

The Wrong Tool for the Job: Data Caps, Price Discrimination, and Bandwidth Pricing

As the discussion surrounding data caps shifts from one about “data hogs” to one about pricing models, it is critical to examine the issue with precision. This short paper examines the role that price discrimination can play in broadband pricing, and considers the different ways to implement a price discrimination strategy. It concludes that, while price discrimination can be an effective way to increase access to broadband, data-based pricing is an inefficient and counter-productive means to that worthy end.

The Shift From Congestion to Discrimination

Even ISPs have begun to admit that data caps are not about addressing network congestion.¹ This admission was inevitable as the position never stood up to scrutiny. Congestion is a phenomenon that is specific to a time and place on a network. Data caps are monthly aggregates of usage. They cannot discriminate between streaming video during high periods of network usage and remotely backing up data in the early hours of the morning. In light of this, there is little reason to think that monthly caps have any meaningful impact on peak network congestion.

This shift does not mean that ISPs are moving away from caps. Instead, they have found a new justification for the caps: price discrimination. Price discrimination, which can make broadband more accessible by forcing people who value it more to pay more (and therefore allows people who value it less to pay less), is a pricing strategy found throughout the economy and is not, in and of itself, problematic. In fact, two recent whitepapers have made strong cases that price discrimination in broadband pricing can benefit consumers.² Unfortunately, in making the case for price discrimination, ISPs have been unable to explain why we should embrace data caps specifically. As will be illustrated below, policymakers should be wary of blindly applying general discussions about price discrimination to data caps in particular.

Price Discrimination and Data Caps

Before examining how data caps fit into an examination of broadband price discrimination, it is worth reviewing price discrimination as an economic phenomenon. Simply put, price discrimination occurs when a seller charges different prices to different purchasers. This type of activity can increase economic efficiency. A single price for goods means that some people pay less than the good is worth to them – therefore forcing the seller to “leave money on the table.” Conversely, that same single price means that some people who are interested in the good, but do not value it at that single price, do not purchase it at all. Neither of these missed opportunities are ideal.

Price Discrimination

First-order price discrimination – a largely theoretical type – occurs when a seller knows exactly how much each potential customer is willing to pay for the good and prices the good accordingly. This pricing model leads to maximum economic efficiency. Unfortunately, however, perfect knowledge of potential customers’ valuation of goods can be hard to come by in the real world.

1 See John Eggerton, *NCTA’s Powell: Usage-Based Pricing About Fairness, Not Capacity*, *Broadcasting & Cable*, January 17, 2013, http://www.broadcastingcable.com/article/491396-NCTA_s_Powell_Usage_Based_Pricing_About_Fairness_Not_Capacity.php.

2 See Daniel A. Lyons, *The Impact of Data Caps and Other Forms of Usage-Based Pricing for Broadband Access*, Mercatus Center, George Mason University, October 2012, <http://mercatus.org/publication/impact-data-caps-and-other-forms-usage-based-pricing-broadband-access>; Johannes M. Bauer and Steven S. Wildman, *The Economics of Usage-Based Pricing in Local Broadband Markets*, Michigan State University, December 14, 2012, http://i.ncta.com/ncta_com/PDFs/Wildmanreport_web.pdf.

In the real world, sellers must find some sort of proxy to help identify high value purchasers from low value purchasers. A classic example of this is airline seat pricing. Airlines do not know which potential customers are vacationers more sensitive to high prices and which potential customers are business people less sensitive to high prices. They therefore use time as a proxy for price sensitivity. Advance purchasers (presumably vacationers) pay lower fares while last minute purchasers (presumably business people traveling to important last-minute meetings) pay higher fares. While imperfect, this proxy does a reasonably good job of sorting high-value purchasers from low-value purchasers.

Of course, not all proxies are created equal. Airlines could have chosen something else – height, whether the purchaser weighed an odd or even number of pounds on the day of the flight, number of letters in the purchasers last name – to try and identify which purchasers were more likely to place a high value on airline tickets. In a competitive market, this type of poor proxy choice will manifest itself quickly as some consumers move to game the system while others simply move to a competitor. However, in less competitive markets these proxies can persist.

Price Discrimination in Internet Access

In the history of the consumer internet, there have been at least three different proxies for price discrimination in the market.

Time

The first was time. As dial-up veterans recall, originally most people accessed the internet at a per-minute rate. In many ways, time served as an effective proxy for how much a consumer valued her connection. People who used the internet more presumably valued it more and therefore paid more. People who used the internet less presumably valued it less and therefore paid less. As an added benefit, people had an existing understanding of time and could (reasonably) accurately estimate how much time they were spending online.

For all of its benefits as a price discrimination tool, per-minute pricing was not popular with customers. It turned every session into an exercise in watching the clock, getting the information you needed as quickly as possible and then getting off. The per-minute structure discouraged browsing for new information and trying new services. It made the internet a precious thing that could be stressful to explore.

Fortunately, the dial-up ISP market was fiercely competitive. This competition drove per-minute prices down and, eventually, led to unlimited monthly access fees. Suddenly, consumers could explore the internet at their leisure. They could try new things and seek out information they did not even realize that they wanted. It also made trying the internet for the first time less fraught with anxiety. These were all positive developments for the growth of the internet.

Speed

However, the move to unlimited monthly access made price discrimination much harder by eliminating time as an available proxy. But just as dial-up was going unlimited, ISPs began rolling out always-on broadband. This presented a new proxy for price discrimination: speed.

Like time, speed served as a reasonable proxy for price discrimination. People who valued the internet highly valued speed. High speed meant that they could do more things, and that more advanced applications worked better.

Speed also excelled as a signaling device of value to consumers. It gave consumers immediate feedback that they might be high-value internet users. For example, if a particular website always loaded slowly, the consumer could evaluate – in real time – if they valued a speedy load time for that site enough to pay more for a faster tier. Being annoyed by a slow load time once an hour suggested that it was time for a faster connection. Conversely, if the annoyingly slow download was a rare occurrence, it might not be worth paying extra to speed it up.

Just as importantly, speed had none of the drawbacks of time. There were no financial penalties for exploring the internet and trying new things. There was no meter to keep track of, or minutes to count. Doing something new – like building a website or streaming a song – did not require a user to decide what established internet habit she was going to give up for the month.

As a result, speed fueled a virtuous cycle of broadband expansion. Liberated from keeping an eye on the clock, users were free to explore the internet and try new things. As they discovered more and more new things, their demand for faster connections increased. Their move up the pricing scale helped fund further network improvements making speed more accessible and restarting the cycle once again.

Data

In some ways, speed was too good of a proxy. It was a metric that consumers understood and that allowed them to effectively sort themselves. Slow tiers reduced the chance of someone being priced out of connectivity altogether. Faster tiers gave high-value users a reason to pay more. But the ease of understanding speed also meant that there were fewer people overpaying for a tier they did not really need.

While ISPs might want people to over-pay for their internet connection, in a competitive market that wish would go unfulfilled. The market would quickly punish any ISP that moved from a proxy that consumers accepted to a proxy that consumers hated. However, in a market with limited competition it might be possible to replace a consumer-friendly proxy with a more ISP-friendly one. That appears to be what is happening as ISPs move towards using data as a major tool of price discrimination.

Pricing connectivity according to data consumption is like a return to the use of time. Once again, it requires consumers keep meticulous track of what they are doing online. With every new web page, new video, or new app a consumer must consider how close they are to their monthly cap. Using the internet becomes an exercise in worrying about paying overage fees, not in exploring and trying something new.

Inevitably, this type of meter-watching freezes innovation. Instead of seeking out new applications and then demanding connections that can support them, consumers stick with what they know and assume what they have is “good enough.” This is good news for ISPs who would prefer to avoid spending on network upgrades, but bad news for everyone else.³

³ This is especially true as capital investment in cable networks have slowed as the profitability of those networks have increased. See Hibah Hussain, Danielle Kehl, Benjamin Lennett, and Patrick Lucey, *Capped Internet: No Bargain for the American Public*, The New America Foundation’s Open Technology Institute, February 20, 2013, http://www.newamerica.net/publications/policy/capped_internet_no_bargain_for_the_american_public.

Data caps introduce new problems as well. Unlike time, almost no one has an intuitive understanding of data. Most consumers do not understand what a megabyte is, or how they relate to the gigabytes that are used to define their caps. Furthermore, file sizes can be hard to estimate. A minute of internet access is always equal to a minute of internet access. But a minute of video can require a highly variable amount of data.⁴ Simply intuiting one's data consumption can lead to frequent, and costly, errors. In fact, measuring data usage is so complicated that few ISPs are able to present independent certification that their own meters are accurate.⁵

Finally, data massively delays the feedback loop offered by speed. As described above, speed expresses itself to a consumer while she is engaged in the data-intensive activity. If a user's video is buffering, she can ask herself how often she watches online video and if that activity justifies moving up to the next price tier. In sharp contrast, a user does not find out that she exceeded her data allowance until she receives an alert that she must pay an overage fee. At that moment, she must try and reconstruct days, weeks, or even a whole month's worth of usage and try to identify which data-intensive activities she was engaged in, how important they are to her, and if they are worth paying extra to support. In light of this uncertainty, it should come as no surprise that many consumers choose to over-buy and under-use data.

Stepping Back Instead of Moving Forward

There is no doubt that price discrimination can benefit consumers and increase broadband availability. But how price discrimination is implemented is just as important as whether it is implemented in the first place. In that regard, moving from speed-based discrimination to data-based discrimination represents a step in an anti-consumer, anti-innovation direction. When compared to speed, data is harder to understand, discourages experimentation, and may intimidate novice internet users. This shift undermines our national goal of a digitally-literate citizenry constantly innovating online.

⁴ Streaming rates change not only from ISP to ISP, but also from month to month on the same ISP. See, e.g. ispspeedindex.netflix.com.

⁵ See Stacey Higginbotham, *More bad news about broadband caps: Many meters are inaccurate*, GigaOm, February 7, 2013, <http://gigaom.com/2013/02/07/more-bad-news-about-broadband-caps-many-meters-are-inaccurate/>.