Retail channel price discrimination

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ABSTRACT

This paper examines price differentials of identical items across retail channels. Many consumer packaged goods are sold through both grocery and drug stores. Liquor is unique in that in much of the country there is a third retail channel of distribution, liquor stores. If consumers in each retail channel differ in their willingness to pay for certain items, then sellers can exploit those differences and charge different prices for the same items in each channel. We examine a unique data set of pooled cross sectional retail scanner data on wine to test whether sellers use retail channel to identify heterogeneous consumer market segments and engage in price discrimination. We begin by presenting a model of price discrimination by retail channel along with behavioural assumptions regarding shoppers in each channel. Next we examine sales by retail channel and find persistent price differentials for the same item across retail channel after controlling for sample selection bias and seasonality. Lastly, we estimate the price elasticity of demand correcting for endogeneity and find differences across channel consistent with the price differentials. The extent of price differential, however, differs significantly with respect to price point.

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1. Literature review

This paper investigates the difference in price of identical items across retail channel. We argue that these retail channel price differentials are a form of first degree or market segmented price discrimination in which consumers, who differ in their price elasticities of demand, self-select themselves into each retail channel. Modern concepts of price discrimination in non-competitive markets go back at least to Pigou (1920), whose categorization of price discrimination into first, second and third degree is still used today. Robinson (1933) elaborated on the conditions required for firms to engage in effective third degree price discrimination, namely that there exist identifiable market segments that differ in their price elasticities of demand. Using this background, Blattberg and Sen (1974, 1976) and Blattberg et al. (1978) show how market segmentation based on identifiable demographic characteristics can be effectively exploited. More recently, Hoch et al. (1995) use scanner data to show how demographic characteristics can be used to price discriminate by store location. Where differences in price elasticity are not easily identifiable, Moorthy (1984) provides a model where firms exploit differences in consumer preferences across market segments by offering product variants at different prices, allowing consumers to self-select among those products. More generalized models of price discrimination in contestable markets with differentiated products have been developed by Salop and Stiglitz (1977), Narasimhan (1984), Borenstein (1985) and Holmes (1989). The type of consumer behavior closest to that examined in this paper is that of Narasimhan (1984), who presents a model of coupon use as a form of price discrimination for identical goods. Specifically, Narasimhan presents a model in which consumers, who differ in their price elasticity of demand, self-select themselves into coupon use based on comparing the savings associated with using coupons with the opportunity cost of using coupons. We extend this model by allowing consumers to compare the savings associated with one retail outlet with the associated opportunity cost as defined in Kahn and Schmittlein (1989) and Bell et al. (1998).

Finally, with respect to retail channel, Gerstner et al. (1994) examine price discrimination by retail channel, however, their paper concentrates on the effect of retailer mark-up on the size of discount offered, while Park and Keh (2003) look at the effect of manufacturers utilizing both the traditional retail channel as well as selling direct to consumers. Our paper, on the other hand, provides a unique perspective on the use of retail channel itself as a means of price discrimination.

2. A model of price discrimination

We model retail channel as a form of market segmentation. Just as coupons serve as a means of consumers self-identifying...
themselves into market segments according to their price elasticities of demand (Narasimhan, 1984), retail channel can serve a similar function. From the consumer's perspective, purchasing some goods at a lower cost retail channel provides an alternative as long as the savings associated with shopping at that channel are greater than the costs. In this context, choice of retail channel is consistent with Narasimhan's (1984) model of coupon usage on several dimensions. First, both coupon usage and retail channel are decisions of self-selection by rational utility maximizing consumers. Second, consumers will decide to purchase a specific product at a lower priced retail channel as long as the savings associated with shopping at that channel are greater than the opportunity cost required to search, travel to, and shop at that channel for the specific good in question. This is analogous to the model of coupons where usage depends on the savings being greater than the opportunity cost in time required to search, clip (print etc.), store, organize, retrieve and use coupons. Finally, both coupon usage and choice of retail channel are decisions consumers make based on the potential savings on individual products and not overall savings on all products. Specifically, we do not assume that some retail channels are more or less expensive for all or even most products, but rather that some retail channels are more or less expensive for one particular product.

From the firms' perspective, it will engage in price discrimination as long as the marginal revenue from price discrimination is greater than the marginal cost. While price discrimination is generally associated with monopolistic or oligopolistic industries, models of price discrimination in differentiated product markets have been developed by Borenstein (1985) and others.

In its simplest form, given ‘r’ different market segments, which differ in their price elasticities of demand, and for whom arbitrage among the market segments is costly, we can investigate discriminatory behavior by examining the firms’ profit function,

$$\Pi = \sum_{i=1}^{r} TR_i(Q_i) - TC(Q),$$

where:

- $i$ denotes the different market segments identified by the firm.
- $TR_i(Q_i)$ represents total revenue in market $i$ from unit sales $Q_i$.
- $TC(Q)$ represents total cost of production across all three channels so that $Q = \sum_{i=1}^{r} n_i Q_i$.

Profit maximization results in the usual first order conditions:

$$\frac{\partial TR_i}{\partial Q_i} - \frac{\partial TC}{\partial Q_i} = 0, \forall i$$

If we assume costs are common to all markets ($Q_i$ is identical) we can rewrite the optimizing condition as,

$$\frac{\partial TR_i}{\partial Q_i} - \frac{\partial TC}{\partial Q_i} = 0, \forall i$$

which produces the familiar condition that $MR_i = MC$.

Since

$$TR_i = P_i Q_i,$$

$$\frac{\partial TR_i}{\partial Q_i} = P_i + Q_i \frac{\partial P_i}{\partial Q_i}, \forall i$$

which can be rewritten to express in elasticity form,

$$MR_i = P_i(1 + \frac{1}{\varepsilon_i}), \forall i$$

For our three-market (channel) scenario, this results in

$$P_1 \left(1 + \frac{1}{\varepsilon_1}\right) = P_2 \left(1 + \frac{1}{\varepsilon_2}\right) = P_3 \left(1 + \frac{1}{\varepsilon_3}\right).$$

In this form we see that the price in each market is inversely proportionate to the absolute value of the price elasticity of demand in that market. That is, $P_1 < P_2 < P_3$, if $|\varepsilon_1| > |\varepsilon_2| > |\varepsilon_3|$.

3. A model of consumer behavior

We view channel price discrimination similar to that of coupon usage in which consumers self-identify themselves for coupon usage by comparing the marginal cost with the marginal benefit. We propose that consumers self-select themselves into each retail channel (drug, food and liquor store) based on demographic characteristics and shopping intent. As with coupons, shoppers then compare the cost and benefit of searching out a lower priced good, in this case, a bottle of wine.

Consider first, drug store shoppers, who can be characterized as one of two groups. Drug store shoppers can be considered category specific shoppers, ostensibly shopping for goods other than wine. In this case, wine may be considered an unplanned purchase, which Bucklin and Lattin (1991) show have a relatively high price elasticity of demand. Drug store patrons may also consist of quick or fill-in shoppers, who as Kahn and Schmittlein (1989) show, tend to have “smaller-sized families, lower incomes ... and more retired”, a group that we would expect to purchase relatively lower priced wines and to have a relatively high price elasticity of demand. For drug store shoppers, both shopping intent and demographic characteristics would lead to greater price sensitivity.

In contrast to drug store shoppers, for whom wine may be an impulse good, wine more likely to be part of a larger shopping list or basket of goods for grocery store shoppers who make more infrequent regular shopping trips. Kahn and Schmittlein (1989) and Bucklin and Lattin (1991) show that these types of shoppers tend to be from a larger family, which would increase search costs, and from families with a higher incomes, which would decrease price sensitivity.

Liquor store shoppers on the other hand have a specific shopping intent. Category specific shopping of this type tends to reduce search cost and decrease price sensitivity (Bell et al., 1998).

Based on the search costs, shopping intent and demographic characteristics we expect drug store patrons to be the most price sensitive, followed by grocery store shoppers and liquor store shoppers: $\varepsilon_{\text{Drug}} > \varepsilon_{\text{Grocery}} > \varepsilon_{\text{Liquor}}$. If this is the case, then we should observe prices for the identical wines to cheapest at drug stores, more expensive at grocery stores and most expensive at liquor stores: $P_{\text{Drug}} < P_{\text{Grocery}} < P_{\text{Liquor}}$.

4. Data

We use scanner data of retail purchases of wine in the US to investigate price differentials across three retail channels: Drug stores, food or grocery stores and liquor stores. Retail scanner data, provided by proprietors such as Information Resources Incorporate (IRI) and the Nielsen Company, is increasingly becoming the primary source of data for analytics in the consumer packaged goods industry due to the ready availability of data at the item level on factors such as price, quantity, promotional activity and sales channel. In this paper, we use Nielsen Scantrack data to construct a pooled cross section of data on point of sale purchases of wines from major U.S. retail chains, for the years 2007–2010. The data consist of national sales of all wines, foreign and domestic, purchased from major retail chain stores, defined as those with sales of over 2 million dollars per year. The data are aggregated for all markets and include the price paid, quantity sold, store keeping unit (SKU) and retail channel of each item. For uniformity, we concentrate on wine purchases of standard 750 ml
glass bottles (approximately 84% of all purchases) and exclude boxed wine, as well as smaller or larger bottles. The benefit of scan data is that it represents actual purchases of wine by consumers and is thus more reflective of the consumer demand than manufacturers’ suggested retail price. The drawback of scan data is that it only records purchases in major U.S. retail chains and does not represent wine sold on premise at wineries, purchases through wine clubs or purchases at restaurants. Despite these limitations, the scan data works well for our analysis of pricing behavior across major retail channels.

Furthermore, wine is unique in that it is sold through three retail channels, food, drug, and liquor stores. Finally, the wine industry provides an ideal example of a differentiated product market characterized by a high degree of price and non-price competition.

5. Summary statistics

The data used to examine retail channel price differentials consist of 44 four-week periods from 2007 to 2010. Each period contains approximately 14,000 unique items sold. However, not all items are sold through all three channels. Cursory examination of mean prices can lead to spurious price differentials based on sample selection bias and not discriminatory pricing behavior. For instance, if drug stores sell wines with lower average prices than grocery stores, and liquor stores sell wines with higher average prices than grocery stores, then differences in mean prices across channels would be due to the differences in wines carried across the channels and not differences in the price of the same wines across channel. This is illustrated in Table 1 and Fig. 1, which shows summary statistics on prices for the full sample across channel.

Fig. 1 illustrates several points. To begin with, the width of high priced wines increases from drug to liquor stores with food stores selling a significantly greater range of high priced wines than drug stores, and liquor stores selling a greater range of high priced wines than food stores. Furthermore, Table 1 demonstrates that the maximum price at drug stores is approximately $43 compared with a maximum price at grocery and liquor stores of $178 and over $200, respectively. Obviously differences of this magnitude are the result of differences in the composition of items sold in each channel.

A closer examination of the data shows that the highest priced wine sold through drug stores channel was a Conn Creek Napa Valley Cabernet Sauvignon blend which sold for $42.68, while the highest priced wine sold through the food channel was an Opus One Red blend that sold for $177.97 and the highest priced wine sold through the liquor channel was a Penfolds Shiraz that sold for $223.72. Differences in the composition of items sold across channels are further illustrated by the difference in the number of observations across channels shown in Table 1.

5.1. Matched Sample 1

To control for the sample selection bias caused by the difference in the composition of items sold across channels, we examine two subsets of the data. The first subset contains only those items, matched by store keeping unit (sku), sold across all three channels in any specific period. Thus, in each period, only items of the same sku sold in all three channels in that period are analysed. Matched Sample 1 is illustrated in Fig. 1, and again shows a monotonically increasing relationship across the three channels, albeit, with significantly less variation in prices across each channel. Note also, that the highest prices are significantly lower than in the full sample and are more similar across channels. Table 1 confirms the graphical display, showing that the highest prices differ by less than twenty dollars across channels compared to a nearly two hundred dollar differential in the full sample. Table 1 also shows that the number of items sold across channels is nearly identical.

Fig. 2 shows the price difference for identical bottles of wine sold at grocery stores and drug stores in Sample 1. Differences greater than zero indicate wines at drug stores priced higher than the same wines sold at a grocery store, and differences less than zero indicate drug store prices less than the same wine sold at grocery stores. As can be seen from Fig. 2, not all wines sold at drug stores are priced lower than the same wine at grocery stores. However, for the majority of wines in the sample, drug store prices are lower than grocery store prices for the same wine.

Fig. 3 shows the price difference for identical bottles of wine sold at liquor stores and grocery stores in Matched Sample 1. Once again, Fig. 3 makes clear that not all wines sold at liquor stores are more expensive than the same wine sold at a grocery store. However, for the majority of wines in the sample, prices paid at liquor stores are greater than those paid at a grocery store for the same wine.

5.2. Regression specification

While the summary statistics in Table 1 and Figs. 2 and 3 indicate a consistent pattern of price differentials, we now take a closer look at retail channel price differentials. We estimate the following semi-log fixed effects hedonic model of price...
differentials:

\[ \text{In } \text{Price}_{ijt} = \beta_0 + \beta_1 \text{Drug}_{ij} + \beta_2 \text{Liquor}_{ij} + \beta_3 \text{Month} + \Omega \text{Year} + \gamma \text{Brand} + \phi \text{Varietal} + \delta \text{Country} + u_{ijt} \] (1)

The model specifies the price of each bottle of wine \((i)\) as a function of channel \((j)\) at time \((t)\), where:

- \(\text{InPrice}_{ijt}\) is the natural logarithm of price for each unique bottle of wine \(i\) sold in market \(j\) at time \(t\).
- \(\beta_0\) is the intercept.
- \(\beta_1\) and \(\beta_2\) are coefficients for drug vs. liquor stores.
- \(\beta_3\) is the price differential coefficient for the month variable.
- \(\Omega\) is the coefficient for year.
- \(\gamma\) and \(\phi\) are the price differential coefficients for brand and varietal.
- \(\delta\) is the coefficient for country of origin.
- \(u_{ijt}\) is the error term.

We estimate the price differentials in Eq. (1) using a fixed-effects model for year, brand, varietal and country of origin. The initial regression results for each sample are shown in column (2) of Table 2. The results from Table 2 indicate that, on average, the price of a bottle of wine sold at a drug store is approximately 7.8% lower than the same bottle of wine sold at a grocery store while for wines sold at liquor stores, prices are approximately 4.1% more, on average, than the same bottles of wine sold at a liquor store. Both results are statistically significant at a 1% level of significance.

5.3. Econometric issue #1-sample composition

While we control for the sample selection across channel, it should be noted that the wine market is highly segmented by price. To control for the difference in the composition of wines sold across channel, we construct three wine price segments: Under $10 per bottle, $10 to under $20 per bottle and over $20 per bottle. Fig. 4 shows the distribution of mean monthly cases sold through each channel by sample. As Fig. 4 clearly shows, food or grocery stores have the highest volume of sales across all price segments in Matched Sample 1. However, moving up price segments, drug and food stores decline in sales volume while liquor stores increase sales volume.

Regression results by price segment are shown in columns 3–5 in Table 2. For the lowest price segment, under $10 per bottle, drug store prices are on average 8% lower than liquor store prices while liquor store prices are 5.3% greater than grocery store prices for the same bottles of wine. Both results are statistically significant. For the $10 to under $20 per bottle price segment, prices at drug stores are 6.3% lower than liquor store prices, while liquor store prices are 6% greater than grocery stores. Both results are statistically significant at the 1% level of significance. For the highest price segment, $20 and over, drug store prices are 2% lower, while liquor store prices are 1% higher than grocery store prices. Both results are statistically significant.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Price differential regression results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Matched Sample 1</td>
</tr>
<tr>
<td></td>
<td>All wines</td>
</tr>
<tr>
<td>Drug</td>
<td>-0.078***</td>
</tr>
<tr>
<td>Liquor</td>
<td>0.041***</td>
</tr>
<tr>
<td>Constant</td>
<td>2.936***</td>
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<tr>
<td>Observations</td>
<td>79,835</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>0.910</td>
</tr>
</tbody>
</table>

Coefficients for month, brand, country and varietal omitted.
Robust p-values in brackets.

\(^* p < 0.01, ^{**} p < 0.05, ^{***} p < 0.01.\)
5.4. Econometric issue #2-sample consistency

In Matched Sample 1 we examine only those items sold across all three channels. However, not all items are sold in all three channels in all 44 periods. While we do control for seasonal variations in price, we also examine a final matched sample of only those items sold in all three channels in all 44 periods. This is shown in Fig. 5 and Table 1 as Matched Sample 2. Fig. 5 demonstrates two relevant characteristics about Matched Sample 2. First, the average price of items sold in all three channels in all periods is less than those in Matched Sample 1. Second, there is less variation in prices across channels in Matched Sample 2 than in Matched Sample 1.

Regression results for Matched Sample 2 are shown in Table 2 columns 6–9. For all wines, price differentials are consistent with those of Matched Sample 1 with drug store prices are 5.6% lower, and liquor store prices are 4.7% higher than grocery stores. Both results are statistically significant. Similarly, for the under $10 price segment, drug store prices are 1.6% lower than grocery stores prices, with liquor store prices less than 1% higher. While the direction of the price differentials is consistent with those of Matched Sample 1, only the results from drug stores are statistically significant. For the $10 to under $20 price segment, our results show that both drug store and liquor store prices are less than grocery store prices. The results for the $20 and over price segment are inconsistent with our previous results showing drug store prices greater than grocery store prices and liquor store prices less than grocery store prices. These results may be driven by a relatively small sample size.

5.5. Econometric issue #3-endogeniety

Price discrimination occurs when differences in prices are based on differences in consumers’ willingness to pay and not on cost differences. One potential confounding factor is if the observed price differentials are driven by cost differentials due to quantity discounts on the part of wine producers or distributors. That is, what we may be observing is not third degree price discrimination based on market segmentation, but rather costs differences at the retail level resulting from second degree price discrimination by producers or distributors. While we do not have data on costs, we can observe average volume sold through each channel.

Fig. 6 shows average monthly sales in cases by retail channel and price segment for Matched Sample 1. As is evident from Fig. 6, food stores sell by far the most wine followed by liquor stores with drug stores selling the least amount. This is true especially at the lowest price segment where the price differential is greatest. If the price differentials were based on quantity discounts, then grocery stores should have the lowest prices followed by liquor stores and drug stores. Since drug stores have the lowest observed prices, followed by food and liquor stores, second degree price discrimination on the part of producers or distributors seems unlikely.

6. Price elasticities

The data examined shows a clear and consistent pattern of price differentials across retail channel. Specifically, wines at drug stores are consistently priced lower than the same wines at grocery stores, while wines at liquor stores are consistently priced above those same wines at grocery store prices. Moreover, we...
have shown that these price differentials are greater for high volume wines than for lower volume wines.

Opportunities for price discrimination exist when market segments differ in their price elasticities of demand. Theoretically, if $P_{Drug} < P_{Grocery} < P_{Liquor}$, then $|\epsilon_{Drug}| > |\epsilon_{Grocery}| > |\epsilon_{Liquor}|$. The previous section demonstrated that the price of a bottle of wine at a drug store is less than the same bottle of wine at a grocery store, which is less than the same bottle of wine at a liquor store. We turn now to estimating the price elasticity of demand for wine across all three channels. To estimate the price elasticity of demand across channel, we use a standard double log demand specification of the form:

$$\ln(Cases_{ijt}) = \beta_0 + \beta_1 \ln(Pric_{ijt}) + \beta_2 Drug_{it} + \beta_3 Liquor_{it} + \beta_4 Income_{i} + \lambda Month + \omega Year + \gamma Brand + \phi Varietal + \theta Country + u_{ijt}$$

(2)

Drug is a vector including an indicator for drug store sales as well as an interaction between the indicator and log price. Liquor is a vector including an indicator for liquor store sales as well as an interaction between the indicator and log price. Income is the natural logarithm of income in period “t”. Month, Year, Brand, Varietal and Country are defined as in Eq. (1).

We estimate the price elasticities in Eq. (1) using a fixed-effects model for year, brand, varietal and country of origin. The regression results are shown in Table 3 and illustrate a few noteworthy points. To begin, across samples and price segments, the model explains a significant portion of the variation in cases sold. Additionally, the price elasticities across channel and price segment are all negative, indicating the “law of demand” remains intact. Furthermore, our results for all wines, which ranges from −1.26 for drug stores to −0.89 for grocery stores are similar to that of Cuellar and Huffman (2008) who find a price elasticity of demand of −1.232 and Fogarty (2006) who find a mean price elasticity of −.77. These values are, however, somewhat lower than those found in Bijmolt et al. (2005) who find a mean price elasticity of −2.62. Consistent with our hypothesized results, Table 3 indicates that consumers at drug stores are more price elastic than consumers at grocery store. These results are all statistically significant and are generally consistent across price segment and across sample, except for the last two price segments of Matched Sample 2. The estimated price elasticities for liquor stores are mixed. While the regression results indicate that liquor store consumers are less price sensitive than those at grocery stores in the highest price segment, the results for the lower price segments indicate a greater price elasticity of demand at liquor stores. While these results appear contrary to our hypothesized relationship, these results are consistent with the conjecture that liquor store sales are concentrated in the upper price segment. These results are also consistent with the observed price differentials which were smaller than those observed for drug stores. In this context, our results are consistent with the condition required for price discrimination. That is, $|\epsilon_{Drug}| > |\epsilon_{Grocery}| > |\epsilon_{Liquor}|$.

6.1. Econometric issue #4-identification

Estimating the price elasticity of demand inevitably raises questions about endogeneity and identification (Andrews et al., 2011; Cuellar and Huffman, 2008; Fogarty, 2006; Villas-Boas and Winer, 1999). To correct for endogeneity we use lagged price as a readily available instrument for current price. Our results are shown in Table 4. Note from Table 4 that the estimated price elasticities are uniformly lower than the OLS estimates in Table 3, although the magnitude of the difference is not generally significant. For all wines, the price elasticity of demand from the OLS estimate is −.738 while the estimated elasticity from the IV regression is −.899. In addition, the differences in price elasticities across channels are generally similar to those of the OLS estimates.

7. Discussion

We find that retail channel is used as an effective means of price discrimination. Just as coupons and rebates offer discounts to low willingness to pay consumers whose opportunity cost of time is less than the associated savings or rebate, retail channel provides a similar opportunity for discriminatory pricing based on consumer self-selection. We show that drug stores offer a
selection and prices consistent with lower income and low opportunity cost shoppers. This is illustrated by Figs. 4 and 6 which show that the sales of wine at drug stores decrease as you move up each price segment. Because drug stores carry fewer items in total than grocery stores, drug store shoppers may represent more frequent “fill in” or quick shopping trips consisting of smaller “shopping baskets” than grocery store shoppers. As Kahn and Schmittlein (1989) note, “quick [shoppers] have lower incomes, more older males and older females and more retired people” than regular shoppers. In addition to demographic characteristics, shopper intent may play a role in the lower prices observed at drug stores. If the primary purpose of shopping at a drug store is to purchase items other than wine, then offering a price lower than other retail outlets is an efficient means of enticing marginal consumers. This is consistent with the behavior observed by Bucklin and Lattin (1991) who show that consumers are more price responsive when purchases are unplanned. The greater price elasticity of demand estimated for drug store shoppers supports both these explanations.

Grocery stores are the largest of the three retail channels for wine but one whose market share falls as you move up the price segments. In contrast to drug store shoppers, wine, on average, can be assumed to be part of a larger shopping list or basket of goods that are purchased on more infrequent shopping trips. Such shoppers, according to Kahn and Schmittlein (1989) tend to be from larger families with higher incomes. We show that these larger, high income families, who have a higher opportunity (or search) cost of shopping, pay more for an identical bottle of wine than drug store shoppers. While the typical grocery store shopper may not be aware of the lower prices of wine at a drug store, it is not clear that

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this knowledge would result in an additional shopping trip. For example, even if the typical grocery store shopper knew that an identical wine can be purchased at a drug store for less, they must weigh the costs of an additional shopping trip against the associated savings. The costs associated with an additional shopping trip include the time needed to travel to a drug store including parking, the in-store shopping time and the check-out time. Travel time may or may not be a significant cost since many shopping centers have grocery, drug and liquor stores located in the same center or even adjacent to each other. Shoppers must still, however, weigh whatever costs they incur with the potential savings. Given that the potential savings would be approximately 4% to 8%, with the greatest savings being on wines less than $10 per bottle, the savings may not be enough to cover the costs of an additional shopping trip. This relative price inelasticity is consistent with our estimated price elasticity as well as the shopping behavior of those on planned trips observed by Bucklin and Lattin (1991).

Finally, in contrast to drug and grocery stores, liquor store sales increase as you move up the price segments indicating that shoppers at liquor stores are more likely to purchase more expensive wines. Additionally, liquor store patrons are ostensibly category specific shoppers with a specific shopping intent, namely to buy liquor. As Bell et al. (1998) note, while category specific stores reduce the search costs of shopping for that category, this specific shopping intent increases insensitivity to price. This is confirmed by our estimated price elasticities of demand for liquor store shoppers as well as our results that show liquor store prices are on average greater than drug and grocery store prices for the same wine.

8. Conclusion

Increased competition both domestically and internationally has led firms to seek new sources of revenue. Price discrimination across all dimensions, time, space, demographic characteristics and offline versus online is one means of extracting surplus from consumers. The proliferation of social network coupon sites is an illustration of this. We show that use of retail channel is an effective means of price discrimination based on demographic self-selection and shopping intent. While the current research shows a clear and consistent pattern of discriminatory price differentials for a single category of goods, wine, there is no reason to believe that other categories are not following similar behavior. If not, we show that the opportunity may exist.

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