The Welfare Effects of Vertical Integration in Multichannel Television Markets

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Introduction

- Welfare effects of vertical integration are among the most contentious areas in antitrust.
  - Hospital acquisitions of physician groups
  - Google acquisitions of vertical search engines (supply of data to search rivals)
  - Comcast - NBCU, Time Warner Cable – Turner, DirecTV – News Corp

- Trade-off between greater efficiency in production against increased market power in merger policy.
  - reduced double marginalization
  - improved investment incentives
  - Foreclosure/raising rivals costs incentives

- Almost no work examining pro and anticompetitive effects of vertical integration, and allowing a welfare evaluation.

Research Question

- **Our specific focus:** What are the welfare effects of vertical integration (content and distribution) for *regional sports programming* in the multichannel television industry?
  - What would happen if vertically integrated firms were split?
  - What would happen if un-integrated firms became vertically integrated?
  - What are the effects of existing regulatory policy towards vertically integrated content and distribution?

Approach

- Estimate a model of consumer demand and viewership, downstream pricing, downstream carriage, and upstream-downstream bargaining over terms of carriage.

- Estimate degree of internalization by upstream and downstream divisions within integrated firm.
  - In setting prices and carriage (double marginalization)
  - In foreclosing access to downstream rivals (foreclosure)

- Simulate: VI, and strengthening and relaxing rules on serving rivals

Institutions

- RSNs- carry professional sports most notably NBA, MLB, and NHL
- Second highest fees after ESPN (2-3x CNN, Fox News, TNT, USA).
- Aggregate $4B per year in 2010.
- And growing around 10% per year over last decade.
  - TWC SportsNet LA paid $8.35 billion for rights to air Dodgers over twenty five years

Regional Sports Networks (RSN's)

Institutions

- Linear fee contracts

- Program access rules / “unfair acts”
- Terrestrial loophole

- Current situations in:
  - Houston: Comcast RSN with NBA and MLB rights. Unavailable on satellite.
  - Los Angeles: TWC RSN with NBA and MLB rights. Unavailable on satellite
  - New England: Comcast RSN with NBA rights. Dropped from Dish Network on 8/4/2014
  - Northwest: Comcast RSN with NBA rights. Unavailable on satellite.

Data sets

- Cable system locations, channel carriage, total subscribers from Nielsen FOCUS, 2000-2010
- Prices from TNS Bill Harvest, newspaper archives, and rate card archives by cable system-year
- Channel ratings from Nielsen (DMA-year) and Mediamark/Simmons (individual-year)
- Input fee and advertising revenue by channel-year (including separately by RSN) from SNL Kagan
- State excise tax on satellite by state-year

Model – Overview and Timing

1a. Content and distribution bargain over terms of carriage.

1b. Distribution systems decide pricing and carriage at the market level.

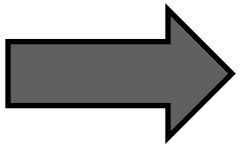
2. Consumers choose downstream firm.

3. Consumers choose how much to watch content available to them.

Similar on many dimensions to Crawford and Yurukoglu (2012), but with some important modifications.

Model – Data Combination

Model	Data
Viewership	Ratings
Firm Choice	Market shares
Downstream Pricing	Prices
Downstream Carriage	Channel Carriage
Bargaining	Input Fees



Outputs

1. Elasticity of demand with respect to price
2. Change in demand from adding and removing channels
3. Degree of internalization within firm

Model - Viewership

- Consumer i on firm j:

$$\max_{\boldsymbol{t}_{ij}} v_{ij}(\boldsymbol{t}_{ij}) = \sum_{c \in \mathcal{B}_j \cup \{0\}} \frac{\gamma_{ict}}{1-\nu_{ic}} (t_{ijc})^{1-\nu_{ic}}$$

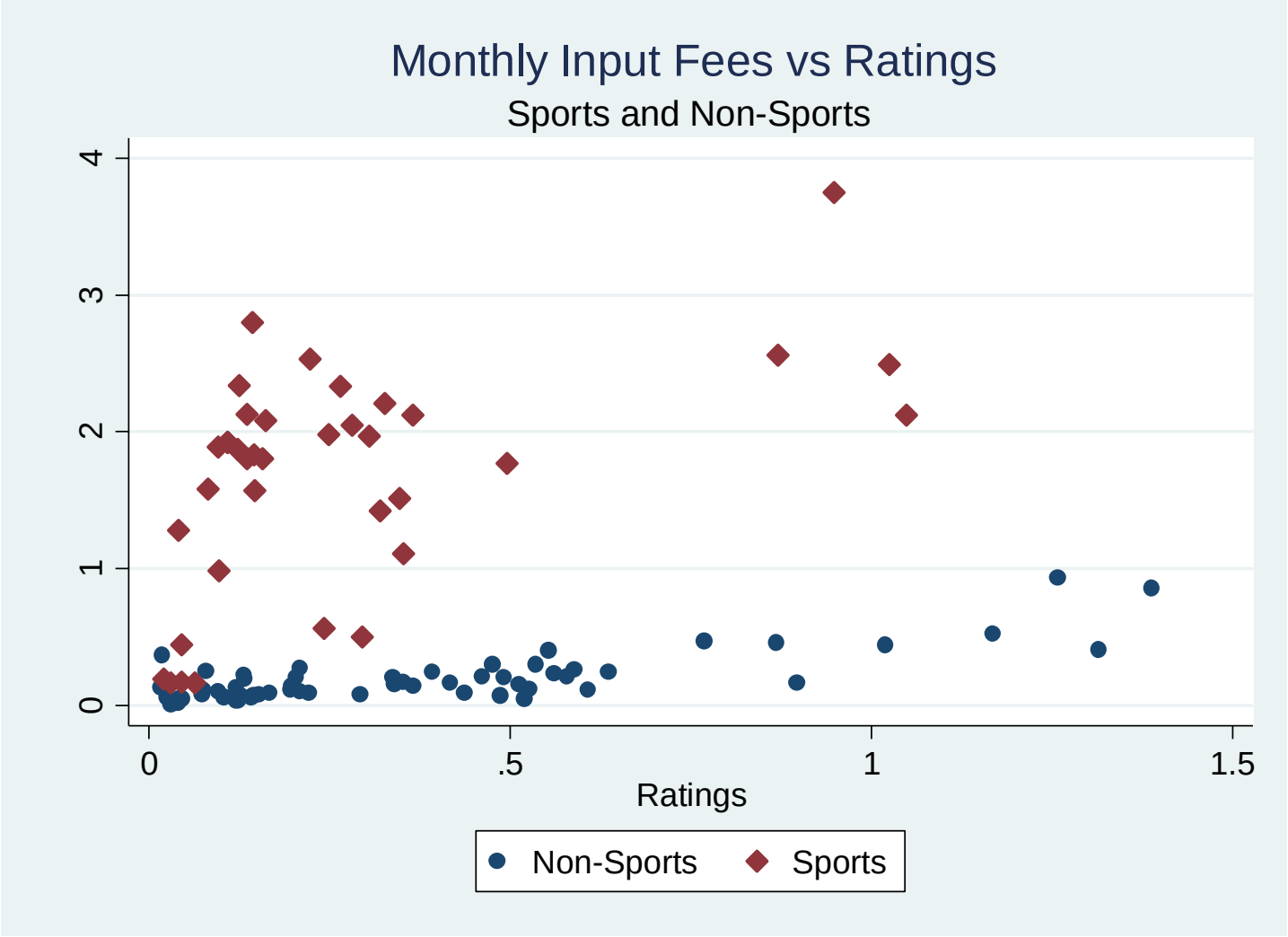
$$s.t.: \quad t_{ijc} \geq 0 \; \forall \; c$$

$$t_{ijc} = 0 \; \forall \; c \notin \{\mathcal{B}_j \cup \{0\}\}$$

$$\sum_{c \in \mathcal{B}_j \cup \{0\}} t_{ijc} \leq T$$

- Allows for consumers to have high WTP relative to time spent watching for different channels.
- Sports channels have high marginal valuation for initial time which decays quicker than non-sports.
- RSN tastes scaled down by distance to teams and parameter.

Model - Viewership



Model – Downstream Choice

$$u_{ijt} = \beta^v v^*_{ijt} + \beta^x x_{jt} + \beta^{sat}_j \chi^{sat}_{ij} + \alpha_i p_{jt} + \xi_{jt} + \epsilon_{ijt}$$

$$s_{ijmt} = \frac{\exp(\beta^v v^*_{ijt} + \beta^x x_{jt} + \beta^{sat}_j \chi^{sat}_{ij} + \alpha_i p_{jt} + \xi_{jt})}{1 + \sum_{k \in \mathcal{F}_{mt}} \exp(\beta^v v^*_{ikt} + \beta^x x_{kt} + \beta^{sat}_k \chi^{sat}_{ik} + \alpha_i p_{kt} + \xi_{kt})}$$

- Integrate over distribution of channel taste parameters and α_i to obtain predicted market shares for each firm.

Model – Distributor Payoffs

- Downstream firm f in market m in year t:

Standard margin term

$$\Pi^{M}_{fmt}(\mathcal{B}_{mt}, p_{mt}, \tau_t; \mu) = D_{fmt}\left(p_{fmt} - \sum_{c \in C_{fmt}} \tau_{fct} - \omega_{ft}\right) + \mu \sum_{c \in \mathcal{V}_{ft}} \left[\sum_{g \in \mathcal{F}_{mt}: c \in \mathcal{B}_{gmt}} D_{gmt}(\tau_{gct} + a_{cmt}) \right]$$

Integrated firm internalization parameter

License fee and advertising revenue to upstream channel

- Choose price and channel carriage as best response to other firms' prices and carriage and input fees.

Model – Channel Payoffs

- Channel c in market m in year t considers payoff as:

License fee and advertising revenue to channel

$$\Pi^{C}_{cmt}(\mathcal{B}_{mt}, \boldsymbol{p}_{mt}, \tau_t; \mu, \lambda_R) = \sum_{g \in \mathcal{F}_{mt}: c \in \mathcal{B}_{gmt}} D_{gmt}\Big[\tau_{gct} + a_{cmt} + \mu\lambda_{R:fc}\big[\mathbb{1}_{c \in \mathcal{V}_{gt}}(p_{gmt} - mc_{gmt}) + \sum_{d \in \mathcal{B}_{gmt} \setminus c} \mathbb{1}_{\exists h: c,d \in \mathcal{V}_{ht}}(\tau_{gdt} + a_{gdt})\big]\Big]$$

Integrated firm RRC parameter

Downstream margins

License fee and advertising revenue to sister channels

Model – Bargaining

$$\hat{\tau}_{fct}(\boldsymbol{\tau}_{-fc,t}, \mathcal{B}_t, \boldsymbol{p}_t) = \arg\max_{\tau_{fct}} \Bigg[\underbrace{\sum_m [\Delta_{fc} \Pi^M_{fmt}(\mathcal{B}_{mt}, \boldsymbol{p}_{mt}, \{\tau_{fct}, \boldsymbol{\tau}_{-fc,t}\}; \boldsymbol{\mu})]}_{GFT^M_{fct}} \Bigg]^{\zeta_{fct}}$$
$$\times \Bigg[\underbrace{\sum_m [\Delta_{fc} \Pi^C_{cmt}(\mathcal{B}_{mt}, \boldsymbol{p}_{mt}, \{\tau_{fct}, \boldsymbol{\tau}_{-fc,t}\}; \boldsymbol{\mu}, \lambda_R)]}_{GFT^C_{fct}} \Bigg]^{1-\zeta_{fct}}$$

- Interconnected Nash bargains with Horn and Wolinsky “Nash-in-Nash” equilibrium.

Model – Timing

- We assume that bargaining, pricing, and carriage happens simultaneously (Nocke-White).

- This is different than Crawford-Yurukoglu where bargaining happens first, then pricing and carriage.

- Tractability benefit
- Open question as to which is more realistic under which circumstances.

Moments in Estimation

- Average ratings by channel
- Fraction of viewers who watch zero by channel
- Cov(ξ, satellite taxes) = 0

- Optimal downstream pricing
  - (2007) Margin over content input costs from 10k reports

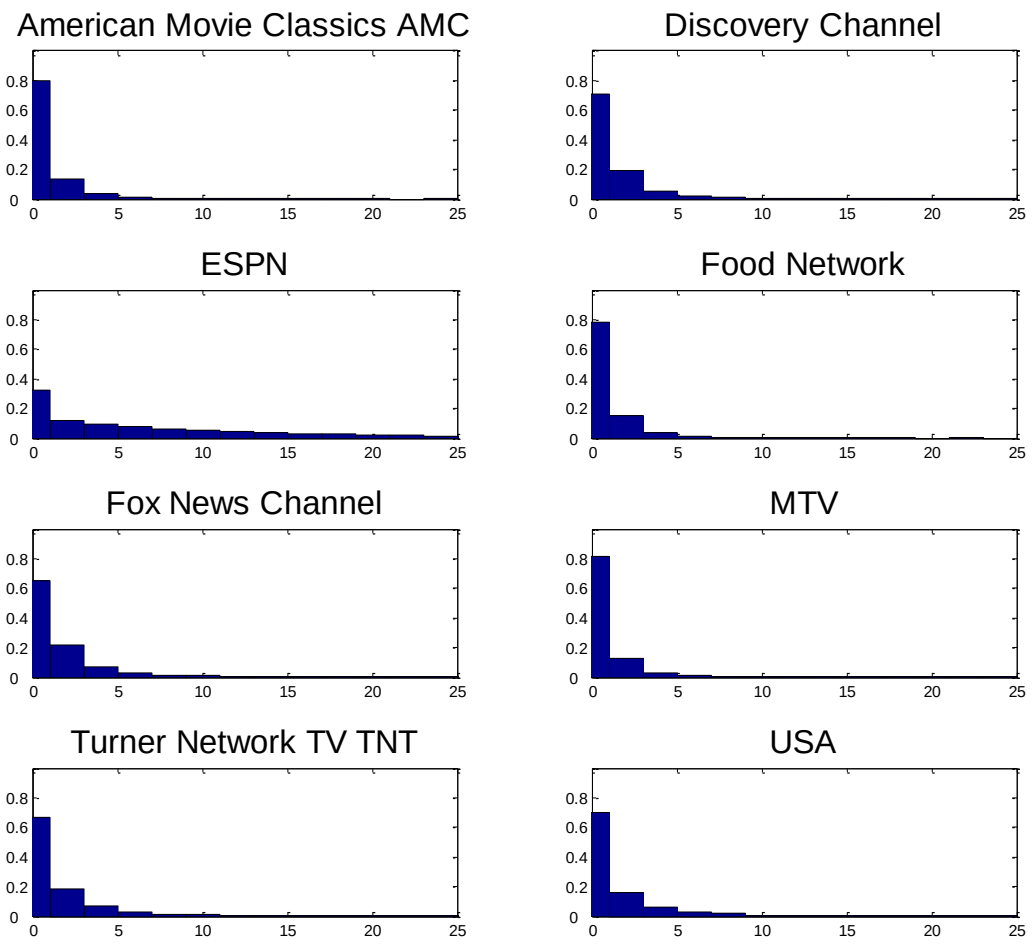
- Optimal carriage
  - (2007) RSNs

- Average input fees
  - (2007), RSNs + ESPN, ABC Family, TNT, USA

Elements of Estimation

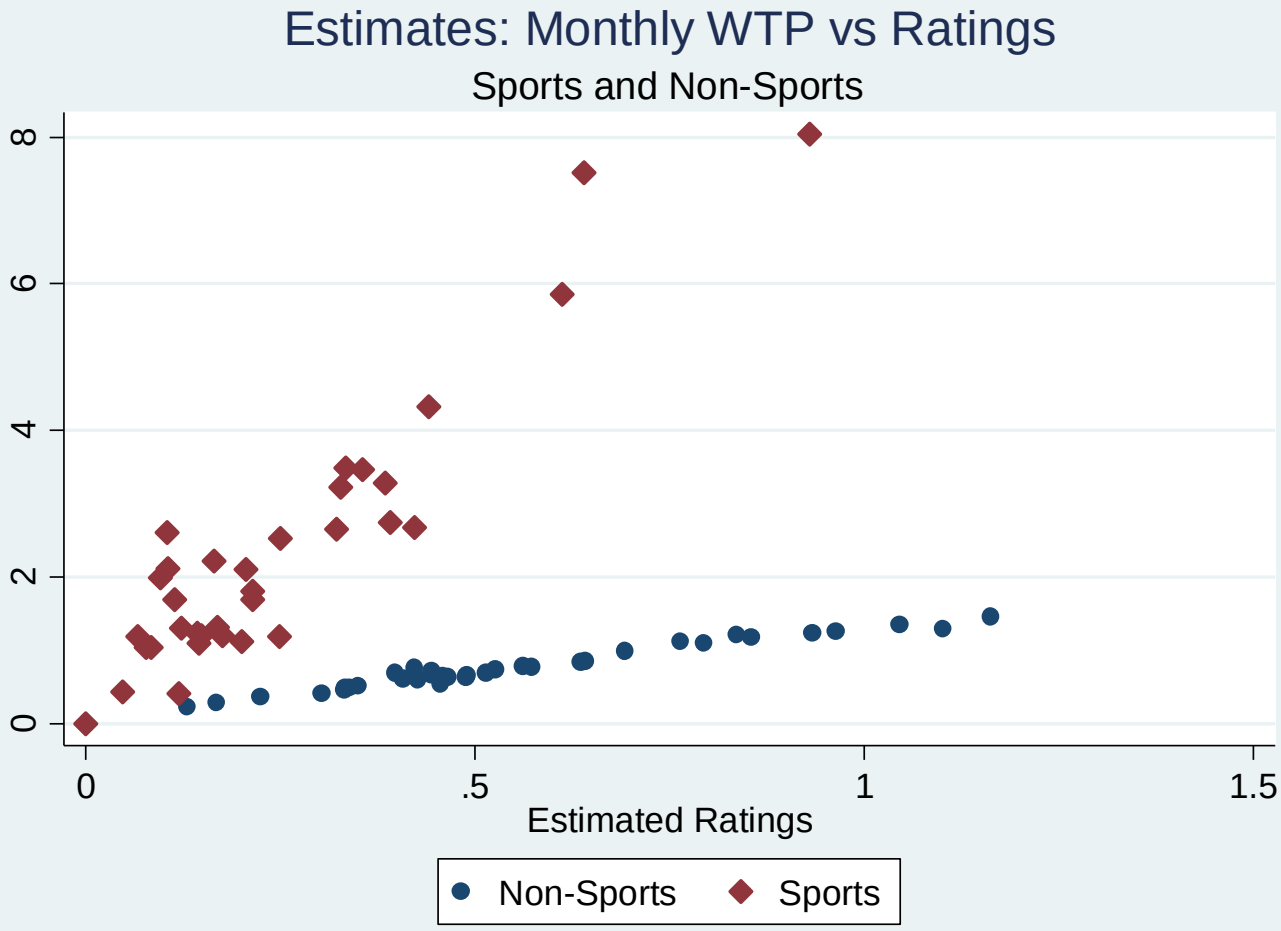
- γ parameters off of time spent watching, market shares, prices, and input fees
- ν from ratio of input fees to time watched for sports vs non-sports
- α from market share changes wrt satellite taxes
- μ from integrated and non-integrated carriage differences, conditional on distance
- λ_r from non-carriage in Philadelphia and San Diego

Estimates - Distributions of Monthly WTP



- WTP for channels is driven by viewership time, fraction of consumers who watch, and channel input costs.
- Median viewership for most channels is 0.
- Model strikes a balance between viewership and input fee if they don't accord exactly.

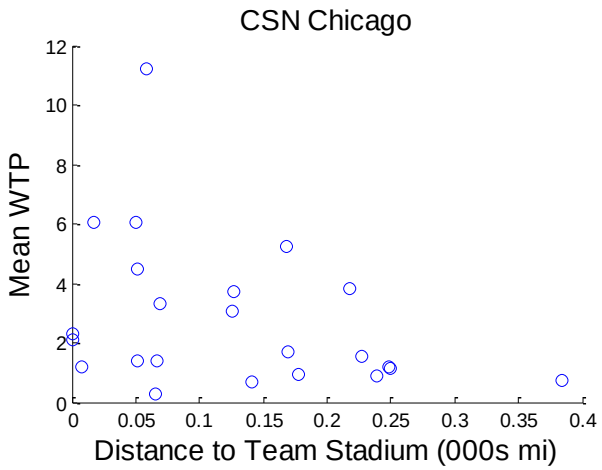
Estimates – Input Fees and Time Watched

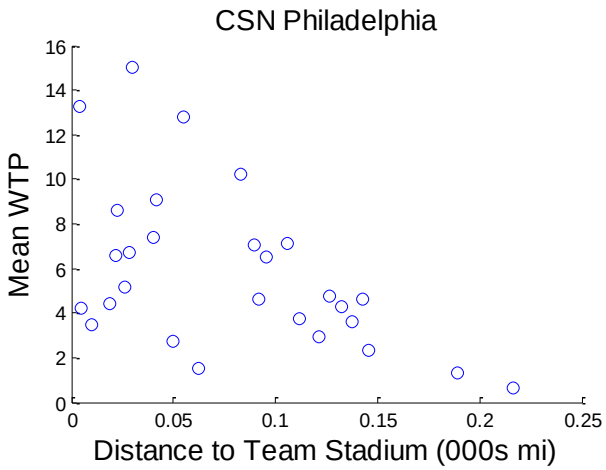


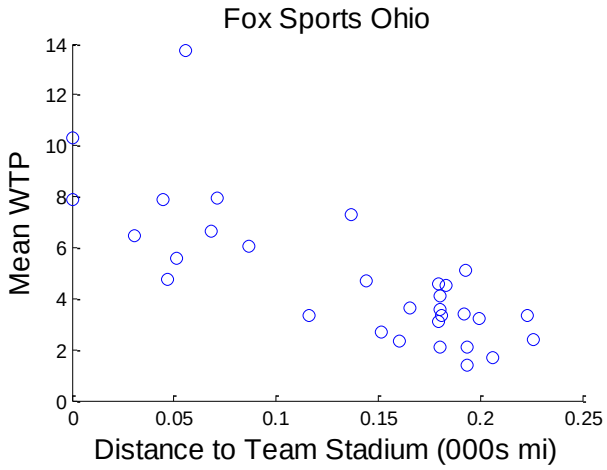
- $\nu_{\text{sports}} = 0.93$
- $\nu_{\text{non-sports}} = 0.64$

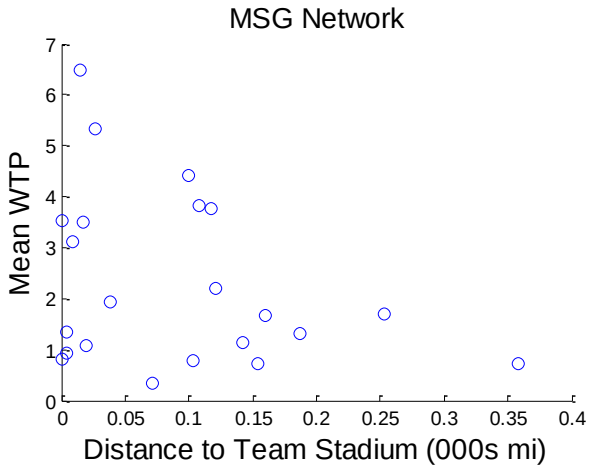
- Implies marginal utility of extra minute falls faster for sports than non-sports.
- Model needs to explain higher fees with comparable ratings for sports.

Estimates - RSN WTP and Distance









- RSN distance decay parameter = -6.03
- Estimate that WTP drops by 2/3 at 200 miles from team.
- Carriage less likely at distance (map coming up).

Estimates – Price Sensitivity

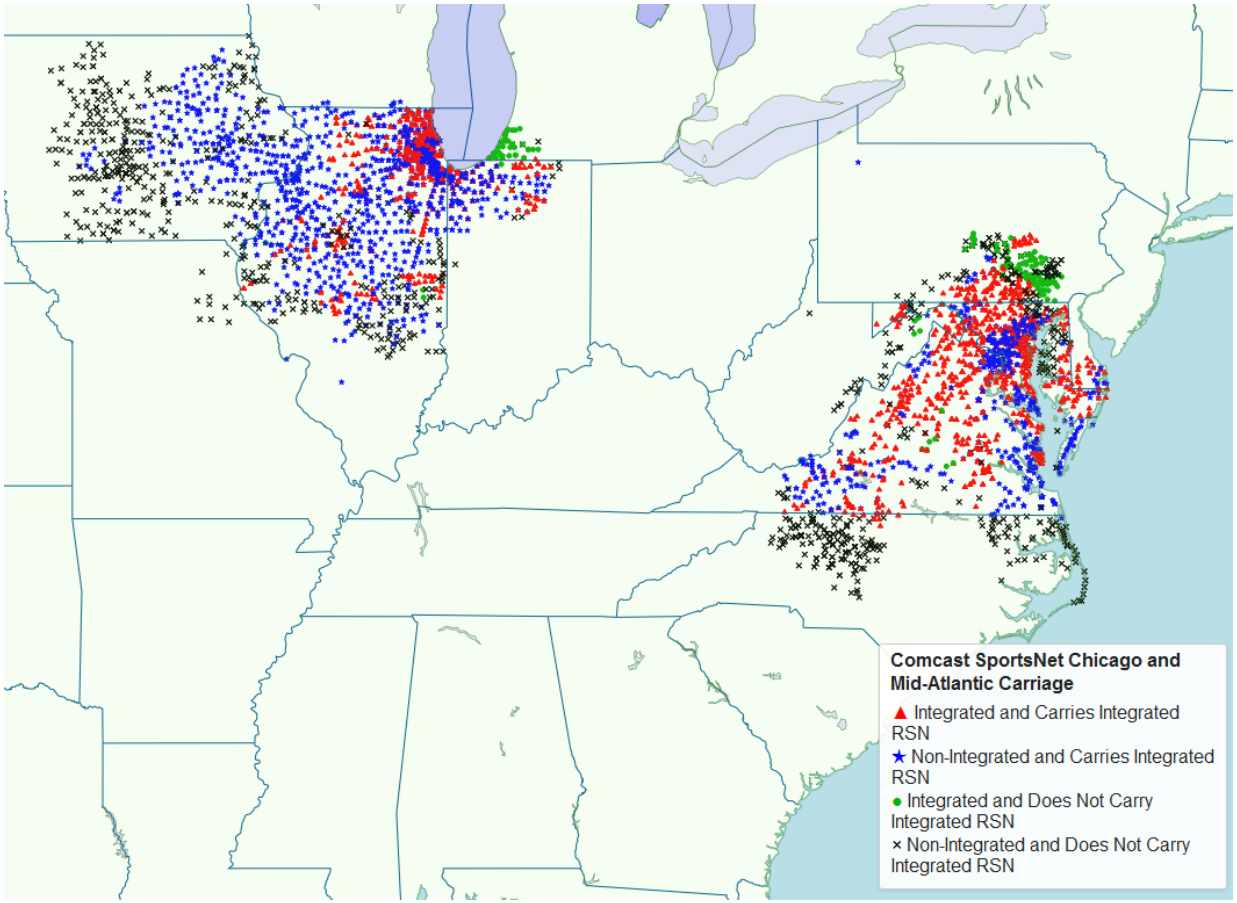
Estimated Mean Own Price Elasticity	
Cable:	**-1.51**
Satellite:	**-3.02**

- Use within state differences in tax on satellite as instrument for price

- OLS: -.0046** (t: -2.40)
- IV: -.0987*** (t: -6.17)

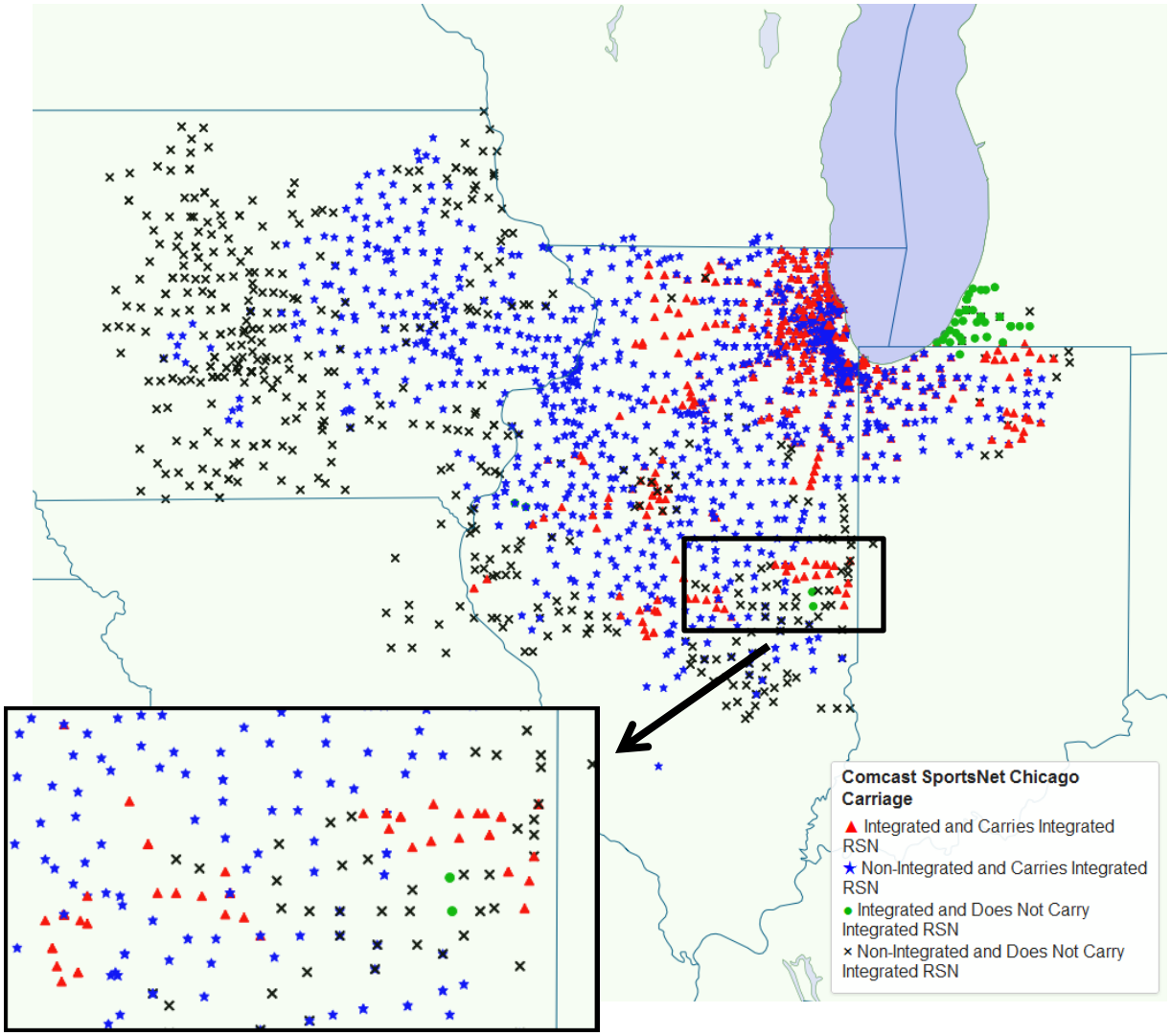
Switcher States		
State	**Year**	**Change in Tax Rate**
CT	2003	5%
FL	2002	10%
KY	2006	5%
MA	2009	5%
NC	2003	7%
OH	2003	6%
UT	2003	5%

Estimates - μ and RSN Decay



- Estimate:
  μ = 0.79
  distance decay = 6.03
- Integrated RSN more likely to be carried by integrated firm, conditional on distance.
- All systems less likely to carry RSN at distance.

Estimates - μ and RSN Decay



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Estimates - μ and RSN Decay

RSN Carriage Regression			
	Coeff.	SE	t
Integrated with RSN	0.143	0.026	5.46
Distance to RSN (mi)	-0.001	0.000	-11.08
N MLB Teams on RSN	0.070	0.019	3.62
N NBA Teams on RSN	0.065	0.021	3.15
N NHL Teams on RSN	0.210	0.028	7.49
RSN-Year FE	Yes		
MSO FE	Yes		
DMA FE	Yes		
R-squared	=	0.5704	
N	=	11063	

- Estimate:
  μ = 0.79
  distance decay = 6.03
- Integrated RSN more likely to be carried by integrated firm, conditional on distance.
- All systems less likely to carry RSN at distance.

Estimates - μ and RSN Decay

Frankm333

New Visitor

Posts: 1
Registered: 01-08-2013

Comcast SportsNet New England - (New Haven, CT area)

01-08-2013 01:05 AM

Is there a reason why we in the New Haven area do not get this channel? We live in New England, and have comcast as our cable provider. I have called comcast several times about this. Can an administor/moderator povide me with some reasoning, PLEASE?!

ComcastTeds

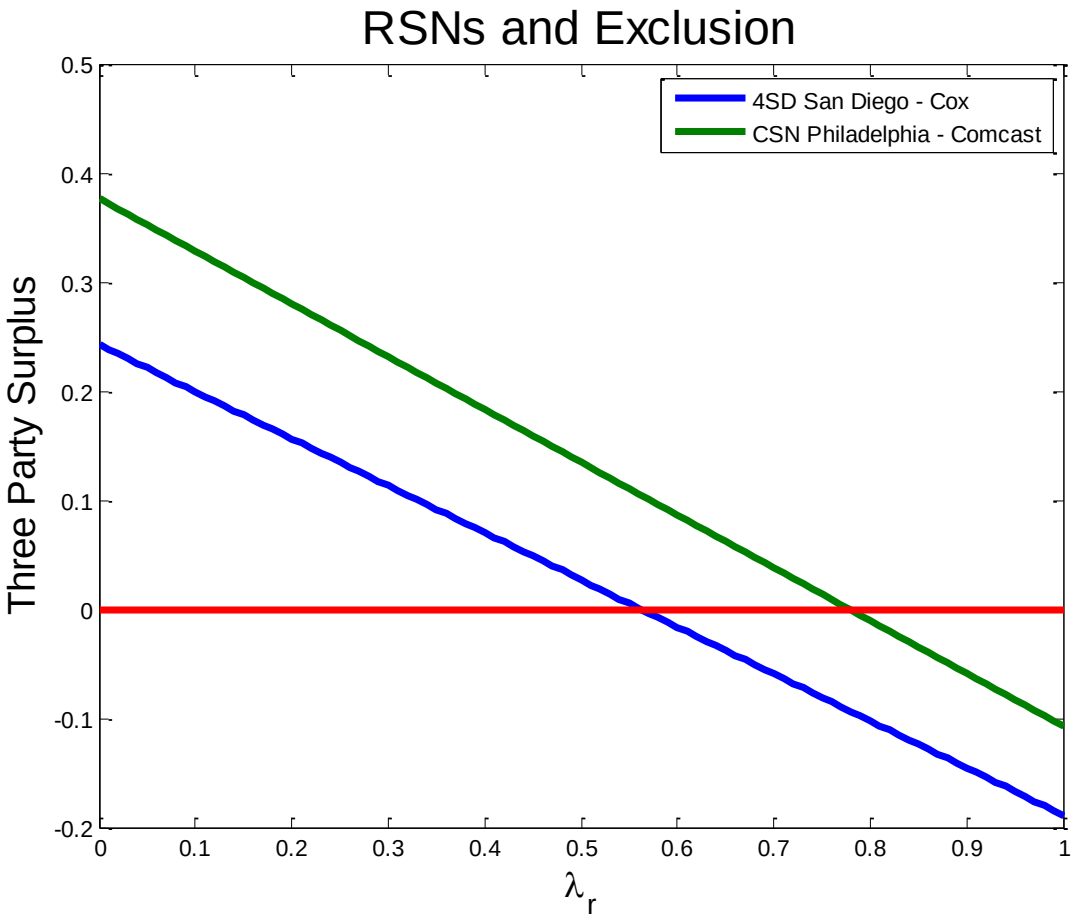
Official Employee

Posts: 6,858
Registered: 01-09-2012

I talked with the team that oversees cable TV programming in your area of Connecticut.

While Comcast SportsNet New England is one of many regional sports networks owned and operated by Comcast, carriage of this network still requires significant monthly fees in order to provide this programming to customers in your area. These are fees that the local management team has made a business decision to not incur and to not pass along those costs to all of our customers.

Estimates - λ_r



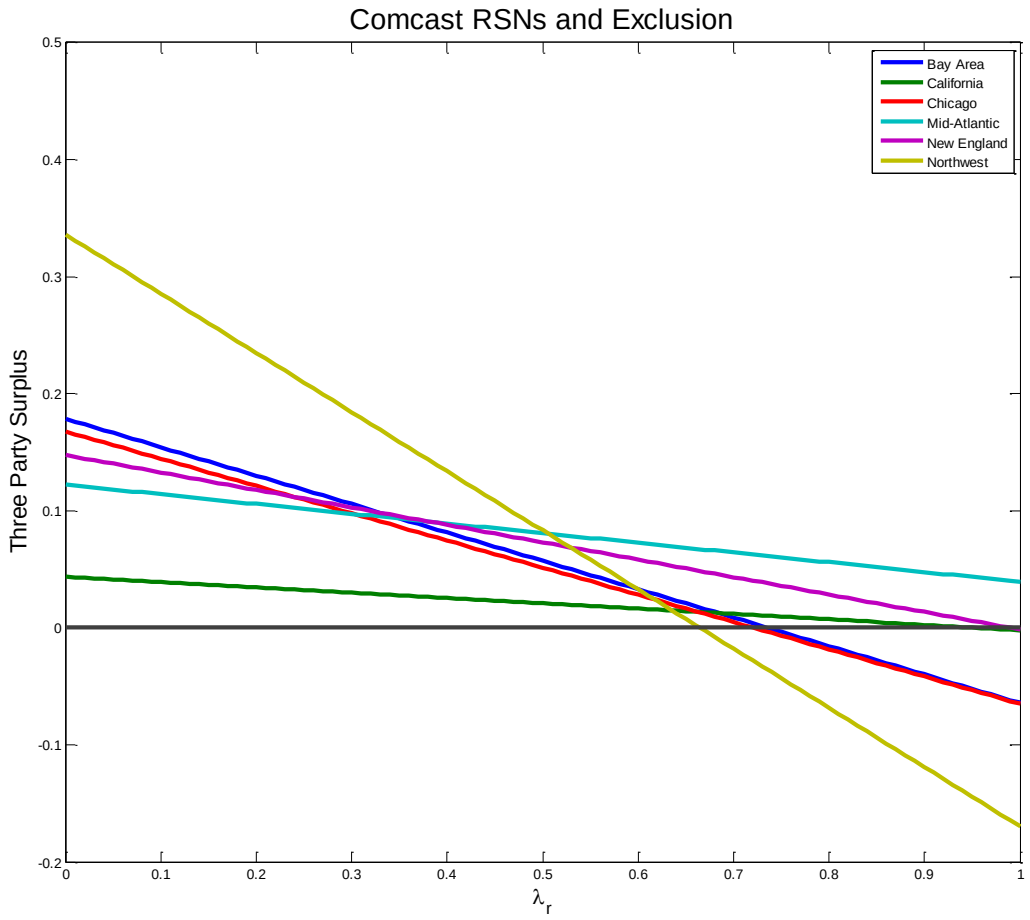
- In Philadelphia and San Diego areas, ask what is the lowest λ_r that would induce the integrated RSN to withhold from satellite?

Close Loophole in 2007

		Market Share			Surplus ($/month/capita)		
		exc.	w/o exc.	change	exc.	w/o exc.	change
4SD	Integrated Cable:	0.739	0.716	-3.10%	13.271	12.864	-3.06%
Cox	Satellite:	0.106	0.132	23.80%	0.975	1.205	23.57%
Pop. 1052705	Consumer:				29.921	30.304	1.28%
CSN Phil.	Integrated Cable:	0.646	0.612	-5.25%	10.915	10.421	-4.53%
Comcast	Satellite	0.159	0.199	25.19%	1.624	2.011	23.83%
Pop. 2762396	Consumer:				26.794	27.822	3.84%

- Forcing RSN onto satellite predicted to increase consumer surplus by 1-4%.

Remove Program Access Rules



- Predict exclusion by Comcast in Bay Area, Chicago, Pacific Northwest
- Possibly in New England and Sacramento
- Not in DC

Removing Program Access Rules

	Exclusion?			Market Share			Surplus		
	$\lambda_r = .79$	$\lambda_r = 1$		w/o exc.	exc.	change	w/o exc.	exc.	change
CSN Bay Area	Yes	Yes	Int. Cable:	0.615	0.634	2.97%	8.202	8.461	3.16%
Comcast			Satellite	0.211	0.189	-10.45%	1.882	1.689	-10.26%
Pop. 5676023			Consumer:	-	-	-	25.178	24.294	-3.51%
CSN CA	No	Yes	Int. Cable:	0.605	0.609	0.67%	8.892	8.941	0.55%
Comcast			Satellite	0.212	0.207	-2.42%	1.899	1.853	-2.41%
Pop. 4623318			Consumer:	-	-	-	24.391	24.221	-0.70%
CSN Chicago	Yes	Yes	Int. Cable:	0.597	0.614	2.89%	6.861	7.103	3.52%
Comcast			Satellite	0.209	0.189	-9.36%	1.965	1.789	-8.98%
Pop. 5041614			Consumer:	-	-	-	23.885	23.307	-2.42%
CSN Mid-Atl.	No	No	Int. Cable:	0.662	0.674	1.68%	6.056	6.139	1.37%
Comcast			Satellite	0.165	0.152	-7.81%	1.644	1.519	-7.63%
Pop. 4423934			Consumer:	-	-	-	25.378	25.020	-1.41%
CSN NE	No	Yes	Int. Cable:	0.646	0.659	1.98%	9.040	9.205	1.83%
Comcast			Satellite	0.116	0.100	-13.10%	2.801	2.701	-3.59%
Pop. 4734329			Consumer:	-	-	-	22.532	22.215	-1.41%
CSN NW	Yes	Yes	Int. Cable:	0.598	0.632	5.70%	7.934	8.433	6.29%
Comcast			Satellite	0.254	0.217	-14.47%	2.206	1.889	-14.35%
Pop. 3275967			Consumer:	-	-	-	36.672	35.731	-2.57%

- Allowing exclusion would lead to 1-4% decreases in consumer surplus in markets where we predict exclusion.

Removing Program Access Rules

- Decision to exclude driven by two factors in our model:

1. Coverage of integrated cable firm
2. Mark-ups of satellite and integrated cable firms

- For DC, Cox operates a large cable system in Northern Virginia. Comcast excluding satellite generates returns to Cox that Comcast only partially shares.

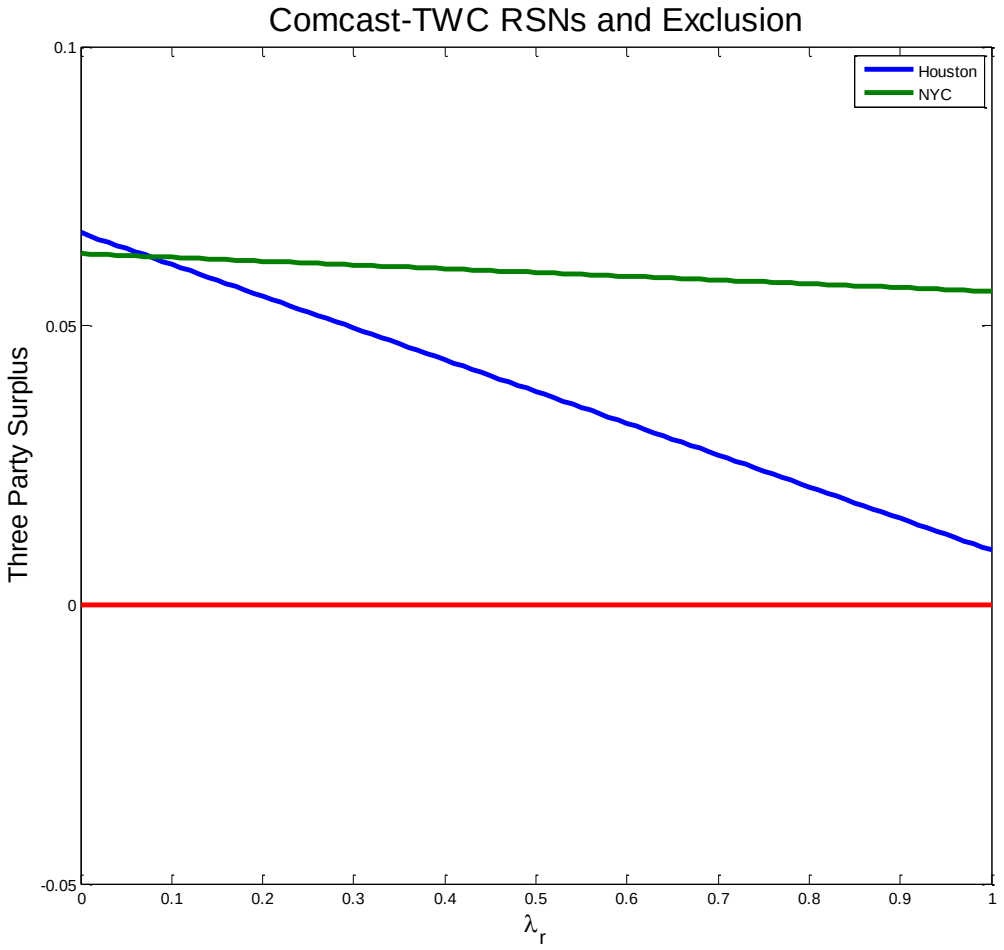
Comcast – Time Warner Cable Integration

- Comcast and Time Warner Cable both have footprints in two major RSN markets: NYC and Houston.

- We can use our estimates to predict exclusion behavior in each of these markets.

- We transfer control of FSN Houston to Comcast-TWC in 2007.

Comcast – Time Warner Cable Integration



To do list and Caveats

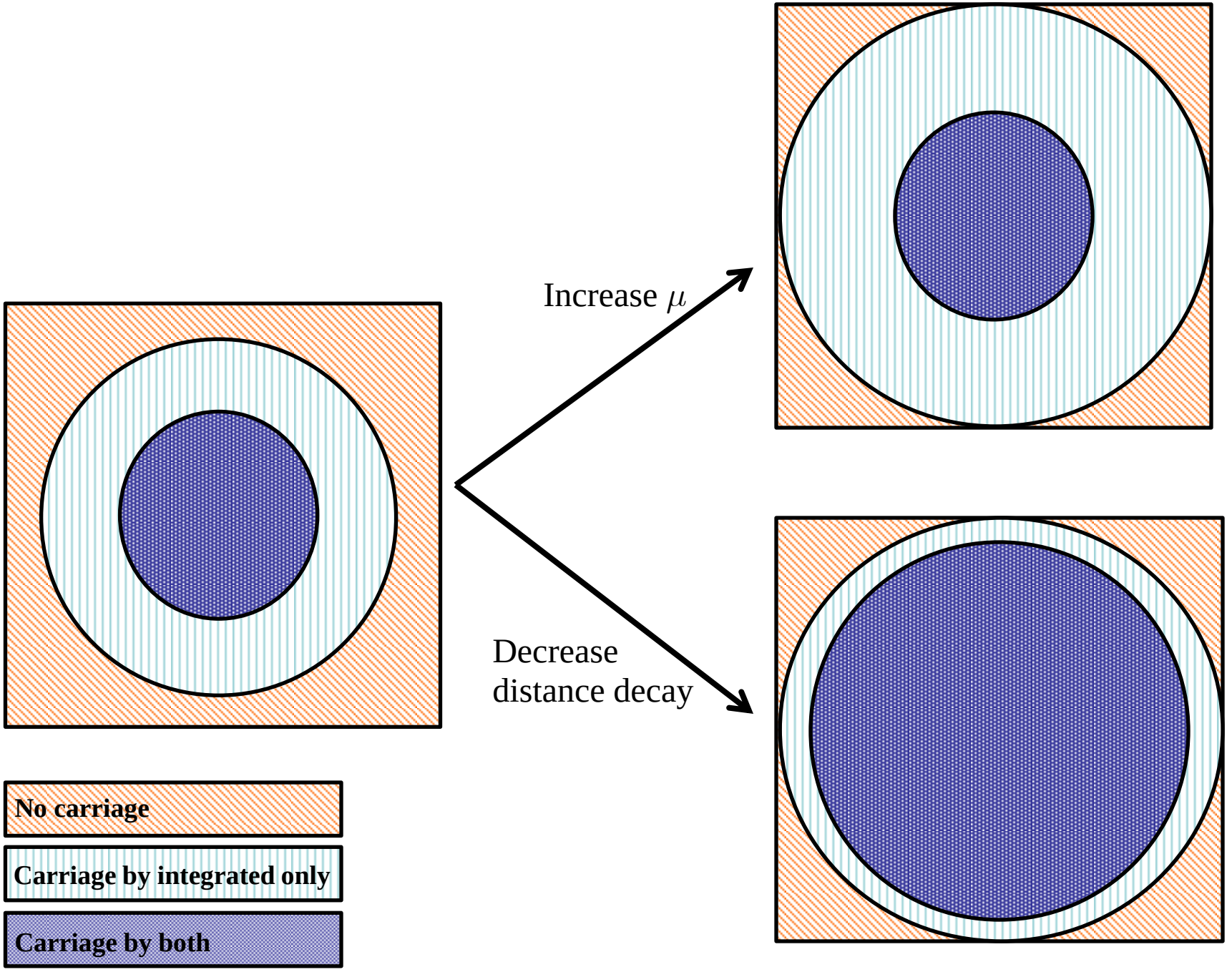
- Re-equilibration of τ and prices following exclusion.
- Relaxing assumption that $\lambda_r = 0$ under Program Access Rules.
- …
- Extend to more years
- Partial ownership shares
- Deal with team blackout territories that cut through DMA's.

Conclusion

- Framework for vertical merger analysis allowing for

- Efficiencies
- Foreclosure
- Partial coordination by upstream and downstream units within integrated firm.

- Find regulatory policy prevents exclusion in several important markets.
- Comcast-TWC doesn't raise obvious issues in RSN market


Increase μ
Decrease
distance decay
No carriage
Carriage by integrated only
Carriage by both