

Platform Competition and Access Regulation on the Internet

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Research Question

- The effects of access regulation (Net Neutrality) on
 - consumer Internet prices
 - advertising fees from CPs
 - consumer demand for the Internet and CPs' network participation
 - welfare

Net Neutrality

- Net Neutrality requires ISPs to treat all data packets equally regardless of the type or the destination.
- We focus on the aspect of regulating last mile access charges

Literature

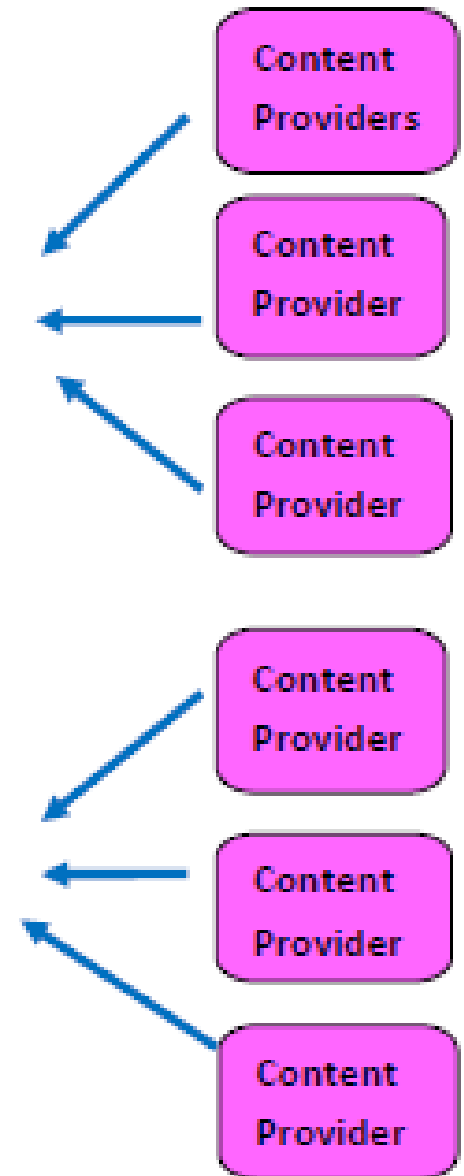
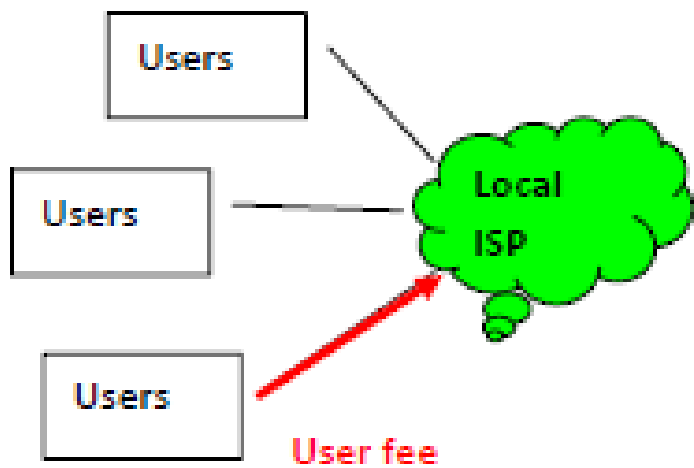
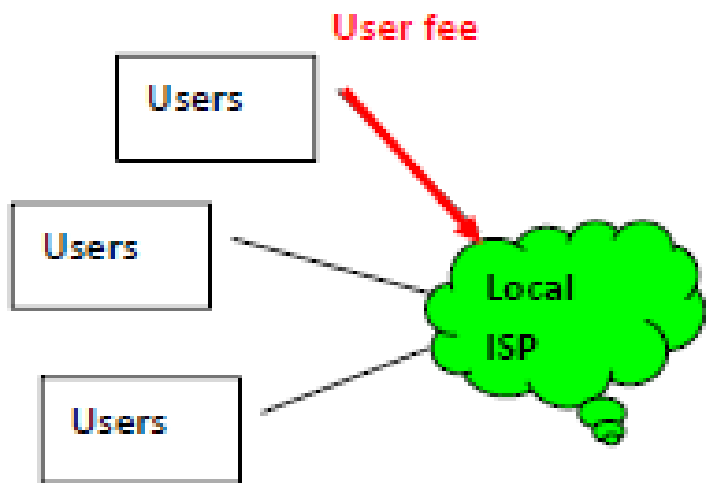
- ISPs' incentives to invest in infrastructure
 - Cheng, Bandyopadhyay, and Guo (2011)
 - Choi and Kim (2010)
 - Economides and Hermalin (2012)
 - Musacchio, Schwartz, and Walrand (2009)
- Economides and Tåg (2012)
- Our paper
 - considers the two sided markets for “content”
 - models the role of Content Network Platforms (CNPs)
 - focus on the effects on consumer demand for the Internet connection

Main Results

- The effect on consumer price is important.
 - A low access charge can lower both advertising fees (f) for CPs and consumer Internet prices (p)
- If consumer Internet prices decrease, total welfare improves
- Even if Internet prices increase, welfare can still improve as long as consumer demand increases due to increased network externality

Model

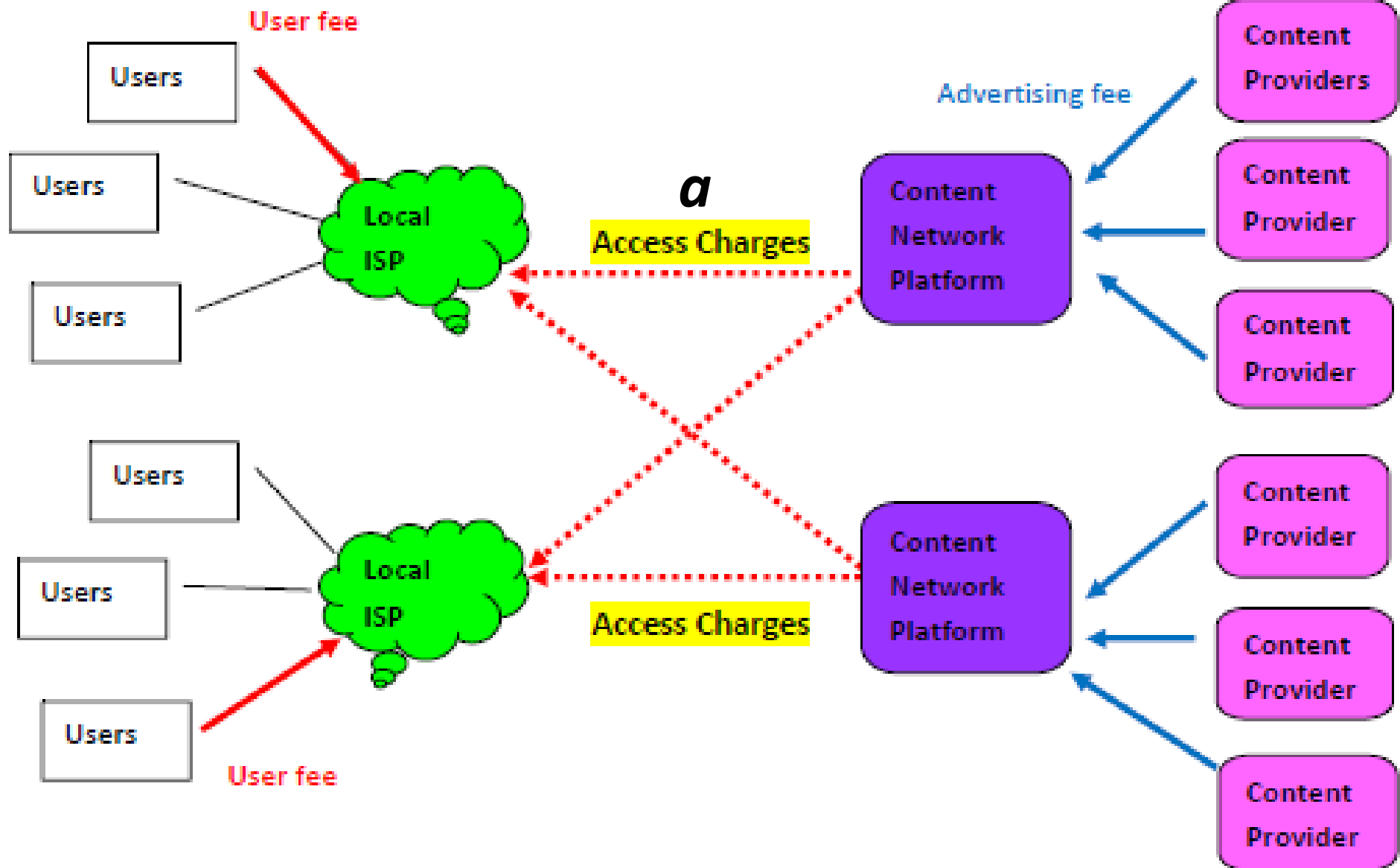
- Two-sided market
- Vertically related platforms: duopoly ISPs and duopoly CNPs
- CNPs: platforms for consumers and CPs
- ISPs: platforms for consumers and CNPs



Consumers ISPs

CNPs

CPs

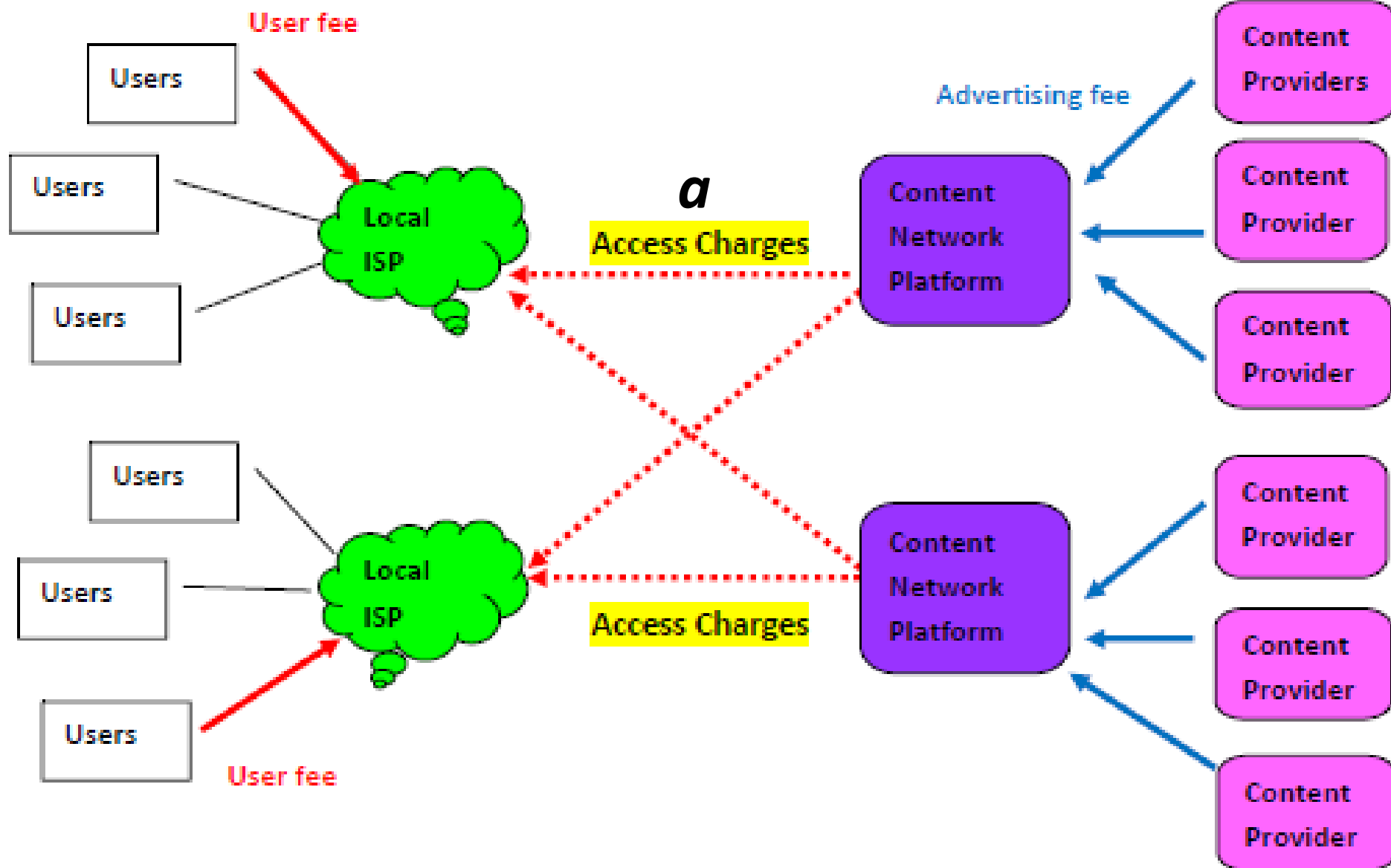


$Nd(p, Ns)$

$p(a)$

$f(a, p(a))$

$\pi(f, Nd)$



Benchmark: Without Regulation

- Suppose p^* , q^* , and f^* are the equilibrium consumer Internet price, access charges, and advertising fees when there is no access regulation
- Access regulation: $0 \leq a < q^*$

Optimal Advertising Fee (f)

$$(1) \quad \frac{f - q}{f} = \frac{1}{(\eta_f^s + \eta_f^b)}$$

where $\eta_f^s = -\frac{\partial N^s / \partial f}{N^s} f$ is the elasticity of CP's participation w.r.t f

$\eta_f^b = -\frac{\partial D / \partial f}{D} f$: is the elasticity of consumer participation w.r.t. f

Optimal Advertising Fee (f)

(2)

$$\frac{\partial f}{\partial p} < 0,$$

- Higher $p \Rightarrow$ lower $N_d \Rightarrow$ CNPs lower $f \Rightarrow$ higher network externality \Rightarrow greater N_d
- ISPs are more inclined to charge a high p

(3)

$$0 < \frac{\partial \bar{f}}{\partial q} < \frac{1}{2},$$

Effect on Consumer Price (p)

Proposition 3 Suppose $a > 0$ and $\hat{\theta} > 0$. Lowering a below q^* reduces p if and only if

$$\gamma_p \left(1 + \kappa \gamma_a \frac{(\gamma_p - 1)}{(\varepsilon_p - 1)} \right) > 2\varepsilon_p(1 - \gamma_a), \quad (30)$$

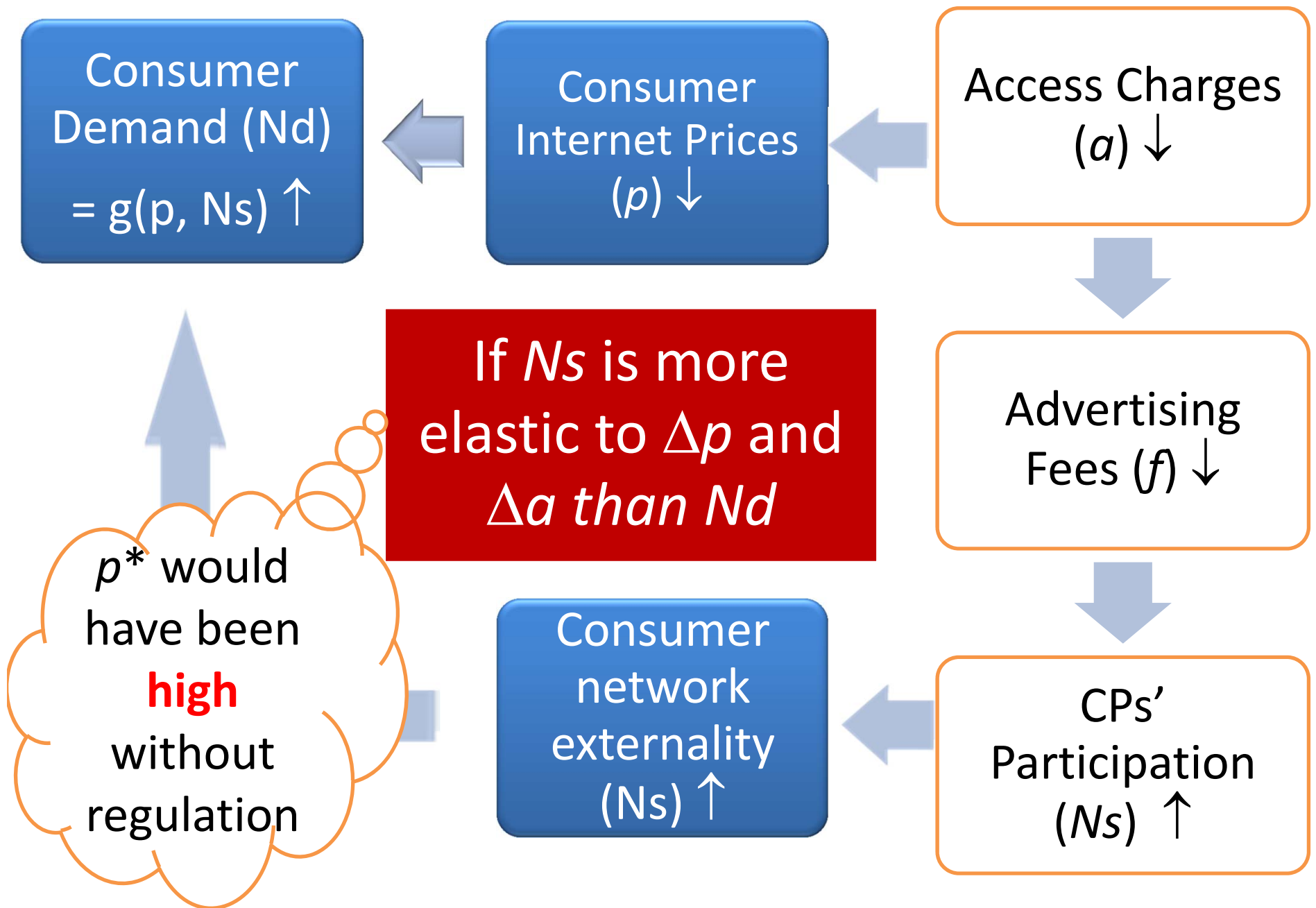
where $0 < \gamma_a < 1$ and $\kappa = \frac{\lambda N^2}{2D}$.

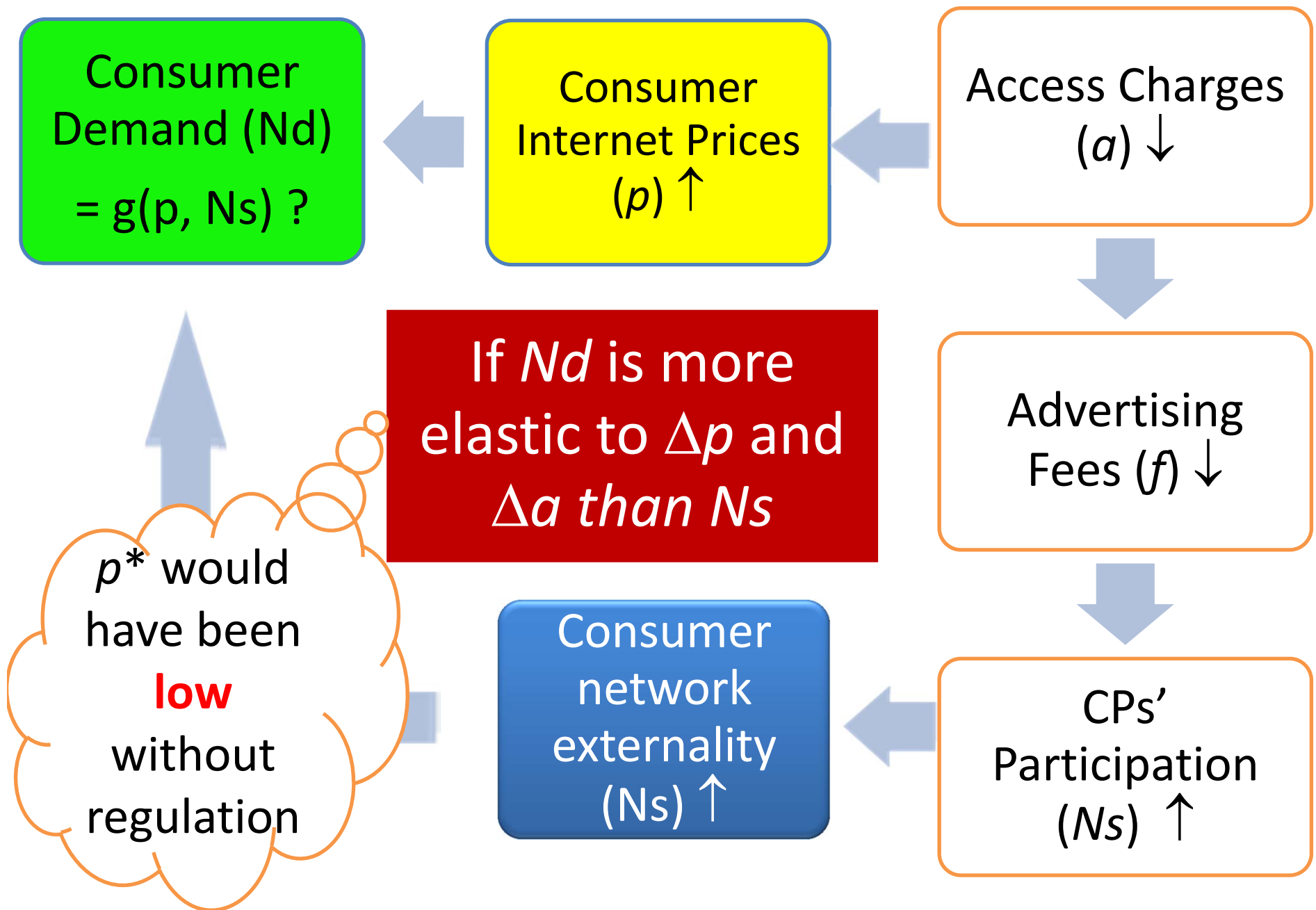
- Access regulation can lower consumer internet price if $\gamma_p = \left(\frac{\partial N^s}{\partial p} \right) \frac{p}{N} = \left(\frac{-1}{\phi} \frac{\partial f}{\partial p} \right) \frac{p}{N} > 0$ and $\gamma_a = -\left(\frac{\partial N^s}{\partial a} \right) \frac{a}{N} = \left(\frac{1}{\phi} \frac{\partial f}{\partial a} \right) \frac{a}{N} > 0$ are high

Effect on Advertising Fee (f)

Proposition 4 *Regardless of the effect on p , access regulation lowers advertising fees f .*

$$\bullet \frac{df}{da} = \underbrace{\frac{\partial f}{\partial a}}_{(+)} + \underbrace{\frac{\partial f}{\partial p}}_{(-)} \cdot \underbrace{\frac{dp}{da}}_{(-,+)} > 0$$





Welfare

- If consumer demand for the Internet increases, welfare improves
- If consumer demand for the Internet decreases substantially, CPs are worse off, and thus welfare reduces

The National Broadband Plan (2010)

- "nearly 100 million Americans do not have broadband,"
- "[t]he mission of the plan is to create a high-performance America [...] in which affordable broadband is available everywhere and everyone has the means and skills to use valuable broadband applications."
- To achieve this goal, the plan recommends designing "policies to ensure robust competition and, as a result, maximize consumer welfare."

Conclusion

Implicit assumptions behind this plan

- (i) a lower access charge is effective in inducing a greater demand from consumers, and
- (ii) an increase in consumer demand for the Internet is crucial in enhancing welfare

We find

- A low access charge does not necessarily induce greater demand from consumers
- However, if it does, it does improve overall welfare