



# Streaming and Bundling in Video Entertainment

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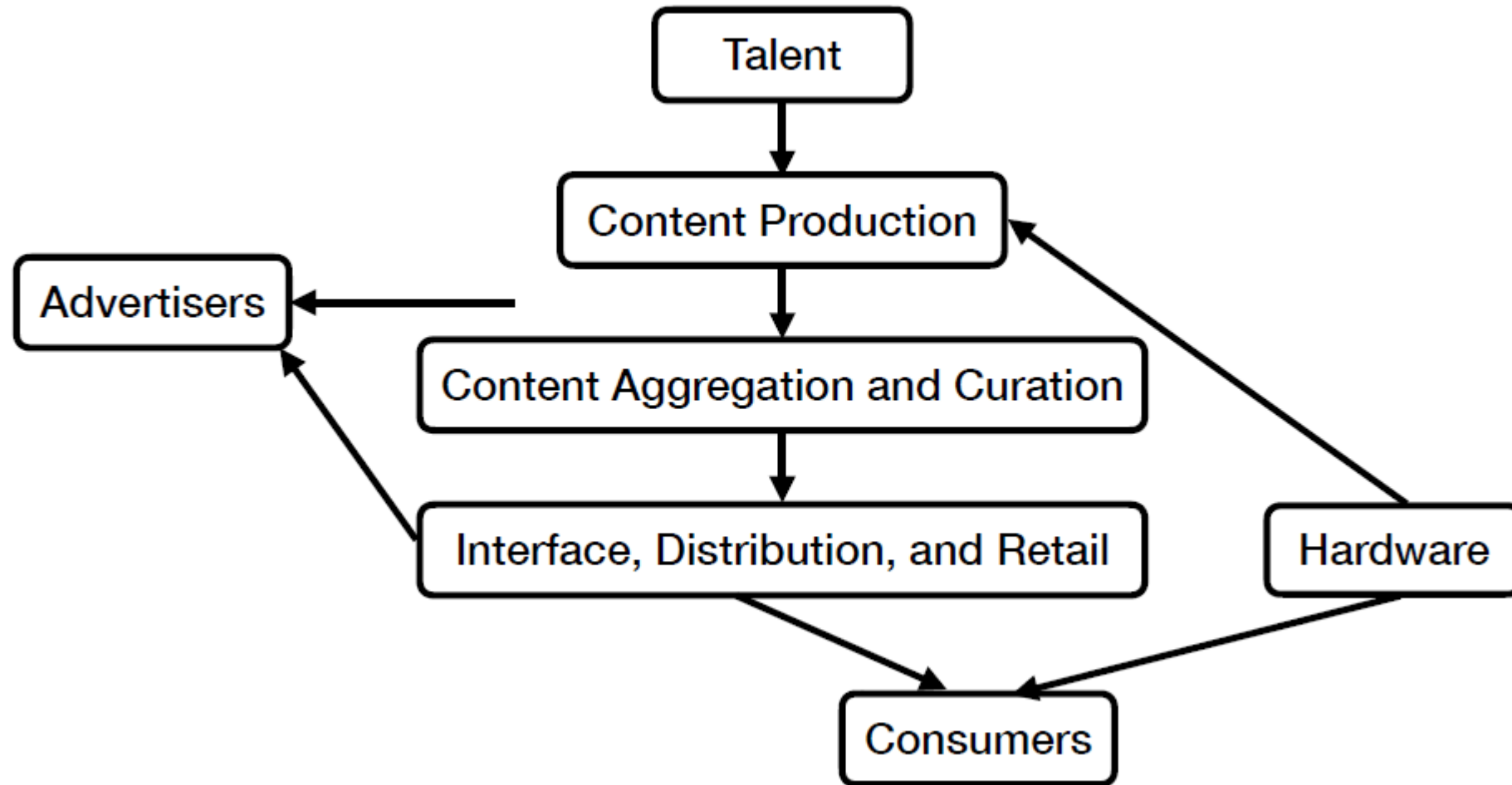
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December 2024

*Preliminary research findings, please do not cite or circulate.*

# Who Should Sell What in Media?

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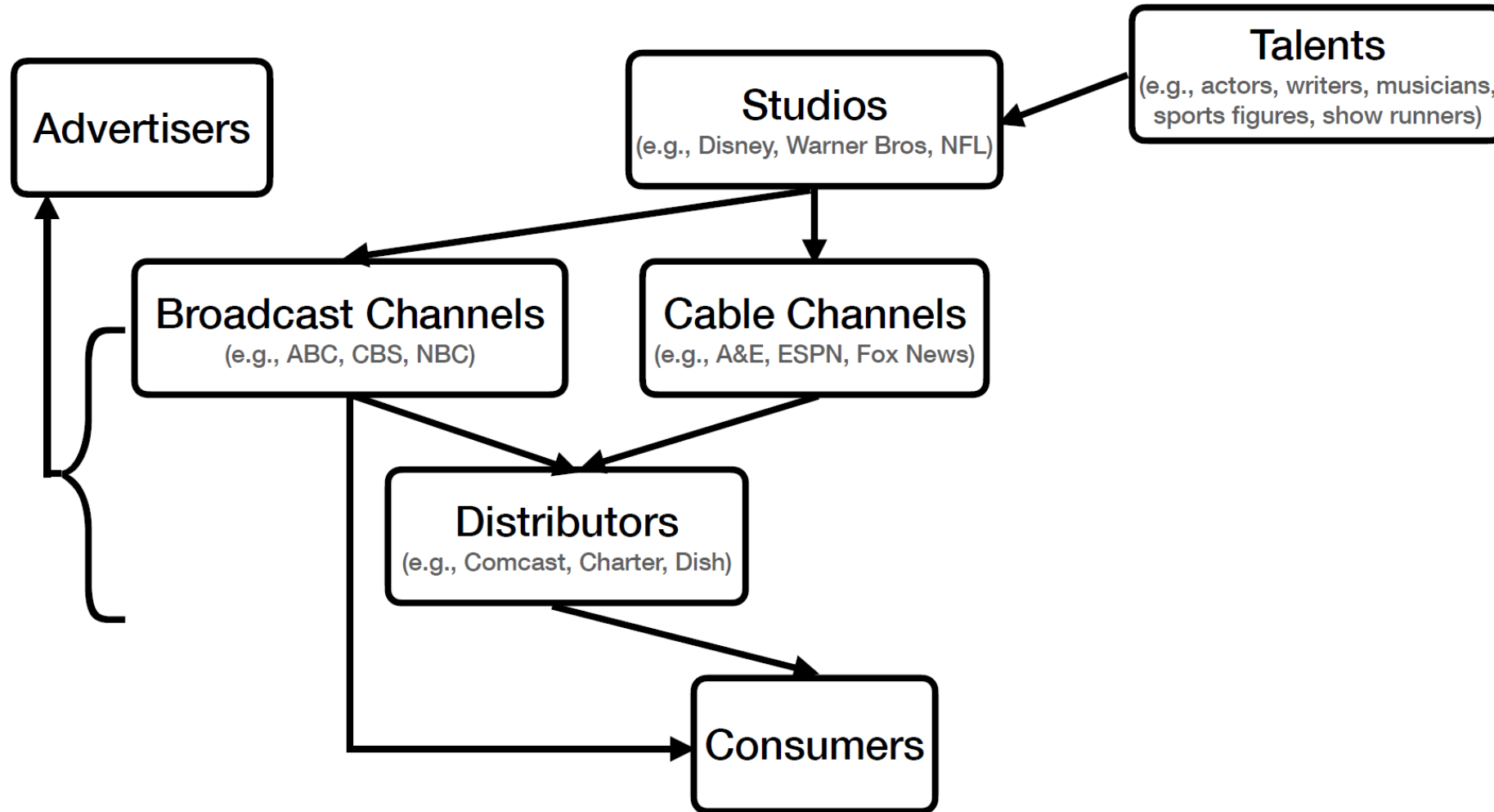
# Research Question

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- How do different configurations of **bundling** and **vertical integration** affect welfare?
  - Digital music
    - Originally **à la carte** by song on iTunes.
    - Now **grand bundle** through intermediaries Spotify, Apple Music, Amazon, etc.
  - Print journalism
    - Long era of newspapers and magazines: **Bundling and integration**.
    - Substack: **Unbundled and intermediated**
  - Video games
    - Mix of à la carte and subscription rentals (e.g. Game Pass, PlayStation Plus)
    - Some integrated console-developers, some exclusivity
- Our study is in the market for **video entertainment**, or “**television**”

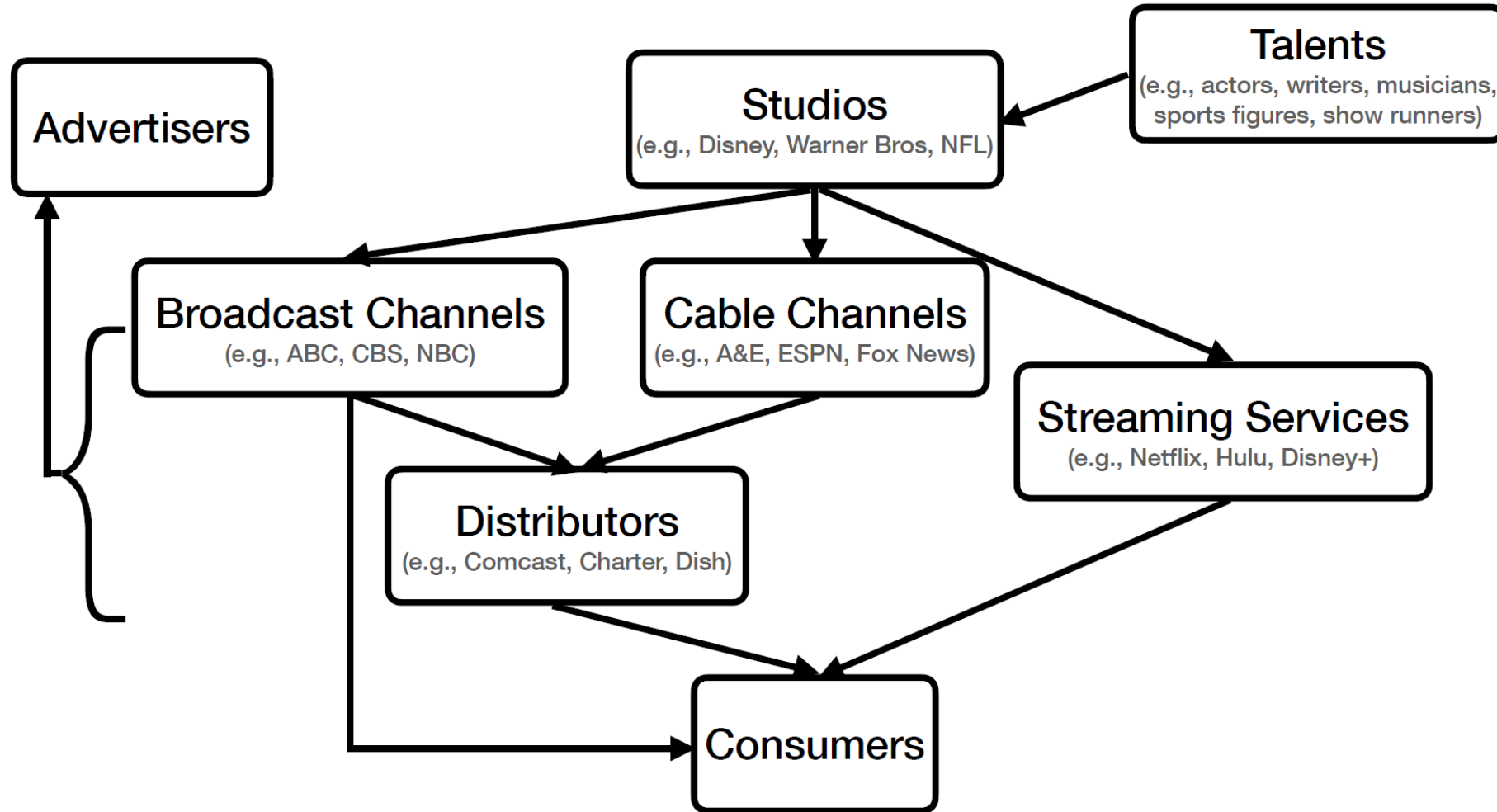
# Television 1980 to ~2010

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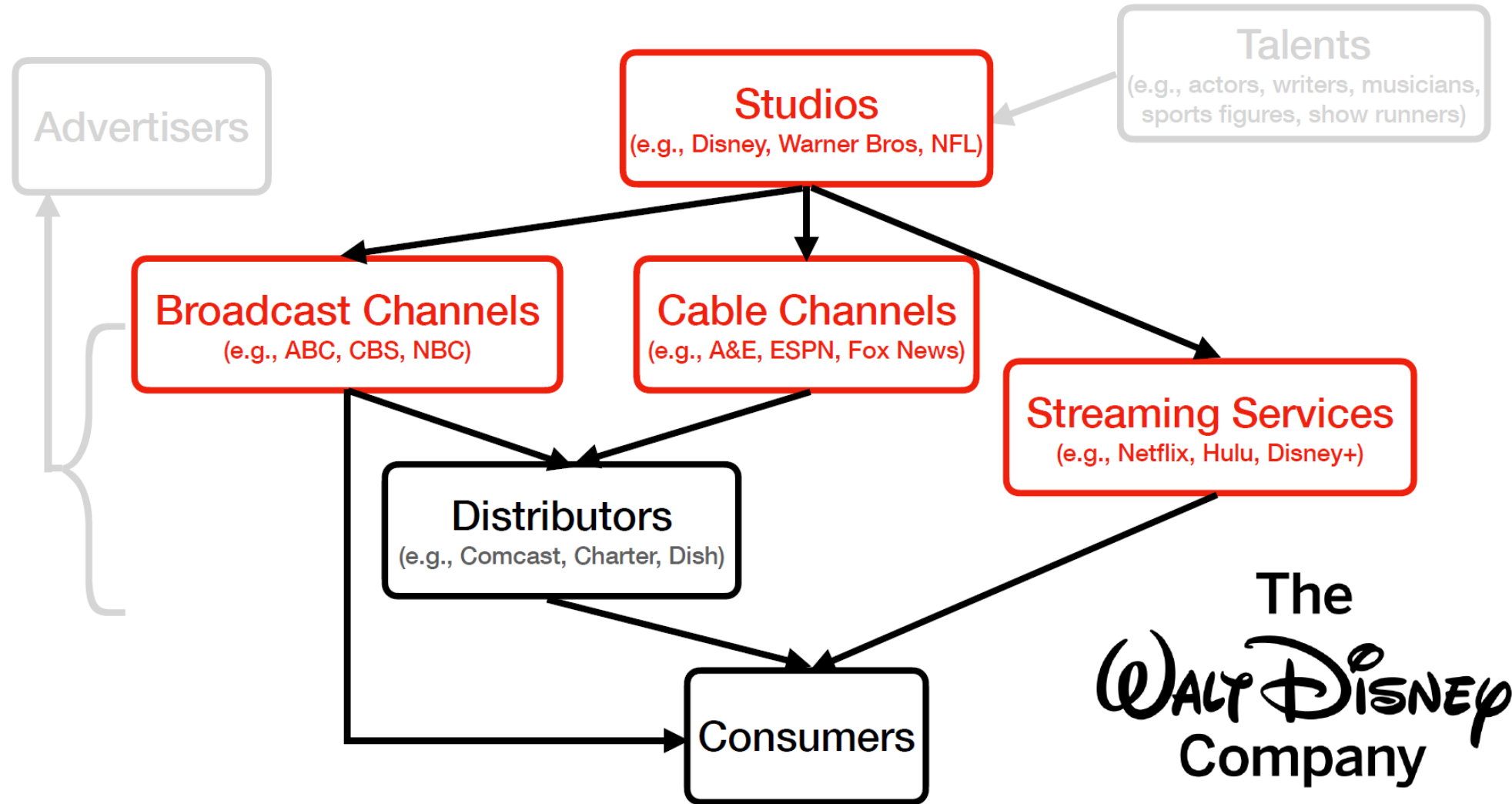


# Television After 2010

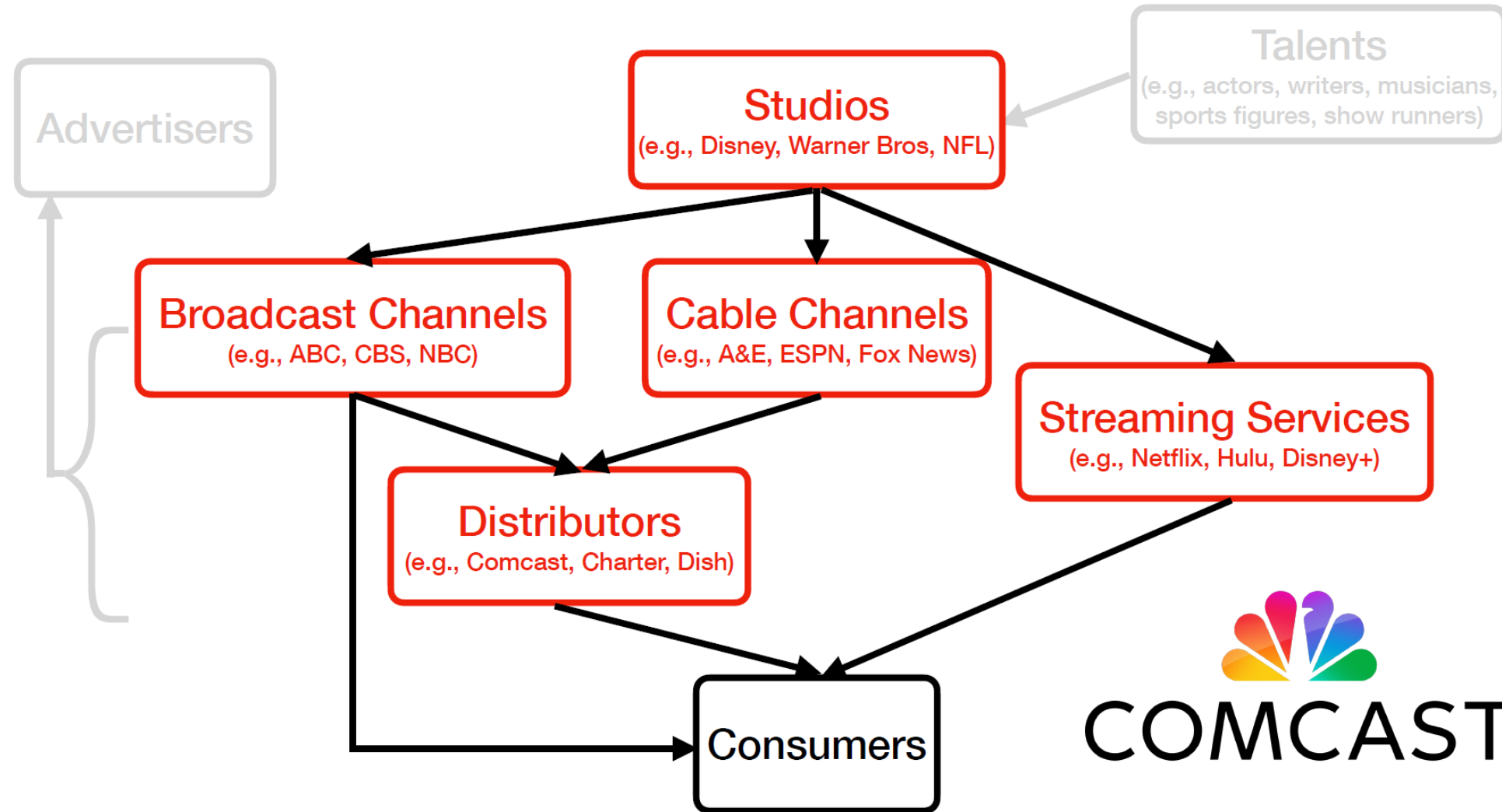
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# Television After 2010

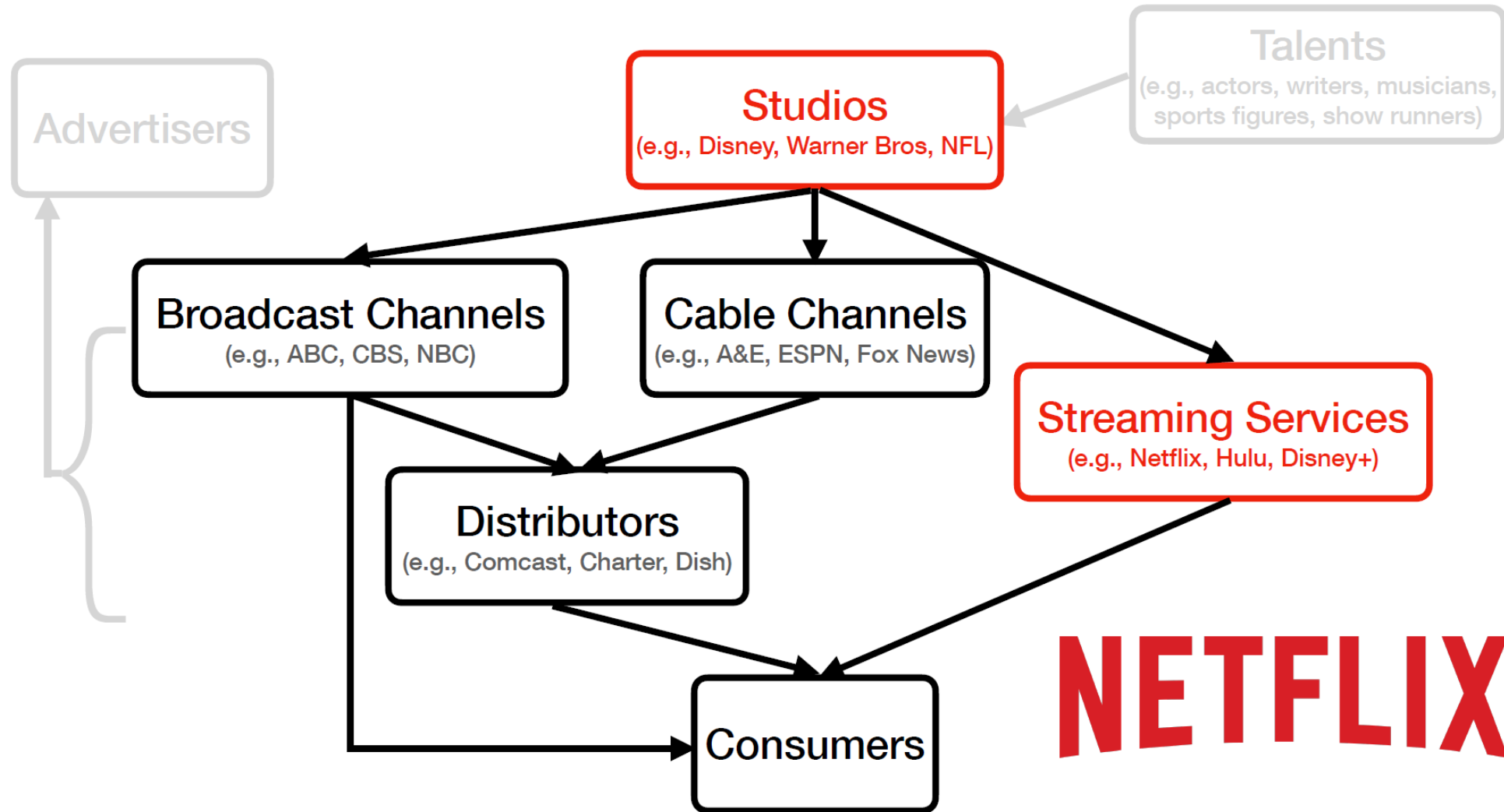


# Television After 2010



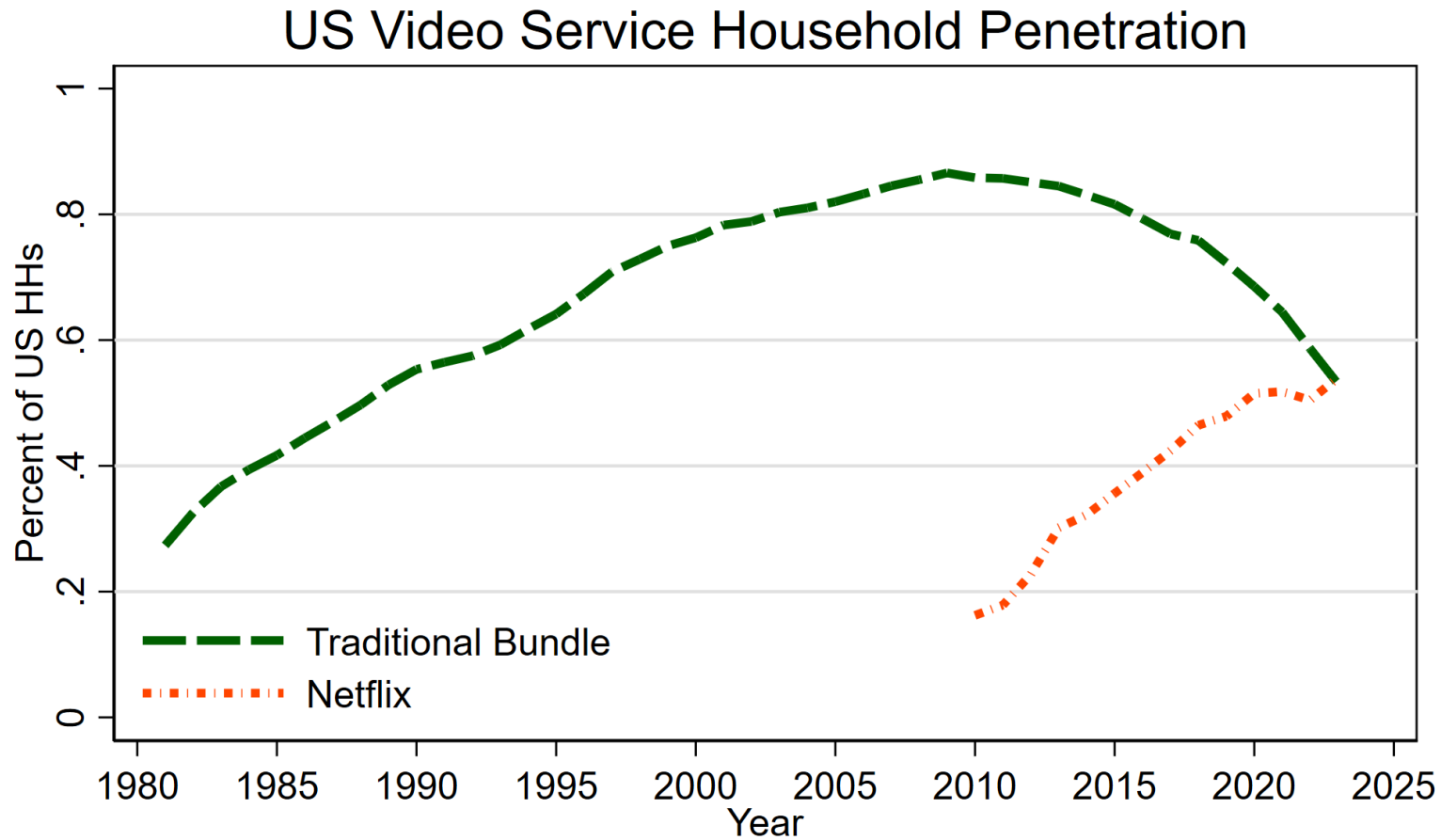


# Television After 2010





# Television: “The Bundle” vs Netflix



# The Rise of Streaming

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- Netflix **invested in a lot of original content** and provided it to consumers at a **relatively low price**, about \$8 to \$15 a month.
  - We will quantify the consumer welfare benefits of this.
- Arguably **better experience** than traditional cable and satellite.
  - Personalized recommendation system, more fluid software.
  - No commercial breaks during its growth period.
- **Amazon Prime Video** also invested a relatively large amount in original programming.
- Over a relatively few number of years, **Netflix** went from scrappy newcomer to **one of the largest companies** in the world.
  - Netflix market cap (~300B) today is almost double The Walt Disney Company (~170B) and Comcast (~150B).
  - The major media companies all essentially **followed suit and launched streaming services.**

# The Rise of Streaming

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- **Not a physical disintermediation** like iTunes and Tower Records, or Amazon and Borders.
  - The same big studios are delivering content over essentially the same wires and airwaves.
- Most cable and satellite allowed **on-demand and time shifting** by 2015.
- Some streaming services that were heralded as forward thinking (e.g. The WWE Network) exited and folded back into larger services.
- Fatigue of keeping track of different interfaces, content discovery, and subscription billing.
- If “**the bundle**” was a good system in 2010, why wouldn’t it be now?
- Another way of putting it: if instead of Spotify or Apple Music, would you prefer if you could mix and match between **Warner Music Max, Sony Music +, and Universal Music Plus**?

# The Rise of Streaming

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- Television has become **partially unbundled**.
  - All the streaming services are still bundles, and most of them have the full spectrum of genres.
  - Welfare effects of unbundling ambiguous in theory.
- More **integration** of studios into the “distributor” role of interface and retail.
  - Welfare effects of vertical integration ambiguous in theory.
- Likely to have effects on size of **investments in content**.
  - Huge number of new programs during the launch of streaming, i.e. “Peak TV”
  - Are there already too many TV shows due to business stealing?

# Approach

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- Assemble a data set that spans the market from 1994 to 2022. (For today, data is from 1994 to 2017 and 2022)
- Specify and estimate a model of
  - Consumers **viewership** and **subscription** choices
  - Distributors and streamers **pricing** to consumers
  - Distributors **negotiating** for content from channels
  - Streamers and channels **negotiating** for content from studios
  - Studios **investing** in content
  - Allowing for observed patterns of **ownership** and **vertical integration**.

# Approach

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- Do welfare calculations and simulate counterfactuals
  - **Benefits of additional content** from Netflix, Amazon, and Hulu
  - **Short run vs long run pricing** incentives of streamers
  - **Streaming only:** Netflix, Amazon, Hulu and Disney+, ESPN+, Fox Nation, Max, Paramount Plus, Peacock
  - **Rebundling** streaming.

# Main Results

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- **Value of Initial Streaming Entrants:**

- Netflix, Amazon, and Hulu **generated about \$32 of consumer surplus** per US household per month relative to a world with only the traditional cable and satellite bundles (evaluated in 2017).

- **Introductory vs Long Run Optimal Pricing**

- The current set of major streaming services (Netflix, Hulu, Amazon, Max, Disney+, ESPN+, Paramount Plus, and Peacock) seem to be **pricing below static optimal levels**.
- If they were to price at static optimal levels (assuming zero marginal cost), consumer welfare would **decrease by about \$20** per household per month relative to current pricing levels. (evaluated in 2023)

- *Results are still preliminary and do not account for changes in content investment yet.*



# Main Results

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- **Streaming Only:**

- Moving from the mix of traditional bundles and streaming to a “streaming only” world would **reduce consumer welfare by about \$65** per household per month. (evaluated in 2023)

- **Rebundling Streaming:**

- By contrast, adding Netflix, Hulu, and Amazon to the bundles and removing them as standalone options would **raise consumer welfare by about \$5** per household per month. (evaluated in 2023)

- *Results are still preliminary and do not account for changes in content investment yet.*



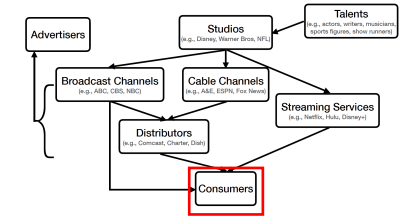
# Model

# Model: Overview and Timing

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- Multi-stage static model:
  1. Studios **invest** in content
  2. Streamers and channels **negotiate** content fees with studios
  3. Distributor negotiations and pricing
    - a) Distributors **negotiate** over content fees with channels
    - b) Distributors and streamers set **prices** to consumers
  4. Consumers make **subscription** choices
  5. Consumers make **viewership** choices
- Allowing for observed patterns of **ownership** and **vertical integration**.

# Model: Consumer Viewership



- Having subscribed to a set of content  $\mathcal{C}_j$  through cable and/or streaming, or just free-to-air broadcast, **household  $i$  allocates its time across content ( $bc$ )** by solving CES utility maximization problem:

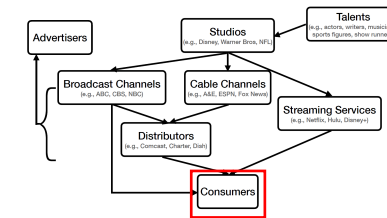
$$v_{ij}^* = \max_{t_{i0}, \{t_{ibc}\}_{b,c \in \mathcal{C}_j}} \log \left( \left( \gamma_{i0} t_{i0}^{\frac{\epsilon-1}{\epsilon}} + \sum_{b,c \in \mathcal{C}_j} \gamma_{ibc} t_{ibc}^{\frac{\epsilon-1}{\epsilon}} \right)^{\frac{\epsilon}{\epsilon-1}} \right),$$

$$s.t. \quad t_{i0} \geq 0, \quad t_{ibc} \geq 0,$$

$$t_{i0} + \sum_{b,c \in \mathcal{C}_j} t_{ibc} = T.$$

**Household  $i$  taste**  
parameter for **studio  $b$**   
content on **channel  $c$** .

# Model: Consumer Viewership

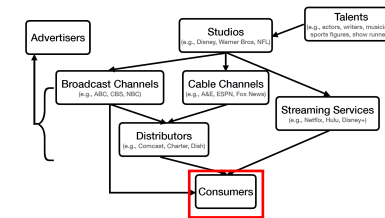


- This problem leads to the following analytical expressions for time allocation and indirect utility from content viewership.

$$t_{i0}^* = \frac{\gamma_{i0}^\epsilon}{\gamma_{i0}^\epsilon + \sum_{b',c' \in \mathcal{C}_j} \gamma_{ib'c'}^\epsilon} T, \quad t_{ibc}^* = \frac{\gamma_{ibc}^\epsilon}{\gamma_{i0}^\epsilon + \sum_{b',c' \in \mathcal{C}_j} \gamma_{ib'c'}^\epsilon} T,$$

$$v_{ij}^* = \log \left( \left( \gamma_{i0} (t_{i0}^*)^{\frac{\epsilon-1}{\epsilon}} + \sum_{b,c \in \mathcal{C}_j} \gamma_{ibc} (t_{ibc}^*)^{\frac{\epsilon-1}{\epsilon}} \right)^{\frac{\epsilon}{\epsilon-1}} \right).$$

# Model: Consumer Subscriptions



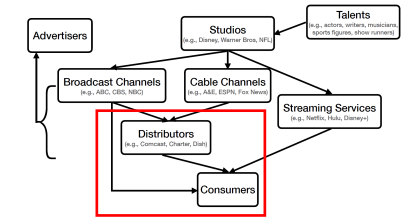
- **Household  $i$**  in **geographic-time market  $m$**  chooses what combination of content to subscribe to by trading off viewership utility, price, and other characteristics:

$$u_{ijm} = \beta_v \log(v_0 + v_{ij}^* - \underline{v}_i) - \alpha_i p_{j m} + \beta x_{j m} + \xi_{j m} + \epsilon_{ijm}$$

Aggregation over households

$$s_{jm}(\mathbf{p}_m, \Gamma) = \int \frac{\exp(\delta_{ijm})}{\exp(\delta_{i0m}) + \sum_j \exp(\delta_{ijm})} dF(i)$$

# Model: Cable Distributor's Problem



- Distributor  $f$  chooses prices in each **geographic-time market**  $m$  to maximize profits

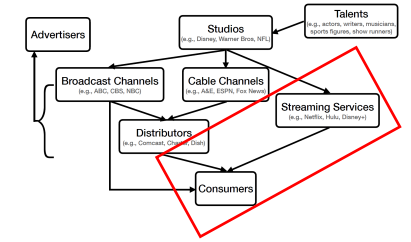
$$\max_{\{p_{fm}\}} \Pi_f(\mathbf{p}, \boldsymbol{\tau}_f, \Gamma) = \sum_m N_m \left( p_{fm} + r_{fm} - \omega_{fm} - \sum_{c \in \mathcal{C}(f)} \tau_{fc} \right) s_{fm}(\mathbf{p}_m, \Gamma),$$

↑  
Distributor advertising  
revenue per subscriber

↑  
Per subscriber fees  
from distributor  $f$  to  
channel  $c$ .



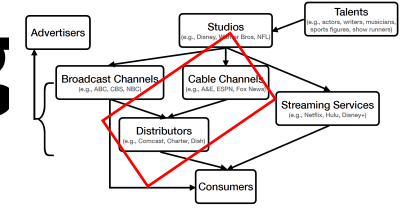
# Model: Streamer's Problem



$$\max_{p_c} \Pi_c(\mathbf{p}, \Gamma) = \sum_m N_m(p_c - \omega_c) s_{cm}(\mathbf{p}_m, \Gamma), \quad c \in \mathcal{C}_2.$$

↑  
Nationwide streaming  
service price

# Model: Channel – Distributor Bargaining



$$\Pi_c(\mathbf{p}, \boldsymbol{\tau}, \Gamma) = \sum_m N_m \sum_{f \in \mathcal{F}(c)} (\tau_{fc} + r_c) s_{fm}(\mathbf{p}_m, \Gamma).$$

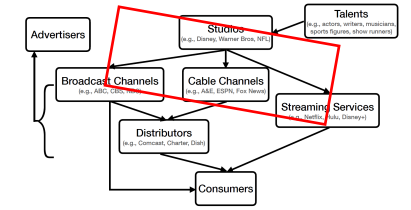
Per subscriber fees from  
distributor f to channel c.

Advertising revenue for  
channel c

$$\max_{\tau_{fc}} \left( \Pi_f(\mathbf{p}, \boldsymbol{\tau}, \Gamma) - \Pi_f(\mathbf{p}, \boldsymbol{\tau}, \Gamma -_{fc}) \right)^{1-\zeta_c} \left( \Pi_c(\mathbf{p}, \boldsymbol{\tau}, \Gamma_{fc}) - \Pi_c(\mathbf{p}, \boldsymbol{\tau}, \Gamma -_{fc}) \right)^{\zeta_c},$$

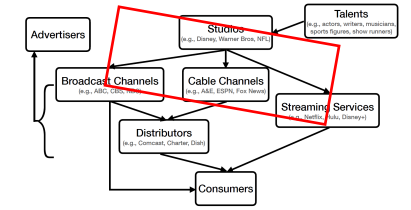
“Nash-in-Nash” bargaining at the conglomerate level over  $\tau_{fc}$

# Model: Studio Bargaining



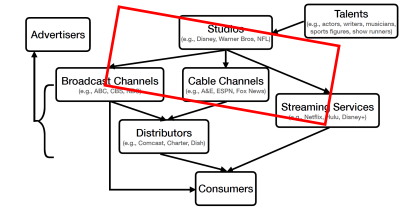
- We employ the **weighted Shapley value** to model how studios and channels/streamers split channel/streamer revenues.
  - Shows are generally assigned to single channels or streamers, so would need to modify disagreement points to apply Nash-in-Nash.
  - Flat fee contracts lend themselves better to Shapley value.

# Model: Studio Bargaining



- For each channel/streamer, there is a set of studios indexed by  $b$  providing certain amounts of content described by their  $\gamma_{bc}$ .
- Consider all the **different orderings of channel** and the studios which provide content.
  - All content has zero marginal contribution until the channel comes along. The channel “activates” all the content that arrived before it.
- Under the Shapley value, the payment to each agent is the **average marginal contribution** across the orderings.
- The weighted Shapley value assigns a **weighted average marginal contribution** with where more weight assigned to orderings where the channel arrives later.

# Model: Studio Bargaining



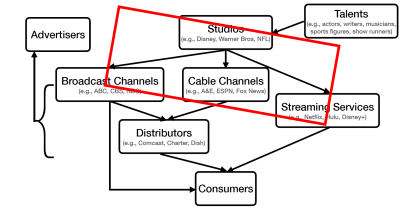
- Full solution would require resolving downstream equilibria over and over for each ordering, and in our data the number of orderings can be quite large.
- We do **two approximations** to estimate the weighted Shapley value.
  1. Assume channels/streamers and studios use a **log-linear regression** to evaluate how equilibriums revenues vary with additional content.

$$\log(\tau_{fc}) = \alpha_f + \beta_f \log\left(\sum_b \gamma_{bc}\right) + \epsilon_{fc}$$

2. Assume there are **infinitely many small shows** which collectively make up the studios content

$$\gamma_{bc} = \sum_{s \in \mathcal{S}_{bc}} \gamma_s$$

# Model: Studio Bargaining



- The channel's weight in the weighted Shapley value maps into its probability of arriving earlier in the sequence (equal weights means all sequences are equally likely).

$$\tau_{fc}^c = \frac{w_c}{\beta_f^\tau + w_c} \tau_{fc}$$

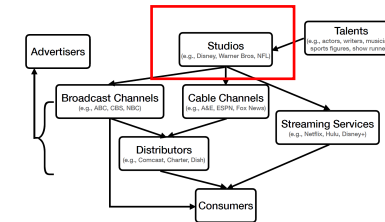
*Shapley weight for channel/streamer*

*Effect of content on revenue according to log-linear regression model.*

$$\tau_{fc}^b(\gamma) = \frac{\beta_f^\tau}{\beta_f^\tau + w_c} \frac{\gamma_{bc}}{\sum_b \gamma_{bc}} \tau_{fc}$$

*Contribution of studio's content to channel/streamer's content portfolio*

# Model: Studio Investment



- Studio  $b$  chooses a single dimensional level of quality which is apportioned to all the content they air on all channels and streamers.

$$q_b = \sum_c \gamma_{bc}.$$

- Assume quadratic functional form for total production costs.

$$TC_b(q_b) = \psi_b q_b^2$$

- Choose  $q_b$  to maximize profits:

$$\max_{q_b} \Pi_b(\mathbf{q}) = R_b(\boldsymbol{\gamma}(\mathbf{q})) - TC_b(q_b)$$



# Model: Integration

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- The model we compute allows for **arbitrary patterns of ownership**.
- We assume **full internalization** of each “division’s” actions on their sister divisions.
- For example, if **costs for Comcast cable service** increase, this can
  - Raise profits at the Peacock streaming service.
  - Hurt Comcast-NBC owned cable channels advertising revenues.
  - Increase revenue for Universal produced shows on Netflix.

# Model: Equilibrium Definition

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- An equilibrium consists of (1) **distributor and streamer prices** to consumers, (2) **per-subscriber fees** from distributor to channels, (3) **payments from channels and streamers to studios**, (4) **content investment levels**, and (5) **parameters of log-linear approximating regression** models such that:
  1. Distributors and streamers cannot improve profits by changing prices
  2. Distributors and channels solve their Nash bargaining problems, holding other prices fixed
  3. Payments from channels and streamers to studios are determined by the weighted Shapley value under the log-linear approximating model.
  4. Studios cannot improve profits by changing their investment levels
  5. The log-linear approximating model parameters are generated using least squares applied to data from the equilibrium.



# Data

# Data – Program Viewership

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- Broadcast and cable channel viewership for 1994-2017 from Nielsen:
  - Program-Channel-Year-Total Minutes
  - Total minutes viewed summed up across all households
- For streaming viewership:
  - Estimate rank-fraction of viewership relationship from Nielsen for cable channels
  - Get Google Trends ranks of program searches by streaming service – year
  - Total time spent on streaming service from MRI and public disclosures
  - Combine total time and ranks to assign time on program by streaming service
  - Validate with 2017 data from Plum Research on Netflix viewership

# Data – Content Database

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- Content database:
  - For each program in each year, manually research **production studios** (mostly from IMDB and Wikipedia)
  - For new programming (as opposed to rerun), assume the channel or streaming service on which it airs is at least 50% co-producer.
  - **Each program** is thus a **joint venture** between its co-producers.
    - E.g. Monday Night Football is a 50-50 joint venture between the NFL and ESPN.
- Aggregate viewership to the channel-studio-year level.

# Data – Content Expenditures and Ownership

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- S&P Global:
  - Per subscriber license fees by channel-year.
  - Content expenditures by channel/streaming service – year.
- Conglomerate database (assembled by hand)
  - Matches studio, channel, streamer, and/or distributor to conglomerate for each year.

# Data – Household Level Data

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- Household level data by zip code – year from MRI-Simmons:
  - Cable/satellite provider if any,
  - Subscriptions to streaming services
  - Household income
- Household level data from Fourth Wall Media for 2012 (cable subscribers only)
  - Total time watching television (to calculate std dev of total time)
  - Relationship of total time watching television and household income
  - Concentration of viewership among different channels
- Prices from rate cards, Cable Factbook, public disclosures, FCC price survey.
  - For streaming, we use the blended average price of ad supported and ad free tiers, weighted by subscriptions.



# Data – Market Shares and Prices

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- Aggregate household level combinations of services up to zip code and then up to geographic market defined by cable operator combination – year
  - E.g. “Comcast and Verizon Market in 2016,” or
  - “Time Warner Cable Market in 2005,” or
  - “Rural Satellite Only Market in 2014”
  - We do some adjustments to concord with public disclosures of total subscribers by streaming service.
- Prices from rate cards, Cable Factbook, public disclosures, FCC price survey.
  - For streaming, we use the blended average price of ad supported and ad free tiers, weighted by subscriptions.

# Data – Viewership Summary

Table 1: Top Channels and Streamers by Viewership

Rank	1997			2007			2017		
	Channel	Conglomerate	Hours	Channel	Conglomerate	Hours	Channel	Conglomerate	Hours
1	NBC	GE	241.2	CBS	CBS	163.1	Netflix	Netflix	210.0
2	CBS	Westinghouse	210.7	ABC	Disney	134.8	CBS	CBS	138.3
3	ABC	Disney	199.4	NBC	NBCUniversal	127.0	NBC	Comcast	103.7
4	Nickelodeon	Viacom	103.6	Disney	Disney	96.1	Fox News	News Corp	92.0
5	Fox	News Corp	91.9	A&E	A&E Networks	82.6	ABC	Disney	90.9
6	A&E	A&E Networks	82.4	Nickelodeon	Viacom	80.5	MSNBC	Comcast	57.7
7	HBO	Time Warner	79.8	TNT	Time Warner	77.7	CNN	Time Warner	49.5
8	TBS	Time Warner	69.3	USA	NBCUniversal	77.2	A&E	A&E Networks	48.3
9	TNT	Time Warner	64.3	Cartoon	Time Warner	70.5	HGTV	Scripps	44.8
10	USA	MCA/Universal	57.8	Fox	News Corp	66.0	ESPN	Disney	44.8
11	ESPN	Disney	49.0	TBS	Time Warner	59.4	Disney	Disney	44.2
12	Lifetime		38.8	ESPN	Disney	56.6	Cartoon	Time Warner	44.0
13	Cartoon	Time Warner	34.6	Fox News	News Corp	53.9	USA	Comcast	43.9
14	Disney	Disney	31.5	Lifetime		44.7	Fox	News Corp	43.5
15	Discovery	Discovery Net.	30.0	MTV	Viacom	40.3	Hallmark		41.3
16	CNN	Time Warner	29.5	TV Land	Viacom	37.5	TNT	Time Warner	39.4
17	Family		28.2	HGTV	Scripps	35.5	ION		38.0
18	MTV	Viacom	27.1	Hallmark		35.3	Nickelodeon	Viacom	37.2
19	TNN	Viacom	23.8	AMC		35.2	Hulu	Disney	35.0
20	Showtime	Westinghouse	20.5	History	A&E Networks	34.5	Amazon	Amazon	34.9

**Notes:** This table provides the hours viewed per household for the top 20 channels or streamers and associated conglomerate for the years 1997, 2007, and 2017.

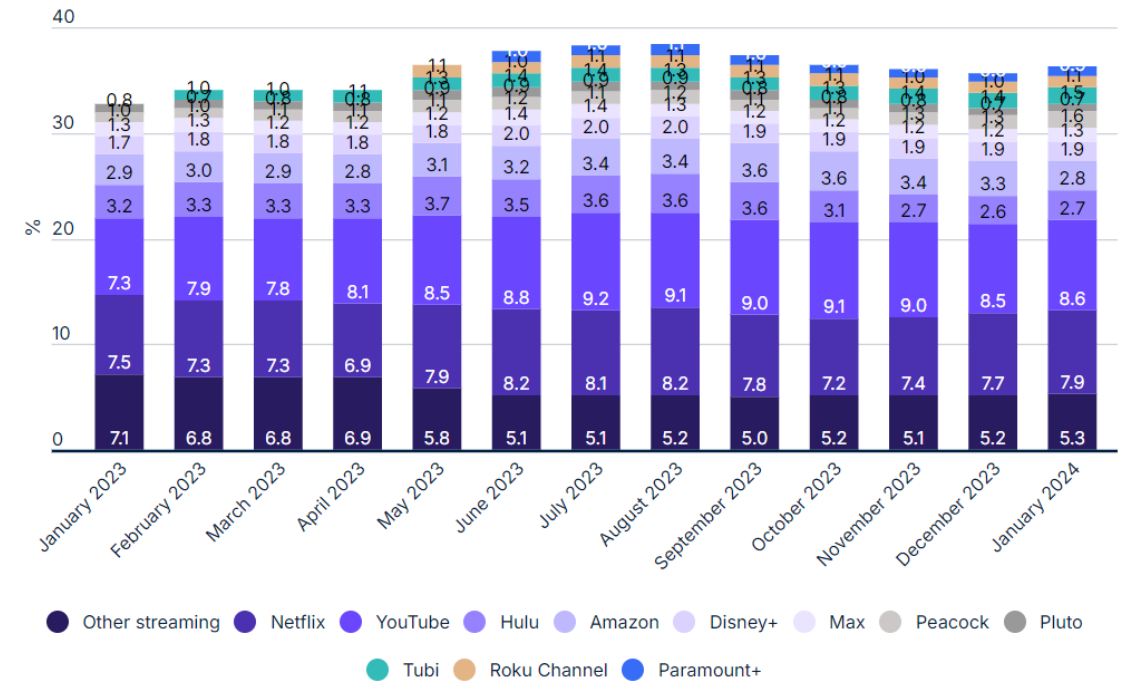
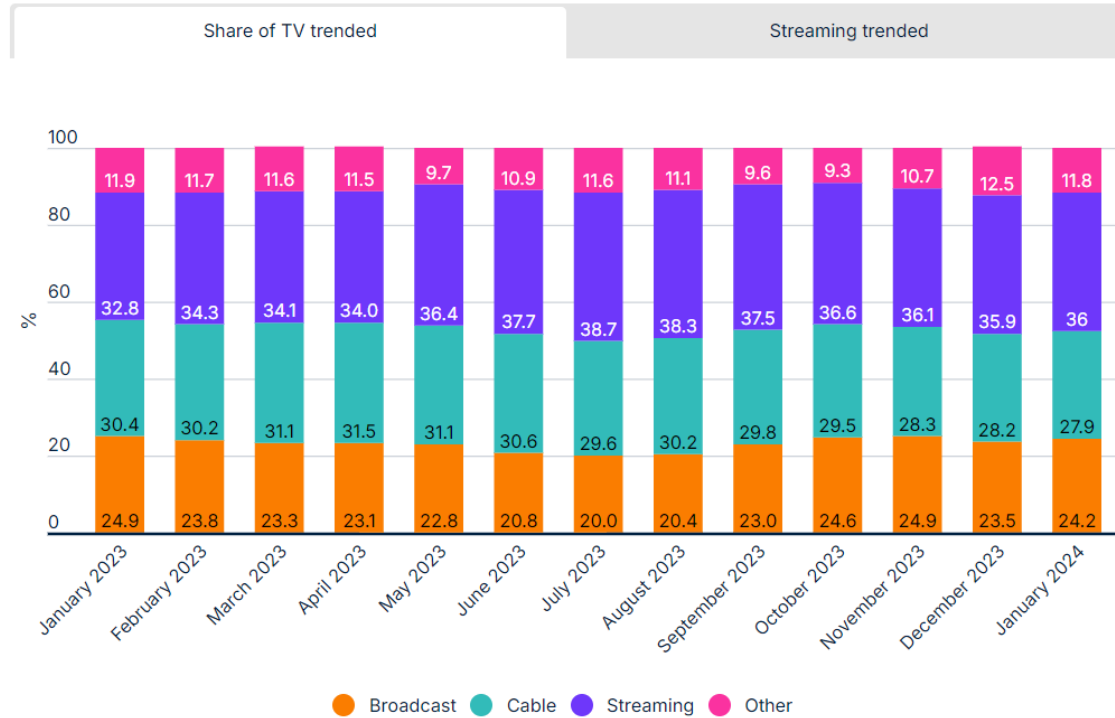
# Data – Viewership Summary

Table 2: Top Conglomerates by Production of Viewership

Rank	1997		2007		2017	
	Conglomerate	Hours	Conglomerate	Hours	Conglomerate	Hours
1	Disney	252.6	Disney	257.3	Time Warner	194.6
2	GE	164.9	CBS	188.1	Comcast	181.4
3	Viacom	158.6	NBCUniversal	187.8	Disney	175.3
4	Westinghouse	138.3	Time Warner	170.7	CBS	148.7
5	Time Warner	134.2	Viacom	165.1	News Corp	147.1
6	News Corp	71.9	News Corp	130.3	Viacom	69.2
7	Sony	60.5	Discovery	62.7	Scripps	67.1
8	A&E Networks	44.0	A&E Networks	59.8	A&E Networks	49.9
9	Discovery	38.8	Scripps	53.7	Discovery	48.8
10	NFL	24.3	Sony	38.4	NFL	38.2
11	MCA/Universal	19.6	Wolf Entert.	38.0	Sony	37.7
12	MLB	16.9	NFL	28.5	Netflix	30.4
13	NCAA	14.2	Comcast	21.1	Wolf Entert.	28.8
14	Wolf Entert.	9.5	Carsey-Werner	15.5	NCAA	14.6
15	NBA	9.4	NCAA	14.7	Cablevision	13.8
16	Carsey-Werner	7.2	BBC	10.6	BBC	9.7
17	Comcast	7.2	MLB	7.7	NBA	7.0
18	MGM	6.7	NBA	4.8	MGM	6.0
19	WWF	5.8	MGM	4.6	WWE	5.6
20	BBC	3.2	WWE	4.5	Carsey-Werner	4.7

**Notes:** This table provides the hours viewed per household attributed to the production studios of each of the top 20 conglomerates for the years 1997, 2007, and 2017.

# Data – Viewership Summary



Source: <https://www.nielsen.com/insights/2024/colder-weather-and-nfl-playoffs-drive-increased-tv-usage-in-january/>

# Data – Content Spending

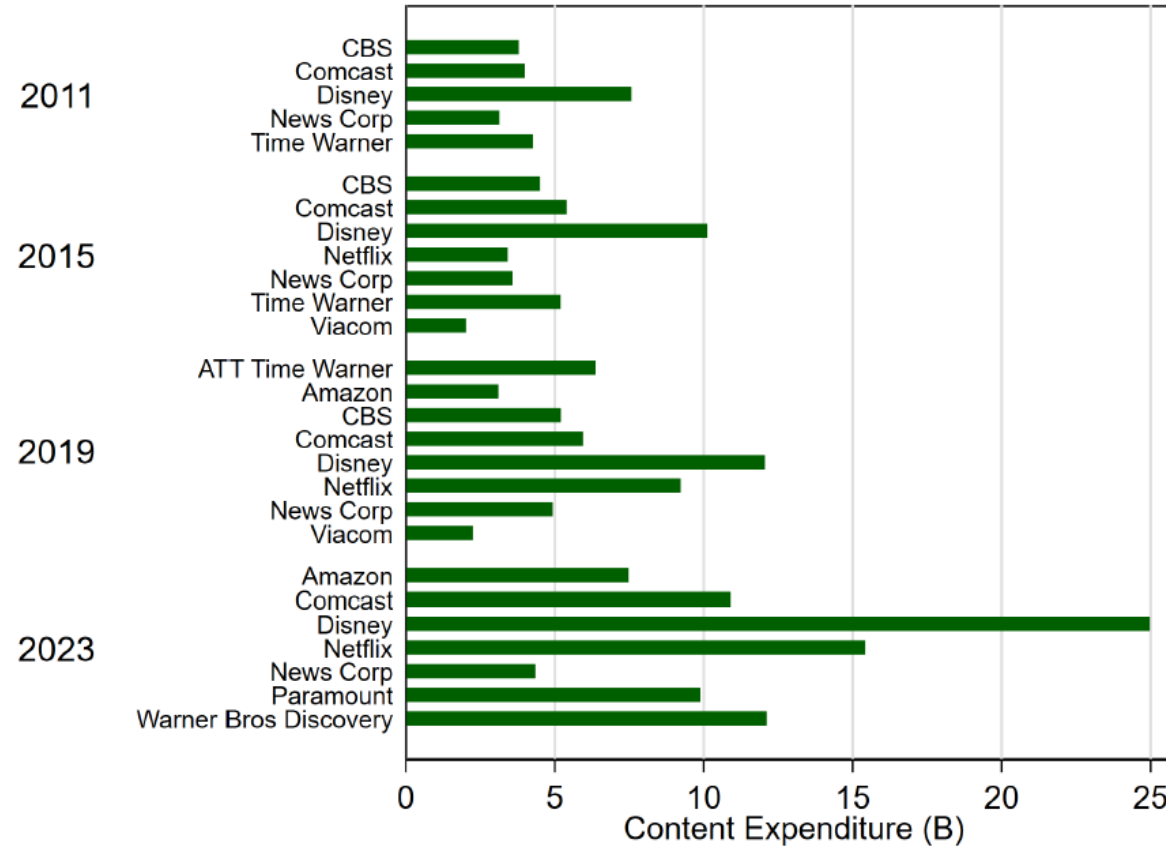


Figure 4: Content Spending by Major Media Conglomerate

Notes: Content spending for conglomerates in selected years, conditional on content spend being above 2B.



# Estimation

# Estimation

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- We estimate in a sequence of separate steps:
  1. Demand (viewership and subscription) parameters
  2. Downstream pricing and distributor-channel bargaining parameters
  3. Studio-channel/streamer bargaining (Shapley weights)
  4. Studio investment cost parameters

# Estimation: Demand (1/2)

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- Demand parameters
  - $\gamma_{sc}$  viewership parameters: Time spent watching channel/streamer-studio pairs
  - Effect of income on viewership outside option: Correlation between total time spent watching television and household income (negative)
  - Unobserved heterogeneity in viewership outside option: Standard deviation of total time spent watching television
  - CES parameter  $\epsilon$ : Within-household HHI of viewership across channels



# Estimation: Demand (2/2)

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- Demand parameters
  - Mean price sensitivity  $\alpha$ : Target elasticity of -4 for satellite in 2007 (from panel variation in tax changes, estimated in CLWY (2017)).
  - Effect of income on price sensitivity: MRI correlation between subscription probability and household income (positive)
  - Value of content parameter  $\beta_V$ : Moment condition that the correlation between unobserved demand shock (conditional on distributor and year fixed effects) and mean utility from content is zero.
    - These are essentially identified from HBO and Showtime add-on's to cable and satellite: how much does the increased viewership utility from these add-ons translate into market share at the observed prices.

# Estimation: Pricing and Bargaining

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- For a **candidate set of bargaining parameters**, “invert” demand system to find **distributor and streamer marginal costs** of additional subscriptions and **implied channel-distributor license fees ( $\tau_{fc}$ )**.
  - This is a matrix equation given simultaneous timing assumptions.
- Find conglomerate-year bargaining parameters which match average per subscriber license fees by conglomerate-year.

# Estimation: Shapley Weights and Investment Costs

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- Find **Shapley value weights** to match **content expenditures** by each conglomerate.
- For investment costs:
  - Given other parameters, we **calculate the marginal benefit of improving content quality** for each conglomerate in a given year.
  - Under the assumption of **optimal investment, this equals their marginal cost**.
  - Choose **content cost parameters to match this marginal cost**.

# Estimates - Demand

- In current formulation, content which has **more total minutes watched** generally has higher estimated value.
- Sports content and new feature films likely have WTP that is disproportionate to total hours watched.
  - Plan to incorporate this.

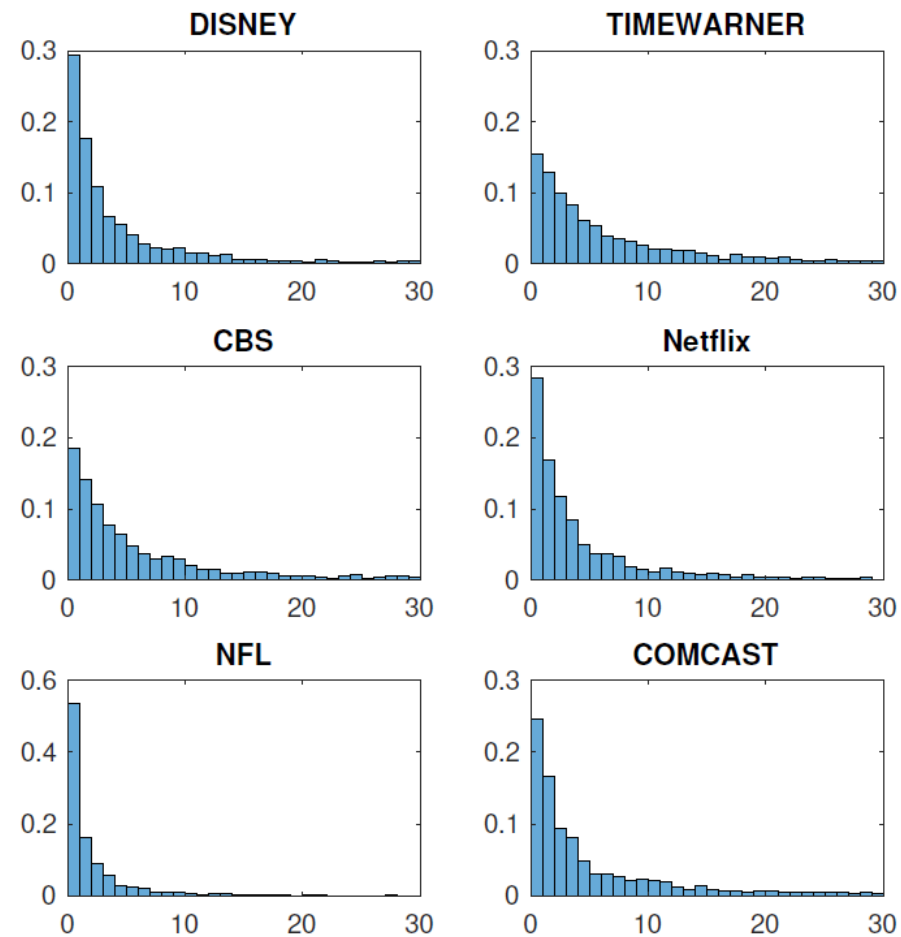


Figure 5: Selected WTP Distributions

Notes: Monthly WTP distribution in 2017 for content produced by named studio. For joint productions, these figures count the WTP attributable to each co-producer. For example, for a telecast of NFL on ESPN, the portion attributable to the NFL is included in the NFL distribution, and the portion attributable to ESPN is included in the Disney distribution.

# Estimates - Demand

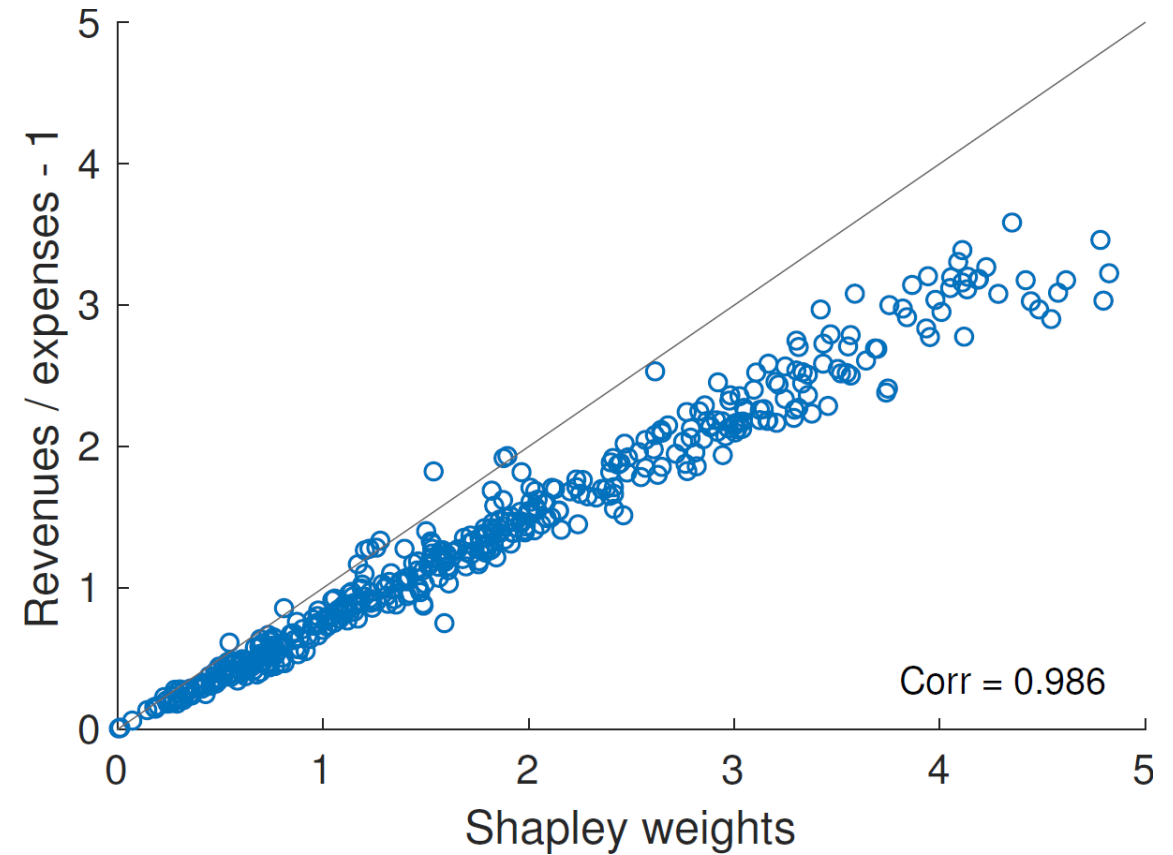
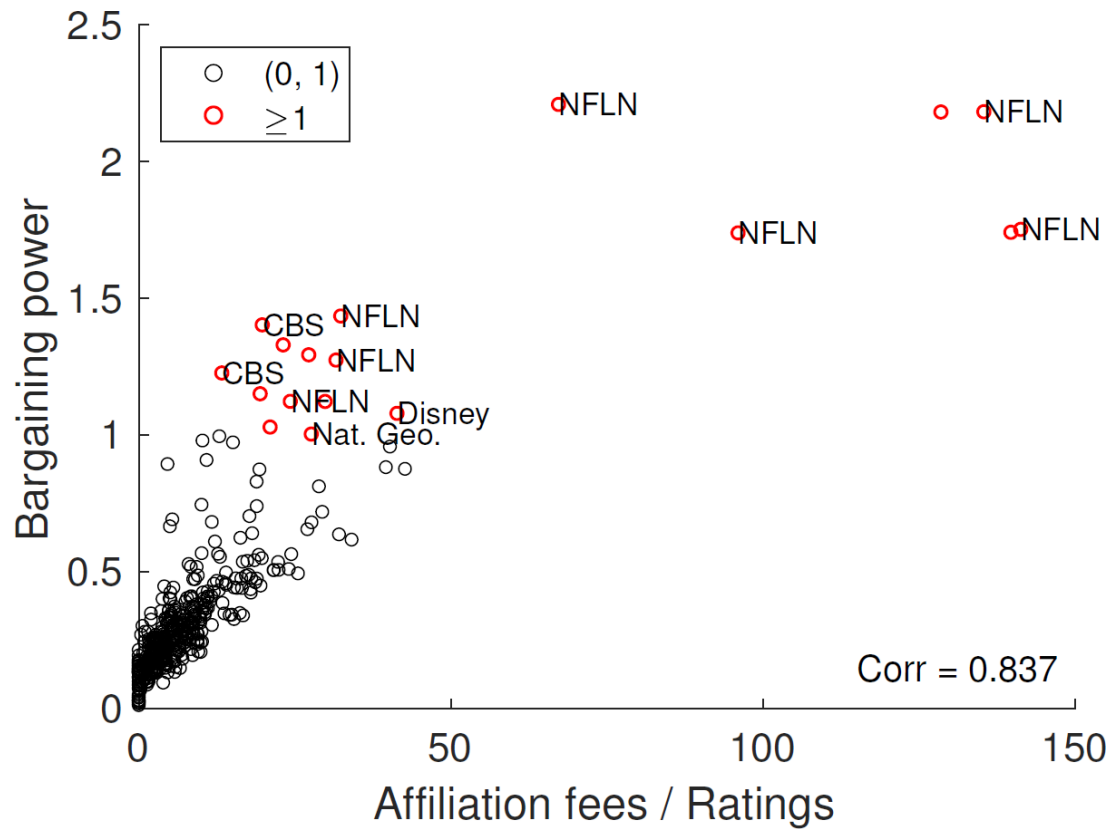
- Elasticity estimates for streaming indicate **statically suboptimal pricing** according to model.
- We interpret the implied negative marginal costs as **introductory pricing incentives**.

Table 3: Elasticity Estimates

	Cable/Telco	Satellite	Netflix	Hulu	Amazon
Cable/Telco	<b>-1.58</b>	3.55	-0.03	0.55	0.10
Satellite	1.63	<b>-4.70</b>	0.20	0.21	0.17
Netflix	-0.06	0.05	<b>-0.42</b>	-0.22	-0.17
Hulu	-0.01	0.01	-0.04	<b>-0.51</b>	-0.06
Amazon	-0.02	0.01	-0.05	-0.11	<b>-0.51</b>

Notes: Mean percentage change in column share for percentage change in row price for 2017.

# Estimates – Supply Side





# Counterfactual Analysis

# Counterfactual Analysis: Value of Streaming

Table 4: 2017 Value of Streaming Counterfactual Simulation Results

	Scenarios	
	2017 Status Quo	No Streaming
<b>A: Market Outcomes</b>		
Any Streaming	54.0%	0.0%
Streaming Only	12.9%	0.0%
Broadcast Only	9.5%	16.9%
Average Number of Streaming	0.80	0.00
<b>B: Consumers</b>		
Monthly Expenditure	\$82.4	\$78.5
Daily Hours Watched	8.28	7.61
Consumer Surplus from Broadcast Channels	189.1	189.1
Consumer Surplus	380.9	348.3
<b>C: Firm Profits (\$ Per Household)</b>		
<u>Cable/Telco/Satellite Distributor</u>		
Subscription Revenues (+)	71.4	78.5
Advertising Revenues (+)	8.9	9.3
Marginal Costs (−)	25.2	25.8
Affiliation Fees (−)	35.8	41.7
Profits	19.3	20.3
<u>Streaming Package</u>		
Subscription Revenues (+)	10.9	0.0
Marginal Costs (−)	-12.3	0.0
Program Expenses (−)	6.7	0.0
Profits	16.5	0.0
<u>Channel</u>		
Affiliation Fees (+)	35.8	41.7
Advertising Revenues (+)	40.9	42.9
Program Expenses (−)	46.6	50.9
Profits	30.1	33.8
<u>Studio</u>		
Program Revenues (+)	53.3	50.9
Investment Costs (−)	27.0	27.0
Profits	26.3	23.9
<b>D: Total Welfare</b>		
Industry Profits	92.3	78.0
Total Welfare	473.1	426.3

Notes:

- **New content** from Netflix, Hulu, and Amazon at **attractive prices** led to about 32 dollars per household per month consumer surplus in the late 2010's.
- Not surprising these were popular products!



# Counterfactual Analysis: Streaming Only

Table 6: 2023 Streaming Only Counterfactual Simulation Results: Prices

	Scenarios			
	Status Quo	Streaming Only	Status Quo Zero MC	Streaming Only Zero MC
<b>A: Cable/Telco/Satellite Package (No Premium Channels)</b>				
Cable/Telco	101.0		105.6	
DirecTV	115.0		111.7	
Dish	105.0		103.4	
YouTube TV	73.0		77.5	
<b>B: Streaming Package</b>				
Amazon	8.0	10.1	34.9	38.4
Disney+	12.9	18.3	19.8	27.1
ESPN+	11.0	14.4	16.0	20.9
Fox Nation	6.0	11.9	19.3	31.4
Hulu	13.5	21.4	24.4	38.3
Max	16.5	30.7	25.4	46.8
Netflix	15.4	20.3	42.9	50.6
Paramount+	9.8	16.3	19.3	31.4
Peacock	7.4	17.4	22.1	48.9

Notes: Prices are in dollars per month.

- Here we use market shares, prices, and viewership shares to calibrate to the 2023 market for the first column.
- For “Streaming Only,” **all content migrates to some streaming platform**, e.g. Monday Night Football migrates to ESPN+.

# Counterfactual Analysis: Streaming Only

Table 7: 2023 Streaming Only Counterfactual Simulation Results: Market Shares

	Scenarios			
	Status Quo	Streaming Only	Status Quo Zero MC	Streaming Only Zero MC
<b>A: Cable/Telco/Satellite Package (Basic + Premium)</b>				
Cable/Telco	0.294		0.353	
DirecTV	0.059		0.069	
Dish	0.035		0.035	
YouTube TV	0.130		0.168	
<b>B: Streaming Package</b>				
Amazon	0.410	0.463	0.132	0.179
Disney+	0.260	0.317	0.133	0.212
ESPN+	0.130	0.155	0.067	0.103
Fox Nation	0.050	0.064	0.015	0.031
Hulu	0.320	0.391	0.153	0.237
Max	0.190	0.297	0.090	0.217
Netflix	0.520	0.582	0.211	0.289
Paramount+	0.200	0.264	0.084	0.155
Peacock	0.140	0.200	0.044	0.092

Notes: Market shares are the fraction of households subscribing to the service.

- Disney+, ESPN+, and Hulu are all integrated under the Walt Disney Company.
- We model Amazon Prime Video as a standalone service using the standalone price and estimates of usage.

# Counterfactual Analysis: Streaming Only

Table 5: 2023 Streaming Only Counterfactual Simulation Results

	Scenarios			
	2023 Status Quo	Streaming Only	Status Quo Zero MC	Streaming Only Zero MC
<b>A: Market Outcomes</b>				
Any Streaming	76.4%	90.9%	45.8%	72.8%
Streaming Only	42.0%	90.9%	24.4%	72.8%
Broadcast Only	6.2%	9.1%	13.1%	27.2%
Average Number of Streaming	2.22	2.73	0.93	1.52
<b>B: Consumers</b>				
Monthly Expenditure	\$84.6	\$50.6	\$97.0	\$59.0
Daily Hours Watched	8.16	6.22	7.95	5.40
Consumer Surplus from Broadcast Channels	189.1	189.1	189.1	189.1
Consumer Surplus (Variance Adjusted 2)	380.5	326.7	361.6	289.4
Consumer Surplus (Raw)	407.9	341.5	381.8	300.2
<b>C: Firm Profits (\$ Per Household)</b>				
<u>Cable/Telco/Satellite Distributor</u>				
Subscription Revenues (+)	57.8	0.0	70.7	0.0
Advertising Revenues (+)	5.9	0.0	7.1	0.0
Marginal Costs (−)	27.2	0.0	32.0	0.0
Affiliation Fees (−)	20.4	0.0	27.2	0.0
Profits	16.1	0.0	18.5	0.0
<u>Streaming Package</u>				
Subscription Revenues (+)	26.8	50.6	26.3	59.0
Marginal Costs (−)	-32.4	-38.8	0.0	0.0
Program Expenses (−)	7.7	22.9	4.2	20.2
Profits	51.6	66.5	22.0	38.8
<u>Channel</u>				
Affiliation Fees (+)	20.4	0.0	27.2	0.0
Advertising Revenues (+)	31.0	11.2	35.1	11.2
Program Expenses (−)	30.8	7.7	37.5	7.7
Profits	20.6	3.4	24.8	3.4
<u>Studio</u>				
Program Revenues (+)	38.5	30.7	41.7	28.0
Investment Costs (−)	27.9	27.9	27.9	27.9
Profits	10.6	2.8	13.9	0.1
<b>D: Total Welfare</b>				
Industry Profits	98.9	72.7	79.2	42.3
Total Welfare	479.4	399.4	440.8	331.7

Notes: Revenues, costs, and surplus measures are in dollars per month per household.

- “Variance Adjusted” consumer welfare is for comparing to the no streaming world. All the possible combinations of streaming add many logit shocks, so we have a methodology to reduce the influence of those shocks on consumer welfare.

# Counterfactual Analysis: Rebundling

Table 8: Streaming Bundles Counterfactual Comparison

	Scenarios	
	Streaming Not in Bundle	Streaming in Bundle
<b>A: Market Outcomes</b>		
Any Streaming	29.5%	0.0%
Streaming Only	9.2%	0.0%
Broadcast Only	16.5%	16.6%
Average Number of Streaming	0.36	0.00
<b>B: Consumers</b>		
Monthly Expenditure	\$89.8	\$90.7
Daily Hours Watched	7.92	8.63
Consumer Surplus from Broadcast Channels	189.1	189.1
Consumer Surplus	359.7	363.1
<b>C: Firm Profits (\$ Per Household)</b>		
<u>Cable/Telco/Satellite Distributor</u>		
Subscription Revenues (+)	77.2	90.7
Advertising Revenues (+)	10.0	11.2
Marginal Costs (−)	32.5	36.7
Affiliation Fees (−)	36.3	45.4
Profits	18.3	19.9
<u>Streaming Package</u>		
Subscription Revenues (+)	12.6	0.0
Marginal Costs (−)	0.0	0.0
Program Expenses (−)	3.7	0.0
Profits	8.9	0.0
<u>Channel</u>		
Affiliation Fees (+)	36.3	45.4
Advertising Revenues (+)	39.6	43.1
Program Expenses (−)	45.5	49.9
Profits	30.4	38.6
<u>Studio</u>		
Program Revenues (+)	49.2	49.9
Investment Costs (−)	27.0	27.0
Profits	22.3	22.9
<b>D: Total Welfare</b>		
Industry Profits	79.8	81.4
Total Welfare	439.6	444.4

Notes: Revenues, costs, and surplus measures are in dollars per month per household.

- We consider competition between pure bundles of all available content.
- Importantly, the streaming services negotiate with the distributors as if they were cable channels.
  - Dubious that they would use flat fees to license their streaming services to competing distributors.

# Conclusion

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- Television has undergone a **partial unbundling** and **forward vertical integration** into distribution by studios through streaming services.
- Is this the future we want?
- Our analysis indicates:
  - **Consumer welfare benefits from low priced additional content** from new streamers Netflix, Amazon, and Hulu.
  - Eliminating bundles and moving to “**streaming only**” would **lower consumer welfare**.
  - **If prices rise** because current prices reflect introductory incentives, **then even worse**.
  - **Benefits to rebundling** television content, the same way music is bundled.
    - Distributors would no longer necessarily be cable companies, but could be YouTube TV, Roku, Amazon, Apple, Fubo, or other new entrants.