Quantifying the Value of Local Showrooms in Consumer Search and Purchase

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Abstract

We investigate how the presence and absence of local showrooms impact customers’ searching and purchasing behavior with competitors. Using an exogenous event of showroom exit, we found that showrooms not only impact sales of competitors, but more importantly, change the intensity of customer search.

1. Introduction

Many retailers have been grappling with whether to seek both online and offline presence, some with unsuccessful experiments. For example, Dell abandoned its direct store effort (started in 2008) rather abruptly by closing all its 140 kiosks (showrooms) in January 2008. On the other hand, many online retailers recently opened physical storefronts. WarbyParker.com, a fashion eye wear retailer in the U.S. has been successfully introducing display only showrooms since 2010. Amazon.com, an exclusive online retailer, ventured into offline retailing with its first brick-and-mortar store in 2012.

The online and offline channels are distinctive in the type of product information they provide. In the presence of a local store, customers may visit the store to experience and evaluate the product first and then purchase the product from an online retailer; thereby taking advantage of both channels. This phenomenon has been recognized by the industry and academia alike. Lal and Sarvary (1999) defined the differences between digital and non-digital goods in terms of customers gaining information about product attributes, showing that customers may visit physical stores to evaluate non-digital attributes whereas may directly purchase digital goods from internet retailers. Leading retailers such as Target and Best Buy have recognized the customer behavior of evaluating products in their stores and then purchasing them from an online retailer as showrooming. More formally, the phenomenon of showrooming involves customers searching for product attribute information more in a physical store and less on an online store and simultaneously making fewer purchases at the offline store and more purchases at the online store. In this situation, the local store bears all the cost for product display and demonstration while its online competitor free rides on the product experience it provides. In 2012 Target sent a memo seeking its vendors’ help to thwart showrooming. Best Buy in 2013 implemented an elaborate price matching scheme to kill showrooming with limited payback. These examples demonstrate the danger of showrooming to the local stores and some of countermeasures they employ to thwart the effects of showrooming.

Although the phenomenon of showrooming has been long recognized by academics (e.g., Lal & Sarvary, 1999), most of the existing literature on showrooming is analytical in nature, focusing on optimal strategies that firms should employ in the presence of customers’ showrooming behavior. There is a lack of empirical research in measuring and quantifying the effects of showrooming, although anecdotal evidence has been abundant in the business press. This is partly due to the rarity of exogenous showroom opening or showroom closing.
events in real world situations. And the feasibility of such quasi-experimental studies is further complicated by the lack of detailed information about customers’ buying patterns and impacts to them due to the presence (or absence) of showrooms. One notable exception is Bell et al. (2014) [3] that study the migration of customers across the online and offline channels of the same firm after it adds a display-only showroom in addition to its existing online shopping channel. However, due to its focus on the internal migration within a single firm, their study cannot address the more common question that inflicts companies such as Bestbuy or Target: of how they serve showroaming for competitors like Amazon? Without understanding the showroaming effect in a competitive market, it is difficult to quantify the value of having a physical showroom to an online retailer. We address this research gap by studying the cross-competitor showroaming effect.

Further, the existing empirical literature has primarily relied on sales as the single metric to quantify the showroaming effect, while leaving customers’ search behavior, an important antecedent of the sales effect, largely unaddressed. We maintain that measuring how showrooms facilitate customers’ pre-purchase online search is a more direct barometer (than sales) to quantify the showroaming effects. We fill in this gap by developing new measures to quantify the value of a showroom by examining how it alters customer searching behavior online. This is necessary to fully capture the showroaming effect along the entire purchase path of a customer.

In this paper we empirically examine the question of whether the showroaming effect exists. Specifically we quantify the effects of showroaming by examining the online search and purchase behavior before and after the closedown of a local showroom. Our approach to teasing out the showroaming effect from the lens of consumer search enriches the literature that primarily focuses on consumer purchase. This represents a significant step forward in defining, measuring and analyzing the change of search costs in an online setting with vs. without a showroom since search costs are important enablers (or inhibitors) online sales. In the current study, we address the above questions by taking advantage of an exogenous event that occurred in November 2008 and caused the closedown of 155 local stores of Circuit City, a leading electronics retailer. In this industry we consider the “provider” side of the showroaming effect in Circuit City. On the other hand the beneficiaries of showroaming are large online retailers such as Amazon and Dell who have a price and inventory size advantage over their offline counterparts. When a Circuit City store closes in a neighborhood, we expect a positive increase in sales at the online channels due to the migration of local customers from the offline channel to online channel. We refer this effect as the sales substitution effect. At the same time there may also be an overall decrease in the number of customers (hence decrease in sales) due to some customers dropping out of the purchase process fearing the high product search and evaluation costs involved resulting from the closedown of a local showroom. We refer to this effect as the sales dampening effect. These two effects move in opposite directions, and their relative magnitude determines whether the net sales effect would be positive or negative. The extant literature almost exclusively relies on using change of net sales to gauge the showroaming effect, which suffers from the intrinsic limitation of failing to disentangle the dampening effect from the substitution effect. In contrast, our proposed approach examines how customers change their searching and purchasing behavior in reaction to showroom closedown, enabling us to quantify the true showroaming effect.

We use a difference-in-difference approach to examine the changes in customers’ online product information search and purchase patterns in the electronics categories before and after the abrupt closedown of local Circuit City stores. We measure the benefit of having a physical showroom to the competing online retailers such as Amazon and Dell.

Our results show that after a local Circuit City store closed down, Dell experienced a positive and significant sales increase, suggesting the sales substitution effect is greater than the sales dampening effect. However, we do not find a similar increase in Amazon’s case. Our analysis shows that Amazon’s online sales were not significantly different before and after the closedown of a local Circuit City store. One interpretation is that Dell customers rely less on the local showroom for product evaluation compared to Amazon customers, therefore the sales dampening effect is weaker for Dell. Our analysis in consumer online search patterns lends further support for this argument. We find that Amazon customers indeed intensify their search once the Circuit City store in their neighborhood closes. Interestingly, Dell customers’ online search behavior did not change significantly. This contrast clearly shows that when a neighborhood store closes, the Amazon customers seek more product information at the online channels before making a purchase. By measuring this increase in search intensity we provide a measure of showroaming produced by the brick-and-mortar store. We also find that if there is another showroom from Bestbuy in the vicinity of the closed store, then the dampening effect weakens and the online search intensity increases less.
Based on these results we examine who are the gainers and losers of showrooming. This helps us provide viable strategies to retailers (both offline and online) based on our metrics for showrooming.

2. Related Research

The phenomenon of showrooming or free riding has been studied in existing literature. The majority of these studies utilize analytical modeling in a game theoretical framework. For example, Lal and Sarvary 1999 [1] show customers would benefit from using brick and mortar stores to evaluate non-digital product characteristics. Mehra et al. (2014) [2] model the showrooming phenomenon and find that it hurts the profits of physical stores.

Few studied the showrooming effects empirically. Bell et al. (2013) [3] study the migration of customers across the online and offline channels in the presence of a showroom for a specific retailer. They find that in the case of a single retailer the introduction of a display only showroom increases demand and drives customer channel migration. However, due to its focus on the internal migration within a single firm, their study cannot address the more common question that are often asked by industry practitioners, that is, how much value does a physical showroom add to the online business in a competitive environment? Existing research has largely been silent on the impact of showrooming in the presence of competition. This motivates our research. There is also considerable research in the area of product information revelation in the form of product reviews and recommendation systems. In essence, showrooming involves product information gathering. However, there is no research quantifying the information search intensity of consumers in the context of showrooming. In this research we address these gaps by econometrically evaluating the impact to online sales and online search intensity when a showroom in a neighborhood closes abruptly thereby removing the showrooming effect.

3. Research Setting

A key challenge in studying the effects of the showrooming in the real business setting is that the counterfactual effect cannot be directly observed or experimentally controlled: existing showrooms cannot just be closed down and its impact observed. In addition we need to ensure and control for other factors that may confound the extraction of the showrooming effect when such a store is closed in a neighborhood.

An ideal setting would be if stores were closed due to some exogenous event such as stores’ inefficiencies that are not related to the makeup of the markets they serve. We could then, observe and study the effects on the market of such an exogenous store closing event. In November 2008 the second largest electronics retailer in North America, Circuit City announced that it would close 155 stores across the US. This event could be considered as an exogenous shock to the market.

There are several competitors to Circuit City in an online setting. Traditionally, online retailers are known to offer a much more competitive price and a wider variety of goods than their brick and mortar counterparts. However the downsides to an online retailer is the lack of touch and feel that the consumer experiences in an brick and mortar store before making a purchase decision. For this research we consider the two online retailers, Amazon and Dell Inc. since they were among the top online retailers for products sold by Circuit City in 2008-2009.

In 2008 Amazon was the number one online retailer by sales revenue followed by Staples. In terms of product offerings, although Amazon started as a seller of online books, by 2014 it competes in almost every area of consumer retailing. In 2012 Amazon’s consumer electronics market share alone was reported to be 10%. With such a strong background in ecommerce the study of Amazon customers’ online activity pattern before and after Circuit City’s store closings provides an ideal research setting to study the showrooming effect.

We also consider Dell Inc. because they were the 3rd largest online retailer in 2008 and whose products closely resemble the ones sold by Circuit City. Dell started as a personal computer retailer, and by the mid 2000’s, 85% of its revenues came from business customers. These professional customers may not need as much product information provided by a competitor’s showroom before making a purchase decision. Therefore, we postulate that the Dell’s online business would not be affected as much as Amazon by Circuit City’s store closing. By comparing the online traffic and sales pattern of Amazon vs. Dell before and after Circuit City’s store closing would provide us clues to the nature and magnitude of the “showrooming” effect.

3.1. Research Design

In order to isolate the showrooming effect we examine the effect of two main competing stores - Circuit City & Best Buy, henceforth called the providers; and two online beneficiaries -Amazon and Dell. We posit that if a showrooming effect exists, then it would be exhibited strongly on the online beneficiaries in the vicinity of a Circuit City store.
(which subsequently closed). This effect would weaken in the presence of a Best Buy store in the vicinity since there would still be a brick-and-mortar store to absorb the effects of the Circuit City store closure. We also conjecture that this showroming effect would be felt more strongly by Amazon since it traditionally serves B2C consumers who would be more likely to visit a physical store for experiencing goods to make purchase choices. The effect would be weakened in the case of Dell since its customers are mainly businesses who would rely much less on the local stores for product evaluation before making purchase decisions.

Table 1: Summary Statistics of top 5 vendors by Sales Volume

<table>
<thead>
<tr>
<th>Domain Name</th>
<th>Number of Sales Transactions</th>
<th>Total Sales</th>
<th>Total Pages Viewed</th>
<th>Pages per Dollar of Sales</th>
<th>Total Duration in Minutes</th>
<th>Minutes per Dollar of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>dell.com</td>
<td>2,811</td>
<td>$829,206</td>
<td>118,247</td>
<td>0.14</td>
<td>99,307</td>
<td>0.12</td>
</tr>
<tr>
<td>amazon.com</td>
<td>19,068</td>
<td>$631,587</td>
<td>804,445</td>
<td>1.27</td>
<td>640,200</td>
<td>1.01</td>
</tr>
<tr>
<td>staples.com</td>
<td>10,337</td>
<td>$412,395</td>
<td>429,843</td>
<td>1.04</td>
<td>291,059</td>
<td>0.71</td>
</tr>
<tr>
<td>walmart.com</td>
<td>3,231</td>
<td>$258,878</td>
<td>131,747</td>
<td>0.51</td>
<td>112,560</td>
<td>0.43</td>
</tr>
<tr>
<td>bestbuy.com</td>
<td>2,127</td>
<td>$253,558</td>
<td>86,904</td>
<td>0.34</td>
<td>63,394</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Note: We did not present the online sales of Circuit City because during the period of our study, they were very low and hence inconsequential.

4. Description of Data

Our data source comes from a major click stream data vendor who tracked a representative consumer panel’s online activities in the United States from January 2008 through December 2009. This data provides, among other things, the date and time of online activity, domain name of the site visited, number pages viewed, duration in minutes spent by the user on this website, information on whether a sale was made, a description of the product, total dollar amount spent on the purchase and zipcode of the user location.

Since we are interested in the effect of Circuit City’s store closings we only considered the categories of products sold by Circuit City in our data analysis. Based on the descriptions provided, 19 product groups were selected. The filtered data contained 146,803 unique online sales transactions across 10,857 zip codes in the United States.

There are 155 unique zip codes where these closed-stores were located. We used the publicly available zip code finder to convert these 155 zip codes to include other zip codes within a 5 mile radius, the rational being that consumers would be reasonably affected within 5 miles of a Circuit City store closure. This yielded 1368 zip code areas that may have been affected due to the Circuit city store closures which is a subset of the 10,857 zip codes with online sales data.

We then proceeded to construct the data set with all the online transactions in the zip codes that never had a Circuit City store within its 5 miles radius and combined it with the online transactions from zip codes that had one of the 155 Circuit City stores that had closed in November 2008.

From the summary statistics in Table 1 we can make several observations that support our research design. Amazon has, by far, the highest search costs per dollar of sale. In contrast Dell customers have one of the lowest search costs. This aligns with our assumptions that customers of Amazon would tend to use showroming more than customers of Dell. We also find that Best Buy has low online search costs, again aligning with our understanding that the online sales are helped by the showroming effect. We do not consider Staples.com and Walmart.com as online beneficiaries in our study since both firms have their own stores and therefore do not rely on the competitor’s local stores to provide product evaluation experience for their customers.

We finally aggregated this data at the zip code level for each month. An entry $T_n$ gives the transaction

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5 One may argue that the data is old due to changes in search algorithms and virtual showrooms in the last 5 years. However the data used contains a recent exogenous store closing event, combined with lack of sophisticated online search & virtual showrooms, at that time, provides the ideal setting to study the showroming phenomenon.
summary for zip code i, in month-year t. The aggregated transaction data consists of the amount of dollar sales, the number of pages viewed and the amount of minutes spent in the websites before sales were made. Every entry is tagged whether a Circuit City Store existed and then closed (treated group) or not (control group). In other words, the treated group consists of zipcodes where Circuit City closed abruptly in November 2008 and the control group consists of zip codes where a Circuit City never existed. Further, we also identified and tagged the zip codes that had a Best Buy store, in order to control for the moderating effect of another competing showroom in the same location.

5. Econometric Analysis

5.1. Characteristics of the control & treated Groups

In order to understand the characteristics of the two groups, we gauge the trends and patterns in the consumer behavior at each zip code. In the case of showrooiming the important metrics that we have justified and chosen are related to online sales, page views and duration of time spent online on a per zip code basis. Hence a comparison of mean values and trends related to these metrics would provide clues to how these two groups qualify to be treated and control groups.

We find that the change in the mean values for the control group for sales, pages viewed and minutes spent are $3.53, 9.21 pages viewed and 4.32 minutes respectively. Similarly the corresponding treated group differences in mean values after treatment are $2.56, 11.93 pages viewed and 5.01. These changes in mean values between the control and treated groups before and after the treatment dates are very similar. Further, the sales trajectories of the two groups shown in Figure 1 follow a similar path during the period of our study. These observations provide evidence that the control and treated groups are closely related and can be considered similar for the purposes of a quasi-experiment

![Sales Trajectories of Control & Treated Groups](image)

Figure 1: Sales Trajectories of Control & Treated Group

Furthermore we use fixed effects on the zip code in our regression which ensures that the location effects of each zip code are taken into account and dealt with individually. This ensures that any differences between the control group and treatment groups are considered at the individual zip code level.

5.2. Difference in Differences

Having established the existence of treated and control groups in our data, we use a standard difference in differences (DID) analysis to study the effects of Circuit City's store closures. DID analysis exploits a quasi-experimental situation to compare a defined statistic before and after a treatment event for both the control and treated groups. The first difference determines if there is a statistically significant change in the statistic before and after the treatment event for each group (control & treated). The second difference compares the change in the statistic between the two
groups (control & treated) thereby enabling researchers to control for unobserved exogenous shocks that affect both groups. The hypothesis to be tested then is whether the expectation of this difference in difference is zero or not. If the expectation of this difference in difference is zero then there is no effect of the treatment on the measured statistic and vice versa.

In our study the event of Circuit City stores abruptly closing provides this exogenous treatment. Our data allows us to observe the total online sales, number of pages viewed and number of minutes spent (the relevant statistics), originating from each zip code for every time period before, during and after the Circuit City store close event. Further, the zip codes can be identified as being in the neighborhood of the Circuit City closure or as being in an area where a Circuit City store never existed. Thus, the treated group is formed by the market in the vicinity of a Circuit City store which was operating until a sudden closing. The first difference in this treated group is the difference in the value of a statistic (for example, online sale) before and after the treatment date. We use the other zip codes where a Circuit City never existed as the control group and find the first difference of the same statistic. The second difference is then calculated by taking the difference of these differences. If the expectation of this difference in difference is zero then we can conclude that the Circuit City store closures had no effect on the statistic and vice versa.

5.3. Quasi-Experiment

There might be a concern that not all zip codes are the same. The characteristics of consumers in a zip code where a Circuit City never existed may be very different from the one where a Circuit City was present. In fact it could be for this very difference that a Circuit City store was opened in that zip code in the first place. This dis-similarity of the characteristics of a zip code neighborhood may introduce endogeneity. We address this concern of endogeneity in two ways.

First we use the information whether in the control group zip code a competitor to Circuit City existed. If that is indeed the case then we can say that such a control group zip code has similar characteristics to one where a Circuit City store existed and closed. For a comparable competitor to Circuit City we choose the Best Buy chain of stores. Best Buy during 2008 and 2009 was the number one electronic retail store in the United States and hence is an equal competitor to Circuit City which was at that time the second largest electronics retailer. This comparison of the control group with only the zip codes where a Best Buy store exists but not a Circuit City store ensures that the zip codes in the control and treated groups are similar with respect to the demographics and reasons to open large retail electronic stores. In the regressions that follow this information of whether a Best Buy store existed or not will be taken into account.

Secondly we address endogeneity by conducting the regression using fixed effects for the location (zip code) and time (month-year). The zip code fixed effects would account for any residual characteristic at each zip code. Similarly the month-year fixed effects would account for any seasonal characteristics that are unique to a particular month-year.

The accounting for the presence of a Circuit City store competitor in the control group and fixed effects for location and time strengthens our case for a true quasi-experiment.

6. Measuring the Impact of Showrooming

We study the change in customer patterns as a result of showrooming in two ways.

The first is in the change of sales pattern in the zip codes where stores were closed. We expect that the closedown of local showrooms makes product evaluation more difficult and hence may have a negative impact on the online sales generated from the local residents - the sales dampening effect. Also as argued by Syam & Bhatnagar (2010) [4], it is rare to have a total migration of customers from a closed store to the Internet; there would be some attrition of sales to the competition. In our context we hypothesize that a portion of the customers in the store closed zip codes would move to the competition and certain others are bound to move to the Internet which in our case is represented by the increase in online sales originating from the various zip codes with store closing. We call this positive sales effect on competitive online retailers due to the showroom closedown as the sales substitution effect. In our context, due to the lack of individual level sales data in the offline channel we will not be able to identify the sales dampening effect separately from the sales substitution effect. Instead we measure the net sales impact due to the two underlying mechanisms we just laid out.

Second, we expect changes in the online product information search behavior of customers as the stores close in their neighborhoods. Since the difference in the two channels is driven by the informational differences as stated earlier, we expect to see online search patterns for acquiring product information to be impacted. From process-tracking research the amount of information acquired by users can be assessed by the number of information boxes opened and the effort to process the acquired information can be assessed by the time spent for opening these information boxes on
each attribute (Creyer et al. 1990 [5]; Payne et al. 1988 [8]; Lurie 2004 [6]). In the context of online searching, the information boxes can be related to the number of pages viewed and the information processing can be related to the number of minutes spent for a sale. According to Huang et al (2009) [7] the number of pages viewed represents the breadth of an online search to extract information. Further we attach an economic value to a metric such as page views by calculating the ratio of page views with the amount of dollars spent in a session. This ratio will also capture the search costs more succinctly by taking into account the fact that people tend to engage in more intensive information search when they pursue more expensive products. A high value of the pages viewed per dollar spent could indicate that a high amount (breadth) of information is extracted or acquired from the site for every dollar spent. In our empirical context, due to the closure of showrooms in the neighborhood, we expect that a higher amount of information needs to be extracted from the online counterparts which should translate to higher pages viewed per dollar spent.

The minutes spent on an online session represent the depth of information acquisition (Huang et al 2009 [7]) and it is also a common measure in web analytics to measure the amount of human activity in a website. Again taking into account that people may spend more time for information acquisition for a purchase that is more expensive we define the ratio of minutes spent on the site by the amount of dollars spent to signify the minutes on the site per dollar spent. As in the previous case, this measure, captures the economic value of every minute spent before a sale and is normalized to account for different sales amounts. A high value of this metric would indicate that the user is expending more time processing the extracted or acquired information for every dollar spent and vice versa. Hence we hypothesize that as showrooms close in a neighborhood the online activity to gather and process information before a purchase will increase. We capture these changes in two metrics: the pages viewed and minutes on site for every dollar in purchase. We collectively call these showrooming effects on customers’ search patterns as the Online Search Effect.

We would like to note that our approach to teasing out the showrooming effect from the lens of consumer search enriches the literature that primarily focuses on consumer purchase. This represents a significant step forward in defining, measuring and analyzing search costs in an online setting.

6.1. The Sales Effect

In order to study which online retailer benefits and by what degree we run the following regressions:

\[
\log(\text{AmazonTotalMonthlySales}, \\
\text{DellTotalMonthlySales})_{it} = \mu_i + \tau_t + \beta_1 \text{StoreClose}_i + \beta_2 \text{StoreCloseDate}_t, \beta_3 \text{BBStorePresent}_i, \beta_4 \text{StoreClose}_i, \beta_5 \text{StoreCloseDate}_t, \beta_6 \text{BBStorePresent}_i + \epsilon_{it}
\]

where we log-transformed AmazonTotalMonthlySales and DellTotalMonthlySales aggregated in dollars for month-year t in zip code i for Amazon and Dell respectively. StoreClose, is a binary variable that indicates if there was a Circuit City Store closed in zip code i and StoreCloseDate, indicates whether Circuit City stores were open or closed during the month-year t. BBStorePresent, indicates whether a Best Buy store was present in zip code i. The interaction variable (StoreClose, * StoreCloseDate,) is the difference in difference parameter and the significance of its coefficient \( \beta_t \) indicates the two-way interaction effect of Circuit City Store closures on the TotalMonthlySales. Finally the coefficient \( \beta_5 \) captures the three-way interaction effect of the Circuit City store closure in the presence of Best Buy Stores on online sales.

This specification also includes \( \mu_i \) which captures any time invariant fixed-effects related to each zip code entry and \( \tau_t \) which captures the time or seasonal effects. This ensures that we account for economic variations and seasonal changes that may be present and unique to each zip code. Note that in the above specification, the coefficients for the time-invariant variables (e.g. StoreClose,) will be subsumed by the fixed-effects and not directly estimable. If \( \beta_t \) itself is of main interest, one can drop the fixed effects. We keep these variables in equation (1) for completeness purpose.

6.2. Online Search Effect

We assume that if a customer does not have the luxury of evaluating a product in a physical store then they would incur additional costs by viewing more online pages and spending more time for a transaction. We capture this online search effect by measuring the number of pages viewed per dollar spent and the minutes spent on the site per dollar of sale. The AmazonPagesPerDollar\(_t\) and DellPagesPerDollar\(_t\) variables (for zip code i in month-year t) capture the search cost to purchase a dollar worth of products more succinctly and are normalized to account for fluctuations in the sales amount.

Similarly we use the duration of time spent in the site culminating in a sale to capture the other dimension of search cost. The AmazonMinsPerDollar\(_t\)
and DellMinsPerDollar\(_i\) variables (for zip code \(i\) in month-year \(t\)) capture the number of minutes spent at the website for every dollar of purchase.

The following definitions & regressions capture the effect of the store closings on user search costs:

\[
\log(\text{AmazonPagesPerDollar}, \text{AmazonMinsPerDollar}, \text{DellPagesPerDollar}, \text{DellMinsPerDollar})_{it} = \mu_i + \tau_t + \beta_1 \text{StoreClose}_i + \beta_2 \text{StoreCloseDate}_t + \beta_3 \text{BBStorePresent}_i + \beta_4 \text{StoreClose}_i \times \text{StoreCloseDate}_t + \beta_5 \text{StoreClose}_i \times \text{BBStorePresent}_i + \epsilon_{it}
\] (2)

7. Results

7.1. The Sales Effect

From Table 2 we see that the coefficient \(\beta_4\) for Dell is significant and positive indicating that there is an overall increase in sales by 3.9% in the areas where a Circuit City store closed (treated group) after the month of store closure as compared to the control group. Two effects intertwine in sales. First a sales substitution effect increases sales since an outlet (Circuit City) has closed. In addition there is a negative sales dampening effect of showrooming which drives some customers out of the market since they do not have a showroom to evaluate the product. The net effect of sales is what we observe as being positive and significant in this case. Since a typical customer of Dell does not need to use the showroom to evaluate the product we see that the sales substitution effect dominates the sales dampening effect. We also see that the presence of a Best Buy store weakens this sales increase which is indicated by the negative and significant coefficient (\(\beta_3\)) value for Dell. We attribute this decrease in the sales to customers who may take their business to a Best Buy store that is in the vicinity. This aligns with our concern of endogeneity where the control group could contain zip codes where it may not have been profitable to open an electronic retail store. However if we study the results for Amazon we find that the net sales effect is insignificant. One possibility is that that the increase due to the sales substitution effect is cancelled out by the negative sales dampening effect due to a portion of the customers completely leaving the market due to the lack of a showroom to evaluate the products.

### Table 2: Results of Regression for the Sales Effect

<table>
<thead>
<tr>
<th></th>
<th>log(AmazonMonthlySales) (Standard Error)</th>
<th>log(DellMonthlySales) (Standard Error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient Value (\beta_2)</td>
<td>0.008 (0.010)</td>
<td>-0.231*** (0.007)</td>
</tr>
<tr>
<td>Coefficient Value (\beta_4)</td>
<td>0.039 (0.031)</td>
<td>0.0390* (0.022)</td>
</tr>
<tr>
<td>Coefficient Value (\beta_5)</td>
<td>-0.0151 (0.033)</td>
<td>-0.0132 (0.023)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.115</td>
<td>0.072</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Time Controls</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>5059</td>
<td>1753</td>
</tr>
<tr>
<td>Number of zips</td>
<td>1991</td>
<td>848</td>
</tr>
</tbody>
</table>

Note: Standard errors in parenthesis, * sig. at 0.1, ** sig. at 0.05, *** sig. at 0.01

7.2. Online Search Effect

Table 3 shows that after the closing of the local Circuit City stores, we find a statistically significant 3.8% increase in the pages viewed per dollar spent in the treated group as opposed to the control group. This shows that search costs in the treated zip codes do increase after the Circuit City stores closed as compared to the zip codes where there were not Circuit City stores. This increase in search cost is dampened in the presence of a Best Buy showroom (-2.7%) due to some customers still using the Best Buy stores for showrooming purposes. This supports our speculation that after a showroom closes in a zip code the online search costs increase.

In contrast we find that the changes in Pages per dollar values for dell.com are not significantly different
between the treated group and the control group after the closing of the local Circuit City stores. This shows that there is little change in the search costs for dell.com customers. This aligns with our assumption that most of Dell’s customers are businesses that likely did not need to use the showrooming capabilities of Circuit City when it was present. Now these business customers have moved their purchases from Circuit City to dell.com (which is shown by the increase in sales effect) but did not necessarily search more at the dell.com site before making a purchase.

Table 3: Results of Regression for the Online Search Effect – PagesPerDollar & MinsPerDollar

<table>
<thead>
<tr>
<th></th>
<th>log(AmazonPages PerDollar) (Standard Error)</th>
<th>log(DellPagesPer Dollar) (Standard Error)</th>
<th>log(AmazonMins PerDollar) (Standard Error)</th>
<th>log(DellMinsPerDollar) (Standard Error)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient Value β2</td>
<td>0.011*** (0.004)</td>
<td>-.001 ** (0.0004)</td>
<td>0.009*** (0.003)</td>
<td>-.001*** (0.0004)</td>
</tr>
<tr>
<td>Coefficient Value β3</td>
<td>0.038*** (0.012)</td>
<td>0.0004 (0.001)</td>
<td>0.027*** (0.011)</td>
<td>0.0002 (0.001)</td>
</tr>
<tr>
<td>Coefficient Value β4</td>
<td>-0.027** (0.013)</td>
<td>0.0005 (0.001)</td>
<td>-.0156 (0.011)</td>
<td>0.0006 (0.001)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.099</td>
<td>0.078</td>
<td>0.093</td>
<td>0.070</td>
</tr>
<tr>
<td>Fixed Effects</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Time Controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>5059</td>
<td>1753</td>
<td>5059</td>
<td>1753</td>
</tr>
<tr>
<td>Number of zips</td>
<td>1991</td>
<td>848</td>
<td>1991</td>
<td>848</td>
</tr>
</tbody>
</table>

Note: Standard errors in parenthesis, * sig. at 0.1, ** sig. at 0.05, *** sig. at 0.01

Similar to the previous results we find that the minutes per dollar of sale for Amazon increases by 2.7% in the treated group than in the control group after the closing of the local Circuit City stores. This result supports our earlier finding that there is an increase in search costs after the Circuit City store was closed. And as before the presence of a Best Buy store in the vicinity dampens this increase in search costs (although not statistically significant). We also find that for Dell (this is an example) customers, the changes in the minutes per dollar of sale after the closing of local Circuit City stores are not significantly different between the treated group and the control group, which is consistent with our expectation that business customers likely moved their purchases from the brick and mortar store to dell.com and were not necessarily seeking more product information online due to the store closure. Similar to the previous case we find the search costs for Dell remain relatively unchanged.

From this section there is clear evidence to support the Showrooming Effect.

8. Conclusions, Managerial Implications and Future Work

In this research, we have studied the impact of showrooming on consumer search and purchase in the presence of competition. By using a difference-in-difference approach, we examined the changes in customers’ online product information search and purchase patterns in the electronics categories before and after the abrupt closedown of local Circuit City stores and were able to quantify the benefit of having a physical showroom to the online retailers such as Amazon and Dell.

A significant methodological contribution of this paper is our approach of measuring the effect of showrooming using online search intensity. This enriches the common approach that values showrooming only through sales. The significant increase in online search intensity for amazon.com suggests that customers who were used to searching for product information at a showroom now have to search more at the online retailer. In contrast, the search intensity remains unchanged for an online retailer catering primarily to enterprise customers, such as Dell. This indicates that the closure of a showroom migrates enterprise customers who require little showrooming to the online channel.

There are several managerial implications of our research results both to the providers of showrooming (brick and mortar stores) as well the beneficiaries (competing online retailers). From our research we have shown that once a showroom closes the online market place will be flooded with customers who are seeking product information more intensely than before. Managers of online retailers should be ready for this increase in information seeking customers by providing better search algorithms and product

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information systems such as videos, pictures and specifications.

Also for the beneficiaries, showroaming is an important aspect of online sales as shown by our research. Physical kiosks opened by large online retailers such as Amazon are moving in the right direction in providing tangible product information to customers which will positively impact their sales. Such retailers should also explore other virtual showrooms such as the one by online clothing and accessory retailers. For example Divalicious⁶, a mobile shopping app lets users “try on” apparel on virtual mannequins. Shoppers would upload their own images and then can view how they would look in the selected products.

On the provider side, for the brick and mortar stores, showroaming is indeed a real threat. Search intensities on online stores are lower in the presence of a showroom, which means that there exist potential customers visiting stores who do not purchase. Hence managers of showrooms should provide ways to keep the customers coming and entice them to make the purchases. Since a big attraction of online retailers is lower price, the brick and mortar stores can implement “no questions asked” price matching in their showrooms. Best Buy in 2013, very boldly, implemented a full price matching scheme in order to “kill” showroaming. Although the jury is still out in the success of this price matching effort, our research shows that this is a step in the right direction.

As future research we are planning on further segregating the sale goods by their product features such as experience vs. search goods. It is expected that showroaming will be more evident with experience goods due to their very nature as compared to search goods.

10. References


