# Unit 9. H&R Block/TaxACT

## Part 1. Market Definition

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# A Little Law

# Clayton Act § 7

- Clayton Act § 7 provides the U.S. antitrust standard for mergers

> No person engaged in commerce or in any activity affecting commerce shall acquire, directly or indirectly, the whole or any part of the stock or other share capital and no person subject to the jurisdiction of the Federal Trade Commission shall acquire the whole or any part of the assets of another person engaged also in commerce or in any activity affecting commerce, where in **any line of commerce** or in any activity affecting commerce **in any section of the country**, **the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly**. [1]

- Essential elements of a Section 7 violation
  1. Acquisitions of stock or assets that,
  2. "in any line of commerce" (product market)
  3. "in any part of the country" (geographic market)
  4. the effect of the acquisition "may substantially lessen competition or tend to create a monopoly"

Called the *relevant market*

Called the *anticompetitive effects test*

[1] 15 U.S.C. § 18 (emphasis added; remainder of section omitted).

# Proving the prima facie case

- Three elements:
  1. *Product market definition*: Courts broadly look at two types of indicia in evaluating evidence on the relevant product market—
     a. The "*Brown Shoe* factors"
     b. The "hypothetical monopolist test"
  2. *Geographic market definition*: Courts broadly look at two types of indicia in evaluating evidence on the relevant geographic market—
     a. "The area of effective competition"
        i. The area where customers of the merging firms can practically turn to alternative suppliers (when customers travel to suppliers—think retail stores)
        ii. The area where alternative suppliers exist that can practically service the customers of the merging firm (when suppliers travel to customers—think plumbers)
     b. The "hypothetical monopolist test"
  3. *Anticompetitive effect*: Courts broadly look at two types of indicia in evaluating evidence on the relevant geographic market
     a. The *Philadelphia National Bank* presumption
     b. Theories and supporting direct and circumstantial evidence of likely anticompetitive harm resulting from the merger

*Before turning to market definition, we need to examine the* Philadelphia National Bank *presumption*

# The *PNB* presumption

> "This intense congressional concern with the trend toward concentration warrants dispensing, in certain cases, with elaborate proof of market structure, market behavior, or probable anticompetitive effects. Specifically, we think that a merger which **produces a firm controlling an undue percentage share of the relevant market**, and **results in a significant increase in the concentration of firms** in that market is so inherently likely to lessen competition substantially that it must be enjoined in the absence of evidence clearly showing that the merger is not likely to have such anticompetitive effects."[1]

- Requires—
  - The combined firm to pass some (unspecified) threshold of *market share*, *and*
  - The transaction to result in a *significant increase in market concentration*

  NB: The opinion was careful to note that it was not setting a lower bound and that commentators had suggested 20% as a threshold of "undue" market share
- Supposed to reflect the latest in economic thinking in the then-prevailing structure-conduct-performance paradigm
  - "[T] the test is fully consonant with economic theory."[2]
  - "[C]ompetition is greatest when there are many sellers, none of which has any significant share."[3]

[1] United States v. Philadelphia National Bank, 374 U.S. 321, 363 (1963).
[2] *Id*. (citing extensively to structure-conduct-performance literature).
[3] *Id*.

# The *PNB* presumption: Background

- Application in *Philadelphia National Bank*
  - Combined firm had at least a 30% share in the relevant market
    - Enough for an "undue market share"
  - The share of the two largest banks in the relevant market increased from 44% to 59%:
    - Enough for a "significant increase" in market concentration
  - Supreme Court
    - The combined firm's share and the increase in market concentration was sufficient to predicate the *PNB* presumption
    - There was nothing in the record to rebut the presumption
      - The district court misplaced reliance on testimony that competition was vigorous and would continue to be vigorous (problem too complex; witnesses failed to give "concrete reasons" for their conclusions)

# The *PNB* presumption: Background

- The Supreme Court in the 1960s was very aggressive on the market share thresholds of the *PNB* presumption
- Some (infamous) early Supreme Court precedents
  - Brown Shoe/Kinney (1962)[1]
    - Combined share of as little as 5% in an unconcentrated market
  - Von's Grocery/Shopping Bag Food Stores (1966)[2]
    - 4.7% (#3) + 4.2% (#6) → 8.9% (#2) in an unconcentrated market
  - Pabst Brewing/Blatz Brewing (1966)[3]
    - 3.02% (#10) + 1.47% (#18) → 4.49% (#5) in an unconcentrated market

*Bottom line*: Through the 1960s and into the 1970s, antitrust law prohibited most significant horizontal mergers and acquisitions

[1] Brown Shoe Co. v. United States, 370 U.S. 294 (1962).
[2] United States v. Von's Grocery Co., 384 U.S. 270 (1966).
[3] United States v. Pabst Brewing Co., 384 U.S. 546 (1966).

# The *PNB* presumption: Background

- Status of the *PNB* presumption as of the late 1970s
  - *General Dynamics* (1974) had returned to a rebuttable presumption
  - BUT
    - There was no meaning test of market definition
    - The market share triggers remained very low
    - The evidence sufficient to rebut the presumption remained generally undefined
- 1982 DOJ Merger Guidelines
  - Introduced the *hypothetical monopolist test* to provide an economically rigorous and sensible means of defining markets in the context of the *PNB* presumption
  - Introduced the HHI as the measure of market concentration
  - Provided new market share thresholds to be used by the DOJ
  - Provided a catalog of defenses to rebut the presumption

*This is why we need to introduce the PNB presumption before examining market definition*

# *Baker-Hughes*[1]

- Uses a three-step burden shifting approach:
  1. The plaintiff bears burden of proof in market definition and in market shares and market concentration within the relevant market sufficient to trigger the *PNB* presumption and thereby prove a prima facie Section 7 violation
     - More generally, this should be the burden of proving a prima facie case (whether or not the *PNB* presumption or other evidence is invoked to show anticompetitive effect)
     - You can think of the burden here as the *burden of production*, that is, the plaintiff must adduce sufficient evidence to allow the trier of fact to find each and every essential element of a Section 7 violation
     - Essential elements
       1. The relevant product market
       2. The relevant geographic market
       3. The requisite anticompetitive effect in the relevant market
  2. If the plaintiff satisfies this burden, the *burden of production* shifts to defendants to adduce evidence sufficient to rebut *PNB* presumption and create a genuine issue for the trier of fact
     a. Negate the plaintiff's market definition
     b. Rebut the predicates of the PNB presumption and other evidence of gross anticompetitive effect
     c. Prove one or more downward-pricing pressure defenses

[1] United States v. Baker Hughes Inc., 908 F.2d 981, 982-83 (D.C. Cir. 1990).

# *Baker-Hughes*[1]

- Uses a three-step burden shifting approach:
  3. *The burden of persuasion* then returns to plaintiff to prove in light of all of the evidence in the record that the merger is reasonably probable to have an anticompetitive effect in the relevant market

# Market Definition Generally

# An essential element of the prima facie case

- Some good quotes for use in briefs:
  - "Determination of the relevant product and geographic markets is 'a necessary predicate' to deciding whether a merger contravenes the Clayton Act."[1]
  - "Determination of the relevant market is a necessary predicate to a finding of a violation of the Clayton Act because the threatened monopoly must be one which will substantially lessen competition 'within the area of effective competition.' Substantiality can be determined only in terms of the market affected."[2]
  - "Statistics reflecting the shares of the market controlled by the industry leaders and the parties to the merger are, of course, the primary index of market power; but only a further examination of the particular market—its structure, history and probable future—can provide the appropriate setting for judging the probable anticompetitive effect of the merger."[3]

[1] United States v. Marine Bancorporation, Inc., 418 U.S. 602, 618 (1974) (quoting United States v. E. I. Du Pont de Nemours & Co., 353 U.S. 586, 593 (1957).
[2] United States v. E. I. Du Pont de Nemours & Co., 353 U.S. 586, 593 (1957) (footnote omitted).
[3] Brown Shoe Co. v. United States, 370 U.S. 294, 322 n.28 (1962); *accord* United States v. General Dynamics Corp., 415 U.S. 486, 498 (1974).

# Some basic points

- Question of fact
  - The determination of the boundaries of the relevant market is a question of fact
- Burden of proof on the plaintiff
  - Bears the burden of proving a *prima facie* relevant market in Step 1 of *Baker Hughes*
    - Essentially a burden of production
  - Bears the *burden of persuasion* on relevant market in Step 3 of *Baker Hughes*
- Motion to dismiss: *Twombly* applies
  - The complaint must contain sufficient factual allegations to make the alleged market definition plausible under the market definition standards in the case law
  - The plaintiff's failure in a complaint to adequately plead the factual predicates of market definition will result in the complaint's dismissal under FRCP 12(b)(6)
  - However, *Twombly* challenges are typically not brought where—
    1. The defendants are not likely to ultimately challenge the plaintiff's definition of the relevant market, *and*
    2. It is easy for the plaintiff to replead the complaint and supply the missing factual allegations to support its alleged market definition
  - Motions to dismiss are rare in preclosing merger antitrust challenges
    - Merging parties want to proceed to the merits as quickly as possible

# Some basic points

- Forward looking
  - Since merger antitrust law is forward-looking—that is, it makes unlawful mergers and acquisitions that are likely to lessen competition substantially in the future as compared to what competitive conditions would have been absent the transaction—market definition equally must be forward-looking
  - Product market definition, for example, should take into account new products that shortly will be released or old products that will soon be obsolete
  - Likewise, geographic market definition should take into account the construction of new facilities, changing transportation modes or patterns, or new methods of purchasing or distribution.
- Appeal
  - As a finding of fact, district court ruling reviewed under the “clearly erroneous” rule
  - FTC findings reviewed under the “substantial evidence” rule

# A debate

- Is the proof of a relevant market really necessary?
  - Some commentators argue that direct evidence of anticompetitive harm should obviate the need to prove the relevant market
    - For example, say the challenge is to a consummated merger and that the plaintiff can prove the merger resulted in a substantial price increase
  - Opponents of this view argue that by its terms Section 7 requires the showing of the product and geographic dimensions of a relevant market
  - Views of the DOJ and FTC
    - The DOJ and FTC agree that the determination of a relevant market is not necessary in order to prove the requisite anticompetitive effect in the vast majority of mergers
    - BUT they have not been willing to test whether they can dispense with the market definition elements in court
  - Courts
    - Have not had to decide a case on precisely point
  - WDC view
    - Courts will require proof of a relevant market in all Section 7 cases
    - BUT will not be too demanding on the dimensions of the market if market shares and market concentration statistics are not being using to prove anticompetitive effect

# Market Definition
# Part 1: The judicial tests

# Introduction

- Two dimensions
  - Every relevant market has two dimensions:
    - The product dimension: The products within the market (the *relevant product market*)
    - The geographic dimension: The geographic area covered by the market (the *relevant geographic market*)
- The relevant market in H&R Block/TaxACT
  - The parties stipulated that the relevant geographic market was the United States
    - It is common for the parties to stipulate to the relevant markets
    - *Exception*: the relevant market is frequently a major issue in "retail" deals (where individuals travel to the business location—think retail stores, banks, hospitals)
  - The dimensions of the product market was a central issue in the case

*One or both market dimensions almost always will be a major issue in any litigated case. Empirically, disproof of the plaintiff's market definition is the major reason plaintiffs fail in merger antitrust cases.*

*We will focus on product market definition in this unit*

# Product markets generally

- What is a relevant product market?
  - A relevant product market defines the product boundaries within which competition meaningfully exists[1]
  - Although discussed in terms of products, the product market concept equally applies to services or a mixed combination of a product with accompanying services
- Modern concept of relevant markets
  - Products in the relevant market should exert significant price pressure on one another
    - That is, an increase in the price of one of the products in the market should cause customers to switch to other products in the market, and this loss of sales should result in the price increase being unprofitable.
  - Some definitions
    - *Inframarginal customers* continue to buy the product after the price increase
    - *Marginal customers* would buy the product at the original price but not at the increased price
- The showing of the relevant market(s) is an essential element of every Section 7 violation
  - The plaintiff must make a prima facie showing of a relevant market as part of its prima facie case and bears the ultimate burden of persuasion

[1] United States v. Continental Can Co., 378 U.S. 441, 449 (1964).

# Two complementary tests in judicial analysis

1. The judicial approach
   - The judicial approach to product market analysis takes its point of departure from the Supreme Court's decision in *Brown Shoe Co. v. United States*,[1] which identified a variety of factors to be considered but said very little about how to consider them
   - The result was enormous confusion, bad analysis, bad decisions, and inconsistency in the courts
2. Merger Guidelines approach
   - Much of the confusion in the courts, and essentially all of the doctrinal disarray in the Antitrust Division and the FTC, has been eliminated by the new market definition approach introduced in the 1982 DOJ Merger Guidelines and continued today (with some changes) in the 2010 DOJ/FTC Horizontal Merger Guidelines[2]
   - The Guidelines' approach seeks to identify markets as product and geographical groupings that are susceptible to the exercise of market power by a hypothetical monopolist
   - Although the Guidelines' approach is not binding as a matter of law, courts have adopted the foundations of the Guidelines' hypothetical monopolist test as conceptually appealing and practically workable

[1] Brown Shoe Co. v. United States, 370 U.S. 294 (1962). [2] There does remain confusion when products have a zero price.

# The judicial approach: *Brown Shoe*

- *Brown Shoe* provides the starting point in judicial analysis for market definition:

> The outer boundaries of a product market are determined by the **reasonable interchangeability of use** or the **cross-elasticity of demand** between the product itself and substitutes for it. However, within this broad market, well-defined **submarkets** may exist which, in themselves, constitute product markets for antitrust purposes. The boundaries of such a submarket may be determined by examining such practical indicia as industry or public recognition of the submarket as a separate economic entity, the product's peculiar characteristics and uses, unique production facilities, distinct customers, distinct prices, sensitivity to price changes, and specialized vendors. Because § 7 of the Clayton Act prohibits any merger which may substantially lessen competition "in *any* line of commerce" (emphasis supplied), it is necessary to examine the effects of a merger in each such economically significant submarket to determine if there is a reasonable probability that the merger will substantially lessen competition. If such a probability is found to exist, the merger is proscribed.[1]

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962) (internal citations and footnotes omitted; emphasis added).

# *Brown Shoe* "outer boundaries" test

- *Brown Shoe*:

> The outer boundaries of a product market are determined by **the reasonable interchangeability of use** or the **cross-elasticity of demand** between the product itself and substitutes for it.[1]

  - This remains the prevailing definition of a relevant product market in the case law
  - Key indicia—
    1. Reasonable interchangeability of use
    2. [High] cross-elasticity of demand
  - Modern usage
    - Reasonable interchangeability of use has largely come to mean high cross-elasticity of demand and is no longer a distinct "outer boundary" factor

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962) (emphasis added).

# *Brown Shoe* "outer boundaries" test

- General idea
  - In a horizontal merger, the relevant product market should—
    1. *Start* with the overlapping products of the merging firms
    2. *Contain* all products that exhibit a reasonable interchangeability of use and a high cross-elasticity of demand with one another
    3. *Exclude* all products that lack reasonable interchangeability of use and have a low cross-elasticity of demand with products in the relevant product market

*Designed to isolate all and only those products that exert significant price-constraining force on the overlapping products*

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962) (emphasis added).

# *Brown Shoe* "outer boundaries" test

- The core concept
  - Substitutes that are reasonably interchangeable and exhibit a high cross-elasticity with the products of the merging firms are central to market definition because these substitutes determine the extent to which customers of the merging firms can protect themselves against anticompetitive price increases, quality decreases, or declines in the rate of technological innovation or product improvement.
  - If the combined firm attempts to act anticompetitively, either alone or in concert with others, it will only lose sales and, more importantly, profits. The availability of substitutes serves to discipline the combined firm to act competitively.
  - The alternative products in the relevant market need not be the first choice of all customers; it is enough that a significant number of customers of the merging parties would turn to the other products in the market if the merged firm's prices were to increase relative to the prices of these other products.
  - In this sense, market definition, as properly conceived in the reasonable interchangeability of use and high cross-elasticity of demand criteria of *Brown Shoe*, seeks to identify substitutes for the products of the merging firms as a first step in ascertaining whether the disciplining effects of these substitutes are likely to be sufficient to maintain the competitive *status quo ex ante* in the wake of a merger or acquisition.

# *Brown Shoe* "practical indicia" test

- Submarkets and "practical indicia" of relevant markets

> However, within this broad market [defined by reasonable interchangeability of use and high cross-elasticity of demand], well-defined **submarkets** may exist which, in themselves, constitute product markets for antitrust purposes. The boundaries of such a submarket may be determined by examining such **practical indicia** as
>
> [1] industry or public recognition of the submarket as a separate economic entity,
>
> [2] the product's peculiar characteristics and uses,
>
> [3] unique production facilities,
>
> [4] distinct customers,
>
> [5] distinct prices,
>
> [6] sensitivity to price changes, and
>
> [7] specialized vendors.[1]

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962).

# *Brown Shoe* "practical indicia" test

- Submarkets and "practical indicia" of relevant markets
  - This list of "practical indicia" was not intended to be exhaustive
  - Some additional factors that courts typically consider—
    1. Relative prices of products in the provisional market
       - A Timex and a Rolex both tell time, but they are unlikely to exhibit a high cross-elasticity of demand with one another
    2. Different functional attributes that might appeal to different classes of buyers
       - Consider the functional difference between a Ferrari 812 (0-60 mph: 2.8 sec.; top speed: 211 mph) and a Nissan Versa (0-60 mph: 10.2 sec.; top speed: 115 mph)
       - Differences in functionality are often reflected in differences in price (Ferrari 812 base price: $404,494; Nissan Versa base price: $14,980)
    3. Differences in reputation
       - Even without functional differences

- Problems with the *Brown Shoe* "practical indicia" test
  - The list provides some factors to consider but does not say what weight they should be given or give any other analytical technique to apply them to determine the boundaries of submarkets
  - This created an enormous amount of confusion, bad analysis, and bad decisions

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962).

# *Brown Shoe* submarkets: The modern view

- Submarkets (surprisingly) remain a valid concept in antitrust law
  - Courts still employ the concept, but with decreasing regularity
- But most courts view submarkets as no different than a relevant market
  - Under this view, the *Brown Shoe* "practical indicia" are simply circumstantial evidence probative of reasonable interchangeability of use and cross-elasticity of demand
    - "The requirements for establishing a relevant submarket are no different than those for establishing a relevant market."[1]
  - Courts routinely rely on the *Brown Shoe* factors to define the relevant product market in merger and other antitrust cases[2]
- Since 1982, the merger guidelines have rejected submarkets as distinct from markets

[1] Flovac, Inc. v. Airvac, Inc., 817 F.3d 849, 855 (1st Cir. 2016); *accord* PSKS, Inc. v. Leegin Creative Leather Prods., Inc., 615 F.3d 412, 418 (5th Cir. 2010); Geneva Pharm. Tech. Corp. v. Barr Labs., Inc., 386 F.3d 485, 496 (2d Cir. 2004).
[2] *See, e.g.*, United States v. Sabre Corp., 452 F. Supp. 3d 97, 141 (D. Del. 2020), *vacated*, No. 20-1767, 2020 WL 4915824 (3d Cir. July 20, 2020); FTC v. Peabody Energy Corp., 492 F. Supp. 3d 865, 892 (E.D. Mo. 2020); FTC v. Wilh. Wilhelmsen Holding ASA, 341 F. Supp. 3d 27, 46 (D.D.C. 2018); FTC v. Tronox Ltd., 332 F. Supp. 3d 187, 198 (D.D.C. 2018); United States v. AT & T Inc., 310 F. Supp. 3d 161, 195 (D.D.C. 2018), *aff'd*, 916 F.3d 1029 (D.C. Cir. 2019); FTC v. Staples, Inc., 190 F. Supp. 3d 100, 126-27 (D.D.C. 2016); United States v. H & R Block, 833 F. Supp. 2d 36, 51-60 (D.D.C. 2011); FTC v. CCC Holdings, 605 F. Supp. 2d 26, 39-44 (D.D.C. 2009); FTC v. Swedish Match, 131 F. Supp. 2d 151, 159-64 (D.D.C. 2000); FTC v. Cardinal Health, Inc., 12 F. Supp. 2d 34, 46-48 (D.D.C. 1998); FTC v. Staples, Inc., 970 F. Supp. 1066, 1075-80 (D.D.C. 1997).

# Special case: Supply-side substitutability

- Introduction
  - In a footnote, *Brown Shoe* suggested that "cross-elasticity of production facilities" may be an important factor in defining markets[1]
    - But because the lower court made only limited findings on the feasibility of interchanging equipment in the production of different types of shoes, the Court did not explore it
  - Supply-side substitutability can constrain prices by encouraging producers to shift into the production of a higher margin product and thereby compete the price of that product down
    - The usual exercise of market power is manifested in a reduction of output, which results in an increase in price.
    - However, when a price increase induces new firms to enter the market, aggregate supply increases over what it would have been otherwise, which in turn may mitigate or eliminate the original price increase.
    - Supply-side responses, therefore, can be as critical to the analysis of price-constraining forces as demand-side responses.
  - Many courts have used supply-side substitutability as a factor in market definition
    - Since 1982, the Merger Guidelines have used only demand-side substitution to define markets
    - The Merger Guidelines account for supply-side substitutability when identifying firms and their market shares in the relevant market and *not* as part of market definition

[1] Brown Shoe Co. v. United States, 370 U.S. 294, 325 n.42 (1962).

# Special case: Supply-side substitutability

- The Merger Guidelines approach[1]
  - Market definition under the Merger Guidelines is determined solely by demand-side considerations
  - *Query*: How is the analysis conducted when two products that are not demand-side substitutes are manufactured on the same production equipment (perhaps with some minor modifications or retooling) and firms can rapidly switch their mix of production from one product to the other in response to small changes in relative prices?
    - For example, multiple grades of paper can and are produced on the same paper-making machines. Customers may not regard the different grades of paper substitutable for one another, but paper mills continuously change their production mix among the different grades in response to changes in relative prices
    - Are all grades of paper made on the same machine in the same relevant product market? If not, how do the Merger Guidelines take into account the clear competitive effects created by this supply-side competition?
  - Answer
    - The Merger Guidelines do *not* include products that are not demand-side substitutes in the same relevant market even if the products exhibit a high degree of supply-side substitutability
    - Instead, the Merger Guidelines will consider the firm making the supply-side substitute a participant in the relevant market and will assign it a share based on the level of production the firm would make of the relevant product in the event of a SSNIP

[1] *See* 2010 DOJ/FTC Horizontal Merger Guidelines §§ 5.1-5.2.

# Special case: Supply-side substitutability

- The Merger guidelines approach—Example[1]
  - Pencil-making firms can make both No. 2 pencils (the common type) and No. 4 pencils (used by architects in architectural drawings) on the same machine by just changing the mixture of graphite that goes into pencil's lead core. Changing the production mix on a given machine involves relatively low switching costs. No. 2 and No. 4 pencils are not demand-side substitutes.
  - Ace Pencil and Benny Pencil, currently the only two manufacturers of No. 4 pencils, have announced their merger
  - Using the demand-side considerations of the Merger Guidelines, the relevant product market in which to analyze the merger is No. 4 pencils
  - The following chart gives the premerger production levels of No. 2 and No 4 pencils:

| | Current Production | |
|---|---|---|
| | No. 2 | No. 4 |
| Ace | 3000 | 300 |
| Benny | 4000 | 200 |
| Cavalier | 7000 | |
| Delta | 6000 | |
| Enterprise | 3000 | |
| Funny | 5000 | |
| Gabriel | 5000 | |

[1] Thanks to Professor Salop for this example. I have modified it slightly.

# Special case: Supply-side substitutability

- The Merger guidelines approach—Example (con't)
  - Additional facts
    - Enterprise has a 5-year contract to supply No. 2 pencils to the American Accountants Association) that will use all of its capacity.
    - Each of the other four third-party manufacturers of No. 2 would each shift 10% of their production to No. 4 pencils in the event of a 5% SSNIP in No. 4 pencils
  - Under the Merger Guidelines, what are the firms in the No. 4 pencil market and what are their respective market shares?

| | Current Production | | Post-SSNIP No. 4 | | |
|---|---|---|---|---|---|
| | No. 2 | No. 4 | Production | Shares | HHI |
| Ace | 3000 | 300 | 300 | 10.71% | 115 |
| Benny | 4000 | 200 | 200 | 7.14% | 51 |
| Cavalier | 7000 | | 700 | 25.00% | 625 |
| Delta | 6000 | | 600 | 21.43% | 459 |
| Enterprise | 3000 | | | | |
| Funny | 5000 | | 500 | 17.86% | 319 |
| Gabriel | 5000 | | 500 | 17.86% | 319 |
| | | | 2800 | 100.00% | 1569 |
| | | | | Delta | 153 |
| | | | | Post-HHI | 1722 |

*Notes*: In the event of a 5% SSNIP in No. 4 pencils—

1. The merging firms are not assigned any additional production since the MG anticipate that they would contract production of No. 4 pencils and not expand it.
2. Cavalier, Delta, Funny, and Gabriel would each shift 10% of their production of No. 2 pencils into the production of No. 4 pencils (facts in the hypothetical).
3. Enterprise would not shift production into No. 4 pencils since all of its capacity is committed under contract to the production of No. 2 pencils for the next five years.

# Special case: Supply-side substitutability

- The Merger guidelines approach—Example
  - So although current production indicates that the Ace/Benny merger is a merger to monopoly in the relevant market, under the Merger Guidelines supply-side considerations make the merger a 6-to-5 transaction in a moderately concentrated market with a relatively small delta. If we take the numbers as given, the deal is unlikely to create any antitrust problem.

# Special case: Supply-side substitutability

- The judicial approach
  - Courts have not fully adopted the Merger Guidelines approach
  - Although the question has not arisen frequently, modern courts are split on whether to include supply-side substitutability as a factor in market definition
    - Some courts follow the Merger Guidelines approach
      - Or at least hold that defining the boundaries of relevant markets using demand-side considerations only and using supply-side to determine the participants in the market and their respective markets shares is an acceptable legal alternative[1]
    - Other courts allow supply-side considerations to be taken into account when defining the boundaries of the relevant market[2]
      - *Brown Shoe* suggested that supply-side substitutability should be considered in defining a relevant market[3]

[1] *See* United States v. Bazaarvoice, Inc., No. 13-CV-00133-WHO, 2014 WL 203966, at *31-*32, *37, *67 (N.D. Cal. Jan. 8, 2014).
[2] IFTC v. Lab. Corp. of Am., No. SACV 10-1873 AG MLGX, 2011 WL 3100372, at *17 (C.D. Cal. Feb. 22, 2011) ("Courts place products in the same product market where there is either effective demand-side substitution or effective supply-side substitution.").
[3] *See* Brown Shoe Co. v. United States, 370 U.S. 294, 325 (1962) (including "unique production facilities" as a practical indicium of market definition).

# Special case: Supply-side substitutability

- The judicial approach
  - The economic criticism
    - When courts take supply-side considerations into account in defining the boundaries of the market, they include 100% of the production of the supply-side substitute in the relevant market. This can lead to lead to seriously incorrect inferences.
    - Example:
      - Use the same pencil hypothetical, but make the current production levels of No. 2 and No. 4 pencils somewhat less lopsided by reducing current production of No. 2 pencils

| | Current Production | | Merger Guidelines approach Post-SSNIP No. 4 | | | Judicial full consideration Post-SSNIP No. 4 | | |
|---|---|---|---|---|---|---|---|---|
| | No. 2 | No. 4 | Production | Shares | HHI | Production | Shares | HHI |
| Ace | 300 | 300 | 300 | 41.10% | 1689 | 600 | 17.14% | 294 |
| Benny | 400 | 200 | 200 | 27.40% | 751 | 600 | 17.14% | 294 |
| Cavalier | 700 | | 70 | 9.59% | 92 | 700 | 20.00% | 400 |
| Delta | 600 | | 60 | 8.22% | 68 | 600 | 17.14% | 294 |
| Enterprise | 300 | | | | | | | |
| Funny | 500 | | 50 | 6.85% | 47 | 500 | 14.29% | 204 |
| Gabriel | 500 | | 50 | 6.85% | 47 | 500 | 14.29% | 204 |
| | 3300 | 500 | 730 | 100.00% | 2646 | 3500 | 100.00% | 1690 |
| | | | | Delta | 2252 | | | 588 |
| | | | | Post-HHI | 4898 | | | 2278 |

      - Here, the Merger Guidelines approach indicates that the merger is 2-to-1 with a fringe and the HHI statistics indicate that the merger is strongly presumptive anticompetitive. When the full production of No. 2 pencils is added to that of No. 4 pencils under the judicial approach, the merger is 6-to-5 and the HHIs do not suggest a serious competitive problem.

# Special case: Supply-side substitutability

- The judicial approach
  - The economic criticism (con't)
    - In practice, however, the problem is unlikely to arise frequently
      - First, in most cases, supply-side substitutability is not a factor that arises, so courts usually do not have to deal with the issue
      - Second, courts are increasingly sophisticated in the competitive analysis of mergers. Even if the production facilities of two products are identical and switching production between the two products is easy and can take place rapidly as a technical matter, the courts are likely to include the full production of the supply-side substitute in the relevant market only if the supply-side response to a SSNIP in the products of interest would "flood" the market and so defeat the profitability of the SSNIP.
        - This is what would have happened in the original pencil hypothetical. While the original production of No. 4 pencils was 500 units, a 5% SSNIP would have precipitated a supply-side response of adding 2300 units—more than four times the original level of production.
        - On the other hand, in the second version of the hypothetical, the supply-side response would have added only an additional 230 units. In this case, the court likely would have rejected the argument that the supply-side substitute should be included in the relevant market and instead examined whether entry of new firms or expansion of small incumbent firms already in the relevant market would be sufficient under an ease of entry/expansion/repositioning defense to prevent a postmerger price increase as part of the competitive effects analysis rather than market definition.

# Special case: Supply-side substitutability

- Supply substitutability in practice
  - Production switching
    - Courts look to high cross-elasticity of supply between two products resulting from an easy switching in their manufacture as an indication that they should be included in the same relevant product market, even if customers do not regard them as substitutes and would never switch between them
    - The same production equipment, for example, with only a slight change in tooling, could easily be used to manufacture glass milk bottles and glass baby food jars, therefore supporting the inclusion of all glass food containers in the same relevant product market.
  - Barriers to switching
    - To the extent that supply-side substitutability is considered, it is important to examine not only the ease of switching production but also the ability to sell the resulting product
    - For some products, the lack of access to distribution channels, reputation, or post-sale service can be greater impediments to successful participation in the market than the need for sophisticated or capital-intensive production technology
    - Such a lack of access can significantly dampen cross-elasticity of supply even when it is technologically easy to switch existing production equipment to manufacture the product under scrutiny

# Special case: Supply-side substitutability

- Supply substitutability in practice
  - Incentive to switch
    - In addition, for supply-side substitutability to be competitively meaningful, there must be an incentive for firms to switch their production mix in response to a price increase in the putative relevant market
    - If the manufacture and sale of products in the putative market are not profitable for firms outside the market that have the requisite production technology (taking into account any additional costs associated with distribution and sale even at the higher SSNIP-increased price), then those firms will not change their production mix in response to a price increase and should not be included in the market

# Hypothetical monopolist test

- The original idea
  - The purpose of market definition is to identify competitive restraints on the creation or exercise of market power to the detriment of customers
  - The relevant market should be—
    1. the smallest group of products containing the products of interest (say, the products of the merging firms in a horizontal merger)
    2. in which a hypothetical monopolist of those products would raise prices profitably over the current level
    3. by at least "small but significant nontransitory" amount
  - Observations
    - Introduced in the 1982 DOJ Merger Guidelines
    - "SSNIP" = "Small but significant nontransitory increase in price"
    - Under the Merger Guidelines, a SSNIP is usually taken to be a price increase of 5% for at least one year
    - "Candidate market" = the market being tested to see if it is a relevant market

# Hypothetical monopolist test (1982)

- Propositions:
  1. If a hypothetical monopolist would not have market power with respect to a group of products to be able to profitably raise prices for those products, then a fortiori a merger of firms producing products within that group could not produce in an anticompetitive price increase
  2. If a hypothetical monopolist would not raise prices by a SSNIP because it would be unprofitable, then products outside the candidate relevant market must be exerting competitive price pressure and the candidate market needs to be expanded to include the next closest substitutes (and the test run again)
  3. Find the smallest group of products for which a hypothetical monopolist would have market power to raise prices and then assess whether a merger of two firms producing products within this group would likely result in an anticompetitive price increase

*Accordingly, the candidate market should be accepted as a relevant market if and only if a hypothetical monopolist could raise prices profitably*

# Hypothetical monopolist test

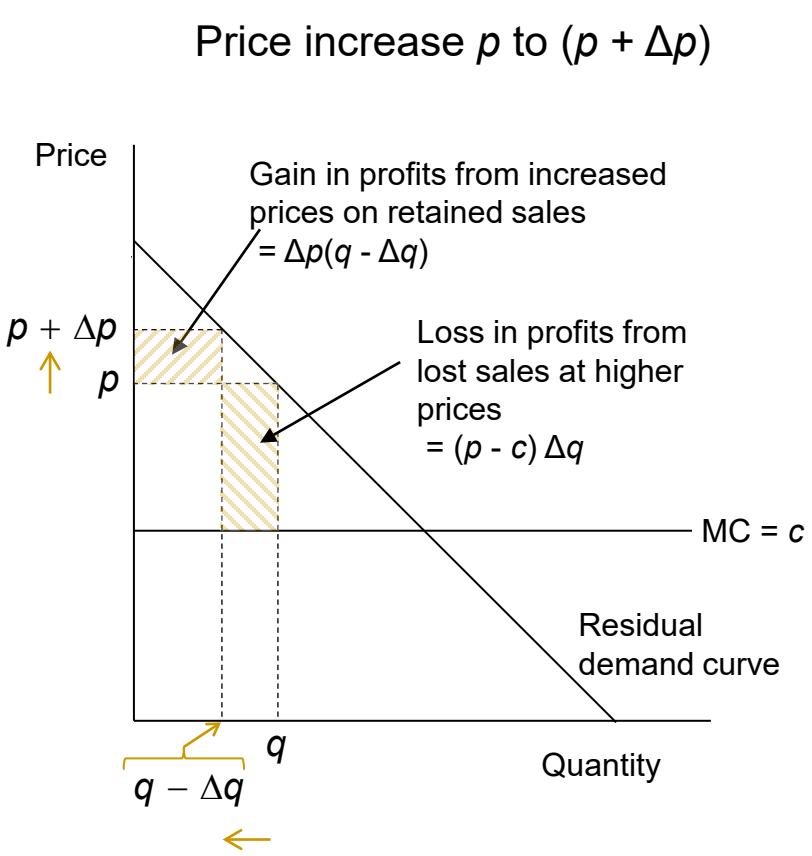
- "Hypothetical monopolist" paradigm for market definition
  - A little arithmetic
    - A price increase of $\Delta p$—which will result in a quantity decrease of $\Delta q$—is profitable if the firm's profits after the price increase are greater than the firm's profits before the price increase:

$$(p + \Delta p - c)(q - \Delta q) > (p - c)q$$

    - Rearranging, this implies

$$\Delta p(q - \Delta q) > (p - c)\Delta q$$

that is, the gain in profits on the inframarginal sales is greater than the loss of margin on the lost marginal sales



# Hypothetical monopolist test

- Example—Uniform price increase on all products in the candidate market

Consider blue cars (a homogeneous product) as a candidate market. Say blue cars are priced at $20,000 per car, cost $17,000 per car to produce, and sell 50,000 cars per year. If the price is increased by 5% on all blue cars, blue cars will only sell 45,000 cars per year. Are blue cars a relevant market under the hypothetical monopolist test for a 5% SSNIP?

| **Data** | | | **Incremental profit on inframarginal sales (area G)** | | |
|---|---|---|---|---|---|
| Unit sales (q1) | 50,000 | From problem | Inframarginal sales | 45,000 | |
| Price (p1) | $20,000 | From problem | $SSNIP | $1,000 | p1 times q1 |
| Unit cost (c) | $17,000 | From problem | Incremental gross profits | $45,000,000 | Difference |
| $Margin ($m) | $3,000 | Calculated | | | |
| | | | **Incremental loss of profit on marginal sales (area L)** | | |
| Retained sales (q2) | 45,000 | From problem | Marginal sales | -5,000 | Δq |
| Lost (marginal) sales (Δq) | 5,000 | Calculated | $Margin | $3,000 | $m |
| %SSNIP | 5% | From problem | Incremental gross losses | -$15,000,000 | $m times Δq |
| $SSNIP | $1,000 | Calculated | | | |
| | | Calculated | **Incremental net profits** | **$30,000,000** | |

- Incremental net profits are positive, so blue cars are a relevant market under the hypothetical monopolist test
- This is a “brute force” accounting implementation of a uniform SSNIP test

# 1992 Merger Guidelines

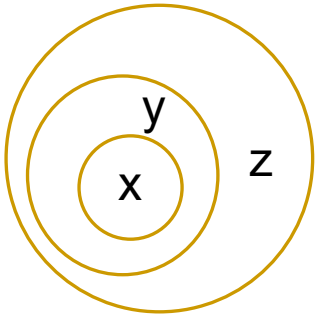
- Methodology

> [T]he Agency will begin with each product (narrowly defined) produced or sold by each merging firm and ask what would happen if a hypothetical monopolist of that product imposed at least a "small but significant and nontransitory" increase in price, but the terms of sale of all other products remained constant. If, in response to the price increase, the reduction in sales of the product would be large enough that a hypothetical monopolist would not find it profitable to impose such an increase in price, then the Agency will add to the product group the product that is the next-best substitute for the merging firm's product.
>
> . . .
>
> The price increase question is then asked for a hypothetical monopolist controlling the expanded product group. In performing successive iterations of the price increase test, the hypothetical monopolist will be assumed to pursue maximum profits in deciding whether to raise the prices of any or all of the additional products under its control. This process will continue until a group of products is identified such that a hypothetical monopolist over that group of products would profitably impose at least a "small but significant and nontransitory" increase, including the price of a product of one of the merging firms. The Agency generally will consider the relevant product market to be the smallest group of products that satisfies this test.[1]

[1] 1992 Horizontal Merger Guidelines § 1.11.

# 1992 Merger Guidelines

- Methodology
  - Algorithm
    - Start with the product of a merging firm as the starting candidate market.
    - Ask whether a hypothetical monopolist of the candidate market could profitably increase price by a SSNIP. If so, then that candidate market is a relevant market. If not, go to Step 2.
    - Expand the market to include the next closest substitute to the products in the prior candidate market and repeat Step 2.




1. Start with candidate market x. Apply HMT.
   If HMT is satisfied, this is the relevant market
   If HMT fails, expand market to y
2. Apply HMT to new candidate market
   If HMT is satisfied, this is the relevant market
   If HMT fails, expand market to z
3. Apply HMT to new candidate market
   If HMT is satisfied, this is the relevant market
   If HMT fails, expand market . . .

[1] 1992 Horizontal Merger Guidelines § 1.11.

[1] 1992 Horizontal Merger Guidelines § 1.11.

# 1992 Merger Guidelines

- Methodology (con't)
  - Definitions
    - Any group of products being tested is called a *provisional* or *candidate* product market
    - The first group of products that satisfies the hypothetical monopolist test is the relevant product market (under the "smallest market" principle)[1]
  - Prices
    - In the ordinary course, the agencies will use premerger prices
    - If premerger circumstances are strongly suggestive of coordinated interaction, the agency will use prices more reflective of the noncollusive price
    - If changes in the prevailing prices can be predicted with reasonable reliability, the agency may use likely future prices (assuming no merger)
  - SSNIP
    - A "small but significant and nontransitory" increase in price (SSNIP) is usually 5%
    - There is no explanation of when a SSNIP smaller or larger than 5% is appropriate
      - NB: The larger the SSNIP, the less likely the SSNIP will be profitable, so larger SSNIPs can be viewed as conservative

[1] We will see that this requirement was eliminated in the 2010 merger guidelines.

# 1992 Merger Guidelines

- Some questions
  1. Should the test be whether the SSNIP was profitable for the hypothetical monopolist (the *profitability* or *breakeven test*) or whether the hypothetical monopolist's profit-maximizing price is equal to or greater than the SSNIP (the *profit-maximization test*)?
     - The practice under the 1982 and 1992 Merger Guidelines in the agency and the courts was to use the profitability test
     - After the 2010 Merger Guidelines were released, some economists began to argue the profit-maximization test as the proper one in economic analysis as well as the one prescribed by the language of the Guidelines
       - The practice, particularly in the courts, continued with the profitability test
  2. Uniform or selective SSNIP
     - Should the hypothetical monopolist increase the prices of all products in the relevant market by the same percentage SSNIP or should the monopolist be allowed to selectively increase the prices of one or more products in the relevant market?
       - The 1982 Merger Guidelines required a uniform SSNIP
       - The 1992 Merger Guidelines allowed a selective SSNIP; the practice was to use a selective SSNIP when the product in question was already selectively priced
       - The 2010 Merger Guidelines allowed a selective SSNIP; the practice is to use a selective SSNIP when the product in question was already or could be selectively priced

[1] 1992 Horizontal Merger Guidelines § 1.11.

# Profitable v. profit-maximizing

- The Merger Guidelines
  - The difference
    - 1982 Guidelines:

> "In general, the Department seeks to identify a group of products such that a hypothetical firm that was the only present and future seller of those products *could* raise price profitably."[1]

      - The 1982 Guidelines ask whether it *could* be profitable for a hypothetical monopolist to raise prices by a SSNIP
      - That is, whether it would be profitable to do so, not whether it would be profit maximizing
    - 1992 Guidelines:

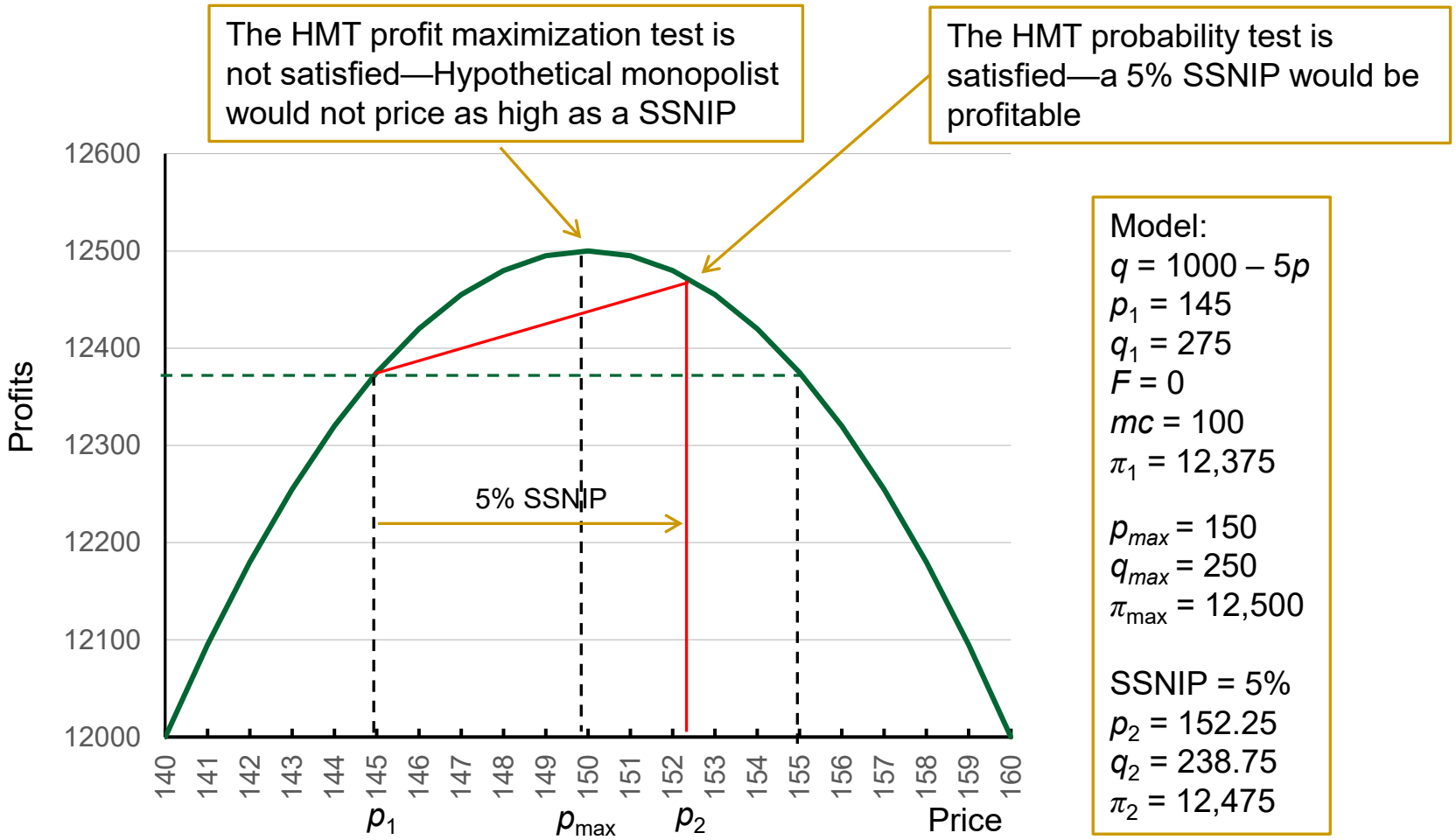
> A market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely *would* impose at least a "small but significant and nontransitory" increase in price, assuming the terms of sale of all other products are held constant.[2]

      - The 1992 Guidelines ask whether it *would* be profit-maximizing for a hypothetical monopolist to raise prices by a SSNIP
      - In other words, is the monopoly price higher by at least a SSNIP to the current price?

[1] U.S. Dep't of Justice, Merger Guidelines § II(A) (rev. 1982) (emphasis added).
[2] U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines § 1.0 (rev. 1992) (emphasis added).

# Profitable v. profit-maximizing

- *Example*: HMT profitability and profit maximization tests in a close-to-monopolized market



# Profitable v. profit-maximizing

- A quick sufficiency test for profit-maximization

  If a hypothetical monopolist satisfies the profitability test for some %SSNIP $\delta$, then the hypothetical monopolist satisfies the profit-maximization test for a SSNIP of $\delta/2$

  - The idea (not a formal proof)

    - From the graph on the previous slide, we see that a hypothetical monopolist that satisfies the profitability test breaks even at a price where the downward portion of the profit curve intersects the horizontal line passing through the original profit level. Given the symmetry of the profit curve, the profit-maximizing price is at a point one-half the distance between the two breakeven prices. Hence, if the hypothetical monopolist at least breaks even for a given percentage SSNIP—that is, the post-SSNIP price is between the two breakeven prices, then a SSNIP of half the size will fall to the left of the profit-maximizing price (at the top of the "hill") and so satisfy the profit-maximization test.

      - The profit curve will be symmetrical when the aggregate demand curve is linear and marginal costs are constant

    - In subsequent case studies, we will see testifying economists use a SSNIP of 10% in a profitability test to show that the hypothetical monopolists satisfies the profit-maximization test for a SSNIP of 5%

# Profitable v. profit-maximizing

- Adoption by the courts
  - As the courts were adopting the hypothetical monopolist test in the 1980s and early 1990s, the 1982 guidelines were in effect
  - Moreover, notwithstanding that change in verb from “could” to “would” in the 1992 Merger Guidelines, the agencies did not change from a profitability test to a profit-maximization test either in their investigations or in their briefs in court
    - The profitability test is sometimes called the *breakeven test*
  - As a result, the agencies urged the courts to adopt, and the courts did adopt in fact, the probability version of the hypothetical monopolist test

# Profitable v. profit-maximizing

- Adoption by the courts (con't)
  - Given this precedent, the profitability test remains the judicial test in most courts notwithstanding the change in the 1992 Guidelines (which was continued in the 2010 revision)[1]

[1] *See, e.g.*, FTC v. Penn State Hershey Med. Ctr., 838 F.3d 327, 338 (3d Cir. 2016); FTC v. Hackensack Meridian Health, Inc., No. CV 20-18140, 2021 WL 4145062, at *15 (D.N.J. Aug. 4, 2021); FTC v. Thomas Jefferson Univ., 505 F. Supp. 3d 522, 540 (E.D. Pa. 2020); FTC v. Peabody Energy Corp., 492 F. Supp. 3d 865, 886 (E.D. Mo. 2020); FTC v. RAG-Stiftung, 436 F. Supp. 3d 278, 293 (D.D.C. 2020); FTC v. Tronox Ltd., 332 F. Supp. 3d 187, 204 (D.D.C. 2018); FTC v. Wilh. Wilhelmsen Holding ASA, 341 F. Supp. 3d 27, 57 (D.D.C. 2018); FTC v. Tronox Ltd., 332 F. Supp. 3d 187, 204 (D.D.C. 2018); United States v. Aetna Inc., 240 F. Supp. 3d 1, 20 (D.D.C. 2017); FTC v. Advocate Health Care, No. 15 C 11473, 2016 WL 3387163, at *4 (N.D. Ill. June 20, 2016), *rev'd on other grounds and remanded*, 841 F.3d 460 (7th Cir. 2016); United States v. Bazaarvoice, Inc., No. 13-CV-00133-WHO, 2014 WL 203966, at *30 (N.D. Cal. Jan. 8, 2014); FTC v. Arch Coal, Inc., 329 F. Supp. 2d 109, 120 n.7 (D.D.C. 2004); FTC v. Swedish Match, 131 F. Supp. 2d 151, 160 (D.D.C. 2000). Other courts employ language supporting both tests, but the default appears to be the profitability test. *See, e.g.*, Olin Corp. v. FTC, 986 F.2d 1295, 1299 (9th Cir. 1993); United States v. H & R Block, Inc., 833 F. Supp. 2d 36, 52 (D.D.C. 2011). Some courts do appear to cite the profit-maximization test, but it does not appear from the opinions that the results would have been any different under a profitability test. *See, e.g.*, FTC v. Sanford Health, No. 1:17-CV-133, 2017 WL 10810016, at *10 (D.N.D. Dec. 15, 2017), *aff'd*, 926 F.3d 959 (8th Cir. 2019); United States v. Sabre Corp., 452 F. Supp. 3d 97, 125 (D. Del. 2020), *vacated*, No. 20-1767, 2020 WL 4915824 (3d Cir. July 20, 2020); FTC v. Wilh. Wilhelmsen Holding ASA, 341 F. Supp. 3d 27, 47 (D.D.C. 2018); United States v. Sungard Data Sys., Inc., 172 F. Supp. 2d 172, 192 (D.D.C. 2001).

# 1992 Merger Guidelines

- Profitable v. profit-maximizing
  - Effect in practice
    - The change was largely ignored in practice, with the emphasis remaining on whether it would be profitable, not profit-maximizing, for the hypothetical monopolist to raise prices by a SSNIP
    - Moreover, since the current price would be close to the monopoly price only in the presumably rare situation where the market is operating close to a perfect monopoly, in most cases the profitability test and the profit-maximization test will reach the same result with respect to a candidate market
  - *Query*: Were the 2010 Guidelines correct in adopting the profit-maximization test?
    - Won't it reject markets close to being monopolized and increase the probability of a *Cellophane* fallacy?

# 1992 Merger Guidelines

- The *Cellophane* fallacy
  - *Rule*: A monopolist will not price in the inelastic portion of the demand curve
    - *Implication 1*: A monopolist will increase its price until other goods become sufficiently substitutable to make a further price increase unprofitable
    - *Implication 2*: At the profit-maximizing price, a monopolist will not be able to profitably increase its price, much less increase its price by a SSNIP
    - *Implication 3*: Using prevailing prices, the hypothetical monopolist test will reject a perfectly or close to perfectly monopolized market as a relevant market
  - The *Cellophane* case[1]
    - In 1947, the DOJ sued DuPont for monopolizing cellophane, a flexible wrapping material duPont had developed, through anticompetitively restrictive patent practices
    - The Court evaluated the relevant market using duPont's prevailing prices for cellophane
    - At these prices, other wrapping materials—including aluminum foil and Saran wrap—exhibited significant cross-elasticity with cellophane
    - *Conclusion*: In the proper relevant market of all flexible wrapping paper, cellophane's relatively small market share negated the DOJ's monopolization claim
  - Implications for the hypothetical monopolist test
    - The profit-maximization version of the hypothetical monopolist test is more susceptible to the *Cellophane* fallacy than the profitability version since it is more likely to reject close-to-monopolized markets

[1] United States v. E.I. du Pont de Nemours & Co., 351 U.S. 377 (1956) ("Cellophane").

# 1992 Merger Guidelines

- The *Cellophane* fallacy—Important note
  - The *Cellophane* fallacy is primarily important in monopolization cases, not merger antitrust cases
    - In monopolization cases, it is important to exclude products from the market that are substitutes only because the defendant is charging a monopoly or near-monopoly price in order to show that the defendant has a market share indicative of monopoly power
    - In merger antitrust cases, however, the question is whether the merger will enable the combined firm to increase prices above the level they would have been going forward in the absence of the merger
      - We will see later in this unit that a "monopolist" within the meaning of Sherman Act § 2 charging a monopoly price in a market characterized by the *Cellophane* fallacy may still increase its price further if it combines with a firm that is a close enough substitute at the monopoly price

# 1992 Merger Guidelines

- Assessing buyer reactions to a SSNIP
  - Factors identified in the 1992 guidelines to consider in assessing buyer reactions to a SSNIP:[1]
    - Evidence that buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables
      - Often includes testimony from knowledgeable representatives from buyers (as in *Sanford Health*)
      - Economic or econometric evidence introduced by an economics expert
    - Evidence that sellers base business decisions on the prospect of buyer substitution between products in response to relative changes in price or other competitive variables
    - The influence of downstream competition faced by buyers in their output markets
      - This is sometimes called “derived demand”
    - The timing and costs of switching products
  - These factors are nonexclusive: Any evidence probative of buyer switching reactions may be considered

[1] 1992 Horizontal Merger Guidelines § 1.11.

# 1992 Merger Guidelines

- Assessing buyer reactions to a SSNIP
  - "Where the rubber meets the road"—Customer testimony
    - In practice, actual evidence of switching behavior in response to changes in relative prices is rarely available
    - In the absence of actual switching evidence, the agencies usually ask customers what they would do in the event of a SSNIP and then use the response in assessing buyer reactions
      - This is true only when the buyers are somewhat sophisticated
        - Usually intermediate product buyers (i.e., business firms that are buying products or services as an input into the production of another product)
      - The agencies do not survey average consumers in retail products mergers
        - Instead, use econometric analysis of point-of-sale scanner data for consumer products to estimate cross-elasticities for use in the hypothetical monopolist test
    - Customer interview responses have proven notoriously unreliable for three reasons:
      1. Even sophisticated customers often do not know what they would actually do if faced with a SSNIP
         - Still, often will give the agency an answer just to make them go away
      2. Customers that understand the merger antitrust game may give an answer that is designed to achieve a strategic objective (such as stopping the merger or forcing a significant divestiture)
      3. Prices are determined at the margin; hence only the responses of marginal customers should count. But there is no way for the agencies to distinguish between marginal and inframarginal customers in interviews and therefore are likely to credit all responses equally.
         - This leads to a significant bias in favor of narrower markets

# 1992 Merger Guidelines

- Significant head-to-head bidding competition
  - "Where the rubber meets the road"—Significant head-to-head bidding competition
    - Where firms in the provisional market (especially the merging firms) engage in significant bidding competition with each other, that competition would be eliminated by a hypothetical monopolist—along with any price decreases that resulted from the bidding competition
      - Sophisticated customers can become very expert at "playing firms off of one another" in bidding competitions in order to minimize the price they pay
    - Evidence of significant head-to-head bidding competition is probative of competitive effects as well as market definition
      - Where the merging firms compete with each other frequently, especially in the so-called "best and final" round, and customers say (with supporting reasons) that no other supplier could replace this competition after the merger, the agencies will almost certainly challenge the merger

# 2010 Merger Guidelines

- Adopts the 1992 Merger Guidelines methodology with three very significant changes
  1. Relegates market definition to one of several tools useful in merger antitrust analysis
     - May not be necessary or even helpful in all cases
     - Was the point of departure for all merger antitrust analysis under the 1992 guidelines
  2. *One-product SSNIP tests*. Expands the ability of the hypothetical monopolist to discriminate in raising prices of products in the candidate market:

> Specifically, the test requires that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future seller of those products ("hypothetical monopolist") likely would impose at least a small but significant and non-transitory increase in price ("SSNIP") *on at least one product in the market, including at least one product sold by one of the merging firms*.[1]

     - Only differentiated product markets are susceptible to discrimination among products within the market
       - Product attributes
       - Channels of distribution
     - The market for homogeneous products admits only a single price for all products

[1] U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines § 4.1.1 (rev. 2010) (emphasis added).

# 2010 Merger Guidelines

- Adopts the 1992 Merger Guidelines methodology with three very significant changes
  3. *No smallest market requirement*. Abandons the "smallest market" principle and with it unique relevant markets
     - The 1992 guidelines considered the relevant product market to be the smallest group of products that satisfied the hypothetical monopolist test
     - The 2010 guidelines accept as a relevant product market any group of products that satisfies the hypothetical monopolist test
       - This permits "cherry-picking" of products to include in the relevant product market
       - Also makes it difficult for defendants to argue in court that prosecuting agency misspecified the relevant product market
     - Coupled with the one-product SSNIP test, this means that any product grouping that contains a relevant product market is itself a relevant product market
       - *Idea*: Apply the SSNIP to those products that made the smaller product grouping a relevant market and hold the prices of all other products constant
       - The simple way to express this principle is that any *superset* of a relevant market is a relevant market
     - Many courts still cite the smallest market principle
       - The precedent developed under the 1982 guidelines and continues to be cited[1]

[1] *See, e.g.*, FTC v. RAG-Stiftung, 436 F. Supp. 3d 278, 292 (D.D.C. 2020); FTC v. Tronox Ltd., 332 F. Supp. 3d 201 (D.D.C. 2018); United States v. Aetna Inc., 240 F. Supp. 3d 1, 40 (D.D.C. 2017); FTC v. Sysco Corp., 113 F. Supp. 3d 1, 26 (D.D.C. 2015); United States v. H & R Block, Inc., 833 F. Supp. 2d 36, 59 (D.D.C. 2011) ("[T]the relevant product market should ordinarily be defined as the smallest product market that will satisfy the hypothetical monopolist test.")

# 2010 Merger Guidelines

- Examples of "cherry-picking" under the 2010 guidelines[1]
  - Motorcycles and cars

    *Example 4:* Firms A and B, sellers of two leading brands of motorcycles, propose to merge. If Brand A motorcycle prices were to rise, some buyers would substitute to Brand B, and some others would substitute to cars. However, motorcycle buyers see Brand B motorcycles as much more similar to Brand A motorcycles than are cars. Far more cars are sold than motorcycles. Evaluating shares in a market that includes cars would greatly underestimate the competitive significance of Brand B motorcycles in constraining Brand A's prices and greatly overestimate the significance of cars.

    *Example 7:* In Example 4, including cars in the market will lead to misleadingly small market shares for motorcycle producers. Unless motorcycles fail the hypothetical monopolist test, the Agencies would not include cars in the market in analyzing this motorcycle merger.

  - Exclusion of closer substitutes

    *Example 5:* 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. Therefore, Products A and B satisfy the hypothetical monopolist test using a five percent SSNIP, and indeed for any SSNIP size up to ten percent. This is true even though two-thirds of the sales lost by one product when it raises its price are diverted to products outside the relevant market.

[1] For examples, see 2010 Merger Guidelines § 4.1.1.

# Product markets: Special cases

- Cluster markets
  - Courts sometimes define markets around collections of products that are almost always offered for a sale at a single location
  - The products in a cluster market can vary widely and typically exhibit little if any cross-elasticity of demand
    - *Examples*: Commercial banking services, supermarkets, office supply stores, department stores, sporting equipment, acute care inpatient hospital services, retail pharmacies
  - Courts have found a relevant product to be a subset of products within a retail store
    - Sale and distribution of consumable office supplies to large business-to-business customers[1]
    - Cluster of prescription drugs that are typically sold in brick-and-mortar retail pharmacies[2]

[1] FTC v. Staples, Inc., 190 F. Supp. 3d 100, 117, 123-26 (D.D.C. 2016).
[2] *See* Sharif Pharmacy, Inc. v. Prime Therapeutics, LLC, 950 F.3d 911, 918 (7th Cir. 2020)

# Product markets: Special cases

- Cluster markets
  - Two types of cluster markets
    1. Products that share similar shares and demand characteristics
       - Not well defined in the case law
       - Accepted "for analytical convenience" when market shares are likely to be the same across products[1]
       - Typically, analytic similarity is simply asserted rather than analyzed by courts
    2. Product groups that exhibit economies of scope
       - WDC: The best justification for combining diverse products and services into a single relevant product market is where there exist substantial economies of scope in purchasing, so that sellers tend to offer for sale at a single location the entire collection of products and customers tend to select sellers more on the basis of their aggregate offerings and less on the offerings of single products (think grocery stores or hospitals)[2]
       - If customers are attracted by the totality of the products offered at the seller's location, then sellers have some flexibility in setting the prices of individual products without being constrained by competition from partial line or single product sellers, provided that the sellers remain competitive within their product offering as a whole
       - In a properly defined cluster market, specialty dealers that offer a limited selection of products should only be able to operate in narrow niches and should not be able to compete successfully for a large fraction of the total sales of their particular products

[1] *See, e.g.*, FTC v. Staples, Inc., 190 F. Supp. 3d 100, 117 (D.D.C. 2016).
[2] *See* FTC v. Advocate Health Care Network, 841 F.3d 460, 467 (7th Cir. 2016) ("But products can also be 'clustered' together if the 'cluster' is itself an object of consumer demand.") (citation and internal quotation marks omitted); *accord* Sharif Pharmacy, Inc. v. Prime Therapeutics, LLC, 950 F.3d 911, 918 (7th Cir. 2020).

# Product markets: Special cases

- Cluster markets
  - Separable demand or supply conditions
    - A cluster market would not be appropriate if customers would respond to a price increase of a single product within the cluster by shifting some or all of their purchases to partial line or single product sellers
    - Example
      - In *Staples/Office Depot*, the district court sustained an FTC cluster market that included all general office supplies except toner, ink, and BOSS ("beyond office supplies") products[1]
      - The court found that the excluded products were subject to significantly different competitive conditions than the other products in the alleged cluster market and hence properly excluded

[1] *See* FTC v. Staples, Inc., 190 F. Supp. 3d 100, 122-26 (D.D.C. 2016).

# Product markets: Special cases

- Price discrimination/"targeted customer" markets
  - Ordinarily, the SSNIP is applied uniformly to all products in the provisional market
  - However, if the market is or can be subject to price discrimination, the agency may apply a discriminatory price increase on sales to—
    - particular products in a differentiated products market, or
    - particular targeted buyers
  - Introduced in the 1992 Merger Guidelines

> *Example*: Consider a merger of two string bean producers. Assume that a hypothetical monopolist could not profitably raise prices because of diversion to carrots, so that carrots must be included in the provisional market. Assume further that spinach is a close substitute for carrots but not as close a substitute for string beans, and that a hypothetical monopolist could not profitably implement a SSNIP to both string beans and carrots.
>
> Under the usual pre-1992 approach, spinach would be added to the provisional market. But under the new approach of the 1992 guidelines, if the hypothetical monopolist finds it maximally profitably to raise string bean prices by a SSNIP but carrots by something less than the same SSNIP (to avoid diversion to spinach), string beans and carrots would be a relevant market.[1]

    - Implications
      - Price discrimination can narrow a market considerably
      - In some years, the FTC aggressively used price discrimination to narrow markets even when there were no historical occurrences of price discrimination

[1] Janusz A. Ordover & Robert D. Willig, *Economics and the 1992 Merger Guidelines: A Brief Survey*, 8 Rev. Indus. Org. 139, 140-41 (1993).

# Product markets: Special cases

- Price discrimination/"targeted customer" markets
  - Modern courts have adopted this approach to market definition[1]
    - *Example*: United States v. H & R Block, Inc.:

> An analytical method often used by courts to define a relevant market is to ask hypothetically whether it would be profitable to have a monopoly over a given set of substitutable products. If so, those products may constitute a relevant market. This approach—sometimes called the "hypothetical monopolist test"—is endorsed by the Horizontal Merger Guidelines issued by the DOJ and Federal Trade Commission. In the merger context, this inquiry boils down to whether "a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future seller of those products . . . likely would impose at least a small but significant and non-transitory increase in price ("SSNIP") *on at least one product in the market, including at least one product sold by one of the merging firms*." The "small but significant and non-transitory increase in price," or SSNIP, is typically assumed to be five percent or more.[1]

    - For other cases noting, apparently with approval, the Merger Guidelines "one product" approach to market definition, see—
      - FTC v. Wilh. Wilhelmsen Holding AS, No. 18-cv-00414-TSC,2018 WL 4705816, at *7 (D.D.C. Oct. 1, 2018)
      - United States v. Anthem, Inc., 236 F. Supp. 3d 171, 198 (D.D.C. 2017)
      - United States v. Aetna Inc., 240 F. Supp. 3d 1, 20 (D.D.C. 2017)
      - FTC v. Staples, Inc., 190 F. Supp. 3d 100, 121 (D.D.C. 2016)
      - FTC v. Sysco Corp., 113 F. Supp. 3d 1, 33 (D.D.C. 2015)
      - *In re* Live Concert Antitrust Litig., 863 F. Supp. 2d 966, 987 (C.D. Cal. 2012)

[1] 833 F. Supp. 2d 36, 51-52 (D.D.C. 2011) (internal citations omitted; emphasis added).

# Product markets: Special cases

- Price discrimination/"targeted customer" markets
  - Modern examples
    - Large business customers in the Staples/Office Depot merger[1]
      - Large B2B customers solicit multiyear contracts through "requests for proposals" (RFPs), which permits customized (and often nonlinear) pricing terms not available to retail customers
      - The volume of large B2B customers allows them to purchase office supplies at about one-half of the price paid by the average retail customer
    - Customers requiring nationwide service in Sysco/US Foods merger[2]
      - Nationwide distribution network important to these customers
      - Require national contracts and use RFPs to solicit bids
      - Require a single technology platform to interface with distributor
      - Require nationwide product consistency (especially in private label)
      - Sysco and US Foods each have broad distribution networks and a dedicated sales sole to handle national accounts
      - Cooperatives of geographically dispersed regional distributors formed to compete for these customers

[1] FTC v. Staples, Inc., 190 F. Supp. 3d 100 (D.D.C. May 17, 2016
[2] FTC v. Sysco Corp., 113 F. Supp. 3d 1 (D.D.C. 2015).

# Product markets: Special cases

- Bidding markets
  - The idea
    - In some markets, large supply contracts are let out for bid
      - For example, when General Motors is developing a new car, it has to arrange for a supply of the parts necessary to manufacture the car. Many times, these parts are custom designed and not interchangeable with the parts for existing models. General Motors will issue a “request for proposal” (RFP) asking potential suppliers to bid to supply a particular part. General Motors will ultimately awarded the agreement contract to one or perhaps two bidders.
    - Where the contracts are large and extend over multiple years, the bidding can be intense and involve multiple bidders
    - Only one bidder, however, will ultimately obtain the contract and that bidder will supply 100% of the contract
    - Giving the winning bidder a 100% share and the other bidders a zero share gives an inaccurate picture of the competition for the contract
  - The solution
    - In these situations where each bidder has a realistic chance of winning the bid, each of the *n* bidders is assigned a share in the bidding market of 1/n

# Product markets: Special cases

- Bidding markets (con't)
  - Assigning shares in bidding markets
    - The infrequent, large contract case
      - When—
        - Supply contracts are infrequently put up for bid,
        - Each contract constitutes a substantial share of the overall market, *and*
        - There is no arbitrage among customers,

        then

        This is important! →
        - Each contract is its own individual "targeted customer" market, *and*
        - Shares may be assigned according to the probability of each bidding firm winning the bid
      - *Corollary*: When *n* firms are likely to bid for a contract and each firm appears to be equally capable to winning the bid, then each firm should be assigned a share of 1/*n*
      - Example
        - Say off-shore oil drilling leases are a relevant market. These are infrequent, large contracts. The federal government puts these leases out for bid and five equally capable firms regularly bid for them. Three firms currently operate drilling operations on the leases they have won. Regardless of their market shares (say, based on oil production or oil reserves), all five regular bidding firms would be deemed to be participants in the in the market and each would be assigned a share of 20% for the purpose of testing the applicability of the *PNB* presumption.

# Product markets: Special cases

- Bidding markets (con't)
  - Assigning shares in bidding markets
    - The frequent, small contract case
      - When—
        - Supply contracts are frequently put up for bid,
        - Each contract constitutes a relatively small share of the overall market,
        - The same firms regularly bid for each contract, *and*
        - There is no arbitrage among customers,

        then
        - The contracts may be aggregated into a single bidding market, *and*
        - Shares may be assigned according to the (annual) revenues earned by each firm under a contract
      - The idea:
        - While in principle each contract may be an individual "targeted customer" market, in practice the contracts are aggregated into a single market
        - Revenue shares in the single market are used as a proxy for the probability that each firm has of winning a bid—that is, most capable or efficient firms are likely to have won more bids and they should be weighted more heavily than firms that have won fewer shares when assigning bids
      - Examples
        - Sysco/US Foods
        - Staples/Office Depot

# Product markets: Special cases

- Research and development markets
  - There have been occasional efforts by the enforcement agencies to define markets around the R&D activities of firms
    - The leading case is *United States v. General Motors Corp.*, where the DOJ alleged, among other things, that the proposed acquisition by ZF Friedrichshafen AG of the Allison Transmission Division of General Motors Corporation would violate Section 7 because it would eliminate actual and potential competition worldwide "in the market for technological innovation in the design, development, and production" of medium and heavy automatic transmissions for commercial and military vehicles. The DOJ alleged that this technological competition "has resulted in improved products, new products, lower costs of manufacture, and lower prices to consumers."[1]
  - The concept is both unnecessary and legally unsound
    - More sensible to define markets around the products that the R&D seeks to create or improve
      - A decrease in innovation competition would result in a decrease in the rate of technological innovation or improvement in the underlying product, which is a cognizable anticompetitive harm
      - Since Section 7 is forward looking, true even if the products do not yet exist (e.g., two pharmaceutical companies racing against each other to develop a vaccine for Ebola)
    - If companies are not selling their R&D services, then in what sense is this a "line of commerce" for Section 7 purposes?

[1] Complaint, United States v. General Motors Corp., Civ. Action No. 93-530 (D. Del. filed Nov. 11, 1993) (withdrawn upon voluntary termination of transaction).

# Product markets: Special cases

- Single manufacturer products
  - The idea is that the product of a single manufacturer is by itself a relevant product market
    - Rarely arises in merger antitrust cases
    - But arises frequently in other areas of antitrust
    - *Possible example*: Kodak replacement parts for high-speed Kodak printers
  - Practice
    - No rule that single manufacturer product markets cannot exist[1]
    - Usual rules for defining markets apply
    - But courts are reluctant to find manufacturer product markets absent compelling evidence
      - The problem is that the manufacturer will always have monopoly power in a single manufacturer product market, which removes a major hurdle in proving antitrust liability. The courts are concerned that this might result in significant overinclusiveness errors in the finding of liability.

[1] Eastman Kodak Co. v. Image Tech. Servs., Inc., 504 U.S. 451 (1992).

# Geographic Markets

# Geographical markets generally

- Definition
  - For each relevant product market, there is one or more associated relevant geographic markets
  - A single firm may operate in a number of different geographic markets
    - E.g., a dialysis firm operating in a retail dialysis product market can operate in multiple distinct geographic markets
  - Relation to the sales area of the merging parties
    - The relevant geographic market is not necessarily, and indeed frequently is not, congruent with the sales area of one or both of the merging parties
    - The boundaries of the relevant geographic market turn not on where customers have gone to purchase the relevant product, but rather where they practically could go to protect themselves in the event the merger or acquisition was in fact anticompetitive

# Relevant geographic markets

- Judicial tests: *Philadelphia National Bank*
  - Defined the relevant geographic market to be "the area of effective competition . . . in which the seller operates, and to which the purchaser can practically turn for supplies."[1]
  - The Court also observed that an element of "fuzziness would seem inherent in any attempt to delineate the relevant geographic market" and that the market need not be defined by "metes and bounds as a surveyor would lay off a plot of ground."[2]
  - Can be applied separately from the test for relevant product market definition
- Merger Guidelines test
  - Hypothetical monopolist test
    - Applied simultaneously to the candidate product market and the associated candidate geographic market
    - That is, you cannot apply the HMT to a product market without knowing also delineating the area in which the products may be obtained

[1] United States v. Philadelphia Nat'l Bank, 374 U.S. 321, 359 (1963) (emphasis removed) (quoting Tampa Elec. Co. v. Nashville Coal Co., 365 U.S. 320, 327 (1961) (Sherman Act § 2).
[2] *Id*. at 360 n.37; *see* United States v. Connecticut Nat'l Bank, 418 U.S. 656, 669 (1974) (geographic markets "need not—indeed cannot—be defined with scientific precision").

# Judicial tests

- Other articulations
  - "This approach evaluates the geographic aspect of the elasticity of a specified market—that is, how far consumers will go to obtain the product or its substitute in response to a given price increase and how likely it is that a price increase for the product in a particular location will induce outside suppliers to enter that market and increase supply-side competition in that location."[1]
  - "The relevant geographic market for antitrust purposes is some geographic area in which a firm can increase its price without 1) large numbers of its customers quickly turning to alternative supply sources outside the area; or 2) producers outside the area quickly flooding the area with substitute products."[2]
  - The relevant geographic market "must include the sellers or producers who have the . . . ability to deprive each other of significant levels of business."[3]
  - "[I]f customers would defeat the attempted price increase by buying from outside the region, it is not a relevant market; the test should be rerun using a larger candidate region."[4]

[1] Heerwagen v. Clear Channel Commc'ns, 435 F.3d 219, 227 (2d Cir. 2006).
[2] *Id*. (quoting Herbert Hovenkamp, Federal Antitrust Policy: The Law of Competition and its Practice § 3.6, at 113 (2d ed. 1999).
[3] Rebel Oil Co. v. Atlantic Richfield Co., 51 F.3d 1421, 1434 (9th Cir. 1995) (internal quotation marks and citation omitted); *accord* FTC v. Advocate Health Care Network, 841 F.3d 460, 468 (7th Cir. 2016).
[4] Saint Alphonsus Medical Center-Nampa Inc. v. St. Luke's Health System, Ltd., 778 F.3d 775, 784 (9th Cir. 2015);; *accord Advocate*, 841 F.3d at 468.

# Judicial tests

- General rules
  - Proponents cannot rely on political boundaries (such as towns, counties, or states) to establish the boundaries of a relevant geographic market without providing evidence of the competitive forces within these boundaries
  - Actual sales and shipment patterns are most often used by courts to determine the dimensions of the geographic market
  - In many cases, the geographic boundaries of the relevant market are well understood and are often the subject of stipulations by the parties
  - Nice summary
    - "The relevant geographic market for goods sold nationwide is often the entire United States, though it need not be if purchasers cannot practicably turn to areas outside their own area for supply of the relevant product. In certain service industries, the geographic market may be confined by the fact that it can be impractical for consumers to travel great distances to procure particular services. For example, historically, the geographic market for banking services is localized due to the local nature of the demand for such services. Start-up or transportation costs may prohibit new entrants from readily competing within an area even in response to increased prices. Accordingly, courts have held that the market for certain entertainment services—such as, for example, tickets to movie theater showings—is local or regional."[1]

[1] Heerwagen v. Clear Channel Commc'ns, 435 F.3d 219, 228 (2d Cir. 2006) (internal citations omitted).

# 1992 Merger Guidelines

- Methodology
  - Uses the hypothetical monopolist test to define relevant geographic markets:

> In defining the geographic market or markets affected by a merger, the Agency will begin with the location of each merging firm (or each plant of a multiplant firm) and ask what would happen if a hypothetical monopolist of the relevant product at that point imposed at least a "small but significant and nontransitory" increase in price, but the terms of sale at all other locations remained constant. If, in response to the price increase, the reduction in sales of the product at that location would be large enough that a hypothetical monopolist producing or selling the relevant product at the merging firm's location would not find it profitable to impose such an increase in price, then the Agency will add the location from which production is the next-best substitute for production at the merging firm's location.
>
> . . .
>
> The price increase question is then asked for a hypothetical monopolist controlling the expanded group of locations. In performing successive iterations of the price increase test, the hypothetical monopolist will be assumed to pursue maximum profits in deciding whether to raise the price at any or all of the additional locations under its control. This process will continue until a group of locations is identified such that a hypothetical monopolist over that group of locations would profitably impose at least a "small but significant and nontransitory" increase, including the price charged at a location of one of the merging firms.[1]

[1] 1992 Horizontal Merger Guidelines § 1.21. Note that this assumes that the products in the market have been identified.

# 1992 Merger Guidelines

- Methodology (con't)
  - Analogy to product market definition
    - The merger guidelines define geographic markets using the same hypothetical monopolist test and elasticity concepts as are used in product market definition
    - As in the case of product substitution, some geographic substitution may be expected in the event of a small price increase
    - Provisional geographic markets, prices, SSNIPs, and price discrimination markets are treated analogously to their treatment in product market definition
  - Factors identified in the 1992 guidelines to consider in assessing buyer reactions to a SSNIP:[1]
    - Evidence that buyers have shifted or have considered shifting purchases between different geographic locations in response to relative changes in price or other competitive variables
    - Evidence that sellers base business decisions on the prospect of buyer substitution between geographic locations in response to relative changes in price or other competitive variables
    - The influence of downstream competition faced by a buyer in their output markets
    - The timing and costs of switching suppliers
  - These factors are nonexclusive: Any evidence probative of buyer switching reactions may be considered

[1] 1992 Horizontal Merger Guidelines § 1.21.

# 1992 Merger Guidelines

- Methodology (con't)
  - Geographic markets are often stipulated by the parties
    - In many mergers, there is no serious dispute over geographic market definition
      - Many geographic markets are national or even worldwide
    - Notable exceptions where geographic market definition can be highly contentious:
      - Products sold in retail stores and purchased by end-user consumers
        - So that consumers have to travel to the retail stores
        - Broadly defined to include, for example, grocery stores, department stores, banks, hospitals, dialysis clinics
      - Intermediate products with high transportation costs relative to their prices
        - So that it is costly to ship products to customers (e.g., glass beer bottles shipped to breweries)

[1] 1992 Horizontal Merger Guidelines § 1.21.

# 2010 Merger Guidelines

- Adopts the 1992 Merger Guidelines methodology with some very significant changes
  - As with product markets
    - Relegates geographic market definition to one of several tools useful to merger antitrust analysis and which may not be necessary in all cases
    - Abandons the “smallest market” principle and unique relevant markets
  - Two cases
    - Geographic market definition has been problematic in antitrust cases
    - The principal reason is that the law attempted to define relevant geographic markets using the same approach in two entirely distinct situations:
      1. where the merging firms operate in fixed locations to which customers travel to make their purchases, and
      2. where the merging firms operate central production facilities and ship their products to the customers
    - The 2010 Guidelines properly draw the distinction

# 2010 Merger Guidelines

- Geographic markets based on the locations of suppliers
  - Generally
    - Here, customers travel to the supplier's location, so the relevant question is to which supplier locations is the customer willing to travel if a hypothetical monopolist of the locations in the provisional market raises price
      - This is typically the case, for example, in consumer retail markets, such as grocery stores, department stores, consumer banks, office supply stores, and hospitals
    - In other words, how much farther would a customer be willing to travel to avoid a SSNIP?
  - Guidelines test
    - The relevant geographic market is then the region encompassing the seller locations from which sales are made where a hypothetical monopolist controlling these facilities could raise prices profitably at a SSNIP from at least one or more of these facilities, including at least one location of one of the merging firms
    - Notably, when the geographic market is defined based on supplier locations, sales made by suppliers located in the geographic market are counted, regardless of the location of the customer making the purchase
      - As a result, some customers who buy from firms in the relevant market may themselves be located outside the boundaries of the geographic market
      - When the locations of the suppliers define relevant geographic markets, a single firm may operate in a number of different geographic markets, even for a single product

# 2010 Merger Guidelines

- Geographic markets based on the locations of suppliers (con't)
  - Guidelines considerations (not exhaustive)[1]
    - How customers have shifted purchases in the past between different geographic locations in response to relative changes in price or other terms and conditions
    - The cost and difficulty of transporting the product (or the cost and difficulty of a customer traveling to a seller's location) in relation to its price
    - Whether suppliers need a presence near customers to provide service or support
    - Evidence on whether sellers base business decisions on the prospect of customers switching between geographic locations in response to relative changes in price or other competitive variables
    - The costs and delays of switching from suppliers in the candidate geographic market to suppliers outside the candidate geographic market
    - The influence of downstream competition faced by customers in their output markets

[1] 2010 DOJ/FTC Horizontal Merger Guidelines § 4.2.1.

# 2010 Merger Guidelines

- Geographic markets based on the locations of customers
  - Generally
    - Here, suppliers ship to the customer's location, so the relevant question is which suppliers are willing to compete for a customer at a given location in the event that a hypothetical monopolist of the suppliers in the provisional market raises price
      - The idea is that an increase in a local price increases the margin earned by a supplier, and a more distant supplier can use the additional margin to offset its shipping costs (that is, how much farther would a supplier be willing to ship in the event if prices increased)
    - The relevant geographic market is then the region encompassing the *customer locations* to which sales are made where a hypothetical monopolist supplying that region could raise prices profitably at a SSNIP
      - This usually entails a straightforward calculation of the additional shipping distance that could be funded by a SSNIP (keeping in mind that the loading and unloading costs are already covered)

# Geographic markets in practice

- Stipulated by parties
  - In many cases, the geographic boundaries of the relevant market are well understood and are often the subject of stipulations by the parties
- National markets
  - Where manufacturers produce products at a single location but ship and sell nationally at no competitive disadvantage, the relevant geographic market is are usually found to be national
- Regional markets
  - Generally
    - Where a firm and its rivals sell their product only in a limited geographic area and their customers have no ready access to an outside source of supply, the general rule is to define the geographic market as that particular area and to include only sales made within the market

# Geographic markets in practice

- Notable exceptions where geographic market definition can be highly contentious:
  1. Products sold in retail stores and purchased by end-user consumers
     - So that consumers have to travel to the retail stores
     - Broadly defined to include, for example, grocery stores, department stores, banks, hospitals, dialysis clinics
  2. Intermediate products with high transportation costs relative to their prices
     - So that it is costly to ship products to customers (e.g., glass beer bottles shipped to breweries)
  3. Products that involve network competition
     - So that while products are shipped locally, buyers with geographically dispersed facilities want to purchase from one company regionally or nationally and so want sellers to have multiple facilities to serve them

# Geographic markets in practice

- Local markets
  - Where sellers sell to customers only locally, the relevant geographic market is are usually found to be local
  - Consumer retail markets
    - Local geographic markets are especially common in consumer retail and similar markets, such as supermarkets, drug stores, department stores, and inpatient and outpatient medical services, since consumers typically are unwilling to travel outside of the local area to make purchases even in the wake of a small price increase
  - Local market boundaries
    - Local retail markets are often defined in terms of metropolitan statistical areas (MSAs) or county, city, or town boundaries
    - Depending on the circumstances, local markets may be very confined, such as individual airports for airline passengers seeking rental cars[1]
    - If a merging party, in the regular course of business, has prepared maps identifying the trade area for a given store and the store's competitors, the enforcement agencies are likely to give significant weight to those maps in determining the relevant geographic market

[1] Complaint ¶ 5, *In re* Hertz Global Holdings, Inc., No. C-4376 (F.T.C. Nov. 15, 2012).

# Geographic markets in practice

- Markets with transportation costs
  - When the shipments and sales patterns are not conclusive, or when one of the parties argues for a market boundary apparently contrary to what these patterns suggest, courts will consider transportation costs in relation to the price of the product
    - Low transportation costs relative to the product price suggest broader geographic markets
    - Higher transportation costs relative to price indicate narrower markets[1]
- Other considerations
  - Other factors recognized by the courts as probative on the question of geographic market definition include—
    - Lack of parallel movements in price
    - Governmental barriers to trade (such as tariffs or quotas)
    - Common area-wide price advertising,
    - Customer preferences for dealing locally
    - Perception of local competitors of the extent of competition provided by distant firms
    - Industry recognition.

[1] *See, e.g.*, FTC v. Procter & Gamble Co., 386 U.S. 568, 571 (1967); *In re* Weyerhaeuser Co., 106 F.T.C. 172, 1985 WL 668940 (1985) (east coast and west coast separate markets for corrugating medium; price differential did not cover transportation costs across continent).

# Geographic markets in practice

- Markets with network competition
  - Generally
    - Even when services are local, however, when firms compete for customers by providing retail networks and customers contract for regional coverage, the relevant geographic market will be regional
      - For example, in mergers of pharmacy benefit managers (PBMs)—essentially intermediaries between insurance companies and prescription pharmacies—the FTC has defined the relevant geographic market as the area in which chain stores compete for PBM and other third-party payor contracts[1]
    - When national customers insist on identical terms from their suppliers in different parts of the country, a national or large regional relevant market may be appropriate even though no single supplier services the entire area

[1] *See, e.g.*, Complaint ¶ 7, *In re* CVS Corp., No. C-3762, at ¶ 7 (filed May 29, 1997) (defining the relevant geographic markets as the state of Virginia and the Binghamton, New York MSA where the relevant product market was the retail sale of pharmacy services to third-party payors such as insurance carriers and health maintenance organizations).

# Geographic markets in practice

- Downstream indirect customer substitution
  - An example
    - Consider the store location by itself to be a provisional geographic market for the wholesale sale of groceries to grocery stores
    - If a hypothetical monopolist controlled all of the wholesale grocery sales into the local grocery store location, under what conditions would this be, or not be, a relevant geographic market? If the hypothetical monopolist raises its prices to the neighborhood grocery store, the grocery store most likely will raise its prices to its retail customers. If some of these retail customers switch to other grocery stores, the grocery store will suffer a reduction in unit retail sales, which in turn will translate into a reduction in the hypothetical monopolist's wholesale sales
    - The profitability of the hypothetical monopolist's price increase will then depend on whether its profit gain on the increase in its margin on the sales that it continues to make is greater than the gross margin loss on the sales that it will lose as a result of the price increase
      - While this is the usual formula for determining the profitability of a hypothetical monopolist's price increase, the analysis is likely to turn on the switching behavior of the downstream indirect retail customers rather than on the switching of the hypothetical monopolist's direct wholesale customers
      - If the grocery store's retail customers do not have good alternatives—say because the next nearest grocery store is 30 miles away—the price increase will be profitable
      - If there is another grocery store across the street that offers a close retail substitute, then the price increase will not be profitable

# Geographic markets in practice

- Implausible markets
  - Even without a rigorous analysis, courts have rejected market definitions where common sense indicates that they are implausible
  - Examples of "implausible" markets
    - Market defined by a five-block radius around a retail pharmacy store:

> Sharif's assertion that the five-block radius around its location is a relevant market is not plausible. The antitrust statutes require a "pragmatic" and "factual" approach to defining the geographic market. The market must "correspond to the commercial realities of the industry." Where geographic convenience is important to consumers, retail markets can be small, but not this small. It defies belief to suggest that a hypothetical monopolist retail pharmacy could raise its drug prices substantially without losing customers to competitors outside that tiny area.[1]

[1] Sharif Pharmacy, Inc. v. Prime Therapeutics, LLC, 950 F.3d 911, 917 (7th Cir. 2020) (internal citations omitted).

# Critical Loss Analysis

# Critical loss

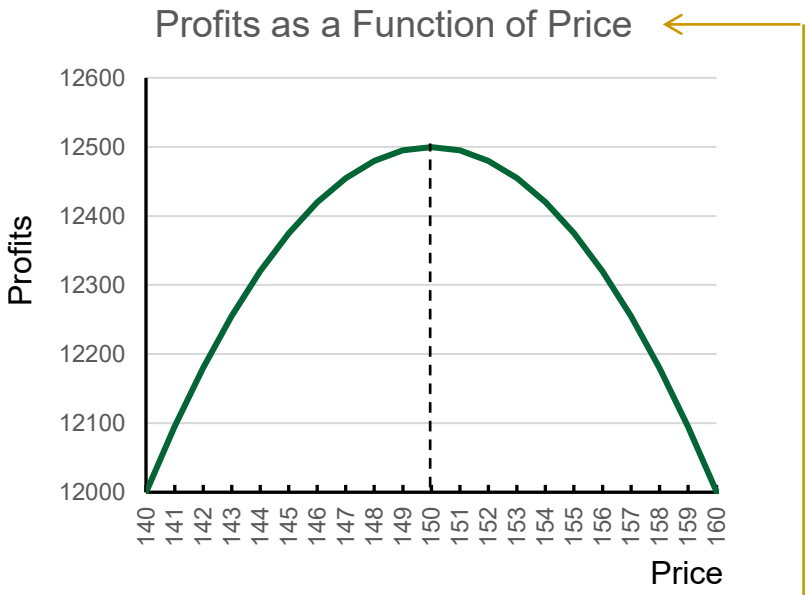
- The basic idea
  - Consider a price increase $\Delta p$ in the product of a hypothetical monopolist of homogeneous products and an accompanying loss of sales $\Delta q$ when the demand curve is downward sloping
    - When the loss of sales is sufficiently small, the gross gain in profits from higher prices on retained sales will be greater than the gross loss in profits from lost sales and the price increase will be profitable
    - When the loss of sales is sufficiently large, the gross gain in profits from higher prices on retained sales will be smaller than the gross loss in profits from lost sales and the price increase will be unprofitable
  - *Definition*: The loss of sales $\Delta q_{cl}$ at the tipping point when the gross gain in profits just equals the gross loss is called the *critical loss* (CL) or, more precisely, *unit critical loss* because it looks to losses in unit sales
    - Percentage critical loss (%CL) is the percentage $\Delta q_{cl}/q$, where $q$ is the premerger level of sales. Percentage critical loss looks to losses in percentages of lost unit sales
    - NB:
      - A decrease in sales *greater* than $\Delta q_{cl}$ will mean a net *loss* in profits compared to the starting quantity $q$
      - A decrease in sales *less* than $\Delta q_{cl}$ will mean a net *gain* in profits compared to the starting quantity $q$
  - Dependencies
    - Critical loss (*CL*) is a function of the starting quantity $q$, the price $p$, the price change $\Delta p$, and the gross dollar margin $(p - mc)$ (or the percentage gross margin $(p - mc)/p$)

# Critical loss

- The basic idea
  - When demand is linear, the profit curve as a function of price is a parabola

Model:
$q = 1000 - 5p$
$F = 0$

$p_{max} = 150$
$q_{max} = 250$
$\pi_{max} = 12{,}500$



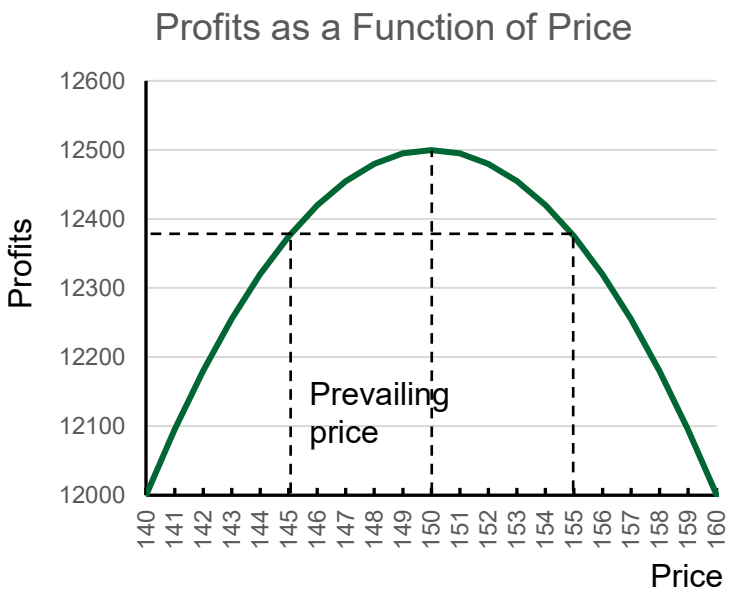

NB: We typically do this graph as a function of quantity, but this time we are doing it as a function of price because the HMT as whether a *price increase* (a SSNIP) would be profitable

# Critical loss

- The basic idea
  - That means that, other than at the profit maximum, there are two points (prices) where the firm earns the same profit
    - One on each side of the profit maximum
    - Here, both $p_1 = 145$ and $p_2 = 155$ yield the same profit of 12,375

| $p$ | $q$ | $\pi$ |
|---|---|---|
| 145 | 275 | 12,375 |
| 155 | 225 | 12,375 |

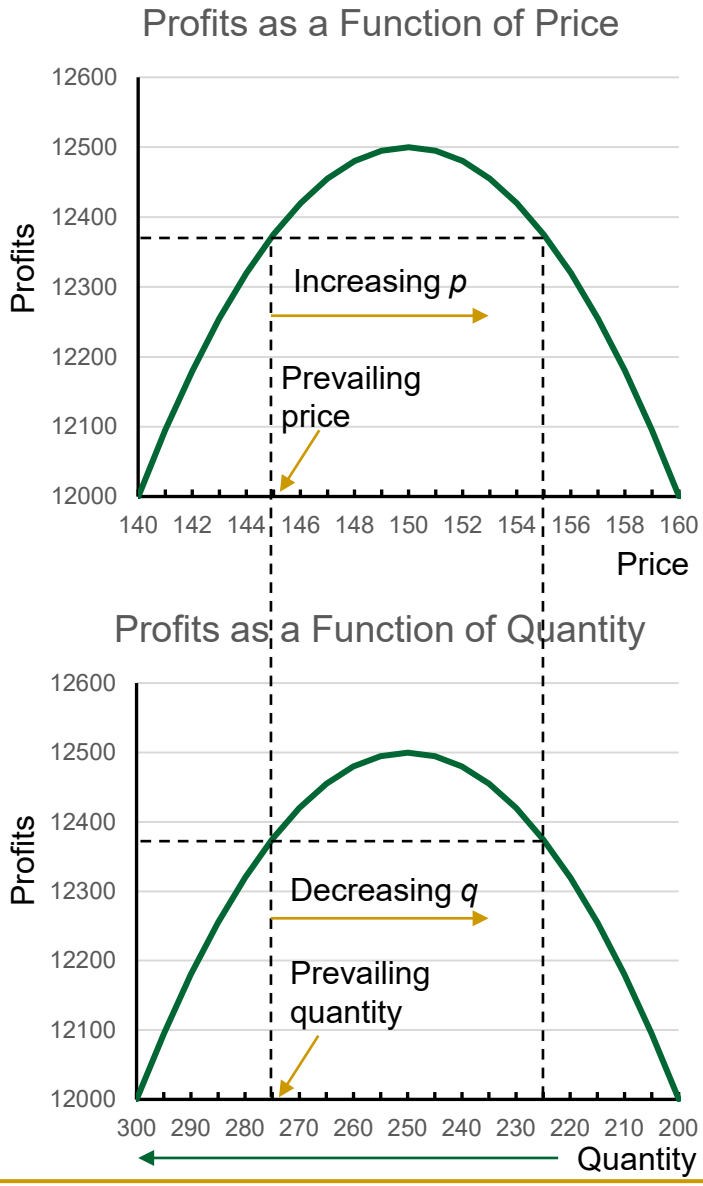
  - One of these points will be in the inelastic portion of the demand curve, so the firm would never operate there
    - Here, $p = 155$ is in the inelastic portion of the demand curve
    - So suppose that $p = 145$ and $q = 275$ are the prevailing price and quantity



# Critical loss

- The basic idea
  - Now plot the same profit curve as a function of quantity, but order the x-axis in *decreasing* quantities
    - The two curves are identical, since each price and its associated quantity are at the same place on the x-axis
  - *Query*: What is the maximum amount the firm can decrease quantity (and so increase price) so that the firm does not lose money?
  - This maximum amount is called the *critical loss* ($\Delta q_{cl}$)
    - Note that any decrease in quantity *less* than the critical loss will increase profits
  - Here the critical loss is 50 units

| $p$ | $q$ | $\pi$ |
|---|---|---|
| 145 | 275 | 12,375 |
| 155 | 225 | 12,375 |

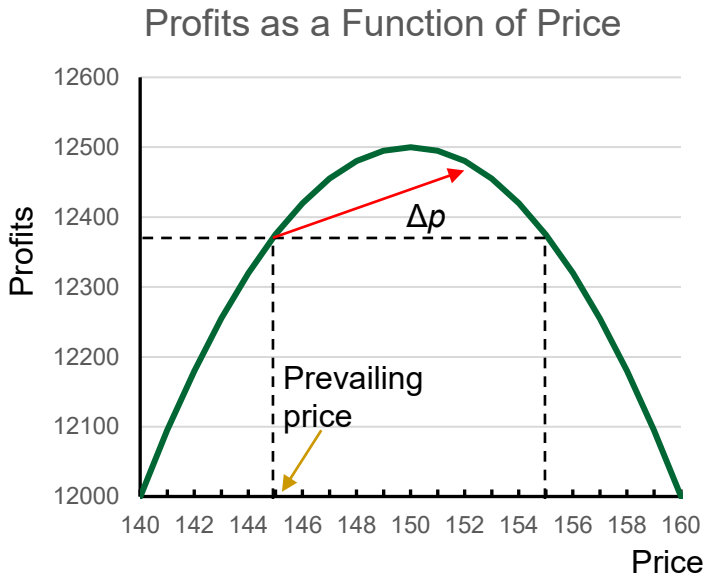


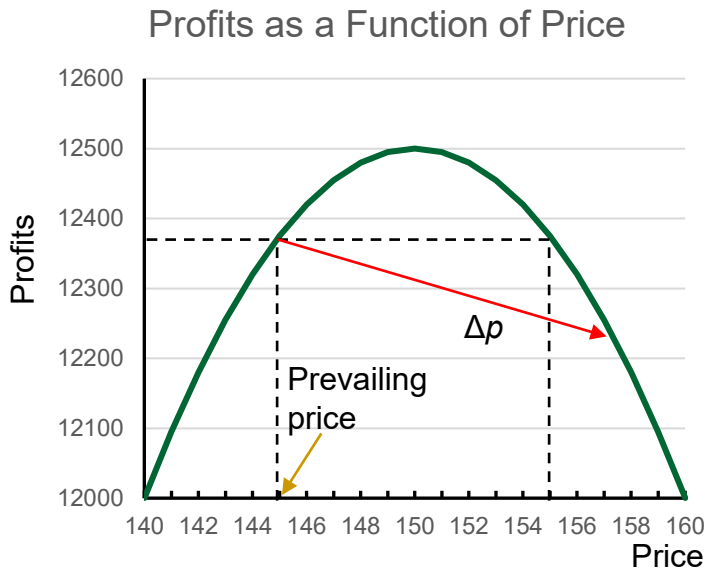
# Critical loss

- Implementing the hypothetical monopolist test with critical loss
  - The critical loss for $\Delta p$ will be the maximum quantity the hypothetical monopolist could loss $\Delta q_{cl}$ and still make at least as much in profit as it did before the SSNIP was implemented, that is, whether—

    *Post-price increase profits ≥ Pre-price increase profits*

  - $\Delta p$ is profitable in the first graph and unprofitable in the second graph



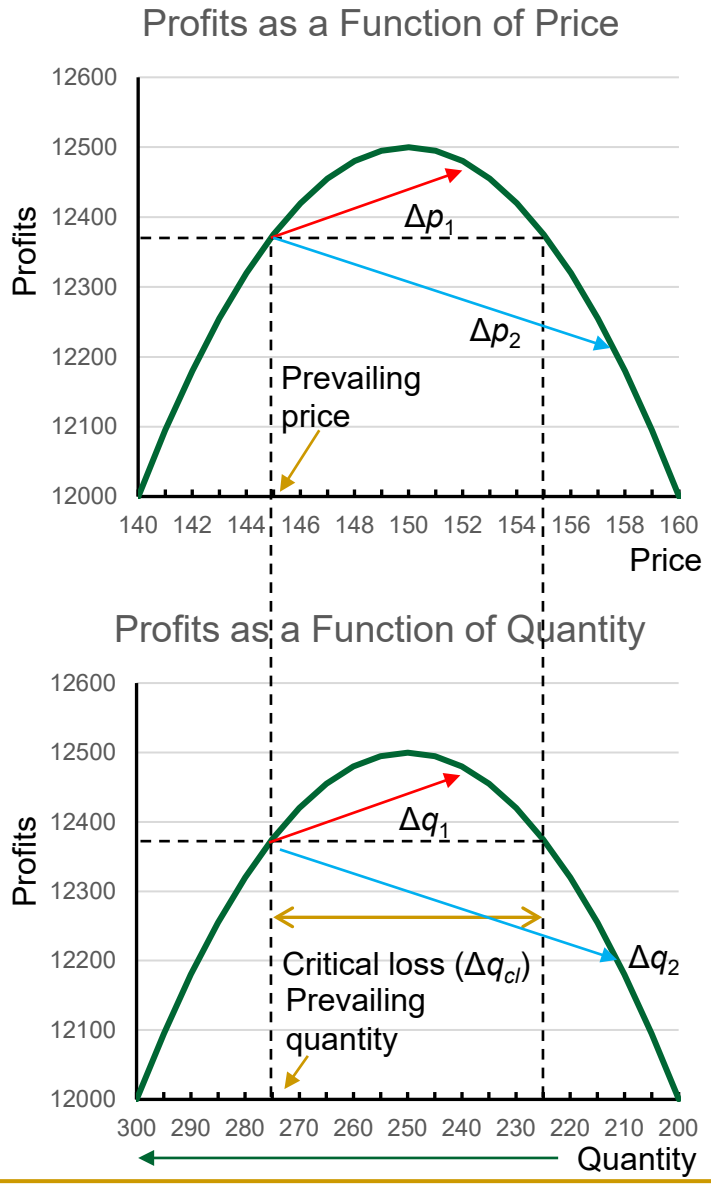
# Critical loss

- Implementing the hypothetical monopolist test
  - We can associate an actual loss $\Delta q$ with a price increase of $\Delta p$

*Whether the price increase is profitable will depend on whether the associated quantity decrease is less than the critical loss, that is:*

$$\Delta q \leq \Delta q_{cl}$$

- This is called the *critical loss test*
  - So $\Delta p_1$ is profitable because $\Delta q_1 \leq \Delta q_{cl}$
  - So $\Delta p_2$ is unprofitable because $\Delta q_2 \leq \Delta q_{cl}$



# Critical loss

- The *critical loss rule*:

*If actual loss is less than the critical loss,*
*the candidate market satisfies the HMT*

- The idea
  - When actual loss is less than critical loss, this means that for a given SSNIP the hypothetical monopolist is able—
    - to capture enough incremental profits on the margin increase on its inframarginal sales
    - to offset the incremental profit decrease on the loss of the marginal sales
- A caution
  - Actual loss and critical loss are functions of the magnitude of the SSNIP
  - A hypothetical monopolist that satisfies the HMT at a 5% SSNIP may fail the HMT for a different SSNIP (e.g., 10%)

# Critical loss

- The basic idea
  - The critical loss for $\Delta p$ will be the maximum quantity the hypothetical monopolist could loss $\Delta q_{cl}$ and still make at least as much in profit as it did before the SSNIP was implemented:

Post-price increase profits: $(p + \Delta p - c)(q - \Delta q_{cl})$ = Pre-price increase profits: $(p - c)q$

($p_2$ = $p + \Delta p$; $m_2$ = $p_2 - c$; $q_2$ = $q - \Delta q_{cl}$; $m_1$ = $p - c$)

Breakeven condition with constant marginal costs

  - Rearranging this equality, we can also express this 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: $\Delta p(q - \Delta q_{cl})$ = Loss of margin on lost sales: $(p - c)\Delta q_{cl}$

Note: Critical loss is a function of the starting point $q$ as well as $p$, $\Delta p$, and $c$

# Critical loss

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

1. Unit critical unit loss formula:

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

In a HMT, $\Delta p$ is the $SSNIP

- Requires—
  - The same price (and hence the same $\Delta p$) for all products in the candidate market
  - The same dollar margin for all products in the candidate market

# Critical loss

- Formulas for critical loss
  2. Divide Equation 1 by *q* to obtain *percentage critical loss*:

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

2. Percentage critical loss formula:

$$= \frac{\delta}{\delta + m}$$

where

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

In a HMT, $\delta$ is the %SSNIP

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

- Requires a constant percentage margin *m* for all products in the candidate market

# 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: $$\left|\varepsilon_{cl}\right| = \frac{\frac{\Delta q_{cl}}{q}}{\frac{\Delta p}{p}} = \frac{\Delta q_{cl}}{q}\frac{1}{\delta} \Rightarrow \frac{\Delta q_{cl}}{q} = \delta\left|\varepsilon_{cl}\right|$$

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 Δq in any equation.*

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

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

3. Critical elasticity formula

  - Accordingly, when the actual own-elasticity of demand $\varepsilon$ is less than the critical elasticity $\varepsilon_{cl}$ (i.e., $\varepsilon$ is more inelastic than $\varepsilon_{cl}$ or equivalently $\left|\varepsilon\right| < \left|\varepsilon_{cl}\right|$), then for a small enough %SSNIP the price increase will be profitable
    - We can express this as:

$$\left|\varepsilon\right| < \frac{1}{\delta + m}$$ means the HMT is satisfied

# Critical loss and market definition

- The application
  - 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 (profitability test)
    - So for any candidate market with current aggregate output $q$ and price $p$ and a SSNIP $\Delta p$, then if the change in output $\Delta q$ is less than the critical loss $\Delta q_{cl}$ a hypothetical monopolist could profitably raise price by the SSNIP and the candidate market is a relevant market
  - Algorithm
    1. Start with a product of the merging firm
       - Or a product of the merging firm together with other closely related products (as in H&R Block/TaxACT)
    2. Assume a hypothetical monopolist over the group of products—the "candidate market"—and raise price by a SSNIP
    3. Compare actual loss $\Delta q$ to critical loss $\Delta q_{cl}$,
       - If the actual loss $\Delta q < \Delta q_{cl}$, then a hypothetical monopolist could profitably raise prices by the SSNIP and the product grouping is a relevant market
         - Whether the SSNIP is profitable will be determined by the candidate market's *own-elasticity of demand*
       - If the actual loss $\Delta q \geq \Delta q_{cl}$, then a hypothetical monopolist could not profitably raise prices the product grouping is not a relevant market → add to the product group another product with a high cross-elasticity of demand/diversion ratio and repeat Steps 2 and 3.

# Critical loss and market definition: Example 1

Products A and B are being tested as a candidate market. Each has a price of $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?

*Given the actual loss, so think unit critical loss*

# Critical loss and market definition: Example 1

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*Given the actual loss, so think unit critical loss*

| **Parameters** | | | **"Brute force" 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 | | | | |
| Customer loss | ΔQ | -200 | | ΔQ | -200 | qΔp | 12000 |
| | | | | m | 40 | (p+Δp)-c | 45 |
| | | | | Loss | -8000 | CL | -266.6667 |
| | | | | | | | |
| | | | 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 under the HMT

*Brute force 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 under the HMT

# Critical loss and market definition: Example 2

Premium cupcakes sell for $1.50 apiece and cost $0.90 to make. At this price, producers collectively sell 10,000 premium cupcakes. When the price for all premium cupcakes is increased by 5%, 15% of the customers switch to regular cupcakes. Do premium cupcakes constitute a relevant market under the 2010 Guidelines?

*You are given the percentage loss, so think percentage critical loss*

- Step 1: Summarize the variables
  - $p = 1.50$ — %SSNIP = 5%
  - $c = 0.90$ — $Q = 10{,}000$
  - $m = \frac{1.50 - 0.90}{1.50} = 40\%$ — $\%\Delta Q = 15\%$
- Step 2: Calculate the percentage critical loss:

$$(\%CL =)\frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m} = \frac{5\%}{5\% + 40\%} = 11.11\%$$

- Step 3: Compare percentage actual loss to percentage critical loss
  - Percentage actual loss = 15%
  - Percentage critical loss = 11.11%
- *Answer*: Since $\%\Delta Q > \% \Delta Q_{cl}$, premium cupcakes are NOT a relevant product market

# Critical loss and market definition: Example 3

Premium ice cream sells at $3.00/pint and has a constant marginal cost of $2.25/pint. The own-elasticity of aggregate demand for premium ice cream is -0.50, 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?

*You are given the actual elasticity, so think critical elasticity*

- Step 1: Summarize variables
  - $p = 3.00$ %SSNIP = 5%
  - $c = 2.25$ $\varepsilon = -0.50$
  - $\%m = \frac{3.00 - 2.25}{3.00} = 25\%$
- Step 2: Calculate the absolute value of the critical elasticity:

$$\left|\varepsilon_{cl}\right| = \frac{1}{\delta + m} = \frac{1}{0.05 + 0.25} = 3.33$$

In calculating critical elasticity, be sure to convert the percentages into decimal numbers!

- Step 3: Compare the actual elasticity with the critical elasticity:
  - Actual elasticity (absolute value) = 0.50
  - Critical elasticity (absolute value) = 3.33
- *Answer*: Since $|\varepsilon| < |\varepsilon_{cl}|$, premium ice cream is a relevant market under the HMT

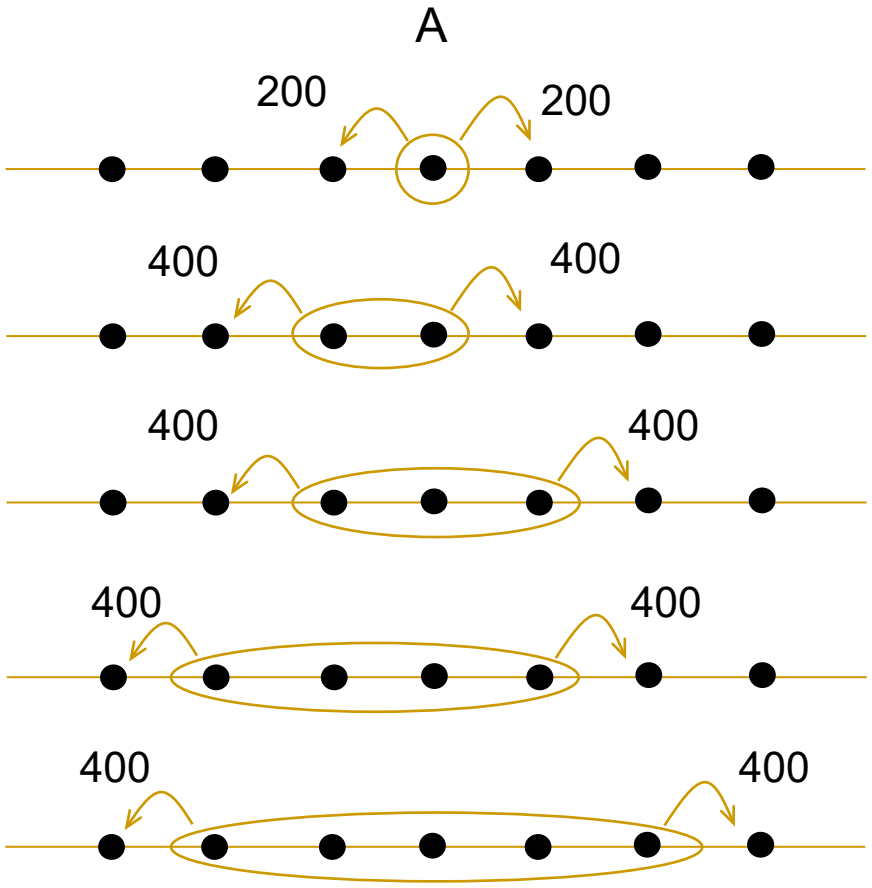
# Critical loss and market definition: Example 4

Assume that there is an identical gas station every mile on a straight road. Each gas stations charges $3.25 per gallon, has an incremental costs 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?

*We'll do this step by step*

# Critical loss and market definition: Example 4

- Example 4: Gas stations on a road
  - Step 0: Make sure you understand the switching behavior!



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*This is complicated, so think brute force*

- Step 1: Summarize the variables
  - $p$ = 3.25
  - $c$ = 2.50
  - $\$m = \frac{3.25 - 2.50}{3.25} = 40\%$
  - Customers/station = 1000
  - Customer loss per station = 400

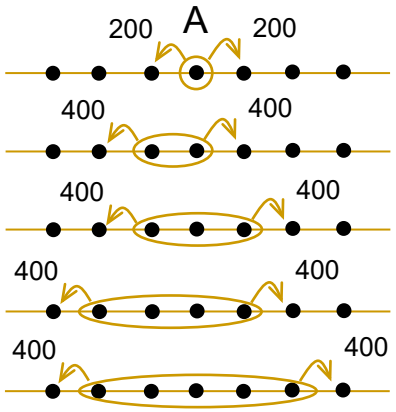
%SSNIP = 5%

$\$SSNIP = 0.05 * 3.25$

$= 0.1625$

- Step 2: Calculate net profit gain as the market expands

| Stations in the market | Q | ΔQ | 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 |




Five stations, with Station A in the middle, is the relevant geographic market

# Critical loss and market definition

- Estimating actual loss ($\Delta q$)
  - We can estimate the percentage critical loss if we know the aggregate own-elasticity of demand for the candidate market when:
    - Premerger profit-maximizing pricing satisfies the Lerner Condition ($\varepsilon = 1/m$)
  - First-order approximation of the percentage actual loss:

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

"≈" means approximately

where $\varepsilon$ is the residual own-elasticity of demand for the candidate market (i.e., of the hypothetical monopolist)

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

  - First-order approximation of the actual loss for an arbitrary downward-sloping demand curve:

4. Percentage actual loss formula

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

NB: This is exact in the case of linear demand

  - Calculating exact actual loss for a linear demand curve from own-elasticity:

5. Unit actual loss formula

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

# 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*: $\left|\varepsilon_{cl}\right| \cong \frac{1}{\delta + m}$

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

- *Percentage actual loss (linear demand)*: $\frac{\Delta q}{q} = \delta\varepsilon$

- *Unit actual loss* (linear demand): $\Delta q = \varepsilon\delta q$

# Uniform SSNIP tests with Differentiated Margins in Homogeneous Product Markets

# Critical loss: Differentiated margins

- Multiple margins in homogeneous product markets
  - In the percentage critical loss formulas in the earlier slides, the percentage margins of the various products in the candidate markets were all assumed to be equal
  - In many candidate markets, however, the percentage margins will differ among firms
    - Production technologies may differ among firms resulting in different marginal costs and hence different margins even when all products are homogeneous and sell at the same price
  - Since the products are homogeneous, the market is single-priced and the hypothetical monopolist must increase the prices of all firms in the candidate market by a SSNIP

# Critical loss: Differentiated margins

- Setting up the problem
  - Without loss of generality, assume that there are three firms in the candidate homogeneous product market:

| Firm | Sales ($q_i$) | Share ($s_i$) | %Margin ($m_i$) | Diversion ($\Delta q_i$) |
|---|---|---|---|---|
| 1 | 500 | 0.5 | 0.4 | 60 |
| 2 | 300 | 0.3 | 0.6 | 30 |
| 3 | 200 | 0.2 | 0.2 | 10 |

    - The market price $p$ is \$10
    - The diversion $\Delta q_i$ for firm $i$ is the quantity that diverts outside the candidate market for a uniform 5% SSNIP (presumably there is no intramarket diversion with a uniform price increase)
    - Total division from the market for a uniform 5% SSNIP is $\sum_{i=1}^{3} \Delta q_i = 100$
  - HMT: Is a uniform 5% SSNIP profitable? YES
    - As in all cases, the answer depends on whether the gain to the monopolist on the increased margin on the inframarginal sales is greater than the loss of margin on the marginal sales

Brute force calculation

| Gain on Inframarginal Sales | | | | Loss on Marginal Sales | | | |
|---|---|---|---|---|---|---|---|
| Firm | $q_i - \Delta q_i$ | \$SSNIP | Gain | $\Delta q_i$ | %Margin | \$Margin | Loss |
| 1 | 440 | 0.5 | 220 | 60 | 0.4 | 4 | 240 |
| 2 | 270 | 0.5 | 135 | 30 | 0.6 | 6 | 180 |
| 3 | 190 | 0.5 | 95 | 10 | 0.2 | 2 | 20 |
| | | | 450 | 100 | | | 440 |

# Critical loss: Differentiated margins

- Percentage critical loss test
  - Recall that when the percentage margin $m$ is the same for all products in the candidate market, a uniform SSNIP $\delta$ across all products is profitable for a hypothetical monopolist if:

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

  - When margins are differentiated, a similar test applies:

$$(\%CL =)\frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m_{Ave}} > \frac{\Delta q}{q} \ (= \%\text{actual loss}),$$

    where $m_{Ave}$ is the *diversion share-weighted average* of the margins of the products in the market:

$$m_{Ave} = \sum_{i=1}^{n} \frac{\Delta q_i}{\Delta q} m_i.$$

  - In essence, we have created a single *composite product* out of the three products in the candidate market and assigned that product a percentage margin of $m_{Ave}$

  - *Note:* When losses $\Delta q_i$ are proportional to market share in the candidate market (that is, $\Delta q_i / \Delta q = s_i$)—the common assumption by antitrust economists in the absence of other information on diversion—then:

$$m_{Ave} = \sum_{i=1}^{n} s_i m_i.$$

When used, this assumption is frequently not challenged. This is probably because the lawyers do not understand it.

# Critical loss: Differentiated margins

- Percentage critical loss test: Applied to previous problem

| Firm | Sales ($q_i$) | Share ($s_i$) | %Margin ($m_i$) | Diversion ($\Delta q_i$) | Diversion share ($\Delta q_i/\Delta q$) | $m_{Ave}$ contribution ($\Delta q_i/\Delta q$) ($m_i$) |
|---|---|---|---|---|---|---|
| 1 | 500 | 0.5 | 0.4 | 60 | 0.6 | 0.24 |
| 2 | 300 | 0.3 | 0.6 | 30 | 0.3 | 0.18 |
| 3 | 200 | 0.2 | 0.2 | 10 | 0.1 | 0.02 |
| | 1000 | | $\Delta q$ = | 100 | $m_{Ave}$ = | 0.44 |

$\delta = .05$

$$m_{Ave} = \sum_{i=1}^{3} \frac{\Delta q_i}{\Delta q} m_i = \left(\frac{60}{100}\right)(0.4) + \left(\frac{30}{100}\right)(0.6) + \left(\frac{10}{100}\right)(0.2) = 0.44$$

%Critical loss:

$$\frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m_{Ave}} = \frac{0.05}{0.05 + 0.44} = 0.1020$$

%Actual loss:

$$\%\Delta q = \frac{\Delta q}{q} = \frac{100}{1000} = 0.1000$$

The percentage critical loss (0.1020) is greater than the percentage actual loss (0.1000), so a 5% uniform SSNIP would be profitable for a hypothetical monopolist. The candidate market is a relevant market under the HMT.

# Critical loss: Differentiated margins

- A simple sufficiency test
  - Let $m_{Max}$ be the maximum margin of any product in the candidate market. Then if—

$$\frac{\delta}{\delta + m_{Max}} > \frac{\Delta q}{q} \ (= \%\text{actual loss}),$$

    a hypothetical monopolist can profitably increase prices by a uniform SSNIP
  - Proof

    Since $m_{Max}$ is greater than $m_{Ave}$,

$$\frac{\delta}{\delta + m_{Ave}} > \frac{\delta}{\delta + m_{Max}}.$$

    Therefore,

$$(\%CL =)\frac{\Delta q_{cl}}{q} = \frac{\delta}{\delta + m_{Ave}} > \frac{\delta}{\delta + m_{Max}} > \frac{\Delta q}{q} \ (= \%\text{actual loss}).$$ Q.E.D

  - The idea is simple: This test essentially assumes the worst case—all unit losses by the hypothetical monopolist as a result of a unform SSNIP all come from the product with the highest margin and hence yields the maximum profit loss on the marginal sales
    - NB: This is a *sufficiency test*—the failure of the test does not necessarily mean that the candidate market is not a relevant market
      - The previous example fails the sufficiency test, yet the candidate market satisfies the HMT

# Critical loss and market definition: Example 5

In a homogeneous product market, firms have different technologies and hence different marginal costs and percentage margins. The candidate market contains three firms with different margins given in the table below. For a 5% SSNIP, the hypothetical monopolist would lose 8% of its sales. Is the candidate market a relevant market?

| Product | Share | Margin |
|---|---|---|
| A | 0.5 | 0.4 |
| B | 0.3 | 0.7 |
| C | 0.2 | 0.3 |

- Solution
  - The problem gives the actual percentage loss, so use the percentage critical loss formula
  - Since the margins differ, use the diversion share-weighted percentage margin $m_{Ave}$
    - Also, since we do not know anything about the actual losses or diversion ratios for individual products, use market share (unit shares and revenue shares are the same) as a proxy:

$$m_{Ave} = s_1 m_1 + s_2 m_2 + s_3 m_3 = (0.5)(0.4) + (0.3)(0.7) + (0.2)(0.3) = 0.47$$

    - Solving for percentage critical loss:

$$\%CL = \frac{\delta}{\delta + m} = \frac{0.05}{0.05 + 0.47} = 9.6\%$$

Since the actual loss of 8% is less than the critical loss of 9.6%, the candidate market is a relevant market under a uniform SSNIP test

# Critical loss and market definition: Example 6

2. Maximum margin approach (sufficient condition)
   - Replace $m_{Ave}$ in the above formulas with the maximum margin $m_{Max}$ earned by any firm in the candidate market
   - Example: Same problem as on prior slide

In a homogeneous product market, firms have different technologies and hence different marginal costs and percentage margins. The candidate market contains three firms with different margins given in the table below. For a 5% SSNIP, the hypothetical monopolist would lose 8% of its sales. Is the candidate market a relevant market?

| Product | Share | Margin | |
|---|---|---|---|
| A | 0.5 | 0.4 | |
| B | 0.3 | 0.7 | ← Maximum margin ($m_{Max}$) |
| C | 0.2 | 0.3 | |

- Calculate the percentage "critical loss" using the largest margin:

$$\frac{\delta}{\delta + m_{\max}} = \frac{0.05}{0.05 + 0.7} = 6.67\%$$

- Since the actual percentage loss (8%) is greater than the critical loss calculated using the maximum margin, the candidate market fails this test
- BUT this does NOT mean that the candidate market fails the HMT since it assumes the worst possible losses for the hypothetical monopolist. Using a diversion share-weighted margin (prior slide), we saw that the candidate market *does* satisfy the HMT.

# Critical loss and market definition

OPTIONAL

- Profit-maximization
  - As noted earlier, the guidelines ask whether the hypothetical monopolist for the candidate market profit-maximizing price increase would be above a SSNIP
  - The monopolist's profit-maximizing critical elasticity $\varepsilon^{pm}$—that is, the elasticity at which the hypothetical monopolist's profit-maximizing price increase will be at least as great as the SSNIP $\delta$—is given by:

$$\left|\varepsilon^{pm}\right| = \frac{1}{2\delta + m}$$

  - With a little algebra, we can rearrange the above equation to solve for $\delta$:

$$\delta^{pm} = \frac{-m\left|\varepsilon\right| + 1}{2\left|\varepsilon\right|}$$

  - This equation gives the profit-maximizing percentage price change $\delta^{pm}$ for a given group of products with an elasticity $\varepsilon$
  - It is helpful to remember what is going on here. A profit-maximizing monopolist prices so that the Lerner equation is satisfied ($\varepsilon = 1/m$). Competition within the product grouping, however, may decrease the margin $m$, so that the Lerner equation if no longer satisfied. The profit-maximizing $\delta^{pm}$ gives the percentage price change that the monopolist would implement if it gained control of the product grouping. (Note that when $\varepsilon = 1/m$, $\delta^{pm} = 0$, as it should be.)

# One-Product SSNIPs and Aggregate Diversion Analysis

# Aggregate diversion analysis

- Basic idea
  - When firms supply *differentiated products*, prices as well as margins can differ among products in a candidate market
  - Is there any reason to require the hypothetical monopolist to increase price uniformly in applying the hypothetical monopolist test?
- Evolution in the guidelines
  - 1982 Merger Guidelines
    - Required that the prices of all products in the provisional market be increased by the same percentage SSNIP
  - 1992 Merger Guidelines
    - Technically allowed the hypothetical monopolist to increase the prices of some but not all products in a candidate market (i.e., allowing discrimination in the SSNIP)
    - But not applied in practice except in cases where the premerger market exhibited some discrimination (and sometimes when the postmerger market arguably would exhibit discrimination even if the premerger market did not)
  - 2010 Merger Guidelines
    - After the 2010 Merger Guidelines, some economists—including agency economists in court proceedings—used product-specific SSNIPs in any differentiated products markets
    - A *one-product SSNIP* often (but not always) creates the narrowest relevant markets since it internalizes the maximum amount of diversion

# Diversion ratios

- The idea
  - Definition: The percentage of total sales lost by Firm A ($\Delta q_A$) that divert (switch) to Firm B ($\Delta q_B$) when Firm A increases its price by some given amount ($\Delta p_A$) and all other firms hold their prices constant
  - Mathematically:

$$D_{A \to B} \equiv D_{AB} = \left. \frac{\Delta q_B}{\Delta q_A} \right|_{\text{for some } \Delta p_A}$$

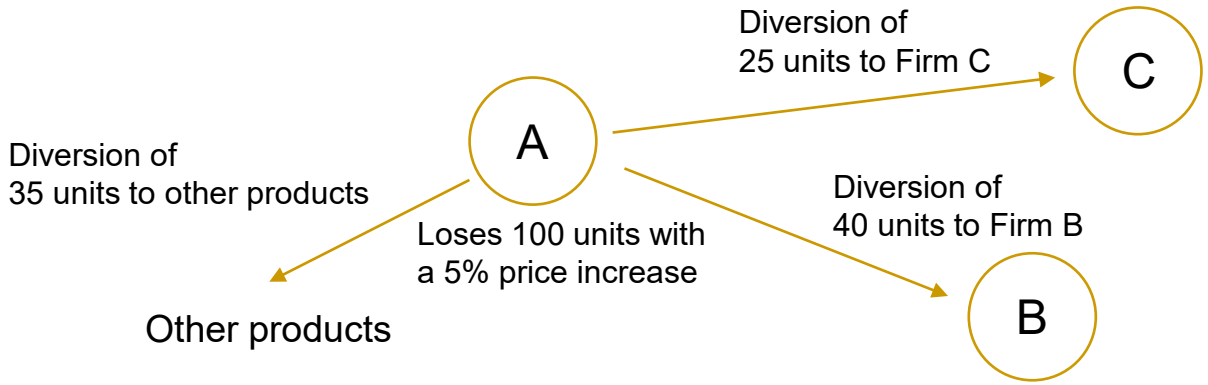
  - *Keep in mind*: The definition of diversion ratios is motivated by Firm A's price *increasing* and a corresponding loss of A's sales, some of which divert to Firm B
    - More formally:

$$D_{AB} = \frac{\frac{\Delta q_B}{\Delta p_A}}{\frac{\Delta q_A}{\Delta p_A}} = \left. \frac{\Delta q_B}{\Delta q_A} \right|_{\text{for some } \Delta p_A}$$

NB: The subscript notation for diversion ratios is not standardized in the literature. I write it so that the first subscript (A) is the firm increasing its price and the second subscript (B) is the firm to which the sales of interest divert.

# Diversion ratios

- Example
  - Firm A raises its price by 5% and loses 100 units (all other firms hold their price constant):
    - 40 units divert to Firm B
    - 25 units divert to Firm C
    - 35 units divert to other products




  - Then:

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

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

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

# Diversion ratios

- How are diversion ratios estimated (usually not very accurately)?
  1. Data collected during the regular course of business (including win-loss data)
  2. Indications in the company documents
  3. Consumer surveys
     - But very sensitive to survey design and customer ability to accurately predict product choice in the presence of a price increase
  4. Market shares as proxies: Relative market share method
     - Commonly used method when other data is not available
     - Assumes that customers divert in proportion to the market shares of the competitor firms (after adjusting for any out-of-market diversion)
       - So that the largest competitors (by market share) get the highest diversions
  5. Demand system estimation/econometrics
     - Econometric estimation of all own- and cross-elasticities of all interacting firms
     - Very demanding data requirements—Usually possible only in retail deals where point-of-purchase scanner data is available
  6. Switching shares as proxies
     - Where switching behavior is not limited to reactions to changes in relative price
     - Use only when better estimates are not available
     - *Example*: H&R Block/TaxACT (where the court accepted a diversion analysis based on IRS switching data only as corroborating other evidence)

# Diversion ratios

- How are diversion ratios estimated?
  - Relative market share method: Application
    - When all diversion is to products within the candidate market:

$$D_{A\to B} = \frac{s_B}{1 - s_A},$$

where $s_A$ and $s_B$ are the market shares of firms A and B, respectively

- Example: Candidate market—
  - Firm A 40%
  - Firm B 30%
  - Firm C 24%
  - Firm D 6%

  60% points to be allocated to three firms pro rata by their market shares
  - No diversion outside the candidate market

Then:

$$D_{A\to B} = \frac{0.30}{1 - 0.40} = 50.0\%$$

$$D_{A\to C} = \frac{0.24}{1 - 0.40} = 40.0\%$$

$$D_{A\to D} = \frac{0.06}{1 - 0.40} = 10.0\%$$

Adds to 100% to account for 100% of the diverted sales

# Diversion ratios

- How are diversion ratios estimated?
  - Relative market share method: Application (con't)
    - When there is some diversion to products outside the candidate market:

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

where $\frac{\Delta q_{outside}}{\Delta q_A}$ is the percentage of Firm A's lost sales that are diverted to firms outside of the market

- Example: Candidate market—
  - Firm A 50%
  - Firm B 25%
  - Firm C 15%
  - Firm D 10%

  } Shares in the candidate market (= 100%)

  - Outside diversion: 15%

  → 85% points to be allocated to the firms in the candidate market

Then:

$$D_{A\to B} = (1 - 0.15)\frac{0.25}{1 - 0.50} = 42.5\%$$

$$D_{A\to c} = (1 - 0.15)\frac{0.15}{1 - 0.50} = 25.5\%$$

$$D_{A\to D} = (1 - 0.15)\frac{0.10}{1 - 0.50} = 17.0\%$$

$$D_{A\to O} = 15\%$$

Total 85% to Firms B, C, and D.
With outside diversion: 100%

# Diversion ratios in *H&R Block*

- Warren-Boulton's derivation of diversion ratios in H&R Block/TaxACT
  - Used market shares to estimate diversion ratios
  - Recall
    - $s_{HRB} = 15.6\%$
    - $s_{TaxACT} = 12.8\%$
  - So

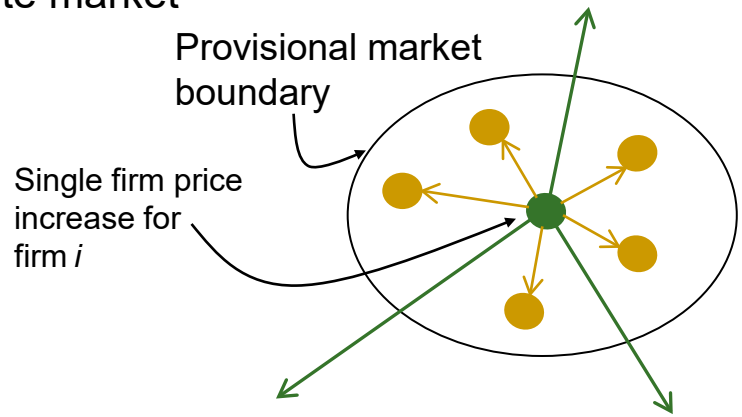
$$D_{HRB \to TaxACT} = \frac{12.8\%}{1 - 15.6\%} = 15.2\%$$

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

  - Interestingly, the court reported these diversion ratios as 14% and 12%
    - Warren-Boulton probably had some diversion to an outside option that was not given in the court opinion
      - An outside option (assisted and manual) of 17% for HRB gives $D_{HRB \to TaxACT} = 14\%$
      - An outside option (assisted and manual) of 10% for TaxAct gives $D_{TaxACT \to HRB} = 12\%$

# Recapture ratio/"Aggregate diversion ratio"

- Definition: Recapture ratio/Aggregate diversion ratio
  - The percentage $R_i$ of total sales lost in the wake of a SSNIP applied only to product *i* that is captured by the aggregate of all other products inside the candidate market




The aggregate diversion ratio $R_i$ for product *i* is more descriptively called the *recapture ratio,* the *recapture rate,* or the *group recapture ratio*

Internal diversion ($R_i$) (the percentage of lost sales recaptured)
External diversion ($1 - R_i$) (which is actual loss $L_i$)

  - Observation
    - 100% of the total loss of sales by firm *i* is equal to the recapture percentage $R_i$ that is retained by firms in the provisional market plus the loss of sales $L_i$ to all firms outside the market (that is, $R_i + L_i = 100\%$ for all firms in the market)
    - The recapture ration $R_i$ is equal to the sum of the diversion ratios from product *i* to other products in the candidate market: $R_i = \sum_{j \neq i} D_{ij}$

This assumes one-to-one substitution

# The one-product SSNIP test

- The 2010 Merger Guidelines and the one-product SSNIP

> The hypothetical monopolist test requires that a product market contain enough substitute products so that it could be subject to post-merger exercise of market power significantly exceeding that existing absent the merger. Specifically, the test requires that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future seller of those products ("hypothetical monopolist") likely would impose at least a small but significant and non-transitory increase in price ("SSNIP") on **at least one product in the market, including at least one product sold by one of the merging firms**. For the purpose of analyzing this issue, the terms of sale of products outside the candidate market are held constant.[1]

This is an important requirement

  - This creates the *one-product SSNIP test*:

> *A provisional market is a relevant market under the Merger Guidelines if a hypothetical monopolist could profitably increase the price of one of the merging firm's products by a SSNIP holding the prices of all other product constant*

    - This is the *profitability* version of the test (as opposed to the profit-maximization version)
    - NB: Just because one product in the candidate market fails the one-product SSNIP test does not preclude another product from passing it

[1] U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines § 4.1.1 (rev. 2010) (emphasis added).

# The one-product SSNIP test

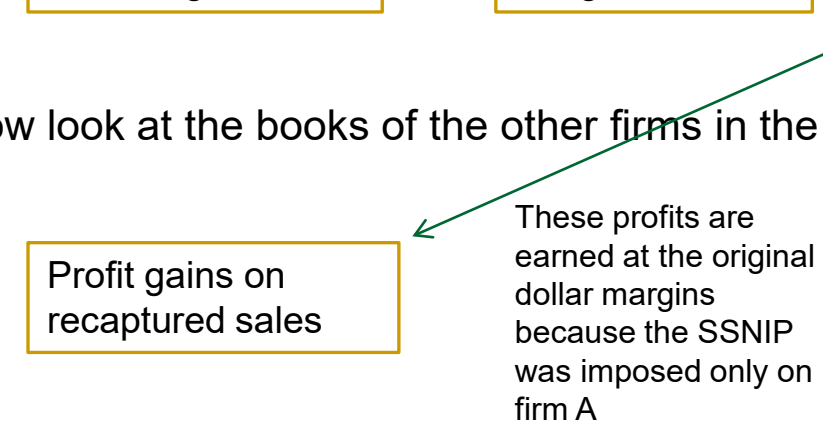
- The idea
  - When the hypothetical monopolist increases the price of only one product in the candidate market, its lost sales divert both to—
    - Products outside of the market ("external diversion"), *and*
    - Other products inside the market ("internal diversion)
  - As always, the profitability of a one-product SSNIP will depend on whether the hypothetical monopolist gains from the price increase outweigh its losses
  - But in the case of a one-product SSNIP, the gains will be—
    - The increase in margin on the inframarginal sales of the product subject to the SSNIP
    - PLUS the profits earned by all other products in the candidate market on recaptured sales from internal diversion
  - *The test*: Assume that there are *n* products in the candidate market. A one-product SSNIP in the price of product 1 is profitable for the hypothetical monopolist if and only if:

| Gains on the inframarginal sales of product 1 | + | Profits on the lost product 1 sales recaptured by products 2, . . ., *n* | > | Loss of profits the lost marginal sales of product 1 |
|---|---|---|---|---|

# The one-product SSNIP test

- The easy way to think about a one-product SSNIP test:
  - Let A be one of the merging firms. Looking only at A's accounting records:


  - Now look at the books of the other firms in the candidate market:




  - In considering the profitability of a price increase on A's product, the hypothetical monopolist considers the accounting results of all firms in the candidate market
  - Test: *Are the profits gains on the recaptured sales sufficient to offset firm A's standalone net loss?*
    - If so, then the candidate market is a relevant market under the HMT
    - If not, look at the profitability of a SSNIP on the other merging product

# Recapture analysis for single-product SSNIP

- "Brute force" method for single product price increase—Example 1
  - Example 1: (Differentiated) Gourmet pizzas
    - Assume that for a single product price increase of 5%, the hypothetical monopolist would retain 90 out of every 100 customers. Of the 10 lost customers, 7 would divert to another gourmet pizza and 3 would go to a standard pizza. Assume that the price of gourmet pizzas is $3.00 and that the dollar margin is $1.50 per pie for all producers.
    - *Query*: Under the single-product 5% SSNIP test, are gourmet pizzas a relevant product market?

| | | | | | |
|---|---|---|---|---|---|
| Data | Out of every units sold: | 100 | Price | $3.00 | |
| | | | Margin | $1.50 | |
| | Units retained | 90 | SSNIP (%) | 5.00% | |
| | Total units lost | 10 | SSNIP ($) | $0.15 | |
| | Units recaptured | 7 | | | |
| Analysis | Gain on inframarginal | $13.50 | Units retained (90) times $SSNIP ($0.15) | | |
| | Loss on marginal sales | -$15.00 | Total units lost (10) times $margin ($1.50) | | |
| | Gain on recapture | $10.50 | Recaptured units (7) times $margin ($1.50) | | |
| | Net gain | $9.00 | | | |

- Since the 5% price increase results in a net profit gain, gourmet pizzas are a relevant market

*Relation to critical loss*: When the dollar margins on the recapture sales are the same as the lost sales, those recaptured sales wash out the associated loss. Hence, you might think that you can look only at the sales not recaptured within the market (i.e., those that go to the "outside option") and do a critical loss analysis.

BUT this is not quite right. The inframarginal sales of Product 1 post-SSNIP earn an additional margin, but the recaptured sales earn the original margin. So you cannot use a critical loss test to test a one-product SSNIP.

# Recapture analysis for single-product SSNIP

- "Brute force" method for single product price increase—Example 2
  - We can use the brute force method for a single product price when *dollar margins* differ among products within the candidate market (here, $\$m_2 = 1.75$; $\$m_3 = 1.35$)
    - Of firm G1's 10 marginal customers, 4 divert to firm G2 and 3 divert to firm G3
    - A "brute force" accounting calculation is almost always the best way to analyze the profitability of a single-product SSNIP when dollar margins differ in the candidate market

**Gourmet pizza--Single product price increase**

(brute force method--different margins for candidate market of three firms)

Out of every 100 units sold by Firm G1 (the firm experiencing the price increase):

| | **For Firm G1:** | | **For Firm G2:** | | **For Firm G3:** | |
|---|---|---|---|---|---|---|
| Data | Total units retained | 90 | | | | |
| | Total unit diverted | 10 | Total units recaptured | 4 | Total units recaptured | 3 |
| | G1 price | $3.00 | | | | |
| | G1 margin | $1.50 | G2 $margin | $1.75 | G2 $margin | $1.35 |
| | SSNIP (%) | 5.00% | | | | |
| | SSNIP ($) | $0.15 | | | | |
| | Gain on retained units | $13.50 | Gain on recaptured units | $7.00 | Gain on recaptured units | $4.05 |
| | Loss on diverted units | -$15.00 | | | | |
| | Total gross gain to HM | $24.55 | = $13.50 + $7.00 + $4.05 | | | |
| | Total gross loss to HM | -$15.00 | | | | |
| | **NET GAIN** | **$9.55** | | | | |

Since the net gain to the hypothetical monopolist is positive, the candidate market is a relevant market

# One-product SSNIP recapture test

- The test
  - The setup
    - Assume $n$ firms in the candidate market
    - Let $p_i$ and $m_i$ be the price and percentage margin of Product $i$, respectively
    - Without loss of generality, impose a percentage SSNIP of $\delta$ on Product 1 holding the prices of Products 2, …, $n$ constant
    - Let $\Delta q_i$ be the change in the sales of Product $i$ resulting from the SSNIP in Product 1
      - $\Delta q_1$ is the loss of product 1 sales because of Product $i$'s downward-sloping demand curve
      - $\Delta q_i$ is the gain of product $i$ sales, $i$ = 2, …, $n$, where other products in the candidate market are substitutes or unrelated to Product 1)
    - Let $\Delta q_R$ be the total quantity recaptured within the candidate market: $\Delta q_R = \sum_{i=2}^{n} \Delta q_i$
    - Let $D_{1i}$ be the diversion ratio from Product 1 to Product $i$: $D_{1i} = \frac{\Delta q_i}{\Delta q_1}$
    - Let $R_1$ be the *recapture ratio* I.e., the percentage of lost units $\Delta q_1$ recaptured by all other products in the candidate market):

$$R_1 = \frac{\Delta q_R}{\Delta q_1}$$

    - Let $k_{1i}$ be the recapture share of Product $i$ when the price of Product 1 is increased: $k_{1i} = \frac{\Delta q_i}{\Delta q_R}$
    - Let $\$m_{RAve}$ be the recapture share-weighted dollar gross margin of the recaptured products:

$$\$m_{RAve} = \sum_{i=2}^{n} k_{1i} m_i p_i$$

# One-product SSNIP recapture test

- The test
  - *Proposition*: A candidate market is a relevant market under a one-product SSNIP recapture test for Product 1 if:

$$R_1 > R^1_{Critical} = \frac{\delta p_1}{\$m_{RAve}} \left( = \frac{\$SSNIP_1}{\$m_{RAve}} \right).$$

That is, if this condition is satisfied, a hypothetical monopolist could profitably increase the price of Product 1 by $\delta$

  - *Observations*:
    1. NB: Any product in the candidate market can be Product 1
       - I assume that the SSNIP would apply to Product 1 to simply the notation
    2. Under the Merger Guidelines, as long a one product satisfies the one-product SSNIP recapture test, the candidate market is a relevant market
       - This is true even if all the other products in the candidate market fail the test

# One-product SSNIP recapture test

Optional

- The test
  - Proof:[1]

    *Strategy*: A hypothetical monopolist of a candidate market could profitably increase the price of product 1 by a SSNIP if the profit loss in product 1 is less than the profit gain from recapture to any sales diverted into other products in the candidate market

    1. Determine the net loss in the sales of product 1 resulting from the SSNIP
       *Note*: There will be a net loss since pre-SSNIP product 1 was priced at its standalone profit-maximizing price. The net profit loss in product 1 has two parts:
       1. The gross dollar loss from the loss $\Delta q_1$ of marginal sales: $\Delta q_1 \$m_1$
       2. The gross dollar gain from the increased margin in the inframarginal sales:$(q_1 - \Delta q_1)\delta p_1$

       So the net dollar loss in product 1 from imposing the SSNIP: $\Delta q_1 m_1 p_1 - (q_1 - \Delta q_1)\delta p_1$
    2. Determine the dollar profit gain from diversion of product 1 lost sales to other products in the candidate market:

$$
\begin{aligned}
D_{12}\Delta q_1 \$m_2 + D_{13}\Delta q_1 \$m_3 &= \Delta q_1 \left[ D_{12}\$m_2 + D_{13}\$m_3 \right] \\
&= R_1 \Delta q_1 \left[ \frac{D_{12}}{R_1}\$m_2 + \frac{D_{13}}{R_1}\$m_3 \right] \\
&= R_1 \Delta q_1 \left[ k_{12}\$m_2 + k_{13} S m_3 \right] \\
&= R_1 \Delta q_1 \$m_{RAve},
\end{aligned}
$$

    where $\$m_{RAve}$ is the term in brackets on the right-hand side, that is, the diversion share-weighted average of the dollar profit gains from recapture by the other products in the candidate market (i.e., all the products except for product 1)

[1] The proof here is for a three-product candidate market. It is easily extended to an *n*-product candidate market.

# One-product SSNIP recapture test

Optional

- Aggregate diversion ratios and the one-product SSNIP test
  - Proof (con't):
    3. The hypothetical monopolist can profitably increase product 1's price by a SSNIP if the profits from the recaptured sales are greater than the net loss in the sales of product 1, that is, if:

$$R_1 \Delta q_1 \$m_{RAve} > \Delta q_1 \$m_1 - (q_1 - \Delta q_1)\delta p_1$$

Rearranging terms:

$$R_1 > \frac{\Delta q_1 \$m_1}{\Delta q_1 \$m_{RAve}} - \frac{(q_1 - \Delta q_1)\delta p_1}{\Delta q_1 \$m_{RAve}} = \frac{p_1}{\$m_{RAve}}\left[\%m_1 - \frac{q_1}{\Delta q_1}\delta + \frac{\Delta q_1}{\Delta q_1}\delta\right]$$

But a profit-maximizing firm satisfies the Lerner condition, that is, $|\varepsilon_{11}| = \frac{1}{m_1}$. Pre-SSNIP, Firm 1 maximized its profits given its residual demand curve, implying:

$$|\varepsilon_{11}| = \frac{\frac{\Delta q_1}{q_1}}{\frac{\Delta p_1}{p_1}} = \frac{\frac{\Delta q_1}{q_1}}{\delta} = \frac{1}{\%m_1} \Rightarrow \%m_1 - \frac{q_1}{\Delta q_1}\delta = 0$$

So the first two terms in the brackets sum to zero and the fraction in the third term equals 1:

$$R_1 > \frac{p_1}{\$m_{RAve}}\left[\%m_1 - \frac{q_1}{\Delta q_1}\delta + \frac{\Delta q_1}{\Delta q_1}\delta\right]$$

Simplifying:

$$R_1 > \frac{\delta p_1}{\$m_{RAve}}.$$

Q.E.D.

# One-product SSNIP recapture test

Optional

- Observations
  - The test is not intuitive (at least to me)—But it does make sense:
    - Consider the fraction $\delta p_1$
    - $\delta p_1$ is the \$SSNIP, that is, the incremental profit earned on each inframarginal sale after the price increase
      - But consider again the Lerner condition for a profit maximum:

$$\left|\varepsilon_{11}\right| = \frac{\frac{\Delta q_1}{q_1}}{\frac{\Delta p_1}{p_1}} = \frac{\frac{\Delta q_1}{q_1}}{\delta} = \frac{1}{\%m_1}$$

      - Solving this time for $\delta$:

$$\delta = \frac{\Delta q_1}{q_1} m_1 = \frac{\Delta q_1}{q_1}\frac{(p_1 - c_1)}{p_1}$$

      - So

$$\$SSNIP = \delta p_1 = \frac{\Delta q_1}{q_1}\frac{(p_1 - c_1)}{p_1} p_1 = \frac{\Delta q_1}{q_1}\$m_1,$$

        or the marginal sales profit loss per unit of original Product 1 sales
    - $\$m_{RAve}$ is the diversion-weighted average dollar margin of one recaptured sale
    - Consequently (with a little rearrangement):

$$R_1 > \frac{\delta p_1}{\$m_{RAve}} \Rightarrow R_1 \$m_{RAve} > \delta p_1 \Rightarrow \frac{(\text{Total units recaptured})}{\Delta q_1}(\$m_{RAve}) > \frac{\Delta q_1}{q_1}\$m_1$$

This says that the recaptured profit gain per lost sale of Product 1 must be greater than the average marginal sales profit loss per unit of original Product 1 sales

# The one-product SSNIP test

Optional

- Corollaries
  - *Corollary 1*: When the *percentage margins* $\%m_o$ of the other products are the same ($m_o$), the test becomes:

$$R_1 > \frac{\delta}{\%m_o}\frac{p_1}{p_{RAve}},$$

That is, if this condition is satisfied, a hypothetical monopolist could profitably increase the price of Product 1 by $\delta$

where $p_{RAve}$ is the recapture share-weighted average of the prices of the other products in the candidate market (i.e., all the products except for product 1)

  - *Corollary 2*: When the prices of the other products are the same ($p_o$), the test becomes:

$$R_1 > \frac{\delta}{m_{RAve}}\frac{p_1}{p_o},$$

where $m_{RAve}$ is the recapture share-weighted average of the percentage gross margins of the other products in the candidate market (i.e., all the products except for product 1)

  - *Corollary 3:* When the prices of all products in the candidate market are the same but the margins differ, the test becomes:

$$R_1 > \frac{\delta}{m_{RAve}}.$$

*Exam hint*: You will have to apply any of the formulas on this slide. If the exam question calls for the use of a one-product SSNIP test, you will be able to apply it using brute force.

# The one-product SSNIP test

- Corollaries
  - *Corollary 4 (symmetric products)*: When all products in the candidate market have the same prices $p$ and margins $m_o$, the test becomes:

You should know this

$$R_1 > \frac{\delta}{m_o}.$$

- NB: Even when the prices and margins of all products are identical in the premerger market equilibrium, if the products can be differentiated by other attributes such as quality or reputation, prices and margins may divert postmerger
  - In such markets, a one-product SSNIP test can be used even when all prices and margins in the candidate market are identical because the hypothetical monopolist could increase the price of only one product and still retain some sales from that product (so that there will be some gross gain on that product's inframarginal sales)

# Recapture analysis for single-product SSNIP

- Example 1A: Single-product SSNIP test (symmetric products)
  - Gourmet pizzas
    - Assume that for a single product price increase of 5%, the hypothetical monopolist would retain 10 out of every 100 customers. Of the 10 lost customers, 7 would divert to another gourmet pizza and 3 would go to a standard pizza. Assume that the price of gourmet pizzas is $3.00 and that the dollar margin is $1.50 per pie for all producers.
    - *Query*: Under the single-product 5% SSNIP test, are gourmet pizzas a relevant product market?
    - *Answer*:

The products are symmetrical (identical prices and margins), so use the one-product SSNIP test for symmetric products: The one-product SSNIP is profitable if $R_1 > \delta/m$.

$\delta$ = 0.05
$m$ = 0.5%
So $\delta/m$ = 10%

$R_1$ = 70%

$R_1 > \delta/m$, so the one-product SSNIP test is satisfied, the hypothetical monopolist can profitably increase the price of product 1 by 5%, and gourmet pizzas are a relevant market (The same result as we obtained earlier).

Generally, as long as $R_1$ > 10% in this problem, the one-product SSNIP test will be satisfied.

# Recapture analysis for single-product SSNIP

- Example 2A: Single-product SSNIP test (same price, different margins)
  - We can use Corollary 3 when the prices of the products in the candidate market are the same but the margins differ
    - Product 2 recaptures 2 units at $\$m_2 = 1.75$
      Product 3 recaptures 5 units at $\$m_3 = 1.05$

Optional

  - *Answer*:

The products different dollar margins, so one-product SSNIP for Product 1 is profitable for a hypothetical monopolist if:

$$R_1 > \frac{\delta}{m_{RAve}}.$$

where $m_{RAve}$ is the recapture share-weighted average of the percentage margins of the other products in the candidate market (i.e., all the products except for product 1)

| | Gourmet pizzas | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | | |
| Price | 3 | 3 | 3 | | From problem |
| $margin | 1.5 | 1.75 | 1.05 | | From problem |
| Loss | 10 | | | | From problem |
| #Recapture (units) | | 2 | 5 | | From problem |
| %Recapture | | 28.57% | 71.43% | 100.00% | Recapture shares |
| $\$m_{RAve}$ contribution | | 0.5000 | 0.4500 | | %Recapture times $margin |
| Average $\$m_{RAve}$ | | | | 1.2500 | Sum of $\$m_{RAve}$ contributions |
| $\%m_{RAve}$ | | | | 0.44166 | Average $\$m_{RAve}$/price |
| $\delta$ | 5% | | | | From problem |
| $\delta/m_{RAve}$ | 12.00% | | | | Calculated |
| $R_1$ | 70.00% | | | | From problem |

$R_1 > \delta/m_{RAve}$, so the one-product SSNIP test is satisfied, the hypothetical monopolist can profitably increase the price of product 1 by 5%, and gourmet pizzas are a relevant market (The same result as we obtained earlier).

# One-product SSNIP recapture test

- A caution
  - In a well-known paper, Katz and Shapiro derived a different condition for a one-product SSNIP test:

$$R_1 > \frac{\delta}{\delta + m_{RAve}},$$

    where the prevailing prices for all products are equal.[1]

    *This condition is INCORRECT for a one-product SSNIP test!*

  - The problem is that the Katz-Shapiro proof assumed that the recaptured sales would be sold at the original price of the recapturing product *increased* by the SSNIP, but in a one-product SSNIP recapture test the recaptured sales would be sold at the original prices charged by the other firms in the market
    - I note this only because this incorrect condition is still in circulation
    - However, it will be a useful condition in a uniform SSNIP test for differentiated products

[1] *See* Michael Katz & Carl Shapiro, *Critical Loss: Let's Tell the Whole Story*, Antitrust, Spring 2003, at 53 & n.25.

# Uniform SSNIPs and the Aggregate Diversion Ratio Test

# Aggregate diversion ratio test

- Extension to a uniform SSNIP
  - Some economists have attempted to create a recapture test for hypothetical monopolist imposing a *uniform* SSNIP in a differentiated candidate market
  - *Remember*: With recapture, the net profits of the hypothetical monopolist from a price increase in each product *i* taken individually comprise—
    - The net gain on the inframarginal sales of product *i* resulting from the price increase
    - MINUS the net loss on the sales of product *i* resulting from the price increase
    - PLUS all incremental profits earned by other firms in the candidate market from the capture of sales diverted from product *i*
  - When the hypothetical monopolist increases all prices in the candidate market by a SSNIP, its overall profit is the sum of the net profits from each of the individual products

# Aggregate diversion ratio test

- Extension to a uniform SSNIP
  - Observations:
    - In a one-product SSNIP test, the hypothetical monopolist earns additional gross profits on the inframarginal sales of product *i* due to the price increase, but earns only normal margins on the sales recaptured by the other products in the candidate market
    - In a uniform SSNIP test, the hypothetical monopolist earns additional gross profits on the inframarginal sales of all products in the candidate market *and* increased margins on the sales recaptured by the other products in the candidate market
    - The diversion ratios are likely to be different in the two situations
      - With the one-product SSNIP, the diversion ratios are from a higher priced SSNIP product to the originally priced other products
      - With a uniform SSNIP, the diversion ratios are from one higher-priced SSNIP product to (now less attractive) other higher-priced SSNIP products

*In general, we can expect the diversion ratios with a one-product SSNIP to be higher than the diversion ratios for a uniform SSNIP*

# Aggregate diversion ratio test

- Extension to a uniform SSNIP
  - Some notation
    - Suppose a candidate market contains $n$ differentiated products, each with a price $p_i$ and a percentage gross margin $m_i$
    - Let $\Delta q_i$ be the actual gross unit loss in the sales of Product $i$ as a result of the SSNIP but before counting any recapture of diverted sales
    - Let $D_{ij}$ be the diversion ratio from Product $i$ to Project $j$ when all products are subject to the SSNIP
    - Let $R_i^U$ be the gross unit recapture of Product $i$ sales collectively by other firms in the candidate market, so

$$R_i^U = \sum_{i \neq j} D_{ij} \Delta q_i .$$

The "$U$" in the superscript is to remind us that it is a uniform SSNIP

NB: $R_i^U$ may be estimated from empirical evidence rather than derived from individual diversion ratios. They may also be estimated by relative share method.

- Let $\$m_{RAve}$ be the recapture share-weighted dollar gross margin of the recaptured products:

$$\$m_{RAve} = \sum_{i=2}^{n} k_{1i} m_i p_i$$

- Let $\$SSNIP_{RAve}$ be the recapture share-weighted dollar gross margin of the recaptured products

$$\$SSNIP_{RAve} = \sum_{i=2}^{n} k_{1i} \delta p_i$$

# Aggregate diversion ratio test

- The aggregate diversion ratio test for a uniform SSNIP:
  - *Proposition 1*. A hypothetical monopolist earns positive profits on product *i* from a uniform SSNIP in the candidate market if:

$$R_i^U > \frac{p_1\delta}{\$SSNIP_{RAve} + \$m_{RAve}} \equiv R_{Critical}^U$$

Call the right-hand side the *critical recapture rate* for a uniform SSNIP.

  - *Corollary (identical margins):* When all products in the candidate market have the same percentage margin *m*:

$$R_i^U > R_{Critical}^U = \frac{p_1\delta}{\$SSNIP_{RAve} + \$m_{RAve}} = \frac{p_1\delta}{p_{RAve}\%SSNIP_{RAve} + p_{RAve}\%m_{RAve}} = \frac{\delta}{\delta + m}\frac{p_1}{p_{RAve}}$$

  - *Corollary (symmetric products)*: When all products in the candidate market are symmetric (same prices *p* and percentage margins *m*):

$$R_i^U > R_{Critical}^U == \frac{p\delta}{p\delta + pm} = \frac{\delta}{m + \delta}$$

The critical recapture rate in the symmetric case is the same as the percentage critical loss

    - In the literature and some cases, the symmetric case is the variation most commonly discussed

# Aggregate diversion ratio test

- A sufficiency test
  - *Proposition 2 (sufficiency)*: If:

$$R_i^U \geq R_{Critical}^U \quad \text{for all firms } i \text{ in the candidate market}$$

$$R_j^U > R_{Critical}^U \quad \text{for some firm } j \text{ in the candidate market}$$

then the uniform SSNIP will be profitable for the hypothetical monopolist and the candidate market will be a relevant market

  - Proposition 2 simply says that if, in the wake of a uniform SSNIP, the hypothetical monopolist at least breaks even on every product in the candidate market and strictly makes positive profits in at least one product, the uniform SSNIP is profitable
  - Proposition 2 only states a *sufficient* condition
    - Failure to satisfy the test does not mean that the candidate market is not a relevant market
    - It is possible for a hypothetical monopolist to make positive profits from a uniform SSNIP even if it losses money in some products as long as it offsets those losses from positive profits in other products

# Aggregate diversion ratio test

- Example: Aggregate diversion ratio test
  - Differentiated three-product candidate market
    - Parameters
      - Each product has the same price of $100
      - Each product has a margin of 60%
      - Assume a uniform SSNIP of 5% across all products
    - Then use the symmetric version of the aggregate diversion ratio test:

$$R^{U}_{Critical} = \frac{\delta}{\delta + m} = \frac{0.05}{0.05 + 0.60} = 0.0769 \text{ or } 7.69\%$$

    - Suppose that the uniform SSNIP generates the following actual recapture rates:

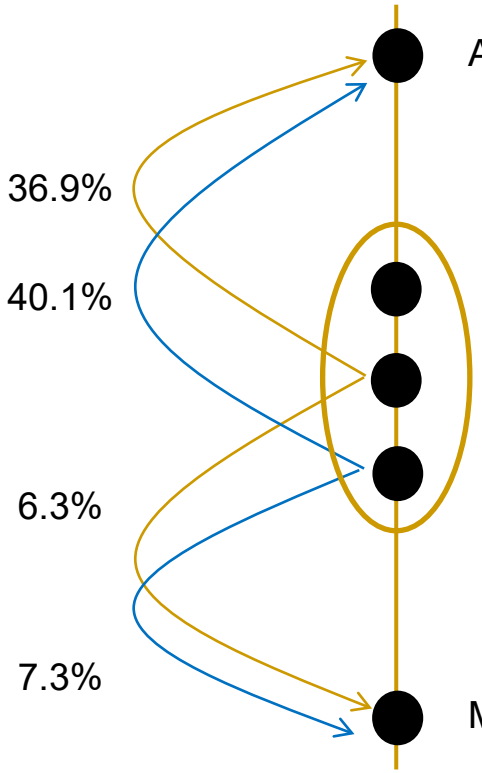
| Product | $q$ | $\Delta q$ | Recapture Units | Recapture Rate ($R^{U}_{i}$) |
|---|---|---|---|---|
| A | 1200 | 100 | 30 | 30.00% |
| B | 900 | 75 | 12 | 16.00% |
| C | 600 | 50 | 10 | 20.00% |

    - *Result*: Since the smallest $R^{U}_{i}$ (16.00%) is greater than $R^{U}_{Critical}$ (7.69%), a hypothetical monopolist can profitably sustain a 5% uniform price and so the three products is a relevant market

# Aggregate diversion ratio test

- Warren-Bolton analysis in H&R Block/TaxACT
  - Recall that Warren-Boulton relied on IRS switching data to estimate aggregate recapture ratios

See Op. 115 for the diversion ratios




TurboTax ($55): $R$ =39%

HRB At Home ($25 average): $R$ = 56.8% (= 100% - 39.6% - 6.3%)

TaxACT (freemium): $R$ = 52.7% (= 100% - 40.1% – 7.3%)

Recall: $R_i = 1 - L_i$, where $L_i$ is the percentage loss of firm $i$'s product from the candidate market

  - *Query*: Does the use of switching data indicated that the estimated $R_i$'s are for a single-product SSNIP or a uniform SSNIP?

# "Aggregate diversion ratio"

- Warren-Bolton analysis in H&R Block/TaxACT
  1. *Question*: Is DDIY a relevant market under a uniform SSNIP test?
  2. *Critical aggregate diversion ratio ($R^U_{Critical}$)*
     - Starting point: Start with DDIY products (HRB, TaxACT, and TurboTax)
     - SSNIP ($\delta$): 10%
     - Gross margin ($m$): 50% on each product (Warren-Bouton assumption)
     - Then:

$$R^U_{Critical} = \frac{\delta}{\delta + m} = \frac{10\%}{10\% + 50\%} = 16.7\%$$

  3. *Actual loss*: Determine aggregate diversion ratios (recapture rates $R^U_i$) for each product
     - *Test*: If each $R^U_i \geq R^U_{Critical}$ for all products in the candidate market and $R^U_i > R^U_{Critical}$ for at least one product $i$, then product grouping is a market
     - Using IRS switching data as a proxy for $R$, Warren-Bolton found:
       - HRB: $R_{HRB}$ = 57%
       - TaxACT: $R_{TaxACT}$ = 53%
       - TurboTax: $R_{TurboTax}$ = 39%
  4. Conclusion (Warren-Boulton)
     - Since each $R^U_i > R^U_{Critical}$, a hypothetical monopolist of the DDIY product could profitably raise price by a uniform SSNIP and therefore DDIY is a relevant product market

# Aggregate diversion ratio test

- A "presumptive" test
  - Some commentators suggest that in a uniform SSNIP test, the single-product SSNIP diversion and recapture rates can be used in Proposition 2 to create a *presumption* that the condition is satisfied and the candidate market is a relevant market[1]
  - But the recapture ratios across products in the candidate market will be at least as high and likely higher using a single-product SSNIP than a uniform SSNIP because of the prices of substitute products will be lower in the former situation. Therefore, we should expect:

$$R_i^S \geq R_i^U.$$

    - As one analyst noted:

> Unless the different products within a candidate antitrust market increase prices by different amounts, it is likely there will be little substitution among the products within the candidate market. Consequently, when there is a price increase across all products in the candidate market the value of the Aggregate Diversion Ratio is likely to be close to zero.[2]

    - Consequently, the presumptive test must be used with great care, if used at all

[1] Michael Katz & Carl Shapiro, *Critical Loss: Let's Tell the Whole Story*, Antitrust, Spring 2003, at 54 (footnote omitted).
[2] Barry Harris, *Recent Observations About Critical Loss Analysis* (undated), https://www.justice.gov/atr/recent-observations-about-critical-loss-analysis

# Implementations of the Hypothetical Monopolist Test: SUMMARY

# Summary

1. Prevailing (premerger) conditions
   - Competitive interactions established premerger equilibrium in prices and production quantities
   - Also establishes other competitive variable such as product attributes, but we do not have good models for this
2. Hypothetical monopolist test
   - Seeks to identify a product grouping (relevant market) that contains the product of one or both of the merging firms in which market power could be exercised
   - *Test*: Whether a hypothetical monopolist of the product grouping could profitably implement “small but significant nontransitory increase in price” (SSNIP) above the prevailing prices in one or more products in the grouping, including at least one of the products of the merging firms
   - The test is satisfied when the profits gained from the increase in margin in the inframarginal sales outweigh the profits lost from the loss of the marginal sales

# Summary

3. Critical loss in homogeneous product markets
   - In the standard models, the hypothetical monopolist increases price by reducing output, which creates a scarcity in the product. Inframarginal customers then bid up the price in order to clear the market.
   - While small reductions in output may increase profits, sufficiently large reductions will reduce profits below the prevailing level
   - The output reduction beyond which any further reduction is unprofitable is call the *critical loss*
     - The critical loss is the output reduction where the profits gained from the increase in margin in the inframarginal sales just equal the profits lost from the loss of the marginal sales
   - *Test*: If the actual loss of sales due to a SSNIP is less than the critical loss, the SSNIP will be profitable and the candidate market will be a relevant market

# Summary

4. One-product SSNIP tests in differentiated products markets
   - In differentiated products market, different products can have different prices and margins
   - The Merger Guidelines recognize as relevant markets products grouping where the hypothetical monopolist can profitably increase the price of one product, provided it is a product of one of the merging firms
   - The same basic critical loss analysis applies with one significant modification: When the product with the SSNIP loses marginal sales, some of those lost sales are "recaptured" by other products in the candidate market
   - The hypothetical monopolist earns profits on the recaptured sales that can be used to offset profit losses from lost marginal sales
     - The profit for each unit recaptured by any "other" product is the other product's original dollar margin (since the price of the recapturing product is not increased by the SSNIP)
   - The recapture rate on the lost marginal units that is just necessary for the hypothetical monopolist to break even with a SSNIP on one product is called the (one-product) *critical recapture rate*
     - The critical recapture rate is specific to the product on which the SSNIP is imposed, the diversion ratios from that product to other products in the market, and the dollar margins of all products
   - *Test*: For the product on which the SSNIP is imposed, if the actual recapture rate exceeds the critical recapture rate, the SSNIP will be profitable and the candidate market will be a relevant market

# Summary

5. Uniform SSNIP tests in differentiated products markets
   - In some differentiated products markets, the prices tend to move together
   - In these situations, it may be most realistic for the hypothetical monopolist to impose a uniform SSNIP on all products in the candidate market
   - The analysis and the test is the same here as it is for the one-product SSNIP recapture test except:
     - The margins of all products in the candidate market are increased by the SSNIP
     - The diversion ratios should take into account that all prices in the candidate market will be increased (so that, in general, the diversion ratios in the uniform SSNIP case should be less than the diversion ratios in the one-product SSNIP case)

# Merger Simulation

# Merger simulation

- Warren-Boulton
  - In addition to critical loss analysis, used "merger simulation" to predict price increases resulting from the merger to test whether a hypothetical monopolist would increase prices postmerger more than a SSNIP
- Warren–Boulton results
  - Used Bertrand pricing model
  - Predicted price increases as a result of the merger—
    - TaxACT 83%
    - HRB 37%
    - TurboTax 11%
- Court
  - Confirms DDIY as a relevant market
    - But discusses in competitive effects analysis

As did the Court, we will defer an examination of the Warren-Boulton simulation model until the anticompetitive effects analysis