

Information Goods with Costly Sharing

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Extended Abstract

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Abstract

It is not uncommon for multiple users to share a single subscription for media streaming services such as Netflix despite there being a cost to sharing. I study the impact of costly sharing on profits as well as a new type of multi-tier menu pricing that has been introduced by the streaming industry recently. Theoretical and simulation results show that illicit sharing almost always reduces profits and multi-tier pricing is able to recover some lost profits from sharing. These results may explain why firms have not actively cracked down on illicit sharing. Interestingly, consumer surplus increases under price discrimination.

JEL Classification: D4, L86

Extended Abstract

The online media streaming industry is relatively new and is becoming increasingly popular. It is projected to worth more than the US Box Office by 2017 with a revenue of \$14 billion according to a PricewaterCooper report (2014). With online streaming, users typically pay a monthly subscription and get “all you can eat” content (TV series, movies, music, etc.). Major players in this market include Netflix, HBO, Hulu and Amazon.

Password sharing is a concern that has arisen in the industry. This involves a single subscription being shared among different users, meaning multiple people have access to the streaming content on just one purchase. Nevertheless, sharing is not without costs, as most firms have restrictions such that only one person can have access to contents at any given time. This means that if Bob and Charles are two friends sharing a subscription, if Bob is streaming the content, Charles cannot stream the content at the same time. This creates a new type of problem that is different from the ones studied in the literature of sharing information good and piracy, where sharing is largely costless and consumption is non-rival.

At the time of writing this paper, password sharing is forbidden by all streaming firms, and according to market research agency Ipsos, this is technically a federal crime punishable by as much as a year in prison. Nevertheless, according to Consumers Report in January 2015, 46% of users share passwords with people outside of their households. A report by Parks Associates (May 2015) claims that up to \$500 million direct revenues are lost worldwide across the industry as a result of illicit sharing. A GlobalWebIndex survey in July 2015 looks at 5,721 Netflix users across the United States and the United Kingdom. It finds that 65% of people share their password, with 30% sharing with one other person, 16% sharing with 2 other persons and 19% sharing with 3 or more persons. Given the figures in the report, Citi Research estimates that in the United States, there are 15.9 million users who do not share, 27.3 million who share between 2, 21.9 million who share between 3 and 34.6 million who share between 4 or more. This means that there are actually 99.8 million Netflix users compared to 45.6 million subscribers.

There has not been any crackdown on password sharing by streaming companies, which begs the first research question of this paper: is password sharing profit-reducing?

To address this question, I study a model where the consumer observes price(s) posted by a monopolist, then decides optimally whether to purchase, share or not purchase. Sharing here is costly in the sense that it degrades the valuation of the product. Consumers have heterogeneous valuations and number of friends (people whom they could share with), these are private information but the firm knows the distribution and sets price(s) accordingly.

While some earlier literature claim that sharing of information goods increases profits (Bakos et al. 1999), I show that when consumers have binary valuations, (costly) password sharing results in a loss of profits. I then show that these results hold in simulations with various continuous valuation distributions in a much more extensive setting. A loss in profits suggest that a crackdown on password sharing could be appealing to the firm.

Nevertheless, a crackdown is not the only way to recover profits. At the end of 2013, Netflix introduced a new price plan that allows users to buy one screen for \$7.99, two screens for \$8.99 and four screens for \$11.99. This means that if Bob and Charles buy two screens, they could actually legitimately share their subscription and stream different contents at the same time without any restriction.

	Basic	Standard	Premium
Price after free month ends on 8/22/15	\$7.99	\$8.99	\$11.99
HD available	×	✓	✓
Ultra HD (when available)	×	×	✓
Screens you can watch on at the same time	1	2	4
Watch on your laptop, TV, phone and tablet	✓	✓	✓
Unlimited movies and TV shows	✓	✓	✓
Cancel anytime	✓	✓	✓

Figure 1: Netflix Pricing August 2015

This is a new and specific form of menu pricing that seems to directly addresses the problem of password sharing, and the second research question of this paper studies what this multi-tier pricing scheme achieves for both firms and consumers.

I find that this multi-tier pricing is only effective when password sharing exists. It reduces the proportion of people sharing passwords and helps recover some (but not all) lost profits from password sharing. Furthermore, this new multi-tier pricing increases userbase compared to uniform pricing. Not only do firms have less of a need to crackdown as a result of this act of price discrimination, consumers may also benefit from it by gaining extra surplus. Multi-tier pricing could therefore be an interesting alternative to crackdown on the problem of password sharing.

Finally, I discuss an alternative solution to the problem of sharing. For instance, if the firm employs a “pay per view” pricing scheme instead of an “all you can eat” scheme, then sharing is not possible. I then briefly discuss other reasons why firms have not taken action to crackdown on password sharing, including competition and the externalities of sharing, as well as the associated risks and costs of a crackdown.

References

Bakos, Y., Brynjolfsson, E., & Lichtman, D. (1999). Shared Information Goods. *Journal of Law and Economics*, 42(1), 117-156.