NBER Digitization workshop application

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Background

I am a PhD candidate in the Department of Economics at Princeton University, with an expected graduation date in 2017. My major field of study is Industrial Organization and my minor field is Econometrics.[1] I have acted as a TA in undergraduate courses in Mathematical Econometrics and the Economics of the Internet. My primary line of research is the structural empirical analysis of bargaining and two-sided markets; for my dissertation, I focus on the industry of internet service provision in the U.S. and the policy of network neutrality. My other research includes consumer habit formation and dynamic congestion management, as well as work on consumer cross-device habit transfer.

My own research agenda and direction was greatly enriched by attending the 2015 NBER Summer Institute Digitization session. If selected to participate in the 2016 Digitization workshop I would hope to develop new opportunities for collaboration and discuss the application of cutting edge empirical tools to relevant problems in the economics of digitization.

Primary research

In the past ten years, there has been a spate of theoretical research on the welfare effects of network neutrality.[2] I contribute to this literature by using modern empirical IO techniques to structurally estimate the market for internet service provision in the U.S., and by performing policy counterfactuals on the effect of abandoning network neutrality and mergers between internet service providers (ISPs) and content creators. My paper also connects more broadly to literatures on two-sided markets, bargaining, and menu pricing.

I model the internet as a two-sided market, where last-mile internet service providers (ISPs) intermediate between consumers who enjoy spending time online and content providers who earn profits through pageviews. On the consumer side, ISPs set menus of prices and access speeds; consumers then select a plan to gain access to content. On the content side, ISPs bargain with

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transit providers over linear transit fees; transit providers are assumed to bargain on behalf of the bloc of all the content that connects through that transit provider.

Conceptually, this model improves on recent theory models that analyze network neutrality. In most models, the *status quo ante* with network neutrality has ISPs charging nothing for content transmission, whereas in reality content creators are often already being charged as part of a transit bloc. Abandoning network neutrality in my model is thus subtler: as their content is now separately observable firms can no longer bargain in blocs, but must instead bargain bilaterally with the ISP. Framing a move away from network neutrality as a change in bargaining protocol allows me to identify novel effects of bargaining in two-sided markets. Consumer access fees and speed-elasticity of content demand feed into the disagreement payoffs in bargaining on the supply side, generating an ambiguous effect of network neutrality on consumer welfare. Estimating the model is therefore not simply a matter of quantifying a sure welfare gain or loss, but is actually necessary to understand the direction of the welfare effect of bargaining in this two-sided market.

My central data contribution lies in constructing the first national panel dataset on zipcode-level subscription shares by ISP and speed tier (5mbp/s, 20mbp/s, etc.) at a monthly frequency from 2011 to 2014. The lack of any large, recent, longitudinal dataset on internet service subscriptions has until now prevented empirical research into the consequences of network neutrality. I also draw on novel, non-standard datasets from computer science and proprietary marketing datasets of online content consumption to estimate the model.

Other research

In addition to my work on network neutrality, I am undertaking several other lines of digitization related research. First, with the recent explosion in bandwidth-intensive streaming services, congestion management—especially across peak hours within a day—has become a pressing concern.[3] I estimate a model of habit formation in online content consumption and evaluate how effective different dynamic pricing strategies are in mitigating the externalities caused by bandwidth congestion.

Second, using an extremely rich panel of proprietary online shopping data that records what device a good was purchased on, I examine how unobserved consumer heterogeneity in purchasing varies across devices. In particular, I ask to what extent learned habits are device specific.

Notes

[1]My generals were IO and Trade, while my coursework was IO, Trade, and Econometrics.

[2]Schuett, Florian (2015) R&R at IJIO; Gans, Joshua (2015) JRE; Economides, Nicholas and Hermalin, Benjamin (2012) RJE

[3]Nevo, Aviv, John Turner and Jonathan Williams. (2015) R&R ECMA