The Use of Empirical Work in Litigation: Recent Examples from the US

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Overview

- Antitrust practice tends to follow the academic literature with a lag
- IO is mostly an empirical field
- Combined with data availability, computers and training seems to lead to a “perfect storm”
- Indeed, in the US this has been the case.
- I will discuss how this has played out in several recent cases

Unilateral effects in merger reviews

- The US legal standard: a transaction is illegal if "the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly"
  - Key phrase: "lessening of competition"
- Lessening of competition can impact prices, quality, capacity, etc.
  - Focus on prices (as is typically the case)
- How do the merging parties' (pricing) incentives change?
  - Higher prices: internalize competition between merging brands
  - Lower prices: merger-specific marginal cost reductions
- Which effect dominates?

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Pre-merger pricing

- Firms 1 and 2 merge; to understand how their pricing incentives change we need to understand pre-merger prices
- Consider Firm 1; if product 1 price goes up:
  - Lose some sales and associated profits …
  - But, higher profits on remaining sales
- Pre-merger optimal prices balance these two effects
- How does the merger change this calculation?

Post-merger pricing

- The merged firm's pricing of product 1: if price goes up,
  - As before, lose sales and profits on product 1
  - Also as before, higher profits on remaining product 1 sales
  - But now some of the losses of product 1 are to product 2 and are <u>not</u> lost to the merged firm
- Everything else equal, merger leads to upward pricing pressure
  - Losses between the merged firm's products are not losses
  - Each product faces less competition post-merger
- The "diversion ratio": the fraction of product 1 sales that are diverted to product 2

Calculating unilateral effects in practice

- How to calculate this upward pricing pressure (and compare it to the expected marginal cost reductions)?
- Multiple models and approaches available
- Like all economic modeling, the right approach depends on
  - The economics of the industry at issue
  - The available data
- Assuming differentiated products competing on price, discuss:
  - UPP and GUPPI
  - Reduced form regressions – *Staples*
  - Merger simulation – *ATT-DTV*

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UPP and GUPPI

- Formalizes the intuition of internalizing competition
- Assuming nothing but pricing incentives change, what will be the merged firm's incentive to increase prices?
- Simplest version: $UPP = Margin \times DiversionRatio$
  - A larger margin (on product 2) implies higher pricing pressure
  - Higher diversion implies higher pricing pressure
- Several alternative versions, all simple formulas
- Two key questions:
  - Where do the inputs come from?
  - Do the implicit assumptions fit the industry?

UPP and GUPPI: pros and cons

- Advantages
  - Easy to calculate (assuming known inputs)
  - Inputs can usually be obtained from business documents
- Potential disadvantages
  - Assumes no other changes (e.g., quality, repositioning)
  - Assumes no competitor reaction
  - Too formulaic: the assumptions do not always fit industry realities
  - Does not predict post-merger prices
  - Inputs often do not match up with economic measures
- Originally UPP was proposed as a quick screen (like HHI)
  - often used for more

Reduced form regressions

- An alternative approach:
  - Use regression analysis to estimate the effect of competition using pre-merger variation in market conditions
  - Past merger or variation across markets
- Avoids the need to rely on
  - A specific model
  - Unknown inputs
- But …
  - Requires data that is not always available
  - Is not tied to a specific mechanism of “loss of competition” (could something else be driving the price variation?)

Reduced form regressions: pros and cons

- Advantages
  - Natural experiment flavor, intuitive
  - Can be based on detailed, reliable data
  - Simple econometrics
- Potential disadvantages
  - Observed variation due to other factors, not merger
  - Even if the merger “caused” price increases, is it a loss of competition?
  - How do the effects in the data relate to the merger at hand?

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Merger simulation

- The 3rd approach combines the best of the first two
- Step 1: write a model that captures the economics of the industry
  - Can be a pricing model like the one used for the UPP/GUPPI
  - But can also be tailored to the industry
- Step 2: estimate the model inputs based on the best available data
  - Can use business documents (as in GUPPI) or econometric analysis (as in reduced form approach)
- Step 3: calculate post-merger equilibrium prices for all competitors reflecting the merger's effects on incentives, costs, quality, etc.

An example: ATT–DTV

- ATT: telecom that offers wireline, cellular, video, and broadband service
- DTV: offers video service via satellite
- The merger presented a potential loss of competition in video (4 to 3 in some markets) but a gain in competition in bundles (of video and other services)
- In addition: cost efficiencies and increased incentive to invest
- How to combine and quantify the various effects?
- The parties offered a merger simulation model that was mostly adopted in the FCC order
- Ongoing: T-Mobile/Sprint

Merger simulation: pros and cons

- Advantages
  - Explicit modeling assumptions
  - Explicit price predictions
  - Richer, can better reflect the rationale of the transaction
- Potential disadvantages
  - Complex, time consuming
  - Can feel like a black box to non-economists
- Note: the inputs are not much more than what is needed for GUPPI.

Aetna-Humana

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Overview

- The merger was proposed joint with another health-care merger
  - Would have taken the industry from 5 to 3
- In many ways a "plain vanilla" merger analysis: market definition, competitive effects and offsetting factors.
- Established two main points:
  - Further acceptance of the 2010 Guidelines by the court
  - The use and presentation of empirical methods
- Ex-ante was considered a close call
  - With many thinking that simple regressions would win over more sophisticated analysis
- The decision was one-sided
  - Key takeaway: empirical analysis needs to fit nicely with other evidence

The Parties and the Transaction

- Aetna
  - Nation's 3rd largest health insurer
  - 23.5 enrollees
  - $60 billion revenue
- Humana
  - Nation's 5th largest health insurer
  - 14.2 enrollees
  - $54 billion is revenue
- The merger
  - Agreed on July 2, 2015
  - $37 billion in cash and stock (break up fee of $1 billion)
  - DOJ filed complaint on July 21, 2016
  - Trial in Dec 2016 with decision in Jan 2017

The products and markets at issue

- Several areas/products of overlap
- The DOJ focused on
  - Medicare Advantage in 364 counties
  - Individual Commercial (ACA exchanges) in 17 counties
- I will focus today on MA

Medicare Advantage

- Original Medicare (OM) is available to eligible seniors (aged 65+)
  - Parts A and B
  - Usually supplemented with MediGap and Part D
- Medicare Advantage (MA) is a private provided alternative
  - Private insurers set price, which is approved by CMS
  - If the price is above CMS "benchmark" then enrollees pays the difference
  - Usually below, so CMS pays benchmark but insurer has to add benefits (like drug, vision, dental, etc.)
- The main tradeoff is between a wider network in OM and lower prices/higher benefits in MA
- Consumers can choose when they age-in and during open enrollment

Economic analysis

- Multiple step analysis
  1. Define relevant product and geographic antitrust markets

  2. Compute competitive effects: structural presumption and empirical analysis

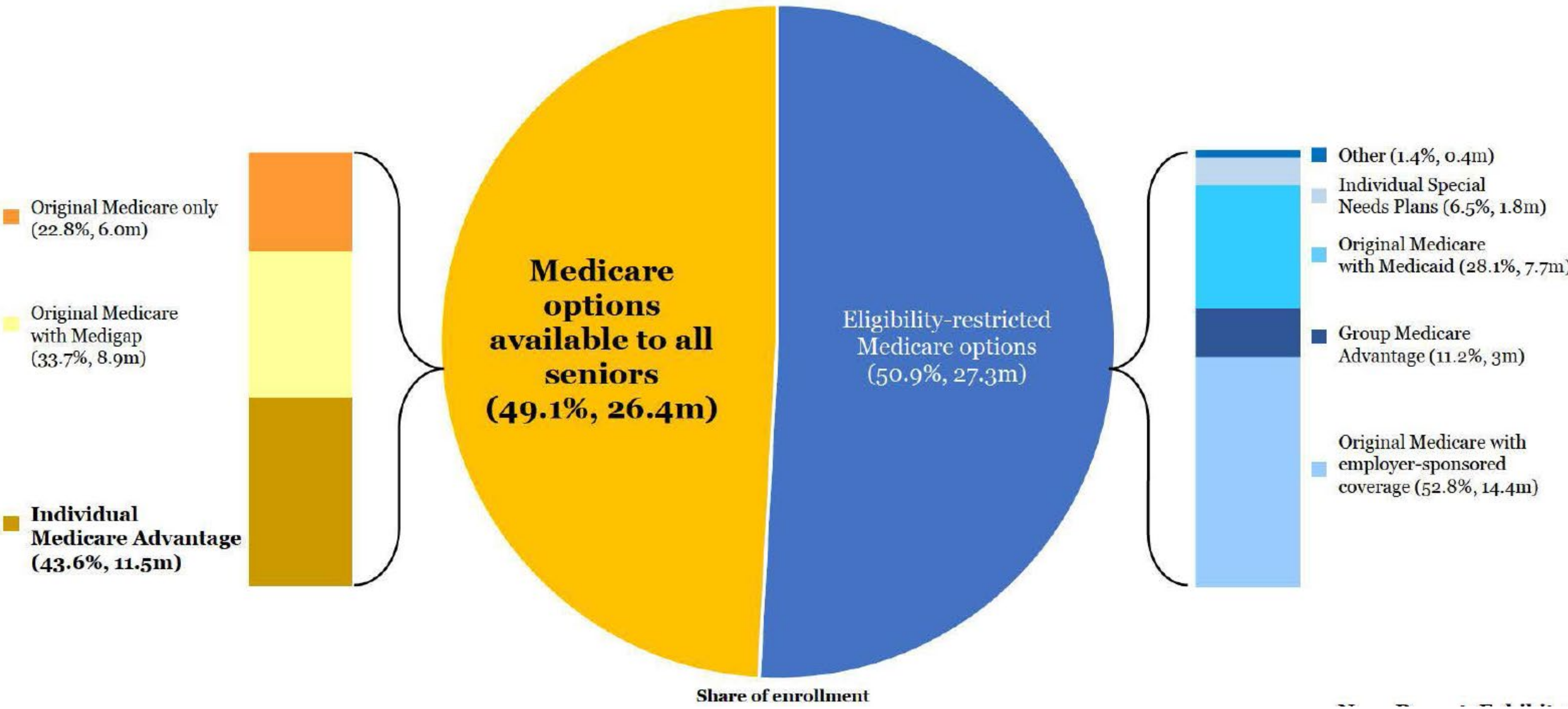
  3. Consider potential mitigating factors: divestiture, entry, and efficiencies

- I will focus on the way empirical analysis informed each of these

Product market definition:
Do MA plans constitute a relevant antitrust product market?

1. Market realities
2. Documentary evidence
3. Actual customer substitution
4. Academic literature
5. Empirical analysis of plan choice
6. Hypothetical monopolist tests

Why Did Market Definition Matter?



MA plans are distinct from other Medicare options

	Medicare Advantage	Original Medicare (with or without supplemental insurance) Parts A & B Only	Parts A & B with Medigap	Parts A & B with Part D
Basic benefits				
Medical benefits of Parts A & B	✓	✓	✓	✓
Visit any medical provider	✗	✓	✓	✓
Out-of-pocket cap on medical costs	✓	✗	✓	✗
Care management & coordination	✓	✗	✗	✗
Star ratings	✓	✗	✗	✓
Single customer-service hotline	✓	✓	✗	✗
Private insurer branding	✓	✗	✓	✓

	Medicare Advantage	Original Medicare (with or without supplemental insurance) Parts A & B Only	Parts A & B with Medigap	Parts A & B with Part D
Additional benefits offered by most plans				
Outpatient prescription drug coverage	✓	✗	✗	✓
Dental coverage	✓	✗	✗	✗
Vision coverage	✓	✗	✗	✗
Hearing coverage	✓	✗	✗	✗
Wellness benefits	✓	✗	✗	✗
Other benefits	✓	✗	✗	✗

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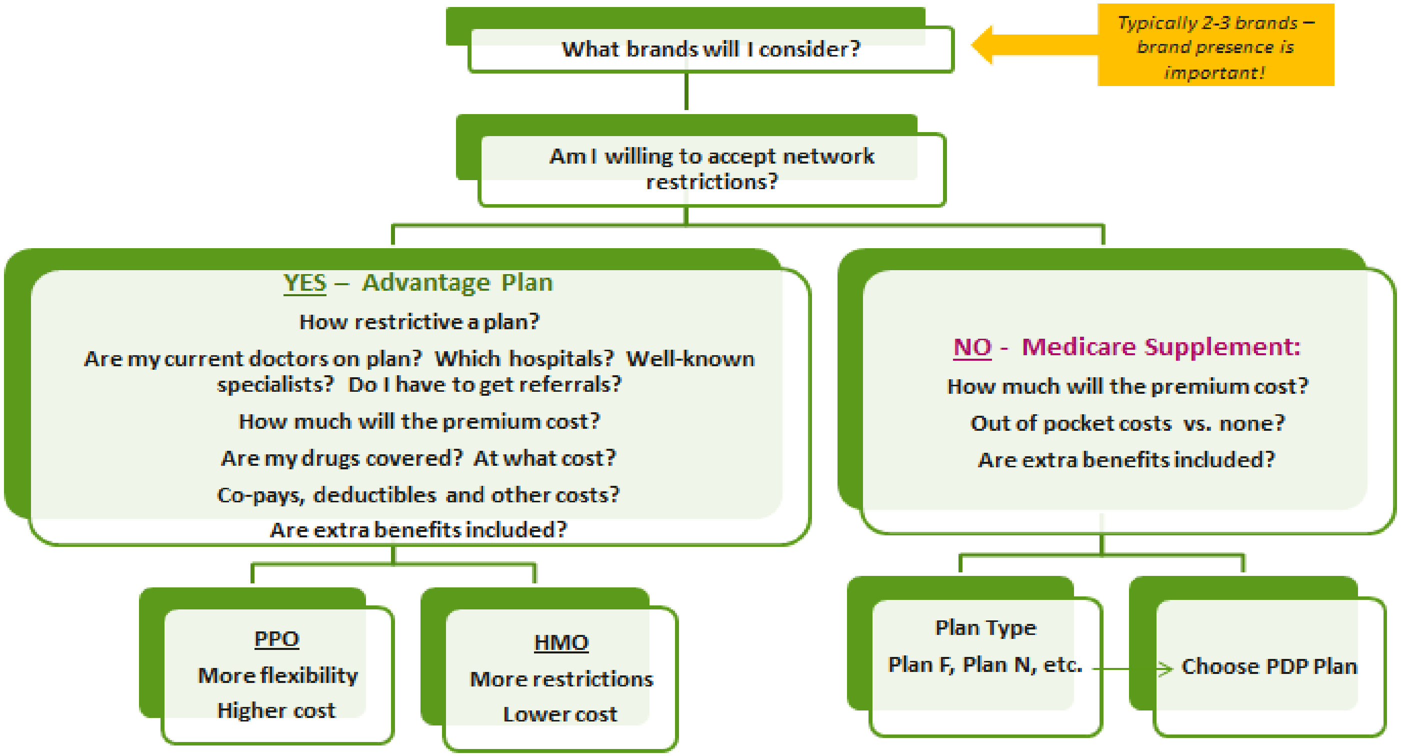
Seniors first choose MA, then a plan

Medicare Age-Ins

Decision Tree – Brand, Network and Costs are Key Considerations.

As consumers start to investigate they learn some plans have networks and that premiums and costs vary - the choice of an Advantage plan vs. a Med Supp plan is made on network and cost factors.



Humana Source: Humana Age In Longitudinal Study 2012, other qualitative research

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Switching data

- How many seniors leaving one MA plan substitute to another MA plan?
  - Switches not necessarily due to price changes

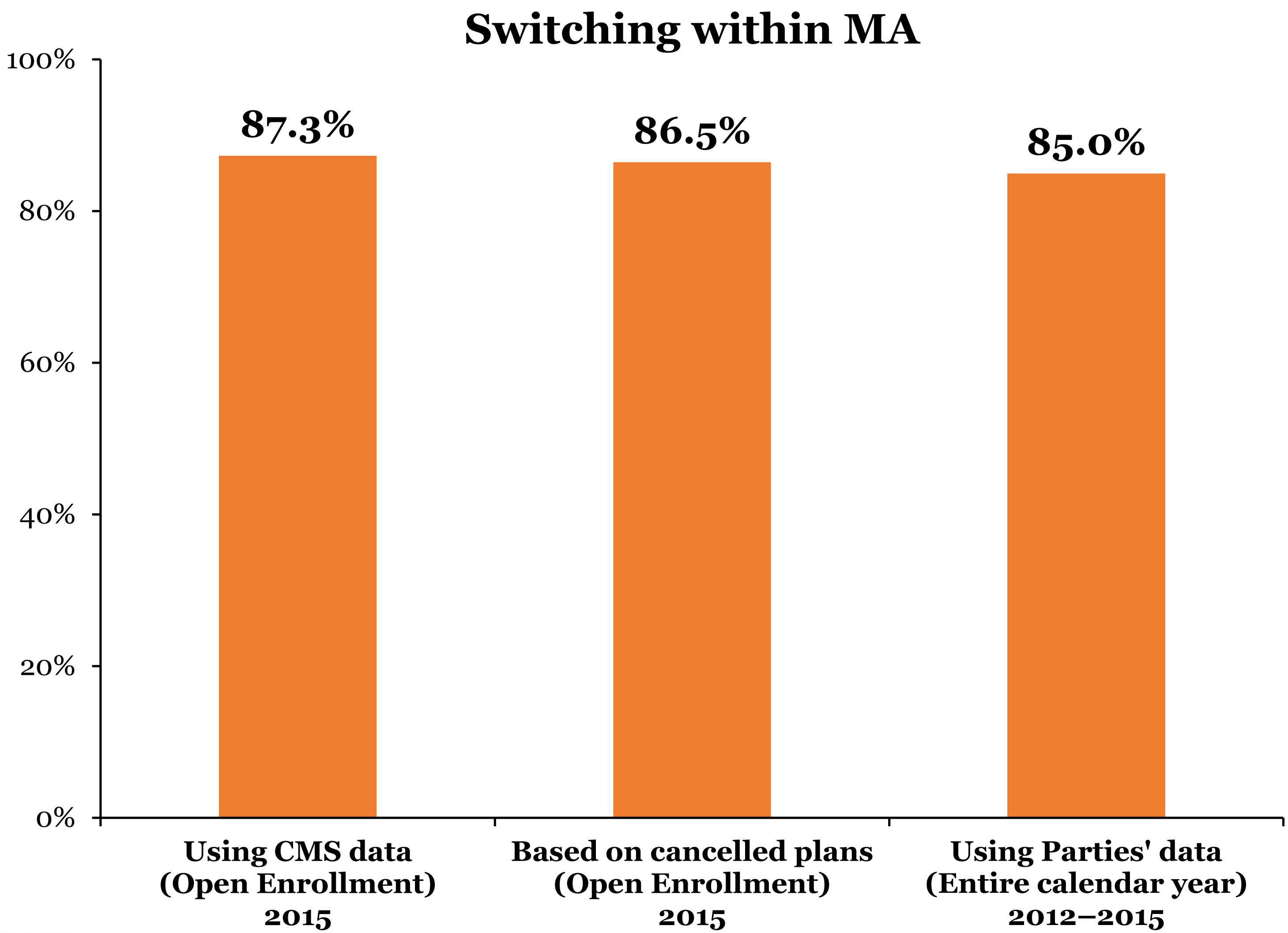
- Switching data served three purposes:

1. Data on actual substitution patterns directly inform market definition

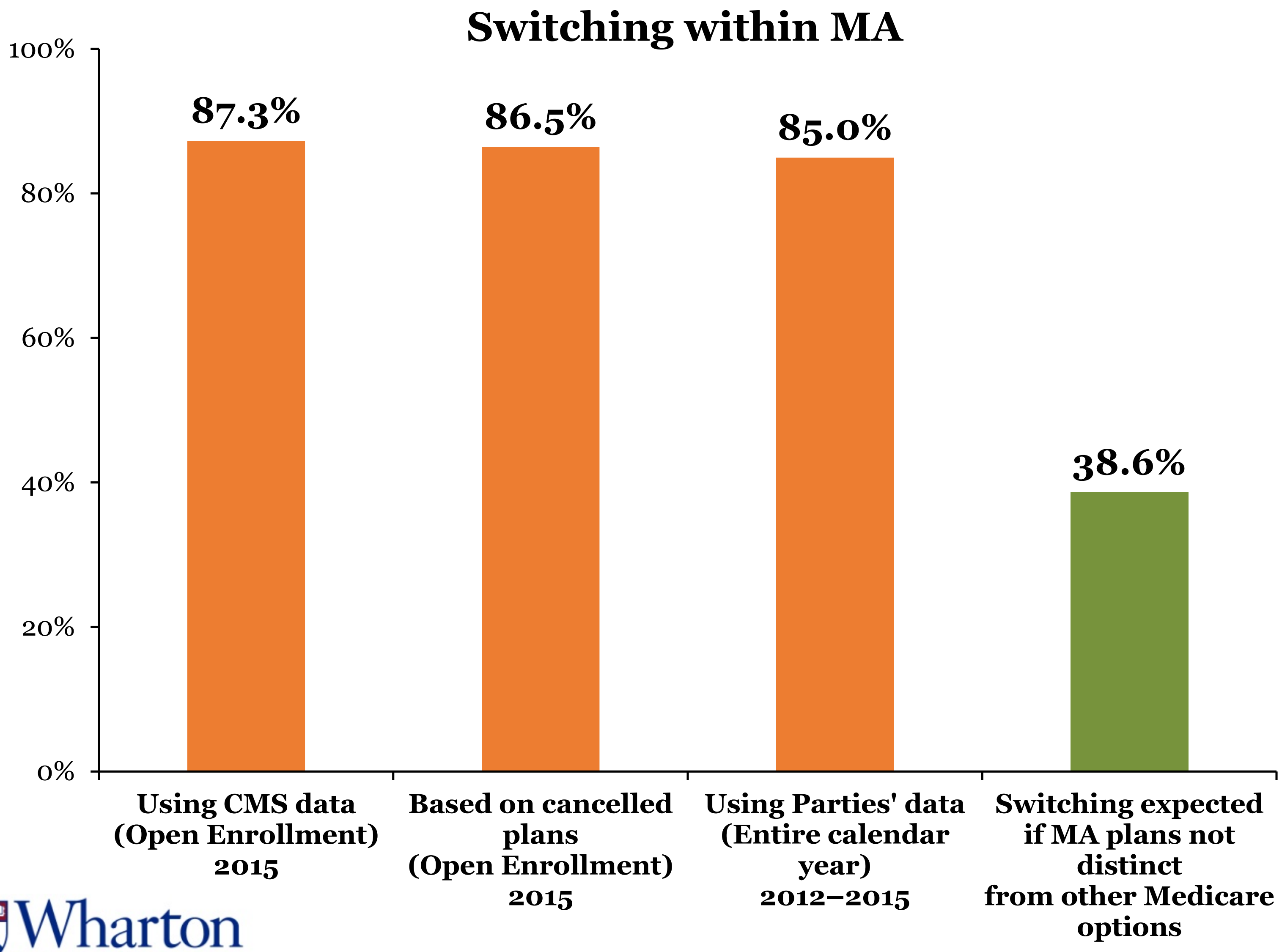
2. Evaluate diversity in senior preferences seen in documentary evidence

3. Reality check on my empirical analysis

Seniors who switch are likely to stay within MA



MA appeals to a distinct set of seniors



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The academic literature

- The academic literature uses the nested logit model
  - MA plans are a nest
  - All other coverage options are the "outside option"
  - Relatively high values of the nesting parameter

Study	Years studied	Authors' preferred nesting parameter estimate
Guglielmo	2008–2011	0.41
Curto et al.	2006–2010	0.32
Dunn	2004–2007	0.66
Hall	1999–2002	0.51
Dafny and Dranove	1994–2002	0.84
Town and Liu	1993–2000	0.58
Atherly et al.	1998	0.55–0.59

Goals for empirical analysis of plan choice

- We also estimated our own nest logit model:

1. Estimating consumer choice model using most recent data and comparing to results in academic literature

2. Provides inputs for:
    1. Hypothetical monopolist test
    2. Competitive effects analyses

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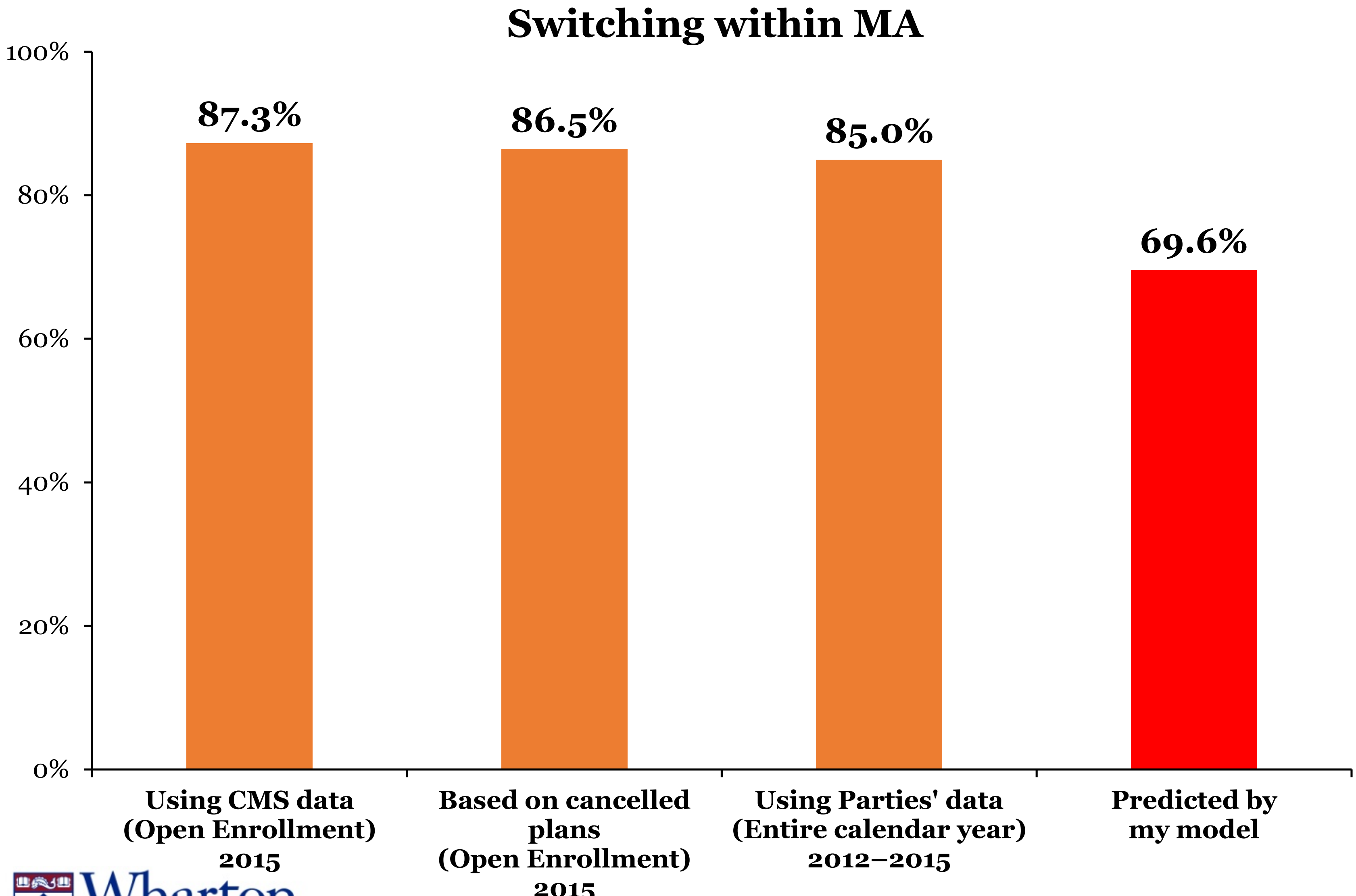
Empirical analysis of plan choice

- Estimated nested logit model, with MA as a group ("nest")
- Found a nesting parameter of 0.65 (and implied margins of 24%)
- Defendant's expert had lower nesting and margins
- Difference driven by IVs
- Key question: does the difference matter?

My estimates reflect actual customer substitution



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The hypothetical monopolist test defined

- Guidelines § 4.1 explain that "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."

- "The Agencies most often use a **SSNIP of five percent of the price paid by customers** for the products or services to which the merging firms contribute value." (Guidelines § 4.1.2)

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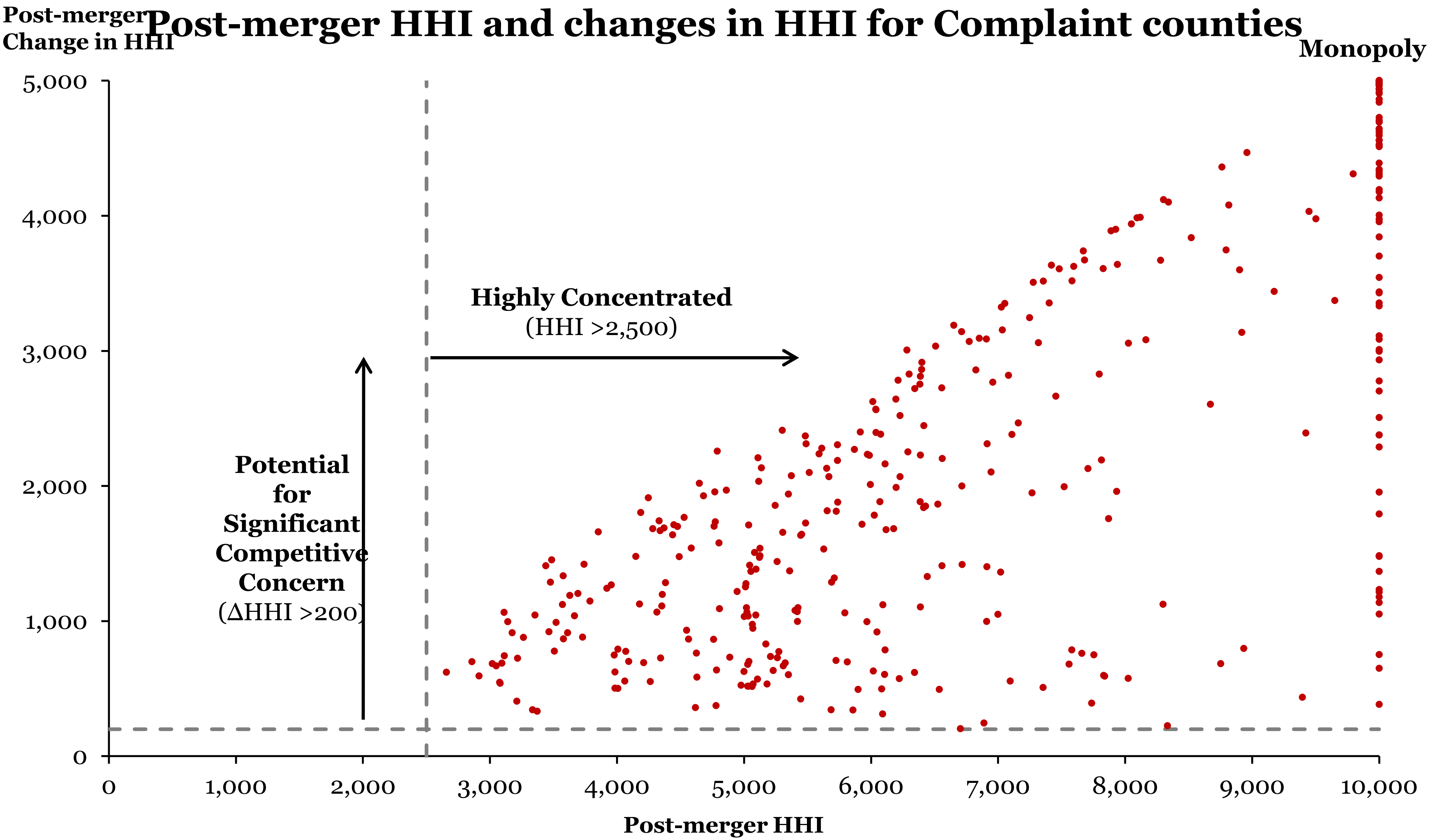
Hypothetical monopolist tests confirm product market definition

- Conducted several formulation of the HMT
- **Single product version**: would a HMT find it profitable to increase the price of at least on product of the merging parties by 5/10%?
  - "profitable" vs "profit maximizing"
  - Implemented using critical loss
- **Multi-product version**: simulation of hypothetical monopolist
- Both tests performed county by county
- The candidate market passed for essentially all counties for a wide range of parameters
  - The other side tried to use the robustness as a weakness

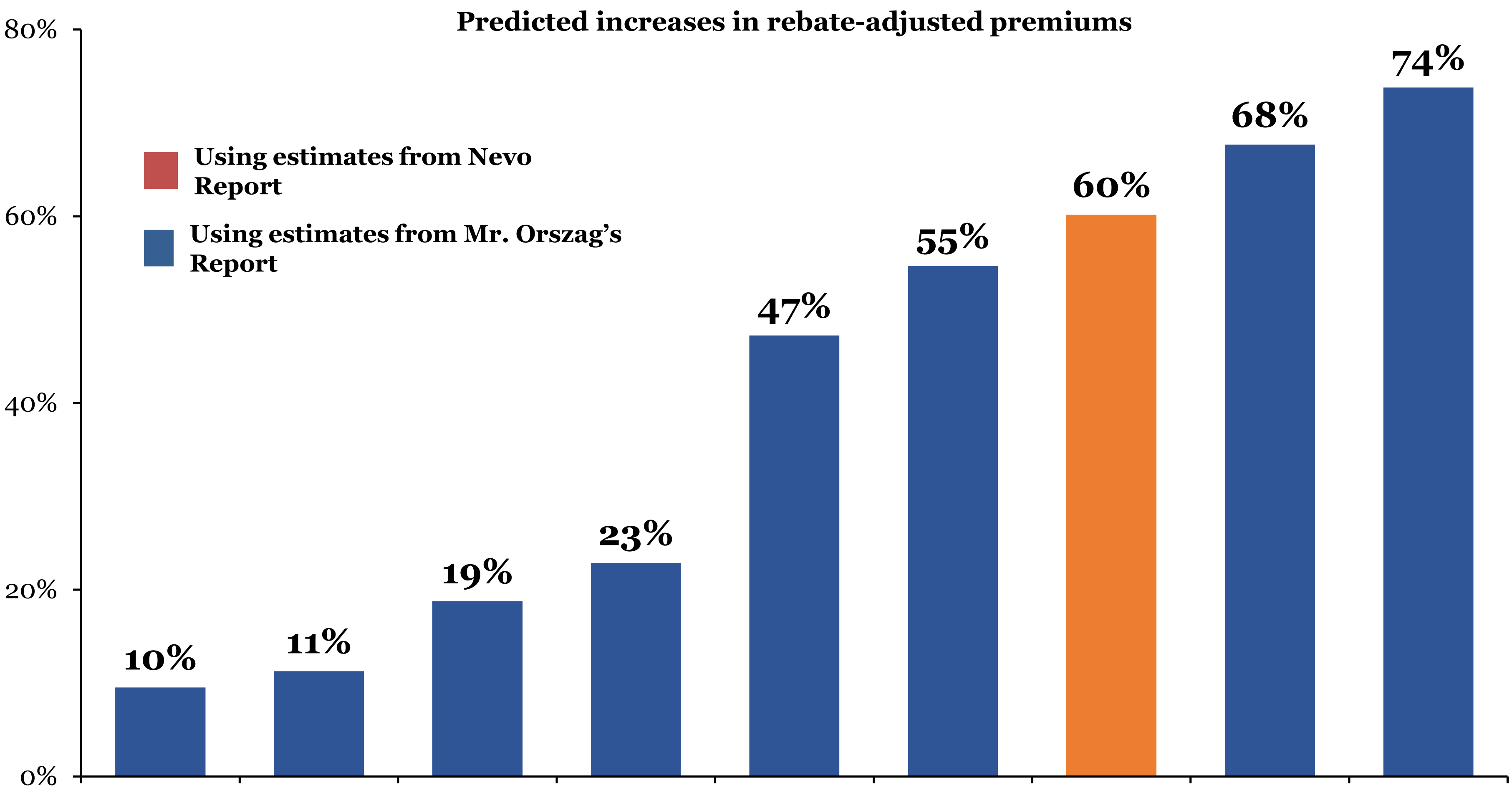
Multiple sources of evidence demonstrate that the proposed merger will lessen competition

1. Concentration measures
2. Merger simulation
3. Documentary evidence
4. Future competition

Concentration thresholds are met in the Complaint counties



Prices consistently increase under all estimates in this matter



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Annual harm of more than $500 million to seniors and taxpayers

- Likely substantial harm in Complaint counties
  - Rebate-adjusted premiums substantially increase
  - Same qualitative result using Mr. Orszag's preferred estimates
- Based on 2016 enrollment:
  - **Seniors: $359 million** from increased rebate-adjusted premiums
  - **Taxpayers: $145 million** from increased CMS payments to insurers

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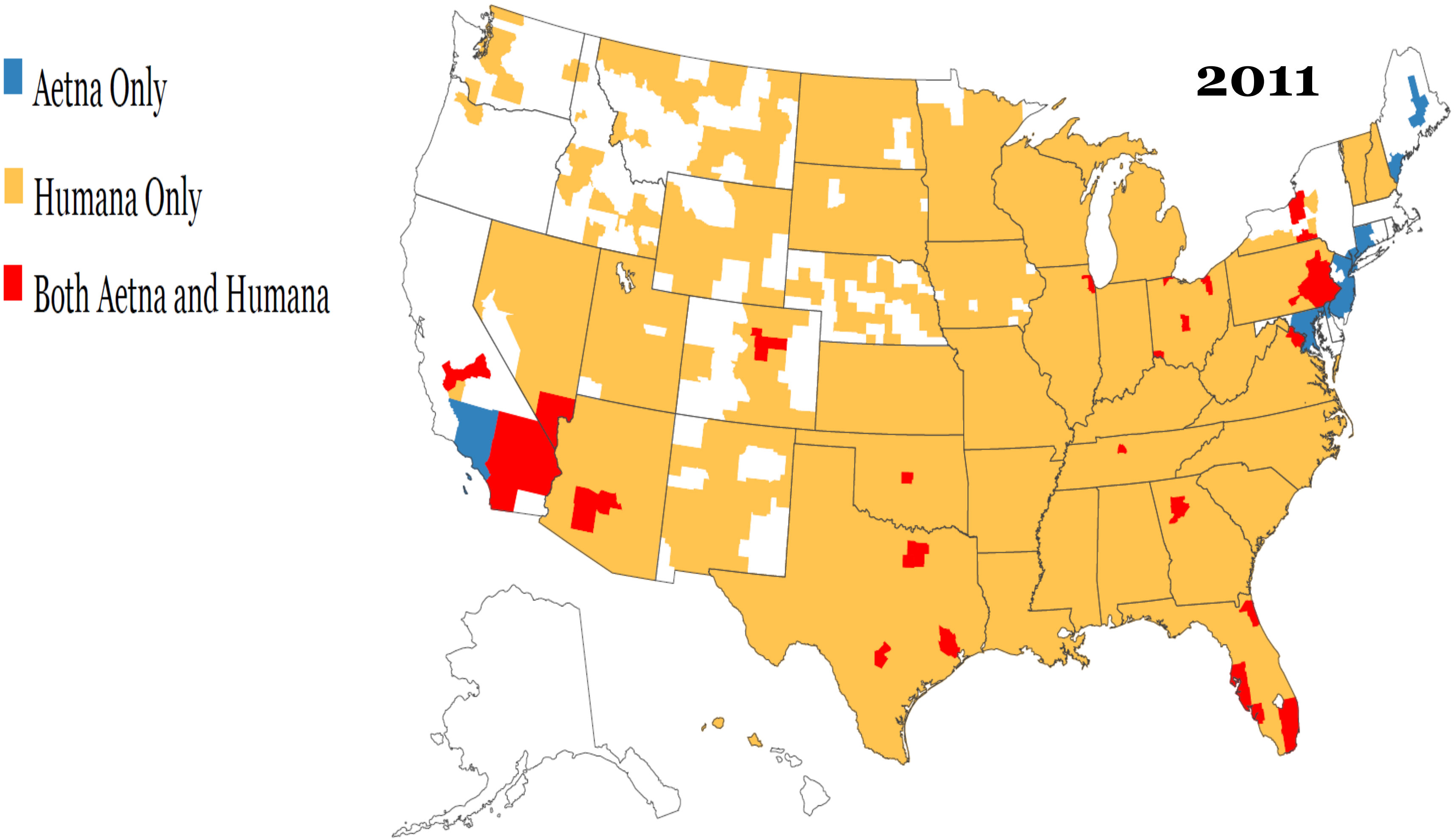
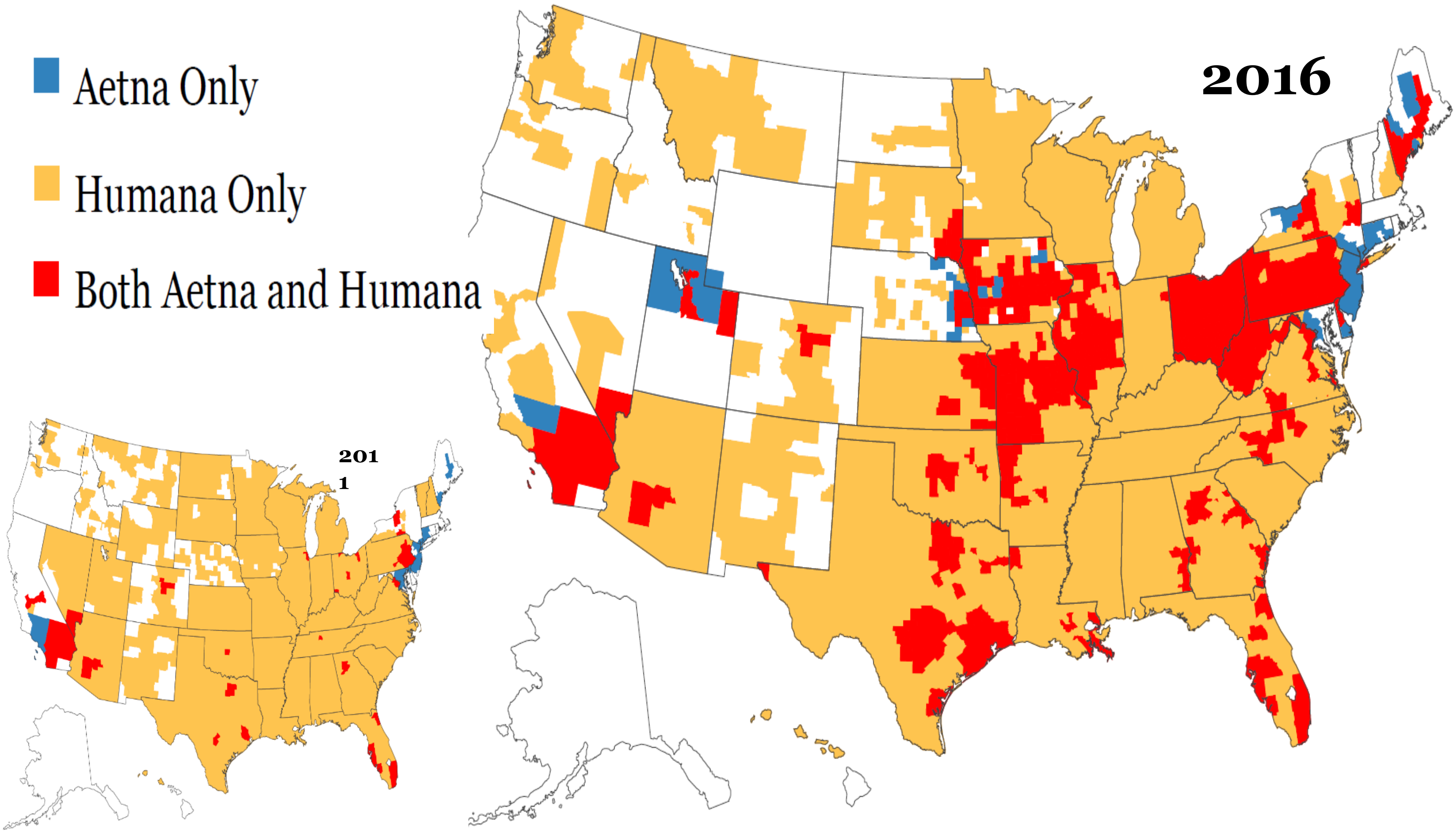
Nevo Report, ¶¶ 214–215, Exhibit 17

In 2011, Defendants competed in only 79 counties



By 2016, Defendants compete in 675 counties



The Defendant's response

- Claim that OM belongs in the market
- Mostly rely on the "circle principle"
  - OM belongs in the market because of higher diversion than plans already in the market
  - Theoretical argument
  - No HMT
  - Only (non-robust) price concentration regression
- Many rebuttal-type shots at the government case
  - Little empirical analysis to support the claims
- Reliance on: Entry, Divesture and other factors
  - These factors were presented in an ineffective way
  - Almost a case study of how not to present work

Potential mitigating factors

- The merging parties claimed: that a divesture, future entry and efficiencies will offset any anti-competitive
- How do you address this?
- Retrospective studies of past mergers
- Merger simulation

Humana–Arcadian sheds light on effect of mitigating factors

- **Humana–Arcadian**, March 2012
  - Presumptive harm in 168 counties
  - **Divestitures** in 45 counties

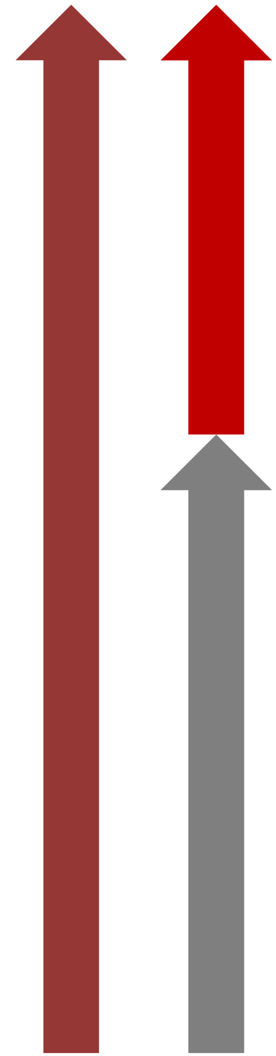
- Can use this merger to study:
  - Were MA divestitures successful?
  - Was there entry in response to the merger?

- Were price increases prevented by:
  - Mitigating factors?
  - Age-ins?
  - Regulation?

Prices increased in presumption counties

- After Humana–Arcadian, **rebate-adjusted premiums increased**
- **Despite** potential entry, divestitures, any efficiencies, CMS regulation, and age-ins

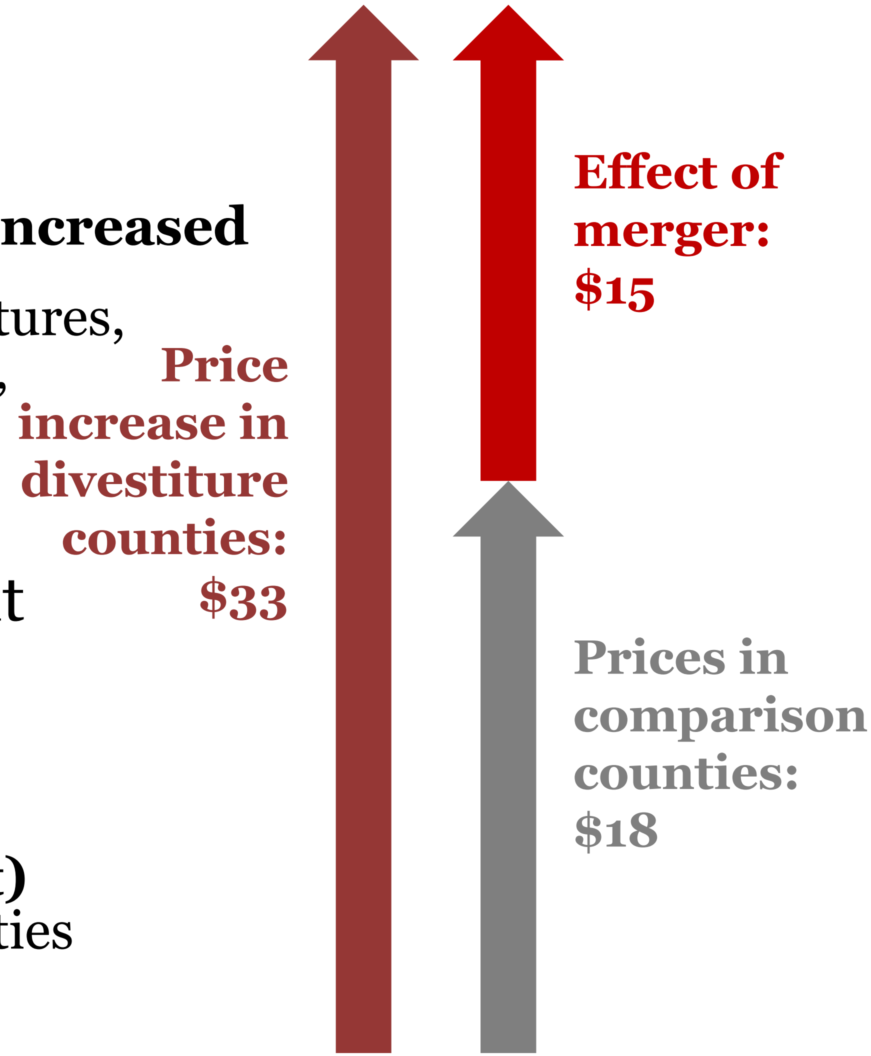
- Did the merger increase prices?
  - $22 increase (48 percent) relative to pre-merger
  - **$9 increase (20 percent)** relative to comparison counties



Prices increased in divestiture counties

- After Humana–Arcadian, **rebate-adjusted premiums increased**
- **Despite** potential entry, divestitures, any efficiencies, CMS regulation, and age-ins

- Did the divestitures prevent price increases?
  - $33 increase (67 percent) relative to pre-merger
  - **$15 increase (30 percent)** relative to comparison counties



Humana–Arcadian divestitures did not succeed

- Buyers **exited in 47 percent** of counties by 2016

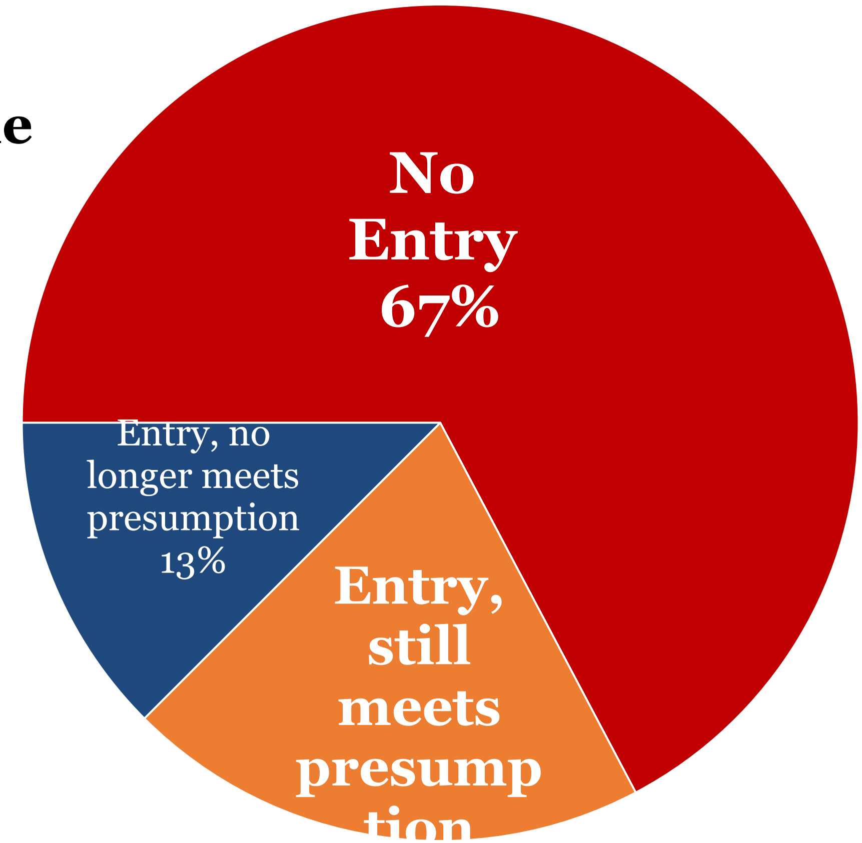
- **Fraction of enrollees retained** by 2016

	All buyers	Buyers with no prior MA presence in county
Average	48 percent	32 percent
Median	33 percent	0 percent

- **Molina has no prior MA presence** in divestiture counties

Entry in response to Humana–Arcadian was not *sufficient*

- Most presumption counties that experienced entry **still meet the presumption thresholds**



Aetna–Coventry demonstrates limited effect of efficiencies

- **Aetna–Coventry**, May 2013
  - No divestitures
  - Defendants claim as **example of efficiencies**

- Can use this merger to study:
  - The effect of claimed efficiencies

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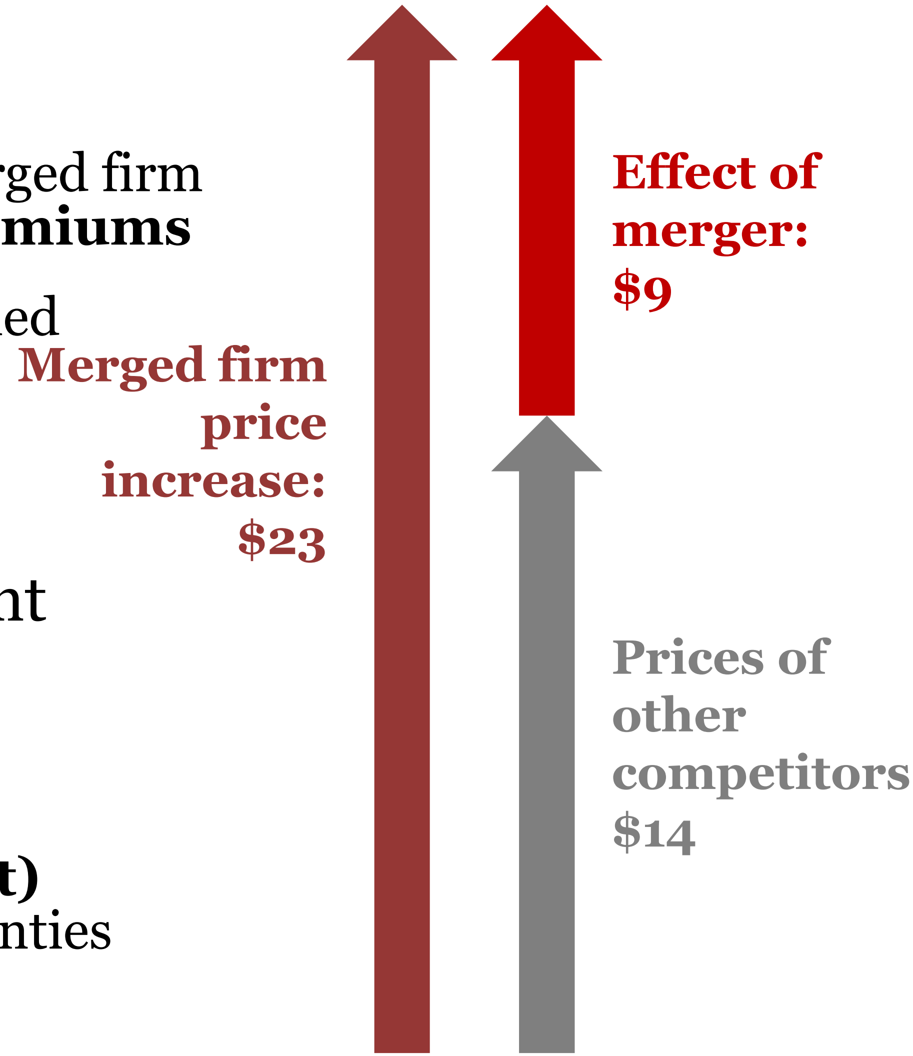
Merged firm increased prices despite mitigating factors

- After Aetna–Coventry, the merged firm **raised rebate-adjusted premiums**
- **Despite** potential entry, claimed efficiencies, CMS regulation, and age-ins

- Did the efficiencies prevent price increases?
  - $23 increase (69 percent) relative to pre-merger
  - **$9 increase (26 percent)** relative to comparison counties



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Could all the effects working together offset harm?

- On their own entry, divestures and efficiencies effects could not offset the harm, but could they do so jointly?
- To address this question, DOJ used the merger simulation and modified the inputs.
- The answer was a clear no!
- Again, empirical analysis (even if considered "sophisticated") won over pure theory

Prologue

- The DOJ prevailed
- Further acceptance of the 2010 Guidelines by the court
  - In particular, affirming the DOJ's view re the "circle principle"
- The use and presentation of empirical methods
  - Main takeaways:
  - Econometric evidence needs to be combined with other evidence
  - Theoretical critiques can only get you so far when credible measurement is presented

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The Merger of American Airlines and USAirways

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Overview

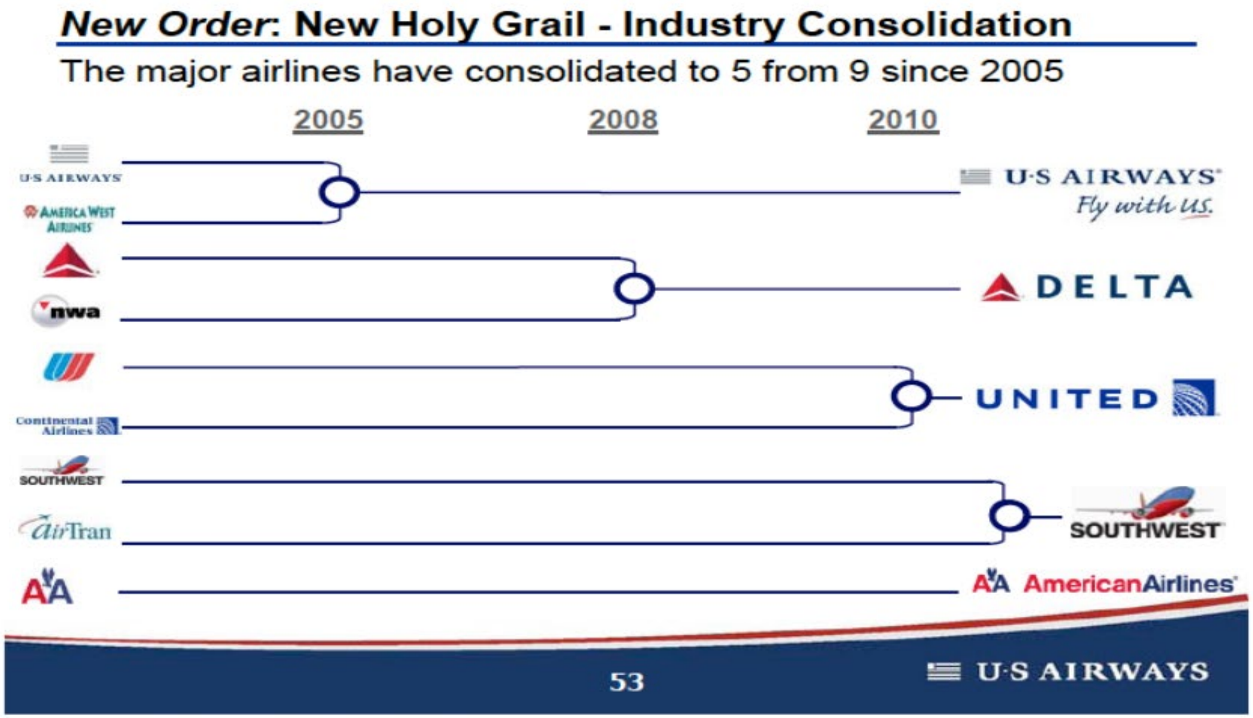
- High profile merger
  - Followed a series of mergers
  - A somewhat surprising path
- Mostly a coordinated effects theory of harm
- Huge amounts of data but little time to do much “sophisticated” analysis
  - Good example how to fit data analysis with the rest of the analysis
- Heavy use of retrospective of past mergers

The US Airline Industry

- Deregulation in 1978
- Legacy airlines vs. low cost carriers
  - The importance of labor costs
  - Southwest vs other low cost carriers
- Most legacy airlines organize in a “hub and spoke” structure
- Some recent trends:
  - Mergers
  - Chapter 11 bankruptcies
  - Increased fees (unbundling)
  - Attempts at simplifying fare structure

AA-USAirways merger

- Background: Several high profile mergers prior:



AA-USAirways merger

- The market assumes that the DOJ will approve this merger
    - Possibly with minor divestures

- The DOJ surprised everyone with an August compliant
    - Stocks of AA and USAir fell sharply

- Case was settled roughly 3 months later just before the trial was scheduled to start

DOJ's concerns

1. Overlap in non-stop and one stop markets

2. Slots at DCA

3. Coordinated effects
   - Advantage fares
   - Capacity

Overlap in non-stop and one stop markets

- What is the concern?

- How can we measure it?

Overlap in non-stop and one stop markets

- What is the concern?
  - Standard unilateral effects
  - Are there efficiencies that would offset the effect?
    - Here mainly network efficiencies
- How can we measure it?

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Overlap in non-stop and one stop markets

- What is the concern?
  - The effect we discussed of internalizing diversion to a competing product
  - Are there efficiencies that would offset the effect
    - Here mainly network efficiencies
- How can we measure it?
  - HHI
  - Past mergers
  - Correlating prices and concentration
  - Merger simulation: estimating demand and a pricing model

Slots at DCA

- DCA one of few airports in the country that requires slots to land and take off
- Post merger the "New American" would control a very large number of these slots.
- So what?

Coordinated effects

- Coordinated effects: will the merger increase the likelihood of coordination?
  - Usually ask are there features that make this industry more prone to coordination
  - How will the merger change this:
    - Smaller numbers
    - Change in incentive

- 2 main issues:
  - Capacity: we saw that there is an incentive to decrease capacity
  - Advantage fares: how did they work? What will the merger change?

Capacity

Industrywide flight capacity increases by almost all major U.S. airlines could negatively affect carriers' profits, American Airlines CEO Doug Parker has warned.

Parker's latest comments to Reuter's news agency on Sunday followed Dallas-based Southwest Airlines' recent announcement that it will increase flight operations at Dallas Love Field.

American Airlines CEO Doug Parker

JAKE DEAN

The chief executive of Fort Worth-based American (NASDAQ: AAL) voiced similar concerns about increasing capacity in a recent interview on CNBC's "Mad Money" show. Parker said in that May 20 interview that American Airlines would not add capacity even though the airline's competitors may be tempted to do so because of lower fuel prices. Adding capacity without growth in demand would lead to lower fares and revenues, Parker said at the time.

Advantage Fares

All flights	US Airways, Inc.	Multiple Airlines	American Airlines Inc.	United Airlines, Inc.	Delta Air Lines Inc.
Nonstop	--	--	From $740	--	--
1 stop	From **$471**	From $686	From $751	From $762	From $762

Advantage Fares

	Delta Air Lines Inc.	United Airlines, Inc.	Multiple Airlines	US Airways, Inc.	Jetblue Airways Corporation	American Airlines Inc.
All flights					jetBlue	
Nonstop	--	--	--	From $685	--	--
1 stop	From **$375**	From $395	From $458	From $696	From $691	From $1,258

Why Was USAir Pricing Differently?

- One view:
  - Structural reason: hubs in smaller cities
  - Higher fraction of revenue from connecting flights (nonstop flights usually have one end at a hub)
  - Less vulnerable to retaliation
  - How would the merger change this? Post-merger the hub structure would look like legacy airlines
- Alternative view:
  - USAir was/is a “maverick”
  - AF meant to shift passengers from the 14+ window to 0-14 window
  - Post merger would expand its “maverickness”

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  - AF meant to shift passengers from the 14+ window to 0-14 window
  - Post merger would expand its "maverickness"

- How would you use data to separate the two explanations?

The settlement

- Shortly before trial the parties settled
- The airlines agreed to divest
  - Slots at DCA and LGA
  - Gates at 5 airports (Boston, Miami, ORD, Love Field, LAX)
- The divested assets went to Southwest, Jet Blue and Virgin
- The hope was to strengthen the “fringe”
- Will this work?

Concluding comments

- Empirical work and data analysis is very common these days in the US in both litigation and investigations
- Used correctly it can be highly influential
- Lessons from ATT-Time Warner