Competition With "Showrooming" Between Store and Online Retailers

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Abstract

Increasing numbers of customers are using physical store retailers' outlets to evaluate products. This helps them to identify their best fit product. However, they buy the product not at the physical store but at a competing online retailer's website. In a similar context of competition between full service and discount retailers, Shin (2007) shows that this free riding customer behavior softens competition and improves profits for the full service store. On the other hand, we find that those results are reversed in our context since the physical and online retailers are differentiated more than full service and discount stores as a given customer has different preferences for the online and the store channel unlike in the case of full service and the discount store. This additional differentiation already softens competition and reduces the impact of softening of competition due to free riding. We then analyze price match commitment and keeping a different assortment from the online store as two strategies that the physical store retailer may adopt to improve its profits. We show that keeping different assortments is useful while price match commitment is not effective to improve its profits.

(*Key words: online retailing, free riding, showrooming, sales service, retail competition, competitive strategy, game theory)*

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1 Introduction

In the context of multi-channel retail, it is well known that customers may research products on one channel and buy on another. Different ways of utilizing the channels are possible. Thus, there is evidence that customers use the online channel for their research and buy at a physical store (Verhoef, Neslin, and Vroomen 2007), or they may use the physical store for research and buy online (Van Bal and Dach 2005, Kucuk and Maddux 2010). Neslin and Shankar (2009) point out that research shoppers come in two varieties: loyal research shoppers who search and purchase from different channels of the same firm and competitive research shoppers who search using one channel of a firm and buy from a different channel of the competing firm. Thus customers may use Target's physical stores to evaluate products but purchase in Amazon's online store if online prices are lower. Customers benefit from using the physical store to evaluate products as many product attributes are non digital in nature and cannot be properly assessed online (Lal and Sarvary 1999). Obviously, this results in the physical store losing potential customers. Some of the recent media articles (Bosman2011 and Zimmerman2012) document that this trend, also sometimes referred to as 'showrooming', seems to be increasing. Bosman (2011), in particular, quotes the market research findings of Codex who use a one month sample of book purchasers and report that 24% of people who bought books from an online retailer saw the book in a brick-and-mortar bookstore first. These numbers show that showrooming is now being practised by a significant chunk of customers and consequently primarily brick-and-mortar retailers, such as Target, perceive an increasing threat to their bottomlines. The scale of this threat is widespread as it is quite clear that this phenomenon is prevalent over a variety of product categories. Thus, Zimmerman (2012) discusses the impact of showrooming on Target, which is a retailer of clothes and toys etc., while Bosman (2011) observes this phenomenon in the case of books.

The impact of customers using the store of one firm for product evaluation and the store of the competing firm for purchase has been studied in marketing literature in the context of competition between full service and discount stores (Shin 2007, Kuksov and Lin 2009). However, these papers do not consider the situation when one of the competing firms employs the physical store channel while the other employs the online channel. This is pertinent because anecdotal evidence suggests that the consequence of competition between retailers employing different channels vis-a-vis same channels has been historically different. Thus the bankruptcy of Borders (a brick-and-mortar book

store) is typically attributed to Amazon which was an online competitor and not to Barnes and Noble who primarily utilized the brick-and-mortar channel.

Our paper is close to Shin (2007) who model competition between full service and discount stores accounting for the fact that customers can utilize the full service store to evaluate products but then purchase in the discount store. Thus the discount store free-rides on the services provided by the full service store in a similar way that the online retailer free rides on the physical store retailer. However, Shin(2007) assumes a particular customer's shopping costs to be the same across the two firms since both of them utilize the same channel. On the other hand, we capture the difference of channels across the two retailers by having customers' shopping costs to be different for the two competitors. This is in line with Neslin and Shankar (2009) who summarize a number of research papers to point to the fact that it is natural to consider intrinsic differences in customer preference for the two channels. This difference of detail in modeling customer behavior is inspired by the second observation of Thomadsen et al. (2011) where they point out that specificity of modeling assumptions may help in answering concrete questions in a specific institutional situation.

Does this difference in modeling a customer's shopping costs to be different across the two competitors because of use of different channels have the potential to provide insights that were not available earlier? This seems quite likely due to a number of reasons. Differentiation between competitors in Shin (2007) is captured by the fact that the uncertainty in whether the product is a good match or not can only be resolved by visiting the full service retailer. Thus, as uncertainty disappears, bertrand competition results and profits of both firms go to zero. In our set up, this does not happen because the intrinsic difference in channel preference provides for another differentiating factor between the two firms and thus softens the competition. Shin (2007) reports that free riding by the discount store is profit enhancing even for the full service store since this softens competition between the two stores. Since the competitive forces are already weaker due to the additional differentiation introduced by difference of channels in our situation, the softening effect of free riding may or may not be enough to reproduce the result of Shin (2007). This is the first research question that we focus on. If indeed Shin (2007)'s results were to apply in competition with showrooming as well, firms like Target have no cause for worry. Our analysis shows that this is not the case and showrooming is likely to hit the bottomline of brick-and-mortar stores like Target.

Further, after discussing the beneficial effect of free riding, Shin (2007) go on to analyze the choices

of retailers to become a full service or a discount store based on the sequence of entry. We digress from this question since free riding by the online retailer on the facilities of the physical retailer does reduce the profits of the physical store retailer in our setting. We therefore focus on exploring what strategies can be employed by the physical store retailer to improve its profits when customers indulge in showrooming. These are also questions currently being debated in the industry (Datko 2012). In particular, we first analyze the impact of price matching commitment by the physical store. Existing literature on price matching has pointed out its collusive effect (Hay 1982). The reason is price matching offer a credible commitment to match prices set by the competitor. Thus, the competitor can raise prices without the fear of being undercut. This leads to softening of competition. On the other hand, work such as by Chen et al.(2001) shows that this can have a competition enhancing effect as well. Both of these effects are pertinent in our model as well. A price matching commitment by the physical store has an anti-competitive effect because of credible commitment by the store that it will not undercut prices. On the other hand, it also has a competition enhancing effect because price matching ensures that customers do not buy in the online store to avail of lower prices (i.e. they do not showroom). Thus, the online store loses a chunk of the market and so it has an incentive to deviate from the equilibrium prices to acquire more customers. It is therefore pertinent to examine whether price matching commitment can potentially improve profits of the physical store retailer when customers indulge in showrooming. Our analysis reveals that such offers are not effective in improving the physical store's profits when showrooming is a threat to its bottomline.

Next, we investigate the impact of the physical store having a product assortment that is different from the online retailer. This is reminiscent of the ideas in Carlton and Chevalier (2001) where they empirically show that manufacturer's benefit by limiting the assortment of goods on the online channel as it is an effective way to mitigate the free riding of the online channel on physical stores. In our situation too, the customers cannot benefit from showrooming if the product they found the best fit for their needs by visiting the physical store for evaluation is not available in the online store. We find that this strategy is quite effective in improving profits for the physical store for products with predominantly digital attributes.

We now present a formal model capturing customer purchase behavior in Section 2. We follow up with an analysis of this model and profit comparison with the benchmark case when there is no

showrooming in Section 3. We present an analysis of the model with price matching commitment which shows that this strategy does not improve profits for the physical store in Section 4. In Section 5, we consider a model when the physical store carries a different product assortment than the online store and show that this strategy improves its profits in certain situations. Section 6 provides concluding remarks for the paper.

2 Model

2.1 Customers

Customers need to buy one unit of the product. A visit to the physical store allows customers to evaluate the digital as well as the non-digital attributes of the products in the assortment to select the product that best fits their unique needs. All customers get a utility v from their best fit product. On the other hand, if customers evaluate the product assortment at the online channel, they are unable to properly assess the non-digital attributes of the product and hence the product they select may not be their best fit product. Therefore, the expected utility from selecting the product at the online channel is δv for all customers, where $\delta < 1$. The values of δ and v are public information.

Customers are heterogeneous in their channel preference. By this we mean that customers incur different shopping costs for using the physical store vis-a-vis the online store. We capture this channel preference by considering customers to be uniformly distributed on the standard Hotelling line between 0 and 1, where a customer's index $x \epsilon [0, 1]$ is proportional to the shopping costs (tx) at the physical store and $1-x$ is proportional to her shopping cost ($t(1-x)$) at the online store. Note that the shopping costs at the physical store are mainly incurred due to the time and effort required to travel to the store and evaluate the products as the costs of completing the purchase are minimal. On the other hand, it is relatively costless to visit the website to look at the product assortment etc. and the shopping costs are incurred mainly at the purchase stage when the customer must give out sensitive credit card information and wait for a few days to get the product delivered. The shopping costs of each customer at the two channels is private information for that customer.

2.2 Retailers

There are two retailers: the physical store retailer and the online retailer. They are represented by subscripts s and o respectively. To begin with, we assume that both retailers carry the same assortment of products. We relax this assumption when we consider the use of non-overlapping product assortment between the two retailers as a strategy used by the physical retailer to mitigate the negative impact on profits due to showrooming. The price of each product in the assortment is set at p_s and p_o by the physical store and the online store, respectively. This represents the kind of situation where all shirts in a particular category (e.g. premium shirts, or casual shirts) are priced the same (very common situation) even though they differ in sizes and designs. Each customer prefers a different shirt based on her size and tastes. These prices are common knowledge for both firms and the customers. We normalize the marginal costs of the products to be zero for both retailers.

2.3 Game Structure

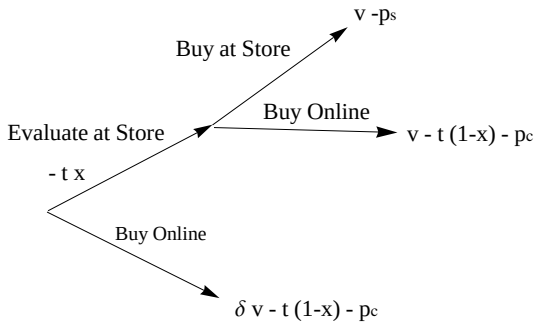
The game proceeds in three steps. At stage 0, both retailers announce their prices, which are observed by the competitor as well as the customers.

At stage 1, the customers decide to visit either the physical store or the online store for evaluating the product assortment to identify the product they want to buy. A visit to the physical store allows them to identify their best fit product which gives them a utility v but they must incur the cost xt. On the other hand, a visit to the website of the online store is costless, but gives a reduced utility of δx from the product they choose since they may be unable to select their best fit product. The choice of visiting a channel depends on the expected value customers can generate from visiting that channel.

At stage 2, the customers decide the channel at which to complete the purchase. If they used the physical store for evaluation, they can buy from the store at no additional shopping costs. Thus, product evaluation and purchase at the store channel provides the customers with a net expected utility of $v - tx - p_s$. Customers can also purchase at the online store once they have identified their best fit product at the brick-and-mortar store. This imposes an additional shopping cost of $t(1-x)$

on the customers since they must now supply credit card information online and wait for delivery etc. Overall, this provides the customers with a net expected utility of $v - t - p_o$. Customers who choose this option are the ones who have used showrooming to maximize their surplus from the transaction. Finally, customers can do both product evaluation and purchase at the online store. In this case, their net expected utility is $\delta v - t(1-x) - p_o$. Note that customers can also choose to evaluate the product online, but buy it at the physical store. This results in a net expected utility of $\delta v - t - p_s$. However, since $v - tx - p_s > \delta v - t - p_s$, customers will always prefer to evaluate and buy at the store compared to exercising this option.

The stages of customers' decisions are depicted in Figure 1.



Decision Tree for Customers

Figure 1

3 Analysis of the Game

As discussed in Section 2, the customers can exercise one of three options: evaluate and buy at the store, evaluate at store but buy at the online store (showroomering) and finally evaluate and buy at the online store. Note that the customer's decisions for visiting a particular channel for completing

the purchase are same at Stage 1 and Stage 2 since there is no uncertainty. Thus, if the customer takes a decision to visit the store and purchase from the store at Stage 1 based on her expected utility at that stage, she will rationally choose the store channel to purchase once she has completed her visit to the store to do product evaluation (Stage 2). Notice that the ex-ante surpluses from exercising the first option is reducing in x, that of the second option is independent of x, and of the third option in increasing in x. Hence, customers exercising the first to the third option must exist from left to right on the Hotelling line. It is also possible that some of these segments do not exist as all customers may get higher surplus from following the other choices. Overall, this points to a possibility of $2^3 = 8$ market configurations, and we must analyze the equilibrium for each of these configurations.

We now present some arguments to reduce the number of configurations we need to analyze. First, observe that if the first segment does not exist, then are are no physical store customers and this store makes zero profits. Note that the surplus for the leftmost customer on the Hotelling line from exercising the first option is $v - p_s$, from the second option it is $v - t - p_o$, and from the third option it is $\delta v - t - p_o$. Thus the second option is always better compared to the third option, and the store can always set a positive price such that the surplus from the first option becomes better than the second one. This way the store also improves its profits. Consequently, some customers who exercise the first option must always exist in equilibrium, and so we will only consider those market configurations that include this segment. Second, we assume that the online store will always attract some customers who do not do showrooming. This implies that the customer at the rightmost end of the Hotelling line secures a higher surplus by exercising the third option compared to the second option. This leads to the requirement $v < \frac{t}{1-d}$. When this is satisfied, the customer segment who exercises the third option must also exist. Therefore, we restrict our analysis for configurations that include this segment as well. Thus, we have two configurations, one consisting of all the three segments (showrooming configuration) and another one having only the first and third segments. The earlier configuration can have showrooming customers with a positive surplus, or zero surplus. Finally, it may also be the case that the market is not fully covered, i.e., not all customers end up purchasing. This is the local monopoly equilibrium in which the first segment of customers exist on the left end, the third segment of customers will be on the right end while the non-purchasers are at the middle of the Hotelling line. Thus, we end up with four market configurations to study.

First, we analyze the case with all three segments. Let the index of the customer indifferent between the first and the second options be x_1 and the one indifferent between the second and third option be x_2. Let the showrooming customers have a positive surplus. The profit function for the physical store retailer is $p_s x_1$ and that of the online store retailer is $p_o(1 - x_1)$. The corresponding Nash equilibrium prices are $p_s^* = \frac{2t}{3}$ and $p_o^* = \frac{t}{3}$. For consistency of customer behavior we need $x_2^* > x_1^*$ and $v - t - p_o^* > 0$ which provide the condition $v > \frac{2t}{3(1-d)}$ and $v > \frac{4t}{3}$, respectively. Next, we verify that the retailers do not have any incentive to deviate from the equilibrium prices. The Nash equilibrium ensures that there are no advantages to deviating as long as the market configuration, and hence the demand pattern seen by the two retailers, remains the same. However, for instance, it is possible that given the equilibrium price of the physical store retailer, the online retailer sets a price different from its equilibrium price to enforce a market configuration that is different from the three segment one we assumed to evaluate the equilibrium prices. This changes the demand pattern and may provide for profitable deviation. In general, both retailers can deviate by either lowering or increasing their prices from their equilibrium prices. This requirement imposes certain constraints on the parameter conditions (see Appendix). We refer to this equilibrium as "A".

Next, we analyze the case with all three segments where showrooming customers get a zero surplus. By setting $v - t - p_c^* = 0$, we get $p_c^* = v - t$. The profit function of the physical store retailer is $p_s x_1$. Optimizing this with respect to price we have $p_s^* = \frac{z}{2}$. For consistency of customer behavior we need $x_2^* > x_1^*$, which provides the condition $d < \frac{1}{2}$. As earlier, we also verify that there are no incentives to deviate. We call this equilibrium "A0". This aforementioned analysis yields the local equilibrium profits with showrooming configuration. However, in order to ascertain that these equilibria are also global, we must also find the profits of both retailers in the remaining two configurations when only segments one and three exist with market covered and with market uncovered. If profits in the showrooming equilibria are pareto optimal, we can then assert that they are also global equilibria. We conduct this analysis and present the following result.

Proposition 1 *There exist two different pure strategy equilibria (A and A0) when customers do showrooming.*

a . When $\delta < \frac{1}{4}$*, equilibrium A0 holds when* $\frac{3t - \sqrt{(1-4\delta^2)t^2}}{2+\delta^2} < z < \frac{t}{1-\delta}$.

b . When $\frac{1}{4} < \delta < \frac{1}{2}$*:*

(i) Equilibrium A0 holds when $\frac{3t-\sqrt{(1-4\delta^2)t^2}}{2+\delta^2} < z < \frac{4t}{3}$.

(ii)Equilibrium A holds when $\frac{4t}{3} < z < \frac{t}{1-\delta}$.

c . When $\delta > \frac{1}{2}$, *equilibrium A holds when* $\frac{2t}{3(1-d)} < z < \frac{t}{1-\delta}$.

The equilibrium A0 is special because even though the markets of the physical store retailer and the online retailer touch, there is no competitive effect. This is easily seen when we observe that the store prices in this equilibrium equals its price in the local monopoly configuration. Thus, the store's profits in the A0 equilibrium are the same as when it is a monopoly. Hence, showrooming is clearly not a problem for the store's bottom line in this equilibrium. Thus, henceforth, we focus only on the equilibrium A.

We now analyze the benchmark case when when showrooming is not allowed in order to compare profits of the retailers in the two situations. The benchmark case may be applicable because customers may be unable to recall the details of their online research on the product availability and price when they are already in a store to evaluate the product assortment. Of course, such a possibility is much less in the current scenario due to devices like smartphones, and hence customers can indulge in showrooming much more easily.

In a competitive situation, the markets of the two retailers must touch and we find the indifferent customer, x_b, from solving $v - tx - p_s = \delta v - t(1-x) - p_c$. The profit functions for the store and the online retailers can be written as $p_s x_b$ and $p_o(1-x_b)$, respectively. The Nash equilibrium prices are $p_s^* = \frac{3t+v-\delta v}{3}$ and $p_o^* = t - \frac{v(1-\delta)}{3}$. For consistency of customer behavior, we need the customer surplus of the indifferent customer to be non-negative. This imposes the requirement $v > \frac{3t}{1+d}$. We verify deviation requirements as well. Comparing profits of the store and online retailers in the benchmark case with the profits in the showrooming equilibria A, we find that:

Proposition 2 *1. The store and the online retailer's prices are lower in equilibrium A compared to the competitive benchmarking equilibrium.*

2. The store (online) retailer's market coverage are higher (lower) compared to the competitive benchmarking equilibrium.

3. *The profits of both the online and the store retailers are higher in the benchmark equilibrium compared to the showrooming equilibrium A.*

Proof. By comparing the equilibrium prices, market coverage and profits for the two retailers in equilibrium A and the competitive benchmarking equilibrium.

This result is interesting because it shows that in the context of multi-channel retail, showrooming is detrimental to the profits of both retailers. In the situation of competition between full service and discount retailers, Shin(2007) has shown the opposite result, i.e., free-riding on the full service stores increases profits of both the full service as well as the discount stores. Thus, our result illustrates that it is important to carefully model the nuances of multi-channel retail to analyze competition in this situation. A less careful extrapolation from results of similar looking theory may lead one to erroneous conclusions.

Next, this result also shows that the physical retailer needs to adopt strategies to improve its profits. We now present use of price matching commitment by the brick-and-mortar store as a strategy to improve its profits.

4 Price Matching Commitment by the Brick-and-Mortar Store

Here we study the impact of a credible commitment by the physical store to match the prices set by the online retailer. Such a credible commitment is possible in many ways such as prominent display signs in the store proclaiming the price match policy or public announcement of this policy in press releases or the store's website. It is easy to see that showrooming will disappear in such a situation because customers no longer get a lower price from purchasing online. Let the price set by the two stores be p_g. The surplus from showrooming is $v - t - p_g$ while the surplus from store purchase is $v - t(1 - x) - p_g$, which is always greater than the showrooming surplus for any customer with index $x < 1$.

Hence, customers will either evaluate and purchase at the store, or evaluate and purchase at the online channel. Equating the customer surplus from these two options (surplus expressions are elaborated in Section 2), we get the index of the indifferent customer $x_g^* = \frac{t+v(1-\delta)}{2t}$. Our assumption

on the upper bound of $z < \frac{t}{1-\delta}$ ensures that x_g takes an internal value, i.e., a value between 0 and 1. In order to maximize its profits, the online retailer sets p_g^* to extract full surplus from the indifferent customer. Thus, $\delta v - t(1 - x_g^*) - p_g^* = 0$ implies $p_g^* = \frac{v(1+\delta)-t}{2}$. A positive value for p_g^* imposes the condition $v > \frac{t}{1+d}$. Using the equilibrium values of p_g^* and x_g^*, we obtain the equilibrium profit for the firm. Note that a credible price guarantee by the physical retailer implies that it cannot deviate from the price set by the online retailer. However, the online retailer may deviate from the equilibrium price. We account for these possible deviations and compare the profits for the physical store retailer under price guarantee and under the showrooming equilibrium A to get our next result.

Proposition 3 *A price match commitment by the store never improves the profits of the physical store retailer compared to its profits under the showrooming equilibrium A.*

Thus, the price match commitment cannot improve profits for the physical store over the showrooming equilibrium. The reason is that while price matching produce a collusive effect and thus help raise the equilibrium prices under this situation. By undercutting these equilibrium prices, the online retailer can attempt to regain its lost customers who did showrooming. This would disrupt the price match equilibrium. The only situation when this can be avoided is when the product valuation v is not too high so that the corresponding prices are also not too high leading to a containment of the incentive to deviate resulting in the maintainability of the price match equilibrium. However, this results in the applicability of the equilibrium in a range of values smaller than the range of v in which the showrooming equilibrium occurs.

5 Different Assortment By the Physical Store

In this section, we consider the impact on the profits of the physical store when it decides to maintain a different assortment from that of the online stores. The impact of this strategy is when a customer visits the physical store to identify her best fit product, it may happen that this product may not be available at the online store. Once a customer visits the physical store and identifies her best fit product, the probability that she finds it in the online store as well is a. Thus a captures the degree of commonality of assortment in the physical and the online store. When the assortments

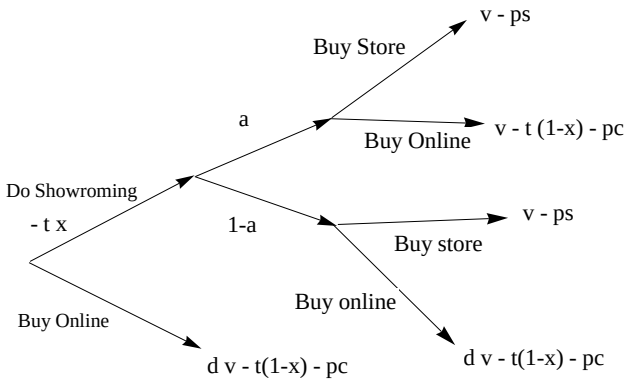
overlap completely, a is equal to 1, i.e. the customer is assured of finding her best fit product in the online store. As the assortment overlap reduces, the value of a becomes smaller.

A customer's decision to visit the physical store for product evaluation depends on her ex-ante utility from exercising this option $(av + (1-a)\delta v - t - p_o)$ vis-a-vis going to the online store directly $(\delta v - t(1-x) - p_o)$. Let the index of the customer indifferent between these two options be x_v. Customers to the left of x_v visit the physical store to conduct product evaluation while those to the right go to the online channel and complete their purchase from there.

With probability $1-a$, a customer will be unable to find her best fit product in the online store after completing her evaluation at the physical store. She can buy from the store itself without incurring an extra shopping cost since she is already at the store and so the shopping cost for product evaluation is sunk at this stage. Her surplus from exercising this option is $v - p_s$. Alternatively, she can buy a product from the online store which will give her lesser utility on an expected basis compared to her best fit product. Exercising this option also requires her to incur an additional shopping cost for doing the transaction at the website and waiting for product delivery etc. Thus, the only reason the customer may exercise this option is if the online prices are lower than store prices. This option will provide a utility of $\delta v - t(1-x) - p_o$. The indifferent customer between purchasing from the brick-and-mortar and the online store is represented by x_d. Customers to the left of x_d will purchase from the store itself while those to its right will purchase from the online channel.

With probability a, a customer succeeds in finding her best fit product in the online store after doing product evaluation at the brick-and-mortar store. As earlier, she can buy from the physical store and get a surplus of $v - p_s$, or she can purchase from the online channel to get a surplus of $v - t(1-x) - p_o$. Note that since the customer succeeds in finding her best fit product online, her gross utility from purchasing on this channel is v instead of δv for the customers who could not find her best fit product on the online store. The indifferent customer between purchasing from the brick and mortar store and the online store is represented by x_f. Customers to the left of x_d will purchase from the store itself while those to its right will purchase from the online channel. The decision tree for the customer is depicted in Figure 2.

It can be easily shown that for any set of prices p_s and p_o, x_f must be smaller than x_d. Hence,



Decision Tree for Customers

Figure 2

three different configurations are possible. These are: (a) $x_v < x_f < x_d$, (b) $x_f < x_v < x_d$ and (c) $x_f < x_d < x_v$. The profit functions for the store and the online retailers depend on the particular configuration. We examine the equilibrium prices emanating from the profit functions under each configuration and find that (a) and (c) are unviable, leaving (b) as the only viable equilibrium configuration. The next result presents the equilibrium under this configuration.

Proposition 4 *When assortments at the store and online retailer don't match, the prices in equilibrium for the store and the online retailer are* $\frac{1}{3}\left((3-a)t + (1-a)(1-d)z\right)$ *and* $\frac{1}{3}\left((3-2a)t - (1-a)(1-d)z\right)$, *respectively.*

Now, we focus on comparing the profits for the store in this case with its profits under equilibrium A. That result is reported next.

Proposition 5 *The store profits under the different assortment equilibrium is higher than its profits in equilibrium A.*

This result shows that different assortments may do the trick where price match commitment fails in terms of increasing the store profits when customers showroom.

6 Conclusions

Competition between physical stores and online stores is now picking up in new product categories such as clothes. The reason for insignificant competition earlier in such categories was that customers could not evaluate products in such categories on the online channel as effectively as they could on the physical store. Consequently, customers would end up making suboptimal purchases if they evaluated products only on the online channel. However, customers could deal with this issue by evaluating products in store, but then returning home to order the product from an online store. The main problem with this approach was that online stores did not keep exhaustive inventories in such product categories earlier. Thus customers could be disappointed to find that the product they chose at the store retailer's site was not available to be ordered online. That is now changing as online retailers like Amazon have significantly expanded their offerings in these categories. Further, with the increasing ubiquity of wireless Internet and devices such as iPads and smartphones to access the Internet, information about product availability and price etc. are much more easily available even when customers are in stores. Hence, use of the physical store only as an information channel to evaluate a customer's best fit product is increasing. Such customers make their purchases in the online channel. Retailers whose business models are overwhelmingly based on physical store retail see this as a threat to their bottomlines.

However, previous literature has discussed a similar situation in the context of competition between full service and discount stores. Some customers use the services at the full service retailer to evaluate the products but purchase at the discount retailer to benefit from its lower prices. In a theoretical model, Shin (2007) shows that the profitability of the full service retailer increases in such a situation because the increased market from such customers causes the discount retailer to set higher prices, thus softening competition with the full service retailer who is also able to set higher prices. Would this result be applicable in the context of offline and online retailer competition as well? We observe that Shin (2007) model competition by having a particular customer having the same cost of visiting either of the two stores. This is apt for the situation they study as both stores

are on the same channel. However, in our context, a given customer is unlikely to be indifferent between the two channels in terms of her preferences of using the channel. This is also confirmed by Neslin and Shankar (2009). This additional heterogeneity results in a softer competition between the physical and online stores compared to the full service and discount stores. Consequently, the further softening of competition between the two retailers due to customers who showroom is not enough to improve profitability in our context.

Given this result, we extend our analysis to consider two strategies to improve the store retailer's profits. These are price matching commitment by the store retailer and ensuring that the store has a different assortment than the online store. We find that price matching commitment cannot improve the store's profits while maintaining different assortments is a useful strategy to improve its profitability. These theoretical results provide some guidance to physical store retailers to safeguard their profits in the face of increasing competition due to the showrooming behavior of customers.

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