

Exclusive Contracts in the Video Streaming Market

Yihao Yuan

UPenn Wharton

September 5, 2024

Motivation

- **87% of the third-party titles are available on only one streaming service**
 - Enabled by prevalent exclusive contracts with studios
 - E.g., Netflix and Warner Bros. (*Friends*), Hulu and FX Networks (*Fargo*)

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- **Exclusive contracts are controversial**
 - Higher consumer spending, partly due to multi-homing

The New York Times

How to Navigate a Flood of Streaming TV Subscriptions

We wanted à la carte television, and now we have it — and it costs more than cable. Here's how to watch your favorite shows without overpaying for a dozen apps.



Forbes HOME

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Home Improvement > Internet > Streaming Trends

Advertiser Disclosure

Streaming Trends for 2024: 44% Report Streaming Costs Increasing Over the Last Year

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- Exclusive contracts are controversial
 - Higher consumer spending, partly due to multi-homing
 - Big services secure exclusive deals more easily; too costly for smaller platforms

Netflix News and Previews

Netflix Reportedly Offered \$90 Million to Keep 'The Office'



Kasey Moore · X @kasey_moore
June 25th, 2019 ·

The New York Times

Netflix Will Keep 'Friends' Through Next Year in a \$100 Million Agreement

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Why streamers are shrinking their content libraries

PUBLISHED TUE, APR 2 2024 7:00 AM EDT



Sarah Whitten
@SARAHWHIT10

WATCH LIVE

KEY POINTS

- In the face of profit pressures and growing competition for users, streamers have turned to removing content to avoid the residual payments and licensing fees.

Forces Behind Exclusive Contracts

- Streaming services use them for **differentiation**
 - Attract new subscribers and soften competition
 - Increase streaming service profits

Forces Behind Exclusive Contracts

- Streaming services use them for differentiation
 - Attract new subscribers and soften competition
 - Increase streaming service profits
- Studios use them as threats in bargaining
 - Studios play streaming services off against each other in bargaining to negotiate favorable deals

Amazon & Netflix Enter a Multi-Million Dollar
Bidding War for 'Crime 101'



Paper Overview

- Who gains and who loses from exclusive contracts?

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- Develop a structural model
 - Consumer demand, subscription price setting \implies differentiation
 - Bilateral contracting \implies bargaining

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 - Title viewership
 - Household subscriptions
 - Title distribution and characteristics

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- Assemble new, highly detailed data from various sources for estimation
 - Title viewership
 - Household subscriptions
 - Title distribution and characteristics
- Contributions
 - Methodological: Identify bargaining powers of firms without data on contractual terms
 - Substantive: Quantify exclusive contracts' effect using a counterfactual without them

Preview of Results

Streaming Services

- Small services (like Hulu) gain substantially
- Large services (Netflix and Amazon) see minimal or negative impact
- Reason: Small services rely on exclusive third-party content for differentiation

Studios

- Small studios gain
- Large studios lose
- Reason: Small studios rely on using exclusive contracts as a bargaining tool

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Consumers

- Consumers lose
- Reason: reduced title distribution and higher subscription prices

Outline

A Stylized Model of Contract Negotiations

Data and Descriptive Evidence

Main Model

Estimation

Counterfactual

The Video Streaming Market



Studios

- Focus on **subscription-based** services



Streaming Services



Consumers

The Video Streaming Market



Studios

Third-party titles

- Focus on subscription-based services

- Title Categories

- In-house titles
- Third-party titles: involve contract negotiations



Streaming Services

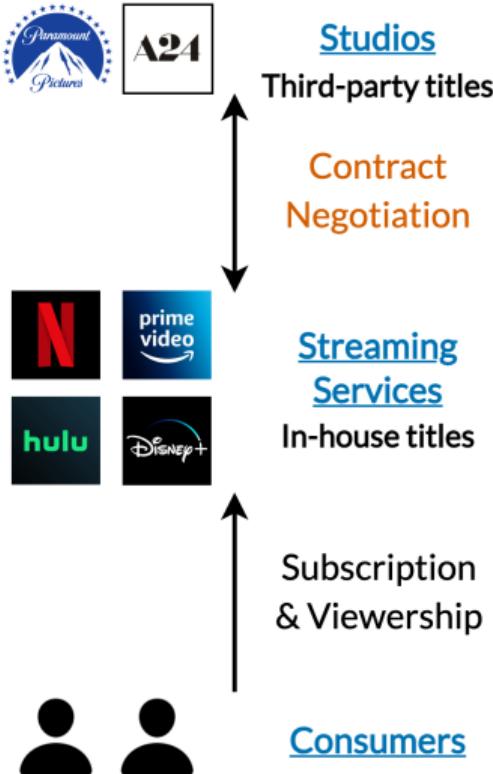
In-house titles

Subscription & Viewership



Consumers

The Video Streaming Market



- Focus on subscription-based services
- Title Categories
 - In-house titles
 - Third-party titles: involve contract negotiations
- Four facts about contract negotiations
 - Negotiations occur at the title level
 - Contracts typically last 12 months
 - Licensing fees are paid in lump sums, with no revenue sharing or performance bonuses
 - Major licensees: Netflix, Amazon, and Hulu

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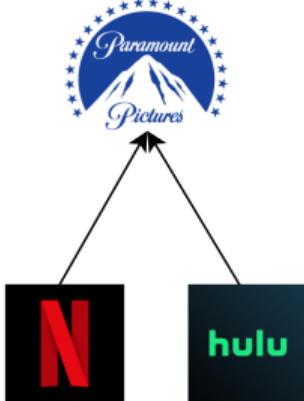
Counterfactual

A Stylized Model of Contract Negotiations

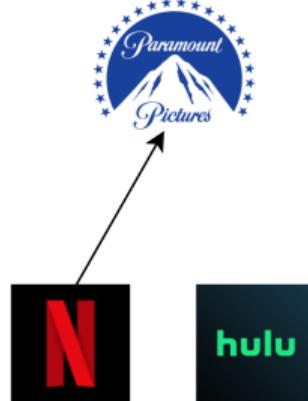
► Contract Example

(1) Both N and H

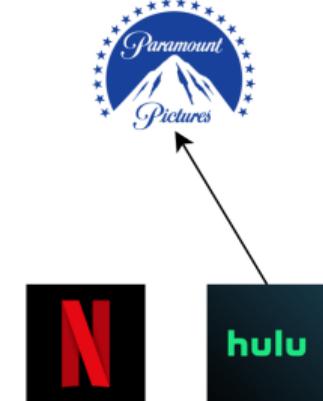
Bargaining
Parametric
Assumption



(2) Only N



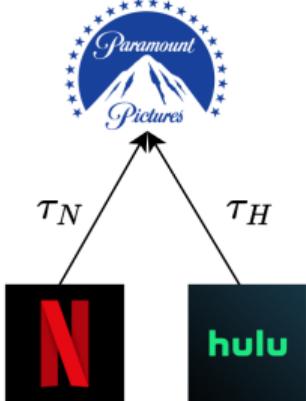
(3) Only H



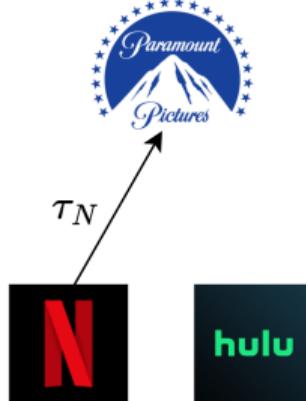
A Stylized Model of Contract Negotiations

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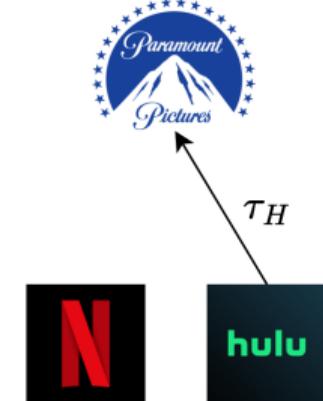
(1) Both N and H



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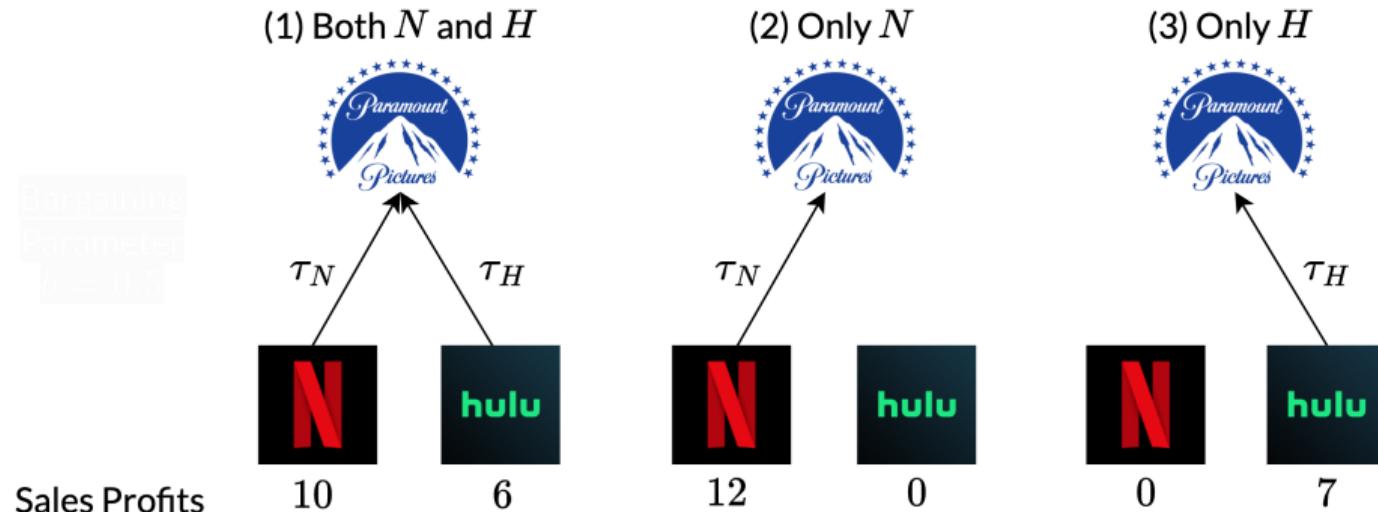


(3) Only H



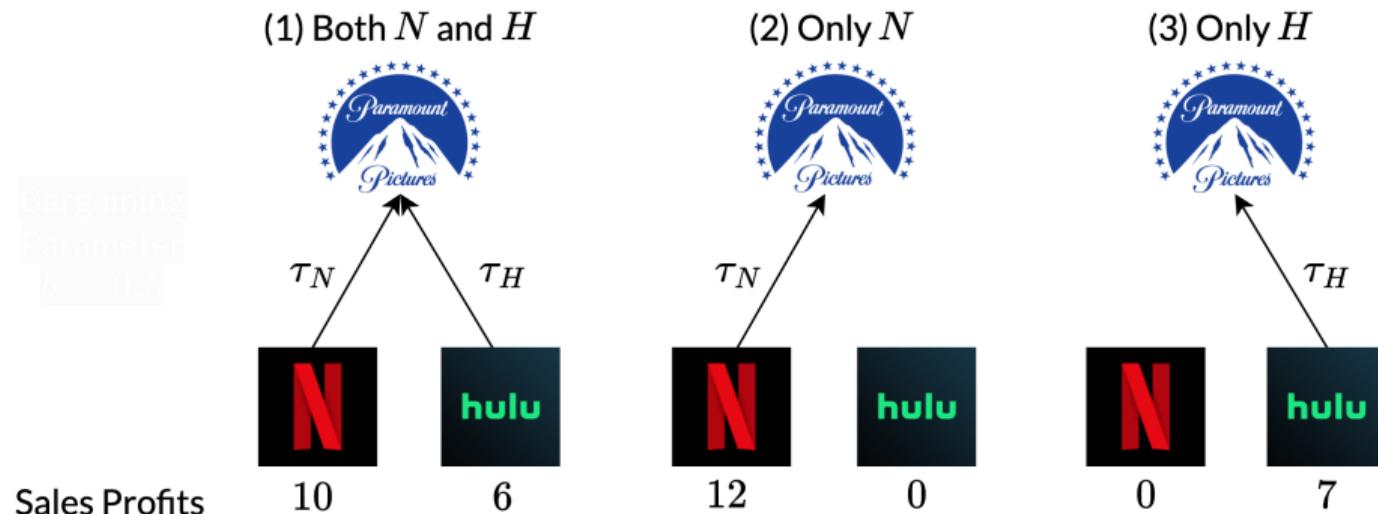
A Stylized Model of Contract Negotiations

► Contract Example



A Stylized Model of Contract Negotiations

▶ Contract Example



τ_N

τ_H

Paramount's Profit

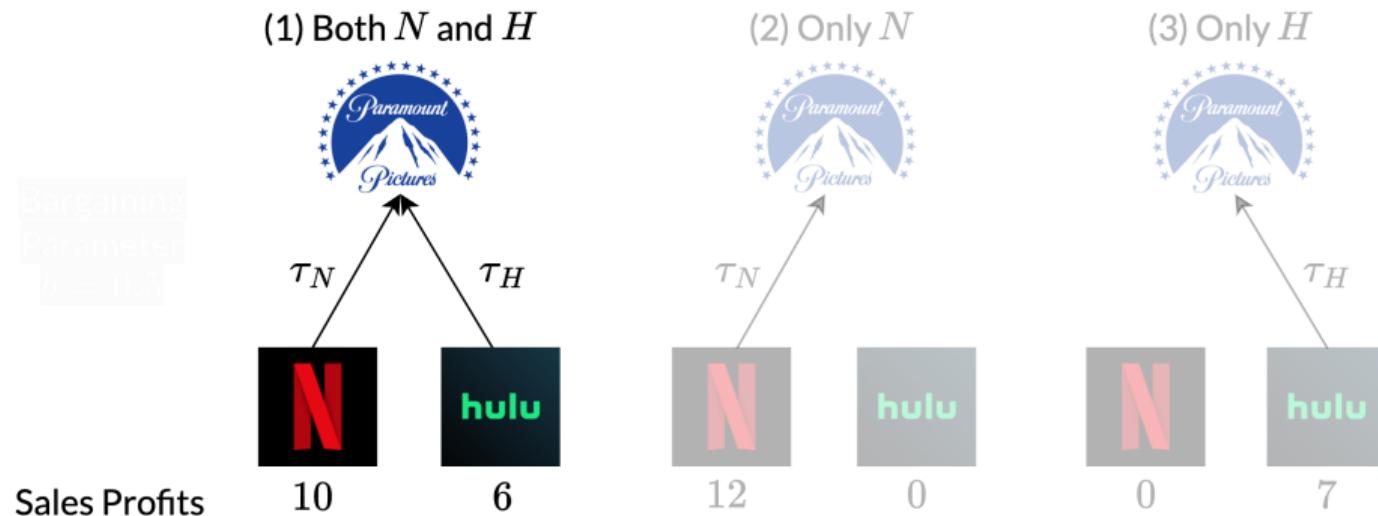
Both N and H

Only N

Only H

A Stylized Model of Contract Negotiations

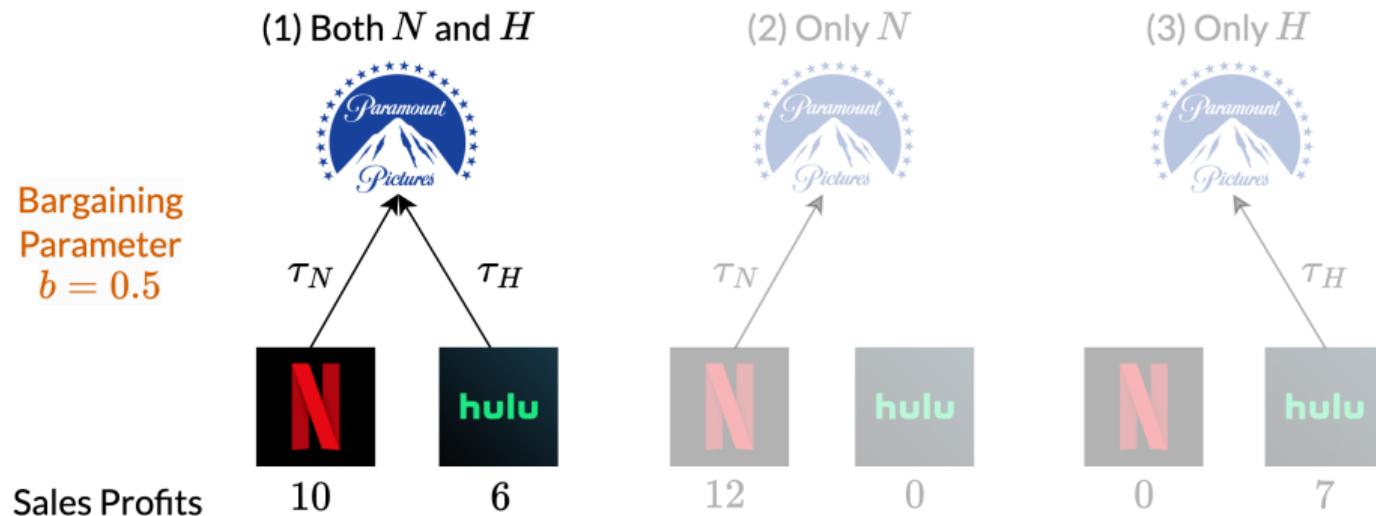
▶ Contract Example



	τ_N	τ_H	Paramount's Profit
Both N and H			
Only N			
Only H			

A Stylized Model of Contract Negotiations

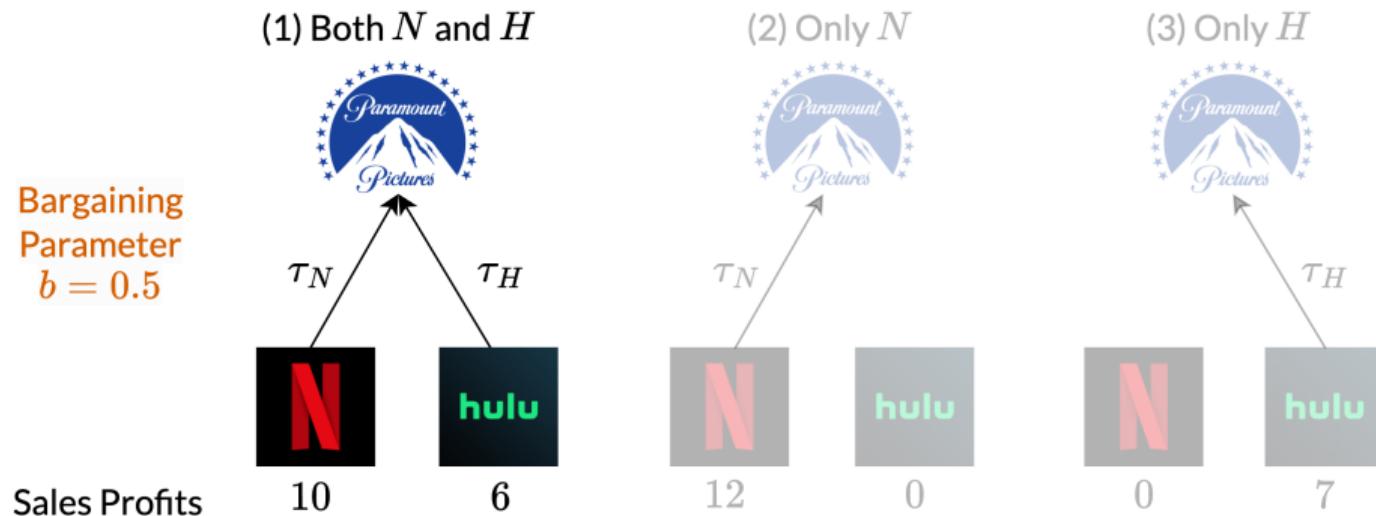
▶ Contract Example



	τ_N	τ_H	Paramount's Profit
Both N and H	$10b = 5$	$6b = 3$	8
Only N			
Only H			

A Stylized Model of Contract Negotiations

▶ Contract Example

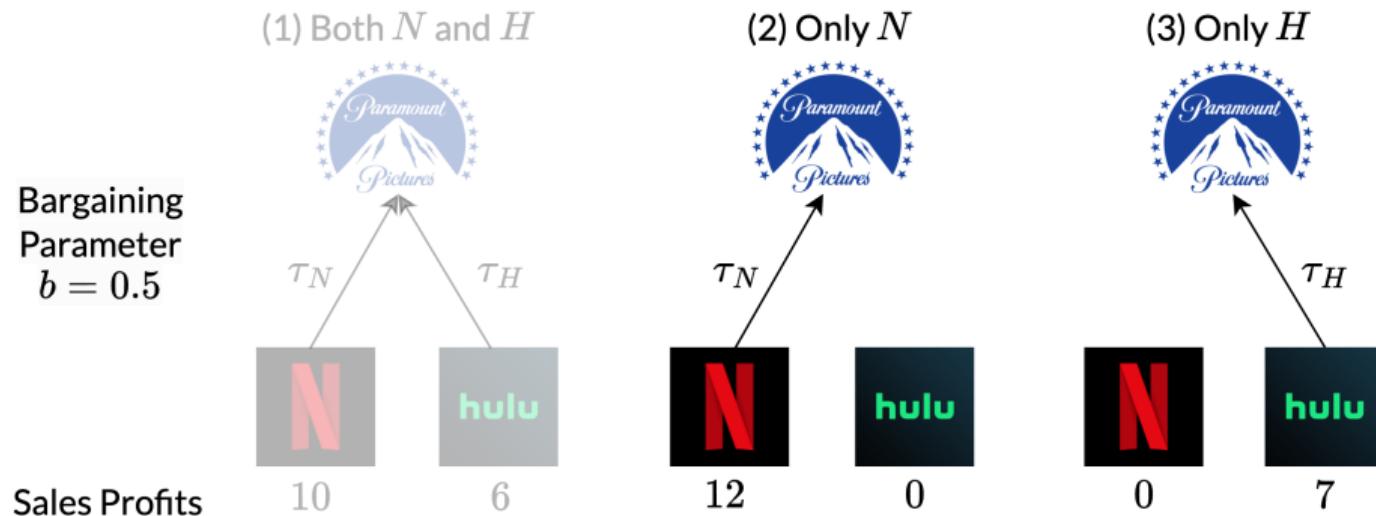


“Nash-in-Nash” outcome

	Paramount's Profit	
Both N and H	$10b = 5$	$6b = 3$
Only N		
Only H		

A Stylized Model of Contract Negotiations

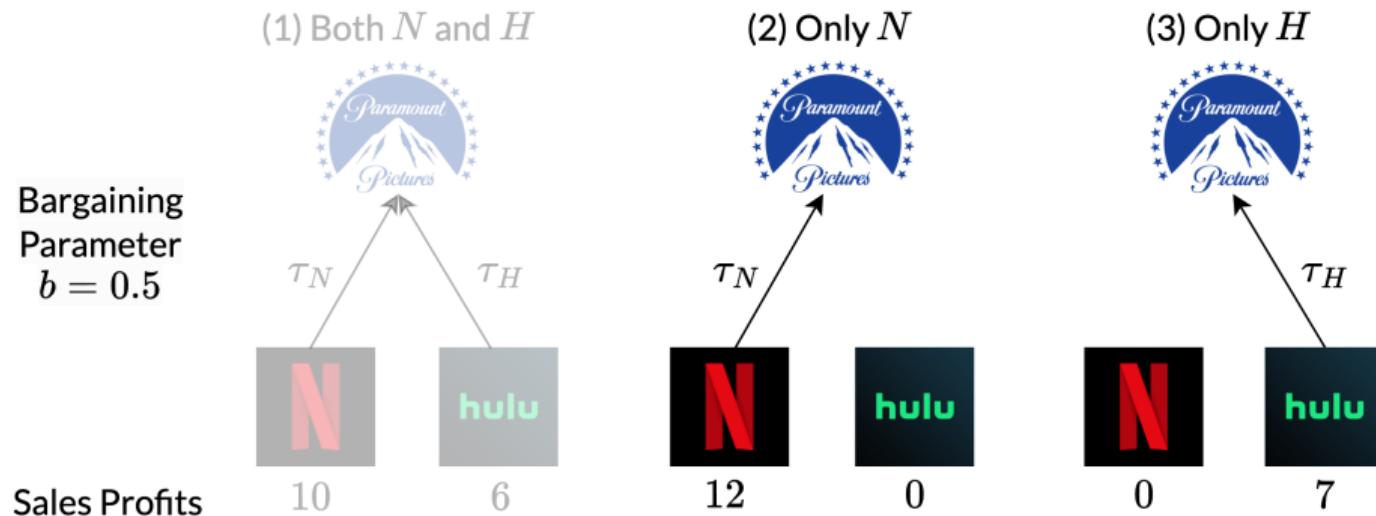
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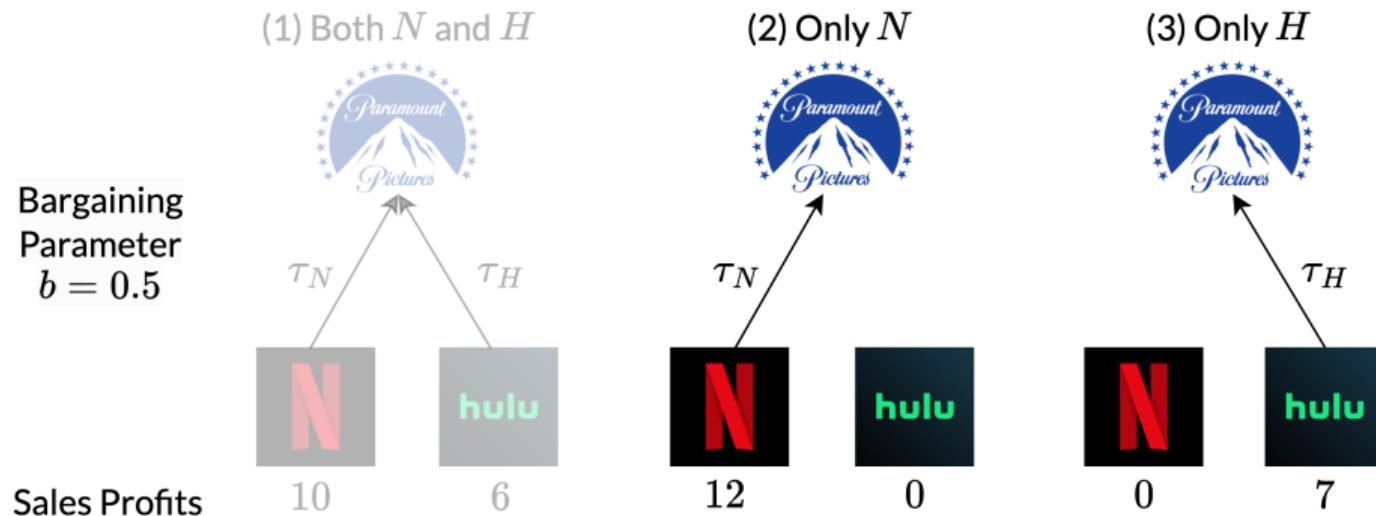


	τ_N	τ_H	Paramount's Profit
Both N and H	$10b = 5$	$6b = 3$	8
Only N	$12b$		
Only H			

“Nash-in-Nash”

A Stylized Model of Contract Negotiations

► Contract Example



	τ_N	τ_H	Paramount's Profit
Both N and H	$10b = 5$	$6b = 3$	8
Only N	$\max\{12b, 7\} = 7$	0	7
Only H			

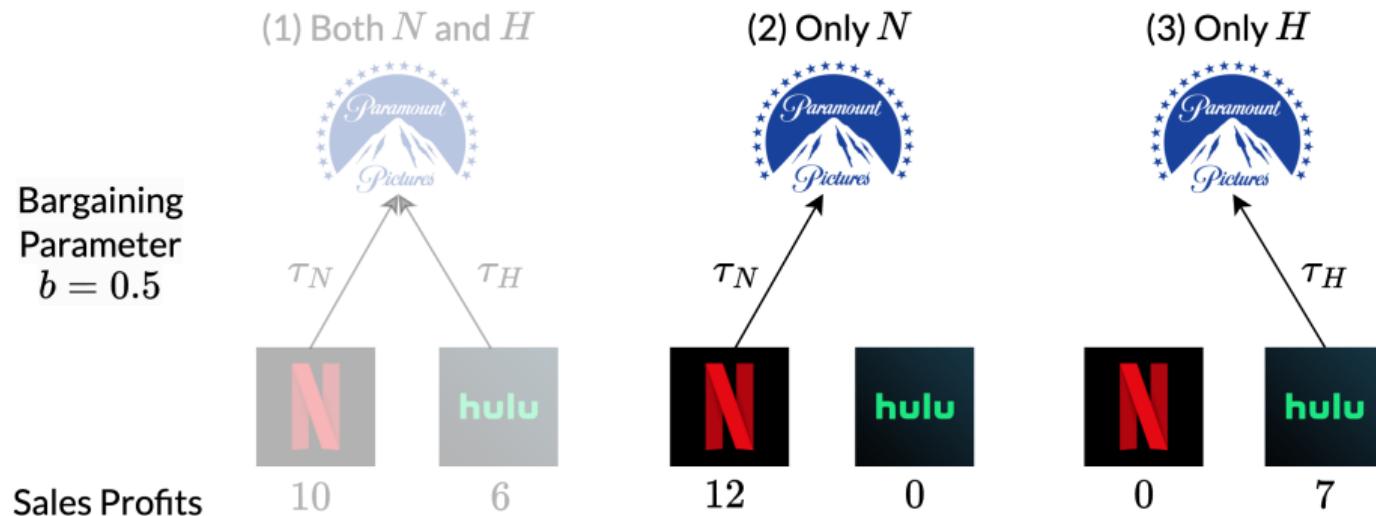
“Nash-in-Nash”

Use Hulu as a threat

(Ho and Lee 2019, Ghili 2022)

A Stylized Model of Contract Negotiations

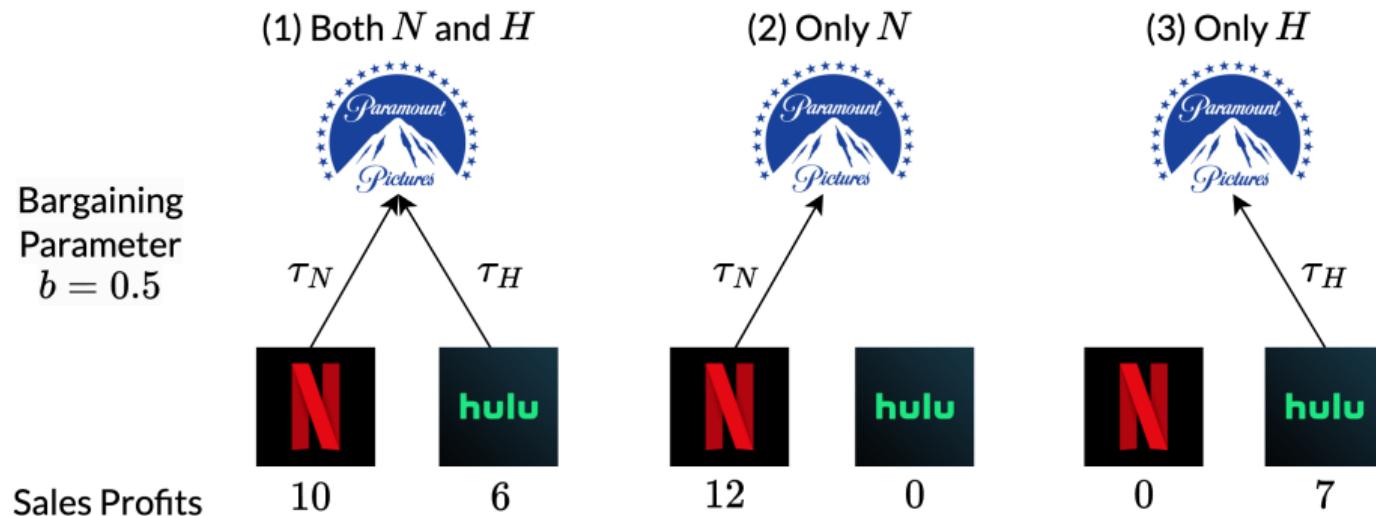
▶ Contract Example



	τ_N	τ_H	Paramount's Profit
Both N and H	$10b = 5$	$6b = 3$	8
Only N	$\max\{12b, 7\} = 7$	0	7
Only H		Not Stable	

A Stylized Model of Contract Negotiations

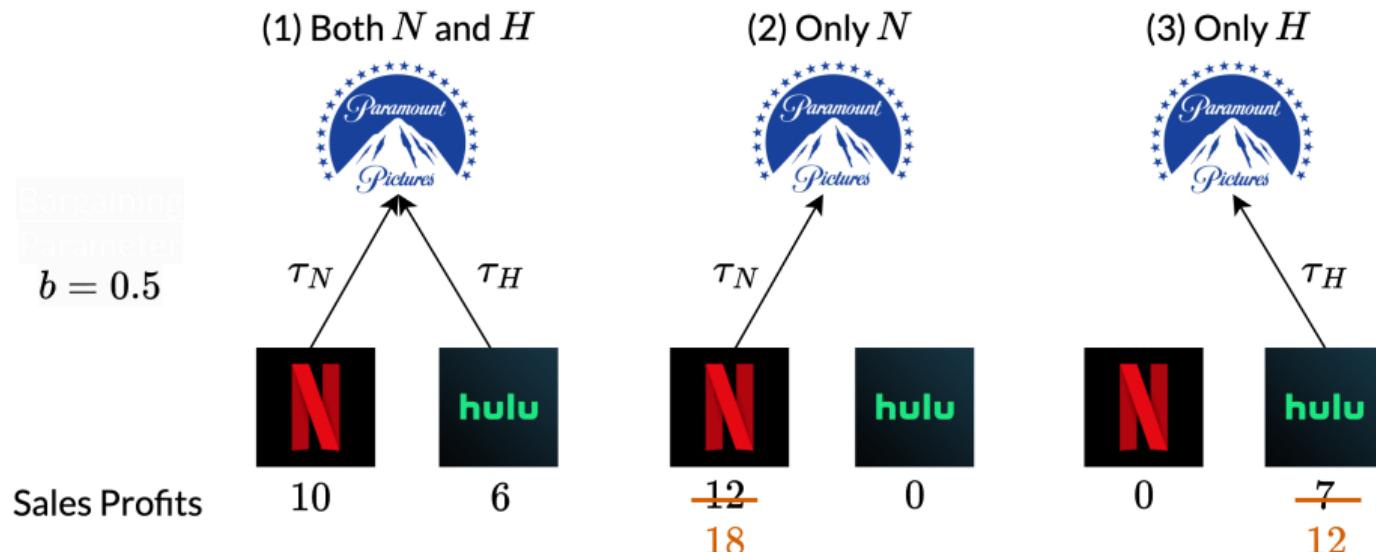
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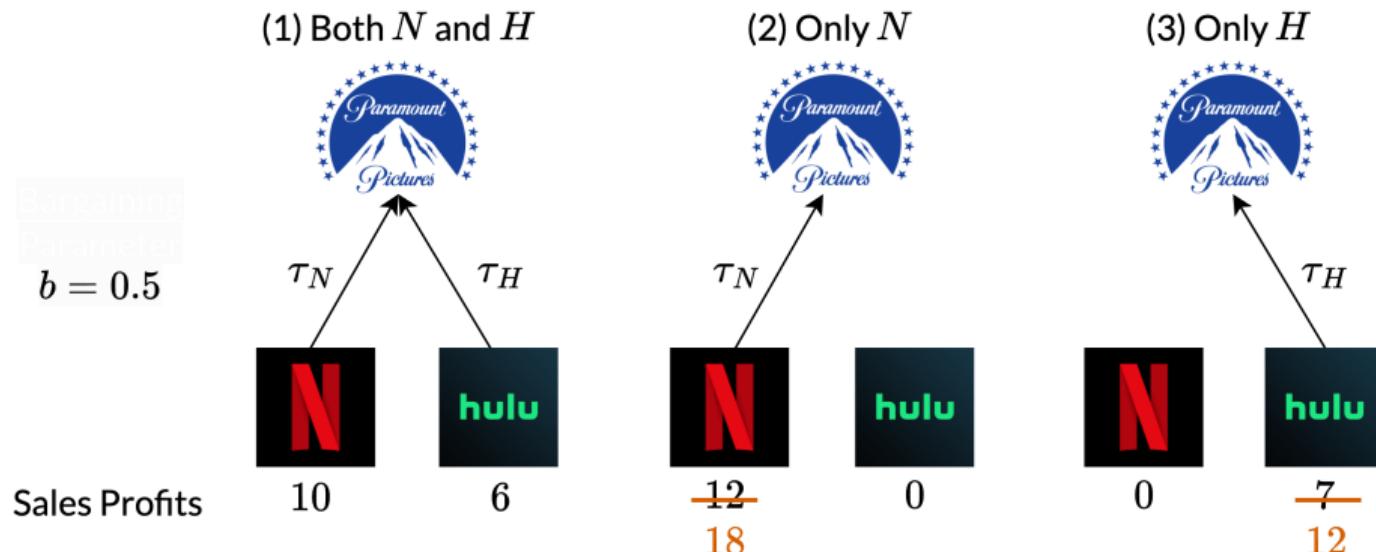
- Paramount chooses a distribution network to maximize profit

	τ_N	τ_H	Paramount's Profit
Both N and H	$10b = 5$	$6b = 3$	8
Only N	$\max\{12b, 7\} = 7$	0	7
Only H		Not Stable	

Rise of Exclusive Contracts: Role of Differentiation



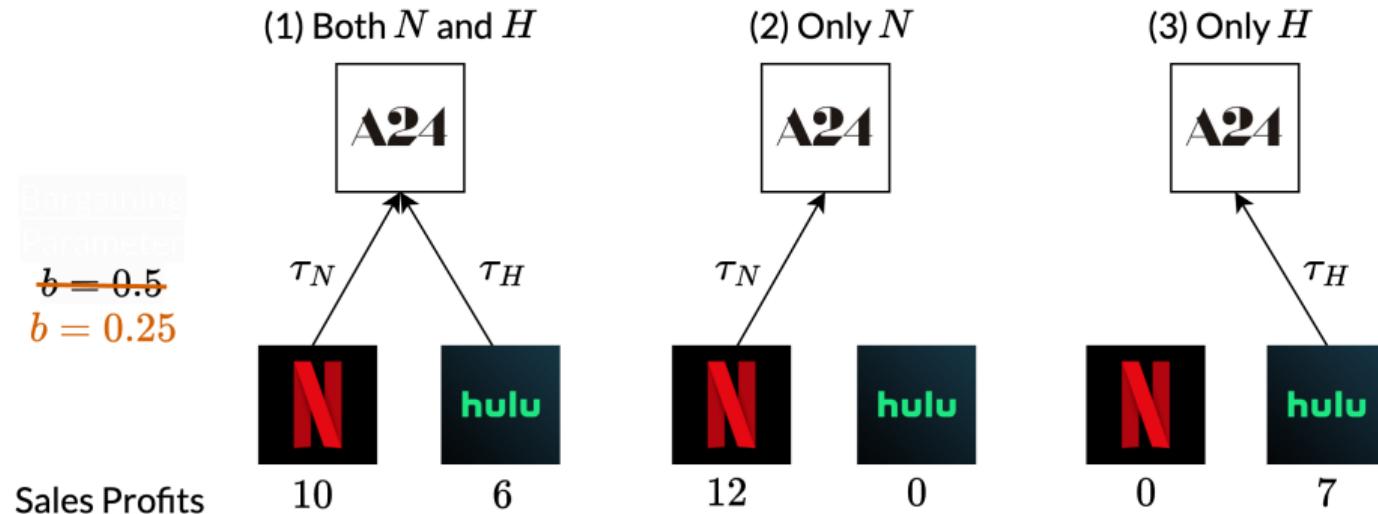
Rise of Exclusive Contracts: Role of Differentiation



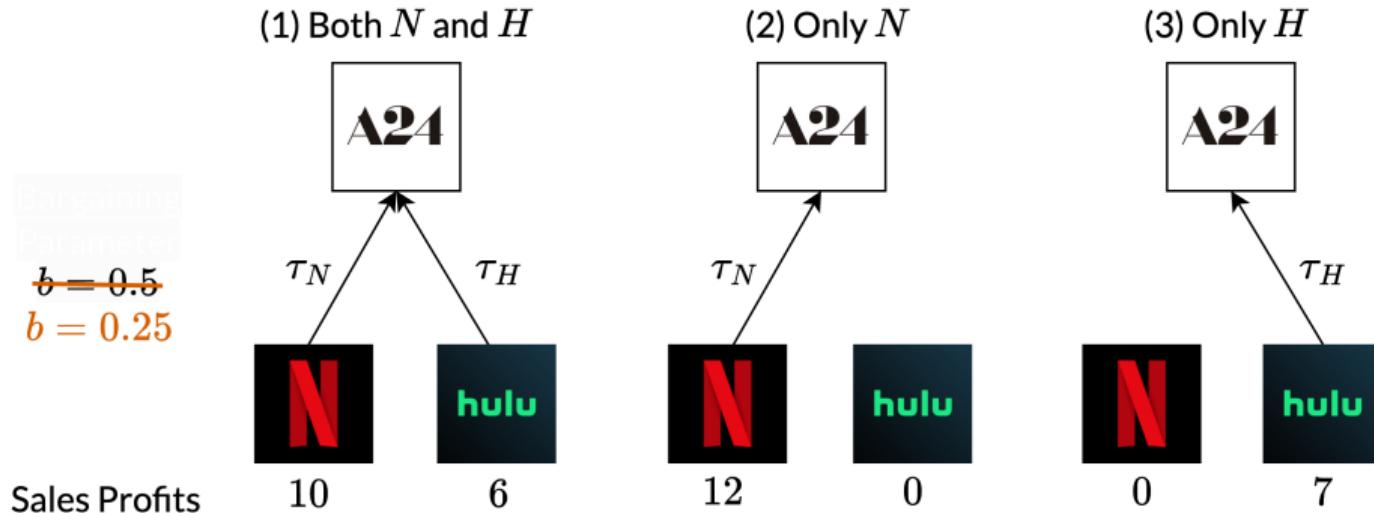
- Exclusive contracts can increase the pie through differentiation
- The extent depends on consumer multi-homing

	τ_N	τ_H	Paramount's Profit
Both N and H	5	3	8
Only N	12	0	12

Rise of Exclusive Contracts: Role of Bargaining



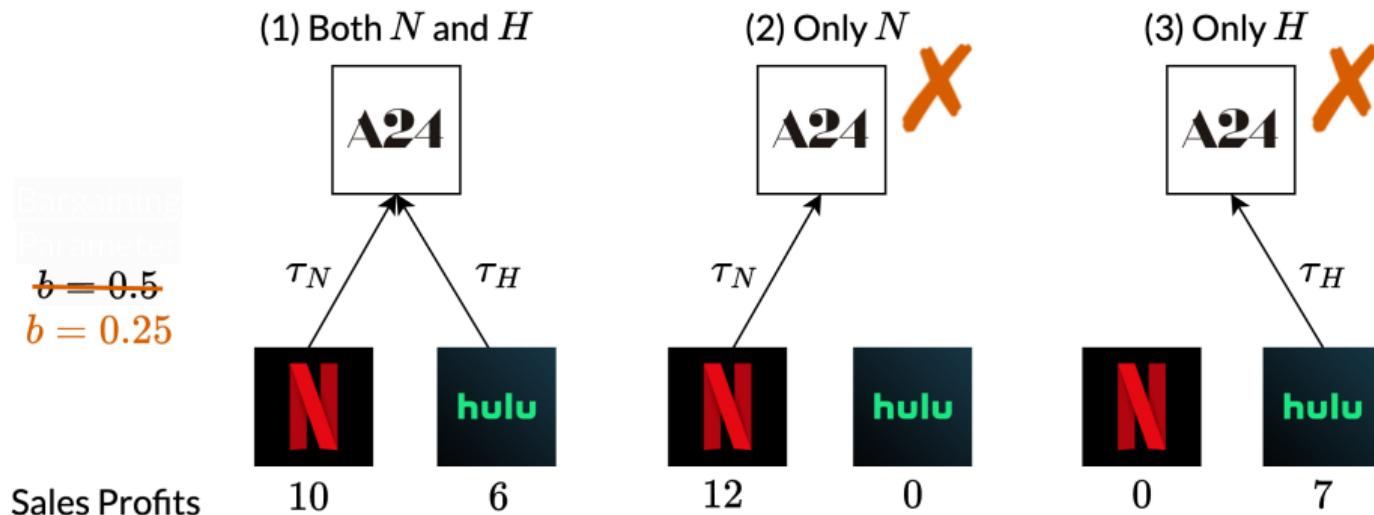
Rise of Exclusive Contracts: Role of Bargaining



- Exclusive contracts can arise even when they reduce the size of the pie
- Reason: A24 can use them as a bargaining tool to secure a larger share

	τ_N	τ_H	A24's Profit
Both N and H	2.5	1.5	4
Only N	7	0	7

Removal of Exclusive Contracts



- If exclusive contracts are removed: only network (1) is stable
- **Reason:** After contracting with Netflix, A24 would also seek a contract with Hulu

Takeaways from the Stylized Model

- **Two incentives for a studio to use exclusive contracts**
 - To create a large pie to be divided through streaming service **differentiation**
 - As a **bargaining** tool to acquire a larger slice of a potentially smaller pie

Takeaways from the Stylized Model

- **Two incentives for a studio to use exclusive contracts**
 - To create a large pie to be divided through streaming service differentiation
 - As a bargaining tool to acquire a larger slice of a potentially smaller pie
- **Key prediction that later tested using the data**
 - Studios with weaker bargaining power have stronger exclusionary incentives

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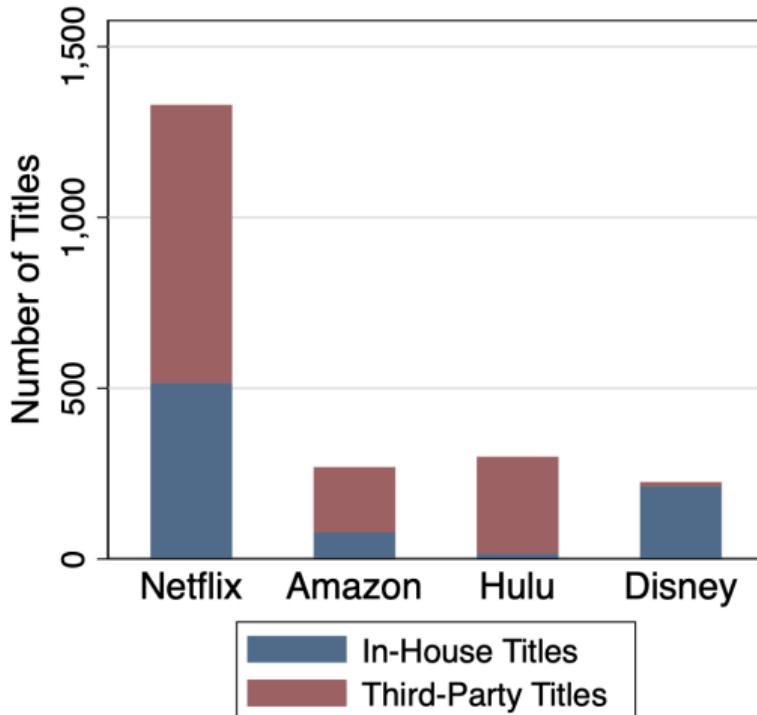
Data Scope

- **Time span:** March 2021 to February 2022
- **Top four services:** Netflix, Hulu, Disney Plus, and Prime Video
- **Top 2000 titles:** 1145 are third-party
- **Representativeness:** ~80% of total revenues, 91% of total viewership

Data: Overview

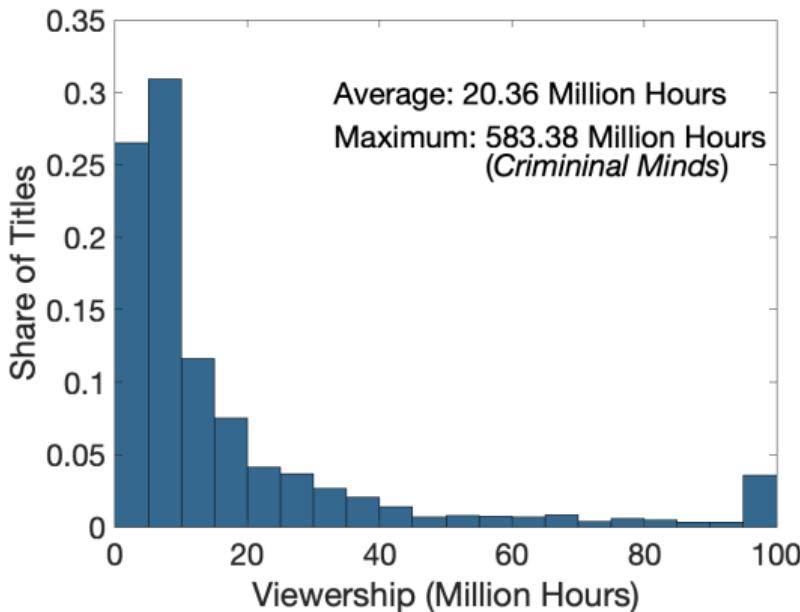
1. Title distribution (Source: Reelgood)

- Title distribution across streaming services



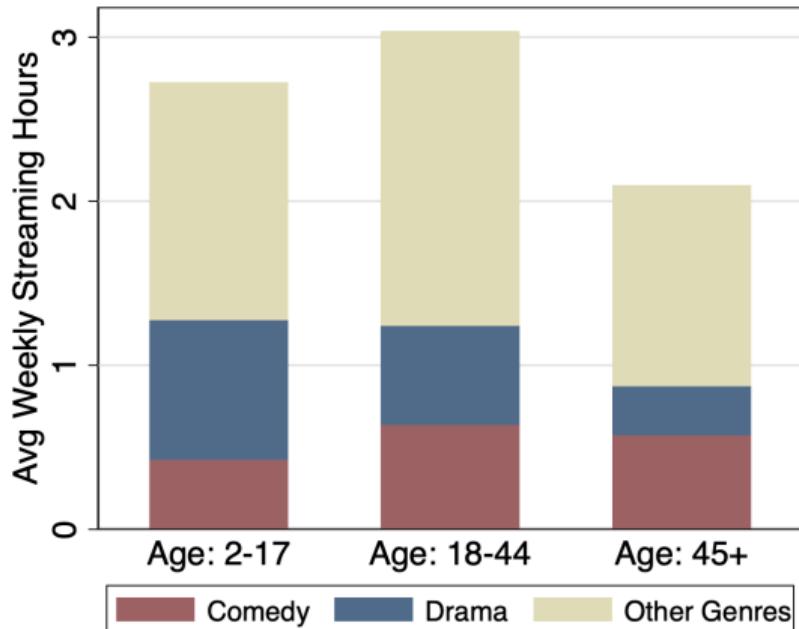
Data: Overview

1. **Title distribution** (Source: Reelgood)
2. **Title viewership** (Nielsen)
 - Viewership: time spent per title by the population



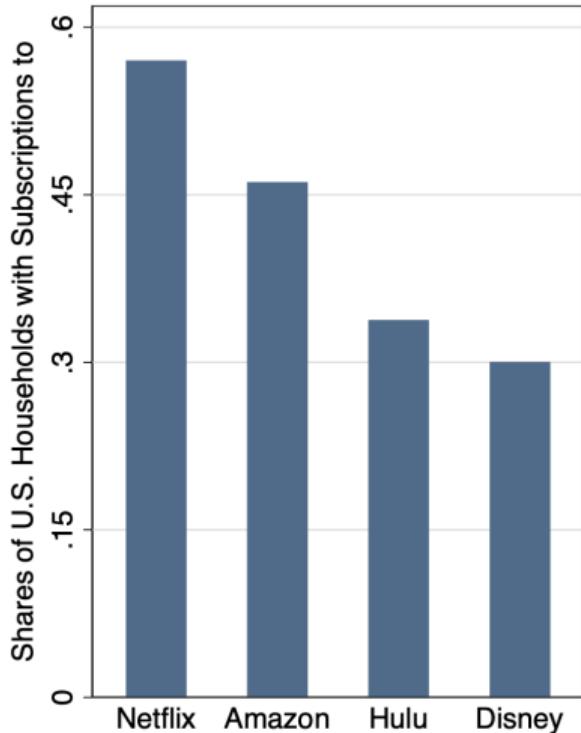
Data: Overview

1. **Title distribution** (Source: Reelgood)
2. **Title viewership** (Nielsen)
 - Viewership: time spent per title by the population
 - Weekly viewership by demographics



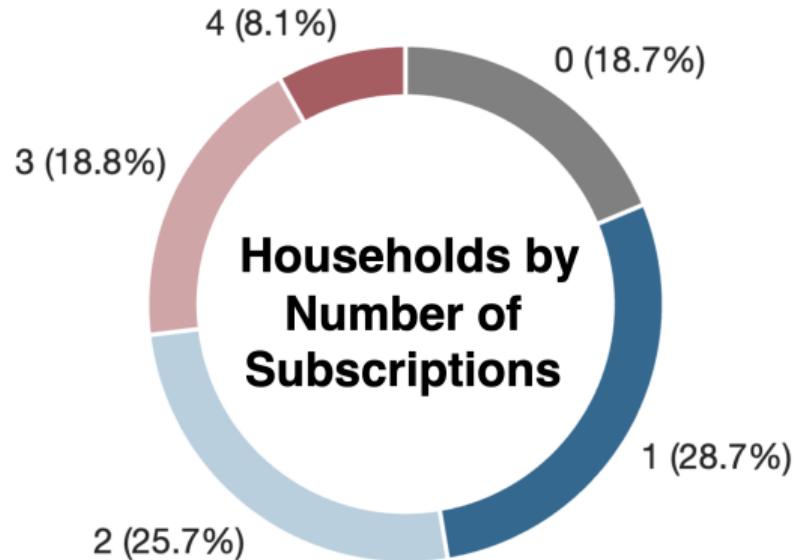
Data: Overview

1. **Title distribution** (Source: Reelgood)
2. **Title viewership** (Nielsen)
3. **Household subscriptions** (Nielsen)
 - Share of households with subscription to each streaming service combination



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Data: Overview

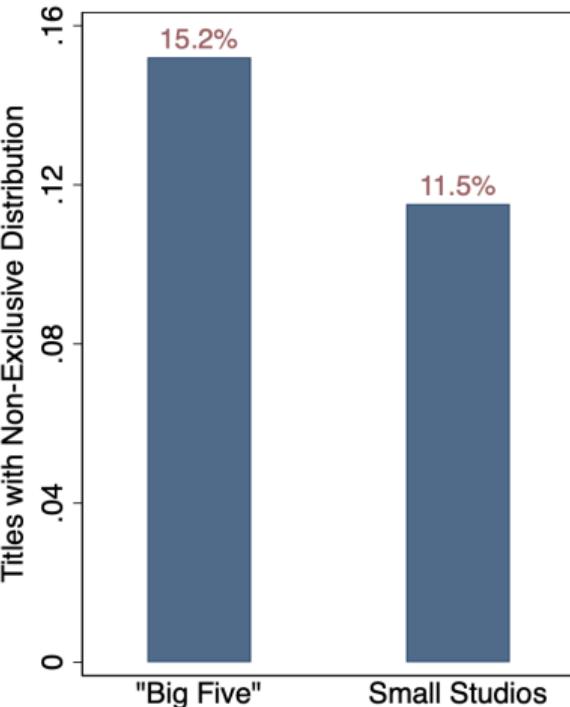
1. **Title distribution** (Source: Reelgood)
2. **Title viewership** (Nielsen)
3. **Household subscriptions** (Nielsen)
4. **Others**
 - Subscription prices (Bloomberg, fiscal reports)
 - Title characteristics (Reelgood, IMDB)

Bargaining as an Exclusionary Incentive

- Are studios with stronger bargaining power more likely to opt for non-exclusive distribution?

Bargaining as an Exclusionary Incentive

- Are studios with stronger bargaining power more likely to opt for non-exclusive distribution?
- Data: The “Big Five” studios are more likely to opt for non-exclusive distribution
 - “Big Five”: NBCUniversal, Paramount, Walt Disney, Warner Bros., Sony
 - The difference remains (-3.8% , $p < 0.05$) after controlling for title characteristics



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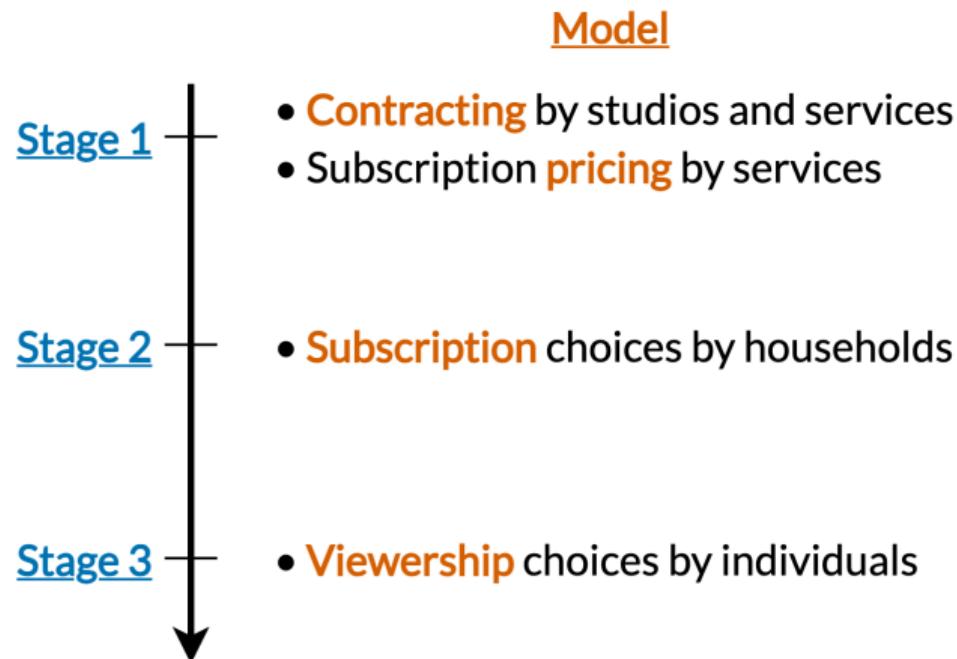
Data and Descriptive Evidence

Main Model

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Counterfactual

Main Model: Overview



Main Model: Overview

Stage 1

Model

- Contracting by studios and services
- Subscription pricing by services

Output

- How to divide the profits?
- The profit margin of a subscription?

Stage 2

- Subscription choices by households

Stage 3

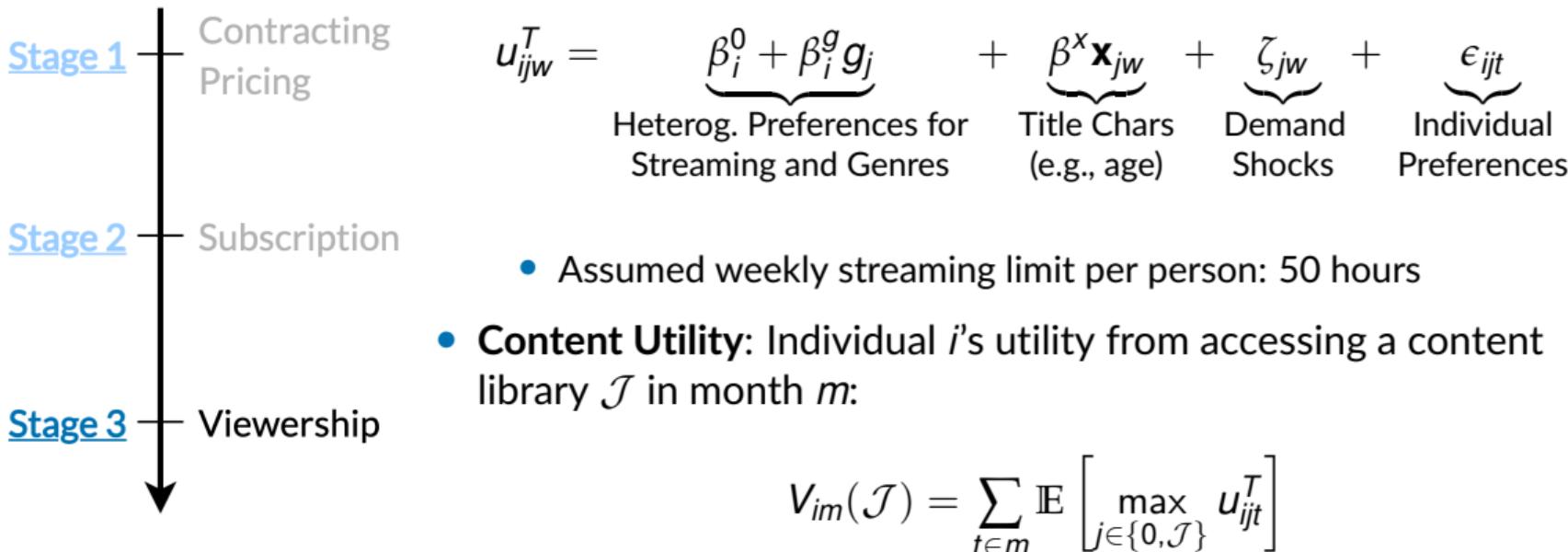
- Viewership choices by individuals

- How many new subscribers a service can gain from licensing a title?



Title Viewership

Model



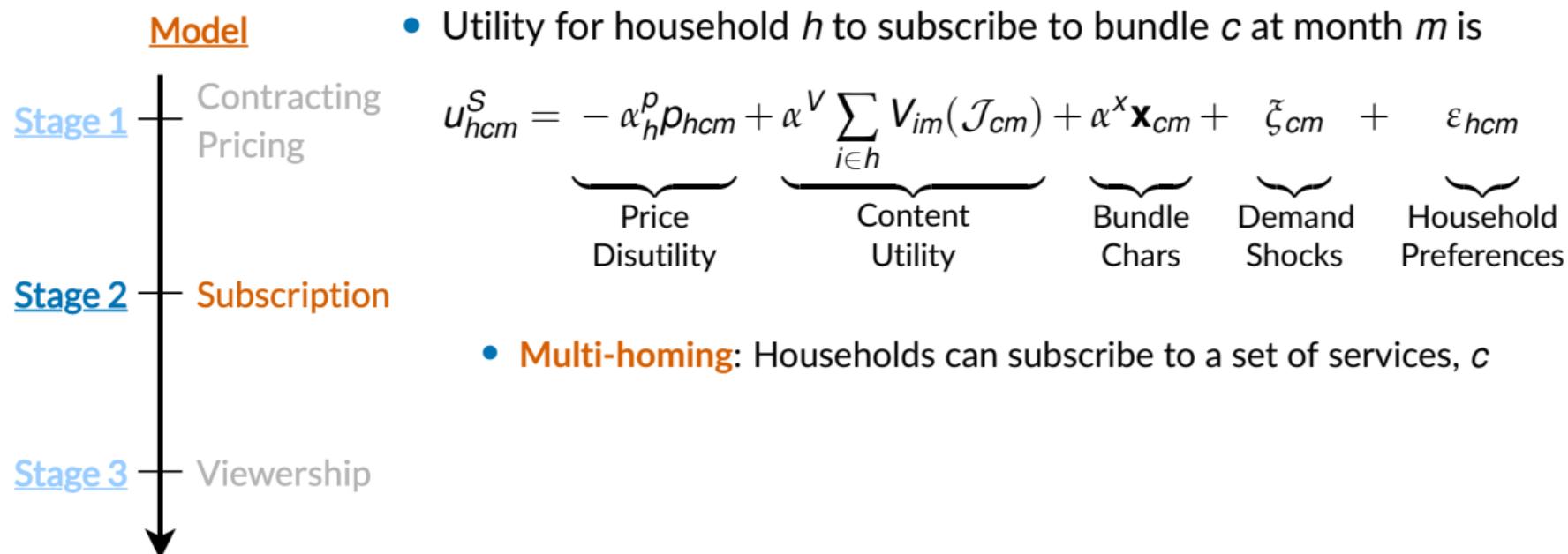
Service Subscription

Model

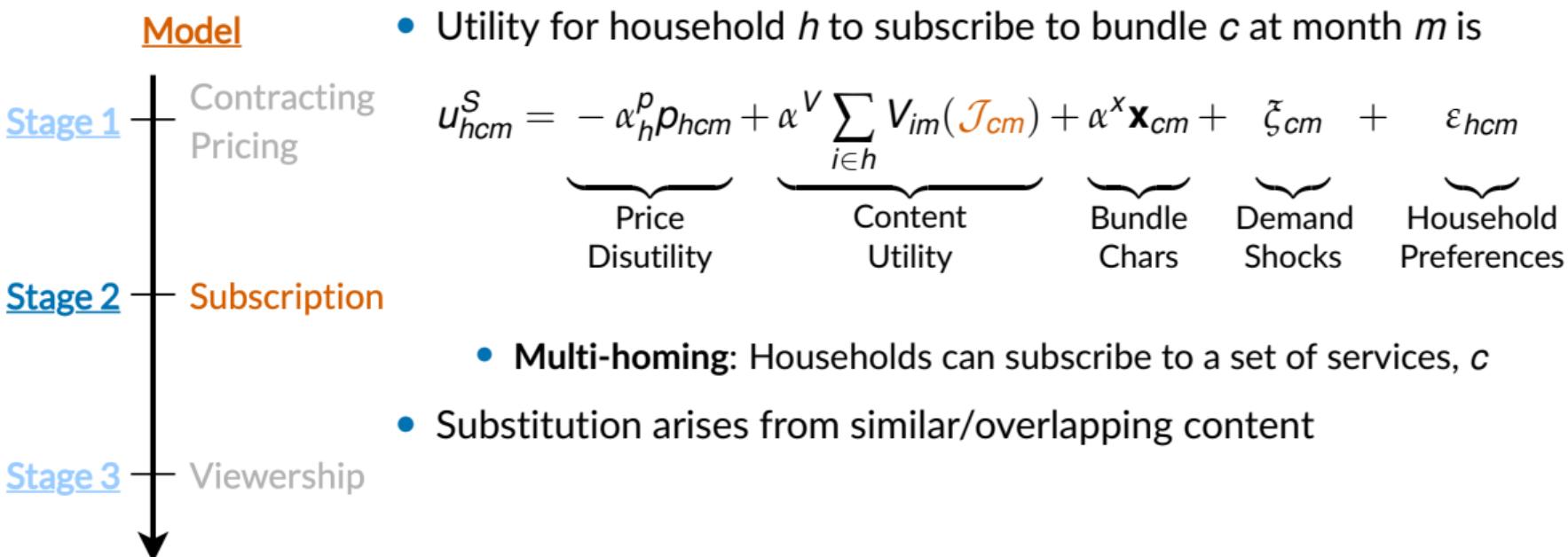
- Utility for household h to subscribe to bundle c at month m is

$$u_{hcm}^S = \underbrace{-\alpha_h^P p_{hcm}}_{\text{Price Disutility}} + \underbrace{\alpha^V \sum_{i \in h} V_{im}(\mathcal{T}_{cm})}_{\text{Content Utility}} + \underbrace{\alpha^X \mathbf{x}_{cm}}_{\text{Bundle Chars}} + \underbrace{\xi_{cm}}_{\text{Demand Shocks}} + \underbrace{\varepsilon_{hcm}}_{\text{Household Preferences}}$$

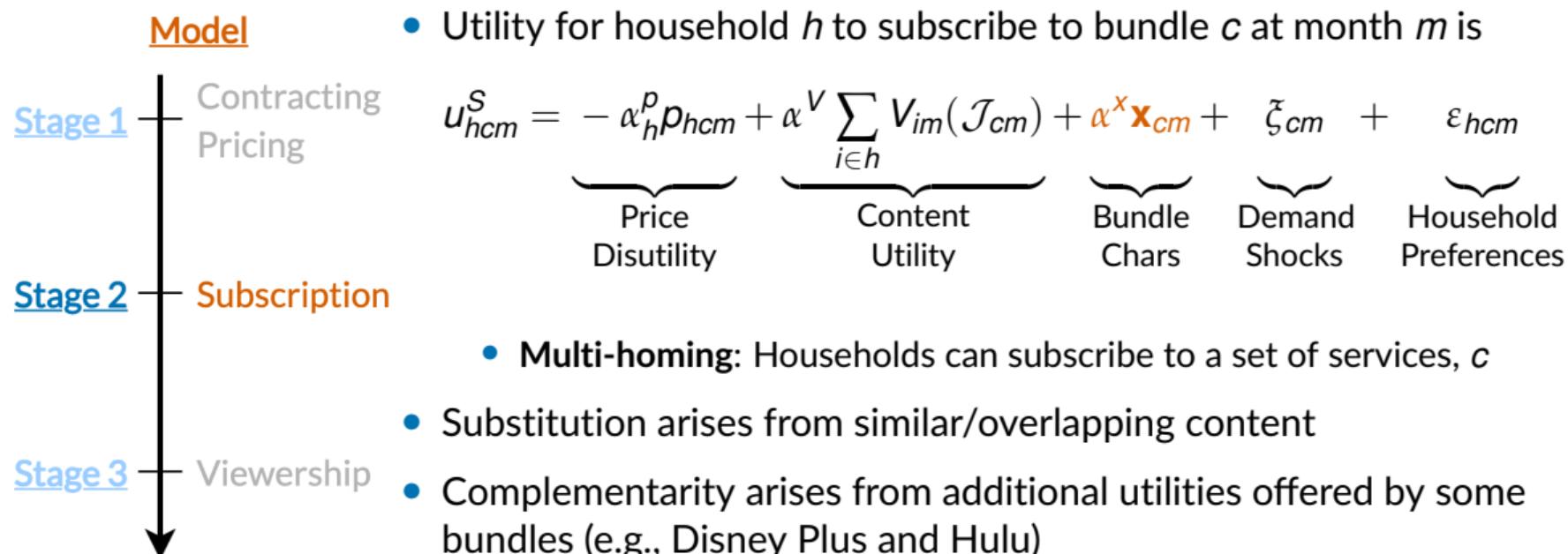
Service Subscription



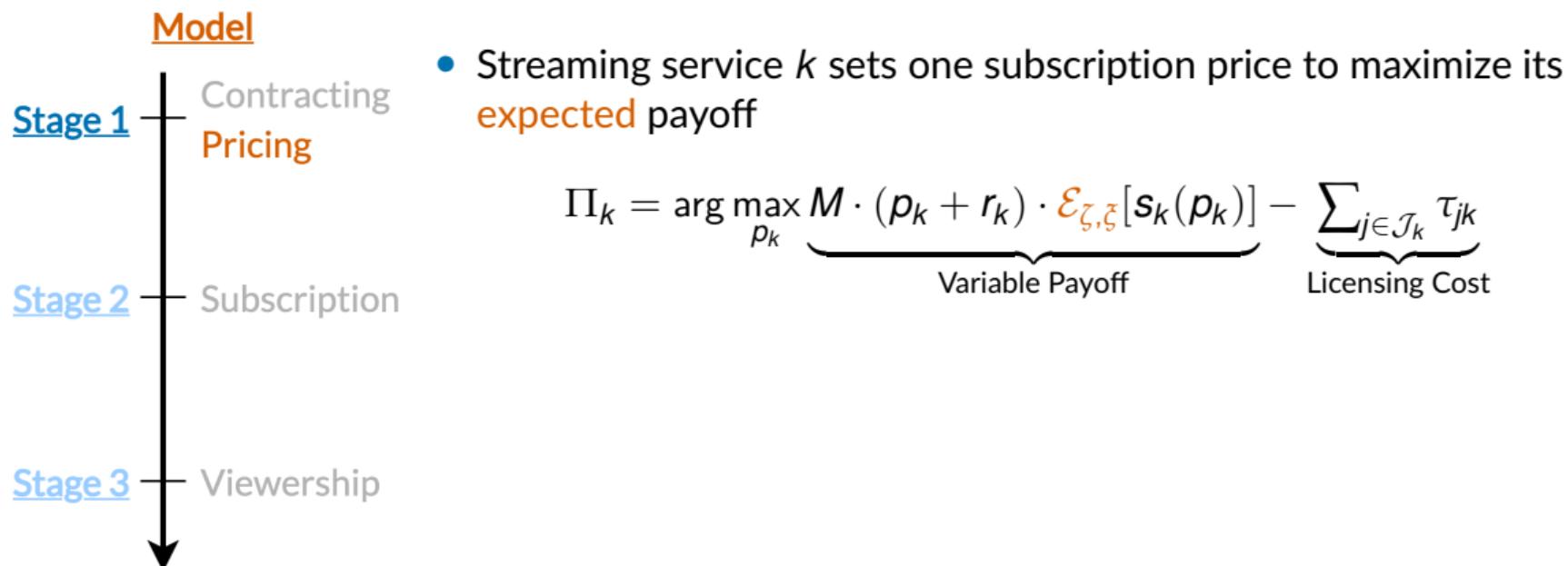
Service Subscription



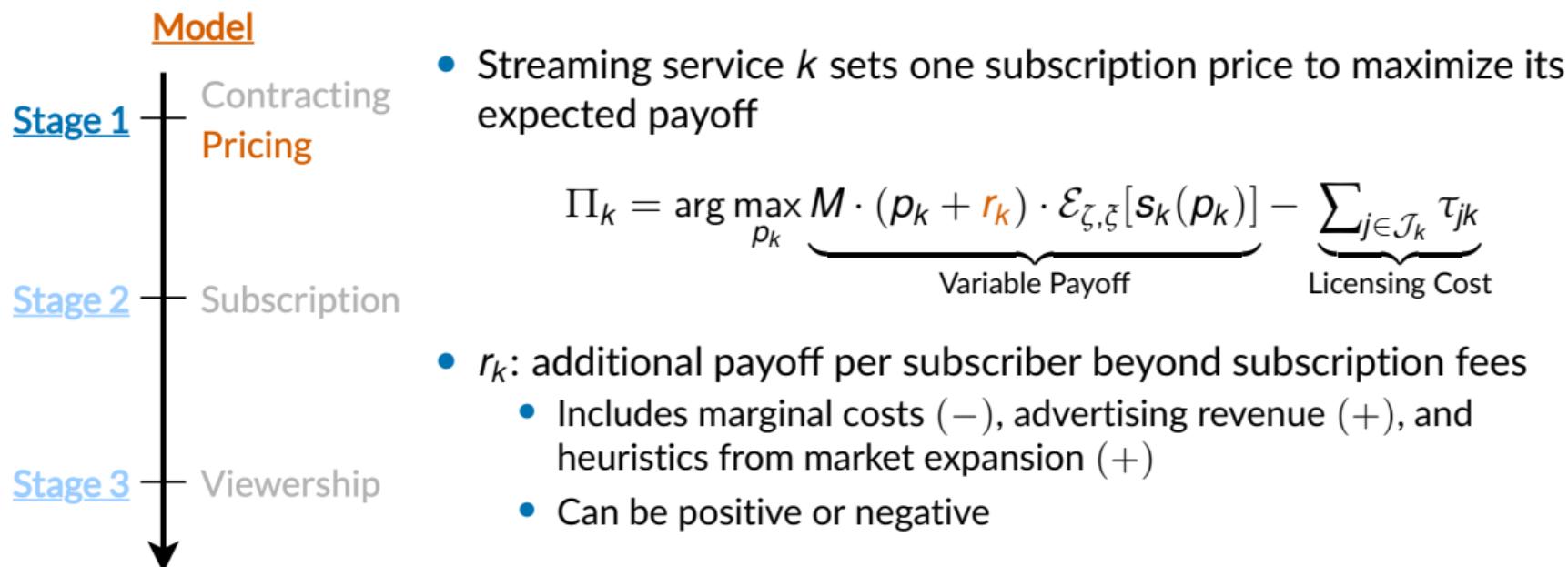
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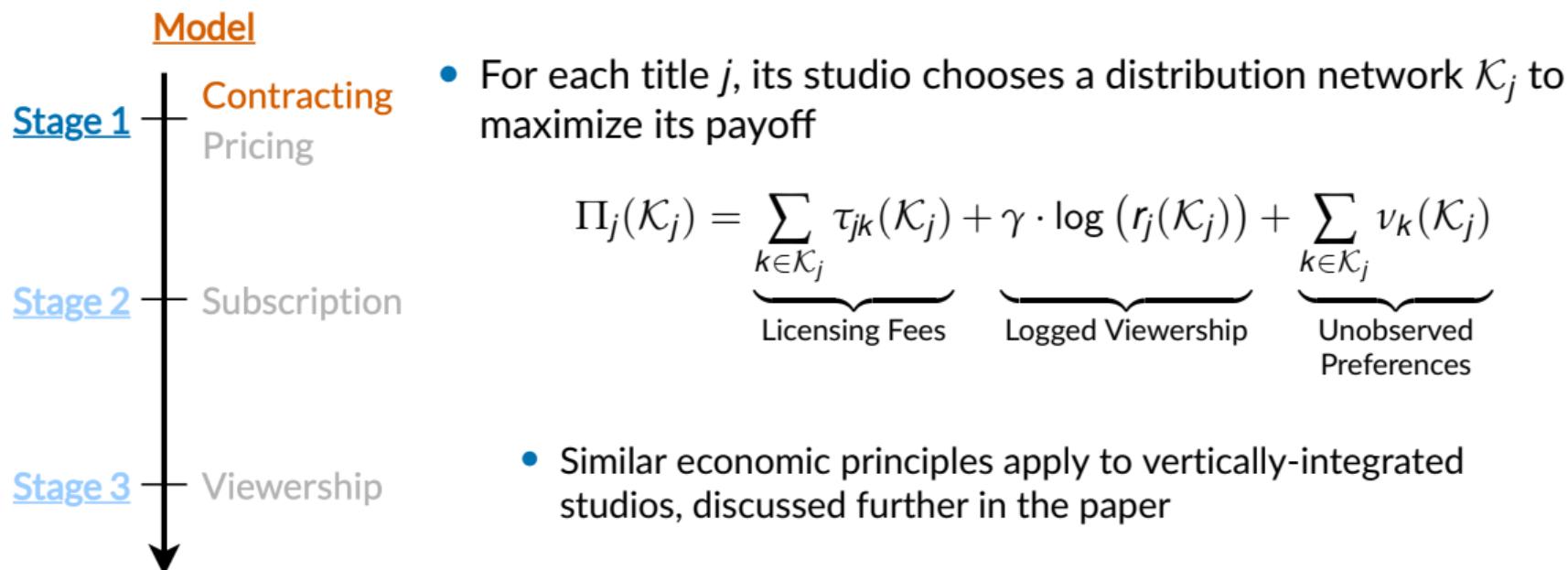
Subscription Price Setting



Subscription Price Setting

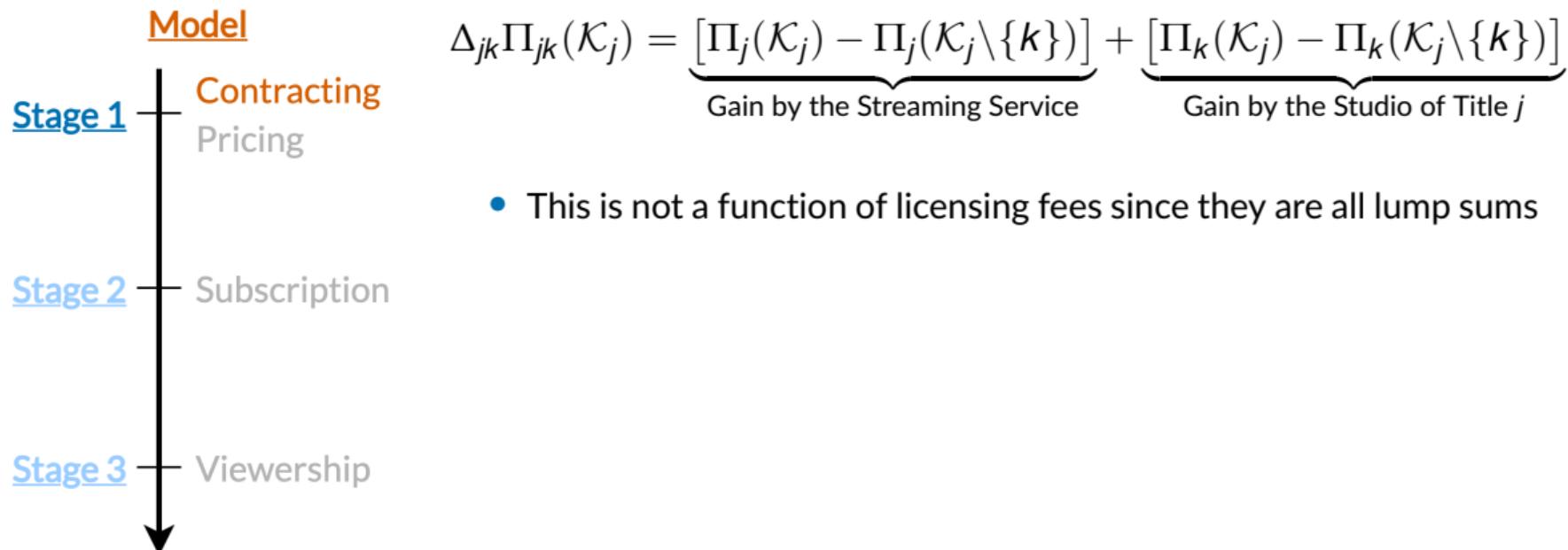


Contracting: Payoffs of Studios



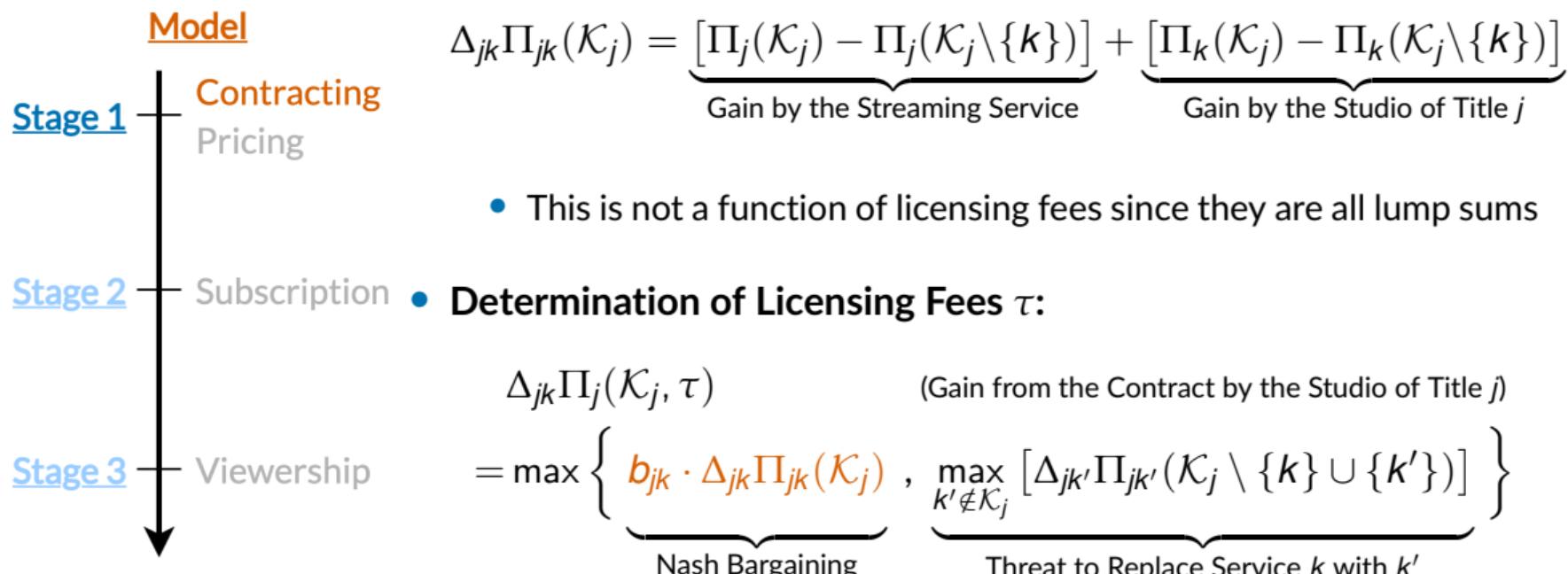
Contracting: Licensing Fee Determination

- Total Gain from Forming the Contract:



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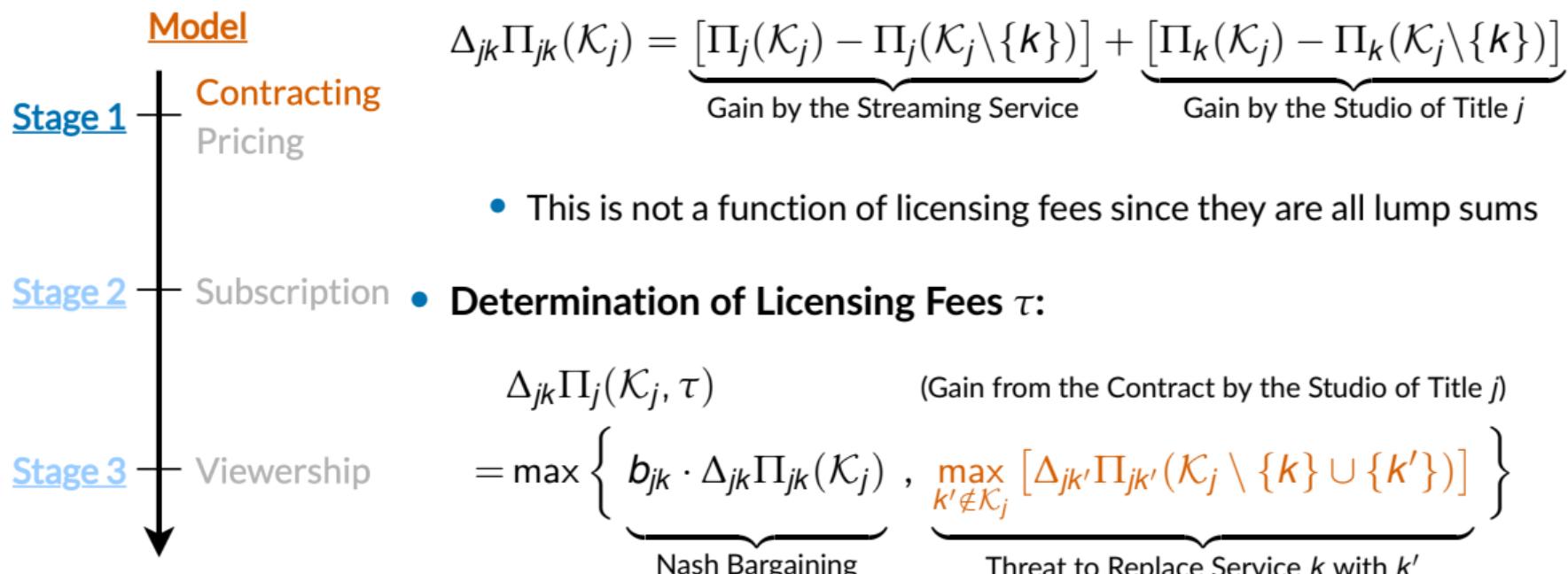


$\Delta_{jk} \Pi_j(\mathcal{K}_j, \tau)$ (Gain from the Contract by the Studio of Title j)

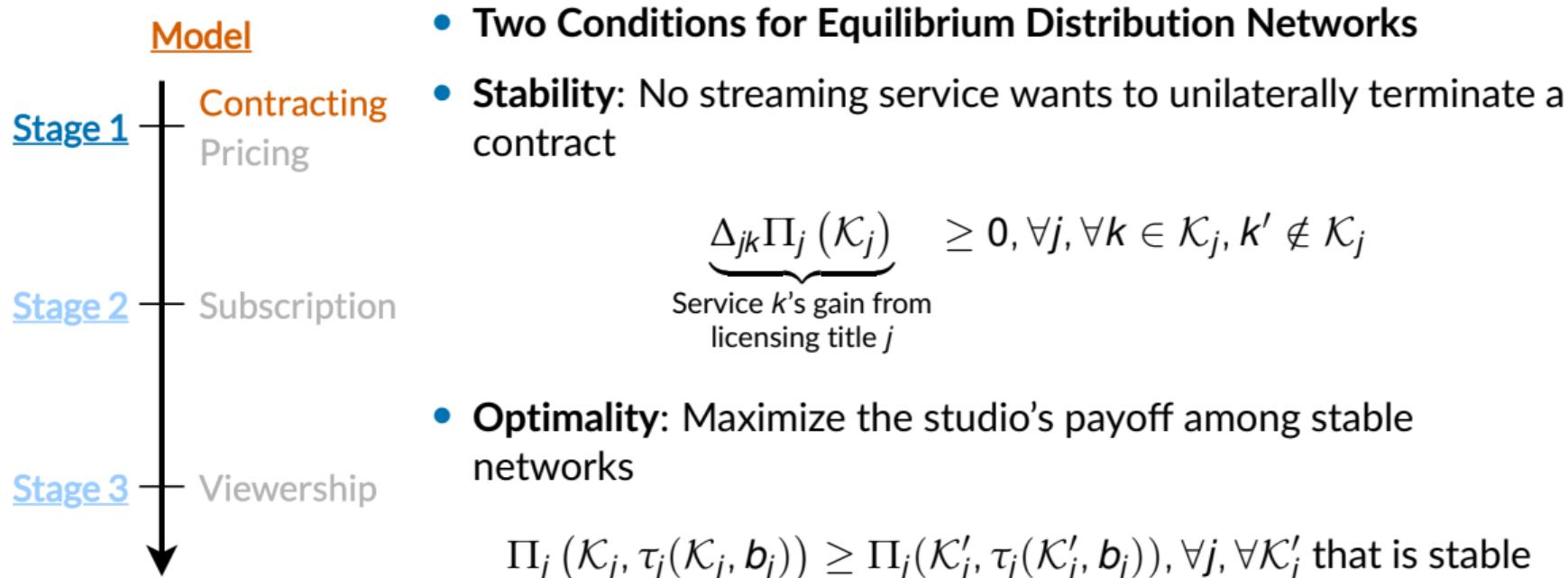
$$= \max \left\{ \underbrace{b_{jk} \cdot \Delta_{jk} \Pi_{jk}(\mathcal{K}_j)}_{\text{Nash Bargaining}}, \underbrace{\max_{k' \notin \mathcal{K}_j} [\Delta_{jk'} \Pi_{jk'}(\mathcal{K}_j \setminus \{k\} \cup \{k'\})]}_{\text{Threat to Replace Service } k \text{ with } k'} \right\}$$

Contracting: Licensing Fee Determination

- Total Gain from Forming the Contract:



Contracting: Studios' Choices of Distribution Networks



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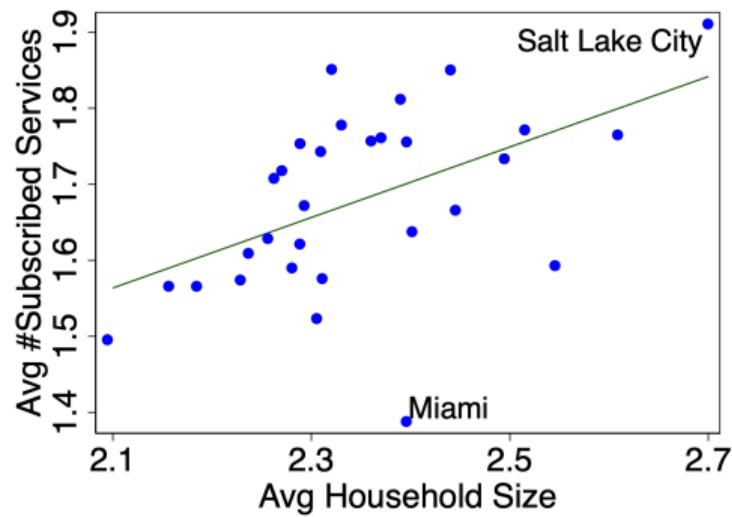
Counterfactual

Demand Estimation: Identification

- α^V (Content Utility Coefficient)
- α^P (Price Coefficient)

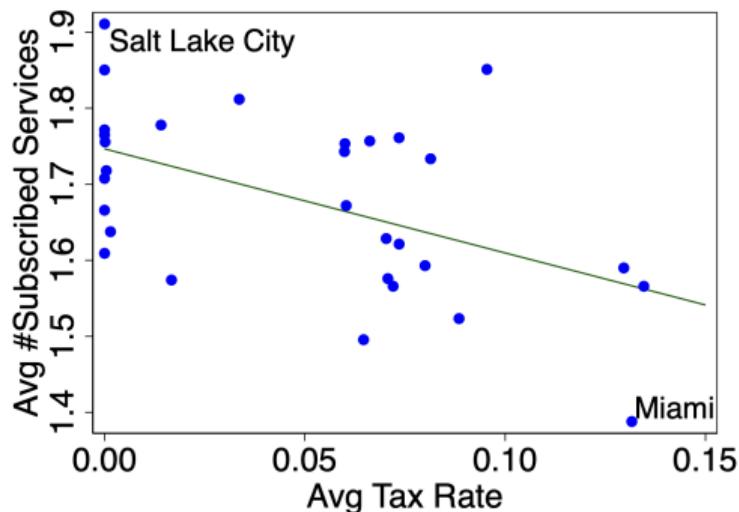
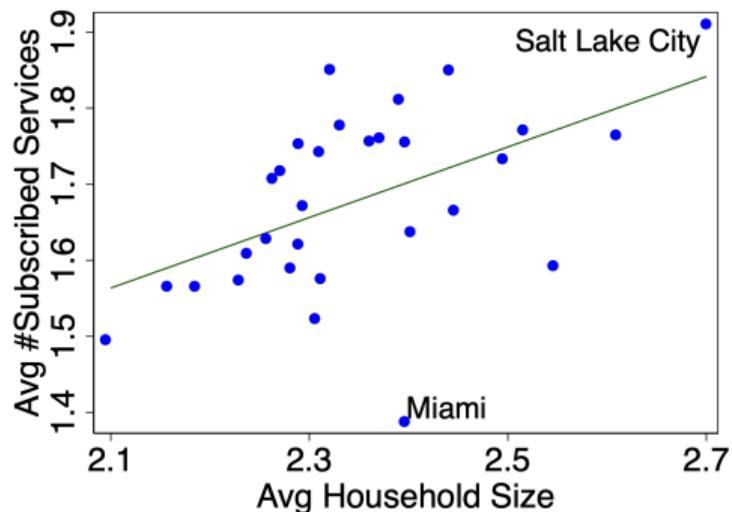
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- α^V (Content Utility Coefficient): Variation in household sizes across DMAs
- α^P (Price Coefficient)



Demand Estimation: Identification

- α^V (Content Utility Coefficient): Variation in household sizes across DMAs
- α^P (Price Coefficient): Variation in subscription tax rates across DMAs
 - Instrument: Tax rates interacted with the number of services in each bundle



Demand Estimation: Results

- **Joint estimation of demand for titles and subscriptions**
 - Solve selection problem: subscribers to streaming services are more likely to have a strong preferences for streaming

Demand Estimation: Results

- Joint estimation of demand for titles and subscriptions
 - Solve selection problem: subscribers to streaming services are more likely to have a strong preferences for streaming
- Elasticities for streaming service subscriptions

	Netflix	Amazon	Hulu	Disney
Netflix	-0.945	0.218	0.286	0.349
Amazon	0.117	-1.705	0.110	0.144
Hulu	0.111	0.080	-1.601	-0.178
Disney	0.107	0.083	-0.140	-1.568

Note. The table presents elasticity of the demand for the column with respect to the price of the row.

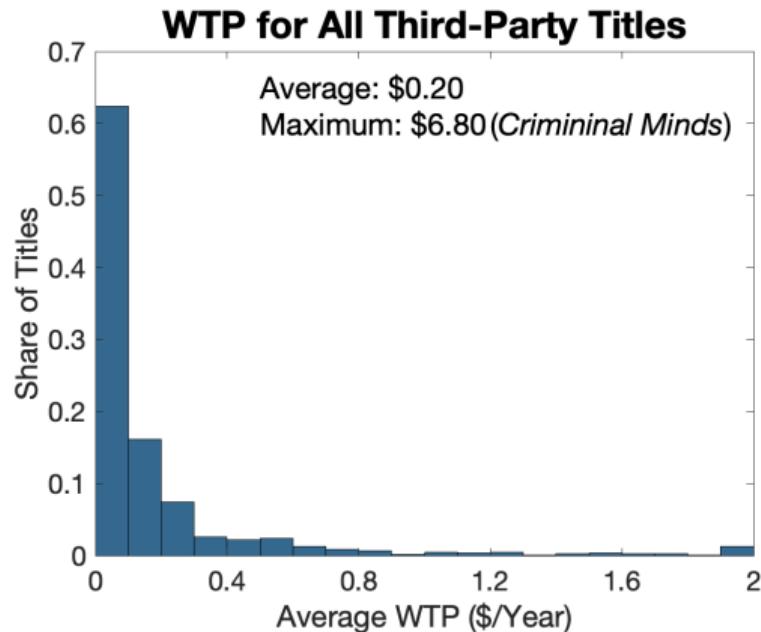
Demand Estimation: Results

- Joint estimation of demand for titles and subscriptions
 - Solve selection problem: subscribers to streaming services are more likely to have a strong preferences for streaming
- Elasticities for streaming service subscriptions

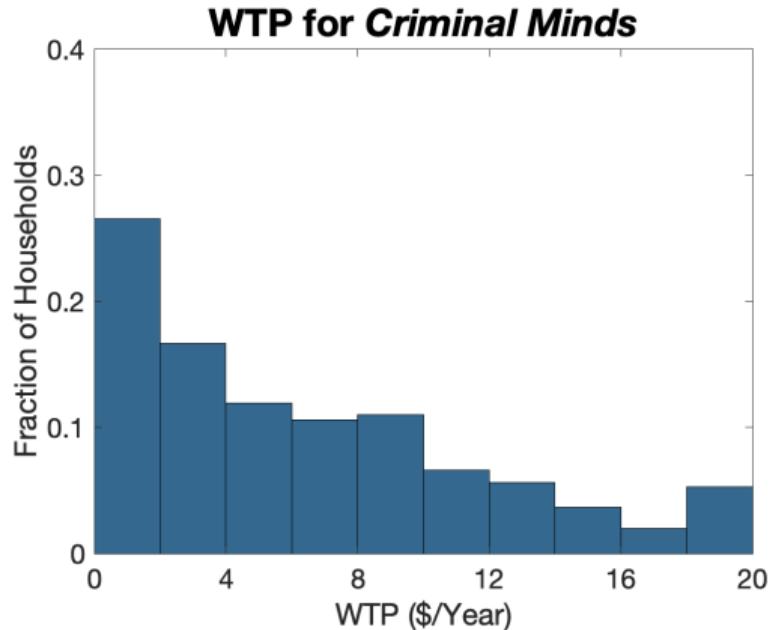
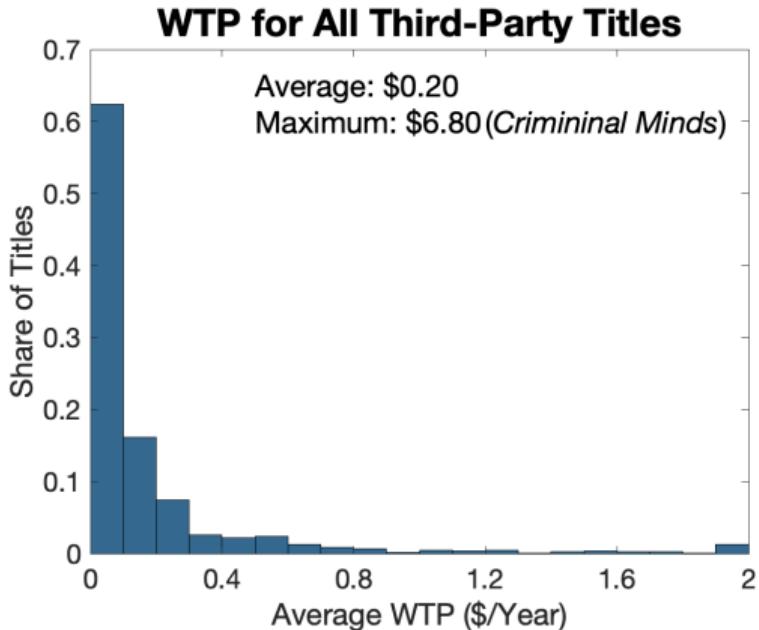
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Amazon	0.117	-1.705	0.110	0.144
Hulu	0.111	0.080	-1.601	-0.178
Disney	0.107	0.083	-0.140	-1.568

Note. The table presents elasticity of the demand for the column with respect to the price of the row.

Demand Estimation: Household WTP



Demand Estimation: Household WTP



Supply Estimation: Identification

- b (Bargaining Power): The probability of exclusive distribution
 - Studios with weaker bargaining power are more likely to use one service as a threat against another to improve bargaining leverage
- μ (Viewership Preference): The tendency to license to Netflix over other services
- σ_v (STD of Unobserved Preferences): Variation in the choices of licensees
 - Larger σ_v implies more random licensing, such that the probability of each streaming service being licensed approaches equality

Supply Estimation: Results

	Estimates	SE	
Bargaining Parameters b			
“Big Five”	0.819	0.035	***
Small studios	0.534	0.192	***
Studio Payoff Parameters			
Viewership preference γ	0.775	0.184	***
STD of unobserved preferences σ_v	0.147	0.025	***

Notes. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

- Small studios have much weaker bargaining power than the “Big Five” \Rightarrow stronger reliance on using exclusive contracts as a bargaining tool

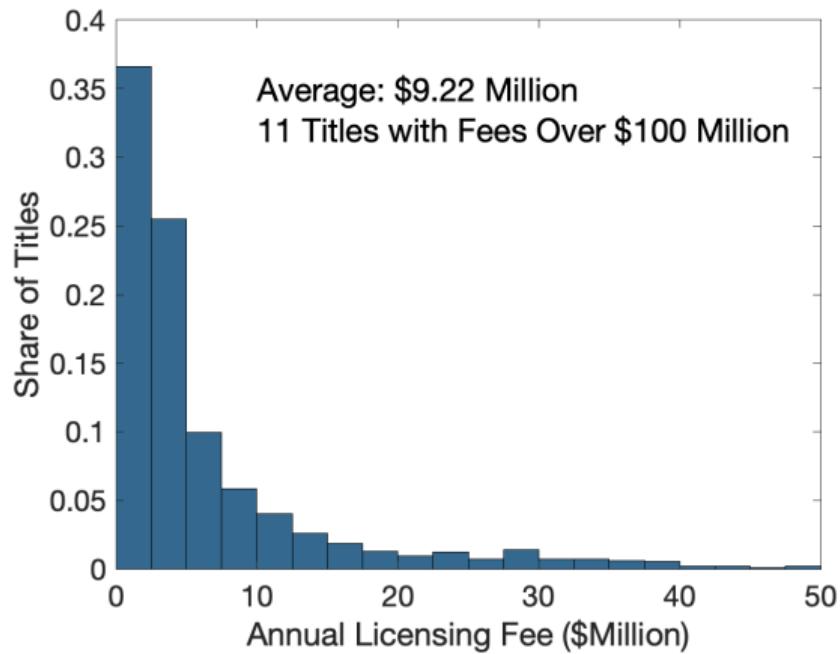
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- Small studios have much weaker bargaining power than the “Big Five” \Rightarrow stronger reliance on using exclusive contracts as a bargaining tool
- Studios value high viewership \Rightarrow Netflix has an advantage in competing for titles

Supply Estimation: Estimated Licensing Fees



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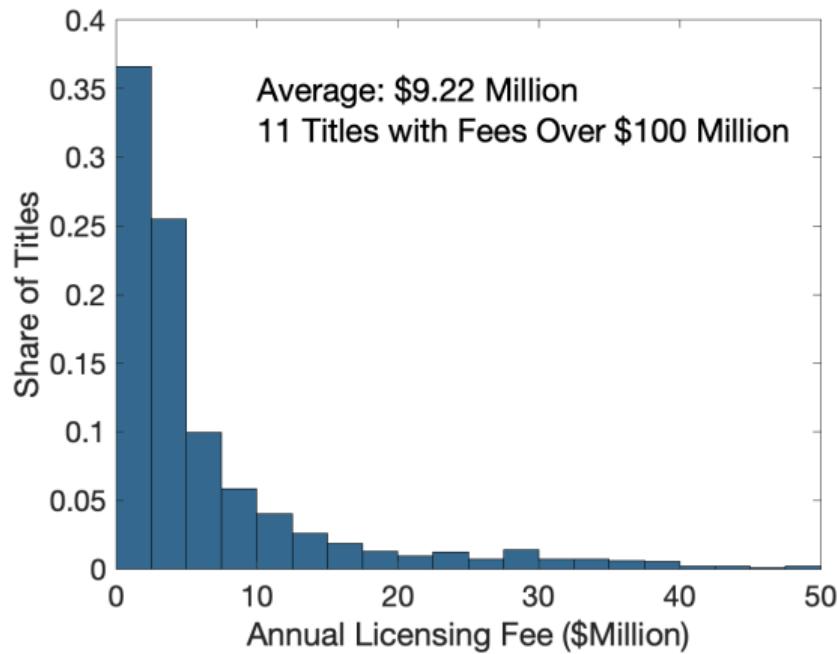


Table: U.S. Licensing Fees (\$Billion)

	Predicted	Reported
Netflix	5.90	N.A.
Amazon	1.07	N.A.
Hulu	3.05	3.30

Outline

A Stylized Model of Contract Negotiations

Data and Descriptive Evidence

Main Model

Estimation

Counterfactual

Impact of Exclusive Contracts on Streaming Services

	No Excl.	Excl.	Change
Service Profits			
Netflix	5.77	5.94	3.0%
Amazon Prime	2.67	2.42	-9.4%
Hulu	0.16	0.33	110.7%
Avg. Monthly Prices			
Netflix	15.54	14.68	
Amazon Prime	9.63	9.55	
Hulu	6.18	8.20	
Market Shares			
Netflix	0.56	0.56	
Amazon Prime	0.46	0.44	
Hulu	0.21	0.29	

- **Counterfactual:** Exclusive contracts are absent ▶ CF Design

Notes. Profits are measured in billion dollars per year.

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- **Small streaming services gain**
 - Reason: Lack of in-house content
⇒ need exclusive content for differentiation ➔ Differential Reliance

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- **Counterfactual:** Exclusive contracts are absent ▶ CF Design
- **Small streaming services gain**
 - **Reason:** Lack of in-house content
⇒ need exclusive content for differentiation ▶ Differential Reliance
- **Large services see small or negative impacts**
 - Reason: Increased competition from small services

Impact of Exclusive Contracts on Studios and Consumers

	No Excl.	Excl.	Change
Studio Profits			
Big Five	8.96	8.47	-5.4%
Small Studios	4.02	4.36	8.4%
Consumer Welfare			
Surplus per Household-Year			-\$24.1

Notes. Profits are measured in billion dollars per year.

- **“Big Five” studios face losses**
 - Reason: Exclusive content boosts subscriber loyalty, lowering services’ fear of losing a title
- **Small studios benefit**
 - Reason: Improved bargaining leverage

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 - Reason: Exclusive content boosts subscriber loyalty, lowering services’ fear of losing a title
- **Small studios benefit**
 - Reason: Improved bargaining leverage
- **The Average Household loses \$24 (10.6%) per year**
 - Reason: Reduced title distribution and higher prices

Distributional Effect of Exclusive Contracts



- **Households with lower income bear heavier losses**
 - Reason: They are more sensitive to price increases
- **Smaller households face greater losses**
 - Reason: Larger households are more likely to multi-home \implies Less affected by reduced title distribution

Long-Term Impact of Exclusive Contracts: Stimulating Content Production

- Exclusive contracts may benefit consumers by stimulating content production in a long term

Long-Term Impact of Exclusive Contracts: Stimulating Content Production

- Exclusive contracts may benefit consumers by stimulating content production in a long term
- **Outcome:** Exclusive contracts still decrease the annual surplus of the average household by \$23.2 even if **small** studios increase production by 1/3
- **Reason:** Price increases by streaming services (e.g., Netflix +9.3%) offset gains from increased content

Conclusions

- Impact of Exclusive Contracts in the Video Streaming Market
- Methodology
 - Put together new, detailed datasets from various sources
 - Fully endogenize the formation of licensing contracts
 - Identify bargaining power using without data on negotiated licensing fees
- Findings
 - Benefit small streaming service with limited in-house titles (Hulu) and small studios with weak bargaining power; the others mostly see loss
 - Consumers lose, even with increased content production

Thank you!

Research Statement

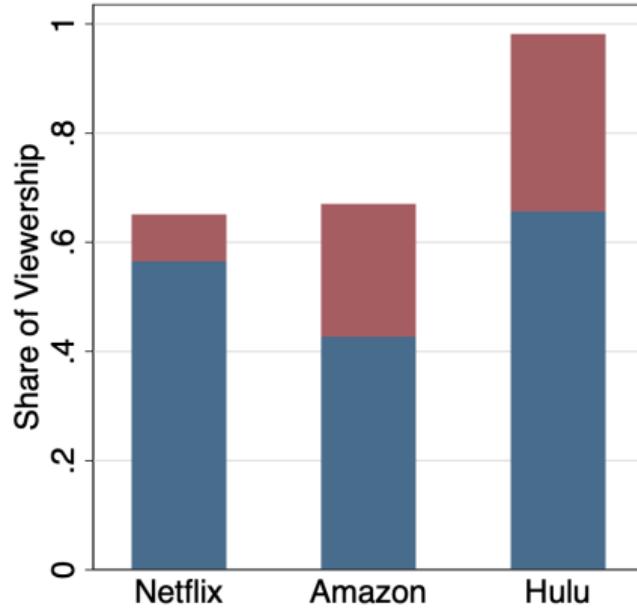
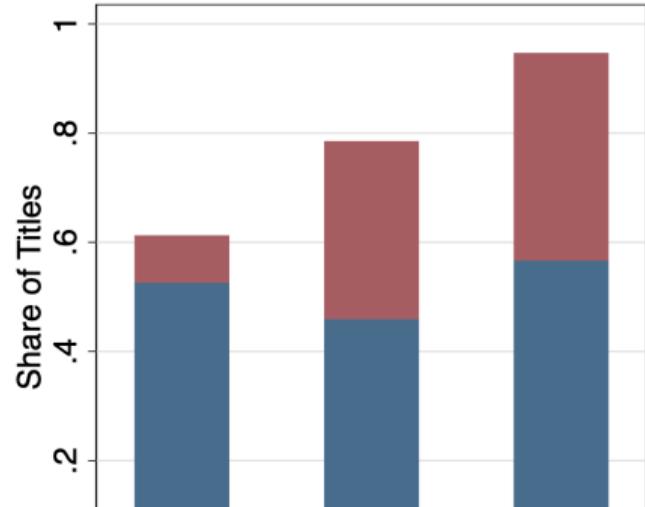
- **Research Interests**
 - How do firms strategically form their relationships?
 - How these relationships affect consumers by shaping product offerings and prices?
 - Study various markets, including digital platforms
- **Research Projects**
 - Exclusive Contracts in the Video Streaming Market (JMP)
 - Distortion and Expansion of Trade Allowances on Product Assortments
 - The Effect of Ad-Supported Plans on Content Offerings of Streaming Platforms
(w Sylvia Hristakeva, Julie Holland Mortimer, and Ashwin Nair)
 - The Use of Entry to Spur Innovation in the PC Market
(w Jimbo Brand and Donald Ngwe)

Outline

Appendix

Differential Reliance on Third-Party Titles

CF Results



TP Titles on Only One Service

TP Titles on Multiple Services

Reduced-Form Evidence on SVOD Subscription Demand

Demand Model

Table: Descriptive Evidence: Demand for SVOD Service Subscriptions

	#Subscribed Services		Spending: Pre-Tax	
	(1)	(2)	(1)	(2)
Tax rate	-1.417*** (0.447)	-1.069** (0.522)	-13.067*** (3.934)	-9.486** (4.526)
Household size		0.345** (0.124)		3.552** (1.101)
Constant	1.749*** (0.026)	0.923*** (0.304)	17.782*** (0.240)	9.258*** (2.703)
#Observations	360	360	360	360

Notes. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Observations are at DMA-month level.
Standard errors are clustered at DMA level and reported in the parentheses.

Stage 3 & 2: Title Viewership and Service Subscription

► Demand Model

- **Title Demand:** Utility for individual i to view title j at week t is

$$u_{ijt}^T = \underbrace{\beta_i^0 + g_j \beta_i^g}_{\text{Heterogeneous streaming and genre preferences}} + \underbrace{\mathbf{w}_{jt} \beta^W}_{\text{Title chars (e.g., age)}} + \underbrace{\zeta_{jt}}_{\text{Demand shocks}} + \underbrace{\epsilon_{ijt}}_{\text{Individual preferences}}$$

- **Service Demand:** Utility for household h to subscribe to bundle c at month m is

$$u_{hcm}^S = \underbrace{-p_{hcm}\alpha_h^p}_{\substack{\text{Price disutility} \\ \text{Tax Effects}}} + \underbrace{\left(\sum_{i \in h} \kappa_i \cdot \mathbb{E} \left[\max_{j \in \cup_{k \in c} \mathcal{J}_{kt}} u_{ijm}^T \right] \right) \alpha^V}_{\substack{\text{Content utility} \\ \text{Decision Power} \quad \text{HH Size}}} + \underbrace{\mathbf{x}_{cm} \alpha^x}_{\text{Bundle chars}} + \underbrace{\zeta_{cm}}_{\text{Demand shocks}} + \underbrace{\epsilon_{hcm}}_{\text{Household preferences}}$$

Stage 1a: Bilateral Contracting I

▶ Supply Model

- The payoff of a studio to license its title j :

$$\Pi_j = \underbrace{\sum_{k \in \mathcal{K}_j} \tau_{jk}}_{\text{Licensing Fees}} + \underbrace{\gamma \cdot \log(r_j(\mathcal{K}_j))}_{\text{Logged Viewership}} + \underbrace{\sum_{k \in \mathcal{K}_j} \nu_k(\mathcal{K}_j)}_{\text{Unobserved Preferences}} + \underbrace{\mu \cdot \sum_{k \in O_j} \Pi_k}_{\text{Effects of VI}}$$

- \mathcal{K}_j : distribution network
- $\nu_k \sim N(0, \sigma^2)$: unobserved network-service-specific preferences
- O_j : SVOD services that are owned by j 's producer

Stage 1a: Bilateral Contracting II

► Supply Model

- **Surplus to Be Divided:** Bilateral Gains-from-Trade (GFT)

$$\Delta_{jk}\Pi_{jk}(\mathcal{K}_j) = \underbrace{[\Pi_j(\mathcal{K}_j, \tau) - \Pi_j(\mathcal{K}_j \setminus \{k\}, \cdot)]}_{\text{Studio } j\text{'s GFT: } \Delta_{jk}\Pi_j(\mathcal{K}_j, \tau)} + \underbrace{[\Pi_k(\mathcal{K}_j, \tau) - \Pi_k(\mathcal{K}_j \setminus \{k\}, \cdot)]}_{\text{Service } k\text{'s GFT: } \Delta_{jk}\Pi_k(\mathcal{K}_j, \tau)}$$

- This is not a function of τ because τ is lump-sum
- Π_j, Π_k : payoffs of studios and streaming services

Supply: Estimation and Identification I

▶ Supply Model

- For each guess of θ , simulate the probability of each network of agreement for each title with $R = 1000$ random draws of ν , and compute the following moments
- Moment Conditions 1:

$$\frac{1}{N_j} \sum_j [(\hat{P}_{j\mathcal{K}} - D_{j\mathcal{K}}) Z_{j\mathcal{K}}] = 0, \forall \mathcal{K},$$

- Instruments in $Z_{j\mathcal{K}}$:
 - ① Network dummies (identify b)
 - ② Network-specific viewership of each title (identify γ)
 - ③ Deviation specific instruments: for each pair of k and k' ,
 $\Delta_{jk}\pi_k(\mathcal{K}) - \Delta_{jk}\pi_{k'}(\mathcal{K} \setminus \{k\} \cup \{k'\}), \forall \mathcal{K}$ with $k \in \mathcal{K}, k' \notin \mathcal{K}$, where $\Delta_{jk}\pi_k$ is the “observed” change in k ’s variable profit by adding j into its content library (identify σ)
 - The identification of σ and γ relies on the stability condition

Supply: Estimation and Identification II

▶ Supply Model

- Moment Conditions 2: matching regression results from the simulated data and observed data (identify b and μ)

Table: Distribution Networks of Titles

	(1)	(2)
	Title Exclusivity	Contract between each service-title pair
“Big Five”	-0.038* (0.019)	
Disney’s studio		-0.254*** (0.036)
Disney’s studio × Hulu		0.745*** (0.061)
Other Controls	Title Chars	SVOD service FE
Observations	1,145	3,435

Notes. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors are reported in the parentheses.

Supply: Estimation Results

▶ Supply Model

	Estimates	SE	
Bargaining Parameters b			
“Big Five”	0.819	0.035	***
Other studios	0.534	0.192	***
Studio Payoff Parameters			
Viewership preference γ	0.775	0.184	***
STD of unobserved preferences σ_v	0.147	0.025	***
Internalization μ	0.627	0.137	***

Notes. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Supply: Robustness Check

▶ Supply Model

Table: Robustness Check: Supply Estimation

	(1) Studio Categorization		(2) Differential <i>b</i> for Studios	
	Estimates	SE	Estimates	SE
Bargaining Parameters				
Big Five: Major	0.817	0.155	***	
Big Five: Minor	0.820	0.117	***	
Big Five: All			0.866	0.158
Smaller Studios	0.576	0.152	***	0.559
Against Netflix			–0.063	0.169
Studio Payoff Parameters				
Logged Viewership	0.869	0.207	***	0.780
STD of Unobserved Preferences	0.164	0.030	***	0.146
Internalization	0.657	0.134	***	0.626

Notes. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Studios' payoffs are measured in millions of dollars. Standard errors are computed using 100 bootstrap samples.

Model Fit

▶ Supply Model

	Observed	Simulation
Monthly Avg. Prices		
Netflix	13.532	14.678
Amazon Prime	8.990	9.546
Hulu	8.407	8.204
Disney Plus	7.907	7.829
Shares of Titles on		
Netflix	0.712	0.755
Amazon Prime	0.185	0.229
Hulu	0.248	0.222
Only One Service	0.867	0.829
Market Shares		
Netflix	0.570	0.556
Amazon Prime	0.461	0.443
Hulu	0.358	0.289

- Equilibrium refinement under the counterfactual: No mutually beneficial contracts for any uncontracted pair of firms; for any $\{K'_j, \tau'\}$,

$$\Pi_j(\mathcal{K}_j, \tau) \geq \Pi_j(\mathcal{F}(\mathcal{K}_j \cup K'_j), \{\tau, \tau'\}),$$

or $\exists k' \in K'_j$, such that $\Pi_{k'}(\mathcal{K}_j, \tau) \geq \Pi_{k'}(\mathcal{F}(\mathcal{K}_j \cup K'_j), \{\tau, \tau'\})$.

- Function \mathcal{F} allows a current partner of the studio to end the contract unilaterally
- Adapted from Ghili (2022)

Main Counterfactual Results: Complete

► Counterfactual Results: Brief

	No Excl.	Excl.
Avg. Monthly Prices		
Netflix	14.678	15.854
Amazon Prime	9.546	9.420
Hulu	8.204	6.174
Disney Plus	7.829	7.868
Distribution Networks		
<i>Share of Titles on</i>		
Netflix	0.755	0.866
Amazon Prime	0.229	0.441
Hulu	0.222	0.440
Only One Service	0.829	0.563
Consumer Demand		
<i>Market Shares</i>		
Netflix	0.556	0.556
Amazon Prime	0.443	0.450
Hulu	0.289	0.209
Disney Plus	0.299	0.302
Multi-Homing	0.500	0.489
Multi-Homing (Excl. Disney)	0.414	0.364
Avg. Weekly Streaming Hours	2.537	2.715