

Dissertation Defense

The impact of new technologies on firm-consumer relationships

Francisco Orlando Cisternas Vera

Friday, April 7th, 2017

3:00PM

324 GSIA (West Wing)

Technology developments have the potential to dramatically change the interactions between firms and their consumers. In recent years technological improvements are occurring at a faster pace than ever before. Now companies are forced to learn quickly and react faster to remain competitive in the current changing world. In my thesis I explore some technological innovations, understand how consumers adjust, and discuss the managerial implications.

In the first chapter I study the Mobile banking innovation. The proportion of US bank customers using Mobile banking has grown from 29% in 2012 to 43% in 2015. This channel of interaction is likely to keep growing due to a further increase in the adoption of smart phones, improvement in quality of Mobile banking apps and channel awareness. As a consequence some banks have reported that they may reduce their number branches by half over the next decade. The adoption of mobile banking displaces many banking functions performed through other channels like: automated teller machines (ATM), telephone banking, and online banking. Using geo-coded transaction data from a large consumer bank, a dynamic structural model to represent consumers' preferences is developed for online and physical channels. In this way changes in banking behavior due to variation in the branch network structure as well as the introduction of the mobile channel are considered. This model is used to predict the timing and type of transactions across channels. The knowledge gained with the demand model is then used to design an optimal branch network in terms of capacities, amenities, location, and number of branches. Counterfactuals allow to evaluate different levels of channel adoption, and considers its effect on banking transactions, and more important, the impact on customer loyalty. The model shows all channels remain relevant and, moreover, we found a strong complementarity between physical and digital worlds. Therefore instead of reducing the number of physical branches, banks should aim to adjust current branch capacities, specializing on transactions that cannot be served with digital channels. In conclusion digital channels will diminish but never replace physical channels and they will be redesigned correspondingly. Is important to note that this is the first time in the banking industry that substitution of branches for digital channels are formally considered in a tool to support branch network design for the middle and long term.

Internet shopping made possible interactive displays. In the second chapter I discuss how the arranging products on a display or retail shelf can directly influence consumer purchases by facilitating or obstructing product search. Product proximity also influences competition and the set of products that a consumer considers. We show that when products are placed closer together competition between the products increases. Thus product display can encourage consumers to purchase products that would not have previously been purchased. The motivation for the result is that consumer search is costly and consumers focus their search on local neighborhoods that are influenced by shelf position. Since search is costly, consumers may not exhaust all possibilities, which means that position could be an important determinant of consideration. To formally model this behavior I used two approaches, first with a behavioral study and second, creating a sequential consideration model. To begin the search consumers are influenced by colors, favorite brand or the closest shelf edge, where few products can be consider. Then consumers shift their focus to neighboring products, in a sequential fashion, increasing the set of products considered, to finally making the purchase decision. By doing this, the display generates spatially induced consideration sets. Using this approach we find that demand is greatly impacted by shelf position and retailers can create plan-o-grams that can shift demand from one product to another. Our focus on using shelf design to stimulate competition contrasts with past research on shelf design that has focused mainly on cost minimization. Using shelf-experiments from Dominick's retail stores shows that re-arranging the products on the shelf can increase profits by up to 15%.