NBER Digitization Tutorial 2017 Application

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I am currently in the fifth year of an Economics PhD program at the University of Toronto, with an expected graduation year of 2017. As part of this program I completed two years of coursework in microeconomics, macroeconomics and econometrics, as well as field specialization in the theory and empirics of Industrial Organization. I passed the Industrial Organization comprehensive exam with distinction. My major field is Empirical Industrial Organization, and my other fields are applied econometrics and applied microeconomics. My dissertation committee consists of Victor Aguirregabiria (chair), Avi Goldfarb, and Heski Bar-Isaac. Very broadly, I am interested in firm competition in online markets, and competition policy and regulation.

My job market paper studies the effects of consumer search costs on competition in online markets. In many of these markets, consumers can search through thousands, or hundreds of thousands, of products. This search is costly. "Discoverability" is important then, as products are hard to find (Hendricks and Sorensen 2009). As a result, consumer search costs should affect firm entry and quality incentives in online markets. Firms could choose to not enter markets with high search costs. Firms may also underinvest in quality, conditional on entry.

My paper examines how consumer search costs in online markets affect market structure, product variety, quality, and consumer welfare. I use 2012-2014 data from the Google Play mobile app store to study these effects. I take advantage of a natural experiment that reduced search costs for a particular product type (game apps) in early 2014. This is the first paper to use plausibly exogenous variation in search costs to identify their effect on firm entry. Difference-in-differences estimates show a 33% increase in entry for game apps relative to non-game apps (the control group). I also show evidence of effects that are new to the empirical literature: (a) lower search costs affected product design, with firms choosing to enter more niche products; and (b) lower search costs reduced the average quality of entrants.

Consumers like variety, so additional entry should be welfare improving. However, the lower quality of entrants potentially offsets this increase in welfare. Since consumers like quality, conditional on the number of products, a higher share of low quality products would reduce consumer welfare. As well, in the presence of search costs, a larger number of low quality products could make it harder to find high quality products.

I develop a structural model of demand and supply to determine the overall welfare effects of the change. The demand side, following Moraga-Gonzalez, Sandor, and Wildenbeest (2015), merges a discrete choice logit model with a search model. The supply side is a discrete choice game of incomplete information where firms make horizontal (app category) and vertical (app quality) entry decisions. After estimating the model, I show that the reduction in search costs increased consumer surplus by 60%. A decomposition shows that most of the increase in consumer surplus comes from the reduction in marginal search costs. There is also an increase in consumer surplus due to greater product variety. This effect is larger than the fall in welfare due to lower quality. This has important implications to public policy - search cost increasing policies in online markets hurt consumer welfare not only directly, but also indirectly through foreclosure.

In the future, I plan to expand my research on online markets. I want to examine the effects of best-selling "superstar" products on online competition. Brown (2011) empirically shows that "superstar" competitors have ambiguous effects on the effort of other players in a golf tournament. To my knowledge, there is no empirical evidence of such effects in a market setting. These issues are particularly relevant in online markets, where there are strong network effects and where firms do not know what types of products will be profitable. Due to network effects, the appearance of a "superstar" product may deter firms from producing similar products and competing with the "superstar." On the other hand, a "superstar" product may signal that similar products are profitable and resolve firm uncertainty about demand. With my dataset on mobile apps, I can examine the number of entrants in a particular niche after a "superstar" appears. I can also test to see many of the new entrants are imitators who copy the "superstar," or innovators who try to improve on the "superstar."

In summary, my current and future research will shed light on firm strategy in terms of entry and product selection in online search markets. I believe that attending the 2017 NBER Digitization Tutorial would substantially benefit me by exposing me to the most recent research in an area I am interested working in, as well as discussing and improving my own research in the field with leading experts and other interested students.

References

Brown, J. (2011). Quitters never win: The (adverse) incentive effects of competing with superstars. *Journal of Political Economy 119*(5), 982–1013.

Hendricks, K. and A. Sorensen (2009). Information and the skewness of music sales. *Journal of political Economy 117*(2), 324–369.

Moraga-González, J. L., Z. Sándor, and M. R. Wildenbeest (2015). Consumer search and prices in the automobile market.