

A Most Egregious Act? The Impact on Consumers of Usage-Based Pricing

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Introduction

Usage-based pricing is increasingly common for broadband services. The evolution in broadband pricing has been long anticipated; customers with widely-variable levels of network utilization impose very different costs on the network and its users, and to pretend that every customer is alike leads to inefficiency. Failing to account for cost differences in such circumstances penalizes customers whose activities do not congest the network—a topic we covered in a paper entitled: *The Welfare Impacts of Broadband Network Management: Can Broadband Service Providers be Trusted?*¹ Indeed, the primary function of prices in markets is to provide the correct signals to market participants, guiding their activities into the most valuable and useful paths. When a resource is socially valuable, like capacity on a broadband network, the price system should discourage its careless use.

Some claim, however, that such pricing may be anti-competitively motivated. For example, one allegation is that wireline broadband providers (in particular, those who provide multichannel video programming) may be using these policies to protect their video profits from competitors like Netflix and YouTube. If motivated by protecting profits rather than, say, congestion management, then these same parties claim that usage-based pricing options are anticompetitive and anti-consumer and thereby justify the price regulation of broadband services by the Federal

Communications Commission.² Indeed, a recent report by Public Knowledge – *Know Your Limits: Considering the Role of Data Caps and Usage Based Billing in Internet Access Service*—makes such a claim.³

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There are a number of reasons for usage-based pricing of broadband services that nearly everyone would deem legitimate. An interesting question is whether usage-based pricing based solely on “profit protection” from broadband-dependent substitute video services is, in fact, anti-consumer, as some claim. In this PERSPECTIVE, I consider that question by taking the argument to its logical conclusion and offering an analysis of a hypothetical scenario in which a broadband provider charges a fee to consumers to access over-the-top video services.⁴ This fee offsets the lost profits associated with the loss of video subscriptions, a scenario some would argue satisfies the definition of anticompetitive and discriminatory pricing that violates neutrality principles. Using a very simple economic example, however, I show that that charging a positive price to account for the substitution of over-the-top video services for the broadband provider’s own video services can make consumers and society

better off. Consequently, regulations that prohibit such actions can make consumers and society worse off.

As shown here, regulatory oversight may not improve well-being even in a case that the proponents of regulation would describe as an egregious example of anticompetitive conduct by broadband providers. Given this, and the fact that there are many economic and business reasons for usage-based pricing that most accept as valid, I conclude that regulatory oversight of usage-based pricing is unlikely to improve social well-being.⁵

An Egregious Act?

In *Know Your Limits*, the authors observe, “in the United States Internet service providers are almost always also in the pay-television business. As such, offerings by companies such as Netflix represent direct competition to a lucrative business.”⁶ The authors then argue that “[i]mposing UBP on broadband data while maintaining a ‘separate pipe’ free of usage-based charges for its own pay-television offering allows service providers to impose an additional cost on their competitors. ... The nature of the competitive threat posed by UBP flows from the fact that most service providers offer both Internet access services *and* applications such as video and voice that rely upon (or can rely upon) that Internet access.”⁷ This argument suggests that if a broadband provider uses its pricing policies to protect its video profits, then its pricing policies are anticompetitive and anti-consumer. But is this assessment of these pricing policies legitimate?

In order to assess the claim, I will evaluate the consumer welfare implications of one such pricing policy. Specifically, imagine a world where a multi-service communications provider offers two levels of broadband Internet service at two different prices. The first service allows the customer to use “over-the-top” video services (“OTT”) to watch video content over

the broadband network. The second, by design, does not, so that only the provider’s video services can be used in conjunction with the broadband service.⁸ The OTT-capable broadband service sells at a higher price in order to maximize profits, so that this price differential offsets the expected lost profits to the provider if the customer uses a third-party video service (e.g., Netflix) instead of the service provider’s own video offering.⁹ The use-restriction and price differential maximizes the profits of the network firm.¹⁰

There are those that would label this practice as anti-competitive, anti-consumer and plainly in violation of network neutrality principles. The Federal Communications Commission (“FCC”) would likely be called upon to terminate the “offensive” pricing tactic and force broadband providers to offer all consumers only the OTT-capable service, and such regulations would undoubtedly be labeled “pro-consumer.”

... prohibitions against usage based pricing forces some consumers to pay more for services they do not want or use, while others are allowed to pay less for services they do. The prohibition, in effect, results in a transfer of wealth from one group of consumers to another, and profits are also reduced. Overall consumer welfare is diminished, even though some consumers are better off.

Yet, it is not difficult to show that prohibiting even this practice can harm consumers and reduce economic welfare. A prohibition of differential pricing renders a single price that lies between the low price for the restricted service and the high price for the unrestricted

service. Therefore, prohibitions against usage based pricing forces some consumers to pay more for services they do not want or use, while others are allowed to pay less for services they do. The prohibition, in effect, results in a transfer of wealth from one group of consumers to another, and profits are also reduced. Overall consumer welfare is diminished, even though some consumers are better off.

A Simple Model

To demonstrate that differential pricing in an effort to protect service profit can raise welfare, I provide a very simple economic model. The argument is just complex enough to demonstrate the conclusion, which is that regulations prohibiting differential pricing based on usage characteristics, even when such differential pricing is motivated purely by profit protection, need not make consumers and society better off.

To begin, consider a communications provider that sells three (related) goods, denoted here by H, L and V. I will discuss the model in terms of a multichannel video provider selling broadband service. The good V is a basic video service that requires no customer investment beyond the price charged to access it. The good L is a broadband connection service that is not capable of supporting OTT video (“low quality”) while H is a connection fully compatible with OTT video (“high quality”). I assume that the use of OTT involves an additional cost to some consumers, including perhaps the purchase and installation of hardware and software, or that there is some cost related to the lower quality of third-party video services.¹¹ Any consumer who buys service H receives the services represented by L (broadband Internet access) and V (video services), although she may have to pay some extra costs to do so. Put simply, H is a substitute for the combination L and V, though additional costs may be incurred to make it so.

Those who buy just L and/or V pay no additional costs use the service.

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To illustrate the welfare effects of regulation aimed at blocking efforts to limit bypass of the provider’s V service through premium pricing of H, we make the following simplifying assumptions. First, any consumer wishes to consume at most one unit each of the services represented by V and L (although he might obtain them jointly through the purchase of H). Second, the most efficient consumer is assumed to pay no additional cost beyond price to implement these services through the purchase of H, while less efficient consumers pay some extra costs or perceive or experience a lower quality of service which is equivalent to a cost. Third, consumers maximize their surplus by purchasing those goods that yield the highest total surplus, defined as the difference between their reservation values and the full prices (including any private costs). Finally, any bundle of goods offered by the service provider must be available to all buyers on the same terms.

Now, consider the following experiment.

First, suppose the seller is allowed to freely select its prices P_H , P_L and P_V , to maximize profits. Suppose these prices are such that, given the pattern of demand and willingness to pay, the seller sells all three products in equilibrium, with consumers self-selecting those services that maximize their own surplus. Next,

suppose a regulator imposes regulation in the form of a uniform pricing condition, so that only a single quality of broadband connection, either H or L, may be sold, and all consumers who buy broadband service pay the same price for that service level. The seller, for its part, must decide whether this single quality will be video compatible (H), or not (L). To avoid additional mathematical clutter, I imagine that the blocking of OTT necessary to make a connection have L quality is costless (there's a simple on/off switch). Further, I assume all goods have zero marginal costs, although this assumption is for expositional purposes only. (The positive prices may be just high enough to earn zero profits, so there may be no real "monopoly" concern in this example.)

Nothing I have said so far implies that differential pricing as described will help consumers. With sensible patterns of willingness to pay, the imposition of a regulation that requires only a single type of connection to be sold may result in: (1) only the H service being sold (which would likely be the regulatory mandate), but (2) a reduction in social welfare. This suggests that, even if the regulation does produce a "neutral" broadband service, it may reduce welfare, and thus is not defensible on positive grounds.

To demonstrate this outcome, suppose that there are three consumers, labeled A, B and C. Their maximum values for the services H, L and V are given in Table 1. Notice first that A's value for H, 40, equals the sum of his values for L and V, so A is the "efficient" consumer of OTT video (there is no additional cost of using OTT video). Second, B's value for H is less than the sum of her values for L and V, reflecting B's additional costs of implementing a service like V using the H connection. Since an H connection can, by definition, provide any service available with an L connection, the values of all consumers for an H are at least that of an L. Finally, C is a consumer who doesn't desire broadband service, but places a value on V.¹²

Table 1. Consumer Reservation Prices

	H	L	V
A	40	20	20
B	39	20	24
C	0	0	24

If the firm can price H, L and V freely to maximize its profits, it will select $P_H = 40$, $P_L = 20$, and $P_V = 24$, resulting in a profit and welfare of 108 [= 40 + 20 + 24 + 24]. This is the maximum possible welfare given the numerical example, as inspection quickly reveals.

Now consider a neutrality regulation of the following form. The seller is allowed to sell either H or L connections (its choice) at a single price. The firm continues to price V freely. For welfare comparisons, we first must decide whether the seller offers H or L. If the seller offers L, the optimal prices are $P_L = 20$ and $P_V = 20$, yielding a profit of 100 [20 + 20 + 20 + 20 + 20] and total welfare of 108 [100 + 2·(24 - 20)]. Alternately, if the seller decided to sell H service, it would maximize its profits at $P_H = 39$ and $P_V = 24$, resulting in profits of 102 [= 2·39 + 24] and welfare of 103 [= 2·39 + 24 + (40 - 1)]. As a profit maximizer, the firm chooses to offer the H variety of broadband connections (102 > 100).

Given these values, the following may be concluded. First, the regulation will reduce social welfare, even though the seller here decides to offer the "neutral" connection H. Good H is more profitable to the firm, yet requiring everyone who wishes a connection to buy it is not in the social interest. The mechanism that causes this to occur in this artificial setting is, however, not artificial at all. Rather, the "inefficient" consumer B is induced to buy the high end service even though she must then waste resources to get it to function as a source of V related services. These extra costs, which apparently have a value of 5, explain the difference between total welfare under the free

pricing regime ($W = 108$) and under the regulatory mechanism ($W = 103$).

Conclusion

Usage-based pricing is increasingly common for broadband services. Some claim, however, that broadband providers may be using these policies to protect their video profits from competitors like Netflix and YouTube. If motivated by such concerns (rather than, say, congestion management), these same parties claim that the policies are anticompetitive and anti-consumer, and thereby justify the price regulation of broadband services by the FCC.

lacking any cost reason to do so, does not imply a neutrality rule is an improvement. This conclusion, when combined with the existence of differences in costs of service and a workably competitive landscape for video content delivery, suggests regulatory oversight of usage-based pricing is unlikely to improve social well-being.

... the fact that firms use differential pricing, even lacking any cost reason to do so, does not imply a neutrality rule is an improvement. This conclusion, when combined with the existence of differences in costs of service and a workably competitive landscape for video content delivery, suggests regulatory oversight of usage-based pricing is unlikely to improve social well-being.

In this PERSPECTIVE, I take this argument to its logical endpoint using a hypothetical scenario in which a broadband provider charges a fee to consumers to access over-the-top video services. This fee is not cost-based, but offsets the lost profits associated with the loss of video subscriptions, a scenario that many would immediately associate with anti-competitive pricing and discriminatory actions violating neutrality principles. Using a simple numerical example, I show that such pricing behavior can make consumers and society better off. Thus, the fact that firms use differential pricing, even

NOTES:

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¹ G. S. Ford, T. M. Koutsky and L. J. Spiwak, *The Welfare Impacts of Broadband Network Management: Can Broadband Service Providers be Trusted?* PHOENIX CENTER POLICY PAPER No. 32 (March 2008) (available at: <http://www.phoenix-center.org/pcpp/PCPP32Final.pdf>).

² Of course, nearly all actions taken by firms are aimed at profit maximization, so this argument lacks economic substance.

³ A. Odlyzko, B. St. Arnaud, E. Stallman, and M. Weinberg, *Know Your Limits: Considering the Role of Data Caps and Usage Based Billing in Internet Access Service*, Public Knowledge (May 2012) (available at: <http://www.publicknowledge.org/know-your-limits-considering-role-data-caps-and-us>).

⁴ This example could be applied to any service offered by a broadband provider in addition to broadband service for which broadband facilitates a substitute service. For example, the same analysis would apply to a DSL and VoIP services, or mobile voice and Skype services provided over a mobile broadband device.

⁵ Given that usage-based pricing has legitimate business purposes, the analysis of usage-based fees as an anti-competitive practice must follow a “rule of reason” approach. In recent rule of reason cases, the Courts have disposed 97% of cases for failure to show an anti-competitive effect. M. Carrier, *The Rule of Reason: An Empirical Update for the 21st Century*, 16 GEORGE MASON LAW REVIEW 827-837 (2009).

⁶ *Know Your Limits*, *supra* n. 3, at 48.

⁷ *Id.*

⁸ This example is not a far cry from the recent pricing policies of Comcast. See J. Baumgartner, *Comcast Denies It's Prioritizing Xbox Video*, LIGHTREADING CABLE (May 15, 2012) (available at: http://www.lightreading.com/document.asp?doc_id=220959&site=lr_cable).

⁹ For a theoretical analysis of the differential, see T. Beard, G. Ford, and L. Spiwak, *Why ADCo? Why Now? An Economic Exploration into the Future of Industry Structure for the “Last Mile” in Local Telecommunications Markets*, 54 FEDERAL COMMUNICATIONS LAW JOURNAL 421 (May 2002) (available at: <http://law.indiana.edu/fclj/pubs/v54/no3/spiwak.pdf>).

¹⁰ Broadband providers today do not offer services that exactly match this hypothetical scenario. While providers offer services that differ in terms of the bandwidth provided (or “speed”), we rarely observe content-specific limits or pricing by broadband providers. The scenario is intentionally chosen as an extreme; a worst-case scenario.

¹¹ All these services are assumed to be provided competitively.

¹² About 30% of households do not have broadband subscriptions. See, e.g., National Telecommunications Information Administration, *Broadband Internet Adoption Moves Forward, but Digital Divide Still Persists* (November 09, 2011) (available at: <http://www.ntia.doc.gov/blog/2011/broadband-internet-adoption-moves-forward-digital-divide-still-persists>).