■ Warren-Boulton analysis in R&R Block/TaxACT

□ Used market shares to estimate diversion ratios

□ Recall

■  $s_{HRB} = 15.6\%$ ,

■  $s_{TaxACT} = 12.8\%$

□ So, if all diverted products stayed in the market, the diversion ratios would be:

$$D_{HRB \rightarrow TaxACT} = \frac{12.8\%}{1 - 15.6\%} = 15.2\%$$

$$D_{TaxACT \rightarrow HRB} = \frac{15.6\%}{1 - 12.8\%} = 17.9\%$$

□ Interestingly, the court reported these diversion ratios as 14% and 12%, respectively

■ The fact that they are lowered than the estimates above suggests that Warren-Boulton took into account diversion of some of the products to outside the market

■ Also, it appears that Warren-Boulton estimated different diversion ratios to products outside the market for HRB and TaxACT

□ Use of the diversion ratios in the market definition section of the opinion do not give the court's numbers, which I have yet been able to replicate

# “Merger simulation”

## ■ The basic idea

- *Merger simulation* attempts to directly predict price changes as a result of a merger
- The usual structure of merger simulation models
  1. A theoretical model that derives market equilibrium from demand and cost characteristics
  2. The estimation of the demand characteristics (own- and cross elasticities, diversion ratios)
    - Ideally, estimated econometrically using a rich set of data (e.g., Nielsen scanner data in retail deals)
  3. The estimation of the premerger cost characteristics (marginal costs, margins)
    - For example, one approach is to assume a model of pricing (often Bertrand) and to use it jointly with the estimated demand parameters to recover implied marginal costs
    - Marginal cost can be approximated from accounting data, but these estimates tend to be unreliable
  4. The estimated demand parameters and costs are used jointly to simulate the new equilibria that would result from a merger
- Models and data requirements
  - More structure (restrictions) on the model can significantly reduce the data requirements
    - *Examples of model restrictions:* Linear demand curves, identical firms, identical diversion ratios, identical margins
    - Of course, the more structure on the model, the less the model is likely to accurately predict actual market responses



# “Merger simulation”

## ■ The basic idea

### □ Use by courts

- Courts have accepted merger simulation models advanced by economic experts as potentially probative (although not dispositive) of the price implications of mergers
  - *FTC v. Advocate Health Care*, No. 15 C 11473, 2017 WL 1022015, at \*11 (N.D. Ill. Mar. 16, 2017)
  - *United States v. Aetna Inc.*, 240 F. Supp. 3d 1, 46-47 (D.D.C. 2017)
  - *United States v. Anthem, Inc.*, 236 F. Supp. 3d 171, 212 (D.D.C. 2017)
  - *FTC v. Sysco Corp.*, 113 F. Supp. 3d 1, 66 (D.D.C. 2015)
  - *United States v. H & R Block, Inc.*, 833 F. Supp. 2d 36, 64 (D.D.C. 2011)
  - *FTC v. Foster*, No. CIV 07-352 JBACT, 2007 WL 1793441, at \*42 (D.N.M. May 29, 2007)
  - *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098, 1122 (N.D. Cal. 2004)
- Because these models go directly to the potential anticompetitive effect of a merger, they are usually highly contested in court
  - Also typically subject to *Daubert* challenges for faulty application (and not unreliability of the method generally)

# GUPPIs

## ■ Definition

- Antitrust economists define a measure called the gross upward pricing pressure index (GUPPI) to assess the merged firm's incentive to raise prices under a unilateral effects theory in the absence of entry, repositioning, and efficiencies:

$$GUPPI_1 = \frac{\text{value of profits from sales diverted to product 2}}{\text{value of all sales lost by product 1}} = \frac{\Delta q_2 (p_2 - c_2)}{\Delta q_1 p_1}$$

where the merging firms produce products 1 and 2, respectively, and  $GUPPI_1$  is the measure for product 1

- Section 6.1 of the 2010 DOJ/FTC Horizontal Merger Guidelines implicitly creates of measure of this type
- GUPPIs can be used in a simple, highly structure (and hence unrealistic) model to predict price increases resulting from a merger
- Let  $m_2 = \frac{p_2 - c_2}{p_2}$ , the percentage gross margin of product 2 and  $DR_{12}$  be the unit diversion ratio between product 1 and product 2. Then multiplying by  $p_2/p_2$  yields:

$$GUPPI_1 = \frac{\Delta q_2 (p_2 - c_2)}{\Delta q_1} \frac{p_2}{p_1} = D_{12} m_2 \frac{p_2}{p_1},$$

NB:  $D_{12}m_2$  is the measure of upward pricing pressure we saw in Unit 3

which is the usual form of the expression for a GUPPI

# GUPPIs

## ■ GUPPIs and various measures of diversion

- Recall the formula:  $GUPPI_1 = D_{12} m_2 \frac{p_2}{p_1}$ ,

where  $D_{12}$  is the diversion ratio from firm 1 to firm 2 in units

- We can also define a diversion ratio in sales:

$$D_{12}^{sales} = \frac{\text{Change in the value of firm 2's sales}}{\text{Change in the value of firm 1's sales}} = \frac{p_2 \Delta q_2}{p_1 \Delta q_1} = D_{12} \frac{p_2}{p_1}.$$

- Using the sales diversion ratio, we have:

$$GUPPI_1 = D_{12}^{sales} m_2,$$

- It is important to understand the measure of diversion in order to use the proper GUPPI formula

- One more useful formula:

$$GUPPI_1 = \frac{p_2 \Delta q_2}{p_2 q_2} \times \frac{p_2 q_2}{p_1 q_1} \times m_2 = \frac{\Delta sales_2}{sales_2} \times \frac{sales_2}{sales_1} \times m_2,$$

- which is the percentage change in the sales (not units) of firm 2 times the ratio of firm 2's sales to firm 1's sales times the margin of firm 2. This formula can be useful when the firms sells multiple products and sales data is more readily available.

# GUPPIs

## ■ “Merger simulation” with GUPPIs

### □ The unilateral profit-maximizing price increase

- In the very special case of linear residual demand curves and equal diversion ratios ( $D_{12} = D_{21} = D$ ), equal marginal costs, equal prices, and equal market shares, Bertrand competition, no changes in the prices of any nonmerging firm, and no entry/expansion/repositioning or efficiencies. The GUPPI gives the profit-maximizing price increase postmerger under the unilateral effects theory
- The profit-maximizing price increase for product 1 leaving the price of product 2 at its premerger level:

$$\frac{\Delta p_1^*}{p_1} = \frac{GUPPI}{(1-D)} = \frac{Dm}{(1-D)}$$

since  $p_1 = p_2$  and so  $p_1/p_2 = 1$

- The profit-maximizing price increase for both product 1 and product 2 when raising the price of both products:

$$\frac{\Delta p_1^*}{p_1} = \frac{\Delta p_2^*}{p_2} = \frac{GUPPI}{2(1-D)} = \frac{Dm}{2(1-D)}$$

- In other words, the profit-maximizing price increase when the merged firm raises the price of both products is half of the profit-maximizing price increase when the merged firm raises the price of only one of the two products
  - This makes sense given the linearity of demand and the symmetry assumptions in the model

For proofs and an expanded treatment, see Carl Shapiro, Unilateral Effects Calculations (Oct. 2010), available at <http://faculty.haas.berkeley.edu/shapiro/unilateral.pdf>.

# GUPPIs

- “Merger simulation” with GUPPIs
  - Example 5 of the 2010 DOJ/FTC Horizontal Merger Guidelines

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. For every dollar increase in the price of Product A, for any given price of Product B, Product A loses twenty units of sales to products outside the candidate market and ten units of sales to Product B, and likewise for Product B. Under these conditions, economic analysis shows that a hypothetical profit-maximizing monopolist controlling Products A and B would raise both of their prices by ten percent, to \$110.

- How do the Guidelines predict that the profit-maximizing price will increase by \$10?
  - Summary of parameters

$$p = \$100 \quad c = \$60$$
$$D = 1/3 \quad m = \frac{p-c}{p} = 0.4$$

- The market exhibits linear demand and complete symmetry, so

$$\frac{\Delta p_1^*}{p_1} = \frac{\Delta p_2^*}{p_2} = \frac{Dm}{2(1-D)} = \frac{(1/3)(0.4)}{2(1-1/3)} = 0.10 \quad \text{or } 10\%$$

# GUPPIs

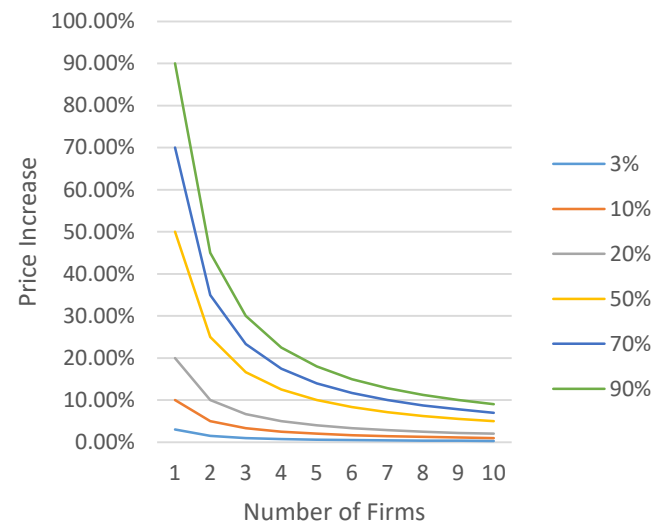
## ■ “Merger simulation” with GUPPIs

- Illustration: The unilateral profit-maximizing price increase for only one merging firm
  - Assume linear residual demand curves and equal diversion ratios, equal marginal costs, equal prices, equal market shares, Bertrand competition, all other firms continue to price at premerger levels, and no entry/expansion/repositioning or efficiencies. Then:

$$\frac{\Delta p_1^*}{p_1} = \frac{GUPPI}{1-D} = \frac{Dm}{1-D}$$

Firms	Share	Margin: DR	3%	10%	30%	50%	70%	90%
Predicted Percentage Price Increase for Only One Merging Firm								
3	33.33%	50.00%	3.00%	10.00%	30.00%	50.00%	70.00%	90.00%
4	25.00%	33.33%	1.50%	5.00%	15.00%	25.00%	35.00%	45.00%
5	20.00%	25.00%	1.00%	3.33%	10.00%	16.67%	23.33%	30.00%
6	16.67%	20.00%	0.75%	2.50%	7.50%	12.50%	17.50%	22.50%
7	14.29%	16.67%	0.60%	2.00%	6.00%	10.00%	14.00%	18.00%
8	12.50%	14.29%	0.50%	1.67%	5.00%	8.33%	11.67%	15.00%
9	11.11%	12.50%	0.43%	1.43%	4.29%	7.14%	10.00%	12.86%
10	10.00%	11.11%	0.38%	1.25%	3.75%	6.25%	8.75%	11.25%
11	9.09%	10.00%	0.33%	1.11%	3.33%	5.56%	7.78%	10.00%
12	8.33%	9.09%	0.30%	1.00%	3.00%	5.00%	7.00%	9.00%

Predicted Percentage Price Increases  
(Only One Merging Firm Increases Prices)



NB: Given the highly restrictive conditions on the model, these estimates are likely to be wildly inaccurate but the agencies have used them for screening. See, e.g., Statement of the Federal Trade Commission, In the Matter of Dollar Tree, Inc. and Family Dollar Stores, Inc. FTC File No. 141-0207 (July 13, 2015)..

# GUPPIs

## ■ Merger screening with GUPPIs

### □ The idea

- The GUPPI models that predict price increases have very restrictive conditions and usually will not provide a good estimate of any actual price increase that would occur as a result of a merger.
- However, the agencies have used GUPPIs to as a “screen” in some merger investigations (that is, as a method of eliminating some facilities from the investigation without the need for a detailed individualized analysis)

### □ Example: Dollar General/Dollar Tree/Family Dollar

#### ■ The situation

- Contested takeover of Family Dollar between Dollar Tree and Dollar General in 1994-1995
  - Family Dollar: 8,200 stores (multi-price point stores generally < \$10)
  - Dollar Tree: 5,000 stores (fixed-price point stores, selling everything for \$1 or less)
  - Dollar General: 11,300-store (multi-price point stores)

#### □ The outcome

- Dollar Tree won (at \$9.2 billion)
- Had to divest 330 Family Dollar stores

### □ FTC problem: How to perform a merger antitrust analysis on so many stores in two separate investigations?

- Number of stores made an individual analysis impossible as a practical matter

# GUPPIs

## ■ Merger screening with GUPPIs

### □ Example: Dollar General/Dollar Tree/Family Dollar (con't)

#### ■ The solution

1. Determine a GUPPI threshold that presumptively should indicate that a given store would not have an incentive under a unilateral effects theory to raise its prices significantly after the merger
2. Estimate the GUPPI for each store in the investigation
3. Compare the estimated GUPPI against the screening threshold

#### 1. Determine a GUPPI screening threshold

- Suppose that the agency decided that a 5→4 merger in a market with equally sized firms charging the same price presumptively would not give rise to a competitive concern
- If we know the margin of the stores, then we can determine the GUPPI for each store (which will be the same for all stores in this hypothetical market)
  - Estimate the diversion ratio according to the proportional share method:  $D = 25\%$
  - Say the agency determined that the proper margin to use is 30%
  - Then  $GUPPI = Dm = 25\% \times 30\% = 7.5\%$
  - Use 7.5% as the screening threshold (that is, if a 5→4 merger in a market of equally sized firms was acceptable to the agency and the GUPPI for each store in the merger was 7.5%, then any store in the transaction with a GUPPI less than or equal to 7.5% should be presumptively acceptable)
- In the Family Dollar investigation, the FTC used different GUPPI thresholds:
  - 7.5% for Family Dollar (→ 6 equivalent firms premerger with a 30% margin)
  - 10.0% for Dollar Tree (→ 5 equivalent firms premerger with a 30% margin)
    - The explanation for the higher GUPPI threshold for Dollar Tree is that DT's format is not to sell items for more than a dollar, so given the disincentives associated with a fundamental change to the store's format the merged firm will be more likely to resist changing DT prices even if there is pricing pressure to do so.



# GUPPIs

## ■ Merger screening with GUPPIs

### □ Example: Dollar General/Dollar Tree/Family Dollar (con't)

#### 2. Estimate the GUPPI for each store in the investigation

- Retail stores that use electronic registers and bar code scanners collect data on each item sold and its price. This point-of-sale (POS) data is collected by services such as [Nielsen](#) and [IRI](#) and made available for purchase
- Retail sales data was available for Dollar General, Dollar Tree, and Family Dollar
- Using econometrics, the FTC estimated the diversion ratio for each store in both a Dollar General/Family Dollar and a Dollar Tree/Family Dollar transaction
  - To illustrate, say an area had only one Dollar Tree and one Family Dollar store. Then from the data the agency could observe weekly changes in sales from both stores. If, as sales volume in one store change, some customers were diverting to the other store, this can be detected econometrically. Moreover, econometrics can estimate the diversion ratio for each store compared to the other store.
  - NB: Using this method, diversion ratios will be estimated using the changes in dollar sales, not unit sales, but this is still consistent with the GUPPI formula:

$$GUPPI_1 = D_{12} m_2 \frac{p_2}{p_1} = \left( \frac{p_2 \Delta q_2}{p_1 \Delta q_1} \right) m_2 = D_{12}^{sales} m_2,$$

where  $D_{12}^{sales}$  is the diversion ratio measured in sales (i.e., the term in the parenthesis)

- In principle, a GUPPI can be calculated for each pair Dollar Tree and Family Dollar stores (of course, stores very distant from one another should have zero diversion ratios). When, say, several Dollar Tree stores have positive diversion ratios with a single Family Dollar store, the total GUPPI for that Family Dollar store is the sum of the pairwise GUPPIs with each DT store

# GUPPIs

## ■ Merger screening with GUPPIs

### □ Example: Dollar General/Dollar Tree/Family Dollar (con't)

#### 3. Compare the estimated GUPPI against the screening threshold

- Dollar Tree determined to divest only Family Dollar stores
- Stores with GUPPIs above the screening GUPPIs thresholds (7.5% for Family Dollar Stores and 10.0% for Dollar Tree Stores), required further individualized investigation
- However, the FTC and the states also reviewed some of the stores with GUPPIs below the screening thresholds based on other information the agencies developed (e.g., through casual inspection of maps)
- Ultimately, the FTC and the states settled with a consent decree that required 330 Family Dollar stores to be divested
  - Including 100 stores that were below the threshold

# GUPPIs

- “Merger simulation” with GUPPIs
  - The model so far is very restrictive with all of its symmetry conditions
  - Loosening these conditions makes things complicated very quickly
    - For example, when residual demand for both firms is linear but diversion ratios and margins differ, the optimal price increase formula becomes:

$$\frac{\Delta p_A^*}{p_A} = \frac{(D_{B \rightarrow A}(D_{B \rightarrow A} + D_{A \rightarrow B}))m_A + 2D_{A \rightarrow B}m_B}{4 - (D_{B \rightarrow A} + D_{A \rightarrow B})^2}$$

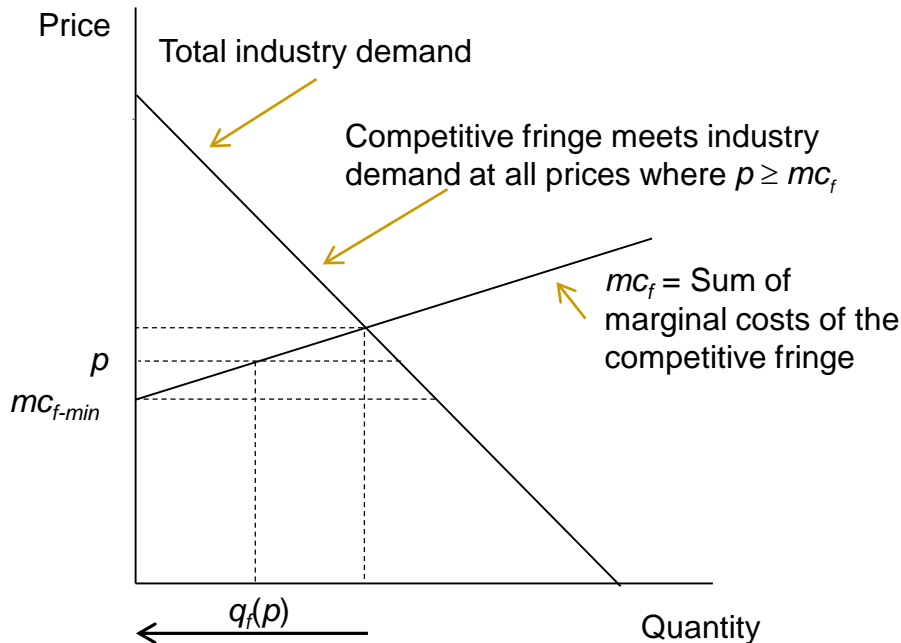
You should just see this to understand how quickly the formula becomes with a relaxation of the restrictions. You will not be required to know or use the formula.

# Unilateral effects with a competitive fringe

- Recall the setup
  - Consider a homogeneous product market with
    - a dominant firm, which sees its output decisions as affecting price and so sets output so that  $mr = mc$ , and
    - a fringe of firms that are small and act as price takers, that is, they do not see their individual choices of output levels as affecting price and therefore price as competitive firms (i.e.,  $p = mc$ )
  - Choice question for the dominant firm: Pick the profit-maximizing level for its output given the competitive fringe
- The model
  - At market price  $p$ , let  $q(p)$  be the industry demand function and  $q_f(p)$  be the output of the competitive fringe. Then the residual demand  $q_d(p)$  for the dominant firm is  $q(p) - q_f(p)$ .

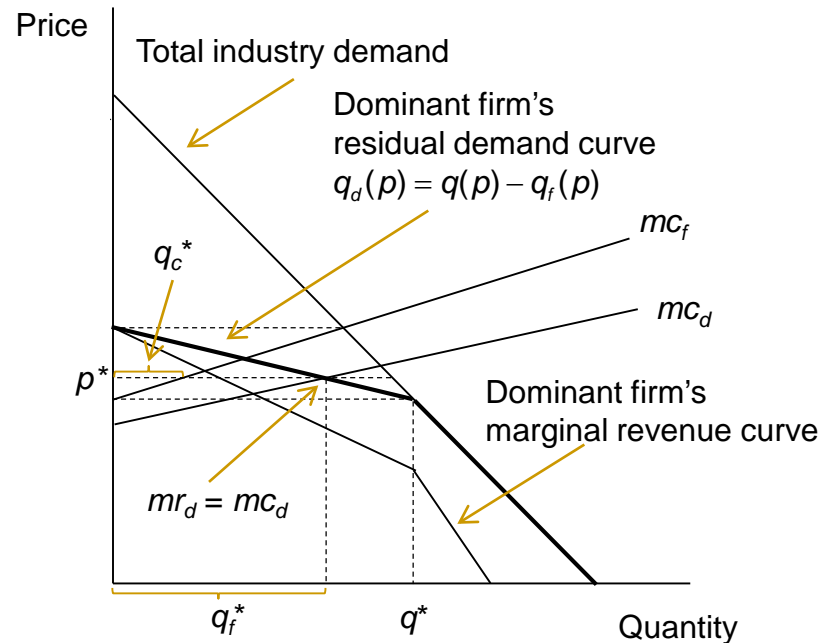
# Unilateral effects with a competitive fringe

## Output of the Competitive Fringe



As  $p$  approaches  $mc_{f-min}$  Competitive fringe reduces output until price equals  $mc_{f-min}$ , its minimum marginal cost. Below this price the competitive fringe does not produce.

## Output of the Dominant Firm



Dominant firm maximizes profit at  $q_f^*$ , where  $mr_f = mc_f$ . Total industry output  $q^* = q_f^* + q_c^*$  at price  $p^*$ .

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# Other Defenses

REVIEW 2010 DOJ/FTC HORIZONTAL MERGER GUIDELINES §§ 8, 10, 11

# Defenses generally

- Common defenses
  - Entry/expansion/repositioning—Addressed earlier in this deck
  - Efficiencies
  - Failing firm
  
- Defenses are negative defenses, not affirmative defenses
  - A negative defense says that the merger is not anticompetitive in the first instance
  - An affirmative defense says that even if the merger is anticompetitive, it is nonetheless not unlawful
  
- *Baker Hughes* burden shifting
  - Formally, the plaintiff can make out its prima facie case on the *PNB* presumption without addressing any defense
  - The defendant has the burden of going forward with evidence predicating the defense (including challenging the *PNB* presumption)
  - If the defendant adduces sufficient evidence to permit the trier of fact to accept the defense, the burden of persuasion shifts to the defendant on the ultimate question of whether the merger, with all evidence taken as a whole, is anticompetitive

# Efficiencies

- Types of efficiencies enabled by the deal
  - Customer value-enhancing efficiencies
    - Make existing product better or cheaper, or
    - Create new products or product improvement better, cheaper, or faster
  - Cost-saving efficiencies
    - Reductions in duplicative costs
    - Increases in the productive efficiency of the combined operation (e.g., through best practices, transfer of more efficient production technology)

*Efficiencies* is the term commonly used in antitrust analysis  
*Synergies* is the term commonly used by business



# Efficiencies

- Examples of typical efficiencies
  - Lower costs of production, distribution, or marketing make merged firm more competitive
    - Elimination of redundant or higher cost facilities, technologies, and personnel
    - Economies of scale or scope
  - Complementary product lines
    - New or broader product offering desired by customers
    - Better integration between merging products further enhances customer value
  - Accelerated R&D and product improvement
    - Greater combined R&D assets (researchers, patents, know-how)
    - Complementarities in R&D assets
    - Greater sales base over which to spread R&D costs
  - Better service and product support
    - More sales representatives
    - More technical service support

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# Efficiencies

- Efficiencies as a merger defense

- The idea is that—

1. even if the merged firm has an incentive to increase prices postmerger (i.e., faces upward pricing pressure) under some theory of anticompetitive harm,
2. the efficiencies that the merger will create will give the merged firm an incentive to expand output and reduce price (i.e., exerts downward pricing pressure), and
3. the net effect of the these two cross-cutting pressures on price will be that the merged firm does not raise prices postmerger and may even decrease them

# Efficiencies

- Efficiencies as a merger defense
  - Efficiencies are a *negative defense*
    - The formal legal nature of an efficiencies defense is a major source of confusion and bad law
    - Some courts appear to view the efficiencies defense as providing a justification for a merger that will in fact create anticompetitive harm (such as higher prices)
      - Framed this way, the efficiencies defense is an *affirmative defense* to an anticompetitive merger
      - Courts routinely question, if not outright reject, the idea of an efficiencies defense without appreciating this framing
    - But properly framed, the defense says that the merger will *not* be anticompetitive in the first instance
      - Since likely anticompetitive effect is an essential element of a Section 7 violation, proof that the merger will not be anticompetitive is a *negative defense*
      - This is true even though the plaintiff is able to make out a prima facie case of anticompetitive effect under the *PNB* presumption
      - As a negative defense, there is no proper objection to the existence of an efficiencies defense in the proper circumstances
      - But as a negative defense only certain efficiencies are cognizable (that is, create downward pricing pressure to offset any upward pricing pressure the merger creates)
        - Reductions in marginal cost
        - Product creation or improvements that “shift the demand curve to the right” (i.e., for a given price, cause the postmerger demand for the product to be greater than the premerger demand)
      - Finally, since there are no affirmative defenses to an anticompetitive merger, the efficiencies must negate the price increase in the relevant market—out-of-market efficiencies do not count

# Efficiencies

## ■ Cost efficiencies

- These are reductions in the fixed or marginal costs of operation and production that result from the deal
- Types of cost efficiencies
  - Reductions in fixed costs
    - *Fixed costs* are costs that do not change with the level of production—that is, they are expenses that have to be paid by a company, independent of any business activity
    - Some fixed costs may be incurred only once, such as the building cost for a new facility
    - Other fixed costs may be recurring, such as the compensation for the CEO, the annual maintenance costs for the headquarters building, the annual interest on the company's debt, insurance costs, and property taxes
    - Fixed cost efficiencies usually result from the elimination of duplicative costs: the combined company does not need two CEOs, two headquarters buildings, or two back office accounting systems
  - Reductions in marginal costs
    - Economies of scale or scope (one factory or one sales force may be able to handle the production and sales of both companies)
    - The combination of complementary technical assets and skills (the combined company may be able to produce products with lower costs or better products faster).

# Efficiencies

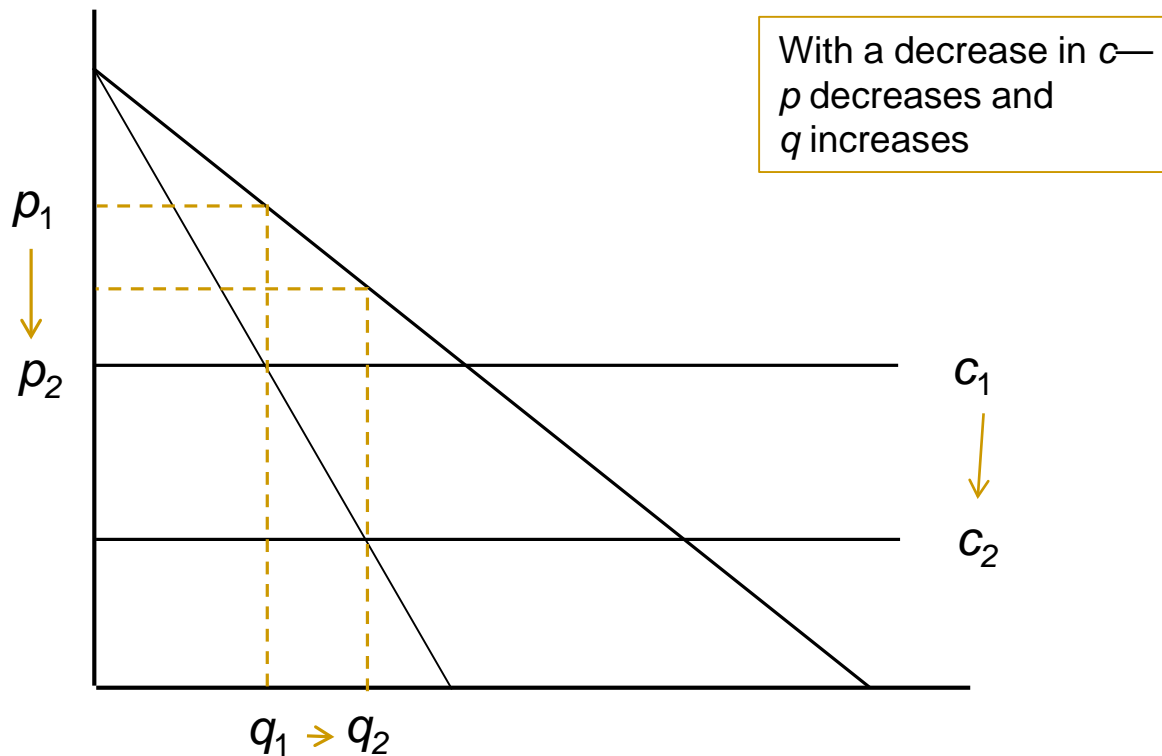
## ■ Cost efficiencies

- Most common type of proffered efficiency defense in merger cases
- *Key result*: Only marginal cost reductions create downward pricing pressure
  - We know that the merged firm will select its output and prices so as to equate its marginal revenue and its marginal cost
  - Although reductions in the merged firm's fixed costs can be very profitable to the merging parties and provide a strong incentive to go forward with the deal, fixed cost reductions do not figure into the  $MR = MC$  first order condition and hence will not provide any downward pressure on postmerger prices
    - NB: This result holds in a static model. In a dynamic model, the parties could argue that it is in the profit-maximizing interest of the combined firm to reinvest the fixed cost savings into improved production technology that would lower marginal costs or products improvements that would shift the demand curve to the right.
    - The dynamic efficiencies defense is not well-recognized and in any event is likely to be very difficult to prove:
      - Difficult to prove that that merged firm's profit-maximizing incentive is to reinvest
      - Difficult to prove that the investment, if it occurred, would result in the alleged consumer benefits
      - Difficult to prove that the merger will not produce an anticompetitive effect in the period of time between the consummation of the merger and the time the consumer benefits emerge
  - As a result, changes in fixed costs are usually disregarded by the agencies in the HSR review.
    - *Query*: Are they also disregarded by courts?

# Efficiencies

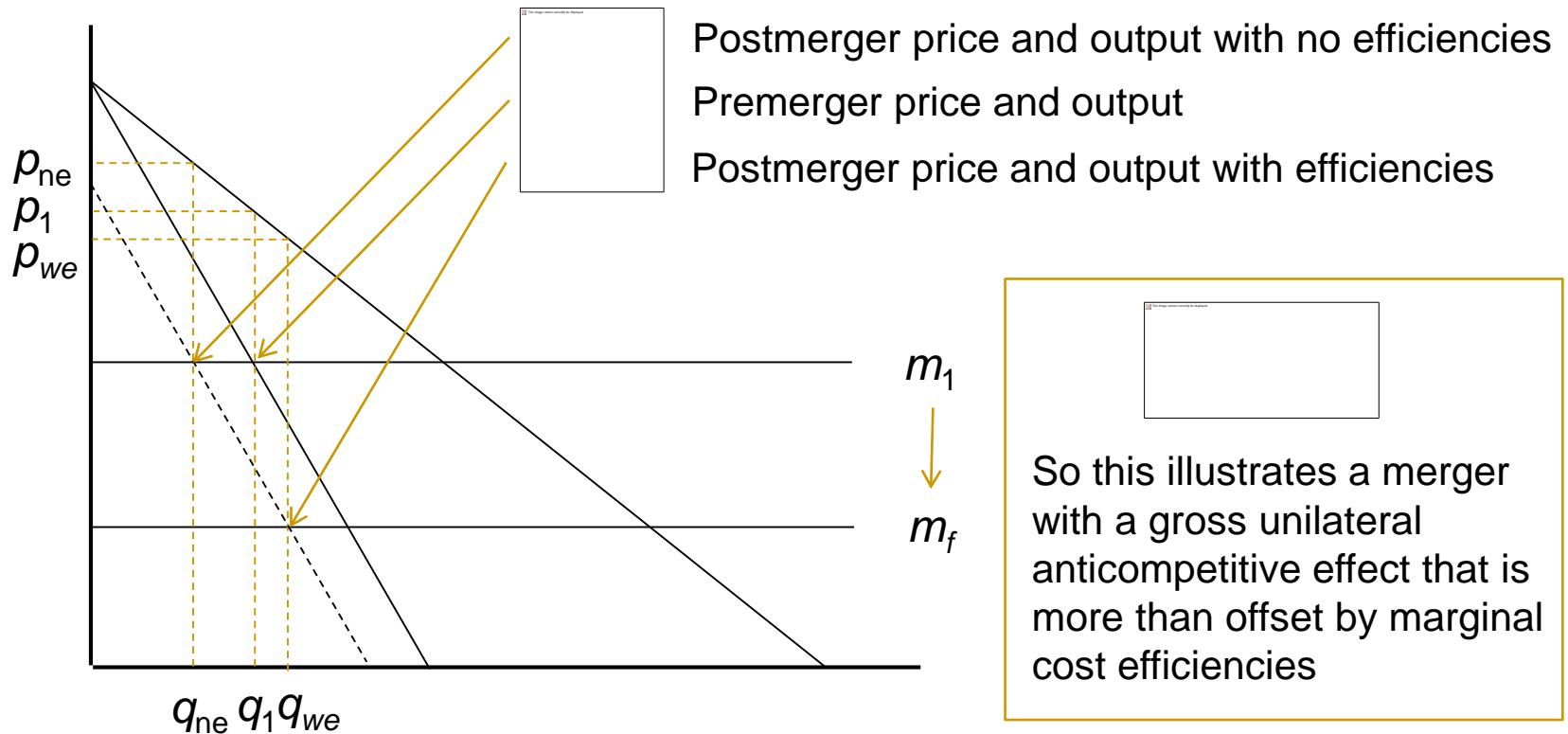
## ■ Cost efficiencies

- *Illustration:* A reduction in marginal cost  $c$  creates downward pricing pressure.
  - Even a structural monopolist will lower its prices and increase its output in response to a reduction in its marginal costs.



# Efficiencies

- Unilateral effects with offsetting efficiencies
  - Unilateral effects shifts Firm 1's marginal revenue curve to the left
  - Marginal cost efficiencies shifts supply curve down from  $m_1$  to  $m_f$



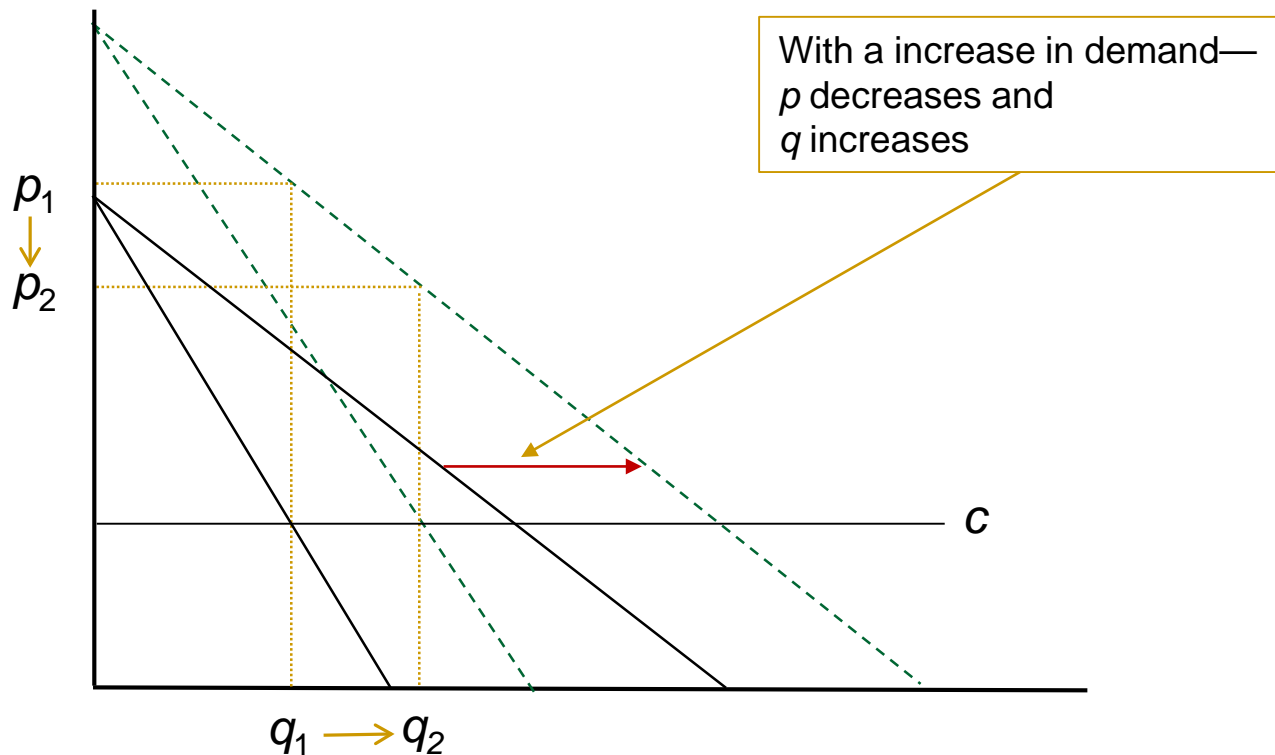
# Efficiencies

- “Shifting the demand curve to the right”
  - A second type of efficiencies that creates downward pricing pressure are new products or improvements to existing products that increase the value proposition to customers and so make customers demand more product postmerger than they did premerger while holding price constant
    - This is called “shifting the demand curve to the right”
    - A shift of this type in the demand curve increase the firm’s postmerger marginal revenue at  $q$  above that of the merging parties’ premerger marginal revenue at the same production level
    - Postmerger then,  $MR > MC$  at premerger prices, which creates an incentive for the merged firm to expand output and lower price to maximize profit
  - Examples
    - Accelerated R&D to create new products and product improvement
      - Greater combined R&D assets (researchers, patents, know-how)
      - Complementarities in R&D assets
      - Greater sales base over which to spread R&D costs
    - Better service and product support for existing products
      - More sales representatives
      - More convenient service support



# Efficiencies

- “Shifting the demand curve to the right”
  - *Illustration:* A shift of demand to the right creates downward pricing pressure.
    - Even a structural monopolist will lower its prices and increase its output in response to a shift of demand to the right



# Efficiencies

## ■ Efficiencies as a merger defense under the Merger Guidelines

### □ Basic idea

[A] primary benefit of mergers to the economy is their potential to generate significant efficiencies and thus enhance the merged firm's ability and incentive to compete, which may result in lower prices, improved quality, enhanced service, or new products. For example, merger-generated efficiencies may enhance competition by permitting two ineffective competitors to form a more effective competitor, e.g., by combining complementary assets. In a unilateral effects context, incremental cost reductions may reduce or reverse any increases in the merged firm's incentive to elevate price. Efficiencies also may lead to new or improved products, even if they do not immediately and directly affect price. In a coordinated effects context, incremental cost reductions may make coordination less likely or effective by enhancing the incentive of a maverick to lower price or by creating a new maverick firm. Even when efficiencies generated through a merger enhance a firm's ability to compete, however, a merger may have other effects that may lessen competition and make the merger anticompetitive.<sup>1</sup>

### □ Examples of how efficiencies can offset the anticompetitive effects a merger would otherwise have:

- Create a more effective competitor by combining complementary assets (e.g., IP rights)
- Offset the unilateral anticompetitive effect by sufficiently reducing marginal costs
- Diminish incentives for coordinated interaction by creating a firm with the cost structure to engage in disruptive conduct

<sup>1</sup> 2010 DOJ/FTC Horizontal Merger Guidelines § 10.

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# Efficiencies

- Four requirements for an efficiencies defense under the Merger Guidelines
  - Merger specificity
  - Verifiability
  - Sufficiency

# Efficiencies

- Efficiencies as a merger defense under the Merger Guidelines
  - Are the alleged efficiencies *merger specific*?

The Agencies credit only those efficiencies likely to be accomplished with the proposed merger and unlikely to be accomplished in the absence of either the proposed merger or another means having comparable anticompetitive effects. These are termed merger-specific efficiencies.<sup>13</sup> Only alternatives that are practical in the business situation faced by the merging firms are considered in making this determination. The Agencies do not insist upon a less restrictive alternative that is merely theoretical.

<sup>13</sup> The Agencies will not deem efficiencies to be merger-specific if they could be attained by practical alternatives that mitigate competitive concerns, such as divestiture or licensing. If a merger affects not whether but only when an efficiency would be achieved, only the timing advantage is a merger-specific efficiency.

- *Could* the efficiencies be achieved in the absence of the transaction? Or is the right question “*Would* they be achieved in the absence of the transaction”?
- Although the Merger Guidelines ask the second question, in practice the agencies strongly (and to an extent the courts) ask only the first question
- Agencies commonly reject considerations of efficiencies for insufficient evidence of verifiability
  - The agencies have rejected synergies as not being merger specific unless there is some absolute barrier to the merging parties achieving the same synergies without the merger (such as a patent)—The fact that the target has not obtained the synergies on its own to date and had no ongoing efforts to do so was irrelevant (the “could” v. “would” distinction)

# Efficiencies

- Efficiencies as a merger defense under the Merger Guidelines
  - Are the alleged efficiencies *verifiable*?

[I]t is incumbent upon the merging firms to substantiate efficiency claims so that the Agencies can verify by reasonable means the likelihood and magnitude of each asserted efficiency, how and when each would be achieved (and any costs of doing so), how each would enhance the merged firm's ability and incentive to compete, and why each would be merger-specific.

- Have the efficiencies been rigorously derived the parties?
- Can they be objectively ascertained by a third party?
  - The agencies usually regard this “third party” as an accountant or an economist, that is, someone without expertise in the industry in question—causes them to reject efficiencies that depend on expert industry judgment
  - Courts are trending this way as well
- Agencies commonly reject considerations of efficiencies for insufficient evidence of verifiability
  - For example, the agencies have rejected testimony by experienced engineers in the buyer that the acquiring company can improve the operating efficiency of the target— even when these engineers has been successful in past acquisitions of similar companies—because they had not done a “suitably detailed” engineering study on the target
    - “Suitably detailed” can be a moving target: Whatever study has been done can be rejected as not suitably detailed

# Efficiencies

- Efficiencies as a merger defense under the Merger Guidelines
  - Are the alleged efficiencies *timely and sufficient*?

[I]t is incumbent upon the merging firms to substantiate efficiency claims so that the Agencies can verify by reasonable means the likelihood and magnitude of each asserted efficiency, how and when each would be achieved (and any costs of doing so), how each would enhance the merged firm's ability and incentive to compete, and why each would be merger-specific.

- Will they occur in time and with sufficient magnitude to offset the anticompetitive effects of the merger that would be likely to occur in the absence of the efficiencies?
- Need for quantitative economic analysis
  - In the absence of strong customer support for the transaction resulting from customer perceptions of the efficiencies, the agencies almost surely will require some formal quantitative economic analysis showing that the efficiencies (assuming that they are merger-specific and verifiable) will offset the anticompetitive effects of the transaction
- Historical note
  - In earlier versions, the Merger Guidelines required that the alleged efficiencies did not result from an anticompetitive aspect of the merger (such as an anticompetitive reduction in output)
  - With the introduction of the requirement that the alleged efficiencies be sufficient to eliminate any anticompetitive effect of the merger, a separate requirement that the alleged efficiencies did not result from an anticompetitive aspect of the merger is superfluous

# Efficiencies

## ■ Efficiencies in court

### □ Judicial skepticism

#### ■ The Supreme Court has cast doubt on an efficiencies defense in three cases

1. In *Brown Shoe*, the Supreme Court, though acknowledging that mergers may sometimes produce benefits that flow to consumers, stated:

“Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of decentralization.”<sup>1</sup>

2. In *Philadelphia National Bank*, the Court observed:

a merger the effect of which “may be substantially to lessen competition” is not saved because, on some ultimate reckoning of social or economic debits and credits, it may be deemed beneficial.... Congress determined to preserve our traditionally competitive economy. It therefore proscribed anticompetitive mergers, the benign and the malignant alike, fully aware, we must assume, that some price might have to be paid.<sup>2</sup>

<sup>1</sup> *Brown Shoe Co. v. United States*, 370 U.S. 294, 344 (1962).

<sup>2</sup> *United States v. Philadelphia Nat'l Bank*, 374 U.S. 321, 371 (1963).

# Efficiencies

## ■ Efficiencies in court (con't)

### □ Judicial skepticism (con't)

- The Supreme Court has cast doubt on an efficiencies defense in three cases
  3. In *Procter & Gamble*, the Supreme Court enjoined a merger without any consideration of evidence that the combined company could purchase advertising at a lower rate:

“Possible economies cannot be used as a defense to illegality. Congress was aware that some mergers which lessen competition may also result in economies but it struck the balance in favor of protecting competition.”<sup>1</sup>

- Significantly, in these older cases an accepted goal of antitrust law was the protection of small business
- In light of these Supreme Court statements, lower courts have expressed skepticism that an efficiencies defense exists<sup>2</sup>

<sup>1</sup> *FTC v. Procter & Gamble Co.*, 386 U.S. 568, 580 (1967) (citing *Brown Shoe Co. v. United States*, 370 U.S. 294, 344 (1962)).

<sup>2</sup> See *United States v. Anthem, Inc.*, 855 F.3d 345, 353-54 (D.C. Cir. 2017) (expressing doubts about an efficiency defense in light of *Procter & Gamble*, which has never been overruled); *FTC v. Penn State Hershey Med. Ctr.*, 838 F.3d 327, 348-49 (3d Cir. 2016).



# Efficiencies

## ■ Efficiencies in court (con't)

- That said, some modern lower courts recognize that efficiencies resulting from the merger may be considered in rebutting the government's *prima facie* case

- Here are two typical statements:

- *Advocate Health Care:*

Although the defense has never been sanctioned by the Supreme Court, the Horizontal Merger Guidelines and some lower courts recognize that defendants in a horizontal merger case may rebut the government's *prima facie* case by presenting evidence of efficiencies offsetting the anticompetitive effects.<sup>1</sup>

- *Penn State Hershey Medical Center:*

Remaining cognizant that the “language of the Clayton Act must be the linchpin of any efficiencies defense,” and that the Clayton Act speaks in terms of “competition,” we must emphasize that “a successful efficiencies defense requires proof that a merger is not, despite the existence of a *prima facie* case, anticompetitive.”<sup>2</sup>

The efficiencies defense, on the other hand, is a means to show that any anticompetitive effects of the merger will be offset by efficiencies that will ultimately benefit consumers.<sup>3</sup>

<sup>1</sup> FTC v. Advocate Health Care, No. 15 C 11473, 2017 WL 1022015, at \*12 (N.D. Ill. Mar. 16, 2017) (entering preliminary injunction on remand).

<sup>2</sup> FTC v. Penn State Hershey Med. Ctr., 838 F.3d 327, 349 (3d Cir. 2016).

<sup>3</sup> *Id.*

# Efficiencies

- Efficiencies in court (con't)
  - That said, some modern lower courts recognize that efficiencies resulting from the merger may be considered in rebutting the government's prima facie case
    - Interpretation
      - The most sensible way to read this statement is that efficiencies can be used as a *negative* defense to disprove the anticompetitive effect element of the prima facie case<sup>1</sup>
      - But they cannot be used to as an *affirmative* defense to permit a merger that has the requisite anticompetitive effect in the relevant market<sup>2</sup>
        - This distinction essentially reflects a consumer welfare standard over a total welfare standard

<sup>1</sup> See, e.g., *FTC v. Univ. Health, Inc.*, 938 F.2d 1206, 1222 (11th Cir. 1991) (“It is clear that whether an acquisition would yield significant efficiencies in the relevant market is an important consideration in predicting whether the acquisition would substantially lessen competition.”).

<sup>2</sup> See, e.g., *Univ. Health*, 938 F.3d at 1222 n.29 (“Of course, once it is determined that a merger would substantially lessen competition, expected economies, however great, will not insulate the merger from a section 7 challenge.”).

# Efficiencies

## ■ Efficiencies in court (con't)

- That said, some modern lower courts recognize that efficiencies resulting from the merger may be considered in rebutting the government's prima facie case

- Difficulty in application

- Plaintiffs establish their prima facie case through the *PNB* presumption and additional supporting evidence of unilateral and/or coordinated effects, which collectively gives a qualitative result that the merger is presumptively likely to substantially lessen competition and harm consumers
- But how is the qualitative result to be negated by a showing of efficiencies, even if the efficiencies are in some way quantified?
- Example: *Penn State Hershey Medical Center*.

Irrespective of whatever benefits the merger may bestow upon the Hospitals in increasing their ability to engage in risk-based contracting, the Hospitals must demonstrate that such a benefit would ultimately be passed on to consumers. It is not clear from the record how this would be so beyond the mere assertion that it would save the Hospitals money and such savings would be passed on to consumers.<sup>1</sup>

- Practical solution
  - Defendants must adduce testimony of customer-witnesses that would be harmed if the transaction was in fact anticompetitive that they believe that the balance of the merger's harmful and beneficial effects will be procompetitive (i.e., beneficial to customers), or, more technically, not anticompetitive
  - Since the defendants must at least make a prima facie case that the efficiencies will offset any of the merger's anticompetitive tendencies, the defendants' failure to adduce such evidence is likely to result in a rejection of their efficiencies defense

<sup>1</sup> *FTC v. Penn State Hershey Med. Ctr.*, 838 F.3d 327, 349 (3d Cir. 2016).

# Efficiencies

- Efficiencies in court (con't)
  - Judicial practice
    - Essentially have adopted the requirements of the Merger Guidelines<sup>1</sup>
      - “Projections of efficiencies may be viewed with skepticism, particularly if they are generated outside of the usual business planning process.”<sup>2</sup>
      - “The difficulty in substantiating efficiency claims in a verifiable way is one reason why courts generally have found inadequate proof of efficiencies to sustain a rebuttal of the government’s case.”<sup>3</sup>
    - No court has yet found that the merging parties have successfully defended a merger through a showing of efficiencies

<sup>1</sup> See, e.g., *FTC v. Penn State Hershey Med. Ctr.*, 838 F.3d 327 (3d Cir. 2016) (reversing question of whether an efficiencies defense exists, but assuming it does applying the Merger Guidelines standard and finding that claimed efficiencies cannot offset the merger’s likely anticompetitive effects).

<sup>2</sup> *FTC v. ProMedica Health Sys., Inc.*, No. 3:11 CV 47, 2011 WL 1219281, at \*40 (N.D. Ohio Mar. 29, 2011) .

<sup>3</sup> *United States v. H & R Block, Inc.*, 833 F. Supp. 2d 36, 91 (D.D.C. 2011) .

# Efficiencies

## ■ Efficiencies in court (con't)

### □ “Pass on”

- In any event, claimed efficiencies can offset an anticompetitive effect on consumers only to the extent that the efficiencies are “passed on” by the merged company to the consumers that otherwise would be competitively harmed.
- *Anthem* court:

[T]he claimed medical cost savings only improve consumer welfare to the extent that they are actually passed through to consumers, rather than simply bolstering Anthem’s profit margin. After all, the merger potentially harms consumers by creating upward pricing pressure due to the loss of a competitor, and so only efficiencies that create an equivalent downward pricing pressure can be viewed as “sufficient to reverse the merger’s potential to harm consumers . . . , e.g., by preventing price increases.”<sup>1</sup>

- In *Anthem*, the court appears to have rejected the idea that an aggregate dollar savings greater than the aggregate dollar value of an anticompetitive price increase would make out an efficiencies defense
  - That is, it is not sufficient that the gross consumer surplus from efficiencies outweigh the gross wealth transfer resulting from an anticompetitive price increase
- Rather, the court appeared to require that the downward pressure on prices from efficiencies at least offset the upward pressure on prices from the anticompetitive effect, so that there would be no net price increase to customers

<sup>1</sup> *United States v. Anthem, Inc.*, 855 F.3d 345, 362 (D.C. Cir. 2017) (internal citations omitted); see *FTC v. Penn State Hershey Med. Ctr.*, 838 F.3d 327, 348 (3d Cir. 2016) (“In order to be cognizable, the efficiencies must, first, offset the anticompetitive concerns in highly concentrated markets.”).

# Efficiencies

## ■ Efficiencies in court (con't)

### □ Rent shifting

- *Query*: Is a lowering of input prices due to greater bargaining power gained by the merger a cognizable efficiency when the lower prices do not reflect any production efficiency?
- *Anthem court*:

The district court also expressed doubt as to whether the type of efficiencies claimed by Anthem, which merely redistribute wealth from providers to Anthem and its customers rather than creating new value, are even cognizable under Section 7.<sup>1</sup>

- The court of appeals also expressed skepticism, but found it was unnecessary to answer the question given the facts in the case

<sup>1</sup> United States v. Anthem, Inc., 855 F.3d 345, 352 (D.C. Cir. 2017) (internal citations omitted).

# Efficiencies

## ■ Unilateral effects and marginal cost efficiencies

### □ The model: Recall—

- Recall that at profit-maximizing premerger output and price, Firm 1 sets marginal revenue equal to marginal cost:  $mr_1 = mc_1$

- When unilateral effects are present, post merger Firm 1 must take into account the opportunity cost of the lost profits of Firm 2 that are diverted to Firm 1, so that Firm 1's marginal revenue now becomes  $mr_1 + \Delta q_{B \rightarrow A}(p_2 - c_2)$ .

- Since opportunity costs are negative, when evaluated at Firm 1's premerger output and price:

$$mr_1 + \Delta q_{B \rightarrow A}(p_2 - c_2) < mc_1,$$

which requires Firm 1 to contract output and raise price in order to reequilibrate marginal revenue and marginal cost postmerger. (This is the source of the *upward pricing pressure*)

- Now say that the merger also reduced the marginal cost of Firm 1 by a percentage  $e$  (but did not change the marginal cost of Firm 2). Firm 1's postmerger marginal cost is then  $(1-e)mr_1$ . The efficiency will offset the upward pricing pressure at firm 1's premerger output and price if:

$$mr_1 + \Delta q_{B \rightarrow A}(p_2 - c_2) \geq (1 - e)mc_1,$$

or

$$\Delta q_{B \rightarrow A}(p_2 - c_2) \geq -e \times mc_1 \Rightarrow e \times mc_1 \geq -\Delta q_{B \rightarrow A}(p_2 - c_2).$$

- This says that for efficiencies to offset the opportunity cost of Firm 2's lost profits, the savings in the marginal costs of production have to be at least as large as Firm 2's lost profits

# Failing firm defense

## ■ Theory

- A “failing firm” is a firm that will exit the market *with its assets* in the absence of an acquisition
- The original idea behind a failing firm defense is that it is better to permit an “anticompetitive” acquisition than to allow the failing firm’s assets—and therefore productive capacity—to exist in the market
  - While this may sound like an affirmative defense, it is actually a negative defense.
  - If the firm’s productive capacity would exit the market in the acquisition, then it has no competitive significance going forward and its acquisition by a competitor cannot reduce competition
  - The key here is whether the firm’s productive assets would in fact exit the market in the absence of the challenged acquisition—if, in the “but for” world, the failing firm’s assets would be acquired by another firm in a transaction that would make consumers better off than with the challenged acquisition, then the challenged acquisition is anticompetitive



# Failing firm defense

- Requirements: The allegedly failing firm—
  1. would be unable to meet its financial obligations in the near future,
  2. would not be able to reorganize successfully under Chapter 11 of the Bankruptcy Act, and
  3. has made unsuccessful good-faith efforts to elicit reasonable alternative offers that would keep its tangible and intangible assets in the relevant market and pose a less severe danger to competition than does the proposed merger<sup>1</sup>
  
- Observations
  - The failing firm defense works in principle for a failing division or subsidiary
  - The failing firm defense has had essentially no success since the Supreme Court recognized it in 1930 by the Supreme Court in *International Shoe*<sup>2</sup>

<sup>1</sup> 2010 DOJ/FTC Horizontal Merger Guidelines § 11.

<sup>2</sup> *International Shoe Co. v. FTC*, 280 U.S. 291, 302 (1930).