ASSA 2022 Virtual Annual Meeting

Regulating platform fees under price parity?

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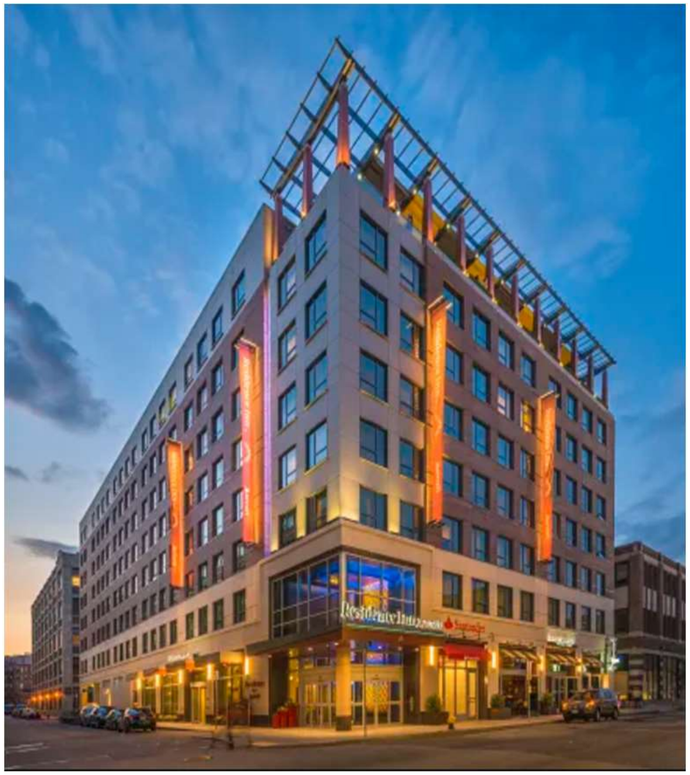
Introduction

- Online platforms provide very **useful services**.
- Most of them operate under the **agency model**, and charge **commission fees** that are rather substantial.
- Platforms often adopt practices such as **price parity clauses** that are highly controversial, as they can contribute to **reduce competition** and/or **increase prices**.
- Should antitrust and/or regulatory authorities intervene? If so, then how?
- Currently, no **international agreements** have been established.

Price Parity Clauses: how do they work?



B.

$ 200

Expedia Hotels

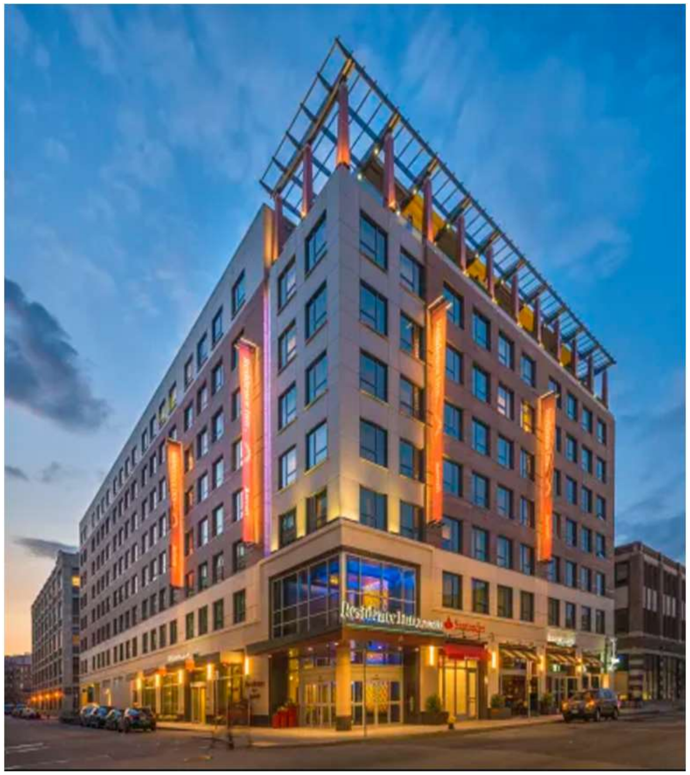
≥ $ 200

https://www.marriott.com/hotels/travel/bosfn-residence-inn-boston-back-bay-fenway/

≥ $ 200

Wide Price Parity Clauses

Narrow Price Parity Clauses



$ 200

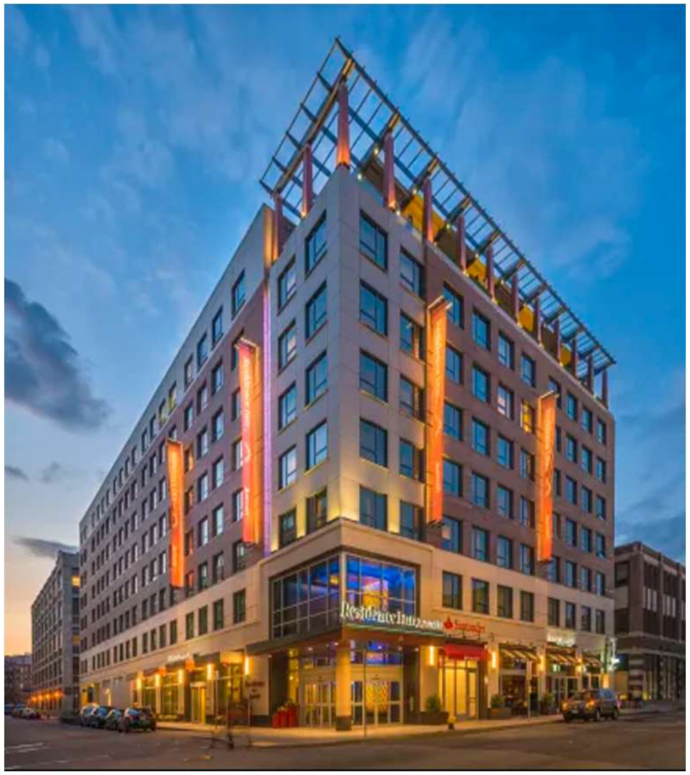
Expedia Hotels

$ 190

https://www.marriott.com/hotels/travel/bosfn-residence-inn-boston-back-bay-fenway/

≥ $ 200

Banning Price Parity Clauses: expected result



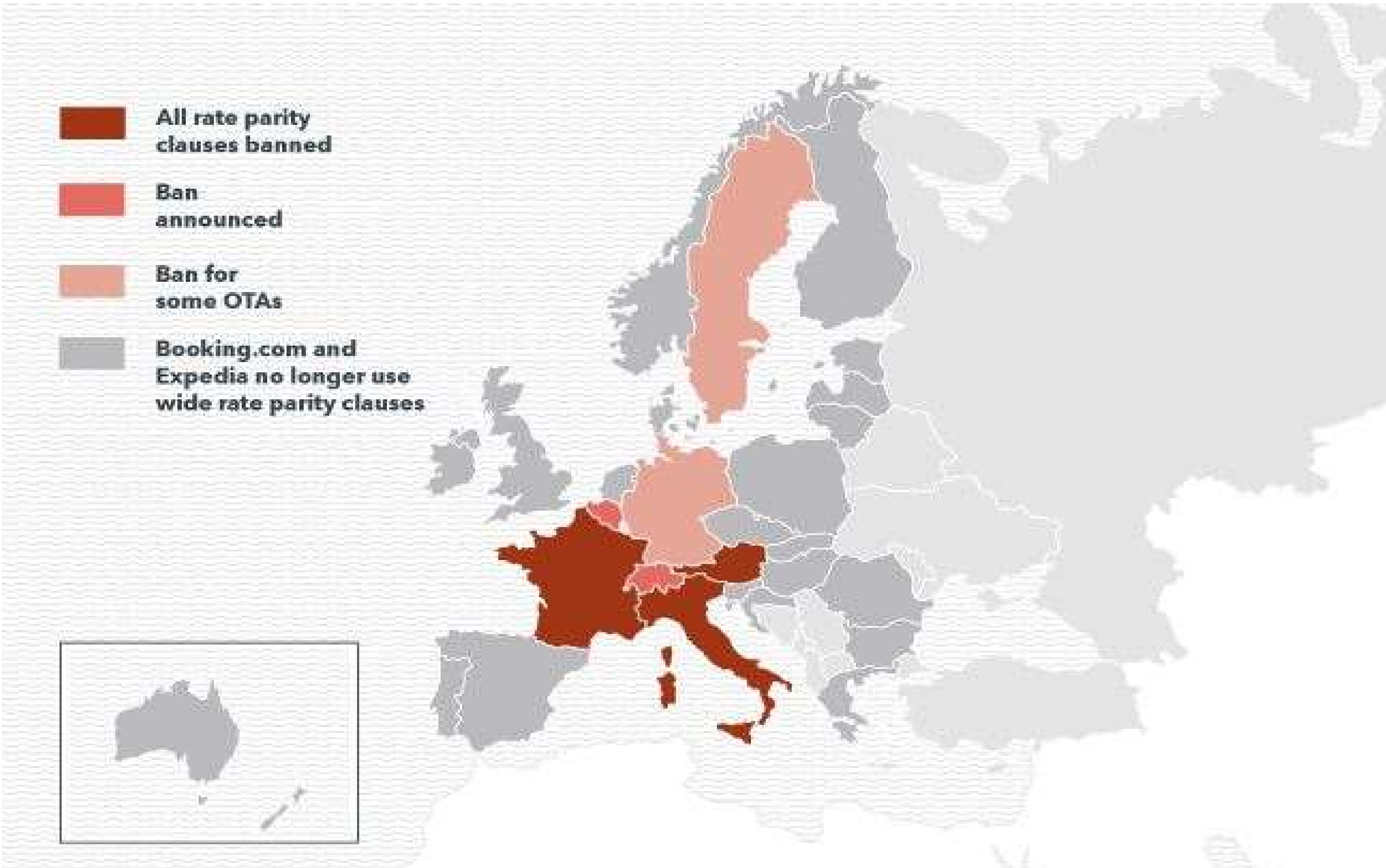
$ 180

$ 180

https://www.marriott.com/hotels/travel/bosfn-residence-inn-boston-back-bay-fenway/

$ 170

OTA's situation



In the literature

- **Theoretical contributions** investigating issues such as *showrooming*, theory of harm, anticompetitive effects of PPCs, suggesting their (**partial or full**) **removal:**
  - Edelman and Wright (2015); Boik and Corts (2016); Johnson (2017); Johansen and Vergé (2017); Wang and Wright (2020); **Calzada, Manna, Mantovani (2021)**; Schlutter (2021).
- **Empirical contributions** measuring the **economic effect of (some) policy interventions**:
  - Hunold, Kesler, Laitenberger, Schlutter (2018), Cazaubiel, Cure, Johansen and Vergé (2020); Ennis, Lagos, Ivaldi (2020); **Mantovani, Piga, Reggiani** (2021); Song (2021).

Have these policy interventions produced tangible results?

- It does not seem so…
  - Sellers might still practice price parities to remain in **good terms** with the platform.
    - Or maybe becuase they are afraid of «dimming» (Hunold et *al.* 2020)?
    - Amazon is removing the **Buy Box** feature for merchants that lower prices on other channels.
  - All in all, only **limited effects** found by ECN (2017), Mantovani et *al.* (2021), Ennis et *al.* (2020).

- **What about regulating commission fees?**

- In May 2020, many US cities passed laws imposing commission caps.
- New York passed on May 16th commission limits imposing that third-party delivery services must **not charge more than 15% per order**.

- Similar initiatives were taken in Canada in 2021, specifically in the provinces of Ontario and Saskatchewan, with caps ranging from 15% to 18%.
- A theoretical framework guiding regulation has however been missing.

App developers criticized the mandatory use of Apple’s own in-app purchase system and the 30% commission rate associated with this.

The Coalition for App Fairness against the “Apple Tax”.

DMA proposal: platforms should allow consumers to directly trade with third-party developers.

In this paper

- Our aim is to:
  - investigate **how to regulate information platforms**;
  - **derive optimal cap**;
  - **relate cap regulation to competition policy alternatives** such as banning price parities.
- Main results:
  - **theory of harm** based on **contractual externality** among firms;
  - we propose simple **tests to assess platform contribution to producer/consumer surplus**;
  - we show that **banning price parity is akin to cap platform fee inefficiently low**.

The baseline model (main elements)

- A **monopolist** platform charging fee per sale.
- N sellers: $j=1,\ldots,N$
- Unit mass of consumers.
- **Consumers' gross utility**:

Vertical component

Consumer-specific match value

$$\hat{v}_j = v_j + z_j$$

  - z is iid draw from symmetric distribution G with density g.
- Each firm faces marginal cost c_j per sale; price is p_j.
- A firm belongs to the **consideration set** of a consumer if he/she observes the pair $(\hat{v}_j, p_j)$.
- Consumers are **heterogeneous** on their **consideration sets**;
  - heterogeneity described by means of **consideration profile** **σ.**
- **Potential demand** is:

$$d_j[\sigma] \equiv \bigcup_{\{s:j\in s\}} \sigma(s)$$

The platform expands consumer information

- Before consulting the platform: information described by symmetric $\underline{\sigma}$, with reach $\underline{n} < N$.
  - It captures all **information obtained outside** of platform.
- All firms listed on the platform are added to the **consideration set** of every consumer.
  - **Implicit assumption**: visiting the platform is **costless** for consumers.
- If all firms join, information described by $\overline{\sigma}$, with reach N.
- Transaction within the platform generates **convenience benefit** b to firms, which pay a fee f_j for each sale.
- **Price parity clauses** are in place.

The platform privately offers f_j	Firms set prices and decide whether (or not) to join the platform	Consumers make purchasing decisions
t = 1	t = 2	t = 3

- Perfect Bayesian equilibrium with passive beliefs.
- The market is fully covered.
- If a firm joins the platform, all of its sales happen through the platform.
- **Assumption**: symmetric market, which implies

$$\delta = v_j - c_j \; \forall \, j.$$

Consumer purchasing and pricing equilibrium

- Each consumer chooses the "best" firm in his/her consideration set.
- Pricing eq. is *symmetric* if firms have constant markups:

Lemma

Suppose consideration profile σ is symmetric with reach $n \geq 2$. Under weak regularity conditions, unique symmetric equilibrium such that

$$p_j^* = c_j + \lambda(n), \quad \text{for all } j \in \mathcal{N},$$

where the markup $\lambda(n)$ is solely a function of the reach n.

- If all firms join at some symmetric fee f, eq. prices are:

$$p_j^* = c_j + f - b + \lambda(N).$$

Laissez-faire: equilibrium characterization

Proposition

There exists a symmetric equilibrium where all firms join and pay a fee $f^* > b$, which solves

$$\frac{\lambda(N)}{N} = |d_j[\underline{\sigma}]| \cdot \max_{\Delta p} \left\{ \left(1 - H^{(N)}(\Delta p)\right)(\Delta p + f^* + \lambda(N) - b) \right\}.$$

- Equilibrium fee f^* leaves each firm indifferent between:
  - **delisting**, facing much reduced potential demand, but competing with lower marginal costs;
  - **remaining**, enjoying large potential demand, but competing under no marginal cost advantage.

The platform is a «must-join»

Corollary

Consider two pre-visit consideration profiles, $\underline{\sigma}_0$ and $\underline{\sigma}_1$, and let f_0^* and f_1^* be their respective equilibrium fees. Then

$$f_0^* \leq f_1^* \quad \Longleftrightarrow \quad |d_j[\underline{\sigma}_0]| \geq |d_j[\underline{\sigma}_1]|.$$

- **Firms accept higher fees the smaller their (pre-visit) potential demands are.**
- **Equilibrium fee f^* grows as potential demand shrinks and it often exceeds convenience and information benefits to consumers and firms.**
- **Why?**
- **The platform is a «must-join»…**

Externality on non-participants

- Suppose all firms join the platform, except for firm j.
- All consumers that consider j now consider all other firms.
- Those consumers who did not consider firm j now consider all firms other than j.
- **Non-participant firm exposed to much more competition with platform than without it.**
- **Contractual externality** (Segal, 1999): this explains why **the platform can appropriate more than its contribution to welfare!**
- Yet, banning price parity prevents the platform from appropriating any of (ex-ante) informational benefits.
- **Remark**: results hold with **public fee** and **two-part tariffs**.

Cap regulation

- The optimal regulation balances **gains from lower fees** and **potential losses from having no platform**.
- Platform's operating cost is $k \sim \Phi$, with pdf ϕ and supp on R_+
- How to compute welfare in absence of the platform?
- We consider a **counterfactual** consideration profile $\hat{\sigma}$ describing consumer information without platform.
- Regulation depends on **conjecturing by how much the platform expands the consideration set of consumers in equilibrium relative to the counterfactual**.

Mature market

- Latent demand is nil.
- The **welfare measure** combines two terms:
  - **consumer** and **producer** surplus;
  - **platform**'s profit.
- Let $Z^{1:n}$ represent the maximum out of $n \leq N$ coordinates
- Assuming the cap binds; the planner objective is:

$$W(\bar{f}) \equiv \int_0^{\bar{f}} \{\delta + \mathbb{E}\left[Z^{1:N}\right] - \bar{f} + b + \alpha\left(\bar{f} - k\right)\} d\phi(k) + \left(1 - \Phi(\bar{f})\right)\left(\delta + \mathbb{E}\left[Z^{1:\hat{n}}\right]\right)$$

weight of platform's profit

Optimal cap regulation (mature market)

Proposition

The welfare-maximizing cap is given by

$$\bar{f}_\alpha = b + \mathbb{E}\left[Z^{1:N}\right] - \mathbb{E}\left[Z^{1:\hat{n}}\right] - (1-\alpha)\frac{\Phi(\bar{f}_\alpha)}{\phi(\bar{f}_\alpha)}$$

If planner is utilitarian ($\alpha = 1$), we obtain

$$\bar{f}_1 = b + \mathbb{E}\left[Z^{1:N}\right] - \mathbb{E}\left[Z^{1:\hat{n}}\right]$$

If no weight is given to platform's profit, and $k \sim U[0, \bar{k}]$,

$$\bar{f}_0 = \frac{1}{2}\bar{f}_1$$

- Obviously, cap regulation is more likely to bind when $\alpha < 1$.

Utilitarian cap regulation

$$\bar{f} = b + \underbrace{E[Z^{1:N}] - E[Z^{1:\hat{n}}]}$$

Convenience Benefit + Informational Benefit

- The optimal cap equals the **expected externality** that the platform imposes on the other market participants.
- Notion of "**fairness**" for remuneration of stacked platforms.
- If the platform is informationally redundant, the surplus-neutral fee equals the convenience benefit b.
- Optimal cap binds provided the size of the pre-visit potential demand $\underline{d}$ is sufficiently lower than its counterfactual counterpart $\hat{d}$

Optimal cap under logit demand

- Suppose the market is mature and consumer match values are iid across firms with a **Gumbel cdf** with scale parameter $\beta > 0$.
- The optimal utilitarian cap is given by:

$$\boxed{\bar{f}_1 = b - \beta \ln\left(\hat{d}\right) = b - \left(\frac{N-1}{N}\right) \lambda(N) \ln\left(\hat{d}\right),}$$

where $\lambda(N) = \beta \left(\frac{N}{N-1}\right)$ is the logit markup.

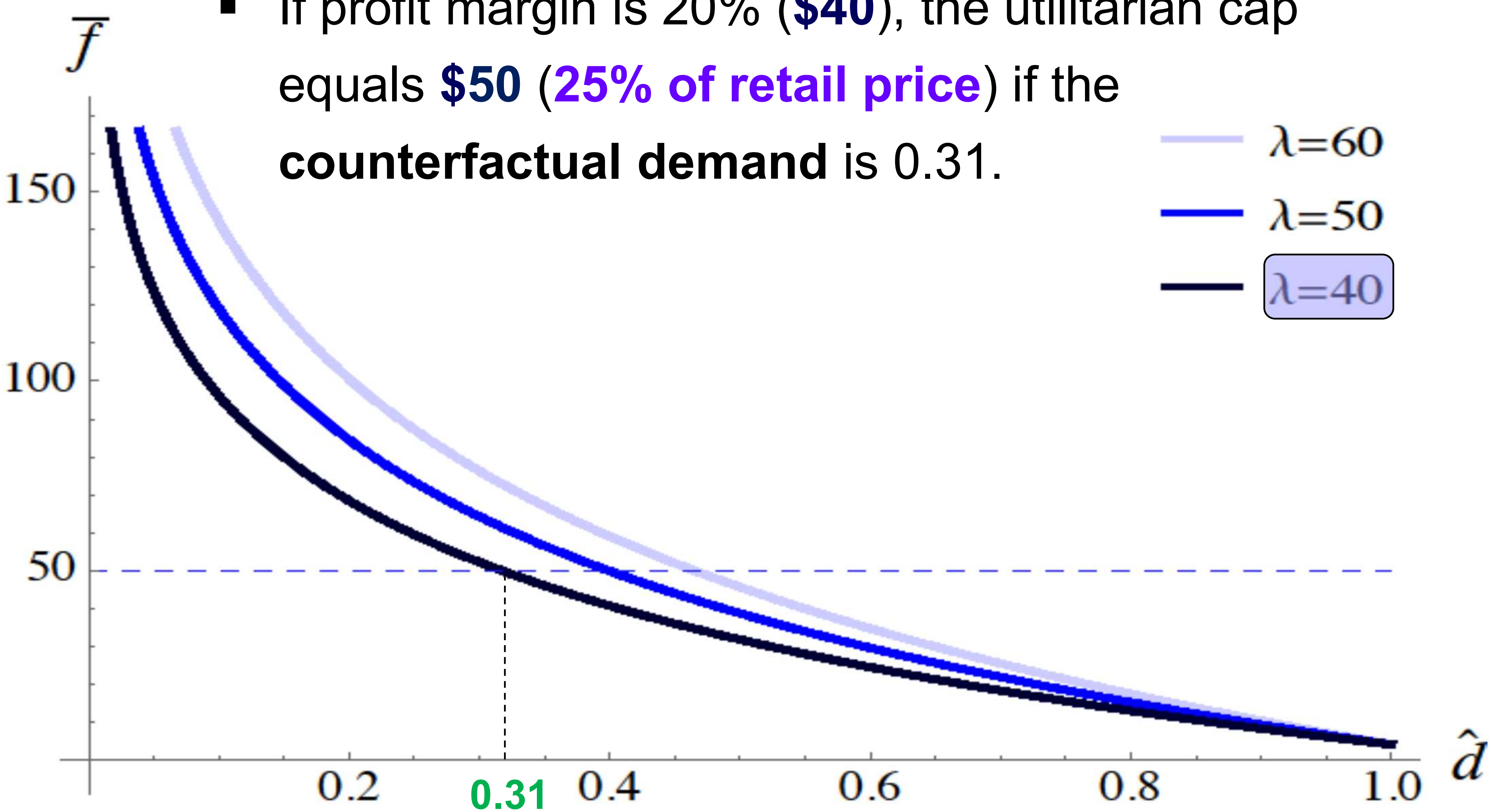
- Useful to express surplus-neutral fee in terms of firms' profit margin and counterfactual demand.

Numerical illustration: New York City

$$\bar{f}_1 = b - \beta \ln\left(\hat{d}\right) = b - \left(\frac{N-1}{N}\right) \lambda(N) \ln\left(\hat{d}\right),$$

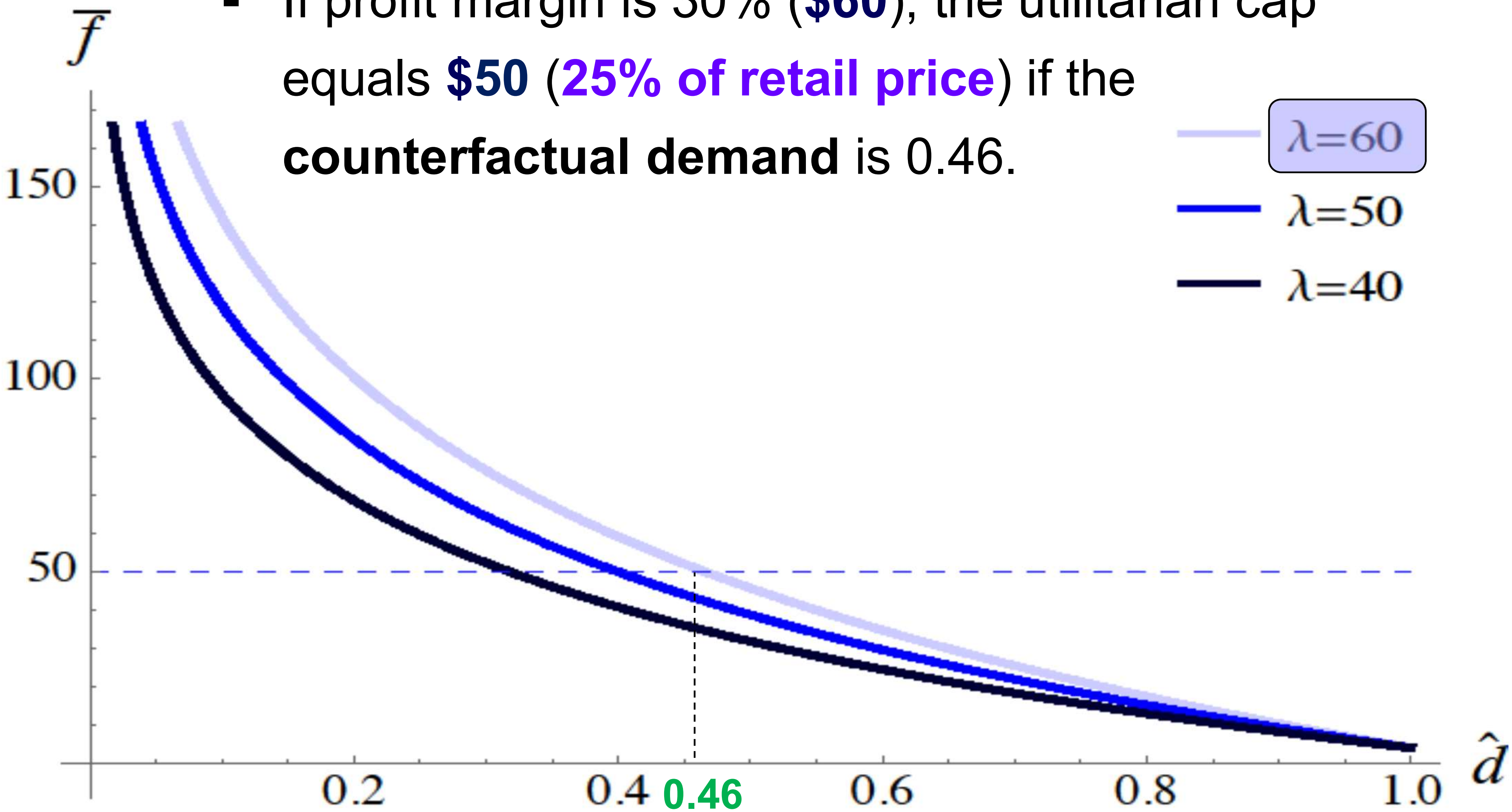
- Consider hotels in **New York City** in 2019:
  - avg rate for a budget double room was around **$200;**
  - **profit margins** varied from 10% to 30% of the retail price;
  - convenience benefit *b* around 2% (**$4**);
  - *(N-1)/N* can be approximated to 1.

- If profit margin is 20% (**$40**), the utilitarian cap equals **$50** (**25% of retail price**) if the **counterfactual demand** is 0.31.



Hence, a commission fee of up to 25% does not exceed the cap, provided the platform **more than triples the hotel's potential demands** under alternative search technologies.

- If profit margin is 30% (**$60**), the utilitarian cap equals **$50** (**25% of retail price**) if the **counterfactual demand** is 0.46.



A commission fee of up to 25% does not exceed the cap, provided the platform **more than doubles the hotel's potential demands**.

Expanding markets

- The platform brings in new consumers (**latent demand**).
- Let d_0 denote the size of the latent demand $\underline{\sigma}(\varnothing)$.

Corollary

Relative to the no-platform benchmark, firms gain with the presence of a monopolistic platform if and only if

$$d_0 > 1 - \frac{\lambda(N)}{\lambda(\hat{n})}.$$

- **Sellers may gain with a platform**, as increased competition for each consumer is accompanied by more sales.

Extending the welfare measure

- The previous discussion suggests that **cap regulation should be more lax**.
- What payoff of latent consumers in the absence of the platform?
- Assume the outside option of latent consumers is the same as that of existing consumers if platform inactive.
- The utilitarian welfare is then:

$$\tilde{W}(\bar{f}) \equiv \int_0^{\bar{f}} \left\{ \delta + \mathbb{E}\left[Z^{1:N}\right] + d_\emptyset[\hat{\sigma}]\lambda(N) + b - k \right\} d\phi(k).$$

$$+ \left(1 - \Phi(\bar{f})\right)\left(\delta + \mathbb{E}\left[Z^{1:\hat{n}}\right]\right)$$

Expanding markets: utilitarian cap

Proposition

Suppose planner is utilitarian. Utilitarian cap is then

$$\tilde{f}_1 = b + \mathbb{E}\left[Z^{1:N}\right] - \mathbb{E}\left[Z^{1:\hat{n}}\right] + \lambda(N)\hat{d}_0.$$

Under Logit demand,

$$\begin{aligned}\tilde{f}_1 &= b - \beta \ln\left(\frac{\hat{d}}{1-d_0}\right) + \lambda(N) d_0 \\ &= \underbrace{b - \lambda(N)\left(\frac{N-1}{N}\right)\ln(\hat{d})}_{\text{cap under mature market}} + \underbrace{\lambda(N)\left(\left(\frac{N-1}{N}\right)\ln(1-d_0) + d_0\right)}_{\text{expanding market adjustment}},\end{aligned}$$

where $\lambda(N) = \beta\left(\frac{N}{N-1}\right)$ *markup.*

If N high, this term is negative

- **The utilitarian cap in an expanding market is very often lower than it would be were the market mature!**
- Fixing size of counterfactual potential demands, the reach of $\hat{\sigma}$ is higher in expanding than in mature markets.

- Consider hotels in **Toulouse** in 2019:
  - avg rate for a double room was around € **80;**
  - **profit margins** 20%; *b* around 2% (€ **1.6**); d_0 around 0.5.
  - *(N-1)/N* can be again approximated to 1.

A commission fee of up to 15% does not exceed the cap, provided the platform **more than doubles the hotel's potential demands (only doubles for mature markets).**

Large markets: approximating optimal cap

- In general, the cap is **not** expressed in terms of observables.
  - What distribution of consumer tastes across firms?
- Idea: employ **approximation techniques based on extreme value theory**.
  - Let the market grow large holding constant latent and potential demand.
- This allows us to express the cap as a function of firms' potential demands and markups.
- Measurable through surveys and experiments.

Asymptotic equivalence

- From definition of symmetric information profiles

$$\hat{d} = \frac{n}{N}\left(1 - \hat{d}_0\right).$$

- Random utility model: match value independent across firms

Proposition

Under a regularity condition on match value cdf G_1,

$$\lim_{\hat{n}, N \to \infty} \left\{ \frac{\mathbb{E}\left[Z^{1:N}\right] - \mathbb{E}\left[Z^{1:\hat{n}}\right]}{\lambda(N)} \right\} = \frac{1 - \hat{d}_0}{\hat{d}} - 1,$$

Relative expansion of consumer cons. set

where the limit above is taken as $\hat{n}$ and N grow large while satisfying (1). Utilitarian cap is then approximated by

$$\tilde{f}_1 \approx b + \left(1 - \hat{d}_0\right)\left(\frac{1 - \hat{d}}{\hat{d}}\right)\lambda(N).$$

Another Easier-to-Use Formula

$$\tilde{f}_1 \approx b + \left(\frac{1 - \hat{d}_0}{\hat{d}} - 1 \right) \lambda(N) + \hat{d}_0 \lambda(N) = b + \left(1 - \hat{d}_0\right) \left(\frac{1 - \hat{d}}{\hat{d}} \right) \lambda(N).$$

- For instance, if the market is **mature** and the **platform doubles potential demands**, **its fee should not exceed the convenience benefit added to the firms' profit margin**.

Other remedies

- If consumers can switch to the sales channel with the lowest price, **banning price parity** is outcome-equivalent to capping the platform fee at the convenience benefit.
  - **This cap is inefficiently low**, be the market mature or growing, as it prevents the platform from appropriating (any of) the informational (ex-ante) benefits it generates.
- We also consider **platform competition**. However, as consumers single-home at equilibrium, fees do not decrease, both under wide or narrow parities.
  - Price parity ties the firm's price at the direct-sales channel to the price charged at some platform where it is still listed.
  - Platforms can sustain the monopolistic fee in equilibrium, rendering competition ineffective.

Concluding remarks

- Platform are often able to charge high fees due to **contractual externality**.
- **Welfare maximizing cap** equals the **expected externality** that the platform imposes on the other market participants.
- The utilitarian cap can be expressed as a function of the **convenience benefit**, firms' **profit margin** and the relative **expansion of consumer consideration sets**.
- **Banning price parity is outcome-equivalent to inefficiently low cap**.
- Competition between platforms may fail to reduce fees under wide or narrow price parity; rather fee caps.

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